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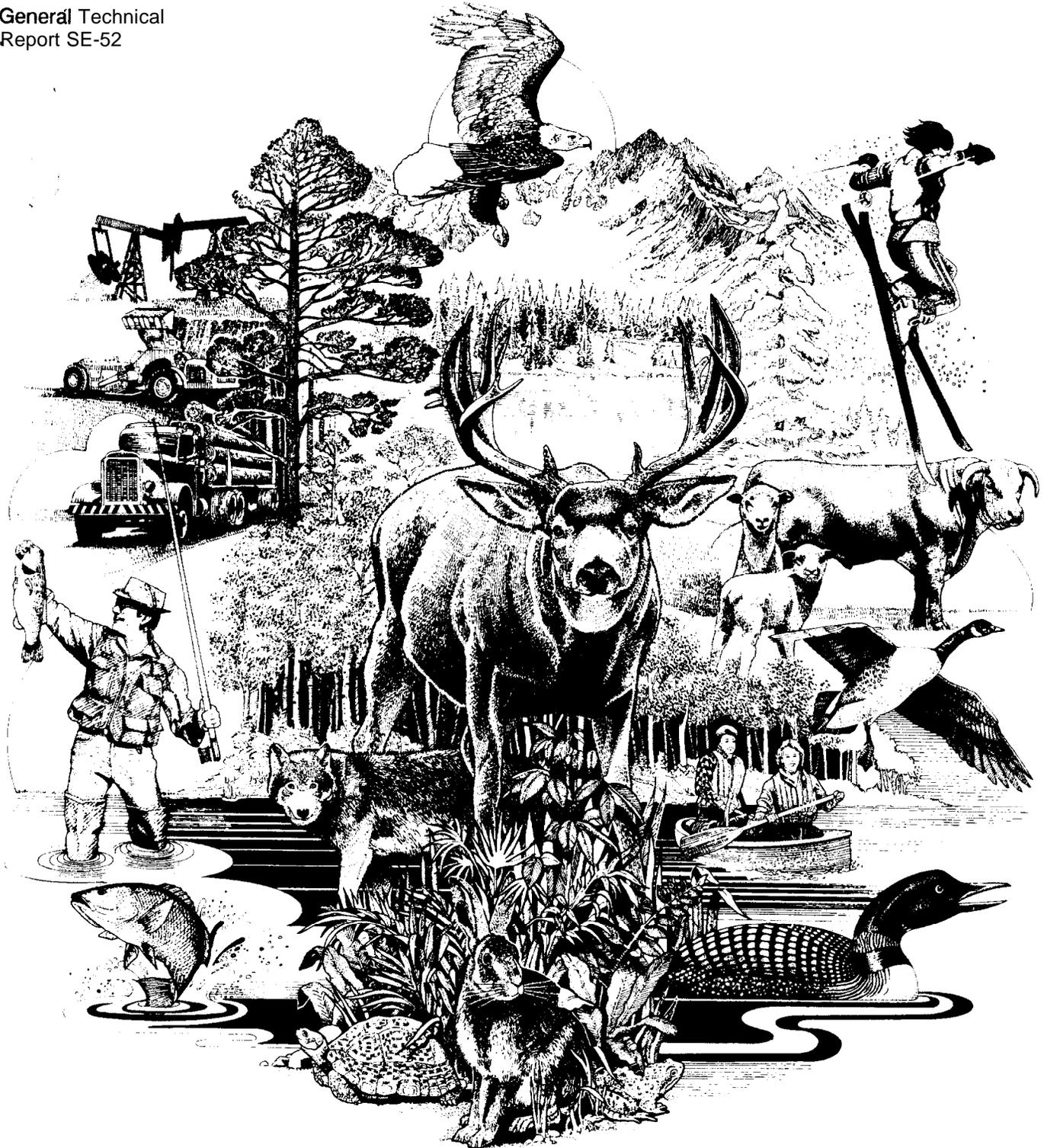


Southeastern Forest
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Outdoor Recreation Benchmark 1988: Proceedings of the National Outdoor Recreation Forum

Tampa, Florida
January 13-14, 1988



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*Outdoor recreation is
life rejoicing in the outdoors.*

*John Fedkiw
January 1988*

December 1989

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NATIONAL OUTDOOR RECREATION FORUM

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ACKNOWLEDGMENTS

BENCHMARK 1988: A National Outdoor Recreation and Wilderness Forum was the first national recreation assessment meeting. The need for this meeting grew out of the desire to incorporate scientific, planning, and administrative peer review into the 1989 RPA Assessment of Outdoor Recreation and Wilderness. This meeting brought together many university and government scientists, State and Federal planners, and Federal agency administrative policy decision makers to review and discuss the status of outdoor recreation and wilderness in the United States. The opportunities for interaction among these participants was expected to help make the RPA Assessment, and subsequent Program recommendations, more relevant to those who are affected and better grounded to a baseline of fact and prevailing opinion.

The BENCHMARK Symposium and these subsequent Proceedings are unique. The papers presented are intended to assess the current state of outdoor recreation and wilderness demand and supply and to project future changes. They contribute substantially to our understanding of expected impacts on social, economic, and environmental dimensions of our country that might result from projected changes in outdoor recreation and wilderness demand and supply. Opportunities and barriers to improved resource management, policy, education, research, and legislation are also a major part of these assessment papers. This effort to apply research knowledge into an assessment of outdoor recreation

and wilderness and to consciously project future impacts and actions should contribute substantially to meeting the recreation needs of the American people in the future.

Primary sources of support for this meeting and subsequent Proceedings were few but strong. We wish to acknowledge first the Southeastern Forest Experiment Station, USDA Forest Service, Outdoor Recreation and Wilderness Assessment Unit for the original idea, motivation, funding, and cooperation. The Intermountain Research Station, USDA Forest Service; the Department of Recreation and Leisure Services, Georgia Southern College; and the Department of Parks, Recreation and Tourism Management, Clemson University, also contributed support to the planning and conduct of the meeting and the publication of these Proceedings.

The contributing authors are congratulated on their presentation of information, exchange of constructive comments, and development of a timely manuscript according to the deadlines and guidelines that we imposed. Finally, and most of all, we wish to acknowledge the efforts of those who were the quality control officers in this activity to assure credibility in the conclusions that were drawn. On the following pages we have listed the Lead Scientists who coordinated paper development and the distinguished speakers and individuals who sacrificed their time to review and comment upon the papers submitted for publication.

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DEDICATED TO DR. MARION CLAWSON

Rarely does a person possess such intellect and drive that they soon become the thought leaders of their chosen field. In the field of natural resources economics Dr. **Clawson** is one of those very special people. Every student of outdoor recreation or of environmental economics has read or been influenced by Dr. Clawson's works. His efforts to help establish and support the Outdoor Recreation Resource Review Commission, to develop the travel cost method, to conceptualize a measure of the effectiveness of supply, to understand the social relevance of National Forests, and the list goes on, are hallmarks of our profession. None of the papers published in these proceedings is without Dr. Clawson's influence. Most reflect extensions, applications, and refinements of concepts and theories that, because of his efforts, are now commonly used in outdoor recreation economics, research, and management. It is with great pride and humility that we, the editors and contributors to the Benchmark Forum, dedicate these proceedings to Dr. Marion **Clawson**, Senior Fellow Resources for the Future.



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Section 1.

General Trends and Issues



TWO GENERATIONS OF HISTORY OF OUTDOOR RECREATION

Marion Clawson¹

Abstract -The 70 years from 1900 to 1970 constitute two human generations. These years were critical for the development of outdoor recreation as we know it today. An understanding of these two generations is basic to a consideration of the present and future problems involving outdoor recreation. This paper stops at 1970, leaving the consideration of recent trends and the present situation to George Siehl. In a single relatively brief paper, one obviously cannot consider all aspects of two generation's history. What follows is an overall survey of those aspects of this period which were most important to outdoor recreation.

AMERICANS LOVE THE OUTDOORS AND REVEL IN OUTDOOR RECREATION

The one constant factor in these two generations has been the love of the outdoors and the delight in outdoor recreation by nearly all Americans. This attitude has been expressed in many ways over the years, and by different persons. Some have engaged in specific actions in the outdoors, in many different forms and ways. Some have spent considerable sums of money, that they might engage in outdoor recreation of one kind or another, or that they might have the opportunity to enjoy the outdoors. There has been extensive literature, describing and glorifying the outdoors and the wilderness, and painters and photographers have found inspiration in natural scenes. Many governmental actions, including legislation and appropriations, have been concerned with the outdoors and with outdoor recreation. It would perhaps be too much to assert that Americans have been unique, among people of the world, in their love of the outdoors. But surely there are many other countries and many other peoples whose enjoyment of outdoor recreation, especially by the average citizen, is less than is ours. I do not assert that every American is a lover of the outdoors and of outdoor recreation. We all know that some people are repelled by natural conditions, afraid of any area not paved over, or uninterested in the natural scene. But these less appreciative persons do not dominate the national scene; instead, ours is a country of Nature lovers and outdoor recreationists – always has been, and probably always will be.

¹Senior Fellow Emeritus, Resources for the Future, Washington, DC.

THE SOCIAL, ECONOMIC, AND TECHNOLOGICAL FRAMEWORK HAS CHANGED

If love of the outdoors and desire for outdoor recreation have been constant in the two generations from 1900 to 1970, they have been almost the only constants. Nearly every other aspect of our social, economic, and technological society and culture has undergone major changes over these 70 years – changes which have directly affected present day outdoor recreation to a major degree.

While one might list and describe a great many changes of these two generations, I shall focus on five:

1. Population factors.
2. Per capita income.
3. Transportation.
4. Time off the job.
5. Recreation technology.

Each of these requires a brief exploration, even in a relatively short paper, and such exploration follows.

POPULATION CHANGES

In 1900 the total population of the United States was 76 million; in 1970 it was 205 million, or nearly three times as large. An increase of this magnitude in this period of time, as measured by generations, is impressive for any species. Such rapid and sustained growth always brings serious problems as well as great opportunities, and this has been true for the increase in human population in these decades of the 20th century. But there have been other aspects of population change in these decades that were as impressive, and as important for outdoor recreation, as was the great increase in total numbers.

In 1900 the United States was a rural society, with well over half of the total population living on farms and in small towns of less than 2,500 population. By the time of World War I, we had become half rural and half urban-the latter meaning living in towns and cities of 2,500 or more people. After 1920, and more particularly after 1950, there were two population relocations of great importance for modern outdoor recreation: 1) on a national scale, we were concentrating our people into urban groupings (cities), and 2)

within those urban groupings we were dispersing them to suburbs and to exurbia. These shiftings in population were accompanied by major changes in lifestyle, one aspect of which was a great emphasis upon the outdoors and upon outdoor recreation.

The increase in total population over these two generations was not at a steady rate. Birth rates slowly fell until about 1930, when they plunged downward during the Great Depression. More impressive and of larger scale has been the Baby Boom from about 1946 to about 1968, when I calculate there were 20 million extra births. This flood of babies created a wave of increased population, first in the schools, elementary, high school, and college – and then into jobs and housing. Today, the Baby Boom children are 20 to 40 years old, at young, biologically reproductive and economically productive ages. This is all very well today, and underlies much of our demand for housing, furnishings, consumption items of many kinds-and outdoor recreation. But, beginning in about 2020 and extending to 2050 before the last of these Baby Boomers has died off, there will be an abnormally large proportion of the total population in the aged classes. This will create special problems of health services, income transfers from productive ages to older persons-and, again, for outdoor recreation.

Even if there had been no Baby Boom, the population of this country would have aged in the future, compared with the past. Health conditions have improved to the point where more people live to older ages. The life expectancy at birth has gone from about 50 years for whites in 1900 to over 70 years today, and may well increase further. Today, 80-year-old persons are as common as were 70-year-old persons when I was young. The Baby Boom accentuated and exacerbated the aging problem, but it would have arisen anyway.

During these two generations, the population has redistributed itself regionally, with the greatest growth rates in the sunbelt and with slower growth or actual declines in many other parts of the country.

During the first two decades of the 20th century, this country took in a lot of immigrants, more from southern Europe and fewer from northern Europe than during the 19th century. Immigration declined sharply after 1920 until 1950, but has increased greatly since then. The source of the immigrants has also changed, with more Hispanics and Asiatics than previously. The greatest impact of this new tide of immigration has been since 1970, and I leave to George Siehl the task of discussing it. But we can

safely say that users or potential users of outdoor recreation opportunity are today, and will be even more in the future, of different national origins and with different lifestyles and cultures than was the case a few decades ago.

PERSONAL INCOMES

Enjoyment of most forms of outdoor recreation requires the expenditure of money, either directly in the recreation activity by the recreationist, or indirectly in terms of clothing, food, and artifacts necessary for the recreation, or indirectly by the public agency or private group which provides the recreation opportunity. The ability and the willingness to spend money in any of these ways depends very much upon the level of average per capita income.

Comparisons of income changes over long periods of time are made difficult or confused by the great changes in price over the same periods, as well as by the fact that the availability and characteristics of many consumption items have also changed greatly. Our concern should be with real incomes-what people can buy and enjoy with their money. In real income terms, average per capita incomes increased by three or four times from 1900 to 1970.

The growth in real income per capita was not at a constant rate over these seven decades. There was good prosperity, for the times, in the 1920s; this was followed by the Great Depression of the 1930s, when incomes fell, on the average, and when millions of workers were unemployed-and this at a time when there were no Federal and only a few local programs of unemployment compensation, welfare, or aid to the needy. The 1950s and 1960s in turn were periods of prosperity, with nearly steadily rising real per capita income.

In real terms, Americans as a whole today are rich-rich by their own historical standards, rich by world standards today. We have long since passed our housing standard of one room per person, though this standard is a hopeless dream for most of the world's population. There are only a few houses in the United States today with outdoor toilets: they were nearly universal in 1900, in cities as well as in the open country. We heat and cool our houses to our comfort standards. Our national food supply is ample, varied, and cheap in relation to our incomes. There are more persons in the United States today who eat too much – more than is good for them-than there are persons who do not have enough to eat.

As a society, we have an enormous range of comforts, conveniences, and pleasures.

We also have a high degree of security for old age, in the form of Social Security, private pensions, and public welfare.

I hasten to add, before someone cries out in outrage, that not everyone in the United States today is equally fortunate – not only are there people whose standard of living is below average, which of course statistically there inevitably must be, but there are millions of people in real poverty. Poverty has been persistent and grave in our society from the beginning and continues today. Poverty is absolute, as when a person is hungry or ill-fed or when illness is not cared for by medical personnel; poverty is also relative, as when a person or family has absolute basics but lacks the amenities which peers or contemporaries enjoy. We have both in the United States today, but at levels of well-being even for the poor which would be considered near-luxury in the really low-income countries of the world. Poverty, both absolute and relative, extends to outdoor recreation as it does to every other aspect of life.

I speak with some feeling on this matter of richness and poverty. I have just published a book relating my professional life ("From Sagebrush to Sage: The Making of a Natural Resource Economist," Ana Publications, 4343 Garfield Street N.W., Washington, DC. 496 pages, paper, \$20 postpaid.) As I wrote this book and recalled my early life and the way we and everyone else lived, I realized, on a human as well as professional level, just how far Americans as a society have advanced during these past two generations. Believe me, the wisecrack that "rich is better than poor" is true.

Nearly three times as many people, each, on the average, with three or four times as much real income, has obviously meant that a great deal of money was available, and was spent, on outdoor recreation. Recreation as a whole, and outdoor recreation as one part of the larger range of activities, is big business in the United States today. Exactly how much money is involved depends on definitions, and I do not propose to explore this topic in detail. Some money is spent directly on outdoor recreation **activities**—entrance fees or boat-launching fees, for instance. Far more is spent for food and lodging as part of the recreation experience, and large sums are spent for equipment, including such general purpose equipment as the auto. Anyone familiar with outdoor recreation can supply, from personal experience, evidence of these expenditures.

TRANSPORTATION

One of the greatest changes in American life in the two generations from 1900 to 1970, and one with profound effects on outdoor recreation, was the development of new, faster, and more comfortable means of personal transportation.

In 1900, travel between cities was by rail, and travel within cities and rural areas, and from farm to town, was by horse-drawn vehicles. A buggy team walked about 4 miles per hour and trotted about 6 miles per hour. Fifty miles was possible but difficult in 1 long day; all horse-drawn travel was slow. Those were the days when horsepower literally meant horse power. Roads were typically tracks across the land, rarely graded to remove excess water, almost never graveled, and never paved. Muddy in wet weather and dusty in dry weather, they could be used by the primitive means of transportation then available. All travel was slow, uncomfortable, and costly in real terms, especially when the time of the travelers was counted among the costs. In 1900 there were only a few autos, confined to cities, and they were more toys than effective transport. Air travel was only a dream.

The period from 1920 to 1940 was when the automobile really came of age in the United States. Paralleling the improvement in autos and the production of what then seemed like large numbers of them was an improvement in roads – now more often graded, or graveled, and sometimes paved as well, though all slow by modern standards. Personal travel increased enormously. I have estimated that per capita travel averaged about 500 miles annually in 1900 compared with about 6,000 miles per capita annually in 1970. This is total travel, for all purposes. In the earlier day, very little of it was for recreation; at the later date, a large, though statistically unknown, proportion was for outdoor recreation.

During World War II all travel was restricted, automobile travel especially so. New cars, tires, and gasoline all were rationed. Total visitation to national parks, National Forests, and State parks fell by about two-thirds as a result of these restrictions on travel – a dramatic evidence of the role of transportation in outdoor recreation.

Since 1950, there have been further improvements in personal transportation. Cars are better, faster, and more comfortable, and roads are better. The new interstate highway system opened up long-distance travel by autos. Air travel has developed

enormously during these years. The combination of air and auto, by flying and renting a car, has given travelers the advantages of both kinds of personal transportation. International travel has also increased greatly.

These improvements in personal travel have directly affected outdoor recreation, including the planning for it. Faster, cheaper, and more comfortable transportation has greatly increased the supply of outdoor recreation available to the individual. Today one can drive 50 miles for a day of fishing when once it would have required a week's vacation. But improved transportation has also increased the demand for outdoor recreation at every site. The number of potential users has increased as travel has become faster, increasing the range of territory within effective travel distance. The greatest impact of improved personal transportation may have been on the recreation planner. No longer could he or she limit consideration to local or even State demands; instead, demands upon many areas have become national or international.

TIME OFF THE JOB

The word 'leisure' has such different meanings to different people that I am reluctant to use it. To some, it means idleness- a contemplation of nature, relaxed readings, perhaps a little gardening, and the like. To others, it simply means time not working or not engaged in necessary personal chores or not in sleep. Instead of talking about "leisure," I shall talk about time off the job. This time may be as active as any work and the available time may be as **over-**committed as is the available income. But outdoor recreation takes time- indeed, we normally measure it in terms of time, such as visitor-day, and outdoor recreation occurs during time off the job.

During the two generations from 1900 to 1970, there have been several kinds of relatively large changes in the amounts and timing of time off the job. The typical workday has shortened, from 10 or 12 hours to 8 or less, leaving time for recreation after work. The typical workweek has also shortened, from 6 or 7 days to 5 or fewer. Combined with the improvements in transportation, this means that today a person or a family may enjoy a weekend of outdoor recreation which once would have been impossible except in a longer vacation. There has also been a great rise in the paid vacation. Once nearly unknown (except for teachers, who often had to work at other jobs during school vacation in order

to eat), the paid vacation today is nearly universal in all but day-employment jobs. Moreover, once most paid vacations were for a week; today, we regard two weeks' vacation as miserly.

These changes in time off the job for employed persons are only part of the story of time available for outdoor recreation. There has been an enormous increase in the number of persons retired. The lengthened age span and the increased average incomes, described above, have combined to produce millions of retired persons with time available for outdoor recreation. Some may have health limitations, but many do not. Their interests in outdoor recreation may be different from those of the young adults, but the old people are an actual and a potential market for outdoor recreation, whether publicly or privately supplied.

Equally great in its social consequences has been the later entrance of young people into the labor force. I had my first full-time summer job when I was 13 years old, and from then on I was a member of the labor force seasonally. My experience was not unique for its day. Today, it is difficult to get a labor permit or a job for anyone under 16, or even under 18, and many young people do not work steadily, even in school vacations, until they are past 20 years old. And this is a most-active group for outdoor recreation-a group which often presents real problems to park managers. Many of these young people have money to spend for outdoor recreation. Those who have neither money nor jobs often present especially difficult problems of leisure time pursuits.

In spite of the great increases in time off the job, for almost all classes of the population, the possible range of activities is so great that the competition for time is often more severe than is the competition for money. The TV advertiser is willing to bring its program to the viewer without cash cost, if it can only get a few moments of attention to its advertising message. The businessman may be able to afford the money costs of a short vacation, if he can only get away from the office for a few days. The weekend camper who can easily afford the campground fee may be unwilling to wait in line to get in. And so on, for many other examples of time-money competition.

Clearly, all of these developments, and any others that might be cited concerning time off the job, have very great implications for the planner and manager of outdoor recreation. One must direct and operate his or her program to the time the client group has available.

RECREATION TECHNOLOGY

Lastly, let me briefly mention a subject about which every recreation specialist must surely be fully aware: the technologies available to outdoor recreationists have changed greatly over the two generations from 1900 to 1970. Indeed, the changes here have perhaps been as great, and as significant for the outdoor recreation professions, as any of the other changes I have briefly described.

By 1970, many forms of outdoor recreation completely unknown in 1900 were available to those who could afford them. Included here would be such means of outdoor recreation as snowmobiles, water skiing, scuba diving, hang gliding, and off-road vehicles. But the improvements in some of the old artifacts and appliances were perhaps even more important. Equipment for fishing, hunting, camping, picnicking, and every other recreation activity known in 1900 has improved greatly. When I was a boy and a youth, a bed roll was so heavy and bulky that it was about all one person could carry, and tents were even worse. Backpacking such equipment was more than anyone could do comfortably. If you went camping, you took either a team of horses and a wagon, or a string of pack animals. Although snow skiing was known in 1900, it was not really a sport then, but a means of personal transportation; no small part of its popularity today is due to the greatly improved equipment.

This matter of improved technology for outdoor recreation is so complex and so full of instances that a whole book could easily be written about it by persons sufficiently knowledgeable. I do not need to pursue this subject further for an audience of persons familiar with outdoor recreation, but only remind everyone to think over the changes that have occurred in his or her professional lifetime, and to consider the possibilities that may arise in the future.

PRIVATE AND GOVERNMENTAL ORGANIZATIONS

During the two generations from 1900 to 1970, there was a great development of private organizations and public agencies to provide outdoor recreation opportunity and generally to help people desiring outdoor recreation.

In 1900 none of the Federal agencies we now associate with outdoor recreation existed. The U.S. Forest Service was not created until 1905, the National Park Service until 1916, the Fish and Wildlife Service not until later, and the Bureau of Land Management's predecessor, the General Land Office, had no interest whatsoever in outdoor recreation. There were scarcely any State park organizations, and only relatively few city park agencies or departments. But the situation for private organizations was hardly different; there were only a few, rather weak and poorly financed, private organizations concerned directly with outdoor recreation.

All of this changed over the years, as new agencies were created and new organizations formed, and as older ones acquired more clout, including more funds. I shall not try to trace these developments in detail, for that would be a long story. But I urge younger workers in outdoor recreation to ask the oldtimers what it was like in the old days.

The greatest single event in public agency development in outdoor recreation during these two generations was the creation of the Outdoor Recreation Resources Review Commission and the publication of its report in 1962. This was the first official Federal acknowledgment of outdoor recreation as a proper governmental concern. The legislation creating the Commission had been carefully crafted by its sponsors to avoid or meet the criticism that outdoor recreation was a purely local matter, not the concern of the Federal Government. The ORRRC study and report had three major consequences for outdoor recreation in the United States:

1. It enormously heightened public awareness of and concern about outdoor recreation. While ORRRC did not hold public hearings and arouse popular involvement in the way that the President's Commission on the Outdoors did in the 1980s, it nevertheless did focus attention on outdoor recreation in a way that previously had been lacking.

2. It led to the creation of the Bureau of Outdoor Recreation, a Federal agency not managing land but directly involved in outdoor recreation. That agency has not survived as an independent organization. Many of us were always disappointed with its performance, but, nevertheless, it was important while it continued.

3. It led to the creation of the Land and Water Conservation fund, under which many billions of dollars were provided to Federal, State, and local agencies to acquire land and develop facilities for outdoor recreation. The possibility of getting Federal matching funds led many States, counties, and cities to float bond issues or otherwise provide funds for outdoor recreation, thus adding to the Federal effect.

The rise in number, size, and effectiveness of profit and nonprofit private organizations directly concerned with outdoor recreation has been most notable since 1970 but was still highly important before that date. We, as a nation, are gradually learning that outdoor recreation is not solely a matter of governmental action.

CITIZEN RESPONSE

The people of the United States responded vigorously to the economic, social, political, and technological changes of the two generations from 1900 to 1970. Indeed, it has been the actions of millions of ordinary people which have dominated the outdoor recreation picture over these years. Imagine, if you can, a world in which no one, or almost no one, cared even to hunt, fish, camp, picnic, hike, backpack, water ski, or do any other outdoor recreation activity. Recreation workers would be without jobs! Little public funds would be spent! An impossible world, we will all agree, but merely to imagine it brings home how much individual decisions and actions have dominated the national scene, as far as outdoor recreation is concerned.

Citizen reaction has taken several forms:

1. A larger percentage of the total population has engaged in outdoor recreation of some kind. We lack quantitative data on how many persons partook of outdoor recreation at any date. The available data on Federal, State, and local parks and other areas are for visits (or visitor-days); some people go not at all, others go often. Visit data do not give us an

accurate measure of person involvement, but it is impossible for me to believe that the proportion of the total population engaged in some kind of outdoor recreation did not increase greatly over these two generations.

2. Those persons engaging in outdoor recreation went more frequently to some area or another, as the years of these two generations passed. Again, and for the same reasons outlined above, we do not know exactly how many times per year the average person engaged in outdoor recreation at a public or private area such as a park or lake. My best guess is that the mythical average person had less than 1 day of outdoor recreation in 1900 and more than 6 days in 1970. These numbers are not precise, but I think they are of the right magnitude.

We do know that attendance at national parks, National Forests, and State parks rose, from the earliest year data were available, at annual rates close to 8 or 10 percent. The rate of increase flattened out in the early 1930s, due to the severe depression, but attendance did not actually decline in those years. There was a major decrease in attendance during World War II, due to the rationing of travel facilities, as noted earlier. There is good reason to believe that outdoor recreation activity increased similarly in other areas for which no data are available. Percentage increases of any magnitude, but especially of the magnitudes of these, cannot continue indefinitely because in time they lead to impossibly large numbers. There was some flattening out of the rate of increase by 1970 but much more has occurred since then, and still more flattening in rate of growth is likely in the future.

3. Nearly three times as many people since 1900, each with three to four times as much real income, obviously means lots more consumer buying power. The average person or family spent more dollars from their increased income on outdoor recreation—including autos, clothing, food, and other common items used for recreation.

4. People as a whole are more demanding in their jobs, in their vocations, and in their lifestyles, about outdoor recreation. They want to live and work where they can also play and enjoy what they regard as desirable living conditions. The strength of this public attitude is so great as to have profound repercussions on business and political life.

I do not wish to leave the impression that every individual in the population holds these views, for many do not. But the attitudes I have described are

the dominant ones in our country today. Nor do I wish to leave the impression that change in these attitudes was at a uniform pace throughout the two generations from 1900 to 1970, because it was not. For the period as a whole, however, the changes I have described were very great and dominant in our society.

CONCLUSIONS

This brief and very general review of the history of outdoor recreation over the two generations from 1900 to 1970 leads me to three conclusions:

1. Outdoor recreation has been, and will continue to be, of great importance in our national life and in the American society.

2. Provision of outdoor recreation opportunity requires the use of many kinds and large amounts of natural resources.

3. Change has dominated the history of outdoor recreation in these two generations and surely will continue. The world has changed and will change; if you are to be a vital part of it, you must change also.

DEVELOPMENTS IN OUTDOOR RECREATION POLICY SINCE 1970

George H. Siehl¹

Abstract. -Outdoor recreation policy and environmental policy have changed significantly since 1970; an important component of these changes has been the increased emphasis placed on environmental issues by old-line conservation groups, which have concentrated their public /and interests upon designation of wilderness areas or other preservation classifications. Broader recreation concerns were addressed during 1985-86 by The President's Commission on Americans Outdoors (PCAO). This paper traces the 5-year effort to establish an Outdoor Recreation Commission, and reviews the work and early results of PCAO. Provision of recreation opportunities "close to home" is deemed essential because of social and economic changes, especially the reduction of leisure time.

THE ENVIRONMENTAL MOVEMENT

Marion Clawson conveniently allowed me pick up the narrative thread of recreation history beginning in 1970. As I have also been asked to touch upon environmental trends, and as the National Environmental Policy Act was signed into law on January 1, 1970, the reason for referring to this as a convenient starting point becomes obvious. The signing of NEPA into P.L. 91-199 marks a watershed of sorts with regard to the organizations which had been the backbone of the recreation movement, supporting the establishment of the Outdoor Recreation Resources Review Commission and the many individual laws implementing the recommendations of the ORRRC. These conservation organizations supported a wide range of outdoor recreation pursuits including hunting, fishing, camping, hiking, motorboating, sailing and canoeing. This broad coalition of outdoor groups supported bills to create the national systems for rivers, trails, and wilderness, measures which were approved by the Congress during the 1960's following the ORRRC recommendations. Many of these organizations also supported bills to clean up our air and water, concerns which became the heart of the environmental movement within the early years of the 1970's. As public concerns over environmental quality grew, the action agendas of a number of the old conservation groups came to reflect more environmental issues and fewer broad recreation items, Designation of lands as wilderness, and setting aside areas in specified protective units such as national parks, wild and scenic rivers, or trails, remained as items the Washington groups supported, but few, for instance, paid continuing attention to the level of funding for States under the Land and Water Conservation Fund. Further, as technology made new forms of outdoor recreation possible and popular, as in the case of motorized recreation vehicles, hang gliders, and camping trailers, some of the groups opposed these kinds of recreation use of public lands. Some of the groups also fought the use of national forest lands for development of downhill skiing facilities, as in the famous Mineral King conflict of the 1970's. The November 1987 Audubon magazine

INTRODUCTION

Since 1970, important demographic, social, economic and political changes have taken place in America, causing, in turn, a number of substantial changes in the policies for outdoor recreation at each level of government. While some of the influencing events have been visible and obvious, such as the recent President's Commission on Americans Outdoors (PCAO), other developments have been equally important in outdoor recreation policy matters, but far less obvious, as in the case of the environmental movement. Marion Clawson has capsulized two generations during which much of the groundwork for recreation policy was set, and Laura Szwak will follow this paper with a review of the particular social and demographic trends bearing upon the changes taking place today. This paper will review some political and outdoor recreation policy changes of the past two decades, with emphasis upon the establishment of the PCAO.²

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²The views expressed in this paper are those of the author, and are not necessarily those of the Congressional Research Service or the Library of Congress.

has identified another recreation target, golfing, in an article characterizing golf courses as environmental hazards.

Thus, among the overall impacts of the environmental movement maturing in the 1970's has been first the diversion and eventually the divorcement of many former conservation organizations from an outdoor recreation agenda affecting the broad range of outdoor people. Clearly, the need for a clean, healthful environment is fundamental to quality outdoor recreation opportunities and experiences. However, as the nature of environmental concerns has evolved, becoming more technical and/or more related to individual health -encompassing issues such as nuclear power, the ozone hole, toxic waste disposal, or carcinogens- the organizational resources have diminished for dealing with broadening the opportunities for more of the public to use the public land base in a variety of ways.

Some waning of expressed concern for recreation issues in the Congress may be because such environmental issues have been drawing the attention of many public policy activists away from recreation and natural resource concerns. **Earon Davis** (1984) wrote of this shift, noting three changes in the public perception of 'environment' since the late 1960's:

First, the environment is moving from the national parks and scenic areas to the neighborhoods. Second, the environment is moving from the great outdoors and into our homes and work places. Third, the environment is moving from an engineering and legal focus to that of public health professionals and "victims' organizations.

Public interest in environmental threats has increased in those matters which pose risks to individual health and safety, a development paralleling the general trend in concern over personal health and fitness. In dealing with such risks, there is a paradox in that while greater control has been exercised over the quantities of the pollutants released into the environment, technology has increased our ability to detect ever smaller amounts of the substances and to detect pollutants that were undetectable previously. Our progress in controlling trace chemical pollutants is thus being measured on a sliding scale.

Notwithstanding the ever increasing complexities of our interactions with the natural environment, very real progress has been made in reducing the levels of many contaminants. The most recent (1985) report of the Council on Environmental Quality reports that

today's cars emit 95 percent less hydrocarbons and carbon monoxide than did the models of 1970, and that urban average maximum concentrations of lead dropped 65 percent between 1975 and 1982.

Not all of the remaining problems with environmental quality fall into the exotic category. A fundamental problem facing most large or growing communities in America is how to safely dispose of waste materials. Water- based recreation, one of the most popular forms of outdoor activity, was seriously curtailed along the New York and New Jersey coasts during the summer of 1986 because of fouling of beaches with garbage, hospital debris, discarded plastics, and fish and wildlife killed by sewage sludge and other waste disposal. As a safety measure, many of these coastal beaches were closed during the height of the summer. One result of the incidents has been increased restrictions being placed on ocean dumping and disposal of plastics at sea. The long term solution to waste disposal in an affluent, consumptive society is difficult to foresee, however, as landfill sites become scarce and vigorously opposed by nearby residents, as incineration produces potential air pollution and toxic ash, which must also be disposed of, and as recycling faces economic uncertainties as demand for materials fluctuates.

Other observations relevant to environmental trends include:

- New technology is producing new pollutants in the outdoor environment and in our increasingly sealed homes;
- Public support for pollution control laws remains high even when weighed against job losses or higher tax levels;
- More of the environmental issues are seen to be international or even global, such as acid precipitation and ozone depletion.

ORIGINS OF PCAO

To return to the recreation mainstream, perhaps the most visible and exciting development of recent years was the 1985 establishment and operation through 1986 of PCAO, the President's Commission on Americans Outdoors. The excitement, it should be noted, is not confined to the 16 months of the Commission's existence, but spreads to the ongoing change that PCAO helped to catalyze.

The origins of this counterpart to the earlier Outdoor Recreation Resources Review Commission date to May 1980 at an informal meeting of principal

staff members of the subcommittees of the House Committee on Interior and Insular Affairs (Cleve Pinnix and Clay Peters) and Senate Committee on Energy and Natural Resources (Tom Williams and Tony Bevinetto) having oversight responsibilities for park and recreation matters, and the author at the Congressional Research Service (CRS). Points of discussion included the declining level of funding of the Land and Water Conservation Fund, the impacts of the then-recent energy crisis on recreation travel, and the shift of interest in many of the conservation organizations to environmental issues rather than outdoor recreation concerns. Following the meeting, the author sent to each of the participants a memo noting that the 20th anniversary of ORRRC was then two years in the future, and suggested that the Committees and CRS might organize a commemorative symposium as a "birthday party for ORRRC." It was also suggested that a recommendation coming from that symposium could be for the establishment of an ORRRC II to review outdoor recreation policies and programs and help to revitalize interest in them across the nation.

In the summer of 1980 the National Recreation and Park Association (NRPA) was independently exploring the idea of a White House conference on recreation. Discussion was held with NRPA staffer Barry Tindall on a possible combination of an ORRRC II process culminating in a White House conference on recreation, and this idea remained active for a period of time.

Renewable Natural Resources Conference

The election of 1980 brought not only a change in party control of the White House with the election of President Reagan but a change in control of the Senate to the Republicans, as well. Scheduled prior to the election but held on November 30 - December 3, 1980, a National Conference on Renewable Natural Resources provided the first public presentation of the proposal for a new ORRRC. Sponsored by the American Forestry Association and nearly two dozen environmental and natural resource user and conservation groups in Washington, the conference was intended to develop a proposed resource action agenda for the presidential term beginning in 1981.

Starting point for the conference's recreation working group was a report prepared by Cordell and Hendee (1980), who reviewed the supply and demand of renewable recreation resources. In the discussion which followed, the idea of a new national recreation assessment as proposed in the CRS memo was

presented to the group. It was accepted as a principal recommendation of the working group and subsequently endorsed by the entire conference. The conference stated:

The Administration and Congress should mandate and participate in a national assessment of outdoor recreation supply and demand to evaluate recreation trends and set priorities for the future. The structure of the body and the mission might be patterned after the Outdoor Recreation Resource Review Commission of the 1960's.

Wallop Workshops (1981-1982)

One initiative undertaken by the new Reagan administration was to propose less land acquisition for recreation purposes. This was accompanied by budget recommendations eliminating funding for the State allocations of the Land and Water Conservation Fund, and by requesting only enough new money for the Federal share of the LWCF to cover the cost of court ordered settlements on lands to be added to the Federal recreation estate. Congress eventually agreed to the halt in State grants under LWCF for Fiscal Year 1982, but continued to fund the Federal acquisition program at a higher level than requested by the administration. This 'cold turkey' approach to land acquisition caused great concern to those in the conservation community and even to many of those who supported a less extensive land acquisition program.

Seeking less draconian ways to balance budgetary concerns with the desire for more outdoor recreation opportunities, Senator Malcolm Wallop, chair of the Senate subcommittee with jurisdiction over park and recreation matters asked the Congressional Research Service to assist in gathering expert advice on how to resolve the problem. The result was the development of a workshop in July 1981 on the topic of "Public Land Acquisition and Alternatives" to which cabinet officers and other invited participants brought relevant information and suggestions. Care was taken to represent the widest range of views possible in structuring the panels. The approach proved so successful that a second, similar workshop on "Land Protection and Management" was held in 1982 by Senator Wallop's subcommittee. These sessions have come to be known as the "Wallop Workshops". Some in the environmental community dismissed the workshops, holding that any congressional activity that does not result in a public law is a waste of effort. Nonetheless, apart from providing a meeting place for diverse opinions, identifying

successful land protection alternatives around the country, and leading the National Park Service to develop a series of alternative land protection scenarios for various park units, the workshops developed an important connection in advancing the outdoor recreation reassessment.

As part of the workshop structure, three moderators were named to participate in the entire workshop and to chair panels during the two day event. Those who served as moderators were Dr. Emery N. Castle, President of Resources for the Future, Mr. William K. Reilly, President of the Conservation Foundation, and Mr. Patrick F. Noonan, Chairman of the Conservation Resources Group and former head of the Nature Conservancy. All three had in-depth knowledge of resource and conservation issues, but were not associated with partisan or strident positions on these issues.

In the autumn of 1981, the three workshop moderators and I were invited to lunch with Interior Secretary Watt to review the sessions. During the lunch, we raised with the Secretary the idea of a new outdoor recreation commission, but his initial reaction was unfavorable, indicating that the administration position was to reduce reliance on the Federal government. A new commission he said, would simply lead to demands to revert to the policies the administration felt were no longer appropriate. During an extended discussion, his guests demurred, citing the evidence of the non-federal government and private initiatives brought out in the workshop. To this, they added the support their organizations could give to such a reassessment.

At the end of the lunch Secretary Watt said, 'OK, you've convinced me. You have turned me around. I will support the effort for a new outdoor recreation commission, but it will have to be done by the private sector, not by the Federal government.' He pledged the cooperation of the Department of the Interior if such an effort was undertaken, and the moderators were left with the task of seeking private support for a new outdoor recreation commission.

Rockefeller Outdoor Recreation Policy Review Group (1982-1 983)

Given this expression of support from Secretary Watt, the moderators drew in additional private sector supporters of a new commission. Among those groups to take prominent roles were the National Recreation and Park Association represented by Barry Tindall and the American Recreation Coalition represented by Derrick Crandall. Dr. Castle of Resources for the

Future made the considerable talents of Dr. Marion Clawson available to the effort. This working nucleus, and others, continued efforts to refine a proposal to establish a private sector review and to bring additional interests and organizations into the process. To the latter end, the National Recreation and Park Association sponsored a meeting at the Wye Institute on Maryland's Eastern Shore early in 1982, inviting a number of urban, youth, ethnic and social groups to participate.

The core group also began to search for funding to support the review, and in this regard contacted Mr. Laurance S. Rockefeller, the chair of the earlier ORRRC. Although a number of observers had expressed the opinion that Mr. Rockefeller no longer held an active interest in recreation policy, they were proved wrong when he not only was interested, but willing to underwrite a reconnaissance of the situation.

To carry out the assessment, Mr. Rockefeller named as chair of the group a longtime associate, Mr. Henry L. Diamond, a Washington, DC attorney and former New York State Commissioner of the Environment and editor of the original ORRRC report. The others who were invited to serve on the Outdoor Recreation Policy Review Group, as it was called, were the three Wallop Workshop moderators, Castle, Noonan and Reilly, along with Mr. Sheldon Coleman, chairman of the Coleman Corporation, and Mr. William Penn Mott, former California State Park Director under Governor Ronald Reagan. Mr. Rockefeller served on the group in an ex officio role. Some have erroneously identified the Policy Review Group as the originator of the idea for a new ORRRC, although the group's advocacy was crucial in advancing the effort.

Beginning in August 1982, the group met primarily in Washington, D.C., receiving briefings and prepared papers from a number of recreation and related professionals in and out of government. Within six months the group completed its review, formulated its findings and recommendations, and issued its report, "Outdoor Recreation for America- 1983." The main recommendation was "that a new Outdoor Recreation Resources Review Commission be created by act of Congress as was the original ORRRC," adding that "an alternative could be a commission established by executive order so long as it had the characteristics of ORRRC: bipartisan membership, congressional participation, a full range of outdoor recreation interests represented, and provision for a staff independent of the Federal agencies.* Events were to prove the wisdom of this bit of foresight.

While the Policy Review Group report was broadly relevant to this Benchmark '88 Forum, the discussion of data collection and research is particularly germane. The report noted that:

In the process of compiling information for the Policy Review Group's consideration, data on supply and demand for outdoor recreation were found to be poor. While there has been an increase in recreation research over the past 20 years, there is a pressing need for better coordination of research efforts.

The report noted that ORRRC had called for a comprehensive program of research and data collection, but that it had not been implemented. The President's Commission in its later work was to experience considerable frustration at the lack of coherent, compatible data on a national basis. Both the Policy Review Group and PCAO used the data gathered by the RPA process as the most reliable and comprehensive available nationwide.

Legislative Effort (1983-1984)

The Rockefeller group did not draft specific bill language to implement its primary recommendation for a new ORRRC, but a number of interested organizations cooperated to prepare a draft bill which was provided to interested legislators. Senator Wallop, after reviewing and modifying the draft language, introduced the first bill, S.1090 on April 19, 1983. Representative Udall introduced an identical bill in the House as H.R. 2837 on April 28, 1983.

Senator Wallop was prepared to schedule hearings on the bill quickly after introduction but, unexpectedly, the measure was assigned to the Senate Committee on Governmental Affairs because the Parliamentarian determined that the measure dealt principally with relations with the States, the jurisdiction of the Governmental Affairs Committee. The 1958 legislation authorizing ORRRC had been handled by the House and Senate Interior Committees, the latter since having been renamed as the Committee on Energy and Natural Resources. Although there was some informal discussion on having the bill re-referred to the Energy and Natural Resources Committee, it was eventually decided to allow both Committees to process the measure. While this slowed the process, it allowed for a number of substantive changes, creating a bill which passed the Senate unanimously in November 1983.

During 1984 the House Interior Subcommittee to which the bill was referred held three days of hearings on the bill, but failed to bring the measure up for consideration by the subcommittee members so that it could be reported. As a result, the measure died in the subcommittee. Subcommittee chairman John Seiberling told a Conservation Roundtable gathering in Washington early in 1985 that he had killed the measure for two reasons: first, to prevent President Reagan from having an opportunity before the November 1984 election to sign a conservation bill in the Rose Garden after the record he had built on the environment, and second, because he feared the kinds of people the President might appoint to the Commission.

Executive Order (1985)

President Reagan, having seen the fate of the new ORRRC bill in the House of Representatives, chose not to wait further for Congressional action. On January 28, 1985, he signed Executive Order 12503 to establish the Presidential Commission on Outdoor Recreation Resources Review. As formulated in the E.O., the Commission was to consist of not more than 15 members, was to carry out functions quite similar to those specified in the Senate passed legislation, and was to complete its work within 12 months. The Secretary of the Interior was charged with providing administrative support to the Commission.

The Secretary of the Interior, William Clark, assembled a list of names of possible nominees for the President's consideration, but before the selections could be made and announced, Secretary Clark had announced his resignation. His successor, Donald Hodel, wished to have input to the list of potential nominees, so there was a delay in creating the final list for the President. Further discussions with the President's choice to chair the group, Tennessee Governor Lamar Alexander, took place during the summer.

Selection of commissioners was not completed until August 1985, when a second Executive Order, 12529, changed the name to the President's Commission on Americans Outdoors and extended the termination date to December 31, 1986, giving the organization an effective life of 16 months. The organization meeting took place at the National Geographic Society in September 1985, with Governor Alexander as chair and National Geographic Society President Gilbert Grosvenor named as vice-chairman. As a presidential commission, all of the members were appointed by the President. Only four congressional appointments were made, compared with the

eight serving on ORRRC, but the strict balance between parties and chambers was maintained. The remaining 11 members were drawn from public and private sectors, a number of them having expertise in one or more areas of conservation or outdoor recreation concern. No changes took place in the membership during the life of the PCAO.

The Executive Order did not provide for a formal advisory group to assist the commission, but a panel of 20 'senior advisors' was established by the commissioners after several months. The advisors were sought to provide expert counsel on topics the commissioners felt were important to their work, but in which they were not expert; the handicapped, other special populations, wildlife, and tourism were among these topics.

REASONS FOR CREATION OF THE PRESIDENT'S COMMISSION

Why create a second national commission on recreation if the first had been so successful? The short answer is that changing circumstances and waning enthusiasms brought into question the continuing effectiveness of the ORRRC-generated recreation policies.

A part of the longer answer was mentioned earlier in discussing environmental trends, and more will be provided in Laura Szwak's following discussion of demographic and societal trends as they affect recreation. But there are larger structural shifts in American society at work, as well, that made the creation of PCAO appropriate.

In 1985, when the American people were asked by the Gallup poll to choose between big government, big business, or big labor, as to which posed the greatest threat to the future of the country, 50 percent of those polled chose 'big government.' In 1959, the first year the question was asked, government was viewed much more positively, with only 14 percent of the people viewing big government as the biggest threat. Gallup characterized this as "a dramatic reversal" in public opinion. Perception of big business as the greatest threat grew from 15 percent in 1959 to 22 percent in 1985.

Broad societal changes such as this have altered the perceptions and expectations people hold regarding the Federal government. Thus, unlike ORRRC, the new commission began in a time when social, economic, and political trends were working to reduce the role and size of the national government, and when sizeable budget deficits appeared to limit new initiatives for Federal action.

Public opinion polls show that, compared with a generation ago, there is less confidence placed in the ability of large institutions, public or private, to solve problems. The Harris survey, for instance, notes that in 1966 (when recommendations of ORRRC were being acted upon by the Congress), 42 percent of the public had "a great deal of confidence" in the Congress. In 1986 this level of confidence had been halved, to 21 percent of those surveyed. Those having a great deal of confidence in the Executive branch dropped from 41 percent to 18 percent between 1966 and late 1986.

About as many people have a high regard for governance closer to home. Local and State governments were given the highest level of confidence by 21 percent and 19 percent of the people, respectively, in 1986. Both of these show an increase of about 3 percent from 1985. There was no comparable question about State or local governments in the 1966 Harris survey.

Increasingly, people demand information about, and a voice in, the planning and decisionmaking processes of governments. Daniel Bell has written, 'Inherently, there is a tension between bureaucracy and participation, and this tension has framed Western society for the past seventy years.'

Public participation is now a standard component of Federal management of natural resources, as in other programs. For instance, the National Environmental Policy Act of 1969, P.L. 91-190, requires that information about environmental impact statements be available to all parties, and that the Council on Environmental Quality 'utilize, to the fullest extent possible' services and information from public and private organizations and individuals.

Public hearings were mandated as part of the Executive branch process for making recommendations under the Wilderness Act of 1964, P.L. 88-577. Also, the principal planning statutes for the U.S. Forest Service (The Forest and Rangeland Renewable Resources Planning Act of 1974, P.L. 93-378) and the Bureau of Land Management (The Federal Land Policy and Management Act of 1976, P.L. 94-579) require the opportunity for public participation.

Congress has not been immune to these social forces. As a result of reforms adopted under the Legislative Reorganization Act of 1970, P.L. 91-510, and changes in the House and Senate rules made in March 1973, committee hearings and business sessions were opened to the public except when national security or the reputation of witnesses were at issue. Similar 'sunshine' legislation prevails in many State and local governments today, as well.

State and local governments also are hearing from a vocal public when decisions are to be made. These governments are facing decisions more frequently than in the past because devolution is placing more responsibility for a greater range of issues at the State and local levels of government.

Federal funding for recreation has reflected the reduction in advocacy caused by diversion of former sources of support to other issues. Dollars appropriated for the Land and Water Conservation Fund reached their peak in 1978, at \$805 million, declining during the remaining years of the Carter administration and in the Reagan administration. The latter proposed that no funds be provided for the portion of the LWCF going to the States, and for one year (FY82) Congress agreed with this recommendation. In subsequent years Congress appropriated more than the administration requested, but far less than the \$900 million authorized for appropriation from the LWCF. In FY82, appropriations dropped to just under \$180 million, then increased in the next several years. FY87 funding was \$188 million.

Similarly, authorization of new Federal park and recreation areas peaked with passage of P.L. 95-675, the famous "park barrel bill", in 1978 and the Alaska National Interest Lands Conservation Act (ANILCA) P.L. 96-487, in 1980. The former added scores of new park, recreation, and historic units to the National Park System and designated several dozen new national trails and wild and scenic rivers to be administered or studied by various Federal agencies. The ANILCA created new parks, preserves, and wild rivers in Alaska which doubled the size of the National Park System. These two measures alone went far toward providing additional recreation places and protecting outstanding natural resources, one possible reason (along with Administration opposition) for fewer new authorizations by the Congress in the early 1980's.

Use statistics for various categories of Federal lands supporting recreation show a leveling of visits in recent years, a decline in the length of time spent on site, and a drop in visitors per acre. This last trend is the result of increasing acreage during a time of stable use. But, as noted above, most of the increase in National Park acreage is in newly designated units in Alaska, protecting spectacular scenic and wildlife resources, but providing minimal accessible land resources for most Americans at this time. The U.S. Forest Service Outdoor Recreation and Wilderness Assessment group at the Southeastern Forest Experiment Station in Athens, Georgia, has documented these trends.

Another significant change emerges in the greatly expanded provision of recreation opportunities by the private sector. In the years following ORRRC, many companies provided new recreation and sports equipment based on the latest technology. Some of this equipment, such as lightweight camping gear, shorter and easier-to-handle skis, and synthetic fiber garments, made outdoor recreation more accessible and comfortable, leading to increased participation. Other equipment innovations created new outdoor activities entirely, such as whitewater-rafting and hang-gliding.

More recently, both entrepreneurs and non-profit organizations have been offering services and facilities to stimulate and meet the demand for recreation. The provision of indoor recreation and fitness centers supplements outdoor opportunities for swimming, tennis, running, and other activities with the added benefit that these facilities are available year-around and, in some cases, around the clock, accommodating lifestyles that are more active and individualistic than in the past.

Some of these trends are those which led to the call for a review of outdoor recreation policy, and others are changes which the Commission discovered during its investigations. The items cited above are only a sample of the trends in both of these categories, but it is hoped that they will show the need for, and importance of, the President's Commission on Americans Outdoors-and of the need to carefully monitor and interpret American social, political and economic trends in the future. Trend awareness is likely to be very important in efficiently assuring a full range of recreation opportunities from all providers.

PCAO WORK

There is probably little need to recount the detailed process followed by the Commission in carrying out its mandate. Initially commissioners organized into three working groups, supply, demand, and new ideas, then combined to work as a committee of the whole for the remainder of the time available.

The process for developing the common information base of PCAO did not rely upon contract research, as ORRRC had done. Rather, extensive use was made of 20 public hearings around the country, along with a series of 11 strategic planning sessions, a public opinion poll commissioned by the National Geographic Society, and the public solicitation of concept papers and new ideas from the

recreation business and professional community and the public at large. In addition, under the management of Laura Szwak, a major, cooperative survey of recreation literature was completed with the assistance of academic and agency research specialists from across the country.

Early in the process the States were challenged to conduct their own individual efforts to reassess the needs and opportunities for outdoor recreation. Some 37 States responded to this challenge with methods ranging from the establishment of counterpart State Recreation Commissions to intensive review of existing statewide recreation plans.

Associated activities included a national conference on urban recreation in Baltimore, Maryland, a conference on the role of private lands for recreation, held in a Senate hearing room, and a hearing session on special populations, also in a Senate hearing room. Commissioners and staff members participated in many meetings of interested organizations throughout the year in 1986.

The public hearings and listening sessions served a very important role in bringing the Commissioners to their final recommendations. While they heard many messages during their term, there were some messages that were offered more frequently or convincingly than others. However, a number of the most frequent messages did not comport well with the presidential caveats on the need to look for new economies in providing recreation opportunities. The "telling" messages included:

- There is a need for continuing Federal financial assistance in some amount and on an assured basis;
- Primary needs for funds at the State and local level are for the care and restoration of existing resources, especially built facilities, and for new protection and acquisition of open space;
- There is a need for clear identification of roles among public and private sectors to determine who is responsible for doing what in providing recreation opportunities;
- A need was expressed for leadership and a common voice on recreation issues;
- There is a need to provide recognition of the benefits of recreation so that it receives fair funding and programmatic consideration by elected officials and agency managers;
- Data on recreation resources, participation, spending and trends are incomplete, inconsistent, and often incompatible from agency to agency.

These needs were presented not in an aura of a crisis in recreation, but out of dual concerns. First, that the recreation estate is **fraying through** lack of stewardship. Second, that the pace of land development in rapid growth areas is claiming sites with recreation potential while creating new, unmet recreation demands. A lack of funding contributes to these concerns, although this is not the only cause of the problems,

The Commissioners heard not only of needs, but of opportunities and successes, as well. In this context, the messages included:

- There has been a tremendous growth in the ranks of volunteers who are providing skills as well as muscle to hard pressed recreation managers, with the potential to do even more;
- partnerships among governments and with the private sector have evolved to the benefit of all parties, including the public, and here, also, the potential for further cooperation is great;
- New, innovative sources of funding for recreation agencies, sites and programs are being developed and implemented, including property transfer taxes dedicated to recreation, a tobacco products tax, and payments by users of public recreation sites and services.

In assessing the future of recreation, this series of needs and opportunities may prove informative to all the institutions concerned with the quality and quantity of recreation opportunities available to the public.

PCAO THEMES

What was the result of the work of the President's Commission on Americans Outdoors? The first measure of results lies in the recommendations the Commission made. As the final report of the Commission has been officially available to the public since 1987, and the list of recommendations is known, for this record I will only characterize what I see as the themes of the recommendations. They are as follows:

- ASENSEOFURGENCY
- DECENTRALIZATION
- CONTINUED FEDERAL FUNDING
- INSTITUTION
- PARTNERSHIPS

PCAO FOLLOW-UP

A second measure of the Commission's impact may be sought in reviewing what has been done with its work and recommendations. This is a subject that shows some complexity, is made up of delay, uncertainty, and individual and organizational initiatives.

Law Suit Delay

The initial delay following the end of the PCAO came because of critics. Chief among these were organizations representing commodity interests which use the public lands, inholders on Federal lands, some administration officials, and organizations and individuals opposed to an increased Federal role in recreation or other programs.

Some of the criticisms were apparently based on interpretations of the recommendations which seem to exceed the intent of the Commission, a flaw which could be remedied with the publication of the full report. Some critics, for instance, perceived the proposed system of greenways as being federally managed, but the Commission viewed greenways as an idea which local or State governments might choose to adopt, varying the characteristics of the idea to suit local situations.

Other problems were seen in the proposal to spend one billion dollars a year on recreation programs, and in the apparent lack of reliance upon the private sector to meet more of the demand for recreation in the future.

One group, the Center for the Defense of Free Enterprise, filed suit, charging among other things, that the Commission failed to follow the Freedom of Information Act, the Executive Order which created the Commission, and the Federal Advisory Committee Act. After a delay of several months, the case was dismissed by the judge, who found in favor of the Commission and the Interior Department on all points.

Interestingly, the early opponents of the Commission, the environmental groups, found themselves pleasantly surprised by the work of the President's group and by its recommendations, and a number are now working toward implementation of those recommendations. Nonetheless, as a vice-president of one of the groups confided, the environmentalists "wound up with egg on their faces."

Executive Branch Now Studying Report in Domestic Policy Council

Additional delay has been caused by uncertainty on the part of the Administration on how to treat the report and recommendations of the President's commission. The arguments raised by critics about increased government control and regulation, and the suggestion of a billion dollar trust fund stopped any immediate embracing of the Commission's work by the Administration. Some cabinet and sub-cabinet level individuals voiced criticism of a number of the recommendations. What eventually evolved was a decision to have the Domestic Policy Council review the report and recommendations, a process now nearing completion in a group chaired by Council on Environmental Quality member Jacqueline Schafer. There has been very little information on the review made public.

Congress Legislating User Fees, LWCF Extension, Possible Trust Fund

Notwithstanding the lack of a position on the PCAO recommendations from the Administration, the Congress is proceeding independently on several of the items requiring Federal action. Specifically, Congress has enacted a permanent increase in National Park Entrance fees, and a 25 year extension of the LWCF. Also, bills have been introduced by Senator Chafee (S.1338) and Representative Atkins (H.R. 3736) to convert the LWCF to a true trust fund as recommended by PCAO. Additional legislation on the latter proposal is anticipated in the 100th Congress from Representative Morris Udall, one of the members of Congress who served on the PCAO. Mr. Udall added Clay Peters to the House Interior Committee staff for a period in 1987 to complete the research work and prepare draft legislation to implement the PCAO recommendations on a LWCF trust fund. Peters served as Associate Director for Federal Lands on the Commission.

States, Localities, Non-Profits Very Active

State and local governments have moved aggressively since PCAO completed its work, particularly in the matter of securing increased funding for land acquisition and facility development. The most noticeable of these efforts have been those associated with bond referenda in 1986 and 1987, and also in funding initiatives by State legislatures such as in Maryland.

In some cases these bond questions and legislative initiatives can be clearly traced to the work of PCAO, particularly Chairman Alexander's challenge to his fellow Governors to establish counterpart State level commissions. In Maine, for instance, such a commission was established, eventually recommending a \$50 million bond issue for land acquisition and open space preservation. The Maine legislature reviewed this proposal and agreed to placing a \$35 million bond question on the ballot last November. The measure passed with 65 percent of the vote, approving a land-protection bond issue approximately 10 times the size of any single similar bond issue in the past.

The trail community was one of the most active and consistent participating interest groups in the work of the Commission, finding a particular friend in Commissioner Frank Bogert, Mayor of Palm Springs, California, and an avid horseman. A rails-to-trails coalition has been organized to support implementation of the trail expansion recommendations of the PCAO and to assist in getting local governments to act on the proposals for creation of greenways. State and local governments are already moving to establish greenways.

BUT WHAT LIES AHEAD?

To borrow from William Shakespeare-and the inscription on the National Archives-it is true that "What's past is prologue," and this review of recent history does not mean that our work is finished. The title of this meeting is recognition of this fact, for we are here to set benchmarks.

If anything should be obvious from the PCAO exercise it is that change is vitally important. In establishing the benchmarks we seek here, we must constantly be aware of the pace, magnitude and direction of change. These are dynamic variables, but to ignore them and seek to impose rigidity on the future would be intellectually derelict and administratively inefficient.

Marion Clawson's third conclusion captured the essence of this challenge for each of us when he said:

Change has dominated the history of outdoor recreation in these two generations and surely will continue. The world has changed and will change; if you are to be a vital part of it, you must change also.

In speaking to groups around the country since PCAO concluded, I have been sharing with audiences two sets of three words that seem to capture much of the experience we gained in our efforts. They may be helpful here in setting benchmarks and looking to the future.

The first set of words is "change, time, distance," all of which will be far clearer after Laura Szwak's paper. Change we have just noted, and it seems to be the dominant factor in our personal and professional lives. Time, especially leisure time is arguably becoming a scarcer commodity, and whatever the actual measures may be, the public perception frequently is that we have less leisure. Distance, that is the distance traveled for recreation, is a function of the perceived lessening of time.

The interrelationship of these three elements leads to the second set of three words, "close to home." Close to home represents the results of these three elements as it applies to recreation (and probably much else in our lives, also). Data are already showing the impact of this trend. Even more may lie ahead with this trend; note the recent celebrity status given to the "couch potato," publicity that will have the likely effect of generating an increase of in-home recreation. The "close to home" phenomenon may pose one of our greatest challenges in providing and managing recreation opportunities, public and private, in the years ahead.

A second, closely related challenge is related to where that home is located. Here the demography of place becomes important, for we find that during the 1970's the non-metro counties were growing faster than the metro areas. Although the metro areas have moved ahead somewhat in growth in the last few years, there is still significant growth in outer-ring counties surrounding metropolitan centers, but also in more remote areas high in scenic amenities. From a strictly recreation perspective, this presents two problems: first, lands suitable for providing outdoor recreation are disappearing, and second, population centers are springing up and will need new recreation opportunities themselves.

There are, of course, other important issues involved in the patterns of land use that are emerging, but I will not attempt to address them. There are several good writers who address these issues with great success, I believe, offering a holistic view that

can be helpful to others with a more specialized perspective. Richard Louv, a writer and editor for the San Diego Union in his book 'America II,' touches upon many current sociological trends, including the strong national nostalgia for small towns. Of these "New Edens" he writes:

The rural rush ... is creating a condoized, computerized culture not really rural and not quite urban. This New Eden offers enormous possibility for a better life, but it also offers what could potentially be the final destruction of nature and the small-town culture for which so many people yearn.

Based on his observations from around the nation in preparation of his book, he also fears the development of community isolation and group polarization and conflict stemming from current trends.

"The New Heartland," by John Herbers, a New York Times writer, examines the same trends and issues as did Louv, but comes away with a somewhat more optimistic view of non-metro growth in which growth and natural values can coexist. In part, he places this assessment on the belief that "the environment is the one issue on which the Federal government can be expected to step in and impose controls or insist that the State and local governments do so."

Jack Lessinger, a real estate professor who has written "Regions of Opportunity," comes out close to Herbers in his work, which is not quite so broadly gauged as the other two books. His reason for optimism as non-metro growth takes place, in what he calls "penturbia," is the emergence of the "caring conserve? as the type of person who is attracted to these outlying areas. He describes the philosophy of the caring conserver by stating:

[I]t is the life-style of 'self-fulfillment' in penturbia. The way pollster and social analyst Daniel Yankelovich explains it, self-fulfillment is a movement sweeping toward **an inspirational array of intangibles. Emphasis is on sharing, participation, adventure, and joy of living.**

Clearly, these views of our mobile population invite much consideration.

CONCLUSION

The two challenges to recreation professionals, where people recreate and where they live, should be seen as people issues rather than resource issues if we hope to meet them.

Indeed, when change is as important as Marion Clawson indicates, it is through the closer scrutiny of people-their hopes, activities, politics, and demographics-that we can best analyze change. For society changes faster, and more erratically, than the natural resources with which we are professionally concerned. To bring about a rewarding, stable relationship between people and resources we cannot ignore the more volatile component.

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APPENDIX: ORGANIZATIONAL ELEMENTS OF THE TWO COMMISSIONS

<u>Element</u>	<u>ORRRC</u>	<u>PCAO</u>
Authority	P.L. 85-470 June 28, 1958	Exec. Order No. 12503 January 29, 1985
Duration	June 1958 - Jan. 1962	Aug. 1985 - Dec. 1986
Membership	15 8 Congressional 7 Private	15 4 Congressional 11 Private
Appointment	President 7 Private	President All
Information Source	Congressional Leaders 8 Congressional	Public hearings and input, staff & contributed reseach
Principal Task	Recommend Federal policy to deal with growth in in outdoor recreation demand	Reassess effective- ness of existing policies for out- door recreation
Report Title	Outdoor Recreation for America	Report and Recommendations

SOCIAL AND DEMOGRAPHIC TRENDS AFFECTING OUTDOOR RECREATION

Laura B. Szwak¹

Abstract – Various social and demographic characteristics influencing participation and interest in outdoor recreation are discussed. The factors include time, work, income, family, health, and urbanization. Lack of time (either real or perceived), increasing job competition, family demands, and other factors may reduce outdoor recreation participation.

INTRODUCTION

In this analysis, I will focus on those social and demographic characteristics that influence people's participation and interest in outdoor recreation. I will not describe trends in outdoor recreation participation because you will hear a lot about these trends, according to the BENCHMARK 1988 program.

In the 1982-83 Nationwide Recreation Survey, the American public was asked what determined the amount of time they spent on outdoor recreation (U.S. Department of the Interior 1986). The public's response to this question guided the characteristics I chose to describe in this analysis of trends. These factors included time, work, family, health, income, and urbanization.

Time

Consistently, the most important variable influencing people's participation and interest in outdoor recreation is time. Time has increasingly sped up for people. The relentless rhythm of the computer has replaced the natural way time has always been measured. Computers operate in nanoseconds, one billionth of a second. According to Jeremy Rifkin (1987), time has never before been organized at a speed beyond the realm of human consciousness, beyond human perception. Efficiency and productivity

are measured in speed. A product's value is dependent on how fast it is available, not necessarily on how long it may last.

Time is becoming our scarcest resource. A Louis Harris (Louis Harris & Associates, Inc. 1984) poll claims that leisure time for American adults has dropped 31 percent (about 8 hours a week) since 1973. As a result, we are growing into a 'convenience culture.' This culture consists of goods and services that allow people to stretch their time. These growing services include takeout food, home deliveries (groceries, pharmaceuticals, liquor, etc.), weekend and evening deliveries, mail order, home shopping, home day care, housecleaning, laundry, and yard work. More than half of American households own a microwave oven. Another example is the one-call travel agent—someone who can put together an entire travel package, including transportation, accommodations, and entertainment with one telephone call. Advertisers use the convenience culture to market their products. Racquetball equipment, for example, is advertised as a quick sport to learn and quick to play for a fast workout.

Other services help people manage their time. Automatic teller machines and VCRs are examples. VCRs help people segment their leisure. There is a high correlation between VCR active users and people who read regularly. These services allow people to tailor their daily schedules to meet their needs and not have schedules imposed on them. Time control is not just convenient; it is becoming necessary. And, consumers are willing to pay to save their precious time.

Why are we experiencing such time famine? According to Judy Langer, a market researcher in New York, 'Everybody just seems to feel worn out' by the growing demands of work, family, and personal achievement (Hall 1988). The time crunch results from a whole host of reasons, including an increasing range of options on how to spend time. As you will see, time or perceived lack of time is only getting worse.

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Work

One of the major determinants of leisure time is time spent at work. The 40-hour workweek remains strong. Most workers say they are satisfied with the amount of time they work. Those who are not satisfied prefer working more hours to receive more income. This opinion is also held by working mothers. A flexible work schedule, thought to be a growing trend in the sixties, is still available to only 12 percent of the work force. Since 1980, moonlighting, or holding more than one job, has increased half a percent. Few workers say they would trade less income for more leisure or family time. Job security accounted for this response (Troost 1986).

What is deceiving about the 40-hour workweek is the amount of work people do at home. Eight million people work at least 8 hours a week at home in addition to their full-time work schedule. One out of four workers works on Saturday; one out of eight on Sunday. (These statistics include workers that have to work weekends as a regular part of their 40-hour schedule.) The personal home computer will increasingly allow people to segment their work and leisure even further and exercise more time control.

The transition of the American economy to one of services further enhances the blurring of leisure and work time. Ninety percent of the 16 million new jobs expected by 1995 will be in the service industry. In manufacturing jobs, workers punch a clock. All the work is performed on the company's site. In a service economy, successful services need to be convenient and available to people where they live.

Job competition is increasing, and this phenomenon is occurring because of demographic changes. The number of people who are 35 to 44 years old -the prime age for middle managers- has increased by 42 percent. However, middle management jobs have grown by only 19 percent. Some of the 'overflow' will become entrepreneurs. In a survey comparing entrepreneurs with other workers, over half of the people who ran their own business said they spent less time with their family, and two-thirds said they cut out recreation and other activities they enjoyed. The others who choose not to become self-employed may go back to school or engage in some other retraining (Troost 1986). Therefore, job security and a reliable source of income will impact use of time for the next 20 years.

Income

The amount of money people said they had determined how much time they spent on outdoor recreation. Money was generally related to equipment purchases. Since each purchase also has a time cost associated with it, those products that are quick for the consumer to learn and, again, are convenient will enjoy the most success.

In 1985, the share of disposable personal income devoted to recreation was 6.4 percent. Two consumer groups – older people and teenagers – influence much of this spending these days.

Adults over 50 years old account for half of all discretionary spending in the United States. This age group spends a greater proportion of their annual income on vacation trips than the general public. They also take 72 percent of all recreational vehicle trips. The income picture for the elderly, at least for the next 10 years, will continue to be positive. Since 1982, people 65 and over have reported a lower poverty rate than the population as a whole. This is a historic reversal of a trend. In the 1950's, 35 percent of older Americans lived in poverty. This reversal resulted from massive Federal assistance. The percentage of Federal dollars devoted to the elderly has risen from 6 percent in the 1960's to a current 30 percent. A total of 350 billion Federal dollars, more than the entire defense budget, is spent on the elderly. This is the fastest growing age group now, and the growth will continue as the Baby Boomers age. It is unknown how government support will continue or change in the next 20 years as the better educated, more healthy, and more affluent Baby Boomers reach their 'golden' years. Since participation in outdoor recreation declines sharply after age 45, interest in outdoor recreation may also wane. The elderly are important targets for aggressive promotions of outdoor recreation.

The second most important consumers are the teenagers, known as the Baby Bust and aged 12 to 21. Despite their smaller size (38 million compared with the Baby Boom of 76 million), the Baby Bust has businesses trying to attract their attention. For example, Campbell Soup advertises on MTV. Many of these teenagers decide how a portion of the family's income will be spent. In their parents' quest for more time, teens are asked to grocery shop on their way home from school. Also, nearly half (45 percent) of the teenagers have part-time jobs and have their own money to spend. Traditionally, teenagers are the most avid outdoor recreation participants – in number of activities and in frequency.

Family

Family composition influences the demand for outdoor recreation. Other than time and money, respondents to the 1982-83 Nationwide Outdoor Recreation Survey said that children determined how much time they spent on outdoor recreation. People with younger children tended to spend less time. As the children grew, the amount of time spent in outdoor recreation grew.

The number of children is declining rapidly. Baby Boomers are delaying marriages and childbearing. More people are not having children at all, estimated at 30 percent of all married couples compared with 10 percent in 1936. The percentage of women who never marry has doubled since 1970. Of those couples having children, they are having fewer, if not only one. Half of all children born today are first born. Parents tend to spend more money on their first-born child. Some researchers call these children of the Baby Boom 'gourmet babies' because they have the best of what money can buy (Clurman and others 1986).

Changes in household composition also influence interest and participation in outdoor recreation. Families are primary users of public parks. In the 1982-83 recreation survey, availability of companions for outdoor recreation was an important element in participation. Household members are ready companions for outdoor recreation. Since the 1960's, the number of people who live alone has tripled to 21.2 million, or one-quarter of all households. By the year 2000, over 7 million more people are expected to live alone. Many of these households consist of elderly women, who traditionally are the least active group of outdoor recreation participants.

To find companions for recreation, people are joining more specialized clubs and associations, some of which include health and hobby interests. The number of specialty magazines increased over 1,000 from 1982 to 1983. Different combinations of groups are forming; i.e., walking clubs and silent sports (bicyclists, canoeists, cross-country skiers) groups. The number of athletic and hobby nonprofit clubs and organizations rose faster than almost any other type of nonprofit organization. These diverse interest groups make management of outdoor recreation resources more challenging. Since 80 to 90 percent of all leisure activities are done with other people, these clubs provide a social atmosphere for recreation.

Learning outdoor recreation skills has been a family activity and depends on family composition. People tend to learn their outdoor recreation skills when they are young. Some activities, such as hunting and trapping, are traditionally passed down from father to son. In 1986, a quarter of American families with children were headed by a single parent. Nineteen percent of households with minor children are headed by a woman with no husband.

Few new activities are taken up by people past their 30th birthday. However, the decline in physical recreation with age accelerates faster than actual physiological ability. Other factors- attitudes, supply of services and/or facilities, and knowledge-suppress older people's interest in outdoor recreation. Careful marketing and servicing of the more affluent, more healthy, and educated elderly may reverse that trend.

Health

Another reason people said they spent more time in outdoor recreation was improving their health. We hear that more people are exercising than ever before, yet we also hear they are not doing enough to improve their physical fitness. Nevertheless, the sales of barbells and weights have doubled since 1977. Over 600,000 stationary bikes were sold in 1977; and in 1984 sales were up to 2.9 million. Teenagers are smoking and drinking less than any previous age cohort. However, hunting, fishing, and camping equipment sales have been declining for the past 10 years (Doyle 1985).

A serious health indicator is the percentage of fat children. Since 1965, obesity increased 54 percent for school-aged children (6 to 11 years old) and 39 percent for teenagers (Price 1987). Outdoor recreation is important to the health of our children.

Fitness is also subject to the convenience culture. People will select products and services that are convenient, yet allow them some individual expression. Aerobics is an example of how the fitness market is segmenting to meet people's various needs. There are low-impact aerobics, nonimpact aerobics, aquatic aerobics, etc.

Urbanization

One of the chief motivating forces behind the creation of the past two presidential assessments of outdoor recreation is the American's perceived loss of wide open spaces. In 1960, 70 percent of the U.S. population lived in metropolitan areas. Twenty years later the percentage rose to 75. By 2000, another

5-percent increase is expected-up to 80 percent of the population. In 1950, there were about 13 acres of land available per U.S. inhabitant. By 2000, that acreage is expected to drop to 5 acres. There is even some research that claims as life becomes more urbanized, the demand for outdoor recreation decreases (Hauser 1962).

The fifties represented a turning point in urban settlement. For the first time, central cities (at least a quarter of them) experienced a population loss. That population decline is continuing. The suburbs of the eighties, the new metropolitan areas, are quite different than those of the **fifties**. Suburbs of the fifties were bedroom communities for the central city. People worked, shopped and enjoyed recreation downtown. In the eighties, the suburbs are expanding beyond commuting distances of the central cities. These new suburbs are separate, dispersed communities and quite metropolitan. One author calls this new mix of urban, rural, and suburban living outside the boundaries of metropolitan areas the "new heartland." This 'new heartland' is not economically tied to central cities (Herbers 1987). **With** the rise in the service economy, new industry is no longer dependent on the central city infrastructure, such as railroad tracks to haul in raw material for manufacturing. Telecommunications allow ready access to information regardless of an office location. The service industry moves to where the people are. And the people are searching for some open space.

Seventeen percent of Americans move to a different home every year. Two-thirds of those people move within their own county. Those who move long distance are moving south. When asked why they are moving, people said they were following their jobs, or they were looking for better places to raise their children.

This spreading development takes a lot of land. The reasons people leave the inner cities-crowded streets, crime, lack of open space-are following them to the suburbs. Yet, in some areas the people are consciously and rigorously controlling growth. Parks, lakes and wooded areas are an integral part of many of these subdivisions, community districts, and smaller cities and towns.

Conclusion

The future looks grim for continued interest in outdoor recreation. This prediction is based on a continued perception of a lack of time, rise in single-person households, more elderly, fewer young people, etc. We can speculate about the future by age cohort, starting with the largest.

The Baby Boomers, pressed for time, may in their later years make up for this lost time and be avid outdoor recreation consumers. Since both husbands and wives are living longer, there will be an increase in the number of years they will spend together free from child-raising responsibilities. Even though people are retiring at an earlier age now, it is uncertain whether the Boomers will be able to enjoy early retirement and still maintain an adequate income. The elderly of today are adding years to their life and life to their years. The Boomers will enjoy a longer life, but their life may be more work than leisure.

The Baby Busters are more realistic about the future than the Boomers. Where the Boomers grew up and expected economic security, the Busters lived through a more insecure economic and social environment – oil crisis, Vietnam War, recession, fewer brothers and sisters, less parental supervision, greater dislocation, and more divorce. However, the Busters actually face a more positive employment outlook than the Boomers. They can expect increased wages, less inflation, decreased unemployment and job shortages-all factors favoring the worker. Even though work is important to this group, it will be interesting to see if the group rebels against the time famine and demands more leisure.

However, a clean, healthy outdoor environment remains very important to people at every age level. The concern for personal health, fitness, and well-being is a value also shared by all age groups as well. People recognize that a dirty outdoor environment threatens their health. We need to continue to link outdoor recreation, in all its active and passive forms, with better personal health and a clean environment.

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THE SUPPLY EFFECT OF RECREATIONAL LANDS AND LANDOWNER LIABILITY: RECREATIONAL USE STATUTES REVISITED

James C. Kozlowski and Brett A. Wright'

Abstract—Population increase creates more demand for recreational opportunities and recreational open space. Public lands do not currently satisfy these demands. An alternative is the opening of private lands for public recreation. However, in spite of legislation to limit their liability, landowners are still reluctant to allow access. New efforts are necessary to protect landowners and encourage the opening of private lands.

Westfall 1977; Wright and others 1988) and estimates of up to 50 percent of the private lands in some States have been reported as being closed to public recreation.

Private landowners have been inundated with a variety of problems that often dissuade them from allowing public recreational access to their properties. These problems vary by locale, but generally include property damages, trespassing, minimal economic incentive to keep lands open and perceived landowner liability when recreationists are injured on the premises. The impact of liability is particularly perplexing given the fact that a concerted effort was made to alleviate this barrier to recreational access over 20 years ago.

INTRODUCTION

As the nation's population increases and the demand for recreational opportunities continues its upward spiral, the supply of recreational open space becomes an increasingly critical issue. Recognizing the inability of public lands to satisfy current demand for outdoor recreation, not to mention future needs, the President's Commission on Americans Outdoors suggested the need to seek alternative ways of increasing the supply of outdoor recreational opportunities.

One such recommendation was to seek the assistance of the private sector in opening more lands for public recreation since fully two-thirds of the nation's land base is in private ownership. However, downward trends in the availability of private lands for recreation suggest that efforts to encourage private landowners to open their land to the public will be difficult, at best. Not only is the nation losing valuable land to development, and that is within easy access of major population centers, we are also experiencing trends of increasing land closures by private landowners. These trends have been monitored by a number of social researchers (e.g., Brown 1974; Guynn and Schmidt 1984; Holecek and

STATE RECREATIONAL USE STATUTES

In 1965, "Suggested State Legislation," by the Council of State Governments advocated a model recreational use statute. This statute was designed to encourage private individuals to open their lands for public recreational use by limiting landowner liability for recreational injuries when access is provided without charge. Research regarding private landowners and their willingness to provide recreation indicates liability is still a major barrier to increasing recreational opportunities. Now, some 23 years later, the purpose of this paper is to again examine the legal aspects of public recreation on private lands in hopes of facilitating ways of increasing recreational access to private open space.

Under the recreational use statutes, there is no landowner liability for recreational injuries attributable to ordinary negligence (i.e., mere carelessness). To recover damages, the injured recreational user, who entered the premises free of charge, must prove willful and wanton misconduct on the part of the landowner. Unlike ordinary negligence, such misconduct is much more outrageous behavior demonstrating an utter disregard for the physical well-being of others.

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At present, 49 states have enacted recreational use statutes (with the exception of Alaska and the District of Columbia), based in whole or in part, upon the 1965 model act. The original intent of this model legislation was to provide limited immunity to private landowners. However, the statutes have also been held applicable to public entities, including the Federal government. Under the Federal Tort Claims Act, the Federal government is liable for negligence 'like a private individual' under the laws of the state where the **injury** occurred. As a result, these recreational use statutes (**RUS's**), intended for private individuals have uniformly been held applicable to the Federal government.

In addition, the **RUS** is applicable to State and local entities in approximately 17 jurisdictions. In some instances, the statutes are limited to recreational activities conducted on rural lands. However, some State courts have found the RUS applicable to urban lands as well. For example, the city of Omaha has successfully raised the State recreational use statute as a defense to alleged ordinary negligence liability for injuries sustained in a public park. Given the applicability of the RUS to public entities (at least in some jurisdictions), public park and recreation systems can, once again, offer programs that they were forced to eliminate because of the perceived **liability** crises.

LEGISLATION IS NOT ENOUGH

If the framework for providing private landowners with recreational **immunity** was developed more than 20 years ago, why is public access still an issue today? Landowner research has shown that most landowners, as well as agency land managers, do not know that recreational use statutes exists. As a result, the statutes do not necessarily encourage private landowners to allow public access by limiting liability. On the contrary, if landowners become aware of the insulation provided by the statute, it is usually after an injury occurs and counsel raises the statute as a defense to negligence liability.

In those few instances where landowners are aware of the statute, there is a perception that the RUS does not provide sufficient immunity to act as an incentive for public access. Private landowners do not want to know if they will have a successful defense to a recreational injury lawsuit. Their concern is much more basic; they want to know: "Can I be sued?" Unfortunately, the answer invariably is **"Yes,"** with or without the limited immunity provided by the RUS. As a result, the lower landowner standard of care (from ordinary negligence to willful and wanton

misconduct) imposed by the RUS will not encourage most private individuals to open their lands to public recreational use.

It could be suggested, therefore, that any solution to the private recreational lands issue must address the private landowners very real concerns about being sued. Whether you win or lose, it has been said that a lawsuit is the worst thing that can happen to an individual with the exception of death or serious illness. Therefore, one of the challenges to increasing the amount of recreational acreage is to somehow insulate the private landowner from the costs attendant to a lawsuit.

Since the management of public lands does not happen in a vacuum and insufficient private opportunities have negative impacts on public land management, the burden of finding ways to encourage more private land access must fall to governmental land managing agencies. These agencies must **exhibit** the same degree of commitment and fervor usually associated with land acquisition programs. As an alternative to fee simple acquisition, lease arrangements with private landowners can provide public recreational land whereby the agency agrees to defend and indemnify the private landowner. Therefore, the private landowner may still be sued, but the public agency will hold the landowner harmless, absorbing the cost of defending the lawsuit. In this way, private landowners will feel less threatened by potential liability when they open their lands to public use. Further, agency information and education divisions need to conduct public awareness campaigns to educate private landowners to the immunity available to them under existing recreational use statutes.

A specific provision of the model legislation that has been adopted by most states preserves limited immunity for lands leased to the State or local government for recreational purposes. Any payment received by the landowner from a governmental agency for leasing the land is not considered a charge or fee within the meaning of the RUS. Thus, lease payments from public entities, unlike entry fees paid to the private landowner, would not deprive the landowner of limited immunity under the recreational use statute.

Where necessary, the recreational use statutes should be amended to make it clear that such immunity applies to public entities, as well as private individuals. In a recreational injury lawsuit involving private land leased to a public agency, the private landowner as well as the agency may be sued. In that case, it

would be preferable that the lower standard of care associated with the RUS be applicable to all potential defendants, public as well as private.

A uniform standard is desirable because the State or local agency will be more willing to enter into a lease agreement whereby the public entity agrees to defend and hold the private landowner harmless when liability must be based upon proof of willful or wanton misconduct. A lower standard of care requiring proof of willful/wanton misconduct for both the public and private parties in a lease of recreational land increases the likelihood of a summary judgment. A summary judgment dismisses or resolves a case prior to a full trial. This significantly lowers the costs attendant to litigation.

COORDINATED SUPPORT EFFORT NEEDED

Attorneys defending recreational injury lawsuits tend to be jurisdiction specific. They are, therefore, not necessarily aware of the status of recreational immunity in other jurisdictions. As a result, recreational use statutes are being interpreted by State courts in various ways. Many of these judicial interpretations do nothing to encourage private landowners to open their lands to public recreational use.

History has shown that it is not enough to get the statutes on the books. There are presently 49 recreational use statutes, but potential landowner liability for allowing public recreational access is still an issue. No doubt, the problem has improved since 1965. However, much needs to be done to ensure that these statutes are favorably interpreted by the courts.

It would be advantageous to the park and recreation profession to coordinate its efforts in the area of recreational injury liability. Specifically, some sort of institutional base needs to be developed to share information and resources on the overall issue of recreational injury liability as has been suggested by the President's Commission on Americans Outdoors. For want of a better term, this proposed think tank has been referred to as the 'Recreation Law Institute.'

An institute of this type is well suited for the university environment, working closely with agencies of all jurisdictions utilizing its services. One would expect the insurance industry to be interested in supporting a coordinated effort by the park and recreation field to address the problem of recreational liability. Absent this coordinated and institutionalized approach, we may be back once again 20 years from now to explore the liability question and how it is affecting the supply of recreational opportunities.

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Section 2.

The Outdoor Recreation Resource: Trends and Current Status



THE NATIONAL PRIVATE LAND OWNERSHIP STUDY: ESTABLISHING THE BENCHMARK

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Abstract – This paper presents the findings of the 1986 National Private Land Ownership Study. The study develops a better understanding of the individuals who own rural lands and the reasons for that ownership. Estimates of tract sizes, amount of land dedicated to specific land uses, and leasing and posting practices currently employed by landowners were established as a framework for examining recreational access dimensions and policies.

Availability of private lands is crucial if America is to meet increasing demands for a number of types of outdoor recreation. Private land and water resources provide businesses for such activities as camping, skiing, boating, horseback riding, fee fishing, and hunting. Noncommercial private lands are also critical to meeting national demands for hunting and fishing. Such private lands also have important regional implications for meeting demands for other wildlife-associated recreation activities, hiking, camping, and snowmobiling.

Unlike public lands, which are managed for public purposes including recreation, private, nonindustrial lands are managed by thousands of individual landowners, primarily for their own private objectives. Many of these private acres provide excellent recreation opportunities, but often they are closed to the public unless permission is obtained. Programs to obtain public access to private lands have most frequently been implemented at State and **substate** levels. **However**, it is important that the Federal government periodically monitor recreational access

to private lands on national and regional bases to ascertain whether sufficient public and private acres in combination are available to meet demands for a host of outdoor activities. The 1986 National Private Landownership Study was implemented for this purpose.

This paper summarizes the importance of the private recreation estate to Americans in the latter half of the 1980's. It examines the literature for factors associated with decisions of private landowners to grant or restrict recreation access. It then presents results of the 1986 national study, and examines trends from the previous study conducted in 1976.

ROLE AND IMPORTANCE OF PRIVATE LANDS

The total private, nonindustrial land base in the United States amounts to about 1.3 billion acres (Resources for the Future 1988). About 90 percent of these lands are in the Eastern states. Because Eastern states have greater population densities and fewer public lands than the West, availability of private lands for recreation in the East is critical to meet growing demands for resources for a number of outdoor activities.

The private sector contributes to the recreation resource base in two ways, Thousands of businesses now provide camping, skiing, boating, horseback riding, hunting, and fishing opportunities. These businesses provide important sources of additional income. They often provide complementary recreational experiences to those provided by the public sector, and they substantially reduce pressures associated with even greater numbers of recreationists on public lands. In addition to private businesses, thousands of rural landowners across America willingly open their lands to hunters, anglers, hikers, and others free of charge. Particularly in the east, where much of choice habitat for wildlife species is found on

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private lands, continued availability of private lands is crucial to meeting demands for hunting and other wildlife-related recreational activities.

THE PRIVATE LAND BASE AND ITS OWNERS

Of 1.3 billion acres of private lands in America, the largest single category, cropland, occupies 464 million acres, 35 percent of the total (Frey and Hexem 1985). About 30 percent, 393 million acres, is forested, while 28 percent, 373 million acres, is in grassland, pasture, and range. The remaining 99 million acres, about seven percent of the total, is in miscellaneous uses. Private land comprises 99 percent of the nation's cropland, 62 percent of grassland pasture and range, and 55 percent of forest lands.

Using the most recent comprehensive landowner study in the U.S. (Lewis 1978), information on amount of land farmed (U. S. Department of Commerce 1978), and estimates of land area of States (U. S. Department of Commerce 1984), a regional view of the preponderance of land in private ownership and proportion of private acreage in farms can be assembled. Although about one-third of the continental U. S. is publicly owned, most of the Eastern and Central regions have less than ten percent of acreage in public ownership (table 1). Thus, the importance of private lands in supplementing the public recreation base becomes apparent.

In the Northeast, Appalachia, and the South, less than half of private acreage is in farms. In Central and Western regions, most private acreage is owned by farmers or ranchers. In the three Corn Belt and Plains Regions, ranging from Ohio west to Kansas, table 1 shows a combination of very little public acreage and high proportions of private acreage in farms. In these States, land owned by farmers is a critically important wildlife recreation resource.

Considerable concern has been expressed in recent years that the supply of land on which to pursue outdoor recreation activities is decreasing at alarming rates (Brown and others 1984; Guynn and Schmidt 1984; Wright and Kaiser 1986). Land is being permanently removed from the open space land base for population expansion and urban development. For example, the U.S. Department of Agriculture estimates 1.5 million acres of agricultural land are being converted to nonagricultural uses annually (Resources for the Future 1983). Moreover, additional amounts of remaining open space are being closed and/or posted by private landowners, thus denying access to the public (Brown 1974; Brown

Table 1. --Percentage of U.S. land area in private ownership and percentage of private acreage farmed

Region ¹	Privately owned ²	Private acreage in farms
<u>Percent</u>		
United States ³	67	55
Northeast	84	28
Lake States	75	66
Appalachian	95	45
Southeast	90	42
Delta States	92	48
Corn Belt	95	81
Northern Plains	92	102
Southern Plains	94	87
Mountain	38	107
Pacific	49	68

¹Regions defined in Lewis (1980).

²Includes public lands leased for farming and some Indian reservation lands still considered to be public domain.

³Exclusive of Alaska and Hawaii.

and others 1984; Guynn and Schmidt 1984; Resources for the Future 1983; Wright and Kaiser 1986). The problem of providing sufficient access to the public for recreation is exacerbated because these decreases in land resources have come during a period of increasing public demands for outdoor activities (President's Commission on Americans Outdoors 1987).

RURAL LANDOWNERS' ACCESS DECISIONS

At least two conceptual models of landowner decisions regarding hunting access have been developed. Wright and others (1988) depicted a landowner hunting access model in which information from three domains went into landowners' decisions: landowner attributes, user behavior, and resource attributes. Landowner attributes included demographic characteristics, ownership objectives, attitudes,

and posting policies. User behavior included various types of property damages and nuisances that are so often associated with irresponsible recreationists.

Resource attributes included existing land uses, wildlife availability and habitat quality, and acreage. Based on information from these three domains, each landowner decided whether to allow open access, restrictive access, exclusive access, or no access (implied is that no fee is charged). The other option is to allow access on a fee basis (Wright and others 1988).

Decker and others (1987) developed a slightly different model of hunting access dynamics of private landowners and hunters. In its most general form, landowners' values, beliefs, and attitudes provided bases for this model of landowner access policies. Through imperfect communications, hunters interpreted these policies and/or developed perceptions of them, from which hunters reacted and displayed certain behaviors toward hunting on private lands. These hunter reactions and behaviors in turn were seen and interpreted by landowners, and fed back into landowner attitudes, beliefs, and values. Each of these models was developed further as background and literature review regarding landowner decisions about public access.

Five primary domains influenced landowners' values, beliefs, and attitudes, and thus formed the bases for their access policies. Although not included among these domains, it was recognized that socioeconomic and demographic characteristics were correlated to some degree with access behavior. Such characteristics as age, sex, education, and whether the landowner resides on the property have been shown to be correlated with posting or hunting access behaviors of landowners, but these factors had low predictive power (Brown and others 1984; Wright and Fesenmaier 1988).

The first domain found to be a basis for landowner access policies is landowner beliefs about hunters and other recreationists, both as individuals that landowners know and as a group that landowners perceive collectively. Brown and Thompson (1976) found that landowner inputs to access decisions came not only from their own personal experiences, but also from those of friends and neighboring landowners. Landowners' perceptions of inappropriate user behaviors have been shown to be a major disincentive for allowing access (Brown 1974; Holecek and Westfall 1977; Rounds 1973). Ninety-seven percent of New York landowners who restricted access

in 1972 reported a behavior-related reason on the part of recreationists contributed to their restrictive decisions (Brown 1974).

A second domain that influences landowner access policies is land use interests of the landowner. In the mind of the owner, land use has two components, recreational and nonrecreational. Brown and others (1983) found that the more active the landowner in wildlife-associated recreation on the property, the greater the likelihood he/she limited access. This has been termed an attitude of 'exclusivity' (Gramann and others 1985) and it has been suggested that this attitude poses "... the toughest access problem of all to resolve" (Wildlife Management Institute 1983). Previous national recreation studies have not dealt with the importance of exclusive owner and family recreational use of property as a barrier to public access. The recreational component has several important subcomponents. Frequency of use, proportion of total activity days for which property is the primary resource, time and monetary investment in enhancing property for wildlife or other activities and the perception of crowding are important aspects of exclusivity.

A third domain that influences landowner access policies is liability. This domain includes more than actual legal liability a landowner would have for an injured recreationist or injury one recreationist might inflict upon another. It also includes threat of being sued (Kaiser and Wright 1985, Kozlowski 1986). Psychological stress, lost time and money in preparing a legal defense, and adverse publicity often accompanying involvement in an incident of this type are also major disincentives. Nearly all (49) States have enacted legislation that limits landowner liability in situations where the landowner receives no fee from recreationists. Although states have varied considerably in their efforts and abilities to convey this information to the landowning public, some experts close to this topic believe that legal actions must either limit the degree to which landowners can be sued, or transfer responsibility of defending sued landowners to the State or another public entity before substantial progress can be made in increasing public access to private lands.

A fourth factor believed to influence public access is opportunity for landowners to derive income or other benefits from hunting or fishing, in particular. Increasingly, landowners are leasing lands to individuals or clubs for hunting. While this benefits some individuals, it prohibits access for all others. Leasing of lands for hunting has a prominent history in Texas (Pope and others 1984), and throughout the South,

and for waterfowl in Maryland (Brunori 1987) and other parts of the Northeast. It is evident that as demands for hunting increase relative to diminishing supply of lands available to the public, increasing numbers of recreationists turn to the option of leases.

The fifth factor that likely influences landowner access behavior specifically for hunting is owners' attitudes about appropriateness of hunting. As recently as 15 years ago this was not an important factor (Brown and Thompson 1976). However, as larger proportions of rural landowners have urban backgrounds, and as animal rights movements gain momentum, attitudes about hunting become increasingly important considerations for landowners.

Access policies that landowners adopt as a result of the five domains of influence include both posting and various levels of access. Brown and others (1984) stressed the importance of not viewing posting and access prohibition synonymously. The majority of landowners who post lands in New York do so at least partly to control and regulate access, while allowing some hunting by others on their properties. On the other hand, some owners who do not post will not allow hunting or other recreation activities. Posting behavior is important both in terms of intent of landowners and how it is perceived by recreationists.

Wright and others (1988) noted that landowners' decisions regarding access were not purely dichotomous choices, but choices of degree to allow or restrict access. Their rural landowner-hunter access model categorized access into one of five distinct policies: prohibitive, exclusive, restrictive, open, or fee (leasing). Prohibitive, open, and fee choices are self-explanatory. Those who adopted an exclusive policy used the resource themselves, and allowed no other uses. Restrictive policies varied by degree, but generally were grounded in an acquaintanceship between landowner and recreationist. Although restrictive, available evidence suggested that such policies allow many an opportunity to find recreation resources. Thomas and Adams (1982) found that 60 percent of Texas hunters found access through friendship or kinship networks.

LANDOWNER ACCESS AND ACTIVITY PARTICIPATION

The last National Private Land Ownership Study (NPLOS), conducted in 1976, identified six principal recreation activities often permitted by private

landowners: hunting, hiking, fishing, picnicking, camping, and horseback riding (Cordell and others 1985). Participation in all of these activities had grown since 1960. However, days of participation in the two most frequently permitted activities, fishing and hunting, declined from 1975 to 1980. Preliminary data from the 1985 Hunting, Fishing and Wildlife-Associated Recreation Survey suggested that fishing participation may have increased from 1980 to 1985, but hunting participation remained constant or declined slightly. Almost certainly, increasing urban population and other demographic factors exacerbated access problems to the extent that participation is being greatly inhibited. Since a previous study projected continued increases in participation in all outdoor activities through the year 2000 (Outdoor Recreation Resources Review Commission 1962), declines since 1975 suggested that these factors may be in part to blame.

Generally, little quantitative data exist on availability of private industrial lands for recreation. A study reported by Resources for the Future (1983) indicated that forest industries held title or managerial control to 68 million acres nationally. In 1960, 97 percent of this land was open to the public for recreation. However, "... by 1977, that figure had fallen to 58 percent, representing a loss of 23 million acres of land available for public recreation use* (Resources for the Future 1983). Cordell and others (1985) noted that at some point in the mid-1960s, industrial forest lands began to shift from being open to charging an entry fee to help cover rising costs associated with providing recreation to the public. A majority of corporate landowners in Virginia (94 percent) followed this strategy (Wright 1986). These landowners made available over a million acres of land to recreationists who were required to purchase use permits prior to entering corporate properties. Thirty percent of these properties were exclusively leased to hunting clubs.

As income generation becomes a more important objective, the preponderance of corporations leasing their lands to individuals and clubs will undoubtedly increase. Overall, leasing (\$0.99 per acre) provided significantly more income to Virginia corporations than did sale of permits (\$0.34 per acre) (Wright 1986).

These factors, all of which lessen likelihood for increased public access to private lands, set the stage for the 1986 National Private Land Ownership Study. Many variables that State-level studies have shown to affect access, and which were not adequately investigated in previous national surveys, were covered in the 1986 study. This inevitably should

provide improved insight into deficiencies of recreational access to private lands, and measures which might alleviate those deficiencies.

METHODS

The Sample

NPLOS was designed to survey nonindustrial, private rural landowners. Counties with high population densities of 200 or more people per square mile or a high concentration of government-owned land (50 percent or more) were eliminated from consideration using the National Outdoor Recreation Supply Inventory System (U.S. Department of Agriculture, Forest Service 1987) county-level data files on population and land area. Of 3,107 counties in the contiguous United States, 338 were too urban and 162 had too much government-owned land to be included in the potential sample. Fifty-one counties had insufficient data available on the amount of government-owned land to make a determination whether or not the county was eligible. These counties were left in the pool of potentials because there was too little information to eliminate them. After eliminating ineligible counties, there was a total of 2,556 counties from which to draw the national sample.

A SAS Graph (SAS Institute 1983) was used to draw six regional maps of the United States. Each map included county boundaries and FIPS codes identifying the counties; ineligible counties were eliminated from consideration. A 36 x 36 cell grid was drawn on a piece of clear acetate and either enlarged or reduced as necessary to cover an entire state. The grid was placed on the state with it aligned with the longest boundary of the state. Three dice were rolled to determine a row, column, and cell block. The county appearing under the chosen block, if it was an eligible county, was selected for the national sample. The grid was used to ensure even geographic distribution of counties chosen from each state.

Alphabetized master tax rolls, available in county tax appraisal offices, were used as sampling frames from which to obtain names and addresses of tract owners in sample counties. Each county was given a randomly selected "starting letter" at which point the search was initiated. Each county provided 25 names randomly drawn from the following size strata to ensure that the total county sample would be representative of tracts: 20-99 acres, 100-499 acres, and 500+ acres.

Data Collection

Procedures similar to those outlined by Dillman (1978) were used to collect needed data. For each landowner, a mailing packet contained a cover letter explaining the survey, tract description, general instructions for completing the questionnaire, number 2 lead pencil, questionnaire, and a return envelope.

Individuals who failed to respond to initial requests were sent postcard reminders to complete questionnaires and return them as soon as possible. Nonrespondents to the first two mailings were sent third requests that included a **followup** letter, questionnaire, and return envelope. By the end of the data collection period, 4,236 of the 11,687 questionnaires had been returned. As a result, a response rate of 36.25 percent and a sampling error of less than 4 percent was obtained. A 5 percent sample of nonrespondents was contacted by telephone to determine if any nonresponse bias was present. Analyses of frequency of responses between the two samples did not reveal any significant differences between the two groups.

Sample Weighting

Because a random sample was used that was known to be disproportionate to the population, post-sample weighting was required. This weighting procedure involved use of baseline information from the National Resource Inventory (U.S. Soil Conservation Service 1982). These baseline numbers provided information regarding number of owners, acreages by region and tract sizes owned. Individual case data within the NPLOS data base were weighted to reflect the population-to-sample ratio of strata proportions (table 2). The end result was a data base that enabled researchers to compute means, conduct multivariate analyses and extrapolate findings to regional and national estimates.

Data Analyses

Analyses of data collected in the survey were conducted in two phases. First, a general description of rural landowners and their properties was provided using simple descriptive statistics. Comparisons of frequency of responses given by respondents nationally and regionally were made.

Second, to understand the factors associated with policy adoption more fully, an effort was made to evaluate each landowner in terms of all access policies implemented. Since landowners may not operate under a single access policy, this required

Table 2. --Sample sizes and population-to-sample weighting ratios for National Private Land Ownership Study, 1986-87

Region	Tract size	Frequency (n)	Percentage	Weight
North	20 - 99	749.00	49.77	1.19
	100 - 499	651.00	43.26	0.91
	500 or more	105.00	6.98	0.23
South	20 - 99	530.00	47.83	1.17
	100 - 499	458.00	41.34	0.92
	500 or more	120.00	10.83	0.57
Rocky Mtn./ Great Plains	20 - 99	170.00	36.56	1.46
	100 - 499	192.00	41.29	0.69
	500 or more	103.00	22.15	0.82
Pacific Coast	20 - 99	174.00	52.73	0.94
	100 - 499	122.00	36.97	0.78
	500 or more	34.00	10.30	2.12

calculation of an 'Access Coefficient' (AC) for each respondent This represented the amount of recreational acreage available under each of their respective policies. To compute this statistic, the percentage of total land reported by respondents being controlled under each of the five access policies (prohibitive = 1; exclusive = 2; restrictive = 3; leasing = 4; and open = 5) was multiplied by the factor corresponding to that policy's position on the access continuum and summed. Landowners were then ranked according to their Access Coefficients and categorized into one of five levels of access.

RESULTS AND DISCUSSION

Owners

The sample of landowners responding to the National Private Landowner Survey was predominately male (79.6 percent) and slightly less than 58 years of age. The overwhelming majority of respondents was white (96.1 percent) and married (32.1 percent); family size averaged 2.6 people. These landowners claimed a variety of occupations; however, 45 percent were retired. Landowners reported earning an average of \$35,303 in total family income for 1985.

Levels of educational attainment represented in the sample were relatively high-58 percent of property owners indicated they had graduated from high school and gone on to complete some college work. Further, 15.6 percent had obtained a college degree and another 14.9 percent had completed some graduate work.

Private land ownership in the U.S. appeared to be family-oriented. Eighty-six percent of landowners reported owning their lands either solely (38.4 percent) or as part of family ownership (47.7 percent) (table 3). They had owned that property for an average of 23.3 years. Further, 38 percent of respondents were resident owners, indicating they lived on their property. Moreover, 90 percent of all landowners lived within a 20 mile radius of their properties.

Regional differences regarding characteristics of rural landowners were found with several variables. Respondents in the Southern region were significantly older (59.5 years) than landowners in all other regions ($p < 0.017$). Family incomes in 1985 were highest among persons from Pacific Coast (\$42,872) and Southern (\$39,321) regions. Incomes of these owners were significantly higher than those earned by owners in Rocky Mountain and Northern regions ($p < 0.001$). Accordingly, landowners in the Pacific Coast Region made more money from their lands in 1985 (\$12,399) than landowners in other regions ($p < 0.001$). Ironically, Southern owners were least dependent on their lands as sources of income (\$5,058). No significant differences were found among landowners in different regions regarding amount of property taxes paid in 1985.

As might have been expected, motives for owning rural lands appear to be changing. Traditional agriculture-related reasons such as growing crops for sale were found not to be as important today as they were in the past. Four out of ten respondents rejected crops/agriculture as an important reason for owning rural land. As shown in table 4, crops/

Table 3.--Percentage distribution of respondents (above) and acreage in selected ownership categories (below)

Owners	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Sole owner	36.09	46.00	32.04	33.00	38.44
	77,889	82,266	45,693	21,531	227,380
Family owner	52.33	40.31	50.87	47.00	47.73
	82,556	57,612	61,375	32,037	233,580
Family partnership	8.13	8.62	11.43	11.92	9.11
	23,586	20,849	19,232	31,589	95,256
Other partnership	1.48	1.71	1.61	3.02	1.72
	2,371	3,028	1,220	3,031	9,649
Family corporation	0.80	1.40	2.62	2.65	1.42
	2,792	5,312	5,762	4,523	18,389
Other corporation	0.13	0.50	0.0	0.25	0.24
	449	1,489	0.0	342	2,280
Other	1.05	1.46	1.44	2.15	1.34
	2,121	3,034	558	2,995	8,707

Table 4.--Importance of selected motivations for owning rural land (percentage of respondents ranking as important/very important)

Motive	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Fee recreation	99.32	98.08	100.00	98.82	98.98
Timber	90.75	80.93	97.00	82.33	87.56
Investment	86.52	85.23	85.86	81.41	85.52
Making estate	79.90	72.82	77.07	74.19	76.78
Livestock	80.78	72.71	62.44	73.44	75.03
Personal recreation	60.17	68.19	82.62	65.77	65.95
Living/rural environment	56.60	64.46	71.45	65.53	61.78
Crops/agriculture	54.90	68.71	54.51	66.69	60.19

agriculture were reported as the least important ownership objective of those investigated. Landowners did report that making money from fee recreation (99 percent), timber (88 percent), and investment (86 percent) were very important reasons why they owned their properties.

The Land

Respondents owned an average of 183 acres. Those from Pacific Coast and Rocky Mountain Regions reported owning largest tracts of land ($X = 310.1$ acres and 304.2 acres, respectively). These tracts were significantly larger ($p < 0.001$) than tracts owned by Eastern landowners. Southern and Northern landowners owned tracts of 163 acres and 132 acres, respectively (table 5).

Ironically, cropland was reported as the largest single land use across the nation ($X = 63.4$ acres), even though many owners rejected crops/agriculture as an important ownership objective. This was followed closely by land in forests ($\bar{x} = 53.3$ acres), even though less than one percent of landowners leased timberland on their properties.

Further, only 39 percent of forest owners had ever sold timber from their forests. Pasture ($\bar{x} = 31.5$ acres) and range ($\bar{x} = 25.2$ acres) accounted for the remaining major uses of rural lands. Forty-two percent of respondents used these lands for grazing livestock, primarily beef cattle (83 percent). Barren lands, water and other land in farms accounted for less than five acres of the respondents' total acreage.

Regionally, Pacific Coast landowners reported the largest mean number of acres in forest lands ($\bar{x} = 75.7$ acres) as compared to Rocky Mountain owners who possessed only an average of 9.1 acres of timber. Tracts in the Rocky Mountain Region were found to be significantly smaller ($p < 0.036$) than tracts in other regions in the amount of land in forests. Landowners in the Rocky Mountain Region joined those from the Pacific Coast in having significantly more land employed as range ($\bar{x} = 71$ acres and $\bar{x} = 91.3$ acres, $p < 0.001$) and row crops ($\bar{x} = 96.1$ acres and $X = 102.2$ acres, $p < 0.001$) than owners from Eastern regions. Rocky Mountain owners also possessed significantly more acreage as pasture ($\bar{x} = 112.4$ acres, $p < 0.001$). No other regional disparities were found among land uses employed by respondents.

Recreation is another common use of land even though it appeared that few landowners were physically altering the landscape to enhance recreational opportunities. Landowners were asked to indicate whether each of 15 different recreational activities was inappropriate, given resources available on their tracts of land. Table 6 reports suitability of private land resources owned by respondents to these activities.

Overall, hunting was reported as the activity most conducive to private lands. Driving off-road vehicles, shooting, photography, nature study, hiking, birdwatching, picnicking, riding horses, and camping also were reported as being compatible activities by a majority of property owners. Water-related activities such as fishing, swimming, canoeing, and boating were much less compatible. This undoubtedly could be attributed to paucity of water resources owned by respondents (30 percent reported owning surface water). Ninety-three percent of respondents' properties accommodated recreation in some manner.

Recreational Access Policies

The degree to which private landowners allow recreation is a question of high priority to recreation planners. As described previously, recreational access policies adopted by private landowners in this study took many forms. Some properties were closed to recreation. Others were maintained for exclusive recreation of owners or restricted to invited guests. Still others were open to the general public, whether it was for a fee or free of charge. Furthermore, landowners often controlled implementation of these policies by posting their properties. Even though posting is not a policy, in and of itself, it does have a significant impact on perceptions of land availability.

Posting Practices

Thirty-three percent of respondents ($n = 1,431$) indicated they posted at least a portion of their lands against trespass. Of these, 85 percent posted all of their properties. In general, it appeared that landowners did not bother with selective posting; that is, posting only a particular section of their lands. On average, owners posted 232 acres of land.

Pacific Coast owners reported the highest percentage of their land posted (40 percent). Southern owners were second (34 percent), followed by landowners from the Northern region (33 percent). Respondents from the Rocky Mountain Region posted the smallest percentage of their lands (24 percent).

Table 5. --Major land uses employed by private, nonindustrial landowners (mean acres)

Land use	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Forests	55.97	61.42	9.13	75.67	53.26
Crops	55.19	49.27	96.12	102.17	63.39
Pasture	9.36	28.37	112.37	29.11	31.49
Range	4.04	15.05	71.03	91.28	25.19
Barren	0.74	1.75	0.65	1.88	1.16
Water	1.25	2.48	1.15	1.94	1.70
Other farm	5.80	4.43	13.70	8.06	6.42
Total acres (mean)	132.35	162.77	304.15	310.11	182.61

Table 6. --Suitability of private land resources to selected recreational activities (percentage of respondents indicating property suitable for activity)

Activity	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Hunting	89.6	87.6	79.9	86.8	87.5
ORV Driving	83.6	77.3	68.7	75.9	79.0
Shooting	79.2	78.7	66.5	76.0	77.1
Photography	79.7	76.7	68.2	76.0	77.0
Nature study	78.0	73.6	68.5	74.1	75.0
Hiking	76.8	72.0	60.3	71.3	72.7
Bird watching	75.5	72.9	58.9	73.1	72.4
Picnicking	72.7	75.2	61.5	69.9	72.3
Horseback riding	71.9	71.9	65.7	74.7	71.4
Camping	64.9	70.0	51.2	61.4	64.5
Fishing	45.3	56.5	32.0	42.1	46.9
Swimming	37.3	47.2	28.7	34.7	39.1
Canoeing	31.6	37.7	22.1	29.0	32.1
Boating	29.8	36.1	19.8	25.2	30.0

When this practice is viewed in relation to total acreage owned, respondents from the Rocky Mountain Region posted significantly more land (\bar{x} = 648.66 acres) than did other landowners ($p < 0.001$). Conversely, Northern owners reported posting the smallest number of acres (\bar{x} = 125.58 acres), which was significantly smaller than the amount of land posted in all other regions ($p < 0.001$).

The relationship between posting and recreational access is not clearly understood. Brown and others (1984) theorized that posting is not necessarily indicative of land closures. Rather, it is more an indication of a landowners' tolerance and a method of controlling varying degrees of access to their properties. This point is aptly demonstrated in findings from the NPLOS study.

Given the total of 1,431 owners who posted their lands, only 14 percent of landowners prohibited all recreational access. Eighty percent of posting landowners provided recreational access for members of their families regardless of whether they lived with them. Sixty-five percent of these owners allowed friends and neighbors to use their lands for recreational purposes. Additionally, 19.2 percent posted their properties to protect rights of persons leasing their lands for recreation, and another 8.1 percent of owners allowed the general public to use their lands as long as they asked permission. Therefore, it would be erroneous to view posting as a single policy of recreational access.

Prohibitive Policies

Very few landowners proscribed all recreation (< 5 percent). Landowners from the Southern Region showed the highest propensity for closing their lands to recreation (6 percent), even though differences found among owners closing their properties from each region were marginal. Numbers of persons closing their lands varied from 3.5 percent of respondents in the North to 6 percent in the South. This, in effect, closed only 5 percent of total land owned by respondents. Table 7 shows effects of respondents' policies on distribution of total acreage.

Exclusive Policies

Thirty-eight percent of respondents reported closing a total of 206,910 acres of land to all but personal recreation. This figure represented 26 percent of respondents' total land base.

Approximately 40 percent of owners in the North, South, and Pacific Coast Regions reported excluding access to all but family members on some portion of their land. Only 22 percent of Rocky Mountain owners indicated they reserved land for private recreation. Acreage affected by these policies was most severe in the Pacific Coast Region. Thirty-nine percent of the respondents acreage in that region was operated under a policy of exclusion.

Table 7. --Distribution of land in acres controlled under specific recreational access policies adopted by private, nonindustrial landowners (above) and percentage of total acreage in region (below)

Policy	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Prohibitive	7,479 (3.16)	17,216 (6.22)	7,445 (3.32)	5,703 (4.88)	37,843 (4.54)
Exclusive	53,289 (24.64)	77,847 (28.14)	30,196 (13.47)	45,578 (38.99)	206,910 (24.81)
Restrictive	99,183 (45.86)	119,911 (43.34)	115,892 (51.70)	34,827 (29.79)	369,813 (44.34)
Leased	4,543 (2.10)	23,062 (8.34)	1,562 (0.70)	14,280 (12.22)	43,447 (5.21)
Open	50,927 (23.55)	35,499 (12.83)	64,805 (28.91)	16,380 (14.01)	167,610 (20.10)
Total	215,421	273,535	219,900	116,768	825,624

Leasing and Fee Recreation

Although research literature has implied that the incidence of landowners adopting fee recreation policies has increased in recent years, relatively few respondents to this study corroborated this. Only 5 percent of all landowners in the sample indicated they leased any portion of their properties for recreation (< 6% of total acreage). This seemed to contradict the importance respondents placed on fee recreation as a reason for owning rural land. Those found to be operating land under this policy reported leasing an average of 253 acres. Approximately 60 percent of these owners leased to clubs or groups of individuals. Slightly less than 40 percent leased to individuals and very few (n = 5) leased lands to government agencies.

The largest number of landowners undertaking a 'fee recreation' policy was found in the Southern region (n = 74, 7 percent). Between 2 and 3 percent of owners in remaining regions charged for recreational access to their properties. Southern owners also dedicated the largest amount of land to fee recreation (23,062 acres).

Motivations behind leasing were fairly consistent among all landowners. Respondents reported monetary reasons for adopting a leasing policy, such as 'helping to pay taxes' and 'gaining additional income.' Other perceived advantages were lessees' enhanced 'stewardship of the land' (32 percent) and their ability to aid in 'controlling trespass' (32 percent).

Overwhelmingly, hunting was the most common type of lease. Forty-seven percent of these owners leased their lands for hunting, a majority (60 percent) indicating that big game was the primary type of hunting, even though other types of hunting were allowed under conditions of most leases. These activities generated an average of \$531 per landowner. Fees charged for hunting leases ranged from less than \$10 to a high of \$8,000. Twelve percent of these persons indicated they would lease an average of an additional 116 acres if the right incentives were provided. Other recreational activities appeared to be insignificant in terms of revenue generation,

Open Policies

Respondents (25 percent) allowed the general public to use 167,610 acres of their lands for recreation. This equated to 20 percent of total acreage owned by all persons in the sample.

Greatest regional disparities regarding amount of private recreational land made available to the general public was found in the East. Thirty-one percent of Northern owners allowed a portion of their lands to be used by people other than personal acquaintances for recreation. In contrast, less than 13 percent of Southern landowners allowed open access.

Rocky Mountain landowners reported the largest percentage of lands open to the public. Slightly less than 29 percent of private lands in this region were open to public recreation (64,805 acres). Twenty-four percent of Northern lands were open as well. Southern and Pacific Coast landowners reported the smallest percentages of total land available to the public under this policy (13 percent and 14 percent, respectively).

National Estimates

By applying the percentage of total acreage under each of the five access policies identified in the study to the total amount of private farm and ranch land in each region, statistical inferences can be drawn. Estimates of the amount of land available for recreation can be seen in table 8.

Of the estimated 1.21 billion acres of land in private ownership in the United States, approximately 63.1 million acres are closed to recreation. Furthermore, over 295 million acres are closed to all but exclusive use of owners. This, in effect, decreases the supply of private land available for recreation of most Americans by almost one-third (30 percent).

The largest blocks of recreational lands are operated under policies based on familiarity. Access to 47 percent of the private land base was estimated to be restricted to persons who were personally acquainted with the owner. Over 568 million acres of land fall under this policy.

Land available to persons without friendship and/or kinship networks to draw upon for recreation amounts to approximately 23 percent of the land in private ownership. Slightly more than 53 million acres were estimated to be operated under some form of leasing arrangement and 230 million acres are open to the public. Persons gaining access to this open acreage may be required to obtain prior permission of the owner (either written or verbal) in order to use these lands, but generally, these lands are open to the general public.

Table 8.--Estimated total acres of private, nonindustrial land available for recreation by access policy (acres x 1,000's)

Policy	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Prohibitive	11,857	27,377	13,361	10,557	63,152
Exclusive	84,614	123,789	54,241	32,365	295,009
Restrictive	156,310	188,041	206,731	17,891	568,973
Fee	5,923	34,719	3,194	9,500	53,336
Open	66,663	53,658	,	11,544	229,664
Total ¹	325,367	427,584	375,326	81,857	1,210,134

¹Numbers may not sum due to rounding errors.

Table 9.--Landowners receptivity to selected recreational activities (percentage allowing access)¹

Activity	North	South	Rocky Mtn./ Great Plains	Pacific Coast	U.S.
Hunting	71.5	64.0	64.2	59.9	67.2
Photography	68.5	56.6	62.7	65.8	63.9
Bird watching	66.0	52.7	63.1	60.4	60.9
Nature study	64.7	51.9	59.8	62.4	59.9
Hiking	64.0	50.7	60.1	55.4	58.7
Picnicking	53.6	47.6	51.8	52.9	51.4
Fishing	50.3	53.4	42.5	46.8	50.6
Horseback riding	50.7	43.0	62.8	51.6	49.8
Shooting	36.2	30.7	36.2	34.3	34.3
Camping	33.8	29.7	45.3	29.4	33.1
Swimming	22.0	25.8	18.5	29.8	23.9
ORV driving	31.4	14.9	18.8	14.3	23.4
Canoeing	24.0	19.1	19.4	16.8	21.2
Boating	15.7	12.3	7.0	15.1	13.6

¹Based only on landowners who indicated owning resources compatible with respective activities.

Receptivity to Specific Recreational Activities

Failure of past research to capture activity-specific access policies of landowners was a weakness in attempts to better understand landowner policy behaviors. Researchers' abilities to document these types of access policies have been limited. Highly detailed inquiries required to overcome this weakness quickly become burdensome to respondents and are not congruent with many research designs, especially mail surveys. The NPLOS questionnaire solicited activity-specific data from landowners, and although these data did not allow owners to be categorized into specific policies along the access continuum, increased insights were gained into receptivity of landowners regarding specific activities.

By eliminating landowners who indicated their lands were not appropriate for each activity and calculating the allow/disallow ratio for all persons having resources compatible with each activity, a better idea of landowners' tolerance for different activities was gained. Inasmuch as hunting was perceived to be the activity most suitable to private resources, it was the activity most often allowed. Sixty-seven percent of landowners allowed hunting on their lands (table 9). Non-consumptive activities such as photography, birdwatching, nature study, hiking, and picnicking also were allowed by a majority of respondents.

However, even though the majority of owners felt their lands were highly conducive to shooting, camping, and off-road vehicle use, these activities were prohibited by over 65 percent of landowners. Perceptions of dangers and/or resource damages associated with these activities may provide some explanation for landowners' intolerance of these pastimes.

Total Access: The Effect of Multiple Policies

The importance of understanding the amount of land available for recreation and landowners' receptivity to specific recreation activities is second only to understanding the landowners who implement these policies, since landowners are the key to future access. Furthermore, it is important to recognize that rarely do landowners operate these lands under a single policy. Rather, respondents reported managing their properties under multiple policies. Therefore, it is beneficial to view landowners in relation to the total amount of access allowed.

To accomplish this, landowners were categorized according to the total effect of all policies implemented. Segmentation of respondents into one of five access policy levels was accomplished based on their "Access Coefficient" (AC). As described in the methodology, this statistic reflects the acreage controlled under each of the five access policies, multiplied by a factor corresponding to that policy's position on the access continuum (prohibition to open). For example, a landowner who owned a 100 acre farm which was used exclusively for his family's personal recreation would produce an access coefficient of 2.0 (100 acres/100 acres x 2 = 2.0). Should that landowner decide to open 50 acres of that tract to friends and other personal acquaintances, then their coefficient would be increased to 2.5 (50 acres/100 acres x 2 + 50 acres/100 acres x 3 = 2.5).

It is important to note that these policy levels are not identical to the policies of prohibition, exclusion, restriction, fee, and open. However, the scaling of landowners within policy levels was designed to have the levels correlate as closely as possible with the corresponding policies.

To test the accuracy of this scaling, landowners of all levels were compared by means of a one-way ANOVA and Duncan's Multiple Range Test, regarding variables pertaining to the amount of land operated under individual access policies. Owners in the first level were the most likely to prohibit all recreational access to their land ($p < 0.004$). Those landowners segmented into Access Level II restricted significantly more land to the exclusive recreational use of their families ($\bar{x} = 176.3$ acres, $p < 0.001$) than owners at other levels. Furthermore, respondents in Level IV leased the most land ($\bar{x} = 67.7$ acres, $p < 0.002$) and respondents in Level V had the most open acreage ($\bar{x} = 203.2$ acres, $p < 0.001$). Therefore, it appears that the Access Levels used in these analyses closely approximate the corresponding policies.

Distribution of respondents within these access levels can be seen in table 10. As with total acreage operated under each of the respective policies, landowners segmented into the most restrictive level numbered less than four percent. Slightly more than 18 percent were categorized into AC Level II and the largest segment by far, again was Level III. Fifty-six percent of all owners fell into this level. The remaining owners were almost equally distributed between Levels IV and V (11.62 percent and 10.2 percent, respectively).

Table 10.--Distribution of respondents within five access policy levels based on access coefficients (percentage of total respondents, n = 3,382)

Access level	North	South	Rocky Mtn. / Great Plains	Pacific Coast	U.S.
I	1.30	1.57	0.47	0.56	3.90
II	7.04	7.78	1.45	2.04	18.30
III	24.69	17.33	9.08	4.88	55.97
IV	5.50	3.67	1.09	1.36	11.62
V	.	2.22	1.57	0.83	10.20
Total	44.12	32.55	13.66	9.67	100.00

CONCLUSIONS

Respondents to the National Private Land Ownership Study were typically in their mid-to-late fifties, married, white, and predominately male. These landowners owned an average of 183 acres of rural, nonindustrial land and had owned that land for approximately 23 years. Ownership of this property was usually family oriented; that is, land was either owned solely by respondents or by the respondent's family. Owners lived in close proximity to their properties. Ninety percent lived within a 20 mile radius of their lands and 38 percent actually resided on the properties.

Reasons reported by respondents for owning rural lands were much different from traditional agricultural-related ownership objectives of the past. Making money through 'Fee Recreation,' "Growing Timber for Sale,' and "Investment Potential of Rural Land" were reported to be most important reasons for owning rural land. 'Raising Livestock,' "Living in a Rural Environment,' and 'Crop Agriculture" were much less important to today's landowners. Moreover, respondents were less dependent on land as a source of income. Less than 20 percent of respondents' total family incomes for 1985 were generated from the lands (\bar{x} = \$6,778).

While it appeared that landowners possessed latent desires to generate income through the outdoor recreation potential of their properties, this desire has not come to fruition to date. Less than 4 percent of owners were actively leasing or charging fees for outdoor recreation. Although leasing practices usually required larger blocks of land than other access policies, the number of acres operated under a fee policy totaled less than 6 percent of total land owned by the sample of respondents.

Implications

Based on results of this study and related research to date, several points become readily evident. First, the nation's undeveloped land base will continue to erode. Population increases and resultant urban expansion will require an increasing amount of rural land be converted to urban uses. Estimates of between one and two million acres of rural land being taken physically out of the inventory on an annual basis are not uncommon (Resources for the Future 1983; President's Commission on Americans Outdoors 1987).

Physical losses of these lands notwithstanding, perhaps an even more severe effect of urbanization occurs in the American mind. Urban Americans are quickly losing touch with the land. They have limited, if any, relationship with the land and its communities. Socio-psychological effects of urbanization may be felt in loss of political support for resource protection and other issues important to perpetuating outdoor recreation opportunities. Moreover, public ignorance resulting from disassociation with the land will continue to affect recreationist behavior, which in turn, will have negative impacts on land access. As property damage, liability, litter, trespass, and other problems which dissuade landowners from allowing recreational access to their lands continue, land closures and restrictions of access to private lands will undoubtedly become more severe.

Also, it is highly likely that there will be major turnovers in land ownership over the next 10 to 15 years. With 45 percent of owners reporting being retired, there is a distinct possibility of major changes in ownership. New owners may bring on even more strict access policies. As this progresses, ownership

for reasons of exclusive resource use, will probably increase. This will, in effect, lock up many recreation resources and further polarize those persons who can afford to purchase land for recreation and those who cannot.

To ensure adequate recreation opportunities on private lands in the future, one of two things must happen—problems with recreationists and other disincentives to landowners must be lessened or eliminated, and/or incentives to provide recreational opportunities that are sufficient to overcome problems being experienced, must be provided to landowners. Educational and legislative implications of this must be addressed by resource management agencies and private organizations dedicated to recreation and resource management purposes.

It has been stated often that behavioral problems associated with recreationists are results of actions of an unconcerned minority that cause the majority of recreationists to suffer. Even if this is true, no longer can Americans find solace in this fact. Landowners' perceptions regarding the severity of these problems are reflected in their increasingly restrictive access policies.

Therefore, innovative approaches must be found to reduce or eliminate these problems. As a first step, more information must be obtained regarding significance of, and causal factors associated with depreciative behavior. Presently, pathetically little research has been conducted in this area.

The alternative to eradicating disincentives is providing incentives to landowners in exchange for allowing access to their properties. Incentives to landowners could be economic (i.e., cash payments or tax relief), legislative (i.e., improved liability protection), technical (i.e., assistance in forest, wildlife and/or recreation management), and/or legal (i.e., increased law enforcement for controlling trespass, stiffer penalties).

One approach to encouraging landowners to allow more access has been through private leasing of recreational access. But as reported, only a small percentage of rural landowners have undertaken leasing as an access alternative. It appears that processes of the free market system have not worked well for all forms of outdoor recreation. Of the few landowners who reported assessing a fee for access, the majority of these transactions were for hunting. Hunters are accustomed to paying for their recreation;

they have traditionally paid for licenses, permits, stamps, and other fees associated with the sport. Moreover, it could be argued that hunting has more tangible benefits associated with it (i.e., trophies, meat, and animal by-products) than other recreational activities: therefore, it is more conducive to commercialization. Without the ability to receive economic incentives, most landowners will be reluctant to open their lands for recreation unless other types of incentives are provided or measures to eradicate disincentives are undertaken by resource management agencies.

To ensure a sufficient supply of private lands for recreation in the future, Federal and State land management agencies should seek to form closer ties to landowners in the private sector, especially those whose lands are in close proximity to public lands. These agencies should emphasize the benefits of conservation assistance programs and encourage the concept of multiple use management. Moreover, inconsistencies in governmental policies send mixed signals to landowners regarding leasing. First, few States have offered tax breaks for property owners who allow public recreation on their lands, whether it be free or for a fee. The State of Texas has been the leader in commercialization of wildlife resources for many years, yet many landowners are reportedly hesitant to participate in State leasing programs or report revenues as income.

Second, State legislation designed to encourage access by eliminating fear of legal liability for recreational injury has been largely ineffective. Protection afforded under recreational-use statutes, now enacted in 49 States, is unknown to a majority of rural landowners. Even though little research has been conducted at the State level to document this fact, Wright and Kaiser (1986) reported that 44 percent of State wildlife administrators surveyed had no knowledge of liability protection provided by these laws. If State officials are not cognizant of these statutes, how can landowners be expected to be aware of them? This has tremendous implications for State information and education divisions. Also, protection afforded by these laws may be inconsequential compared to fear and burdens of being taken to court, on which these statutes have no effect. Having to pay lawyer fees, time away from work, and anxieties associated with litigating court cases are major disincentives in and of themselves.

Further, the vast majority of these statutes predicate insulation from liability on access being made available to recreationists free of charge. Landowners who choose to assess a fee for access lose their protection in most states. This poses a rhetorical question: Is assessing a fee for access, which may only partially cover expenses incurred by landowners for allowing recreational use, inconsistent with purposes of recreational-use statutes? It is the opinion of the authors that it is not! Can a constitutionally valid way be found whereby landowners can charge an access or admission fee to their properties on an "as is" basis, in which they would be subject to lawsuits only in cases involving gross negligence? Much needs to be done to eliminate these inconsistencies in the legal language of liability legislation if the intended purpose of the legislation is to be accomplished.

SUMMARY

The National Private Land Ownership Study is the most comprehensive research effort to date, directed at documenting the supply of private, nonindustrial lands available for outdoor recreation. Through this study, a better understanding of individuals who own rural lands and reasons for that ownership has been gained. Furthermore, estimates of the amount of land in various land uses, leasing practices currently undertaken by landowners, and amount of land controlled under specific recreational access policies were established.

However, now that the NPLOS has established the benchmark from which researchers can monitor changes in the private recreation estate, more in-depth studies of factors associated with landowner behavior, particularly access policy behavior, need to be conducted. This research must go beyond merely understanding the "what" and "how much" of recreational access to private lands, to a greater understanding of "why" landowners adopt specific access policies. A deeper understanding of recreation-related problems experienced by landowners, their attitudes toward providing recreational access, and preferences for incentives is prerequisite to undertaking programs that will encourage additional access in the future. To date, no research at the national level has attempted to model landowner access decisions.

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THE SUPPLY OF PRIVATE AND PUBLIC CAMPGROUNDS 1978-87

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Abstract-A brief history of private and public campgrounds is presented. Changes in the supply of campgrounds and campsites from 1978 to 1987 are discussed, as well as trends in the campground industry.

BRIEF HISTORY OF CAMPGROUNDS

Privately owned campgrounds have been in existence since the 1930's, and were first chronicled for the traveling camper in Woodall's 1937 edition of "Trailer Parks & Campgrounds." However, during World War II many of these campgrounds were converted into emergency housing which subsequently became mobile home parks. Private campgrounds emerged again as an important sector of the outdoor recreation supply system in the mid-1950's. With the expansion of outdoor recreation during the 1950's and 1960's many private land owners started operating small campgrounds. During the same period of time early franchises developed along the interstate highways to serve the traveling camper.

Since its early growth period, the private campground industry has experienced some changes typical of many young industries. A number of small, rustic campgrounds closed due to unprofitability. A number of marginal quality campgrounds such as gravel lots in mobile home parks closed. Many of the campground owners were not business people which resulted in an 8 percent to 12 percent turnover rate in ownership each year. The remaining campgrounds have upgraded their facilities and services. Water, electric, and sewer hookups at each campsite are the norm throughout the industry. Private campgrounds usually contain a swimming pool or lake, a store, and recreation facilities.

Competition within the campground industry remains harsh. Low fees, the average site fee is \$13.50 per night, have hampered the smaller campground owners' ability to make a reasonable return on investment (McEwen 1986). On the average, campgrounds earn a 3.8 percent profit on investment. Parks with 100 and fewer sites, showed a loss of 5.3 percent or **\$4,200** per year on their investment. Based on this information, it's not surprising that 32 percent of the campground owners indicated their parks are for sale. Low return is also the reason private campgrounds are often operated as a second business. They have survived by catering to the luxury oriented camper who requires more extensive facilities and services than those offered in the public campgrounds.

Public campgrounds have probably been in existence since the late 1800's. The National Park Service made provisions for the 'Tin Can' car campers, which began visiting the parks in the late 1920's. The US. Forest Service, also feeling pressure for public campgrounds, began to allocate funds for campground development around the same time. A major surge in public campground development came during the Great Depression when thousands of Civilian Conservation Corps workers built hundreds of campgrounds and trails. Camping became a popular tradition during the depression partly because of the improved facilities and partly because of the inexpensive costs. The tradition of a cheap family camping trip was firmly established during that period of American history, and is still strong today. The general public is resistant to increased fees at public campgrounds.

The second major surge in development of the public campground system came during the 1950's and 1960's when the post World War II baby-boom families turned to camping. There was a tremendous increase in participation in not only camping but all outdoor recreation pursuits requiring Federal and State agencies to build a number of campgrounds. Some of these campgrounds were quite large having 400 or more sites. All were of the rustic design featuring

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Table 1.--Number and percentage of campgrounds in United States by region and ownership,1978-87

Region	Total			Private			Public		
	1978	1987	1978-87	1978	1987	1978-87	1978	1987	1978-87
	<u>Number</u>		<u>Percent change</u>	<u>Number</u>		<u>Percent change</u>	<u>Number</u>		<u>Percent change</u>
Northeast	5,076 3,133 (24)	4,913 (37)	-3	3,515 (43)	3,045 (38)	-13	1,561 (33)	1,868 (38)	+20
Southeast	(24)	3,323 (25)	+6	2,058 (25)	2,136 (26)	+4	1,075 (23)	1,187 (22)	+10
Pacific Coast	1,986 (15)	2,402 (18)	+21	1,198 (15)	1,393 (17)	+16	788 (17)	1,009 (19)	+28
Rocky Mountain	2,657 (21)	2,803 (20)	+5	1,393 (17)	1,488 (18)	+6	1,264 (27)	1,315 (21)	+4
Total U.S.A.	12,852 (100)	13,441 (100)	+5	8,164 (100)	8,062 (100)	-1	4,688 (100)	5,379 (100)	+15

Source: Woodall Publishing Company, Bannockburn, IL.

Note: Number in parentheses represents percentage of column totals.

no hookups at the individual campsites, but with either pumps or running water at the bathroom facilities. Since the 1960's the growth of public campgrounds has slowed considerably.

and 4 percent, respectively. In the public sector, the Pacific Coast region experienced a 28 percent increase, while the Northeast region experienced a 20 percent increase. The Southeast and Rocky Mountain regions increased 10 percent and 4 percent, respectively.

CURRENT SUPPLY

Currently, there are 13,441 campgrounds in the United States, a 5 percent increase over the total number 10 years ago. Much of this increase comes from the public sector which grew 15 percent to 5,379 campgrounds. On the other hand, the private sector was rather stable experiencing only a 1 percent decrease to 8,062 campgrounds. Overall the private sector accounts for approximately 60 percent of all campgrounds.

Currently, there are 1334,048 campsites available in the private and public sectors. This is an increase of 28 percent over the past 10 years. The largest part of this increase came from the private sector, up 32 percent to 947,710 as compared to the public sector which was up 23 percent to 386,338. Overall, the private sector accounts for approximately 71 percent of all campsites.

Examination of regional patterns shows the Northeast and Southeast regions contain the largest percentage of public and private campgrounds, 63 percent of the total. This figure remained unchanged from 1978 to 1987. In terms of growth, 1978 to 1987, some regional differences exist between the public and private sectors. In the private sector, the Northeast has experienced a 13 percent decrease in campgrounds while the Pacific Coast experienced a 16 percent increase. The Rocky Mountain and Southeast regions experienced slight increases of 6 percent

The Northeast region, which comprises 42 percent of the total available campsites, experienced the smallest increase, 13 percent. The greatest increases were in the Pacific Coast and Rocky Mountain regions, especially in the private sector, which saw a 66 and 70 percent increase in these two regions. This tremendous increase in the number of campsites indicates a large expansion of the available private camping opportunities across the United States. In the public sector, campsite increases were evenly spread over all the regions.

Campsites can be classified into four types. Full hookup sites with water, electricity, and sewer comprise 38 percent of the total. Water and electric sites comprise 27 percent, electric-only sites comprise 8 percent, and no hookup sites comprise 28 percent. Full hookup sites showed the greatest overall increase, 68 percent, while no hookup sites showed the smallest overall increase of 4 percent.

Patterns of increase differed between the private and public sectors. In the private sector there was a 69 percent increase in full hookup sites, but a 35 percent decrease in electric only sites. In the public sector, there was a 131 percent increase in water and electric sites, a 79 percent increase in electric-only sites, and a 57 percent increase in full hookup sites. The increase of full hookup, and water and electric sites in the public sector appears to reflect a change in mission from providing more rustic type campground opportunities to more luxury oriented facilities. However the private sector still dominates in these types of sites, 97 percent of full hookup and 86 percent of water and electric. On the other hand the public sector contains 67 percent of the no hookup sites.

Some data are available on facilities and services in private campgrounds. Approximately 90 percent of private campgrounds have flush toilets, 69 percent have dump stations, 66 percent have a lake or swimming pool, and 68 percent have laundry rooms.

Only 20 percent have nature trails. In terms of services, 22 percent of the private campgrounds offer recreation programs, 22 percent have boat rental, and 49 percent have firewood for sale.

UTILIZATION OF PRIVATE CAMPGROUNDS

There is little current research on national occupancy rates in private and public campgrounds. However, several State campground owners' associations provide very good information on this topic; Florida, California, and Pennsylvania. Based on their data, a national average occupancy is estimated to be about 45 percent, but this figure needs to be viewed with caution.

Even less data have been published on occupancy rates in public campgrounds. Several studies in Maine State parks indicate occupancy below the 50 percent mark except for national holidays. At many small rustic public campgrounds the occupancy rate could be in the 10 to 20 percent range.

Table 2. --Number and percentage of campsites in United States by region and ownership, 1978-87

Region	Total			Private			Public		
	1978	1987	1978-87	1978	1987	1978-87	1978	1987	1978-87
	<u>Number</u>		<u>Percent change</u>	<u>Number</u>		<u>Percent change</u>	<u>Number</u>		<u>Percent change</u>
Northeast	488,901 (48)	554,680 369,177	+13	352,933 (49)	387,477 (41)	+10	135,968 (44)	167,203 (43)	+23
Southeast	268,022 (26)	(28)	+38	202,496 (28)	288,103 (30)	+42	65,526 (21)	81,074 (21)	+24
Pacific Coast	128,625 (12)	191,224 (14)	+31	72,553 (10)	120,800 (13)	+66	56,072 (18)	70,424 (18)	+26
Rocky Mountain	142,387 (14)	218,967 (16)	+54	88,740 (12)	151,330 (16)	+70	53,647 (17)	67,637 (17)	+26
Total U.S.A.	1,027,935	1,334,040	+28	716,722	947,710	+32	311,213	386,338	+23

Source: Woodall Publishing Company, Bannockburn, IL.

Note: Number in parentheses represents percentage of column totals.

Table 3. --Number and percentage of campsite types in United States for private and public sectors, 1978-87

Campsites	Total			Private			Public		
	1978	1987	1978-87	1978	1987	1978-87	1978	1987	1978-87
	<u>Number</u>		<u>Percent change</u>	<u>Number</u>		<u>Percent change</u>	<u>Number</u>		<u>Percent change</u>
Full hookups	296,183 (29)	500,393 (38)	+68	285,153 (40)	483,672 (51)	+69	10,651 (3)	16,721 (4)	+57
Water and elec.	292,306 (28)	362,552 (27)	+24	269,551 (38)	310,066 (33)	+15	22,755 (7)	52,486 (14)	+131
Elec. only	88,280 (8)	103,486 (8)	+17	47,752 (7)	30,900 (3)	-35	40,528 (13)	72,583 (19)	+79
No hookups	351,167 (34)	367,130 (28)	+4	113,887 (16)	122,585 (13)	+8	237,280 (76)	244,545 (63)	+3
Total U.S.A.	1,027,936	1,333,561	+29	716,722	947,223	+32	311,214	386,338	+24

Source: Woodall Publishing Company, Bannockburn, IL.

Note: Number in parentheses represents percentage of column totals.

TRENDS

Data presented here indicate there is some increase in the number of public campgrounds, but a slight reduction in the private campgrounds. In terms of campsites, there seems to be a continual increase in both the public and private sectors. Private campgrounds have been increasing in size, growing from an average of 39.2 sites in 1968 to an average of 117.6 sites in 1987, a rise of 200 percent. While private campgrounds have grown in size, they have not grown in numbers. The growth era in numbers of private campgrounds was in the late 1960's to about 1974. The downturn in 1974, and thereafter, reflects closing of the marginal operations.

There has also been a noticeable trend of private campgrounds providing a greater number of full hookup sites to meet the demands of campers for full amenities and greater amperage service. Historically, most campgrounds provided 15 amp electrical service, but today with microwave ovens and air conditioning units in RV's, 30 amp is the norm. The growth in full hookup sites can also be attributed to the trend of campers leasing sites for an entire season. It is interesting to note that the number of no hookup sites has been increasing since 1984. Two possible reasons for this are the resurgence of the private

campground tenting market and the stockpiling by campground owners of sites for possible upgrading to hookup sites as needed.

Along with growth in full hookup sites, there has been a corresponding growth in physical and recreation facilities at private campgrounds. The growth in facilities has been prompted by camper demand and also by the need of campground owners to establish additional income centers. Parks offering swimming pools have grown 289 percent since 1979. Those selling RV supplies grew by 150 percent and those providing tennis courts by 137 percent.

One of the problems campgrounds face is how to maximize their profits in what usually amounts to a 120 to 150 day season. One strategy is seasonal site rental to individuals who leave their campers at the campgrounds all year long. Many smaller campgrounds are adopting this strategy as a means of guaranteeing income. Campgrounds with a high percentage of permanent rented sites take on a resort community aspect with highly landscaped sites that contain a number of semi-permanent developments such as patios, outside refrigerators, and grills. A further indication of this growth in seasonal lease camping is the increase of cable TV and phone hookups at the campsite.

Another emerging trend is the growth in on-site rentals of both tents and RVs. Started as another income source, equipment rental may be a growth area to watch in private campgrounds. As the cost of owning an RV escalates, it becomes increasingly difficult for some people to afford an RV of their own, yet they want the RV experience. Moreover, there is concern within the industry that the number of active campers is declining. Campground owners and the RV industry could turn to rentals as one way to expose non-RVers to the camping experience.

In the 1970's and early 1980's, there was a trend toward campgrounds becoming involved in membership or condominium sales. Interest was spurred by fears about gasoline availability and low profitability. The own-your-own-campsite concept appealed to campers because they were uncertain about future gasoline availability and feared that if shortages occurred, parks within a 50-mile radius of their homes might be over-crowded. The sell-your-park-by-the-site concept appealed to campground owners because they still could manage the park while extracting

substantial profits through site sales. However, membership operations were fraught with problems including unethical sales practices in some cases and marketing costs that ran as high as 70 cents for every dollar in sales. Few of the membership campgrounds have been successful.

The private campground industry will continue to lose campgrounds, and while new ones will be built, they will not be built in numbers to replace the old. The first generation of private campground owners is reaching the age where they wish to retire and their children are not interested in running the business. These campgrounds are either sold or just closed. The value of the land itself affects private campgrounds in two ways. First, the land values of existing private campgrounds are becoming more attractive for shopping centers, resort condominiums or some alternate land use instead of camping. Locations in major metro areas and near oceans or other water resources will be affected first. The industry is already experiencing a loss of campgrounds due to resort construction in New Hampshire, Massachusetts, and

Table 4.--Number of private campground ownership types, facilities, and services by U.S. regions, 1987

Ownership types, facilities, and services	U.S. total ¹	Regions			
		Northeast	Southeast	Pacific Coast	Rocky Mountain
Ownership types:					
Private person	7,034	2,807	1,911	1,246	1,070
Franchised	634	188	220	68	158
Member shareholder	44	7	20	2	15
Facilities:					
Flush toilets/showers	6,931	2,721	1,880	1,203	1,127
Camp store	3,818	1,888	933	474	523
Laundry room	4,850	1,489	1,466	974	921
Dump station	5,325	2,634	1,385	638	667
Recreation room	4,388	2,034	1,205	505	644
Lake/swimming pool	5,106	2,253	1,472	813	568
Playground	3,719	2,181	772	303	463
Nature trails	1,570	862	328	146	234
Services:					
Recreation programs	1,680	846	550	77	207
Boat rental	1,690	1,124	322	194	50
Firewood	3,754	2,527	517	377	333

¹Due to the mode of data access in the computer files, 350 campgrounds were not included in this table.

Source: Woodall Publishing Company, Bannockburn, IL.

Myrtle Beach, South Carolina. It is possible that in the near future few private campgrounds will be **available** on the ocean. Secondly, the high value of undeveloped land, particularly land desirable for recreation, could mean fewer private campgrounds being developed because of prohibitive costs. The development costs for luxury campgrounds can be \$23,000 per site.

Trends in the public campgrounds are less apparent. As these **data** have shown, there are some increases in the number of campgrounds and the number of campsites over the last decade. There appears to be a stronger trend of improving existing campsites by providing electricity, up 79 percent, or electricity and water, up 131 percent. This trend could be in response to the aging population of campers who now prefer **RV's** instead of the tents used during their early days of camping. It could also be a response by public agencies to capture more of the camping clientele who use private campgrounds because they require hookups. However, there is little evidence that public agencies are installing sewer hookups. There is also little evidence that these agencies are installing extensive recreation facilities beyond rustic amphitheaters, trails, and basic playground equipment. It must be noted, however, that many public agencies are reconsidering their role in providing outdoor recreation services. Some of these agencies now rely on concessionaires to manage their campgrounds, and in the next decade many public campgrounds will take on a commercial atmosphere with the installation of various recreation amenities.

SIGNIFICANCE OF COMMERCIAL CAMPGROUNDS

As a sector of the travel and tourism economy, private campgrounds are rather small. Even as a part of the lodging industry, private campgrounds account for a very small **part** of the total revenue generated. In terms of the outdoor land resource, private campgrounds occupy a very small percentage. Campgrounds average 29 acres in size. However, in terms of outdoor recreation experiences, private campgrounds are very important. They occupy a unique position of the outdoor recreation opportunity spectrum by providing luxury-type amenities at relatively low rates. The alternative for people desiring these amenities in an outdoor setting is to patronize resorts. Private campgrounds with their lower fees make these luxury-type amenities more accessible to a wider range of people, many of whom enjoy being in the out-of-doors, but desire some comfort.

The private campground industry, like all industries, constantly strives to make improvements. However, the future of this industry depends not only on its own efforts to improve, but also those of the public agencies which manage large numbers of public campgrounds. The question to be asked is the relationship between private and public campgrounds; competition or cooperation. In the past, public agencies have operated under a philosophy independent of and unconcerned with the welfare of the private campground industry. Today, however, with increasing pressures on public agencies to manage resources more efficiently and with the emphasis on upgrading facilities, the need for more cooperation between the public and private campground industry is apparent. An important issue for debate is the fees charged in public campgrounds. Higher fees in public campgrounds would encourage similar rate increases in private campgrounds with the likelihood of an expansion in services and facilities in the private sector. Such fee increases might be desirable particularly if there is a policy to encourage more recreation on private lands. However, the question of equitableness of access to outdoor recreation resources is an important concern that must be addressed in any increase of fees at public campgrounds. A strong tradition of inexpensive access to outdoor resources for all regardless of economic status is something that will continue to be politically sensitive in the coming decades.

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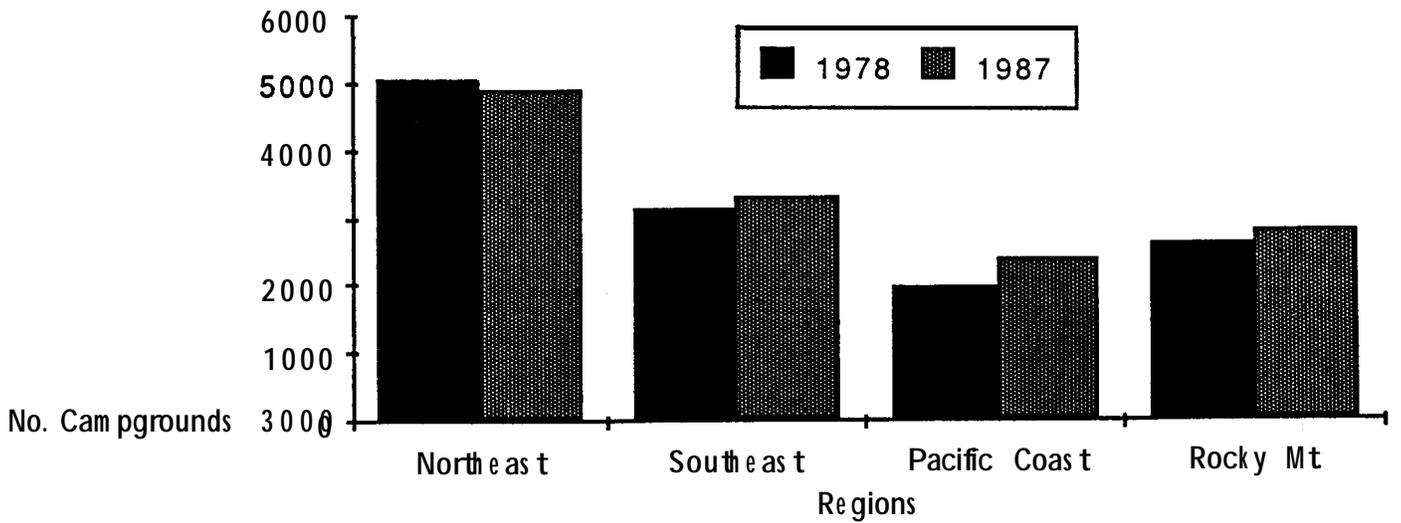


Figure 1. -Total number of campgrounds by region in United States 1978-87.

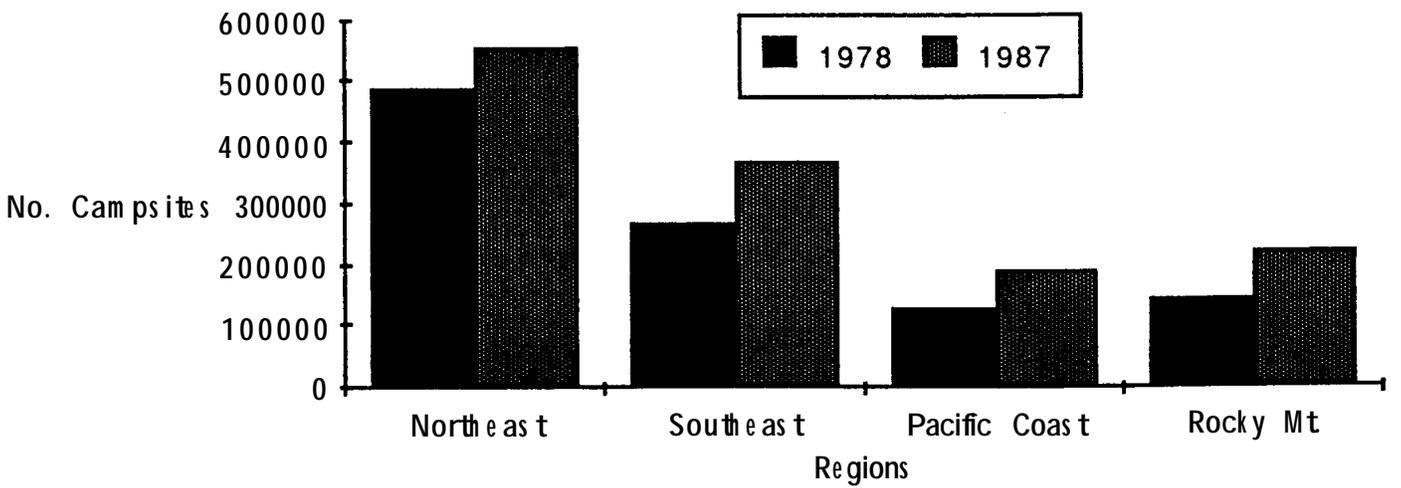


Figure 2.-Total number of campsites by region in United States 1978-87.

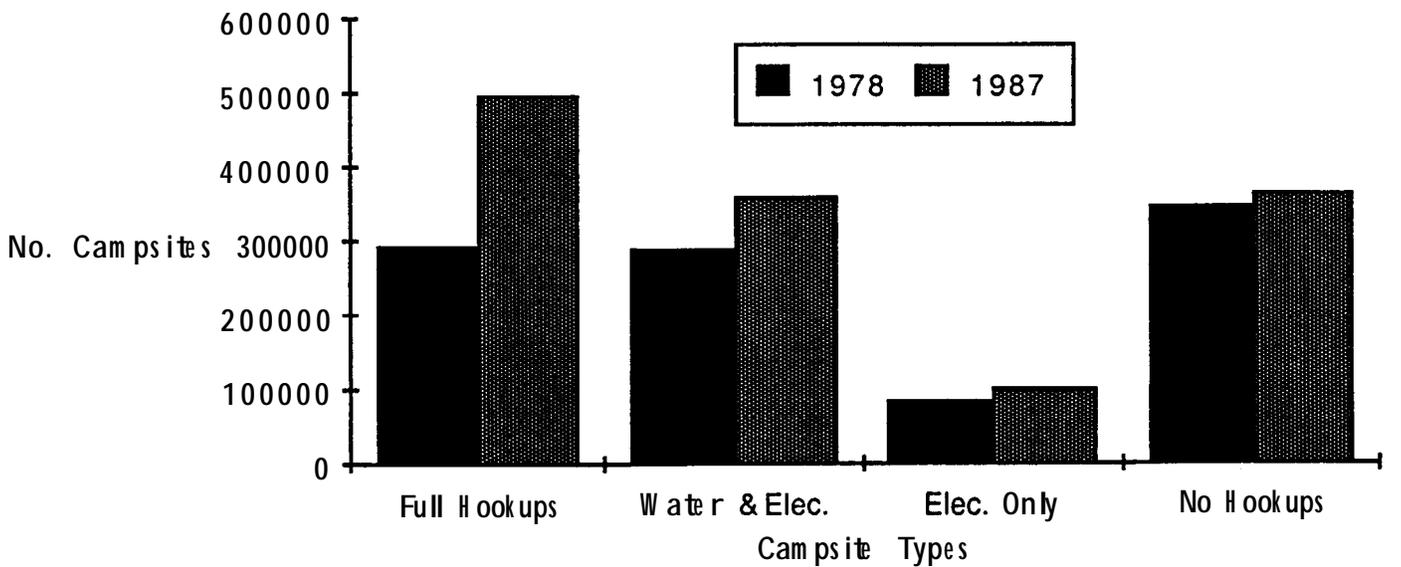


Figure 3. -Total number of campsites by type in United States 1978-87.

FEDERAL AND STATE BACKCOUNTRY RESOURCES

Donald B.K. English'

*Abstract- Federal and State agencies manage a good deal of remote and undeveloped lands and waters available for recreation beyond designated wilderness resources. The remoteness of these resources may best be characterized by their distance from **roaded** access. Distance criteria are applied to agency lands and waters to derive estimates of several categories of resources, including: remote and extensive **unroaded** areas, extensive undeveloped areas near roads, and **roaded** and partially developed areas for land, water, and snow and ice resource bases. Results provide estimates of amounts of resources in each **category**.*

INTRODUCTION

Federal and State recreation resources that are outside of intensively developed areas, such as campgrounds, swimming areas, and picnic grounds, have a wide variety of accessibility. Some areas can be accessed by the average passenger car. Other areas are more remote and getting there requires either physical effort, such as hiking, or specialized equipment, including 4-wheel drive (4WD) or **high**-clearance vehicles, snowmobiles, or trail bikes. Still others can be accessed only by air or sea. These accessibility differences are one of the primary components in determining the types of recreation opportunities provided by the area (Brown and Driver 1979; U.S. Department of Agriculture, Forest Service 1981).

The areas that are sufficiently remote to require either physical effort or specialized equipment to access them provide opportunities for most dispersed recreation activities. In addition, these areas frequently offer opportunities for solitary recreation, generally having little facility development beyond primitive roads, foot trails, and occasional shelters. Several

nearly synonymous labels have been attached to these areas, including "primitive," "undeveloped," "natural," and the one used here, 'backcountry.'

The major difficulties with these terms have been the often imprecise nature of the concept, the lack of reasonably concrete definitions for them, and accounting differences across agencies. One response to these needs has been the development of the Recreation Opportunity Spectrum (ROS), used by the Forest Service and Bureau of Land Management (Driver and others 1985). The ROS categorizes recreation environments along physical, social, and managerial settings (U.S. Department of Agriculture, Forest Service 1981). The first step in ROS categorization is creating distinction by distance from roads or motorized trails. The two most remote categories of resources in ROS are defined by areas more than 3 miles from roads (primitive) and 1/2 to 3 miles from roads (semi-primitive non-motorized). These two distance criteria are used here as well, and the acres in each category separated.

The purpose of this paper is to develop and report regional estimates of the amounts of Federal and State recreation land, water and snow and ice resources in the two backcountry settings. It was assumed that the term 'backcountry' could apply to those Federal and State lands greater than 1/2 mile from a road that is passable by a standard automobile. The most remote category of backcountry was assumed to include wilderness and other lands more than 3 miles from roads, since these other lands would be likely to provide close substitutes to wildernesses. The label used here for these resources was 'Wilderness and other extensive **roadless** areas.' The remaining category of **backcountry** would include lands 1/2 to 3 miles from roads, and was labeled 'extensive undeveloped areas.'

Distance criteria are difficult to apply to water opportunities because of the present state of data. For the purposes of this paper, backcountry water opportunities would include designated components of the Wild and Scenic River System and those river

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segments under study for such designation. Some states also have Wild and Scenic River systems. Backcountry opportunities for snow and ice-based activities would be found on backcountry lands that have some minimal amount of annual snow cover to allow winter recreation activities.

METHODS

In describing the opportunities for recreation on backcountry lands owned by Federal agencies, it was apparent that these data were largely unavailable. Estimates had to be constructed from available data. The data elements desired for each Federal and State area were total acres, wilderness acres, and road miles. From these, backcountry acres were estimated. Wilderness areas by definition are **unroaded**. Nonwilderness backcountry acres were calculated from the remaining acres and road miles. One mile of road with a 1/2 mile wide corridor on either side **equalled** 1 square mile (640 acres) of land. Therefore, backcountry acres were roughly equal to the wilderness acres plus nonwilderness area acres minus road **miles*640**. A similar method yielded **nonwilderness** backcountry acres that were greater than 3 miles from a road.'

Only lands managed by the agency itself were included in these calculations. Inholdings and lands managed by other agencies were not included, since the intent was to describe the opportunities provided by the agencies themselves. Water acres, in the form of impoundments, would also not be included. The remote character of water, either flat or running, seems fairly heavily determined by the character of the surrounding land, and thereby the accessibility.

Lands adjacent to the parcels of Federal lands were assumed to be natural in character. Further, it was assumed that beyond the borders of the federal lands, no roads existed within 1/2 mile. Therefore, no buffer zone at the exterior borders of the federally owned parcels was considered necessary to insure a backcountry character to lands near those exterior borders.

It was not possible to get road miles and total acres for all agencies. The exact method used to estimate backcountry acres was determined by the information the agency had available. The methods used for calculating backcountry acres for each agency are presented below.

Corps of Engineers

Recreation areas managed by the Corps are generally small, heavily developed tracts, providing camping, picnicking, water access, and swimming. It was assumed that none of the lands managed by the Corps provided backcountry opportunities.

Bureau of Reclamation

The Bureau of Reclamation classifies the lands in its recreation areas as either 'developed for public recreation,' 'developed for long-term exclusive recreation use,' or 'undeveloped.' It was assumed that all acres classified in the undeveloped category were within 1/2 mile of a road, and therefore insufficiently remote to provide backcountry opportunities.

Bureau of Land Management

The Bureau of Land Management (BLM) did not have detailed data on its lands below the state level, and did not have data on the miles of roads on BLM lands. At the suggestion of BLM staff, nonwilderness backcountry acres greater than 3 miles from a road were equated with acres in wilderness study areas (**WSA's**). Nonwilderness backcountry acres 1/2 to 3 miles from a road were assumed to be equal to acres in natural areas. Natural area acres were available at the state level.

Fish and Wildlife Service

Backcountry acres for FWS lands were limited to those lands on National Wildlife Refuges that also had some degree of visitor facilities. It was assumed that those refuges not included in the 'Visitors Guide to National Wildlife Refuges' brochure published by FWS did not provide recreation opportunities. Data from the FWS included the total acres for each refuge, as well as the acres on each refuge in 'administrative use'-that is, in roads, parking lots and buildings. It was assumed that roughly 90 percent of the acres in this category would be in road acres, and that roads were 30 feet wide. Therefore, one acre of administrative use lands **equalled** 0.25 linear miles of road.

Tennessee Valley Authority

Much of the recreation land administered by TVA is in developed recreation areas. However, some lands are classified as 'natural areas.' The size and the miles of roads for each area were available. It was assumed all natural areas could provide **backcountry** opportunities, subject to road mile calculations.

National Park Service

Available data included the total acres, wilderness acres, and road miles. It was assumed that all road miles in an area, paved and unpaved, were both open to the public and passable by car. Areas whose total size, including inholdings, was less than 320 acres (1/2 square mile) were not included. It was assumed that these smaller areas were primarily monuments, historic and military areas, and that the lands were too developed to provide backcountry opportunities.

Forest Service

Road miles open to the public, and total acres and wilderness acres were obtained for most National Forests. For those Forests for which road miles were not obtained, the regional ratio of road miles/1000 acres was applied to estimate the number of road miles. Nonwilderness backcountry acres were estimated according to the method described above.

State Parks

Available data for state parks were largely limited to the total size of the park and wilderness acres, if any. It was assumed that these parks were roughly square in shape, and that no roads existed in the interior of the parks. Backcountry lands were assumed to be those lands greater than 1/2 mile from the exterior of the park.

State Forests

Available data included total State forest acres by county, and designated wilderness acres on State Forests by county. It was assumed that all non-wilderness acres on State forest lands were within 1/2 mile of some road that would be passable by car, and so were not included in backcountry.

Wild and Scenic River Opportunities

Data in "The Nationwide Rivers Inventory" (U.S. Department of the Interior, National Park Service 1982) provided miles of designated and study rivers. Data from that source was updated to 12/31/86 by examining legislation adding designated components and study rivers.

Backcountry Snow and Ice Opportunities

Land resources were determined as above. Annual snowfall was determined by data presented in average annual snowfall isolines as depicted in "The National Atlas of the U.S." It was assumed that areas with less than an annual average of 16 inches of snowfall would not provide any snow or ice based backcountry opportunities. The method was to begin with the backcountry lands identified above, and delete the acres in counties that received less than 16 inches of snowfall in an average year.

RESULTS

Backcountry Lands

Wilderness and other extensive **roadless** areas represent the most rugged and remote tracts in the U.S. Extensive undeveloped areas buffer wilderness areas, and can be used for dispersed, motorized and nonmotorized activities including off-road driving, backpacking, and primitive camping.

Wilderness and Other Extensive Roadless Areas

Currently, about 88 million acres of Federal land, have been included in the NWPS. About 56 million of those acres, or about 64 percent, are in Alaska (Table 1). Of the 32 million acres in the lower 48 states, roughly 25 million are in the West. The Eastern half of the U.S. contains only about 3.9 million acres of lands of this type. The Park Service manages almost 37 million acres of wilderness, about 90 percent of which is in Alaska. The FWS manages 19.3 million acres, only 600,000 of which are in the lower 48 states. Wilderness areas managed by the USFS are fairly evenly distributed. BLM manages about 369,000 acres of wilderness land.

Table 2 shows the distribution of extensive **roadless** areas exclusive of wilderness areas by Federal agency and region. Almost half of the 100 million acres in this category are on National Wildlife Refuges in Alaska. Outside of Alaska, neither the Forest Service nor the Fish and Wildlife Service have many nonwilderness lands that are this remote.

Table 3 shows the distribution of wilderness and other extensive **roadless** areas by level of government and region. About 65 percent of these acres are in Alaska. Another 15 percent are in the Rocky Mountain Region. Most surprising, perhaps, are the large

Table 1.--National Wilderness Preservation System acres, by agency and region. as of 12/31/86

Region	Agency				Total
	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	
	----- <u>Thousand acres</u> -----				
			64		
North	1.163	133	470	0	1.360
South	619	1.444		0	2.533
Rocky Mountains	16.576	690	120	330	17.716
Pacific Coast:				0	
Alaska	5.453	32.356	18,678	39	56.486
Other	8.541	2.137	1		10.718
Total	32.352	36.760	19.332	369	08,813

Table 2.--Extensive roadless areas exclusive of wilderness areas by Federal agency and region

Region	Agency				Total
	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	
	----- <u>Thousand acres</u> -----				
North	0	605	18	0	623
South	0	596	217	0	813
Rocky Mountains	1.539	1.863	117	14,725	18,244
Pacific coast:					
Alaska	11.910	11.996	46.826	9.92	70.732
Other	0	1.596	0		11.518
Total	11.910	13.592	46.826	9.922	82.250
Total	13.449	16.656	47.178	24,647	101.930

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

State-owned backcountry acres in the South and Northeast. In both of these regions, State-owned remote backcountry accounts for over 60 percent of the total.

It is interesting to note that designated wilderness makes up not quite half of the total supply of this resource. Certainly some, and perhaps the majority of the non-wilderness remote backcountry lands are under study for inclusion in the National Wilderness Preservation System (NWPS). As additions to NWPS are made, the ratio of wilderness to nonwilderness acres in the Federal agency portion of Table 3 will change. More importantly, perhaps, is to recognize that at least in the short run, the acreage figures presented here represent the maximum amount of remote backcountry opportunities available in this country. Additions to the 200 million acres total will likely only be made as areas that contain roads are allowed to revert to a more primitive state, which may take 50 to 100 years.

Extensive Undeveloped Areas

These backcountry acres are less remote than the categories listed above, and because of that greater accessibility absorb more recreation use than the more remote backcountry areas. The Forest Service, in its Recreation Opportunity Spectrum, has also recognized the more accessible character of these lands, terming them 'semi-primitive.'

Table 3.--Wilderness and extensive roadless areas. by region and level of government

Region	Federal		state		Total
	Wilderness	Extensive roadless areas	state forest wilderness	State per wilderness and extensive roadless areas	
	----- <u>Thousand acres</u> -----				
				30	
North	1.360	623	2.292	5,148	4.305
South	2.533	813	0		8,494
Rocky Mountains	17.716	18.224	0	40	35.980
Pacific coast:					
Alaska	56,486	70.732	0	2.213	129,431
Other	10.718	11,518	10	430	22,676
Total	67.204	82.250	10	2.643	152.107
Total	88.813	101.930	2.302	7.861	200.886

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

Table 4.--Distribution of extensive undeveloped areas, by region and agency

Region	Agency					State	Total
	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	Tennessee Valley Authority		
----- Thousand acres -----							
North	2,011	139	38	0	0	969	3,161
South	1,602	1,512	145	0	6	3,366	6,631
Rocky Mountain	53,227	5,907	243	736	0	601	60,714
Pacific coast:				0			
Alaska	4,142	401	280	318	0	815	5,698
Other	14,561	2,330	3		0	681	17,893
Total	18,703	2,731	283	318	0	1,556	23,591
Total	75,543	10,289	709	1,054	6	6,496	94,097

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

Table 4 shows the distribution of these backcountry acres by agency and region. In all regions except the South, the majority of these lands are under the jurisdiction of the Forest Service. In the South, State parklands provide over 3 million acres of undeveloped backcountry, more than all of the Federal agencies in the region combined. Relatively few acres of this type are found in Alaska, largely because so few roads exist that most of the publicly owned acres there are more than 3 miles from a road.

Total Backcountry Lands

Table 5 shows the regional distribution of both types of backcountry acres. In the Rocky Mountains the majority of backcountry acres are in the less remote category. In the South and Pacific Coast, the reverse is true. Overall, almost 300 million acres of Federal and State lands provide backcountry opportunities. About 45 percent of these acres are in Alaska.

The percentage of agency lands that are in backcountry varies both by region and governmental level (Table 6). In most of the regions, about one-third of Federal lands managed by agencies that have any backcountry at all qualify as backcountry. What seem to be low percentages in Alaska and the Rocky Mountains are probably due to the large BLM land holdings outside of any wilderness, wilderness study area or natural area. The percentage of State park and forest lands that qualify as backcountry varies even more widely. Almost 80 percent of these lands in the South are backcountry. Several large state reserves exist in this region, including one of 2.8 million acres in Texas, over 90 percent of which qualify as backcountry according to these estimates.

Table 5.--Total Federal and state backcountry acres, by type and Forest Service region

Region	Wilderness and extensive roadless areas	Extensive undeveloped areas	Total backcountry
----- Thousand acres -----			
North	4,305	3,161	7,466
South	8,494	6,631	15,125
Rocky Mountain	35,980	60,714	96,694
Pacific coast:			
Alaska	129,431	5,698	135,129
Other	22,676	17,893	40,569
Total	152,107	23,591	175,698
Total	200,906	94,097	294,983

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

Table 6.--Backcountry acres, total agency acres, and backcountry acres as a percentage of total acres, by region

Region	Federal			state		
	Back-country	Total acres	Percent of total	Back-country	Total Acres	Percent of total
----- Thousand Acres -----						
North	4,171	13,450	31.0	3,291	17,494	18.8
South	6,611	20,288	32.6	8,514	10,613	80.2
Rocky Mountain	96,063	257,860	37.3	641	4,978	12.9
Pacific Coast:						
Alaska	132,041	380,672	34.7	3,088	5,255	58.8
Other	39,448	82,675	47.7	1,121	5,860	19.1
Total	171,489	463,347	37.0	4,209	11,115	37.9
Total	278,344	754,945	36.9	16,655	44,300	37.6

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

Note: State total acres equals sum of State park acres and State forest acres open to recreation.

Backcountry Waters

Included in this category would be those opportunities for remote water-based recreation. Opportunities on Federally managed areas specifically related to water recreation would include the Boundary Waters Canoe Area, National Wild and Scenic river system components, and study rivers. The components of the wild and scenic river system would represent flowing water opportunities. The Boundary Waters Canoe Area, covering almost 800,000 Forest Service acres and 289,000 acres of other public land and water, is predominantly flat water.

Wild and Scenic Rivers

These river segments have been given legislative protection from development and intrusion that might compromise their recreational, scenic or free-flowing qualities. The qualifications for inclusion in the system were provided by the National Park Service in The Nationwide Rivers Inventory (U.S. Department of the Interior, National Park Service 1982). At the end of 1986, 7,178 miles had been included as components in the National Wild and Scenic River System (NWSRS). Of that total, almost half of the river miles are in Alaska. About 900 miles, or 13 percent of these total river miles, are in the Eastern half of the US (Table 7). Only 1,134 miles of Wild and Scenic rivers are in the Rocky Mountains.

Five Federal agencies have management **responsibilities** for these resources. The National Park Service manages 2,100 miles of rivers, the Bureau of Land Management about 2,000, and the Forest Service about 1,960. All of the 1,000 miles managed by the Fish and Wildlife Service are in Alaska.

Wild and Scenic Study Rivers

These rivers also represent opportunities for remote dispersed forms of water-based recreation. At the end of 1986, there were a total of 7,597 miles of river segments that are or have been under study for inclusion in the NWSRS (Table 7). About **three-quarters** of these were under the jurisdiction of the National Park Service. The remainder are on or near National Forest land. Fully one third of these study river miles, or almost 2,500, are in the Northeast, and another 1,550 miles are in the South.

Combining these two resources yields almost 15,000 miles of remote river opportunities on Federal lands. About 35 percent of this total is in Alaska, 21 percent in the Northeast, and about 13 percent in

Table 7.--Miles of Components of the Wild and Scenic River System, by region and type, as of 12/31/86

Region	Designated components	Study segments	Total
- - - - - Miles - - - - -			
North	546	2,563	3,109
South	364	1,528	1,892
Rocky Mountain	1,134	1,220	2,354
Pacific Coast:			
Alaska	3,230	1,925	5,155
Other	1,904	361	2,265
Total	5,134	2,286	7,420
Total	7,178	7,597	14,775

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

the South. Relative to other regions, the river miles in the east represent a particularly valuable resource, due to their proximity to major population concentrations.

Backcountry Snow and Ice Opportunities

This section examines the backcountry lands that receive enough snowfall to provide opportunities for winter activities. The portions of the country that receive at least 16 inches of annual snowfall have been termed 'snow country', and it is these resources that are considered here. Backcountry resources that were in counties that receive less than 16 inches of annual snowfall were assumed not to provide winter backcountry recreation opportunities.

There are over 176 million acres of wilderness and extensive **roadless** areas in snow country (Table 8). Almost 171.5 million of these are on Federal lands, and over 127 million of the total are on Federal lands in Alaska. The lands in Alaska do little to provide opportunities for most of the country. More accessible snow backcountry resources are located on Forest Service and Bureau of Land Management lands in the Rocky Mountain and Pacific Coast Regions, and on State and Forest Service lands in the Northeast.

About 77 million acres of snow backcountry between 1/2 and 3 miles from a road exist across the United States (Table 9). Only about 7 percent of the total are located in Alaska. Over 70 percent of these acres are located in the Rocky Mountain Region, and 64 percent of the total are on Forest Service lands in that region. The majority of these lands in every region are owned by the Forest Service.

Table 10 presents the total snow backcountry acres by region and agency. All told, there are over 263 million acres of snow backcountry, compared with a total of about 295 million backcountry acres. Of those, over 135 million acres are located in Alaska. Not surprisingly, in the South there are fewer than 1 million acres of snow backcountry. Over 65 million acres of snow backcountry on Forest Service lands can be found in the Rocky Mountain region, but only about 1/2 million State-owned backcountry acres. The 7 million acres of snow backcountry on state lands are split almost evenly between Alaska and the Northeast region.

DISCUSSION

Designated wilderness acres, both Federal and State, represent a special type of backcountry resource. However, wilderness acres represent fewer than one-third of all backcountry resources. Indeed, in some regions, Federal nonwilderness lands that lie more than 3 miles from a road are a larger resource than designated wilderness lands. Perhaps the most used backcountry areas, and therefore the most heavily impacted and managerially important, are those that lie between 1/2 and 3 miles from a road. These areas are located primarily in the Rocky Mountain portion of the United States, and are largely owned and managed by the Forest Service. In the eastern portion of the United States, State park and State forest remote backcountry acres outnumber those acres owned by Federal agencies

It should be reemphasized that the acreage estimates presented here include as backcountry lands that are more than 1/2 mile from roads passable by standard automobile. Backcountry cannot be equated with wilderness, either in definition or management. Much of the backcountry lands are accessible by motorized vehicles, including 4-wheel drive and off-road vehicles, and in winter, snowmobiles.

The methods used here present estimates only. Data of sufficient detail to allow estimates for State fish and game lands were unavailable. Similarly, estimates for nonwilderness backcountry on State forest lands were not possible due to insufficient

Table a.-- Backcountry lands more than 3 miles From a road providing snow opportunities, by region and agency

Region	Agency					Total Federal and State
	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	State	
----- Thousand acres -----						
North	1,087	736	51	0	2,288	4,162
South	65	5	0	0	2	72
Rocky Mountain Pacific Coast:	16,638	1,091	227	12,005	36	30,007
Alaska	17,363	44,352	65,504	3,527	2,213	129,432
Other	6,931	1,794	1		31	12,384
Total	24,294	46,146	65,505	3,527	2,244	141,816
Total	42,084	47,978	65,783	15,632	4,570	176,047

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

Table 9.--Backcountry lands lying less than 3 miles from a road providing snow opportunities, by region and agency

Region	Agency					Total Federal and State
	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	State	
----- Thousand acres -----						
North	2,011	125	38	0	15	2,989
South	419	32	0	0	16	467
Rocky Mountain Pacific Coast:	48,971	5,508	243	607	505	54,834
Alaska	4,142	401	280	257	75	5,698
Other	11,827	1,034	4		205	13,327
Total	15,969	1,535	284	257	1,080	19,925
Total	67,370	6,100	565	864	2,416	77,315

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

Table 10.--Total backcountry acres in snow areas, by region and agency

Region	Agency					Total Federal and State
	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Management	State	
----- Thousand acres -----						
North	3,098	861	89	0	3,103	7,151
South	425	37	0	0	18	539
Rocky Mountain Pacific Coast:	65,609	5,599	470	11,612	541	84,432
Alaska	21,505	44,753	65,784	0	3,088	135,130
Other	18,758	2,828	5	3,884	236	25,711
Total	40,263	47,581	65,789	3,884	3,324	160,841
Total	109,454	54,078	66,348	16,496	6,986	253,362

Source: National Outdoor Recreation Supply Information System (U.S. Forest Service 1987).

data. In the next few years refined estimates may be possible. Rapid developments in geographic information systems and associated databases will greatly assist this type of natural resource accounting.

Backcountry is a volatile resource. Management activities, most notably road building, can rapidly compromise the remoteness criterion necessary for backcountry. Development of privately owned land, either adjacent to or within public holdings can further reduce the amount of backcountry resources. Additions to backcountry resources can be achieved primarily through closing roads. It would seem that any closure should be permanent in nature, rather than seasonal. However, permanent closures may be opposed by certain user groups and may be politically impractical.

Past trends in backcountry acreage are difficult to assess. No earlier national data exist that are comparable to what is presented here. The RARE II process in the late 1970's identified about 62 million acres of roadless lands in the National Forest system, in addition to the 15 million acres of wilderness it then managed (U.S. Department of Agriculture, Forest Service 1979). These methods have estimated that the Forest Service manages over 120 million acres of backcountry. The difference is probably due, at least in part, to the difference between the estimation process used here and definition of what was included in the RARE II inventory, rather than to an increase in the resource. However, the actual acreage is unknown.

It seems unlikely that much, if any, backcountry has been created in the last 10 to 15 years through road closures. Road construction for fire control, timber harvest, or other reasons has been a fairly constant activity for public agencies, most notably the Forest Service. Since nearly half of all backcountry, and almost two-thirds of snow backcountry acres lie on Forest Service lands, that agency's activity is of prime importance in determining the future of backcountry resources. It seems likely that there is less backcountry now than in the past, although how much less is impossible to estimate. Similarly, the future status of backcountry resources is unknown, but a reduction in the total amounts seems most probable.

MANAGEMENT IMPLICATIONS

One of the obstacles to preparation of this paper was the lack of a clear and widely accepted set of criteria for defining backcountry resources. The

Recreation Opportunity Spectrum developed by the Forest Service provided the guidelines used here and is one such set of criteria. Managers, planners, and policy makers from a number of agencies need to agree on both physical and perceptual definitions of backcountry resources, both from the perspective of users and managers. Then, all agencies need to agree to collect compatible data necessary to determine the amount of backcountry both regionally and nationally.

Since backcountry is in part defined by remoteness, the most obvious method to reduce the amount of the resource is to build roads. Whether the opposite action of closing roads is sufficient to create more backcountry is not certain. A set of management actions needs to be defined that can create more backcountry over a given period of time. Forest managers know what course of action to pursue to have a stand of commercial timber in 30 to 50 years. Whether a similar action plan can be developed that will in essence create backcountry, or even wilderness, may merit consideration by agency managers.

RESEARCH IMPLICATIONS

Several research implications can be developed from the above discussion. One of the most important would be to develop a sample of public land holdings by each agency and test the validity of some of the assumptions used in this paper. For example, detailed maps of National or State parks could be examined for interior roads and development near borders.

Once a definition of backcountry is widely accepted, then a research program should be developed to ascertain what physical elements could be easily measured that would accurately predict the amount of backcountry on public lands. If, for example, distance from roads is the primary criterion, then a detailed geographic database that includes public land boundaries and road corridors could be queried to estimate backcountry acres.

Backcountry areas would seem to contain a great deal of the resources used for many types of dispersed recreation, including trail resources. It seems that a research agenda should be developed to examine both recreational and nonrecreational use and users of backcountry resources, and to monitor use trends in the future. In addition, researchers may find it useful to track trends in the amount of the resource-to identify areas of the country that may be losing the resource, and at what rate the losses are occurring.

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TRENDS IN STATE PARK OPERATIONS IN THE UNITED STATES

W. Donald Martin'

Abstract- Data for this report were taken from surveys conducted by the National Association of State Park Directors from 1975 to 1985. The following trends were analyzed: Acreage administered by State park agencies, selected facilities in State park systems, visitations to State park areas and financial operations. State park directors were also surveyed to ascertain factors which influenced those trends.

4. To analyze trends in State park employment and salaries.

5. To determine factors that may have influenced the trends in State park operations.

6. To determine future trends in State park operations as perceived by State park administrators,

INTRODUCTION

This report presents trends in State park operations in the United States from 1975 to 1985. In addition, complementary data from a survey of State park directors are discussed in an effort to determine what factors influenced past trends as well as the factors likely to have the greatest impact on future State park operations and services. Aspects of State park operations studied included State park acreage and facilities, visitation levels, and financial and personnel operations.

Purpose of the Study

The purpose of the study was to collect data and analyze trends on selected aspects of State park operations in the United States from 1975 to 1985 and to determine factors that influenced the changes. Study objectives were as follows:

1. To determine changes in the inventory of land resources devoted to State parks and recreation services.

2. To determine changes in State park attendance and selected facilities.

3. To analyze the sources and amounts of funds used for financing operations and capital outlays.

PROCEDURES

Data on selected aspects of State park operations were taken from surveys conducted by the National Association of State Park Directors during the past 10 years. Results from the 1975 survey administered by the Missouri Division of Parks and Recreation were published in 'State Park Statistics 1975' by the National Recreation and Park Association. Other data were taken from surveys administered by the Indiana Division of State Parks from 1979 to 1985 and published in the "Annual Information Exchange" by the National Association of State Park Directors. Since a different questionnaire was used in the 1975 survey than was used in later surveys, only a few items can be compared over the 10-year period. A more detailed analysis was made for all factors under study from June 30, 1979, to June 30, 1985.

The questionnaires were distributed to the 50 State park agencies that administer parks, recreation areas, historic sites, and related facilities. With few exceptions, the annual reporting period was from July 1 through June 30. It is important to note that State park agencies administer a wide variety of lands. In some States the park agency has under its control forests, fish and wildlife areas, natural areas, and historic sites as well as related facilities. In other States only the State parks are under the State park system (National Association of State Park Directors 1986).

One must be cautious in making comparisons among the States due to the diversity of administrative patterns and budgeting practices. In the majority of States, parks are administered through a division or

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bureau in a department of natural resources or conservation, or in a department combining natural resources, conservation and environmental management. Thirteen States have either departments of parks, departments of parks and recreation, or a combination of parks and/or recreation with tourism. In other States the parks function is included within a department of fish and wildlife, game or transportation. Ten of the State park agencies included in the surveys also have responsibility for administering State forest lands.

Data for selected aspects of State park operations were compiled from the "Annual Information Exchange" for 1979, 1981, 1982 and 1985 and sent to the 50 State park directors for review, verification, and corrections. Data reflected operations for the fiscal year of July 1 to June 30. Responses were received from 45 of the agencies and telephone follow-ups were conducted with the other five agencies to verify

the data. Also, the directors were requested to return a rating form on the reliability of the data reported in the "Annual Information Exchange." There was a 90 percent return on these forms.

Based on the above data, a trends report was developed and sent to the 50 State park directors along with a questionnaire to determine factors that influenced changes in their State park operations during the past 6 years, as well as their perceptions of the issues and trends for the next 5 years. Forty-two of the agencies returned that questionnaire for a response rate of 84 percent.

RESULTS

Table 1 shows the reliability rating of selected data from the 'Annual Information Exchange.' Over one-half (52 percent) of the items received a very

Table 1.--Reliability of data from the annual information exchange as rated by State park directors

Selected data	Rating ¹	Selected data	Rating
Acreeage in State parks and recreation areas	5.66	Financial Operations:	
Number of facilities:		Total operating budget	5.43
Modern campsites	5.56	Total capital outlay budget	5.44
Primitive campsites	5.05	Federal funds	5.33
Cabins/cottages	5.62	Bonds	5.44
Lodge rooms	5.60	Vehicle entrance fees (daily)	5.65
Attendance:		Vehicle annual pass	5.65
Day visitors	4.32	Modern campsite fees	5.63
Overnight visitors	5.09	Cabin/cottage fees	5.50
No. of campsites rented	5.17	Revenue generated:	
No. of acres purchased	5.82	Entrance fees	5.56
Cost of land purchased	5.84	Campsite rentals	5.69
Cost of new construction	5.45	Concession operations	5.26
Personnel (full-time, year round):		Cabins/cottages/lodges	5.29
Public contact employees	5.25	Other operations	5.31
Field supervisors	5.59	Total revenue generated	5.57
Central office staff	5.52		
Salary ranges for full-time employees	5.64		

¹Very unreliable 1.00-1.50 Somewhat reliable 3.51-4.50
 Mostly unreliable 1.51-2.50 Mostly reliable 4.51-5.50
 Somewhat unreliable 2.51-3.50 Very reliable 5.51-6.00

reliable rating with mean scores between 5.51 and 6.00 on a scale of 1.00 to 6.00. Thirteen of the 29 items (45 percent) were rated as mostly reliable and only one item, attendance data for day visitors, was rated as somewhat reliable. None of the selected types of data received an unreliable rating. It should be noted that although the State park directors feel that the data reported for their respective States are reliable, there may be inconsistencies among States in the reporting of data due to interpretations of certain items on the questionnaires used in collecting the data. For example, definitions for primitive campgrounds may vary from State to State.

Park Acreage and Facilities

Total acreage administered by State park agencies increased from 9.5 million to 10.2 million acres from June 30, 1979, to June 30, 1985 for an average annual increase of 1.2 percent (table 2). The 1975 survey results showed that total land area was 7.0 million acres giving an average annual increase of 8.9 percent from 1975 to 1979. The acreage shown in table 2 includes only those lands administered by the 50 State agencies included in the surveys. It does not include other State agencies that administer forests, fish and wildlife areas or historical sites separate from State parks and recreation areas. Since lands designated as State parks and recreation areas comprise 81 percent of the total lands reported by the 50 State agencies, those classifications were treated separately for trend analysis. The acreage in State parks and recreation areas increased at an average annual rate of 2.3 percent from 1979 to 1985. The 1975 survey did not report acreage for the different types of areas.

In 1979, 28 States reported a total of 3,595 cabins/cottages (table 2). This increased to 34 States with 5,158 cabins/cottages in 1985 for an average annual increase of 7.4 percent in total cabins/cottages. The number of campsites and lodge rooms increased at a much lesser rate. The State park agencies reported having a total of 181.8 thousand campsites in 1985 compared to 167.2 thousand in 1979, for an average annual increase of 1.5 percent. The same 23 States reported having lodges in both the 1979 and 1985 surveys. The number of rooms increased from 3,977 to 4,282 for an average annual increase of 1.3 percent.

Visitations

The rate of increase in State park visitations was not as great in the first half of the 1980's as it was during earlier periods. From 1979 to 1985, the total number of visitors to areas operated by State park agencies increased from 623.3 million to 664.1 million for an average annual increase of 1.1 percent (table 3). This was approximately the same annual rate of increase for the general population in the United States (1.0 percent). Based on data from the 1975 survey, State park attendance increased at an average annual rate of 3.0 percent from 1975 to 1979.

On an average, from 1979 to 1985, the rate of increase for overnight visitors was twice that of day visitors. As indicated previously, the data for State park visitation are considered to be less reliable by the State park directors than the other types of data.

Table 2.--Areas and facilities administered by State park agencies

Areas and facilities	June 1979	June 1985	Average annual percent of change
Total acreage (millions)	9.5	10.2	1.2
Acreage in State parks and recreation areas (millions)	7.3	8.3	2.3
Number of modern campsites (thousands)	124.5	136.3	1.6
No. of primitive campsites (thousands)	42.7	45.5	1.1
No. of cabins/cottages (thousands)	3.6	5.2	7.4
No. of lodge rooms (thousands)	4.0	4.3	1.3

Table 3. --Visitations at areas operated by State park agencies

Type of visitors	June 1979	July 1985	Average annual percent of change
Number of day visitors	566.2	600.1	1.0
Number of overnight visitors	57.1	64.0	2.0
Total number of visitors	623.3	644.1	1.1
Number of campers	54.4	57.9	1.1

Financial Operations

Over the 6-year period (1979 to 1985) operating budgets for State park agencies increased at an annual rate of 8.0 percent (table 4), compared to an annual inflation rate of 7.9 percent. However, during that time capital outlay budgets decreased from \$515.5 million to \$273.7 million for an average annual rate of -7.8 percent.

Based on 1975 survey data, the operating budgets and capital outlay budgets increased at average annual rates of 19.6 percent and 16.5 percent, respectively, from 1975 to 1979.

Federal funds allocated to State park agencies for both capital and operating budgets decreased from \$48.2 million to \$34.0 million from 1979 to 1985 for an average annual decrease of 4.9 percent. To

Table 4. --Financial aspects of State park operations

Financial aspects	June 1979	June 1985	Average annual percent of change
Selected financial aspects:			
Operating budgets (millions)	\$491.9	\$728.0	8.0
Capital outlay budgets (millions)	515.5	273.7	-7.8
Federal funds (operating and capital; millions)	48.2	34.0	-4.9
Funds from bond issues (millions)	50.8	88.3	12.3
Daily entrance fees (vehicle)	1.48	2.09	6.9
Vehicle annual pass fee	9.71	20.03	17.7
Modern campsite fees (average)	4.50	7.19	10.0
Cabin/cottage fees	22.03	41.21	14.5
Revenue generated from operations (millions):			
Entrance fees	\$ 33.0	57.8	12.5
Campsite rentals	42.4	70.7	11.1
Concession operations	25.0	23.3	9.2
Cabins/cottages/lodges	20.8	43.9	18.5
Other operations	44.4	72.9	10.7
Total revenue generated	155.6	268.6	12.1
Percent of operating budget that is revenue generated	31.6	36.9	2.8

Table 5. --Comparison of operating expenditures and generated revenues

State	Operating expenditure per visitor		Average annual percentage change	Revenue generated per visitor	Net operating cost per visitor
	1979	1985	1979-85	1985	1985
United States	.	\$1.10	6.5	8.40	\$.70
Alabama	1.17	1.94	11.0	1.53	.41
Alaska	.76	1.01	5.5	.00	1.01
Arizona	.62	2.02	37.6	.46	1.56
Arkansas	1.65	2.39	7.5	1.11	1.28
California	1.20	1.61	5.7	.47	1.14
Colorado	.91	1.02	2.0	.64	.38
Connecticut	1.15	.94	- 4.6	.35	.59
Delaware	.81	1.02	4.3	.73	.29
Florida	1.03	1.34	5.0	.57	.77
Georgia	.74	1.86	25.2	.67	1.19
Hawaii	.12	.19	9.7	.04	.15
Idaho	1.12	1.53	6.1	.44	1.09
Illinois	.51	.69	5.9	.05	.64
Indiana	.74	.82	1.8	.67	.15
Iowa	.22	.37	11.4	.07	.30
Kansas	.46	.93	6.5	.43	.50
Kentucky	1.19	2.08	12.5	1.27	.81
Louisiana	.89	1.78	16.7	.33	1.45
Maine	.88	1.20	6.1	.36	.84
Maryland	1.12	1.60	7.1	.85	.75
Massachusetts	1.10	1.44	5.2	.47	.97
Michigan	.61	.73	3.3	.53	.20
Minnesota	.92	1.83	16.5	.55	1.28
Mississippi	3.20	2.52	- 3.5	.91	1.61
Missouri	.74	1.00	5.9	.21	.79
Montana	2.53	.58	-12.8	.07	.51
Nebraska	.62	1.20	15.6	.45	.75
Nevada	.78	.97	4.1	.22	.75
New Hampshire	.79	1.24	9.5	1.21	.03
New Jersey	1.70	1.67	- 0.3	.59	1.08
New Mexico	.76	.96	4.4	.33	.63
New York	1.10	2.06	14.5	.64	1.42
North Carolina	1.13	.84	- 4.3	.17	.67
North Dakota	.96	1.32	6.3	.50	.82
Ohio	.48	.51	1.0	.16	.35
Oklahoma	.58	1.08	14.4	.27	.81
Oregon	.25	.45	13.3	.15	.30
Pennsylvania	.68	.83	3.7	.12	.71
Rhode Island	.56	.66	3.0	.20	.46
South Carolina	.47	1.14	23.8	.84	.30
South Dakota	.49	.67	6.1	.28	.39
Tennessee	1.21	1.21	0.0	.67	.54
Texas	.84	1.58	14.7	.48	1.10
Utah	1.22	2.06	11.5	.37	1.69
Vermont	1.99	3.47	12.4	2.98	.49
Virginia	.83	1.55	14.5	.43	1.12
Washington	.38	.42	1.8	.09	.33
West Virginia	1.26	1.79	7.0	1.06	.73
Wisconsin	.36	.62	12.0	.41	.21
Wyoming	.89	1.49	11.2	.04	1.45

help offset the loss of revenues from tax appropriations. State park agencies increased revenues generated from operations by an annual rate of 12.1 percent.

Funds from bond issues decreased from \$525.9 million in 1975 to a low of \$50.8 million in 1979. Since that time bond monies as a source of capital budget revenue have increased at an average annual rate of 12.3 percent. Fifteen State park agencies reported receiving a combined total of over \$88 million in bond funds during 1985.

Revenue generated from **park operations**. In order to generate more revenues, State park organizations increased fees and charges considerably during the 6-year period (1979-1985). In 1979, 27 states charged an average of \$1.48 for vehicle entry. Several other states charged parking fees or individual entrance fees. In 1985, 32 states charged an average of \$2109 for vehicle entry, an average annual increase of 6.9 percent. Fees for vehicle annual passes increased at an annual rate of almost 18 percent, with 29 states charging an average of \$20.03 in 1985. Fees for campsite and cottage rentals increased faster than the rate of inflation from 1979 to 1985.

Entrance fees and campsite rentals accounted for 48 percent of the revenue generated in 1985. The rental of cabins, cottages, and lodges generated 16 percent and concession operations brought in 9 percent of the generated revenue. Other operations, which included beaches, pools, golf courses, ski areas, and similar facilities, generated 27 percent of the revenue in 1985. Even though the amount of revenue generated from park operations increased by 73 percent from 1979 to 1985, the portion of the operating budget that is revenue generated increased only 17 percent during the 6-year period. The data indicate that New Hampshire had the highest percentage (97.6 percent) of its operating budget offset by generated revenues. The national average for 1985 was 36.9 percent.

Per visitor expenditures and revenues. Table 5 shows the 6-year trend in operating expenditure per visitor for each State as well as the revenue generated and net operating cost (expenditure) per visitor of 1985. The first two columns give the total operating expenditure per visitor for the years 1979 and 1985. These figures were determined by dividing the operating budget by the total number of visitors reported by the respective State park agencies. In order to determine the net operating cost per visitor for each State during 1985, the revenue generated per visitor was subtracted from the operating expenditure per visitor.

The national average annual percentage increase in per visitor expenditure (6.5 percent) from 1979 to 1985 was less than the rate of inflation during that same period (7.9 percent). Out of the 26 States that ranked highest in expenditures in 1985, 21 of them also ranked in the top half of the States that collect the most revenue per visitor. The net operating cost per visitor on a national average during 1985 was \$0.70. The State with the lowest net operating cost per visitor was New Hampshire (\$0.03) and the State with the highest net operating cost was Utah (\$1.69).

Personnel and Salaries

The number of full-time, year-round, public contact employees at the field unit level increased from 9,414 in 1979 to 11,940 in 1985, an average annual increase of 4.5 percent (table 6). These are entry level park employees with broad contact, interpretive and facility maintenance duties.

The salaries of park personnel increased at approximately the same rate as inflation during the 6-year period with the average salary of a field unit manager being \$22,943 in 1985. This is the senior, on-site employee who manages the park and supervises subordinate park rangers and other classes of personnel.

Factors Influencing State Park Operations

Tables 7 through 10 contain data related to the responses of State park directors concerning factors that have influenced or will influence State park operations. The responses to each statement were recorded on a Likert scale from strongly agree to strongly disagree. Over 80 percent of the directors indicated agreement with the following statements (table 7):

- State park agencies will make greater use of volunteers during the next 5 years.
- A much greater effort is currently being placed on the marketing of State park services,
- Citizens are willing to accept increased fees and charges for State park services.

Table 6. --Personnel and salaries in State park agencies

Personnel and salaries	1979	1985	Average annual percent of change
Personnel: Full-time, year-round:			
Public contact employees (field unit)	9,414	11,940	4.5
Field supervisors	494	765	9.1
Central office staff	456	483	1.0
Average annual salaries:			
Field unit employee	\$11,040	\$16,505	8.3
Field unit manager	15,761	22,943	7.6
Field supervisor	20,307	29,845	7.8

Over two-thirds of the directors responded on the Likert scale with agreement or strong agreement to the following statements:

- A reduction in Federal funds has greatly decreased land acquisition and capital improvement programs.
- State park agencies have adequate support from the governors.
- The rate of acquisition of State park lands will continue to decrease during the next 5 years.
- The rate of growth in State park attendance increases as the price of gasoline decreases.

Over two-thirds of the directors disagreed with the following statements (table 7):

- Revenue generated from State park operations will continue to increase to the point of covering all operating costs.
- Political support for providing State park and recreation services is eroding.
- Parks and recreation services have a relatively high priority among other State functions.
- Full-time, public contact (field unit) employees will increase at a greater rate than during the past 5 years.

Other interpretations based on the data in table 7 are:

- A greater number of women entering the work force and the increase in single parent families are not perceived as influencing factors on State park attendance by the State park directors.

Forty-eight percent of the directors disagreed with the statement that an increase in fees greater than the rate of inflation tends to decrease State park attendance.

The directors were about evenly divided on the factor concerning the expansion of State park services and the continuing influence of taxpayers' revolts of the late 1970's.

More of the directors (43 percent compared to 36 percent) felt that citizens in their States would vote in favor of a bond issue for parks and recreation.

Fifty-five percent of the directors agreed that greater emphasis will be placed on developing revenue-producing facilities during the next 5 years and 52 percent agreed that more State park operations and maintenance functions will be contracted out to private enterprise.

Table 7.--Opinions of State park directors concerning factors influencing State park operations

Statement	Percent of responses ¹				
	SA	A	NO	D	SD
A reduction in Federal funds has greatly decreased land acquisition for State parks and recreation areas	26.2	45.2	2.4	21.4	4.8
A reduction in Federal funds has greatly decreased the capital improvement/development programs	33.3	33.3	7.1	21.3	4.8
Taxpayers' revolts of the late 1970's are still having a negative impact on tax appropriations and/or bond issues for State park agencies	4.8	38.1	19.0	35.7	2.4
Our agency has adequate support from the governor	19.4	51.2	12.2	12.2	4.9
Our agency has adequate support from the State legislature	9.5	38.1	16.7	33.3	2.4
Legislative appropriations from the general tax fund for State parks will increase at a rate equal to or higher than the rate of inflation as the country's economic conditions improve	2.4	38.1	9.5	38.1	11.9
The rate of acquisition of State park lands will continue to decrease during the next 5 years	9.8	58.5	4.8	22.0	4.9
Revenue generated from State park operations will continue to increase to the point of covering all operating costs	2.4	4.8	9.5	33.3	50.0
Political support for providing State park and recreation services is eroding	0.0	23.8	9.5	57.2	9.5
Parks and recreation services have a relatively high priority among other State functions	0.0	26.8	4.9	46.3	22.0
The era of growth or expanding of State park services is continuing	0.0	47.6	7.2	35.7	9.5
Citizens are willing to accept increased fees and charges for State park services	4.8	83.3	2.4	9.5	0.0
Citizens in your State would vote in favor of a bond issue for parks and recreation services if proposed today	7.2	35.7	21.4	35.7	0.0

Table 7. --Opinions of State park directors concerning factors influencing State park operations--Continued

Statement	Percent of responses ¹				
	SA	A	NO	D	SD
A greater number of women entering the work force has caused a decrease in the rate of growth in State park attendance	0.0	2.4	33.3	45.2	19.1
The rate of growth in State park attendance will increase as the price of gasoline decreases	2.4	66.7	16.6	14.3	0.0
An increase in fees greater than the rate of inflation tends to decrease State park attendance	0.0	40.5	11.9	47.6	0.0
A greater number of single parent families has caused a decrease in the rate of growth in State park attendance	0.0	19.0	50.0	26.2	4.8
Currently, a much greater effort is being placed on the marketing of State park services	31.0	57.1	2.4	7.1	2.4
Our agency is making a concentrated effort to attract out-of-State tourists	9.5	52.4	4.8	28.5	4.8
During the next 5 years:					
Increases in State park attendance will be no greater than the rate of increase in the State's population	2.4	33.3	9.5	50.0	4.8
State park agencies will make greater use of volunteers	14.3	78.6	4.8	2.4	0.0
Pull-time, public contact (field unit) employees will increase at a greater rate than during the past 5 years	0.0	14.3	7.1	71.4	7.1
More State park operations and maintenance functions will be contracted out to private individuals/firms	2.4	50.0	7.2	33.3	7.1
Greater emphasis will be placed on developing revenue producing facilities in State parks	14.3	40.5	14.3	26.2	4.8

¹Strongly agree (SA). agree (A), no opinion (NO), disagree (D), strongly disagree (SD)

Table 8.--Factors having the most positive impact on State park operations/services during the past 6 years

Factor	Response frequency
Professionalism of staff/higher education/training	10
Better public awareness/support/image	7
Improved facilities/better programs/maintenance	7
Better marketing/promotion techniques	6
Increased promotion of tourism	6
Improved economy/better or more sources of funding	6
Use of volunteers	5
Legislature and/or governor's support	4
Reduction in tax support resulting in more creativity in managing public facilities	3
Economic value of State parks was recognized	3
Park ranger program/control of vandalism/law enforcement	2
Increased environmental interest	2
Scarcity/price of gas (earlier years)	2

The State park directors were asked to list factors having the most positive and negative impacts on State park operations/services during the past 6 years. Their responses are shown in tables 8 and 9. The factors having the greatest negative impact were related to inadequate budgets, State of the economy and a reduction in federal funds.

When asked what factors will have the greatest impact on State park operations during the next 5 years the most frequent response was the promotion of tourism and/or better marketing program (table 10). Ranking second was the perception of continued reduction in Federal funds.

Table 9.--Factors having the most negative impact on State park operations/services during the past 6 years

Factor	Response frequency
Budget reductions/ inadequate funding	17
Declining (poor) economy-- recession	13
Reduction in Federal funds	11
Reduction or freeze in number of employees	11
Lack of citizen and/or political support	6
Increased dependence on user fees	4
Tort liability	2
Increase in law enforcement problems	2

SUMMARY AND DISCUSSION

Some of the major trends indicated by the data are: Total acreage administered by State park agencies increased on an average of 1.2 percent per year during a 6-year period from June 1979 to June 1985. In State park systems, the number of cottages and cabins increased at a much greater rate than did the number of campsites (7.3 percent annual increase, compared to 1.5 percent). Total visitations to State park areas increased at approximately the same rate as the general population in the United States from 1979 to 1985 (1.1 percent and 1.0 percent respectively). The rate of increase in attendance has been much less in recent years, compared to the late 1970's, when the average annual increase was 3.0 percent. On an average, over the 6-year period (1979-1985) the rate of increase for overnight visitors has been twice that of day visitors (2.0 percent and 1.1 percent).

From 1979 to 1985, there was a decline in tax support for State park operations and development. To offset the loss of budget revenues from tax

Table 10. --Factors that will have the greatest impact on State park operations/services during the next 5 years

Factor	Response frequency
Promotion of tourism/better marketing program	10
Continued reduction in Federal funds	7
More citizen involvement/use of volunteers	6
Continued poor economy (States)	6
Improved U.S. economy	5
Factors influencing travel (terrorism, gas prices, currency exchange rates)	5
Lack of financial support/continued budget reductions	4
Findings of the President's Commission on Americans Outdoors	4
Better qualified work force	3
Federal government's role in State recreation	3
Increased visitation	3
Recognition of the value of recreation (improved image)	2
Utilization of foundations for funding	2
External threats to park resources	2
Public participation in planning/operations	2
Increased automation technologies	2
Increased budgets and staff	2

appropriations, State park agencies have increased revenues from operations at an average annual rate of 12.1 percent since 1979. The greatest decline has been in capital outlay budgets, which dropped from \$515.5 million in 1979 to \$273.7 million in 1985, an average annual decrease of 7.8 percent. This decrease was caused in large measure by the drop in Federal fund allocations. According to historical data by the National Park Service, since 1981 State grants under the Land and Water Conservation Fund have dropped to one-third of the total appropriated in the previous 5-year period. The deteriorating financial condition in State park operations was corroborated in a study published by The Conservation Foundation (Myers and Reid 1986). The authors stated, 'Funding is by far the most important issue facing State park directors. The three issues they rate highest all have to do with some aspect of funding. Moreover, many of their highest ranking issues are created or exacerbated by tight budgets.'

The salaries of full time, year-round State park personnel increased at approximately the same rate as inflation from 1979 to 1985. Per-visitor expenditure increased at an annual rate of 6.5 percent from 1979 to 1985, which was less than the rate of inflation (7.9 percent) during that same period.

As stated previously, the factors having the greatest negative impact on State park operations during the past 6 years have been inadequate budgets, the state of the economy, and a reduction in Federal funds. One-half of the State park directors feel that legislative appropriations from the general tax fund will not keep pace with inflation in the future and over two-thirds of them feel that the rate of acquisition of State park lands will continue to decrease during the next 5 years. They also feel that a decrease in the price of gasoline will increase the rate of growth in State park attendance. Socio-demographic factors such as the number of women entering the work force and the increase in single parent families are not expected to have much influence on State park attendance.

With a cut-back in Federal funds and State tax appropriations, State park administrators have resorted to a greater reliance on fees and charges to supplement budget funds. In competition with other leisure service agencies for the tourist dollar, a number of State park agencies are now incorporating marketing strategies into their administrative functions. Other innovations reported by Myers and Reid in their State park study included incentives for private sector involvement, earmarked accounts tapping

new revenue sources (cigarette and soft drink taxes, mineral severance fees, lotteries, etc.), and experimenting with diverse partnerships with individuals, nonprofit groups, and **for-profit** companies.

Further study is needed to determine if the increase in fees is adversely affecting the types of participation in State park areas. Also, with the rate of land acquisition beginning to decrease, further exploration should be conducted to determine if unique natural and historic areas are continuing to be preserved.

Of course, State parks provide only one aspect of the overall spectrum of outdoor recreation. With the number of park and recreation agencies at the local, State, and Federal levels of government as well as in the private sector providing services, it appears that one of the greatest needs is that of coordination. A coordinating agency at the national level should be considered to provide a national focal point for recreation policy, planning, financial, and technical assistance.

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INTERPRETATION: BENCHMARKING CURRENT STATUS AND TRENDS

IDENTIFYING ISSUES AND FUTURE NEEDS

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Abstract-Renewed interest in interpretive services in the mid- 1980's has paralleled an expansion of interpretation's roles and the nature of its provision. Changes include more fee programs and cooperative ventures, privatization of services, alternative funding sources, increased use of volunteers, more participatory and special event programming, stronger links with the tourism industry, and inclusion of 'high tech' strategies for presenting information. More emphasis is being placed on discussion of contemporary issues. Barriers, such as legislative restrictions, low pay, inadequate training, traditional ideas, and lack of managerial support, hamper programming. Such issues must be addressed to integrate interpretation with other recreation and managerial concerns.

revealing meanings and relationships in natural, cultural and recreational resources" (AIN/WIA Consolidation Committee 1987). Generally, some modification of this definition is adopted by Federal, State, and local agencies to guide the activities of personnel involved with communications and visitor services. Public agencies, however, are not the only organizations involved with interpretive services. Included are a myriad of private, private nonprofit, and commercial organizations such as museums, zoos, nature centers, historical landmarks and monuments, schools, industries, tour companies, and cruise ships. Some call their communications programming interpretation; many do not. For some, only a portion of the operations is, in fact, interpretation. For these and related reasons, it is difficult to assess adequately the variety, quantity, quality of and trends in interpretive services. Consequently, this paper will focus on major trends and issues as experienced by several Federal agencies involved with interpretive services, and those identified by current national leaders in the field of interpretation.

INTRODUCTION

Educate, inspire, teach, reveal, provoke, create, art, skill, communication, management tool. ... These words represent just a sampling of the concepts that have been associated with interpretation since the idea of 'nature guides' was brought to the United States from western Europe shortly after World War I (Russell 1960). Since that time, the definitions of interpretation and the roles of interpreters have been many and varied. Nevertheless, all revolved around a central concept of communicating with the public about the cultural, natural and historical resources of the world.

A recent definition, as presented by the newly chartered National Association of Interpreters (NAI), describes interpretation as a process, 'the an of

Earth Day, celebrated on April 22, 1970, marked the beginning of the environmental decade. It was an era of citizen protests to demand a healthy environment and of legislative activism to protect the natural resources of the United States (Rose 1988). As the environmental movement swept the country during the 1970's, much attention and many resources were directed to the development of environmental education and interpretive programs, primarily in the natural history area. Funds for new nature centers and for increased programming at established sites became available. School systems initiated environmental education programs, often incorporating field trips to nature centers, parks, and other natural areas. University curricula in environmental studies and interpretation expanded. Many Federal and State agencies initiated or expanded their interpretive

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programs, often developing theme-specific educational packets and programs (such as the USDA Forest Service's 'Investigating Your Earth' series) for school and other youth groups. A 'Volunteers in Forests' (VIF) program was initiated in 1972 to experientially involve the public with the National Forests and their management strategies. In 1966 the USDI Fish and Wildlife Service developed guidelines for visitor information and education programs.

By the late 1970's and early 1980's, the environmental fervor had begun to wane. Changing social values, strained government budgets, and the shift of public attention to other concerns all contributed to reductions in support for interpretive programming. Caught in the backwash of the earlier natural environment emphasis, historians and cultural site interpreters felt ignored. Following a historical trend of wavering support for interpretation, Federal agencies focused their attention and resources on other issues and projects (McKendry 1987). The national organizations for interpreters continued their struggle with identity, focus, and direction. University interpretive training curricula declined in number, as did many of the recreation and natural resource programs in which they were housed.

However, in the last few years there appears to have been a resurgence, both in interest and attention to interpretation and its roles. Federal land management agencies are serving as strong indicators of this revival. In the last 5 years, the USDA Forest Service has made efforts to revitalize its environmental education program, allowing each forest to select relevant issues and subsequently develop its own instructional or interpretive packets. In 1983 the U.S. Army Corps of Engineers formalized for the first time its interpretive/educational mission statement, developing a formal philosophy and general guidelines as well as an interpretive training course.

The National Park Service has refocused attention on interpretive programming, broadening its roles and incorporating its functions in many of the action plans listed in Director William Penn Mott, Jr.'s '12-Point Plan' (1985). Mott (Russell 1987b) has stated that "Rapidly changing socio-demographics continue to strain traditional park services. Environmental education and environmental interpretation [are] efficient and cost effective tool[s] that can alleviate that strain. . . . [They are] the link between the American public and this heritage. . . . Through creative environmental education and environmental interpretation programming, State park systems can continue to maintain a leadership role in balancing the human and resource needs of a future society.' To further highlight the need and support for interpre-

tation, Mott has created a new, Federal level National Park Service position, that of Associate Director of Interpretation. A goal statement for interpretation, 'The Interpretive Challenge,' was published by the National Park Service in May 1988. The document identifies, then presents strategies to address, five major issues in an effort to improve interpretation within the parks and for its constituents elsewhere (U.S. Department of the Interior, National Park Service 1988)

The National Parks and Conservation Association (NPCA), a national nonprofit, membership organization that defends and promotes the National Park System and educates the public about the parks, recently has completed a 3-year study of the park system. In its 10-volume report, 'Investing in Park Futures. The National Park System Plan: A Blueprint for Tomorrow,' NPCA identifies interpretation as one of nine major issues facing the park system. Presented are the need for and suggestions for enhancing the role of interpretation and environmental education in the parks because of their key role in the park experience (National Parks and Conservation Association 1988).

Though interpretation's mission and core definition have remained stable, its face and character have changed drastically. The shift has not been one of major, rapid change but rather a slow, steady process of evolution, characterized by self-assessment and redirected focus. Many traditional interpreters are recognizing changes occurring in the world around them and are beginning to acknowledge that interpretive services must change accordingly to remain effective.

Evolution in any organization is an ongoing process, but currently there appear to be major shifts in the field of interpretation, making this a particularly timely and important opportunity to benchmark the current status and trends.

CURRENT SITUATION

Because evolution is a process of gradual change, it is impossible to separate completely the current status of interpretive services from trends, both recent and future. Efforts will be made to highlight the most significant current conditions and changes, with implications for the future addressed.

Methods

Information for this paper has been synthesized from several sources, including the following:

1) **Nominal Group Process:** Two groups of seven national leaders in interpretation (including practitioners, academicians, association officers, and Federal agency representatives) worked through a modified nominal group process, identifying and prioritizing current trends in interpretation. (See Appendix A for summary of process.)

2) **Survey:** An open-ended questionnaire, asking for identification of major trends and issues in interpretation, was mailed to all 80 academicians listed in the 1983 'Directory of Interpretation Curricula in the United States and Canada' (Hartmann 1983). Thirty-nine questionnaires were returned (response rate of 48.75 percent). **Followup** phone calls revealed that 10 of the nonresponding programs no longer exist. Representatives from seven additional schools could not be contacted (possibly because these programs have been dissolved also.) The additional 24 respondents returned information only on changes in their programs and did not respond to the survey questions. Due to the amount of thought and effort required to respond to open-ended questions, the author believes that the responses received represent primarily universities and faculty most closely and currently involved with interpretation and the training of interpreters.

3) **Personal Interviews:** Personal interviews regarding the current status and trends in interpretive services were conducted with the appropriate directors or branch chiefs of major Federal agencies involved with interpretative services, including the National Park Service (William Penn Mott, Jr.; Ken Raithel; Michael Watson; Roy Graybill), U.S. Army Corps of Engineers (George Tabb), USDA Forest Service (Gerald Coutant; Richard Tobin), and the Bureau of Land Management (William T. Civish; Carl Barna).

Restrictions in time and resources prevented use of surveys or interviews with interpreters in State and local agencies. Traditionally, the Federal agencies, particularly the National Park Service, have taken a leadership role in interpretive training, and in the planning and roles of interpretation. Often this has initiated a trickle-down effect in interpretive trends. On the other hand, many grassroots programs and innovations have occurred at local levels. Numerous locally spawned ideas and nontraditional roles for interpretation currently are being explored and assimilated by Federal agencies. For these reasons, it is believed that trends in Federal agencies will provide strong insight into general trends in interpretation.

4) **Additional Sources:** Additional information has been extracted from recent, topically relevant articles, national workshop presentations, and the proceedings from the 1987 National Interpreters Workshop, held in St. Louis, MO, in November 1987. (See "References" for list of selected papers.)

Results -Trends

Interpretation does not and should not survive in a world unto itself. It is affected by much broader social changes and concerns. Changes in demographics, lifestyle, cultural values, technology and information systems, and governmental structures have been discussed at length elsewhere (Russell 1987a, 1987b); Mitchell 1983; Naisbitt 1982). Current trends and issues in interpretation, as identified by results of the survey and nominal group process, reflect many of those broad social changes.

From both the survey and group work emerged identification of similar trends, though each process resulted in different rankings (based on frequency of responses) of the identified trends. Trends could be classified into similar categories: changes in funding, shifts in providers of interpretation, changes in techniques, expansion of interpretation's roles, and shifts in the clientele and locations where interpretation is conducted.

Realizing there are interrelationships among categories, for ease of discussion each category will be presented individually. Specific examples will be drawn from national workshop presentations and interviews with Federal agency representatives. Detailed results of the survey and nominal group process, including relative response frequencies, can be found in Appendices B - D.

Changes in Funding

Many respondents indicated that changes in funding underlie other trends. Reduction at all levels in government funds available for interpretation seems to be the most commonly expressed trigger for the decline in numbers of public agency-sponsored interpreters and interpretive programs. Consequential trends cited are:

1) Increases in environmental damage and in environmentally nonsensitive behavior such as littering and wastefulness;

2) Failure of this country to foster a critical mass sufficient to change lifestyles in such a way as to ensure healthy living conditions; and

3) A reduction in related research efforts.

In many cases, reductions in funding have occurred because interpreters have failed to justify adequately their roles and effectiveness. Lack of concrete evaluation strategies and records that could support their effectiveness often are not implemented. When budgets shrink, programs perceived as “fluff” or “icing on the cake” are the first to be cut. Therefore, more attention currently is being given to the need for formal justification of the importance and impacts of interpretive services. More careful monitoring and formal evaluation are required. Though still inadequate, efforts are being expanded. Another area needing increased attention is assessment of economic impacts of interpretive program implementation. Additionally, there is a strong need for organizations to secure alternative or supplemental funding sources.

Although alternative funding sources occasionally are found, more often innovative strategies to provide interpretive services without using traditionally allocated funds have been implemented. Specific examples of both are presented below:

- The Army Corps of Engineers is an unusual Federal case in that it currently has sufficient money for a variety of programs. Because the Corps’ operations fall under the funding umbrella of the Defense Department, monies are more readily available to this agency than to many other Federal agencies. Additional monies are earmarked by the National Water Resources Act of 1986. Nevertheless, the Corps contracts with the private sector for much of its interpretive training, exhibit development, and visitor-center operations. The Bureau of Land Management (BLM) often contracts out the design and production of wayside exhibits, signing, and visitor-information pieces.
- The United States Forest Service (USFS), still unable to get a line item in the budget for interpretation, works cooperatively with other divisions (such as Wilderness, Cultural Resources, and Recreation) to benefit from joint projects that might include interpretive components.
- Cooperating associations, used by the National Park Service (NPS) for many years, are being established and operated in conjunction with the USFS and the BLM. The first USFS-related cooperating association was established in 1972. A recent upsurge has increased their numbers to 40. Often the major goals of cooperating associations are to provide support for education and interpretation, and to otherwise further the specific agency’s goals.

- “Friends” organizations are being used in conjunction with many federally managed sites to raise funds and otherwise accept donations for use in support of site protection and interpretation. Corporate donations often can be accepted through such organizations to fund special projects.

- A number of Institutes, such as those at Yellowstone, Yosemite, and Great Smoky Mountains National Parks, are cooperative organizations, often associated with universities and occasionally with private, **nonprofit** organizations. These institutes often include interpretive services as part of their missions.

- Gift catalogs are being published by several agencies (usually site or region-specific) to acquire items that cannot be funded by the annual budget.

- The BLM requires in many of its land use lease agreements the inclusion of some form of mandatory dedication. An example is that hotel/motel/restaurant builders often are required to build an interpretive center in return for approval of a lease to build and operate on BLM land.

- More numerous and wider varieties of services (including interpretive programs, recreation services such as float trips incorporating interpretive information, food services, rentals, lodging, ORV repairs) are being concessioned to the private sector on public lands. Often a fee (and/or portion of the profits) is assessed by the managing agency.

- Seed money from the **\$34** million recreation initiative (resulting from the President’s Commission on Americans Outdoors) is being used by the USFS to provide challenge grant money to individual forests to develop programming. Monies will be distributed and used in a process similar to that of the Land and Water Conservation Fund.

Because many interpretive programs have been constrained by financial restrictions, the demand for such services is becoming more obvious. An indicator of this is visitors’ willingness to pay for interpretive services. Increasingly, user fees are being assessed for many types of interpretive programs. Users who pay for programs expect quality in exchange. This increases the external demand for accountability and program quality.

- The general budget for the NPS has remained relatively stable, though interpretive programming often has been cut at the park level. Recent Federal fee legislation has permitted the NPS to assess entrance or user fees at many of its sites. The money may be used for interpretation, research and resource

management. Much of the money has enabled the hiring of additional staff, many of whom have been used to increase interpretive program offerings at the park level.

Use of user fees places interpretive services in the marketplace, subject to critique as expressed by users' willingness to pay. With interpretation being placed in the marketplace, there is increased need for and a growing emphasis on the marketing of interpretive services. Planners and managers must carefully assess the characteristics, needs, and demands of consumers and subsequently plan their programming and publicity to match specific market segments. Finding themselves in this position, more interpreters are realizing the need for, and developing, skills in business and management.

Shifts in Staffing, Training, Providers; Loss of Professionalism

Reductions in government funding and subsequent interpretive staff reductions have increased the need, not only for alternative funding sources, but for changes in who provides interpretive services. One major change, consistent with a broader social shift toward privatization, is the increasing role of the private sector in providing such services. Increasingly, outfitters, guides, resort owners and other recreation entrepreneurs are incorporating interpretive programming in their offerings. Information increases their recreation programs' attractiveness, giving them a competitive edge and enhancing the experiences of clients.

- In Minnesota, USFS volunteers work with Minnesota Audubon to train people as interpreters to work directly with resorts. The USFS also trains river-runners and other wilderness-trip outfitters in interpretive information and skills.

Interpretation is becoming a basic component of the hospitality industry. Due to increasing public demand, tour companies and others involved in the tourism industry are integrating interpretation into many of their tour packages.

- The USFS is working with cruise ships and ferry operators along the marine highway in Alaska to build and operate visitor-information centers.
- The NPS has placed interpreters on numerous tourism transportation systems, including trains through Glacier National Park; on cruise ships in Glacier Bay, Alaska; on boats at Crater Lake; along the voyageurs trade route. Additionally, it has imposed a requirement for inclusion of interpretive program-

ming when issuing permits to concessionaires who utilize park lands and waters in their businesses (such as on float trips on the Snake River, in concessioned lodges, and on mule rides into the Grand Canyon).

Many private industries and organizations are beginning to view their communications and public relations efforts as interpretation; others are recognizing the value of informing the public about their operations. Visitor information and interpretive services are being integrated more frequently into regional economic development plans, particularly for urban cultural park development.

Cooperative ventures, often between the public and private sectors, and sometimes between several government agencies, are being used to provide interpretive services. This allows pooling and sharing of resources, and in many cases reduces duplication of efforts. Cooperating associations and "friends" organizations are being used more often in a variety of ways, many of which are supportive of interpretation. Interpretive publications and souvenirs are sold, with profits supporting additional interpretive programming. Publication of special interpretive pieces is funded, as is the purchase of special equipment or the production of a special event. Association members often give of their time, special skills, and in-kind gifts to support interpretive programs.

- The BLM established its first cooperating association (at Red Rock in Las Vegas) approximately 5 years ago. Cooperating associations are nonprofit organizations formed to promote the historical, scientific, and educational activities of a site managed by a public agency. Currently, the BLM is working to expand this program as well as its site-specific "friends" organizations. In some areas, cooperative ventures include operation of interpretive sites (such as the Anasazi Heritage Center) by a local chamber of commerce.
- The USFS cooperating association program, mentioned earlier as one of the strategies to provide services not funded by Federal monies, has only recently expanded. Today, 40 associations operate cooperatively within USFS areas, some of them operated entirely by volunteers.
- Increasingly, multiple agencies are sharing construction costs and operations of visitor centers. Agencies also are cooperating more often in the design and printing of publications such as a recent photo brochure on wilderness.
- Occasionally the Corps of Engineers will cooperate with a power company at one of its reservoir sites

for the operation of visitor centers and construction of exhibits. Within the agency itself, there is more cooperation between divisions responsible for interpretive services and those responsible for visitor centers.

- The BLM has worked with Future Farmers of America, a high school organization, to build information kiosks and interpretive/hiking trail systems.
- The USFS is incorporating established outdoor/environmental education programs (such as Project Wild and Project Learning Tree) into its own program planning and implementation.

Use of volunteers, interns, and seasonal staff is increasing in many sectors to replace or supplement full-time, paid interpretive staff. Though use of these people enables additional interpretive programming, there have been concerns expressed about a subsequent reduction in professionalism of interpreters and lack of program quality control.

- The Corps of Engineers received authority for its volunteer program in 1984. Volunteers are involved in a variety of positive, meaningful work experiences, including producing videotapes, presenting interpretive talks, working visitor-information desks.
- The **BLM's** volunteer program is expanding rapidly, with hopes of developing public awareness and a supportive constituency. (In 1986 the BLM recreation program alone received over 187,000 hours of volunteer time worth approximately \$1.2 million.) Hoping to instill a resource ethic in the public, the BLM encourages volunteers to participate in its archaeology digs. As do other agencies, it uses work crews from the Student Conservation Association to perform a variety of tasks. The BLM also conducts a Volunteer Coordinator Workshop to train volunteer program supervisors.
- The USFS established its Volunteers In Forests (**VIF**) program in 1972. Currently in the Boundary Waters Canoe Area, approximately 60 percent of the recreation staff, which includes interpreters, is volunteers.
- The NPS uses a number of volunteer programs (Volunteers in Parks [VIP], Student Conservation Association [SCA], and cooperating association volunteers) to staff many of its programs. This includes approximately 39,000 volunteers used in a single year to conduct approximately 45 percent of interpretive programs.

A decreasing number of students are interested in professional interpretation careers for a number of reasons. The availability of positions in traditional agencies has decreased. Many full-time professional positions are being replaced by volunteer and student intern positions. Opportunities for professional advancement for persons currently working in entry-level positions are minimal. Individuals who do advance tend to move into managerial or other positions and out of interpretive jobs. Salaries for interpreters traditionally are low. General shifts in attitudes of today's youth are away from altruism, away from human services and low pay professions.

Changes in providers of interpretation and the threat of loss of professionalism demand changes in interpretive training programs. There is concern that entry level people do not have an adequate balance of technical knowledge, communications skills, and management/planning skills. Many agencies are moving toward holistic, interdisciplinary training in contrast with traditional job-specific training.

- Deciding to develop in managers, from the bottom up, a sensitivity to the role of interpretation in site management, the Corps of Engineers recently has developed a training course for lower grade managers who eventually will move up in the system. Though not expanding the number of staff, current Corps personnel, including managers and law enforcement officers, are encouraged to do some interpretation. Following formal publication of general interpretation guidelines, an interpretive training course has been developed.
- Interpretation components (as much as a full week) have been incorporated into other training courses such as the cultural resources course (Corps of Engineers) and the Federal Law Enforcement Training Center (FLETC) law enforcement course (BLM and NPS).
- The NPS conducts a 5- to 6-week Ranger Skills Course at its **Albright** Training Center, much of which involves interpretive training. Maintenance people often receive interpretive training **onsite** at their respective parks.
- The NPS recently has initiated 10 regional training teams, composed of top field-level rangers, that conduct special-topic training courses (often at retreat sites) to teach resource management to other rangers. Interpretive courses cover topics such as personal and nonpersonal interpretation, historical interpretation, and programming for special populations.

- Due to extensive use of volunteers, agencies are identifying a need of paid staff to receive training in interpretive operations and volunteer supervision. Also there is a need, though frequently unaddressed and unfunded, to better train the volunteers,

- In efforts to more effectively control program quality, content and accuracy, especially for those programs conducted by non-Park Service personnel, the NPS audits NPS-sanctioned information programs.

- To instill a sense of pride and professionalism in staff, the NPS occasionally selects outstanding personnel to participate in a 1 - to 2-week international study program. Additionally, the Horace Albright Development Fund is used to award grants for outstanding personnel to participate in special activities.

‘A final trend in provision of interpretive services is due to increasing global recognition of the importance of public education in natural resource management. More nonwestern and Third World countries are beginning to implement interpretive and educational programming. Consistent with globalization in other facets of world operations, skills and knowledge about interpretation are being shared with other countries.

Changes in Techniques

In efforts to meet the demand and expectations of a population trained in and accustomed to the use of computers and sophisticated ‘high tech (Naisbitt 1982) equipment and productions, interpreters increasingly are incorporating technological advances and gimmicks into their programs. Computer systems are used to catalog data and artifact collections, to animate models, and to present interactive teaching programs to users. Games, theatrics, interactive videos, puppets, and other gimmicks are used more frequently in efforts to attract and maintain attention of audiences accustomed to a barrage of sensory stimuli through television, music, videos and computers.

Though a strong emphasis on the importance of personal interpretation still exists, nonpersonal interpretation is being used more frequently to meet the needs of many nontraditional users and to offset reductions in interpretive staff.

Seemingly contradictory to survey responses indicating client preferences for nonpersonal, computerized and audio-visual media over personal interpretation, other responses indicate an increase in the use of living history, folk skill and craft demonstrations,

drama, storytelling, and other first-person and participatory interpretation. However, this is consistent with the dichotomous ‘high-tech/high-touch” trend (Naisbitt 1982) in western society.

Because many sites are being visited by larger numbers of non-English speaking guests, and because foreign immigration to the United States continues to grow, more multilingual interpretation is being offered in some parts of the country.

Changes in technique and roles of interpretation demand corresponding changes in interpretive training. It is unclear how much change actually is occurring.

Changes in the Uses and Roles of Interpretation

A major change, perhaps partially in response to the need to justify the expenditure of resources for interpretation, is the increased use of interpretation as a management tool. Interpretive messages are being used more frequently to modify visitor behavior in support of management objectives. Interpretation also serves as a public relations tool to improve agency image and to improve communications with local constituencies.

The scope of interpretation’s responsibility has expanded in many areas to deal with policy issues, to present current environmental issues, to aid in issue management and conflict resolution. The scope of interpretation has been stated clearly to include historical and cultural sites and issues.

- The Corps of Engineers (as do the NPS and USFS) includes interpreters as active members of its management team and uses them for most kinds of public contact, including news media interviews and public meetings, and to help address management problems.

- The NPS uses interpreters for all communications processes, covering all interfacing between the park, the people, and the resources. It will use interpreters to effect positive action in line with all future **service-wide** initiatives,

- The Corps and NPS are dealing more directly with management issues in their interpretive programs. The Corps uses models and demonstrations to address water safety issues. It works with the Coast Guard to conduct courtesy boat inspections and to talk with user groups about boating safety. The NPS now is encouraging discussion of issues such as acid rain and biodiversity.

- The BLM is working with individual States to develop comprehensive cultural resource protection programs that combine communications and enforcement programs. Its Pacific Northwest region is combining efforts of the cultural resources, public affairs, and law enforcement divisions to serve as a model for creating public awareness on a variety of relevant issues.

Interpretive messages, particularly those conducted in the out-of-doors and addressing issues about the natural world, are being integrated into therapeutic programs, especially for the mentally and emotionally disabled.

Changes: In Audiences and Where Interpretation is Presented

Closely associated with the expansion of interpretation's roles are changes in audiences and where programming is presented. Because there are major shifts in the demographic makeup of the population, there are associated changes in potential interpretive audiences. Perhaps the most noticeable change is in the aging of the population. Interpreters are beginning to realize that more older, retired adults who are healthy, mentally alert, and who have substantial amounts of discretionary time and money, are eager to learn (often in more depth than many traditional programs addressed issues) and participate. This group would be particularly receptive to interpretive programs offered in conjunction with group travel tours.

In some parts of the country, environmental education² often is integrated with outdoor education and outdoor skills programs. Field courses such as Project Learning Tree and Project Wild are two examples. Agencies are becoming more involved with traditional school systems as many of them continue to integrate environmental education into their required curricula. Various forms of cooperative ventures are used. Some school districts contract with nature centers to teach the science/ environmental education components of the curricula. In some cities, agency and nature center interpretive programs are developed specifically to meet the school district's curriculum guidelines.

There appears to be a rekindling of interest in the outdoors and in traditional 'park ranger' roles. One indication of this is the new Philadelphia Ranger Corps program, a cooperative venture to train recent

high school graduates as interpretive park rangers. In this case, a private foundation, city leaders, and a university joined hands to support the formation of a private, nonprofit organization to train rangers to work in the city's urban park system.

Additionally, many traditional interpretive organizations are expanding their **offsite** interpretation. Often these programs are conducted during **offpeak** season and in urban areas where many residents find it difficult to travel to the actual sites.

- All agencies are involved in more outreach programs, taking their programs to schools, civic groups, youth groups, 'Good Samaritans,' campers and hikers associations, State fairs, and boat shows.
- Posters, publications, and radio public service announcements are being used more frequently to address public safety issues. The Corps distributes T-shirts, beach towels, police whistles, and floating key holders with imprinted safety messages to help disseminate its messages.
- The NPS is using more teaching packets and videotapes in its outreach programs, particularly with urban clientele. More programming in urban parks is being devoted to outdoor skills how-to programs.

Results – Issues

Many of the issues identified in the survey and during personal interviews reflect many of the same topics discussed as current trends. It is encouraging that trends do seem to address some of the major issues. However, the classification of issues is somewhat different than of the trends. Therefore, this section will simply present the issues as identified.

Training

The most frequently mentioned issue involved the need for a general reevaluation of the training needed by interpreters, particularly in light of the many changes and trends in interpretation today. Most respondents identified needs for expanded training in traditional areas as well as training in new skills such as public relations and volunteer supervision. Though not new, the controversial issue regarding the need for certification of interpreters, or accreditation of training programs, to improve image, skills, and professionalism was raised once again. Should we be educating or simply training interpreters? Also listed as an issue for consideration was the need for better training of volunteers because of their expanding role in interpretive programming.

²Although the distinction between interpretation and environmental education is shrouded in controversy, for purposes of this paper environmental education can be considered as environmental interpretation taken into the classroom.

Skills and knowledge suggested for inclusion in training programs (no particular order) include:

- increased coursework in basic information in natural and cultural history, focusing on field-based education;
- solid internship programs involving role-playing and hands-on experiences;
- improved teaching, retention, learning effectiveness (including open peer critiquing);
- clarity in identification of interpretive and leadership skills;
- environmental psychology;
- problem-solving, critical thinking and coping;
- economics;
- identification of and methods for working with special needs of disabled populations:
- public speaking.

Of the updated interpretive curricula received, some of these needs have been addressed by some programs; many have not. Issues of what ultimately should be incorporated into a training program are still controversial. Also, inclusion of all the above skills would require a degree program extending well beyond the traditional 4-year bachelor program.

Of the 80 curricula listed in the 1983 directory> 15 programs were exactly the same as published previously; 32 were slightly different (often varying only in instructor's name, department where housed, texts used, or some small components of course content or requirements). Fifteen programs were described as very different from the former programs, while 10 programs no longer exist. As of this writing, eight curricula not included in the 1983 directory have been identified. In some cases, the programs are new; in others, they simply were not listed previously.

Of the curricula listed as very different, most have added one or several new courses. Content of new courses reflects various skill needs addressed above (including the addition of computer skills development) as determined most appropriate by instructors at the individual universities. Lack of any clear pattern reemphasizes the controversy existing about what are the most important skills new interpretive professionals should possess.

Cooperative Ventures

The second most frequently identified issue was the need for a variety of cooperative ventures, linking interpreters with many constituencies in efforts to share resources and develop an understanding of and support for interpretive services. Expanded and improved linkages with a variety of sectors are suggested, including:

- tourism and hospitality industries, many of which already incorporate information and interpretive services, though they may label it something else;
- other components of the private/commercial sector;
- schools, environmental education programs, science programs;
- other public agencies (similar and different government levels);
- media;
- recreation programs, both public and private;
- professional organizations with similar missions and functions.

Accountability

The third most frequently mentioned issue was the need for increased accountability. This should involve frequent and adequate evaluation and documentation of programming effectiveness. With increased implementation of user fees and emphasis on marketing techniques, it will be increasingly important to identify user needs and demands, to develop specific program objectives (using Management By Objectives approaches), and to develop programs to address those needs and objectives. Evaluation will help assess success of programs. All efforts to improve accountability should lend support for justifying interpretive programs to managers and in developing broader support for such programming.

Issue Orientation

The need to develop more timely and issue-oriented programs was mentioned by almost one-third of the respondents. Issues included contemporary environmental (e.g., acid rain, biodiversity, forest fire management, buffer zones, geothermal energy) and cultural problems (e.g., display of Indian burial ground contents, traditional resource uses by native Americans, pot hunting, presentation of war). Respondents stressed that conservation efforts should be encouraged as should political involvement in relevant issues. Also stated was that interpreters should develop, teach, and set examples for an outdoor and environmental ethic.

Professionalism

One-quarter of the respondents commented on issues regarding professionalism. A concern over weakening of professionalism was expressed, as were several contributory conditions and issues that must be addressed if any sense of professionalism is to be developed. Included are:

- the low priority often given interpretation by managers;
- lack of a well-defined career path;
- burnout of interpreters at the field level;
- decreasing numbers of people entering the field as professionals;
- general need for professionalism, ethics, values, and feelings of self-worth by interpreters;
- unequal, inequitable pay for interpreters;
- lack of certification or accreditation;
- a need to build academic respectability, especially at the major research institutions in the United States;
- conflicts of interest and certain unethical activities by some interpreters [such as personal buying and selling of artifacts, and violations of deaccessioning guidelines (guidelines for storing, returning, or distributing artifacts after they are no longer needed for display purposes)].

Management Concerns

Identified earlier as a major trend, the need for interpretation to be used more frequently and effectively as a management tool (both to modify visitor behavior in appropriate directions and to guide visitors away from sensitive areas) was raised as an issue. This includes convincing managers of interpretation's effectiveness as well as its limitations in addressing specific managerial concerns. Additionally, interpretation should be used more frequently to communicate management objectives to the general public. A corresponding concern was expressed that, with the expanded roles of interpretation and interpreters, it is important to preserve their integrity.

Support Needs

Related to the issues of accountability and professionalism is the need to develop political and financial support. It is now necessary to identify new and innovative alternative funding sources and/or other strategies to accomplish the goals of interpretation.

Programming

Programming issues were the least often mentioned. However, concerns were expressed that more bilingual and multilingual interpretation is needed as foreign visitation and immigration continue to expand. There is a need also to better meet the special needs of the aging and various disabled population segments. Interpreters should continue to integrate nonpersonal and current technical media in their programming in order to keep pace with changes in the media.

PROJECTED CHANGES

No formal forecasting methods were used in this analysis. Therefore, limitations inherent in survey, interview, and nominal group process techniques, all of which are based on individual perception and experience, will impinge on the following statements.

Because so many current shifts in the direction of trends in interpretation are relatively recent, it is probable that most of them will continue well into the future. Lack of Federal and other government funding, at the root of many of the other changes, probably will not reverse. It is possible that major changes in the national political structure, and subsequent changes in Federal administrative personnel, could have major impacts on future directions of interpretation. The nature of such impacts is unpredictable. Due to the history of wavering Federal support for interpretation, and because of the nature of our political system and terms of office, support probably will continue to fluctuate over the long term. However, barring personnel changes, such impacts in the near future will be modified by actions and innovative programs of those now operating in influential positions. Unless new legislation is passed, many of the barriers to expanded and improved interpretive programming will remain. Though some enabling legislation is possible, rapid changes are not probable.

The most important likely trends for the future include:

- increased demand for nature study and interpretive programs as more people engage in wildlife-related recreation other than the traditional "consumptive" activities such as fishing and hunting;
- continued limits to availability of government funds;
- continued privatization and commercial provision of interpretive services, including an expanded role for interpretation in the tourism and hospitality industries;
- more frequent contracting out or concessioning of interpretive services;
- increased use of cooperative ventures, programming and funding, which will link various public and private groups in the provision of interpretive programs;
- expanded marketing of interpretive services, including more frequent and careful monitoring and evaluation of programs;

- increased assessment of user fees for nonbasic information services and programming;
- increased use of volunteers and docents, combined with implementation and improvement of training programs;
- increased use of nonstatic techniques, including incorporation of computers, video, and other high tech equipment as well as more participatory, personal interpretation such as living history, special events, and demonstrations;
- increased use of interpretation to address management issues; an associated increase in the inclusion of interpretive specialists and planners as part of more comprehensive land management teams;
- continued efforts to improve professionalism and the image of interpreters by addressing issues of training, salary, burnout, respect, and accountability: related attempts to define and facilitate career paths for interpreters;
- continued expansion of the roles of interpreters in efforts to justify their work and to achieve a variety of management goals (to include education, direction and guidance, safety, enhancement of visitor experiences, image promotion, conduct of public meetings, entertainment, use as a management tool, modification of user behavior);
- increase in addressing current issues, often in more detailed and sophisticated programs, as environmental hazards and their effects become more obvious to the general public and more frequently covered by the media;
- expansion of outreach programs to meet the needs of urban, aging, disabled, minority, and international visitor populations;
- expansion of urban interpretation programs, often associated with the creation of urban recreation, natural and cultural sites;
- decrease in the number of university programs in interpretation, but a strengthening and expansion of stronger programs to incorporate changes in the scope of interpretive services and to include more training in marketing and management skills; expansion of graduate curricula in interpretation and development of new training organizations (private, private-nonprofit, and agency-related) outside of the university environment;

- increased efforts by public agencies to recruit minority candidates for training and cooperative education/employment programs as field and managerial level interpreters.

Even if no current barriers at the Federal level are removed, or if new barriers are erected, similar patterns probably will continue at non-Federal levels and with private and private/nonprofit interpretive operations. The recent merger of two national professional interpreters organizations caps a relatively rapid self-assessment of functions, goals, and future directions of interpretation and has dealt smoothly with a variety of controversial internal issues that have been the source of major debate for at least a decade. New leadership in the organization, combined with more openness by interpreters as a whole to accept and work with change rather than to fight it, is providing the impetus for effective growth of the organization as well as successful implementation of new interpretive operations strategies.

There are numerous indications that interpretation and related visitor services will play an increasingly significant role, not only for land management agencies, but also for tourism, resort, and other recreation businesses. Some agencies, such as the California Department of Fish and Game, are creating new positions for interpreters as they realize more visitors are becoming interested in nonconsumptive uses of wildlife. Growing percentages of the United States population are moving into their retirement years. Many of them are healthy and eager to participate in interpretive programming as part of their recreation travel activities. Such trends indicate the potential for growing demand for interpretive services.

The relationship of current trends in interpretation to broader social trends has been addressed earlier. Many of the trends and future directions in interpretation are in response to those changes. An important issue for interpreters is to define ways in which interpretation may be used to initiate or guide some future directions. This could include developing in citizens a land and conservation ethic, providing leadership in relevant political issues, effecting changes in lifestyles, promoting preservation of historical and cultural sites and values, taking a leadership role in modifying cultural and environmental impacts of tourism, etc. These ideas define a much more proactive role for interpreters than has been expressed traditionally.

Although the stage has been set for expanding and more significant functions for interpretive services, recognition and support will not evolve on its own.

Interpreters must take a more global view of themselves and their roles in society, then use this broadened perspective to become strong, vocal advocates for interpretation. They must move out of their traditional, comfortable worlds of working primarily with people of similar ideals and viewpoints. They must interact more frequently and fervently in the political realm to promote supportive legislation, to upgrade and professionalize interpretive positions, to raise salaries and create opportunities for upward mobility.

The interpreters' role as advocate must reach beyond the political arena. It should extend to upper level managers and administrators within agencies. Within the university setting, it should extend to colleagues in other fields as well as be discussed with students. It should involve lifestyles consistent with professed ideals so interpreters can serve as examples to family and community members. It should continue to spread to the business world as a viable and contributing component of community life and some businesses. Interpreters should be more willing to work cooperatively with professionals in other fields, such as recreation, tourism, and education. They must expand their outreach programs to places where people congregate rather than expecting visitors to always 'go to their sites.'

Moving into another nontraditional, and potentially uncomfortable arena, interpreters must deal more directly with controversial issues regarding historic preservation, promotion of cultural diversity, and protection and wise use of natural resources. However, such issues must be addressed in a manner that is nonthreatening to audiences, and without placing themselves on a soapbox.

Interpreters in the future should make concerted efforts to attract more minorities into the field, especially in urban areas. Not only can this provide professional opportunities to minorities, but it can improve acceptance into neighborhoods with residents typically outside interpretive program clientele. Interpretive rangers placed in urban parks and forests can be effective in reaching populations not easily reached in other ways. Interpretive ranger programs need not always be funded by public funds. Perhaps the private sector and foundations can play stronger roles in training and employing interpreters to work in urban resource areas where their services could significantly increase residents' quality of life.

Increased efforts should be made to encourage international exchange of ideas relevant to interpretation. In the past 4 years, two international symposia on heriage presentation and interpretation have

opened the doors to such international exchange. However, more frequent exchanges should occur to improve the quality of programming and to broaden perspectives about roles and approaches to interpretation. International publications, student/field worker exchange programs, joint research projects, and personal correspondence can all improve this exchange.

Use of volunteers in all aspects of interpretive program design and implementation will continue to increase in the future. However, as more and more agencies and organizations turn to volunteers to help facilitate their programs, competition for people's volunteer efforts will increase. This places a challenge on managers to provide strong leadership, training, incentives, and opportunities for volunteers. Likewise, more effort must be placed on training volunteer supervisors. Volunteers also must be given opportunities to create and contribute in significant ways to organizations' programs; they cannot be used only for the clerical and other 'drudge' work.

Currently many interpreters are focusing efforts and money on developing highly sophisticated, flashy interpretive productions. 'High-tech' media play an important role, particularly in attracting the attention of a media-bombarded society. But precautions must be taken to assure relevance and appropriateness of its use. Many interpretive messages can be transmitted in a much simpler, less expensive, and more relevant manner.

If interpretation is to clearly establish itself as a viable and contributing element of land management agencies, businesses, and tourism operations, and if its effectiveness in achieving specific goals is to be evaluated, a thorough set of baseline data must be gathered and continually updated. Such efforts should be incorporated into interpretive planning and programming. Records of baseline data can be improved, though not necessarily perfected, by the following:

- 1) Identification of all State, county, and local agencies involved with interpretive services, particularly on or concerning outdoor or wilderness sites;
- 2) Assessment of personnel's perceptions about relevant trends in interpretive service delivery;
- 3) Development and implementation of an objective questionnaire that would tap descriptive, numerical data relative to interpretive programming, to include things such as program types, hours of

offerings, demographic descriptors of participants, fees collected (if any), participant evaluation of programs, repeat vs. first-time participants, program benefits, etc.;

4) Development and implementation of a monitoring system (or instrument) that would facilitate record keeping of major trend indicators at interpretive sites;

5) Record keeping of all concessioned and contracted services requiring special use permits by land management agencies that would document the types of interpretive services required and offered by such businesses.

BARRIERS TO AND SUGGESTIONS FOR FACILITATING EFFECTIVE INTERPRETIVE SERVICES DELIVERY

Because current barriers often dictate changes needed to facilitate some function or operation, these two sections will be discussed in tandem.

Public funding levels probably never will reach levels capable of supporting unlimited, high-quality interpretive programming to achieve all of the potential goals that have been identified. This requires that alternative funding sources and innovative strategies for programming be found or developed. However, several legislatively imposed barriers exist that effectively block the use of some of these strategies and funding sources. Federal regulations often block an agency's ability to accept certain types of funds or gifts. Often donations and other externally obtained funds must be returned in whole or in part to the United States general treasury. This effectively removes any incentive for sites or agencies to expend time and energies on fundraising. It can, in fact, have negative psychological effects on already overworked and underpaid employees.

Under the new **"Reagonomics"** tax structure, many of the former financial incentives for individuals or corporations to donate land, money, buildings, in-kind gifts, or bequests have been removed. Thus a major source of external support has been extinguished. Other disincentives for external funding sources are restrictions imposed by Internal Revenue Service policies. Many tax deductions are either restricted or no longer allowable, thereby discouraging individuals and corporations from making charitable contributions.

In such cases, friendly tax laws and enabling legislation could encourage future donations. Sorely needed are legislative changes that would allow management agencies to retain a large portion of their external earnings at the site where it was generated, or at least within the respective agency. Also needed is legislation that would mandate a set minimum in the budget to allocate to specific land management agencies, either for development of interpretive operations or to be dispersed as deemed appropriate by the agency administration. Such legislation would permit smoother planning and use of funds over the long term to achieve clearly defined goals. Haphazard and frequent changes in allocations, particularly when there also exists a 2- to 3-year lag time between allocation and receipt of funds, can play havoc with planning and operations.

Additionally, legislation is needed either to ensure allocation of some government funds, or to facilitate the raising and use of external funds, for more evaluation and research. Over the years there has been a decrease for many agencies in funds available for research. Lack of evaluation monies often leaves managers in a position to make managerial decisions based on hunches rather than documented evidence. This is just as true for evaluating the effectiveness of interpretive programs and their ability to achieve a variety of management goals as it is in other management practices. Funds also are needed to properly preserve and catalog existing collections and artifacts, many of which will not survive unless precautionary protective measures are taken. Such collections form the basis for our understanding of the world, which is then shared with the public through interpretive programs.

Another recommendation is to pass legislation that would reinstate, or create a funding source similar to, the Land and Water Conservation Fund that could be used as seed or challenge grant money for agency projects.

Enabling legislation for some agencies, such as the National Park Service, merely imply the provision of educational or interpretive programs. Some believe that in order to stabilize support for and upgrade the image of interpretation's role, such legislation should be amended to clearly provide for interpretive and educational services.

Another barrier to interpretive programming is the lack of a well-defined career path (including opportunities for advancement) for interpreters. An additional hampering is the bottleneck for advancement in the current structure of some agencies. Field-level interpreters can feel trapped in a position,

which contributes to job burnout. Much of the bottleneck is due to broader demographic patterns. Some of the associated problems will resolve themselves in the next few years through attrition and retirement. However, creation of a structured career path is needed. In isolated cases, such as the California's Department of Fish and Game proposal to create new interpretive positions, efforts have been made to incorporate opportunities for upward mobility (Chessher 1988). More efforts to provide advancement opportunities are needed. Additionally, more incentive and award programs encouraging growth and outstanding performance, such as those described in the results section, should be implemented.

With so many major changes in interpretive program implementation and in the skills needed by interpreters, lack of these skills can impede implementation of new strategies and can frustrate current staff. Opportunities for refresher courses and new skills training must be expanded. On a broader scale, preprofessional training programs and educational curricula must begin to incorporate these new skills.

With increased imposition of fee structures for many agency-operated sites and interpretive programs, some segments of the population invariably will be prevented from participation. In order to address equity issues and to provide opportunities for participation by these people, creative strategies for funding or otherwise facilitating their participation, while simultaneously preserving their self-respect, must be developed. Perhaps potential strategies could be developed at the national or regional levels, then provided to individual sites as suggested procedures.

Finally, traditional attitudes and perceptions of interpretation and interpreters, both by managers and by interpreters themselves, can be a major barrier to implementation of new programs. Interpreters must be convinced of the need to expand interpretation's roles and to break away from traditional programs and techniques. Concurrently, managers must be educated about the expanding roles and contributions of interpretation. In many instances this will require carefully planned, slow education of managers by demonstration of direct and indirect results of effective interpretive programs. This includes monitoring and evaluation of economic impacts, demand by users (indicated in many instances by willingness to pay, and by assessment of participants' personal evaluations), and effectiveness in achieving clearly defined management objectives.

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. APPENDIX A

Nominal Group Technique

The Nominal Group Technique is a structured process used to conduct group meetings. The purpose is to gather input from all group members in a way that facilitates rather than hinders participation. It is used widely by business, government, and industry to solve problems, to evaluate, to obtain feedback, and to generate ideas.

In this study, the technique was used to identify current trends in interpretation and to determine which trends are most significant in terms of the impact they will have on future planning and implementation of interpretive services.

Fourteen leaders in the field of interpretation (including practitioners, academicians, consultants, and Federal agency representatives) participated in the Nominal Group process. Participants were divided into two working groups of seven people. Each group's work was guided by a facilitator. The basic steps followed in the process were:

1. **Silent written generation of ideas:** After a brief introduction about the purpose of the Interpretation Status and Trends Study, the Nominal Group process was reviewed. Each participant was asked to individually identify and write down five current trends believed to be occurring in the field of interpretation.

2. **Group recording of ideas:** Moving around the circle in each group, ideas were solicited from group members one at a time, then recorded on wall charts. This gave each participant equal opportunity to share each of his listed ideas. All ideas then were visible to the group.
3. **Clarification of trend items:** Each group was able to discuss the listed trends, to elaborate and clarify each trend for common understanding among group members.
4. **Selection of most influential trends:** Each group member was asked to individually select and list the five trends from the group list believed to be the most important in terms of impact on the future of interpretation. Entries on these lists were solicited one at a time, then recorded in tally format, on the wall charts. Results from each group were shared with the other group.
5. **Compilation of results:** The tally scores from each group were combined, then ranked in importance of influence based on the frequency of identification by individuals as a critical trend.

APPENDIX B

The Most Important Trends in Interpretation: Results of Nominal Group Technique

TRENDS	FREQUENCY OF LISTING	% OF PEOPLE LISTED BY (n = 14)	% OF TOTAL (58) RESPONSES (n = 58)
Increased marketing orientation in offering of interpretive services: - more user/target market assessment - systematic planning	10	71.0	17.0
Decrease in government funding (Federal, State, local), with subsequent increase in user fees		57.0	13.8
Use of interpretation as management tool/ inclusion of interpreters as part of management team	6	42.9	10.3
Increased privatization of interpretive services, including more contracting out by government agencies and stronger links with/provision by tourism industry	5	35.7	8.6
Increased use of computerization and other high-tech techniques	5	35.7	8.6
Increased level of professionalism in interpretive design, planning; in presentation of personal interpretation	5	35.7	8.6
Changes in audiences (including increased needs of and use by disabled, minorities, foreign born, aging; increased sophistication of audiences)		28.6	6.9
Increased controversy over types of training needed by professional interpreters (general vs. technical)	4	28.6	6.9
Reawakening of role of interpretation; expansion of roles beyond traditional uses	3	21.4	5.2

RESULTS OF NOMINAL GROUP TECHNIQUE (cont.)

TRENDS	FREQUENCY OF LISTING	% OF PEOPLE LISTED BY (n = 14)	% OF TOTAL (58) RESPONSES (n = 58)
Increased use of volunteers/ docents (with corresponding need for more administrative and supervisory skills of professional interpreters)	3	21.4	5.2
Increased networking, inter- disciplinary work, and more cooperative ventures	3	21.4	5.2
Program content addressing current environmental and other issues more often than in past	1	7.0	1.7
More programming in museums, zoos, other nontraditional sites	1	7.0	1.7

Other Trends Identified by Nominal Group Participants, But not Ranked Among Top Five Most Important or Influential

Managerial Trends

- Barriers between interpretation and recreation are dissolving
- More use of interpretation to improve agency image; agency propaganda
- Interpretive programs still undervalued and undermonitored in many areas
- Interpretive managers beginning to assess the economic impact of interpretive program implementation (often to justify such programming)
- Land management agencies as a whole are recognizing the importance of bioregionalism; this is being reflected in interpretive programs

External Trends Affecting Interpretation

- Increased international environmental awareness
- National associations more interagency oriented than previously

Trends Regarding Youth

- Mandatory environmental education/interpretation programs in schools
- Increased interpretive programming for very young children (pre-schoolers)
- Young people (in some population segments) are increasingly exposed to natural and cultural resources

Trends in Interpretive Providers

- Increased growth in interpretive programming at county and city levels

Trends in Potential Audiences/Participants and their Program Preferences

- Increased discretionary time and money in many segments of the U.S. population, though both are decreasing for some professional segments; correspondingly, patterns of available discretionary time are changing
- Broader segments of society are seeking natural and cultural interpretation
- Increased sophistication of users makes interpretive planning increasingly more challenging

increased experiential, hands-on, participatory programming

Increased demand for nonpersonal interpretation

Increased sensitivity to minorities

Trends in Who Interprets and in Training of interpreters

- Increased percentage of females are applying for entry-level interpretive jobs

Entry-level interpreters do not have an adequate balance between technical knowledge and communications skills

APPENDIX C

Trends in Interpretation: Results of Survey

TRENDS	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (88) RESPONSES
TRENDS IN PROVIDERS		(n = 38)	(n = 88)
Privatization, entrepreneurship, commercializaion; outfitters, guides, etc.; industrial interpretation	11	28.9	122.5
Integration of interpretive services with tourism and hospitality industries; tour companies; increased willingness-to-pay	7	18.4	8.0
More cooperative ventures: inter-agency; public/private; with regional economic development agencies; cooperating associations	4	10.5	4.5
Increased use of volunteers & interns; concern about loss of professionalism when replaced by volunteers/interns	7	18.4	8.0
Reductions in public sector funds for interpretation; fewer interpretive services than 10 or 20 years ago	6	15.8	6.8
Fewer students interested in professional interpretation careers (decrease in traditional positions available)	1	2.6	1.1
Global recognition of importance of public education about natural resource management	1	2.6	1.1

TRENDS	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (88) RESPONSES
TRENDS IN INTERPRETATION TECHNIQUES		(n = 16)	(n = 88)
Incorporation of high tech strategies (computers, interactive videos, gimmicks, theatrics, games, furry folks; computerization of collec- tion data; mechanized exhibits)	8	50.0	9.1
Less personal interpretation; more non-personal interpretation (to help meet needs of non-traditional visitors)	3	18.8	3.4
More living history, folk skill demonstrations, storytelling, first-person and participatory activities, special events	3	18.8	3.4
More bi-/multi-lingual offerings in some parts of country	1	6.3	1.1
New techniques in training	1	6.3	1.1
TRENDS IN USES AND ROLES OF INTERPRETATION		(n = 13)	(n = 88)
Use as a management tool	5	38.5	5.7
Increased scope of interpretation's responsibility (to include dis- cussion of policy, environmental, management issues; conflict reso- lution; topics beyond natural history)	5	38.5	5.7
Use as public relations tool	2	15.4	2.3
Use for therapy (incorporated into therapeutic recreation programs)	1	7.7	1.1

TRENDS	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (88) RESPONSES
TRENDS IN DEMAND & NEED FOR JUSTIFICATION, FEES & MARKETING		(n = 12)	(n = 88)
Increased need to justify existence, therefore more evaluation & monitoring needed	3	25.0	3.4
Increased demand (indicated often by willingness to pay); increased use of user fees (therefore become accountable for quality)	3	25.0	3.4
Increased emphasis on marketing of interpretive services	2	16.6	2.3
Need for and use of alternate funding sources	1	8.3	1.1
Reductions in public funds and staff lead to:			
- increased environmental damage and problems such as littering	1	8.3	1.1
- previous inability to foster critical mass to change life- styles to ensure healthy living conditions	1	8.3	1.1
- decrease in research efforts	1	8.3	1.1
TRENDS IN WHERE AND FOR WHOM INTERPRETIVE PROGRAMMING IS GIVEN		(n = 10)	(n = 88)
Increased integration of environmental education with outdoor education & skills programs (e.g., Project Wild, Project Learning Tree)	4	40.0	4.5
More deliberate integration of inter- pretive programming with schools	3	30.0	3.4
Renewal of interest in outdoors and traditional "ranger" programs	1	10.0	1.1
More offsite , outreach interpretive programs (try to meet needs of urban population)	1	10.0	1.1
More programs for older/aging audiences	1	10.0	1.1

APPENDIX D

Issues in Interpretation: Results of Survey

ISSUES	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (82) RESPONSES
ISSUES REGARDING TRAINING		(n = 21)	(n = 82)
Need better training of volunteers	1	4.8	1.2
General training/education issues:			
- increase coursework in basic information (natural and cultural history)	5	23.8	6.1
- need solid intern programs; more hands-on & participatory training	2	9.5	2.4
- need better teaching, open class critique	2	9.5	2.4
- general re-evaluation of interpretive training	1	4.8	1.2
- clarity in identification of interpretive & leadership skills	1	4.8	1.2
- opportunities for ALL students to have more science, history education	1	4.8	1.2
- need for environmental psychology education	1	4.8	1.2
- need training in problem-solving, thinking, coping	1	4.8	1.2
- economics training	1	4.8	1.2
- training in needs of special populations	1	4.8	1.2
- accreditation	1	4.8	1.2
- should training be technical training or broad education?	1	4.8	1.2
- need public speaking classes	1	4.8	1.2

ISSUES	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (82) RESPONSES
ISSUES REGARDING LINKAGES, COOPERATIVE VENTURES		(n = 14)	(n = 82)
Integration with private/commercial sector, including travel & tourism	6	42.9	7.3
Integration with school curricula	4	28.6	4.9
Other cooperative efforts (public-private , multi-agency, media, recreation programs, etc.)	3	21.4	3.7
Professional links, especially with national organizations (e.g., NAEF, NAI)	1	7.1	1.2
ISSUES REGARDING ACCOUNTABILITY		(n = 11)	(n = 82)
Evaluation of program effectiveness as strategy for accountability; use of management by objectives approaches and marketing techniques	8	72.7	9.8
General need for accountability to justify value of interpretation to managers	3	27.3	3.7
ISSUES REGARDING ISSUE-ORIENTATION OF PROGRAMS		(n = 10)	(n = 82)
Should programs deal with contemporary environmental & cultural issues?	4	40.0	4.9
How to teach and develop environmental ethics and lifestyles?	3	30.0	3.7
Linkages with conservation efforts and political involvement?	2	20.0	2.4
Increased need to promote public understanding of natural world	1	10.0	1.2

ISSUES	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (82) RESPONSES
ISSUES REGARDING PROFESSIONALISM		(n = 9)	(n = 82)
Low priority of interpretation by managers	1	11.1	1.2
Need to build academic respectability	1	11.1	1.2
Lack of well-defined career path	1	11.1	1.2
Burn-out at field level	1	11.1	1.2
Fewer people (especially those well-qualified) entering profession at the field level	1	11.1	1.2
Need for professionalism, ehtics, sense of value and self-worth	1	11.1	1.2
Certification	1	11.1	1.2
Equal/equitable pay scales	1	11.1	1.2
Conflicts of interest, unethical activities, violations of deaccessioning guidelines	1	11.1	1.2
MANAGEMENT ISSUES		(n = 8)	(n = 82)
Use of interpretation as management tool; integration of interpreters on management teams; internal justification of interpretation's value and uses as management tool; communicating management objectives and strategies to public	7	87.5	8.5
Concern about maintaining integrity of "interpretation" as its roles expand	1	12.5	1.2
SUPPORT ISSUES		(n = 5)	(n = 82)
Need for increased funding; alter- native funding strategies	4	80.0	4.9
Need for political support	1	20.0	1.2

ISSUES	FREQUENCY OF LISTING	% RESPONSES IN CATEGORY	% OF TOTAL (82) RESPONSES
PROGRAMMING ISSUES		(n = 4)	(n = 82)
Increased integration of high-tech and nonpersonal techniques	2	50.0	2.4
More bilingual and multilingual offerings	1	25.5	1.2
Meet needs of increasing, aging population	1	25.5	1.2

Section 3.

Trends in Recreation Participation on Public and Private Lands



OUTDOOR RECREATION PARTICIPATION BY DISABLED PEOPLE

Lawrence A. Hartmann and Pamela J. Walker¹

Abstract—A synopsis of outdoor recreation participation patterns of disabled individuals is provided through a literature review and data from the PARVS. The disabled population appears to be strongly under-represented as users of Federal and State outdoor recreation areas. The demographics, annual participation, and travel patterns of disabled recreationists are provided. The annual outdoor recreation participation patterns of the disabled are similar to the able, but a smaller percentage of the disabled population participate, especially in the more physical activities. Issues, recommendations, guidelines for improving the baseline of information, and a forecast of the future are provided.

INTRODUCTION

Outdoor recreation is an integral part of most American's lives, offering a broad spectrum of opportunities and experiences which enhance life in many ways. Opportunities to enjoy outdoor recreation should be available to anyone who wishes to participate. However, the planning, design, and implementation of outdoor recreation facilities and programs often overlook a segment of the population—those individuals who have a physical, emotional, or cognitive disability.

Who qualifies as a disabled individual? 'Disability is "the limitation of a person's ability to perform a major life activity, as the direct result of an impairment, particularly of the senses or musculoskeletal system"' (Czajka 1984). However, as this source states, the number of disabled people 'may be expanded or contracted depending on how broadly or narrowly one describes the three terms 'limitation of ability', 'major life activity', and 'impairment'.' Temporary

impairments such as a sprained ankle or advanced pregnancy may qualify individuals as disabled under an open definition of the term, while a restrictive definition might consider a person disabled only if they are permanently unable to maintain gainful employment. "However we define disability, it should be clear that the population does not divide itself neatly into disabled and able persons, although the ambiguity is greater the broader the definition' (Czajka 1984). Recently, in advocacy of an attitude that focuses on the opportunities rather than the restrictions of disability, disabled people have been described as physically, mentally, or emotionally challenged. The terms 'disabled' and "challenged' will be used interchangeably in the following text.

This report focuses on the use patterns of people who are more permanently impaired by their physical, emotional, or cognitive disabilities. These disabilities include activity impairments (caused by diseases of the heart, lungs, or forms of arthritis or rheumatism), mobility impairments, manual, visual or hearing impairments, emotional disturbance, mental illness, and mental retardation. Each disability creates a distinct set of challenges for both the providers and participants of outdoor recreation activities.

Recreation managers and facility designers often do not consider the diverse needs of each disabled group. A barrier-free pathway designed to be accessible by wheelchair is not always free of hazards to the visually impaired hiker. A complex sign informing visitors of available activities may be unintelligible to a person with a cognitive disability. Providing uniform accessibility is a difficult challenge, but it is one that public recreation managers must be willing to face.

Disabled people have an equally difficult challenge—educating and informing the public recreation manager about their needs and desires. Communication channels have been opened as acceptance of the need for barrier-free site design becomes more widespread, however, much can be gained by active participation by disabled people in all phases of facility and program planning, design, and implementation.

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There is little qualitative or quantitative research on outdoor recreation participation by challenged people available to assist recreation providers. Most scientific studies are site-specific rather than of national scope. A literature review prepared by Farbman and Ellis (1986) found that available literature focuses on issues of access- architectural, program, and transportation access-as well as on involvement of disabled customers. The review provides detailed research recommendations and concludes that more qualitative studies should be conducted using case studies and interviews with disabled people to determine the policies and programs that should be developed across the Nation.

However, one such qualitative study was accomplished in 1985. A nationwide survey was conducted by Louis Harris and Associates for the International Center for the Disabled (ICD), in cooperation with the National Council on the Handicapped (Louis Harris and Associates, Inc. 1986). This was the first major national survey that studied disabled people's attitudes and experiences.

The 198587 Public Area Recreation Visitors Survey (PARVS) substantially added to the quantitative research on this subject. **PARVS** was an interagency study including 5 Federal agencies and 11 State recreation agencies, Visitors to over 280 recreation areas nationwide were interviewed, resulting in almost 32,000 usable responses. This survey provides the first nationwide collection of information on challenged people's use of public recreation areas (Cordell and others 1987). This study inventoried **onsite** and annual recreation patterns of a representative sample of Federal and State recreation area visitors, as well as their travel patterns, recreation-related expenditures, and demographics. In addition, respondents identified themselves and their group members as 'hearing impaired,' 'visually impaired,' 'mobility impaired,' 'mentally or learning impaired,' or "not disabled." The **PARVS** data have been compiled and are presented for initial review in this document.

Many other resources have been employed to prepare this report, including several informative reviews prepared for the President's Commission on the Americans Outdoors (PCAO), and other research efforts. The aspects presented include:

- Background information on the numbers and characteristics of the disabled population in the United States.
- Leisure patterns of the challenged population.
- Current participation characteristics.

- Barriers to outdoor recreation participation.
- issues and recommendations.
- Guidelines for improving the baselines.
- Forecast of the future.
- Questions for discussion.

THE DISABLED POPULATION IN THE UNITED STATES

Americans With Physical Challenges

In an appendix to The Report of the President's Commission on the Americans Outdoors, Austin (1986) provided the following estimation: 'Figures published by the U.S. Bureau of the Census (1984) place 32.3 million Americans (14.4 percent of the population) in the category of noninstitutional civilians who have physical limitations. These limitations include heart conditions, arthritis and rheumatism, hypertension, impairment of the back/spine, and impairment of the lower extremities and hips. Other Americans who could be classified as physically challenged are those with visual impairments (4.0 percent) and hearing impairments (8.3 percent). Thus, according to the Bureau of the Census, as many of one-quarter of our population may be categorized as having physical disabilities.' This totals to about 60 million Americans who face physical challenges in performing the normal functions of everyday life.

The Bureau of Census data clearly indicate that the elderly population (65 or older) accounts for the largest category of people with disabilities (Austin 1986). This statistic is especially significant when considering population trends. Our country is undergoing unprecedented growth in the number of people over age 65. By the year 2000, it is projected that nearly one in five Americans will be 65 or older (Ringle 1977).

Americans With Cognitive Disabilities

Estimates of the percentage of American people with mental retardation vary according to the criteria of qualification. The American Association on Mental Deficiency defines mental retardation as follows: "Mental retardation refers to significantly subaverage general intellectual functioning resulting in or associated with concurrent impairments in adaptive behavior, and manifested during developmental periods" (President's Committee on Mental Retardation, n.d.).

A person must manifest impairment in both intellectual functioning and adaptive behavior to be classified as a person with mental retardation (Grossman 1983).

Some estimators discount all persons who are no longer receiving assistance for their adaptive behavior, although they were once identified as persons with mental retardation by their intelligence quotient (IQ). On the other hand, there are some who add the borderline mental retardation population to the total estimate, usually because of limitations in intellectual functioning at school. This would greatly increase the population size (Grossman 1983; Mercer 1973; Ramey and Bryant 1987). However, a commonly accepted estimate is that 2.5 to 3 percent of the general population has mental retardation, which is about 7 million people. Over half of them are under age 21 (Association for Retarded Citizens National Research and Demonstration Institute 1987).

Americans With Emotional Disabilities

Again, the definition of disability provides variability in the estimates. Many Americans seek the services of psychiatrists, psychologists, and therapists to assist their adjustment to life stress. Most mentally ill individuals are living in the community as 'chronically mentally ill' residents. A smaller number of people challenged by their emotional condition are those receiving in-patient services for their illness or disturbance. The National Institute of Mental Health reports that the average daily number of residents in mental health facilities during 1979 was 0.2 million – well below 1 percent of the American population (President's Commission on Mental Retardation, n.d.).

Unemployment and Work Disabilities

Unemployment is often one of the most unfortunate delineations of what it means to be challenged. The ability to work is related to the ability to enjoy outdoor recreation activities, as equipment and transportation costs make recreation opportunities less available to economically disadvantaged people. The ability to recreate may also relate to the ability to hold a job, as successful recreational experiences can help some disabled people gain the confidence they need to join the productive work force.

One source of information on the relationship between disabilities and employment is a supplementary report to the 1980 Census (U.S. Department of Commerce, Bureau of the Census 1980). That report compares persons with a work disability with the general population. Some definitional problems are encountered with these data, however, as individuals

who have a "work disability" are not necessarily permanently disabled. In this report, a "work disability" is defined as a health condition which lasts 6 or more months and limits the kind or amount of work that a person could do at a job. A 'health condition' refers to both physical and mental conditions, but does not include temporary health problems. People with a work disability may be working a part-time job. Although these definitions do not necessarily describe the population of permanently disabled people, the information provided by that Census report does provide some insight into the problems and restrictions of this group of challenged individuals. By presenting this information and making some comparisons between this group and the nondisabled population, the authors hope to provide a better understanding of the challenges faced by people with work disabilities. In light of these definitions and limitations, the following characteristics of the 1980 population are presented:

In the United States, 9 percent (12 million) of the civilian noninstitutional men and women 18 to 64 years old have a work disability. Of these people, over half (6.2 million) are prevented from working by their disability.

Three-quarters of the total population lives inside metropolitan areas. There is a slightly greater ratio of disabled to able people living outside metropolitan areas. Eleven percent of the rural population is challenged as compared to 8 percent of the urban population.

Six percent of the civilian noninstitutional Americans did not finish 8th grade, 26 percent (2 million) of these people presently have a work disability. Of the 16 percent of the civilian noninstitutional Americans who finished 4 or more years of college, only 4 percent (more than 1 million) presently have a work disability.

Of the 13 million people living on income below the poverty level, 2.5 million have a work disability (U.S. Department of Commerce, Bureau of the Census 1980).

Another statistical source reported that in 1985 two-thirds of all disabled Americans between the age of 16 and 64 were not working. Only one in four works full-time, and another 10 percent works part-time. No other demographic group under age 65 has such a small proportion working, including young blacks (Louis Harris and Associates, Inc. 1986).

An important statistic for public recreation providers who have a volunteer work-force program is that a large majority (66 percent) of the unemployed

working-aged challenged population say that they want to work. Key comparisons between working and nonworking disabled persons, aged 16 to 64, show that work makes a vast qualitative difference in the lives of disabled persons. Those who work are better educated and have much more money. They are also more satisfied with life, much less likely to consider themselves disabled, and much less likely to say that their disability has prevented them from reaching their full abilities as a person (Louis Harris and Associates 1986).

Positive leisure experiences can also be correlated with employability, job success, physical health, and personal well-being. In 1985, an international forum on Leisure, Sports, Cultural Arts, and Employment for Persons With Disability convened to assess the status of services for persons with disabilities and to chart strategies for improving those services. In the introduction to the documentation of the forum proceedings, the executive director of the conference stated that 'various studies indicate that persons with disabilities who do not have avocational interests and involvement (e.g., hobbies, sports, **socio-recreational** outlets) are more likely to become isolated from community life, have reduced physical health and functioning, and frequently become financial burdens on their families and society. On the other hand, many persons with disabilities have found participation in sports, music, art, drama, and other leisure activities to be a primary link to the world around them. Persons disabled by illness or injury frequently cite their involvement in sports and recreation as the critical factor in their rehabilitation, the avenue for establishing a sense of wholeness and self-esteem. Perhaps most important, these activities provide the skills and motivation to become active and independent participants in the life of their communities' (Kelley 1985).

Disabled people's lives are also enriched by participation in cultural arts. Sikorski (1985) reports that the arts can integrate disabled people into society. She states that "through art we are able to communicate, share ideas, and cross barriers of age, class, culture, and ability. The arts allow a person ... in a body that can't function to have a means of **self-expression** and a way to gain self-confidence and self-respect." A program called Very Special Arts, formerly the National Committee, Arts with the Handicapped, supports the development and expansion of arts programs that enhance learning skills and enrich the lives of physically and developmentally disabled persons.

LEISURE PATTERNS OF THE CHALLENGED POPULATION

The survey by Louis Harris and Associates, Inc. (1986) provided the following statistical information on the effects of disability on people's social life and activities, basic activities, and involvement in community life.

A majority of disabled Americans say that their disability prevents them from getting around, attending cultural or sports events, or socializing with friends outside their home as much as they would like (table 1). Low income, which is highly correlated with more severe disability, also appears to affect social life and mobility adversely. Disabled people who have household incomes of \$15,000 or less are more likely to say that their disability constrains their social life than are those with higher incomes.

The result of such limitations is that disabled people — especially severely disabled **people** — socialize less with friends and family than do able persons. Three-fourths of disabled people say that they socialize at least once a week with family and friends, but this group falls to 67 percent among very severely disabled persons. In contrast, 83 percent of able adults report once-a-week socialization.

Disabled people go to the movies and to cultural events far less often than does the adult population as a whole. Nearly two-thirds (64 percent) of all disabled persons said that they never went to a movie in the past year, as compared with 22 percent of the general population. The differences are equally large when comparing how often disabled and able persons go to the theatre or to live performances. Three-fourths (77 percent) of all disabled persons said that they had not done so. A somewhat smaller gap separates the participation levels at live sports events. Two-thirds (66 percent) of disabled persons never went to such an event in the past year, as compared with 50 percent of all adults.

Disabled participation levels in the leisure activities of shopping, eating in restaurants, attending religious services, and community groups are also less than participation levels of able people (figure 1). The ICD report concludes that "since the proportion of disabled and able persons living in or around metropolitan areas is about the same, it appears that these differences are caused by a lack of money, mobility, transportation problems, difficulties in entering public buildings, and perhaps under-education among disabled people" (Louis Harris and Associates 1986).

Table 1. --Percentage who say disability limits their mobility or social activities

Q: Does your disability prevent you in any way from getting around, attending cultural or sports events, or socializing with friends outside your home as you would like to, or not?

Respondents	Yes, prevents	Does not prevent	Not sure/ refused
Total	56	43	1
Age (years):			
16-34	39	60	1
35-44	53	47	-
45-54	63	36	1
55-64	56	44	(a)
65 and over	65	34	1
Severity of disability:			
Slight	19	81	-
Moderate	45	55	(a)
Somewhat severe	67	31	1
Very Severe	79	20	(a)
Income:			
\$ 7,500 or less	62	31	1
\$ 7,501 to \$15,000	45	37	1
\$15,001 to \$25,000	51	55	
\$25,001 to \$35,000	42	48	1
\$35,001 to \$50,000			
\$50,001 or more	21	79	

^aLess than 0.5 percent.

Source: Louis Harris and Associates, Inc. (1986).

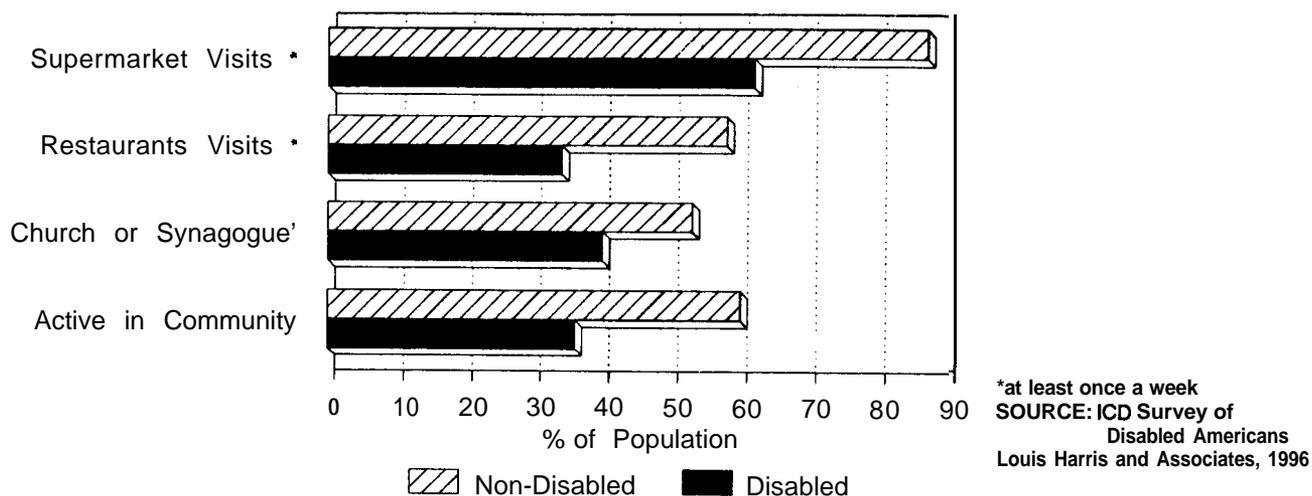


Figure 1. --Social activity participation of disabled and non-disabled people.

Aside from this ICD Survey and the **PARVS** data presented later in this paper, statistical information on leisure patterns of disabled people is sparse. Prior to these two reports, Compton (1985) stated that 'the current status of recreation participation by American disabled people is not empirically definable.' He cited a national pilot study of recreation and parks participation by disabled people performed by Compton, Thorsen, Robb, and **Hitzhusen** in 1985. This study reported that, according to the 100 agencies and organizations that were contacted, it appeared as though there were no standard participation records in either public, private, or commercial facilities. Although respondents were unable to assign numbers in each activity category (such as dramatic activities, team sports activities, outdoor recreation, and education), they felt that it was evident from the data that participation had increased. Compton (1985) concluded that it would be increasingly difficult to determine total annual participation and frequency of that participation in a variety of activity areas due to this lack of empirical data.

OUTDOOR RECREATION PARTICIPATION BY THE DISABLED

The Public Area Recreation Visitor Study (PARVS)

As previously mentioned, most studies of the outdoor recreation use patterns of physically challenged people are conducted as case studies rather than nationwide surveys. However, the 1985-87 Public Area Recreation Visitor Survey (PAWS) provides the first national report on visitors to Federal and State recreation areas which contains empirical data on disability status and type. PARVS is an interagency **onsite** survey of visitors to Federal and State recreation areas nationwide. Five Federal agencies and 11 State agencies have participated in this survey between 1985 and 1987. More than 36,000 visitors were contacted resulting in almost 32,000 usable interviews using a complex survey instrument with over 1,100 variables. Sites were selected by each agency according to their own needs, but generally represented their recreation area system. Groups were usually selected on a random basis (although in some cases logistical restrictions necessitated a relaxing of this requirement), and individual respondents over age 11 within the groups were selected randomly as well.

Questions included in the PARVS questionnaire included recreation activities done at the recreation area where the respondents were interviewed,

recreation activities done during the last 12 months, characteristics of the trip on which the respondent was interviewed, trip and annual expenditures on recreation, and standard demographic characteristics about the respondent and all group members. In addition, information was collected on the disability status of each group member from among the choices of 'hearing impaired,' 'visually impaired,' 'mobility impaired,' 'mentally or learning impaired,' and/or 'not disabled.' Additional information describing the methods and purposes of PARVS has been documented by Cordell and others (1987).

Limitations of PARVS

The reader should be advised of the limitations of this **dataset** before drawing conclusions which may extend beyond the limits of the data. First, the PARVS was conducted at the recreation sites sampled rather than being a sample of the entire US population. Therefore, unweighted PARVS data represent people who use the sampled sites, rather than the general public. Second, the sample from which the data were drawn includes visitors to recreation sites from only five Federal agencies (Forest Service, National Park Service, Corps of Engineers, Tennessee Valley Authority, and National Oceanic and Atmospheric Administration) and State park agencies in 11 states (Georgia, Indiana, Kansas, Minnesota, Missouri, New Jersey, New Mexico, North Carolina, South Carolina, Tennessee, and Virginia). Data are not available for other Federal or State land-management agencies, regional, county, or municipal recreation areas, or private recreation area users. Although these data may represent users to Federal and State recreation areas in general, without including representative recreation areas from all land-managing federal and state agencies, it is inaccurate to say definitely that PARVS represents all people who use public recreation areas.

Some limitations are also specific to the topic of this paper: recreation areas specifically designed to meet the needs of the disabled, such as Clark's Hill Reservoir in Georgia, were not necessarily selected to be included in the sample of recreation areas. Also, all data represent voluntary responses by the individuals selected. Therefore, if an individual did not wish to reveal the presence of a disability to the interviewer, it was not recorded. In spite of these limitations, the PARVS provides the best currently available data covering the recreation patterns and demographic characteristics of disabled individuals who use Federal and State public recreation areas.

PARVS Weighting

Many sociological studies weight their data to place additional emphasis on certain portions of the data. In the PARVS study, it was found that some sociodemographic groups were underrepresented when compared with other national studies of recreationists. Since the PARVS was conducted at the recreation site to represent the users of the recreation areas, and many of the other recreation studies were conducted by telephone to represent the general population, it was possible to weight the PARVS data to better represent the entire recreating public by using comparisons with other studies.

Sufficient information is available in the PARVS survey instrument and other sources (such as the 1982-88 National Recreation Survey and the National Park Service's Fee Reports) to allow weighting to provide an approximation of the annual recreation participation patterns of the recreating U.S. population. The origins of the respondents (using unweighted data) roughly approximate the geographic distribution of the population of the United States, indicating that a good geographic representation of the U.S. population was achieved, so no geographic weighting was performed. PARVS data are weighted to correct for an overrepresentation of overnight users, and weighted to represent the demographic characteristics of the U.S. population using information from the U.S. Bureau of the Census.

The weighting procedure involved adjustment of the distribution of sampled PARVS respondents so that they proportionately represented the distribution of people over 11 years old within defined population strata. Weighting these PARVS data in this manner was necessary to enable pooling across strata. Four types of population strata were recognized for each identified community: gender, age, urban or rural residence, and race. These characteristics were common to both the Census of Population and the PARVS sample.

Underrepresentation or overrepresentation among the gender-age-residence-race-defined strata was identified by comparing the percentage distribution of respondents of the PARVS sample with the Percentage distribution of the total population. Further adjustment was made to account for differences in probabilities of being included in the PARVS sample. The basic determinant of this probability differential was between day and overnight users and whether the interview site was Federally or State administered. Sampling rates and schedules differed among these sampling strata.

Each PARVS respondent was subsequently assigned a population-to-sample distributional ratio

that weighted all data provided by each respondent. This made their responses proportionate to the national proportion of the population in the State matching the respondent's profile. These weighted responses then represented the equivalent for an origin-based survey for obtaining estimates of year-round participation, socioeconomic characteristics, residence situation, population, and other attributes of subregional communities from which recreation trips were generated.

The following information concerns the disabled recreation users' profile, annual activities, and trip characteristics. So few of the randomly selected respondents were mentally or learning impaired (0.2 percent of the PARVS sample), that insufficient information is available to draw conclusions about the recreation profile of those individuals.

Profile of the Disabled Recreationist

Disability Status

Approximately 4.6 percent of the visitors interviewed in the PARVS project reported having one or more disabilities, which is far less than in the total U.S. population (table 2). Although some definitional and methodological differences exist in the sources quoted, it is clear that disabled individuals are underrepresented as users of resource-based recreation areas.

Table 2.--Disabilities of the total U.S. population and users of Federal- and State-based recreation areas

Type of impairment	U.S. population	Public recreation users
	Percent	
Mobility impairment	14.4	2.3
Visual impairment	4.1	1.3
Hearing impairment	8.3	1.2
Mental impairment	2.5-3.0	0.2

Source: 1985-87 Public Area Recreation Visitor Survey, n = 31,995; U.S. Bureau of the Census (1984); Association for Retarded Citizens National Research and Demonstration Institute (1987).

Note: Some definitional differences may exist between the sources cited. The information above is an approximation of the differences in the total U.S. population and the population of public recreation facilities. Data from PARVS represents the individual who was interviewed, rather than all group members, and may thus underrepresent the number of disabled individuals using public recreation areas.

Gender

Fewer disabled females visit public resource-based recreation areas than disabled males. The PARVS data indicated that the disabled recreationists were 45.3 percent female, and 54.7 percent male, whereas able recreationists were 53.8 percent female and 46.2 percent male.

Age

Generally, outdoor recreation participants challenged by disability are older than able recreationists. Figure 2 presents data from the PARVS project on the average age of recreationists by disability category. This figure shows that while average age of the visually and mentally impaired is approximately the same as the average age of able participants sampled, hearing and mobility impaired individuals are approximately 20 years older than the average user of Federal and State outdoor recreation areas and facilities.

Race

Survey results show a lower percentage of disabled nonwhites than able nonwhites in the recreating public. While 11.7 percent of the able visitors of resource-based public recreation areas are nonwhite, only 7.6 percent of the disabled visitors are nonwhite. PARVS found that overall, the percent-

age of nonwhite participation is less than equal to the percentage of nonwhites in the American population.

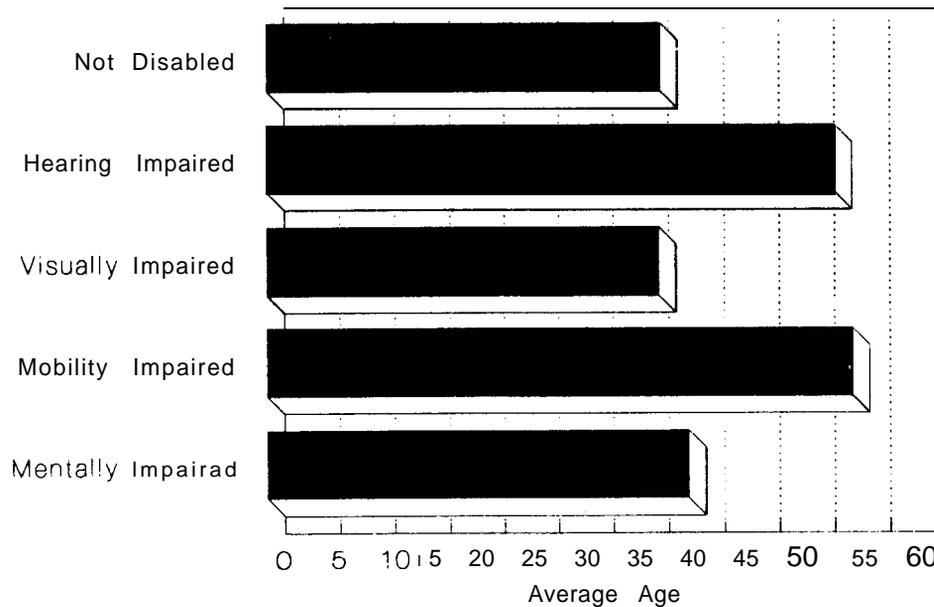
Income

Figure 3 provides a comparison of the income levels of disabled and all recreationists to the income levels of the entire U.S. population. This figure shows that people visiting public recreation areas are in the middle-income classifications-\$20,000 to \$50,000 annual family income. Both higher and lower income individuals are less well represented in the population of participants. However, figure 3 also shows that challenged individuals using public recreation areas are clearly of lower income status than either the U.S. population as a whole or the other visitors to these areas.

Figure 4 provides the average family income of recreation participant by type of disability. Although visually impaired recreationists have approximately the same family income as able recreationists, other disability classifications earn less.

Education

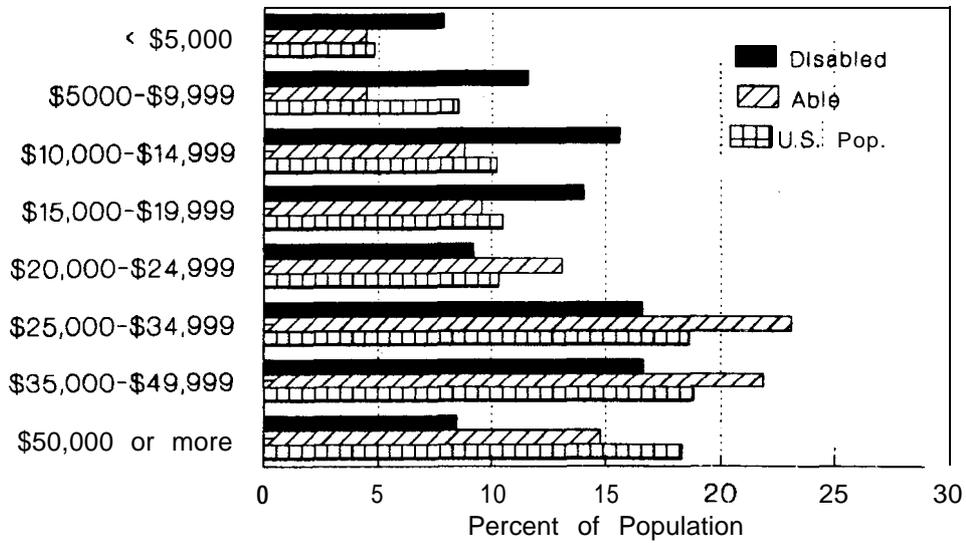
Educational differences were also evident between the disabled and all visitors. Figure 5 shows that disabled visitors are generally less educated than



SOURCE: Public Area Recreation Visitor Survey; n=31,995

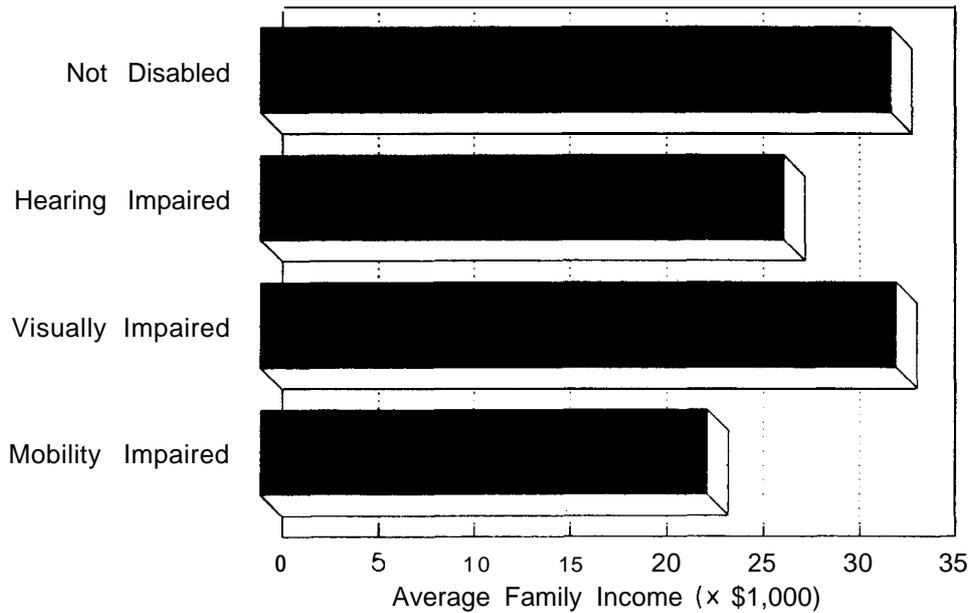
Figure 2. -Average age of public area recreationists by disability.

Family Income



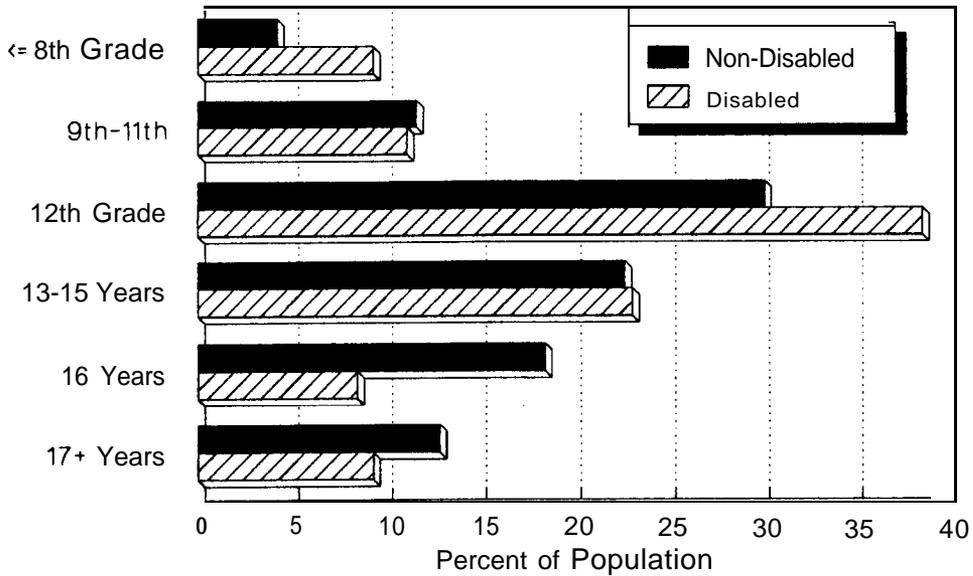
SOURCE: 1985-87 Public Area Recreation Visitor Survey; n=31,995.

Figure 3. -Income of disabled and non-disabled public area recreationists, and U.S. population.



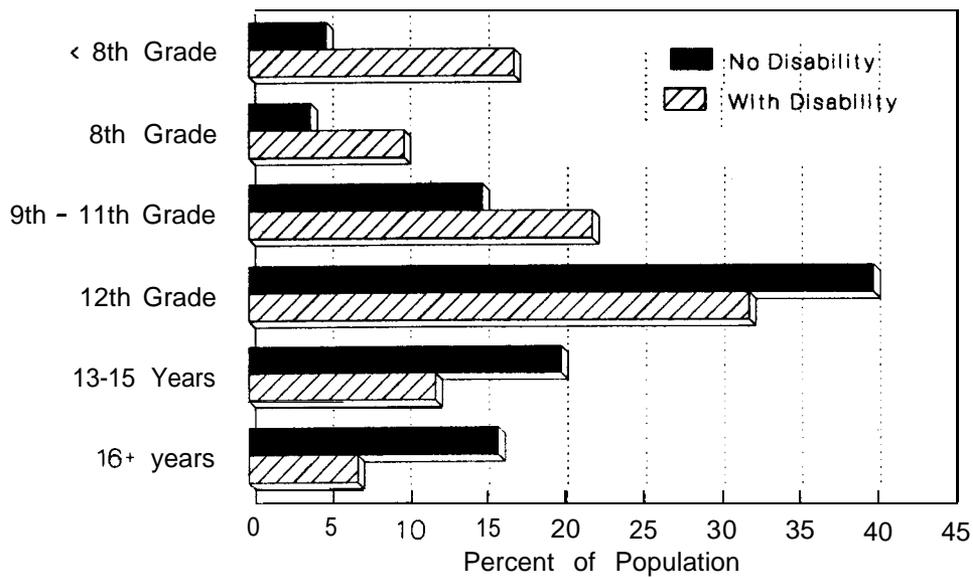
SOURCE: 1985-87 Public Area Recreation Visitor Survey; n=31,995.

Figure 4. -Average family income of public area recreationists by disability.



SOURCE: 1985-87 Public Area Recreation Visitor Survey; n-31,995.

Figure 5. – Educational differences in disabled/non-disabled public area recreationists.



SOURCE: 1980 Census, Work Disability by State

Figure 6. -Educational differences in civilians 18-64 years old with and without a work disability.

the general visitor to the sites sampled. Figure 6 shows the educational differences between American civilians, 18 to 64 years old, with and without a work disability. Although figures 5 and 6 are not directly comparable due to data-base inconsistencies, it appears that the average disabled outdoor recreation participant has a higher education than the average civilian with a work disability. Analysis of data designed specifically to address this issue will be needed, however, before that statement can be made with certainty.

Rural/Urban Origins

By matching ZIP codes or counties of origin of the PARVS respondents with Census data, the respondents were categorized as rural or urban county residents. Here, a 'rural county' is defined as a county with a population of less than 200 persons per square mile. An 'urban county' is a county with a population of 200 or more persons per square mile. This analysis revealed virtually no difference in rural/urban origin between disabled and able recreation participants. Disabled individuals were 36.2 percent rural and 63.8 percent urban. Able individuals were 37.7 percent rural and 62.4 percent urban.

Group Types

Figure 7 presents the composition of recreating groups by disability status. Slight differences are noted between disabled and able groups. Challenged people participate slightly more frequently in family groups, alone, and in clubs. They participate somewhat less in groups of family and friends and friendship groups.

Annual Recreation Activities of Disabled Persons

One portion of the PARVS survey instrument asks the respondent to indicate which of 63 activities the respondent participated in during the preceding 12 months, and how often. By comparing the responses of disabled and able individuals, some variation in the annual recreation patterns of challenged individuals can be ascertained. Although the data have been weighted to represent the entire U.S. population, the weighting process did not include accounting for disabled vs. able persons. Therefore, it should be noted that these data represent those disabled individuals who visited a resource-based public recreation area. The annual outdoor recreation patterns of other challenged individuals may vary from the information presented below.

Land Activities

Figure 8 presents information on the percentage of disabled and able visitors participating one or more times per year in 13 common land-based recreation activities. Patterns of annual recreation participation by disabled individuals are strikingly similar to that of the able recreating public, but with significantly less participation in every activity considered. The most popular annual land-based recreation activities by disabled persons are sightseeing, picnicking, driving for pleasure, walking for pleasure, and nature study/photography.

Water Activities

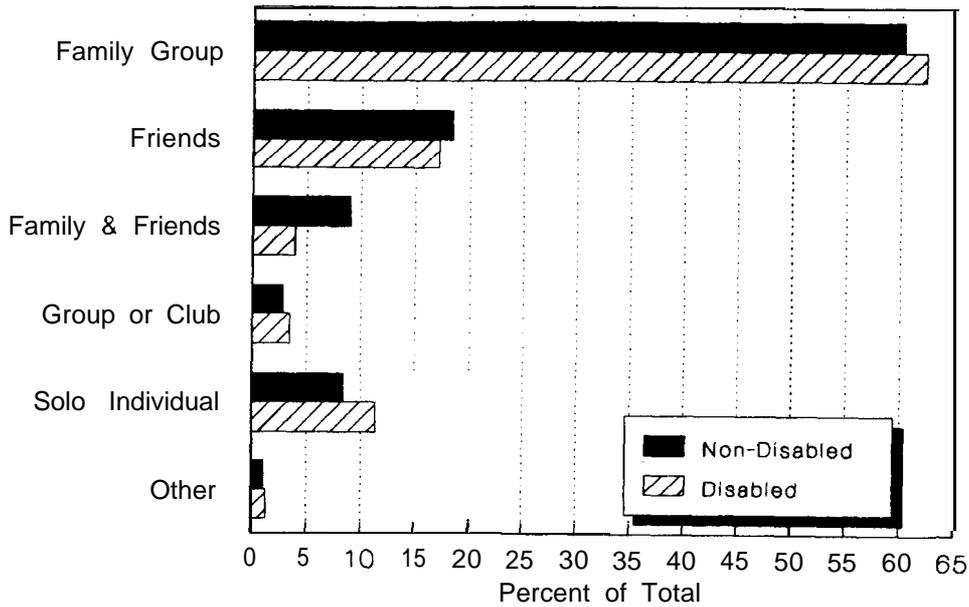
Figure 9 presents information on the water-based annual recreation patterns of disabled and able participants. The most striking difference is in swimming outdoors – disabled individuals participate in that activity about half as often as able individuals. Canoeing/kayaking, motorboating, water-skiing, and sailing also receive less participation by the challenged population than the able population. However, it is important to note that a higher percentage of disabled recreationists participate in all types of fishing than do able recreationists.

Snow and Ice Activities

Figure 10 presents data from the PARVS project on the differences in participation in winter recreation activities between the disabled and able recreating public. This figure shows considerable differences between the two groups, with disabled people participating in those activities about half as much as the able survey respondents.

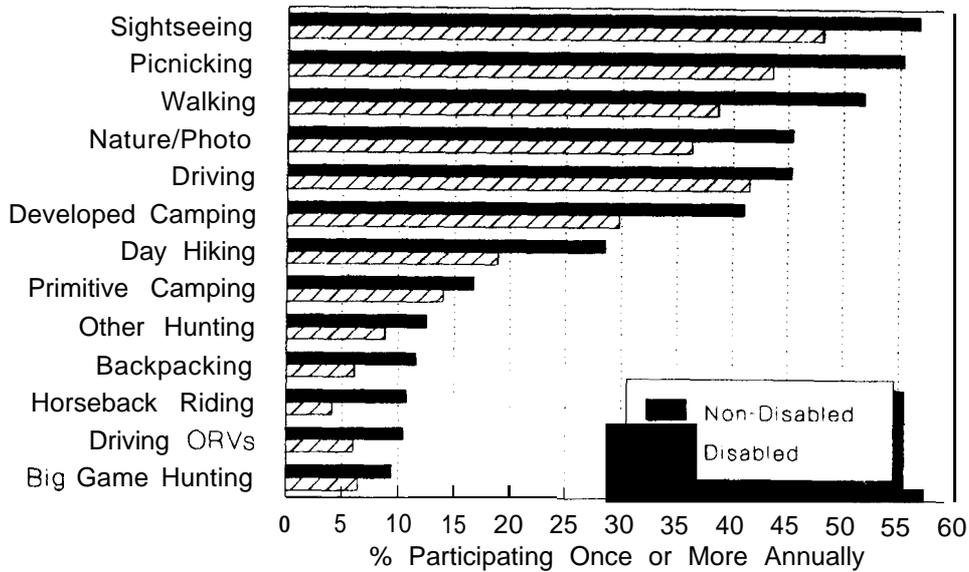
Trip Characteristics of Disabled and Able Recreationists

The PARVS also examined the trip behavior of individuals visiting public recreation areas, including distance traveled, travel time, and time spent at the site. The following information provides a direct comparison between disabled and able recreation participants.



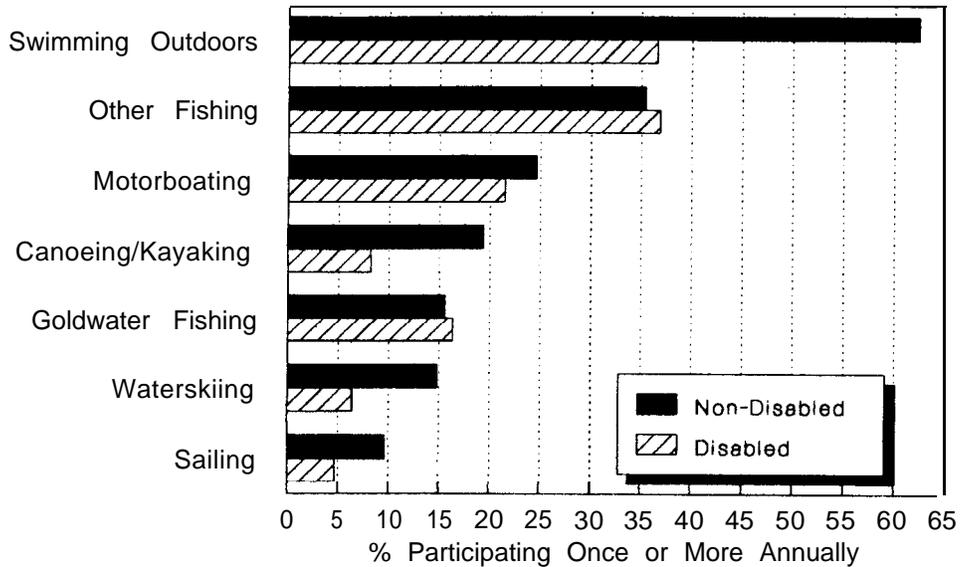
SOURCE: 1985-87 Public Area Recreation Visitor Survey; n=31,995.

Figure 7. -Group type of public area recreationists by disability.



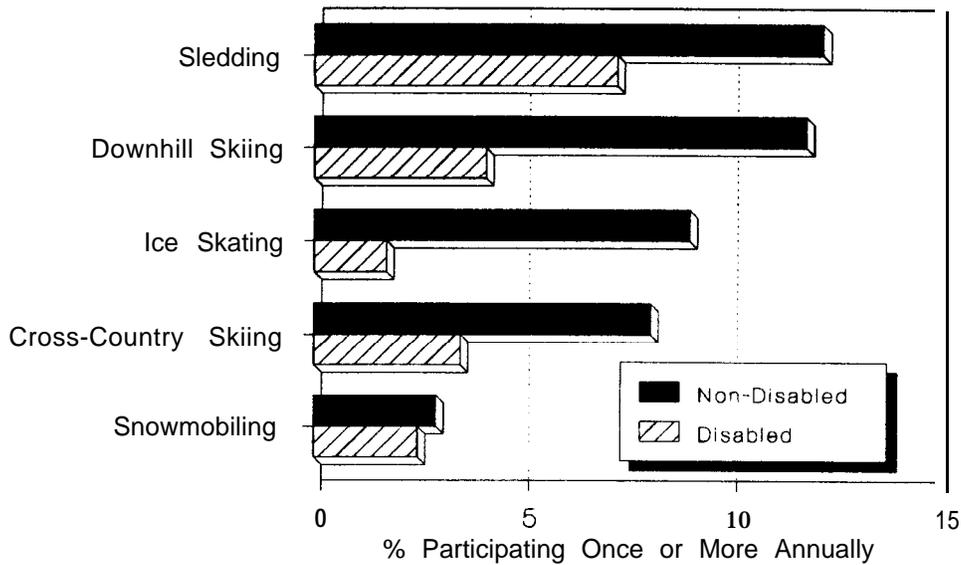
SOURCE: 1985-87 Public Area Recreation Visitor Survey; n=31,995

Figure 8. -Annual land-based recreation activities of public recreationists, by disability.



SOURCE: 1985-87 Public Area Recreation Survey; n=31,995.

Figure 9. -Annual water-based recreation activities of disabled public area recreationists.



SOURCE: 1985-87 Public Area Recreation Survey; n=31,995.

Figure 10. -Annual winter recreation activities of public area recreationists by disability.

Table 3. --Five primary activities most commonly reported by disability type

No impairment	Hearing impairment	Visual impairment	Mobility impairment	Mental impairment
Sightseeing	General recreation	Outdoor swimming	Sightseeing	Outdoor swimming
Outdoor swimming	Sightseeing	Sightseeing	General recreation	General recreation
General recreation	Developed camping	General recreation	Developed camping	Developed camping
Developed camping	Outdoor swimming	Developed camping	Outdoor swimming	Sightseeing
Picnicking	Driving for pleasure	Canoeing/kayaking	Family gathering	Backpacking

Source: 1985-87 Public Area Recreation Visitor Survey, n = 31,995.

Primary Activities on Site

Table 3 presents the most frequently reported 'main recreation activity' by disability group. Although the rank order of the activities varies by disability type, it is important to note the consistency in the four most-often-reported activities: sightseeing, outdoor swimming, general recreation, and developed camping.

Reasons for Visiting

Table 4 presents a comparison of the reasons for visiting the recreation sites by disability status. Chi-square analysis showed no significant differences ($\chi^2=36.001, df=36, p=0.469$) between disability types.

Length of Stay on Site

Minor differences are evident in the length of stay between disabled and able individuals in the PARVS study. The average stay is 22.6 hours for able visitors, 23.3 hours for hearing impaired visitors, 17.2 for the vision impaired, 22.9 hours for mobility impaired, and 34.2 hours for mentally impaired.

Hours of Travel Time

Analysis of one-way travel time to the recreation area also shows minor differences between the disability categories. The mean number of hours for the able is 4.8 hours, 4.4 hours for hearing impaired visitors, 4.9 hours for vision impaired individuals, 5.2 hours for mobility impaired, and 3.1 for mentally impaired. These differences are not meaningful, indicating that travel time to recreation areas is approximately the same regardless of disability type, except for mentally or learning impaired individuals.

Miles Traveled

Some differences exist in the average miles traveled to get to the recreation sites. For the able, the average miles traveled is 193 miles, 259 miles for hearing impaired, 186 miles for mobility impaired, and 148 miles for mentally or learning impaired visitors. From the data in the PARVS, it appears that individuals with mental or learning impairments visit recreation areas closer to home than do individuals with other disabilities or nondisabled people.

BARRIERS TO RECREATION PARTICIPATION

In addition to limitations created by their disability, challenged recreationists encounter barriers stemming from society that inhibit their enjoyment of outdoor recreation. These barriers may be structural, programmatic, or attitudinal. **Although** advocacy groups can do much to ensure that disabled concerns are heard, society in general must provide the initiative to reduce and remove these participation barriers,

Some progress has been made. Since the enactment of the Architectural Barriers Act of 1968 (P.L. **90-480**), many efforts to physically accommodate challenged recreation users at public facilities have been initiated. The Rehabilitation Act of 1973 (P.L. 93-112) created the U.S. Architectural and Transportation Barriers Compliance Board which, among its other duties, was responsible for 'investigating and examining alternative approaches to the architectural, transportation, communication, and attitudinal barriers confronting handicapped individuals, particularly with respect to ... parks and parklands' (Section 502, Rehabilitation Act of 1973, P.L. 93-112). To fulfill its legal obligation in the area of 'parks and parklands,' the Board has, over the past several years, sponsored research projects, conducted public hearings, provided technical assistance, and responded to numerous complaints.

The Board recognized that inconsistent and sometimes inappropriate facilities continued to be designed and constructed, due to the lack of specific guidelines for accessible sites. In 1985, the Board created a Federal Working Group on Access to Recreation Facilities to focus on this problem. To date, the Working Group has developed specific standards for campgrounds, picnic areas, and nature trails.

It appears that these and other Federal efforts have had some positive effects. In late 1985, the nationwide ICD survey that studied disabled people's attitudes and experiences revealed a powerful endorsement of the Federal Government's role in giving better opportunities to disabled persons. According to this study, a two-thirds majority (67 percent) of challenged Americans think that Federal laws that were passed since the late **1960's** that concerned opportunities for disabled people have helped them (Louis Harris and Associates, Inc. 1986).

The survey reported that 'the strength of this endorsement for a Federal program is unsurpassed since the Harris firm began measuring public support for Federal programs and laws. It is an encouraging and important confirmation that the Federal Government has helped, and could continue to help, disabled Americans. And it comes at a time when many people are attacking the Federal Government and its

Table 4. --Reasons for visiting the survey area compared with disability type

Reason for visiting site	No impairment	Mobility impairment	Visual impairment	Hearing impairment	Mental impairment
	----- <u>Percent</u> -----				
Convenient location	21.0	21.5	21.5	18.6	30.6
Good facilities	13.3	13.4	15.9	12.0	21.0
Group trip	4.8	5.4	6.7	4.8	5.3
Repeat visit	19.7	22.2	19.4	19.7	18.0
Scenic beauty	9.4		9.0		9.8
Scene better than	6.3	5.5	7.7	16.4	2.8
Wanted to try					
new area	4.2	3.7	3.3	3.8	3.6
Other areas too					
crowded	17.7	19.4	14.4	18.2	9.0
Personal reasons	3.4	2.8	2.1	4.8	
Other	0.2			0.6	
Total	100.0	100.0	100.0	100.0	100.0

Source: 1985-87 Public Area Recreation Visitor Survey, n = 31,995.

programs as wasteful, unresponsive, and ineffective. The Federal Government has made a real difference for disabled Americans' (Louis Harris and Associates, Inc. 1986).

However, some people feel that too little has been accomplished in the two decades since the passage of the Architectural Barriers Act. In a review of research efforts on the perceptions of disabled people who visit recreation sites, West (1985) found that nonambulatory respondents often have difficulty negotiating park trails due to sand or gravel surfacing, steps, curbs, and steep gradients. Restrooms were often inaccessible due to poor location or design. Designated handicapped parking spaces were often distant from high-use areas. In addition, some survey respondents felt that overly specialized facilities like "wheelchair picnic tables" are unnecessary. These reports indicate that systematic implementation of barrier-free design rarely occurs. The active involvement of disabled consumers in the design and evaluation of park and recreation facilities is needed (Austin 1986).

In addition, the results of the ICD Survey indicate that the removal of physical barriers does not ensure that participation by disabled people will increase. This survey interviewed the general disabled population rather than those who currently visit recreation sites. Surprisingly, only 1 percent of the disabled Americans surveyed who say that they face barriers in connection with their disability feel that making the built environment accessible is an 'important thing' that can be done to help them. In contrast, approximately one-fifth of the respondents felt that improving their own and other people's attitudes (including additional counseling and personal support) would be helpful (Louis Harris and Associates, Inc. 1986).

The survey asked disabled Americans to identify the physical, structural, and attitudinal barriers which they perceive as keeping them from participating in social activities. The most frequently mentioned barrier was not the lack of site accessibility, it was fear." In descending order of mutual importance, the respondents felt that reasons why they do not 'get around, socialize, or attend cultural events' are: fear, dependence on other people for help, lack of convenient and accessible transportation, self-consciousness, lack of access to public buildings and bathrooms, and difficulty in seeing, talking, or hearing. Table 5 details their responses (Louis Harris and Associates, Inc. 1986).

None of these barriers are insurmountable for the public recreation area manager. Fear can be dispelled by outreach to the challenged community.

User education and resource interpretation would provide a sense of familiarity with the outdoor environment and a particular recreation site. Dependence on other people and need for transportation could be resolved through scheduling or encouragement of group outings, and through cooperation with concessionaires and local groups. Continued efforts to provide barrier-free facilities and to inform the public about their location would ease the concern about accessible facilities and difficulty in seeing, talking, or hearing. However, the disabled user's self-consciousness and the attitudes held by recreation managers may be the most difficult barriers to surmount.

Wilkerson (1984) found that instilling a positive attitude toward the integration of disabled and able children on a playground was a more difficult barrier to overcome than the mechanics of providing accessible play facilities. Studies by West (1982, 1984) showed that recreation organizations often have an organizational stigma against challenged individuals, resulting in the exclusion of individuals with disabilities from the mainstream of recreation. It is important to note that West (1982) and Austin and Austin (1983), among others, have indicated that rather than being based on negative feelings, stigmas about disabled people tend to stem from feelings of uneasiness and uncertainty about interaction. Thus, these attitudes may be more aptly characterized as resting on uncertainty rather than on hostility (Austin 1986), which improves the potential for change.

Dattilo (1987) affirms this concept by stating that the reason that many people with mental retardation are not accessing outdoor recreation facilities seems to stem from the constraints placed on them by the public's attitude. Other reasons for the lack of leisure participation for individuals with mental retardation are that they lack local friendships outside the school environment, they are unaware of the available recreation resources, there is an absence of practical guidelines for program planning and implementation of leisure programs, and there are few qualified personnel providing leisure instruction (Dattilo 1987). Overall, lack of appropriate recreational opportunities for the mentally retarded seems to result in unmet recreational needs for this segment of the population.

Austin (1986) recommends that future researchers focus on ways to change the specific attitudes held by park and recreation personnel regarding serving people with disabilities, rather than trying to change their global attitudes. He believes that this will provide a more direct correspondence between the attitude and desired behavior. Several research studies (Austin and Lewko 1979; Hamilton and Anderson 1988;

Table 5.-- Reasons why disabled people's mobility or social activities are limited

Q: Here are some reasons why people don't get around, attend events, or socialize with friends outside their homes as much as they want to. Please say if each is an important reason or is not an important reason why you don't get around, socialize, or attend events as much as you would like to.

Reasons	Total disabled persons	Slightly or moderately disabled	Somewhat or very severely disabled
Total respondents	559	165	378
	----- <u>Percent</u> -----		
Because you fear that your disability or health problem might cause you to get hurt, sick, or victimized by crime.	59	58	59
Because you need someone to go with you or help you but you don't always have someone.	56	48	59
Because you are not able to use public transportation or because you can't get special transportation or someone to give you a ride when you need one.	49	44	51
Because you are self-conscious about your disability.	40	40	40
Because you come across many public buildings and places that you can't get into or that have bathrooms which you can't use.	40	38	40
Because you have difficulty in seeing, talking, or hearing.	37	32	39

Source: Louis Harris and Associates, Inc. (1986).

Kisabeth and Richardson 1985) have demonstrated promising results in the ability to positively influence attitudes toward disabled persons within recreational environments (Austin 1986).

On the national level, advocacy organizations, programs, and committees are making strides in furthering disabled participation in leisure, sports, and cultural arts. Events such as the International Games for the Disabled, World Games for the Deaf, and recent participation in exhibition games at the Olympics have increased national awareness of competitive sports for disabled people. Organizations such as the American Athletic Association for the Deaf, National Association of Sports for Cerebral Palsy, National Wheelchair Athletic Association, and the United States Association for Blind Athletes work to further these opportunities.

However, historical studies of local level park and recreation departments show varying concern for this need (Compton 1985). Compton reported that a 1964 survey of community recreation departments found that 21 percent provided programs or facilities for disabled people. He also quoted a 1971 study of recreation programs in large metropolitan areas that showed a large percentage offered services to handicapped persons. A study conducted by the University of Oregon (1984) found that the percentage of departments reporting programs for disabled people has decreased in recent years. Of the 2,000 U.S. municipalities studied, only 38.4 percent indicated that they have such programs. Of those reporting no programs, 57.4 percent felt that they should not have such programs. In addition, only 15.6 percent of the respondents had two or more full-time staff members who were professionally trained in disabled recreation provision.

ISSUES AND RECOMMENDATIONS

Conclusions from Previous Studies

In 1985, the International Forum on Leisure, Sports, Cultural Arts, and Employment For Persons With Disabilities resulted in the creation of a set of recommendations for improvement of programs and services that intended to significantly affect the quality of life for persons with disabilities. According to Hillman (1985), the editor of the proceedings documentation, the recommendations made to the National Council on the Handicapped represented not only the views of the 350 national and international delegates at the 1985 Forum but also reflected statements made by

consumers over the past three decades. These historical statements were reiterated because, according to Hillman, 'there has been only sporadic response in the past to the recommendations found in the proceedings of such distinguished meetings as the 1974 National Forum on Recreation and Handicapped People ... the 1977 White House Conference on Handicapped Individuals, and the 1978 Humanism and the Arts in Special Education meeting.' However, both Hillman and Kelley (the executive director of that Forum) agree that this trend of limited response is changing. Kelley cites the development of the disability rights movement, the active leadership positions held by persons with disabilities, and the work of the National Council on the Handicapped to affect changes in legislation and public policy as signs of progress (Kelley 1985).

The recommendations from the Forum proceedings have been merged with several key issues identified by Farbman and Ellis (1986) and Austin (1986) and are combined below:

Architectural Accessibility

Recreation facilities should be totally available to persons with disabilities on equal terms with able participants. Federally funded recreation facilities should be systematically monitored to ensure they are accessible and comply with Section 564 of the 1973 Rehabilitation Act and P.L. 94-142.

Specific criteria and universal design guidelines should continue to be developed and should be adopted as a part of the official Uniform Federal Accessibility Standards to define architectural accessibility in outdoor recreation facilities and spaces.

Controversy regarding access of disabled persons to areas where protection and preservation are essential, such as wilderness areas and historic sites, should be resolved on a case-by-case method. It may be necessary to compromise, within the limits of the applicable legislation.

Providing accessible transportation to and from recreation sites and within the site itself can provide unique challenges when the transportation is part of the recreational experience. Boats, rafts, trams, ski lifts, mule trains, and over-snow buses are typical forms of transportation that are often inaccessible. Efforts must continue to ensure that discrimination against people with disabilities is minimized in all modes of transportation.

Program Accessibility

Program accessibility is poorly defined, and therefore is more subject to individual interpretation than architectural accessibility. Separate programs for disabled recreationists are not adequate in themselves. Programs must be integrated so that disabled participants are mainstreamed. This will begin to ease the social stigmas created by unfamiliarity.

Information concerning accessible programs should be widely distributed to both existing and potential user groups and to the general population, Interorganizational linkages between park and recreation agencies and social services agencies must be developed.

Recreation providers are often untrained in the **needs** of disabled participants and therefore are uncomfortable with their responsibilities. Resource materials, guidelines, and training support related to the needs of participants with disabilities should be provided to all public and private agencies conducting recreation programs. Efforts to hire professionally trained personnel should be reemphasized and both in-service and out-service training increased.

Individuals with disabilities should be involved at all levels of programming and leadership in the provision of recreation and leisure services, either as professionals or advisors. Adults with disabilities should be encouraged to enter professional leadership training programs in recreation and leisure services. Affirmative action programs should be used to advance employment opportunities for challenged people.

Existing Federal programs for recreation for persons with disabilities in Section 316, Rehabilitation Act, Personnel Preparation and Research and P.L. 94-142, should receive stronger administrative and congressional support.

A research priority on recreation and leisure for individuals with disabilities needs to be established in all appropriate Federal agencies. Studies and program support services for fully integrated activities should be substantially increased.

Conclusions from the PARVS

Although the information concerning disabled individuals included in the PARVS project was incidental to the primary purposes of that study, the

analysis conducted for this paper provides some insights to the recreation patterns of disabled people and how they differ from able individuals.

Disabled individuals appear to be **underrepresented** as users of the recreation areas included in the PARVS. Comparing disabled recreationists with the able **in the PARVS dataset** shows that the disabled are more likely to be male, older, white, lower income, and less well-educated. Differences were not meaningful between the disabled and the able in rural/urban origins and type of groups.

Examination of the annual recreation patterns of those disabled individuals in the **PARVS dataset** provides additional descriptive information. Those disabled individuals follow approximately the same pattern for activity preferences as able individuals, but a smaller proportion of the disabled participate in those activities. Trip characteristics were similar between the two groups.

The obvious implication from these results is that in addition to their disabilities, the population of disabled users who visit Federal and State recreation areas has other demographic differences from other visitors. In planning to meet the needs of disabled recreationists, managers and planners should take these other characteristics into account as well.

Additionally, comparisons between the **PARVS dataset** and other available sources indicate that while the disabled individuals who visit Federal and State recreation areas tend to be of lower socioeconomic status than other visitors, they are of higher socioeconomic status than the general population of disabled individuals. This may indicate that many disabled individuals are, for reasons not determined by this study, unable or unwilling to visit many State and Federal recreation areas.

It is difficult to make sure conclusions from the PARVS data concerning reasons for the differences between recreation patterns of disabled and able individuals. However, patterns in the data are sufficient to indicate that additional study is needed to investigate this area. A major limitation of this study was the lack of inclusion of local recreation areas in the areas sampled. Perhaps disabled individuals participate in recreation at those areas, which would be less costly to reach. On the other hand, perhaps the outdoor recreation needs of the disabled are not being met sufficiently by public recreation services. Additional studies will be needed before this question can be answered.

GUIDELINES FOR IMPROVING THE BASELINES

Inventory and Document Disabled Recreation Use Levels and Trends

There is inadequate documentation of recreation participation levels of disabled persons. A national study of the leisure patterns of the disabled should be developed using population-based methods rather than site-specific methods. This study should be compared with the results of the PARVS project to identify which segments of the disabled population are not being served.

Continuation and expansion of both the PARVS project and the ICD Survey project will provide baselines for future trends. The PARVS data should be analyzed to investigate the influence of specific disabilities on participation in specific activities and the influence of disabled group members on group participation patterns. Additional exploratory analysis and hypothesis testing of this topic using the PARVS data set is needed.

Define “Disabled”

A consistent definition of ‘disabled’ should be developed for recreation research. As was mentioned, terms are unclear, and may be interpreted either broadly or narrowly by the respondent and the reader. This creates confusion in data comparison and results in imprecision.

Assess Current Condition

An assessment of the extent of services for Americans with physical disabilities throughout recreation systems at the local, State, and national levels would provide a better understanding of available opportunities (Austin 1986). Austin also recommends establishment of a research program that will ultimately answer the overriding applied question of how barriers to recreation can be removed, and to analyze the benefits of recreation participation for persons with physical disabilities.

Implement Accessibility Standards

The Federal Working Group on Access to Recreation should continue their work in recommending accessibility standards and levels for outdoor recreation facilities. Appropriate training materials should be developed for architects, landscape

architects, engineers, recreation planners, and site administrators. New research on accessibility standards is not needed. Existing literature contains adequate information that is practical and has been proven to work. This information simply needs to be studied, modified, and packaged for universal application.

FORECAST OF THE FUTURE

With an aging population and increased attention to the needs of the disabled, the issue of provision for the resource-based recreation needs of the disabled is likely to gradually increase for the foreseeable future. The need for provision of recreation opportunities for the disabled is going to increase. While this is a fairly untouched area in outdoor recreation research, several studies have provided insights to the participation patterns and needs of disabled populations. The disabled do participate in outdoor recreation activities in similar patterns to the able, but to a lesser extent. The goal of recreation opportunity providers should not be to increase the level of participation by the disabled to equal that of the able population, but rather to provide opportunities free from attitudinal, informational, and physical barriers to participation for those disabled individuals that are able to participate and who wish to do so. Although the social significance of provision of resource-based recreation for the disabled is quite important, the economic and environmental impacts are less dramatic.

Recent legislation mandating that all children receive equal educational opportunities regardless of their disability promises to increase the educational level of the disabled population over time. This, in combination with the increase in ‘Handicapped Employment Programs’ promises to increase the income level of the disabled population. As more disabled people occupy influential jobs in communities, pressure on the public recreation manager to provide accessible facilities will increase. With more disposable income and less physical limitation, the demand for and use of barrier-free public recreation programs will increase.

QUESTIONS FOR DISCUSSION

1. What role should public recreation area managers play in encouraging versus accommodating disabled recreation use? How should this role vary at the Federal, State, and local level?
2. Who has the responsibility to see that all individuals have access to all public resource-based recreation facilities? Should enforcement be increased, or is compliance adequate?
3. How should the participation differences between the disabled and able recreation participants affect site and program management?
4. Do the challenged participants in PARVS represent a cross section of the disabled in the population, or is only some segment of the disabled population participating in outdoor recreation? Are there any surprising findings from the responses of the disabled to that survey?
5. What are the nonrecreating, unemployed disabled people doing? How can they be reached? Would the benefits of volunteer work programs using challenged people outweigh the administrative costs?
6. Given limited budgets, should recreation managers concentrate upon creating several "showplace" barrier-free sites or programs, or should the funding be equally distributed to provide a little improvement at all places?
7. Should managers focus on providing facilities or programs for the activities in which disabled people presently participate (fishing, camping, swimming and sightseeing) or is the lack of participation in other activities an indication that other barrier-free facilities are needed to encourage use?
8. How can the discomfort that some able recreation managers and recreation participants feel be reduced?
9. Are recreation use fees a substantial barrier to disabled use? Would fee discount or elimination encourage use or discourage disabled participants from demanding a quality experience (as in "What do you want for free?") ?
10. What other incentives are available to encourage disabled recreation use? Should preference be given to permittees or outfitter/guides that employ or provide programs for disabled participants?

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TRENDS IN RECREATION PARTICIPATION ON PUBLIC LANDS

Carter J. Betz and H. Ken Cordell¹

Abstract- Trends in visitation to Federal and State lands are examined and compared to 1977 visitation data. Although total visitor hours have leveled off or declined on some Federal lands, the number of visits has increased. This appears to be attributable to more close-to-home trips of shorter duration. Visitation to State lands has remained fairly consistent, with about 9 of every 10 visitors taking day trips. Characteristics of visitors to Federal and State lands are also examined using data from the 1985-87 Public Area Recreation Visitor Survey. Additionally, subsets of elderly respondents and those who indicated a willingness to pay user fees were examined. Analyses included travel distance and time, length of stay, and activities engaged in. Disaggregate analyses were performed by agency, length of visit, and region visited. The typical day trip, regardless of agency or region, was a 1 to 2 hour drive, less than 100 miles from home, with a length of stay of 3 to 4 hours. Much more variation existed in overnight visits. Overall, the most popular activities were sightseeing, walking and driving for pleasure, and picnicking. The data support the findings of the President's Commission on Americans Outdoors that demand for recreation is greatest near concentrations of population, especially central cities.

The President's Commission on Americans Outdoors (PCAO), created by executive order in 1985 with a final report published in late 1986, is the latest attempt to assess and summarize the overall role of outdoor recreation in the United States. It was arguably the most comprehensive effort undertaken since ORRRC, one of its directives being to examine ". . . the relationship of outdoor recreation to the broader range of recreation pursuits and its implications for the supply of and demand for outdoor recreation resources and opportunities' (President's Commission on American Outdoors 1986).

Another nationwide assessment is the outdoor recreation and wilderness section of the Renewable Resources Planning Act (RPA), conducted at 10-year intervals by the USDA-Forest Service. The RPA Assessment examines current and projected future demand and supply for outdoor recreation. The purpose of this paper is to analyze one aspect of recreation demand, namely, current trends in recreation participation on public lands.

The PCAO (1986) report provides a good definition of outdoor recreation as an 'experience, in some way, of the natural environment: land, water, air, trees, plants, wildlife and combinations of resources and landscapes.' The terms "participation," "use," and "visitation' are used interchangeably and refer to the phenomenon of leisure behavior which occurs in the out-of-doors. These are not to be confused with the economic concept of demand, which describes quantities of recreation consumed at given price levels.

Public lands are defined as those resources (both land and water) under the jurisdiction of Federal, State, county, municipal or special district government agencies. Adequate data to describe the local government level-counties, municipalities, and special districts-are very difficult to come by, therefore, a description of the local situation is not attempted in this paper. This is unfortunate because although Federal lands constitute more than five times the acreage of State and locally managed resources (Cordell and Hendee 1982), most experts

INTRODUCTION

Perhaps the most enduring conclusion that has come out of every assessment of outdoor recreation since the Outdoor Recreation Resources Review Commission (ORRRC) was formed in 1958 is that recreation is important to American life. As Clawson (1986) said, "... the outdoors is a basic part of American life today.' Every indication is that outdoor recreation will continue to increase in importance as our society continues to grow and change (Outdoor Recreation Policy Review Group 1983).

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agree that the large majority of outdoor recreation participation occurs at the local level in parks and recreation areas close to home. Indeed, the PCAO recommends that the greatest needs for outdoor recreation are in urban areas (just as ORRRC did in 1962), close to where the majority of Americans live. This is particularly true for minority social groups: the elderly, disabled, ethnic minorities, and immigrants, who are most often clustered in central cities (President's Commission on Americans Outdoors 1986).

The focus of this paper is to describe and examine current trends in recreation participation on State and federally managed lands. Where possible, comparisons are made to 1977 data, the date of the previous RPA Assessment. Specific tracking of trends is not attempted. The diversity of methods and lack of standardization of nationwide surveys make this a difficult task at best. Statewide trend analysis may be possible using individual State Comprehensive Outdoor Recreation Plans (SCORP), however, that is beyond the scope of this paper. A thorough, up-to-date examination of the characteristics of recreation users is useful information for both Federal and State outdoor recreation planning, policy, and management.

THE PUBLIC AREA RECREATION VISITOR SURVEY

The Public Area Recreation Visitor Survey (PARVS) is the largest and most comprehensive nationwide on-site survey to date, as well as the most current. Interviewing commenced in the summer of 1985 and has continued into 1987. Nearly 32,000 interviews have been completed. The primary objectives of PARVS are threefold:

- 1) To provide visitor expenditure data that would result in estimates of the income, employment, and industry growth in a region or State resulting from publicly provided recreation opportunities.
- 2) To provide willingness-to-pay estimates for access to public recreation areas by recreational visitors.
- 3) To describe the visitors, their activities, year-long participation patterns, and market areas for public recreation areas.

This paper focuses primarily on objective number three, and presents a few analyses related to the second objective. PARVS was conducted at over 280 sites nationwide, and involved five Federal and

11 State agencies (fig. 1). Two of the Federal agencies attempted to survey a national cross-section of sites, while the others were located primarily in the south-east. The State agencies were voluntary participants in the project, and therefore do not represent a geographic cross-section of the United States. Figure 1 demonstrates, however, a very even distribution of interview sites in the conterminous states. A few sites were selected in Alaska, but none in Hawaii. Moreover, the distribution of respondents' origins provides an even better graphic representation of the breadth and scope of the survey (fig. 2).

Every attempt was made in training interviewers to obtain as random a sample as possible. A random interval was selected for the recreational party as well as the individual respondent within the party. This was not always possible due to site logistics and constraints, availability of respondents, etc. Consequently, a disproportionate number of overnight visitors, specifically campers, were interviewed. The overall sample was weighted to adjust to a more realistic proportion of day users to overnight users (for details see U.S. Department of Agriculture, Forest Service 1987).

VISITATION TO FEDERAL LANDS

The United States Department of the Interior, through the annual 'Federal Recreation Fee Report,' makes a yearly report to Congress in accordance with the Land and Water Conservation Fund Act of 1965. The report contains information on resources, facilities, fee receipts, visitation, and so forth for both the seven Federal land-managing agencies and for the fifty States. Visitation figures are reported in visitor hours, which is the presence of one person engaging in a recreational activity for an aggregate of 60 minutes. In this paper, the data are presented as 12-hour 'recreation visitor days,' i.e., visitor hours divided by 12 (tables 1 and 2).

The total number of visitor days increased slightly from 1977 to 1986. The 1977 Bureau of Land Management data had to be estimated due to an unrealistic figure for fee use (Cordell and Hendee 1982), therefore the validity of the data is in question. The increase in total visitor days from 1977 to 1986 was not substantial (2.4 percent), suggesting a leveling off in hours of visits to Federal recreation sites. The proportion of fee management units to non-fee management units stayed about the same, 24 percent and 76 percent respectively. The fee management units are an indicator of overnight visits, as a majority of these are user fees for camping. Many of the National Park Service fees, however, are entrance

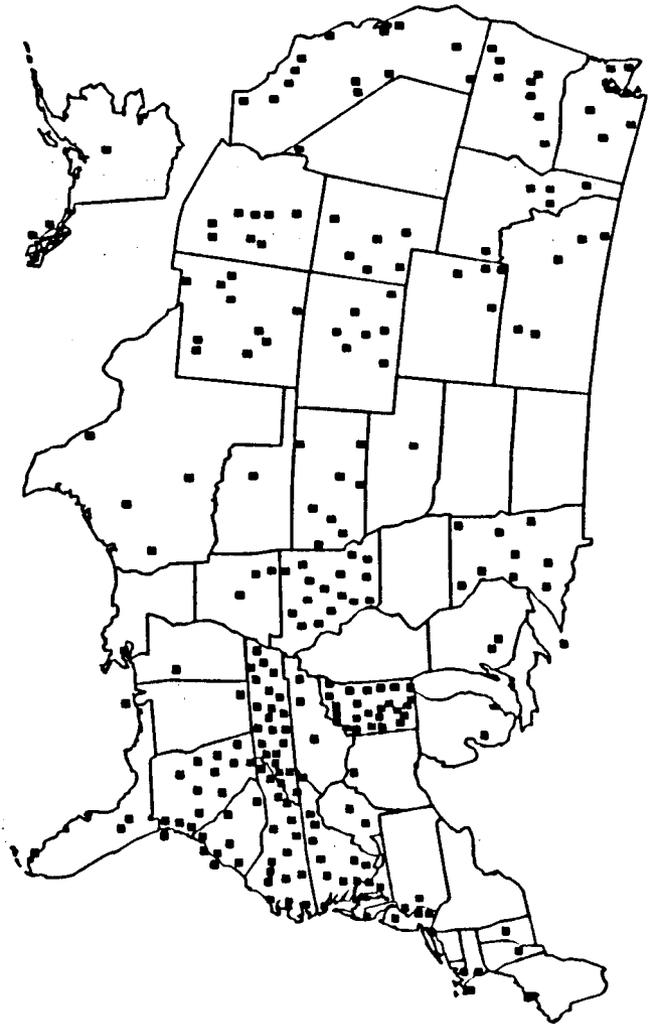


Figure 1. — PARVS interviewing sites.

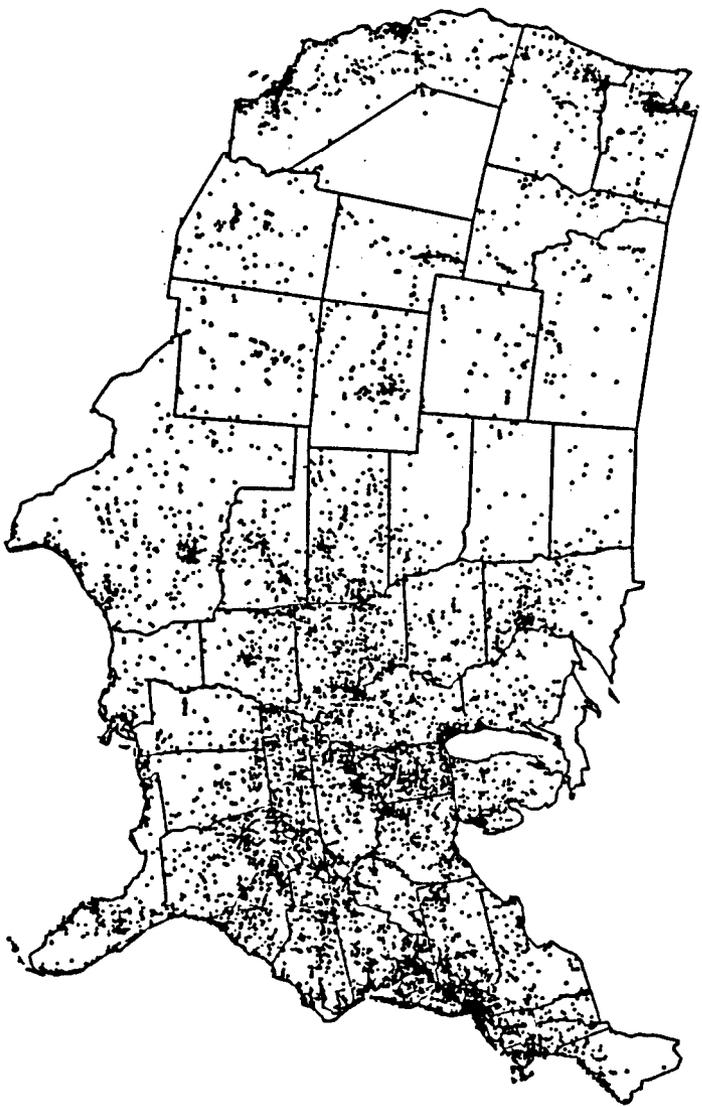


Figure 2. — Distribution of origins of PARVS respondents.

Table 1.--Recreation visitor days at Federal recreation areas in the United States, by managing agency and fee status, 1977

Agency	Total		Fee management units		Non-fee management units	
	Days (1000s)	Percent	Days (1000s)	Percent	Days (1000s)	Percent
	Bureau of Land Mgmt.	27,349	5.1	7,039	1.3	20,310
Bureau of Reclamation	33,607	6.3	146	0.0	33,461	6.3
corps of Engineers	162,751	30.5	11,238	2.1	151,513	28.4
Fish and Wild-life Service	6,010	1.1	1,123	.2	4,887	.9
USDA Forest Service	204,797	38.4	25,646	4.8	179,151	33.6
National Park Service	92,029	7.2	79,596	14.9	12,433	2.3
Tennessee Valley Auth.	<u>6,980</u>	1.3	542	.1	6,438	1.2
Total	533,523	100.0	125,330	23.5	408,193	76.5

SOURCE: U.S. Department of the Interior, Federal Recreation Fee Report, 1977.

Table 2.--Recreation visitor days at Federal recreation areas in the United States, by managing agency and fee status, 1986

Agency	Total		Fee management units		Non-fee management units	
	Days (1000s)	Percent	Days (1000s)	Percent	Days (1000s)	Percent
	Bureau of Land Mgmt.	23,679	4.3	672	.1	23,007
Bureau of Reclamation	24,706	4.5	715	.1	23,991	4.4
Corps of Engineers	144,170	26.4	11,760	2.2	132,410	24.2
Fish and Wild-life Service	5,590	1.0	837	.2	4,722	.8
USDA Forest Service	226,533	41.5	23,923	4.4	202,610	37.1
National Park Service	115,335	21.1	91,918	16.8	23,417	4.3
Tennessee Valley Auth.	<u>6,458</u>	1.2	599	.1	5,859	1.1
Total	546,440	100.0	130,424	23.9	416,016	76.1

SOURCE: U.S. Department of the Interior, Federal Recreation Fee Report, 1986.

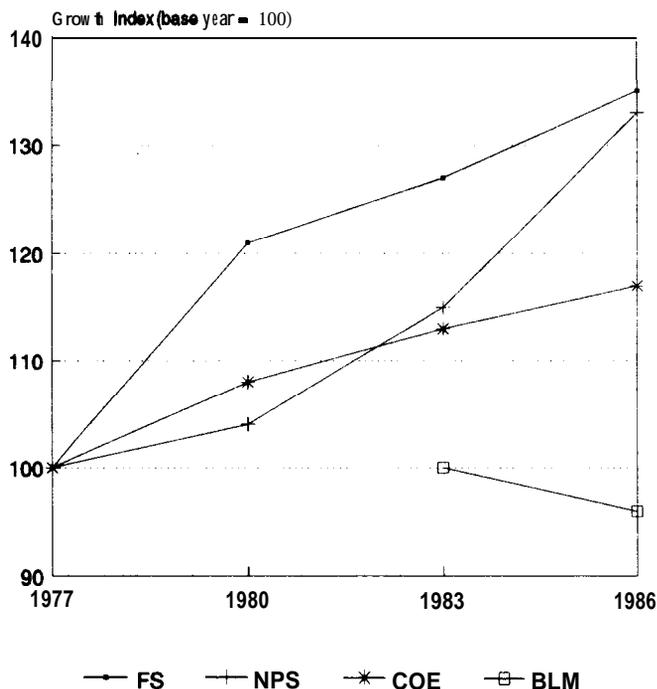
fees only and may not indicate overnight stays. Removing the National Park Service fee units, the remaining agency fee usage dropped 17.4 percent.

Visitor hours, however, do not provide a complete picture. While hours of use have remained stable or declined slightly, the number of visits to these same Federal sites appear to have been on the increase. An examination of visitation records of the Forest Service (FS), National Park Service (NPS), US. Army Corps of Engineers (COE), and Bureau of Land Management (BLM) have, in fact, indicated an increase in numbers of annual visits to sites of three of the four agencies (fig. 3). The Forest Service does not keep records on visits, so these were estimated by dividing visitor hours by mean length of stay (derived from 1977 Federal Estate Visitor Survey and 1985-87 PARVS and interpolated for 1980 and 1983).

The visitation growth indices depicted in figure 3 demonstrate that the flattening and down turn of amounts of FS and COE visitor hours between 1977 and 1986 (shown in fig. 4) does not hold true for visits. Average growth of visits to FS sites between 1977 and 1986 was about 4 percent per year; to COE projects it was about two percent per year. Visits to and visitor hours at NPS sites increased between 1977 and 1986, mostly it would appear, because of rapid increases of visitation to NPS sites in or near urban areas. Visits to BLM sites were down in 1986 from 1983, but the decline was slight, only 4 percent over 3 years.

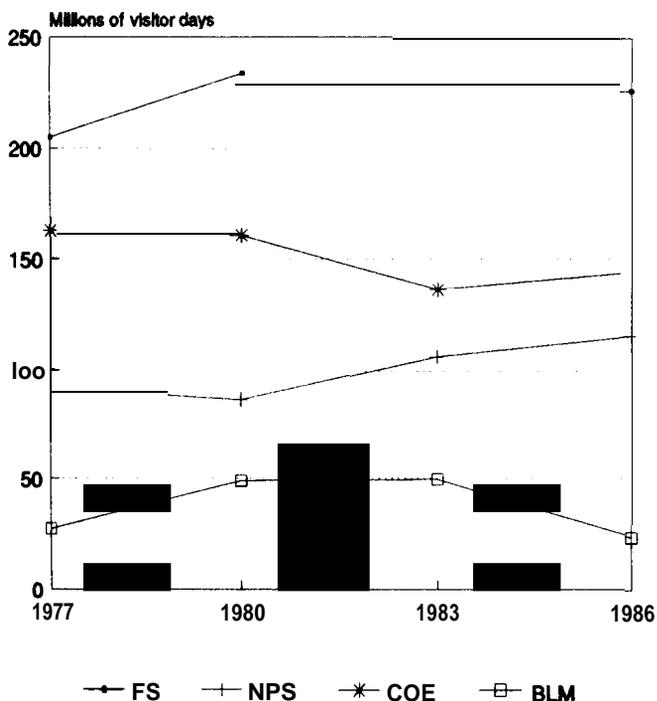
The probable causes of increased visits, relative to visitor hours, is the decreased length of visit at the sites. An examination of FS and NPS recreation sites from the 1977 Federal Estate Visitor Survey (U.S. Department of the Interior 1979) and the 1985-87 PARVS was conducted. Table 3 reports that frequency of visits of less than 4 hours duration increased dramatically for the FS – 14 percent in 1977 to 48 percent in 1986 – and increased from 41 percent to 59 percent for the NPS. Even more dramatic, however, was the reduction in percentage of visits of more than one day's duration between 1977 and 1986; from 70 percent to 21 percent for the FS and from 40 to 14 percent for the NPS. Also associated with increased annual number of visits is a substantial increase in number of repeat visits to both National Forests and National Parks (table 3).

Further, the distribution of one-way travel times changed considerably (table 3). Trips of less than 2 hours increased 67 percent for the Forest Service and 77 percent for the National Park Service. Lengthy



Source: Communication with resource specialists at each agency--1 987.

Figure 3. -Index of relative growth in number of visits to Federal recreation areas.



Source: Federal Recreation Fee Reports, (USDI, 1977-1 986). Statistics on Outdoor Recreation (RFF, 1984).

Figure 4. -Visitation to Federal lands by agency, 1977-86.

Table 3. --Comparison of reported length of stay, repeat visits, and one-way travel time for two Federal agencies, **1977-86**

Item	USDA-FS		NPS	
	1977	1986	1977	1986
	- - - - - <u>Percent</u> - - - - -			
Length of Stay:	6			
0-2 hours	8	26 22	28 13	29 30
2-4 hours				
4 hours to 1 day	16	31	19	26
more than 1 day	70	21	40	14
Repeat Visits:				
0	40	23	63	34
1-2	24	28	16	29
3-5	14	16	8	12
more than 5	22	33	13	25
Travel Time (hours):		72		
< 2	43	14	31	55
3-4	19		13	21
5-8	16	8	15	15
> 8	23	6	41	9

SOURCE: **1977** Federal Estate Visitor Survey; **1985-87** Public Area Recreation Visitor Survey.

trips of greater than 8 hours dropped very sharply: 288 percent for the FS (from 23 percent of all trips to 6 percent) and 455 percent for NPS (from 41 percent of all trips to 9 percent).

Because of different survey methods, these comparisons between the 1977 Federal Estate Visitor Survey and the 1985-87 PARVS may not be totally

accurate. Nonetheless, the impact of close-to-home, shorter recreation trips is evident. The Forest Service and National Park Service cases presented cannot be generalized to the American public at large; however, they do support the PCAO's significant finding that more recreation is occurring closer to people's homes and for shorter periods of time.

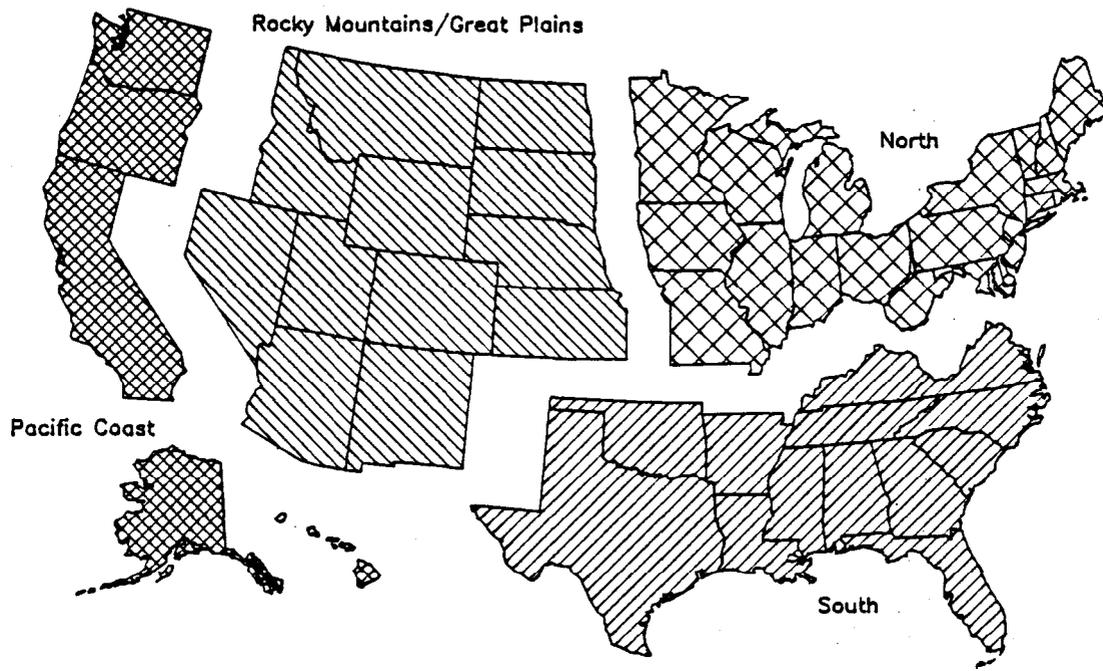


Figure 5. – RPA assessment regions.

CHARACTERISTICS OF VISITORS TO FEDERAL LANDS

The next two sections describe the people who use public lands for their outdoor recreation. The purpose of this section is to describe the characteristics of visitors to Federal recreation areas. The source for this information is the 1985-87 PARVS data base. A grand total of 31,995 interviews have been completed through the summer of 1987. The data set was disaggregated in the following manner:

- 1) By **agency**, defined as either Federal or State.
- 2) By type of **visit**, defined as either a **day** visit or an overnight visit. Day visits are those where the visitor(s) arrived and departed on the same calendar day. Overnight visitors were those who arrived and departed on two different calendar days.
- 3) By region of the country where the visit occurred, Four regions were identified for the RPA Assessment: North, South, Rocky Mountains/Great Plains (**RM/GP**), and Pacific Coast (**PC**) (fig. 5).

The intent of the descriptive characteristics was to examine four of the most basic components of recreation trips:

- 1) How far (miles) did people travel to the recreation site?

- 2) How many hours of travel time were involved?
- 3) How long did the typical party stay at the site?
- 4) In which activities did they most often engage?

To obtain more accurate and realistic descriptive statistics, it was necessary to separate day visits from overnight visits. A 2-week camping trip, for example, would badly skew the responses of the more typical 1 to 2-hour day visitor. The day and overnight responses still tended toward the higher values, therefore medians may be a better indicator of the true situation than means (though both are reported).

Table 4 reports the mean and median one-way travel distances to Federal recreation sites. Here the median distances reflect the fact that the average day and overnight recreation trips were probably much closer to have than the mean distances indicate. The regional differences in medians for day visits are not nearly as pronounced as the means. The North and South regions have the same median distance, while the Pacific Coast and **RM/GP** regions are only five miles apart. Although the median distance in the two western regions is twice that of the two eastern regions, regardless of the region the typical recreation day trip appears to be within an hour's drive. The regional means for day visits show more variation as expected, especially in the western regions.

Table 4. --One-way travel miles to Federal recreation areas¹

Region	Day visitors		Overnight visitors	
	Mean	Median	Mean	Median
North	65	20	238	180
South	54	20	234	110
RM/GP	114	45	373	150
PC	153	40	228	87
Total	74	25	255	130

SOURCE: 1985-87 PARVS.

¹ANOVA, $p < .001$.

The mean distance for overnight visits to the Pacific Coast, North, and South regions was nearly the same, while the RM/GP region was more than 50 percent higher. Interestingly, though, the median overnight distance was shortest in the Pacific Coast, followed by the South, RM/GP and North. This indicates that more visitors travel consistently longer distances in the North to stay overnight, perhaps due to the heavy urbanization and the fact that most urban Federal sites in the North region do not accommodate overnight visitors.

The same pattern seems to hold for one-way travel time (table 5). The mean for overnight trips is greatest in the RM/GP, but the longest median trip time is shared by RM/GP and the North. The Pacific Coast region again appears to have attracted the closest overnight visitors.

The median travel time for day visits was 1 hour across all regions, just as the mileage data suggested. It appears, then, that the typical day trip to a Federal recreation area was about an hour's drive and less

Table 5. --One-way travel time to Federal recreation areas¹

Region	Day visitors		Overnight visitors	
	Mean	Median	Mean	Median
----- Hours -----				
North	2.0	1.0	6.1	4.0
South	1.8	1.0	5.4	3.0
RM/GP	2.4	1.0	7.2	4.0
PC	2.5	1.0	4.4	2.0
Total	2.0	1.0	5.7	3.0

SOURCE: 1985-87 PARVS.

¹ANOVA, $p < .001$.

than 50 miles from home. The mean day visit travel time is higher for the western regions just as travel miles were. This indicates that more people traveled longer amounts of time to visit western areas, perhaps due to the relative distance and attractiveness of mountain sites.

Length of stay at the recreation site is the third descriptive characteristic (table 6). Here, regional differences appeared to be very slight. Median day visits were about 3 hours for each region, with mean stay times ranging from 3.4 to 4.1 hours. Overnight lengths of stay were about 12 hours longer in the eastern regions than in the west (both mean and median). One explanation may be that there is a much wider array of Federal sites to choose from in the west, so people are more inclined to leave an area and move on to another one.

Finally, the most popular activities, based on participation at the site, provide an indication of the types of outdoor recreation occurring at Federal recreation areas, by both day and overnight users. Tables 7 and 8 list the 10 most popular activities for day and overnight visitors, respectively, to the four regions. As a point of comparison, the 10 most popular activities (and percent of the sample activities participating on-site) for the entire sample were:

- | | |
|-------------------------|------|
| 1) Sightseeing | 45.1 |
| 2) Walking for pleasure | 33.7 |
| 3) Picnicking | 30.1 |
| 4) Driving for pleasure | 26.0 |

- | | |
|--|------|
| 5) Non-pool outdoor swimming | 24.1 |
| 6) Wildlife observation and photography | 17.8 |
| 7) Visiting a museum or information center | 17.7 |
| 8) Photography | 17.1 |
| 9) Day hiking | 16.1 |
| 10) Developed camping | 15.7 |

The data from all four regions shows conclusively that sightseeing is the most popular activity of day visitors, and in three of the four regions for overnight visitors. The only exception is the South, where developed camping edged out sightseeing by one percent. For day visitors, the passive activities of walking and driving for pleasure, photography, wildlife observation and photography, visiting a museum, and picnicking made the top ten in every region. Visitors across the country seem to be attracted by the scenic beauty of Federal recreation areas, and then mainly for short, spontaneous visits that do not require much advance planning (save perhaps picnicking).

For overnight visitors, developed camping made the top three of every region but the North, where this activity is not nearly as readily available as in the other three regions. Surprisingly, however, primitive camping finished sixth in the North region and failed to place elsewhere. Apparently, this is a very popular activity at the non-urban Federal areas in the North region. Otherwise, the same types of activities dominated the lists. The two western regions did

Table 6. --Length of stay at Federal recreation areas¹

Region	Day visitors		Overnight visitors	
	Mean	Median	Mean	Median
	----- Hours -----			
North	3.7	3.3	96.6	70.0
South	3.6	3.0	91.1	64.0
RM/GP	3.4	3.0	82.6	50.0
PC	4.1	3.0	77.0	50.0
Total	3.6	3.0	87.7	58.0

SOURCE: 1985-87 PARVS.

¹ANOVA, p < .001.

Table 7.--Percentage participation of on site activities for the ten most popular activities at Federal recreation areas for day visitors, by region

Activity	Percent	Activity	Percent
North:		South:	
Sightseeing	48	Sightseeing	46
Walking for pleasure	46	Driving for pleasure	32
Visiting a museum	28	Picnicking	26
Visiting historic sites	27	Walking for pleasure	24
Picnicking	26	Outdoor swimming	22
Outdoor swimming	25	Warmwater fishing	17
Driving for pleasure	25	Visiting a museum	16
Wildlife observation	20	Visit historic sites	14
Photography	20	Wildlife observation	13
Reading roadside markers	16	Photography	12
RM/GP:		Pacific Coast:	
Sightseeing	57	Sightseeing	66
Driving for pleasure	33	Walking for pleasure	40
Photography	30	Driving for pleasure	33
Walking for pleasure	28	Photography	31
Day hiking	26	Day hiking	25
Visiting a museum	22	Visiting a museum	24
Wildlife observation	21	Wildlife observation	21
Picnicking	21	Picnicking	21
Visiting historic sites	17	Self-guided trails	15
Self-guided trails	16	Reading roadside markers	13

Source: 1985-87 PARVS.

Table 8.--Percentage participation of on site activities for the ten most popular activities at Federal recreation areas for overnight visitors, by region

Activity	Percent	Activity	Percent
North:		South:	
Sightseeing	57	Developed camping	54
Walking for pleasure	55	Sightseeing	53
Wildlife observation	44	Walking for pleasure	51
Visiting a museum	34	Outdoor swimming	39
Outdoor swimming	33	Wildlife observation	35
Primitive camping	33	Driving for pleasure	34
Driving for pleasure	30	Picnicking	32
Photography	30	Visiting a museum	29
Day hiking	30	Dining for pleasure	27
Picnicking	30	Photography	26
RM/GP:		Pacific Coast:	
Sightseeing	55	Sightseeing	56
Developed camping	45	Walking for pleasure	40
Walking for pleasure	37	Developed camping	37
Day hiking	36	Day hiking	32
Wildlife observation	35	Wildlife observation	31
Photography	35	Photography	29
Driving for pleasure	32	Driving for pleasure	24
Picnicking	27	Picnicking	22
Cold freshwater fishing	27	Collecting firewood	21
Visiting a museum	20	Coldwater fishing	21

SOURCE: 1985-87 PARVS.

Table 9.--One-way travel miles to State recreation areas¹

Region	Day visitors		Overnight visitors	
	Mean	Median	Mean	Median
North	51	30	108	70
South	85	25	240	120
RM/GP		35	130	75
Total	51	30	164	85

SOURCE: 1985-87 PARVS.

¹ANOVA, $p < .001$.

add cold freshwater fishing, and day hiking turned up in all but the South region. The most substantive finding of both day and overnight visits is the sweeping popularity of sightseeing. It is highly probable that this is because it is a family-centered activity, requires little advance preparation, and is an activity that lasts relatively short periods of time. This is consistent with the finding of increased numbers of shorter, more frequent trips.

CHARACTERISTICS OF VISITORS TO STATE LANDS

Information about visitation to State parks and recreation agencies is collected annually by the National Association of State Park Directors' 'Annual Information Exchange.' These data make up the other major portion of the 'Federal Recreation Fee Report.' The State information exchange commenced in 1979, but only 39 States reported visitation. For 1979, 91.7 percent of State park users were day visitors, compared to 8.3 percent overnight visitors. In 1980, with 44 States reporting, day visitation constituted 87.3 percent of State park recreation participation. With 50 States reporting in 1986, the proportions were 90.3 percent day use and 9.7 percent overnight use. It appears that State park and recreation participation has held relatively constant, with about 9 of every 10 visitors making a day visit.

Visitor characteristics for State park users were also disaggregated by length of visit and region of the country visited. There were no State agency PARVS interviews conducted in the Pacific Coast region. The median one-way travel distance for day

visitors was very close for the three regions, ranging from 25 to 35 miles (table 9). Mean distance for the two eastern regions was nearly identical, while in the **RM/GP** region the mean distance was considerably longer. Again, lengthy trips produced a much higher mean distance.

Interestingly, overnight trips in the **RM/GP** and North regions were very similar. The South region, however, showed trips to be almost twice the distance of the other regions. The best explanation may be that inland residents were attracted to the coastal sites in the South. The North region interviewing areas included very few beach environments,

Reported one-way travel time supports the mileage data. Similar to Federal areas, the median day visit was a 1 -hour trip (table 10). Mean travel times were very similar in the **RM/GP** and South, and slightly lower in the North. Overnight visit travel times also closely reflected miles traveled. Medians were 2 hours in the **RM/GP** and North and 3 hours in the South. Mean travel time was considerably longer in the South region, more than twice that of the North and 50 percent greater than **RM/GP**.

Length of stay at the recreational site for the three regions did not demonstrate as many differences as distance and travel time (table 11). The median overnight length of stay was longest in the South, as would be expected for longer trips. The mean overnight stay time, however, showed the **RM/GP** to be longer than the two eastern regions. A higher percentage of visits lasting one week or more appears to have pulled the **RM/GP** mean up, while the South had more trips in the two day to one week range of

Table 10. --One-way travel time to State recreation areas¹

Region	Day visitors		Overnight visitors	
	Mean	Median	Mean	Median
	- - - - - <u>Hours</u> - - - - -			
North	1.8	1.0	2.9	2.0
South	2.4	1.0	5.9	3.0
RM/GP	2.2	1.0	3.7	2.0
Total	2.0	1.0	4.2	2.0

SOURCE: 1985-87 PARVS.

¹ANOVA, $p < .001$.

Table 11.--Length of stay at State recreation areas¹

Region	Day visitors		Overnight visitors	
	Mean	Median	Mean	Median
	- - - - - <u>Hours</u> - - - - -			
North	4.3	4.0	73.5	48.8
South	3.7	3.2	89.6	61.8
RM/GP	4.3	3.0	102.0	55.0
Total	4.1	3.5	82.3	51.0

SOURCE: 1985-87 PARVS.

¹ANOVA, $p < .001$.

duration. Day trips seem to be almost normally distributed around the three to 4-hour range, with visits in the North region being slightly longer. Almost identical to Federal area visits, the typical State park day visit appeared to be a drive of an hour or two of less than 100 miles, with the party staying 3 or 4 hours at the site.

The most popular activities engaged in at State recreation areas also looks similar to Federal areas. Active sports such as swimming and fishing, however, appeared to be more popular at State areas (table 12). Sightseeing was popular for day visits, but not to the degree it was at Federal areas. It trailed picnicking and walking for pleasure in the **RM/GP** region, and outdoor swimming and picnicking in the North, but was the most popular day activity in the South. Interpretive activities such as visiting museums and historic areas also proved to be popular. A few popular State activities that did not appear on the Federal lists were motorboating, canoeing, pool swimming, and family gatherings. Picnicking, and walking and driving for pleasure maintained their popularity.

Developed camping was the most popular activity of overnight visitors to all three regions. This suggests that more campers choose State areas as an overnight destination than Federal areas. This is likely due to the greater availability of State areas, however, it is possible that PARVS interviewed a disproportionate number of campers versus visitors who used other accommodations, e.g., cabins, lodges. Again, for State park overnight visitors the activities of sightseeing, picnicking, walking and driving for pleasure, and swimming proved to be very popular. Across all regions, agencies and lengths of visits, these activities were consistently among the most popular. This would seem to indicate that very many recreation trips are basically spontaneous in nature, do not require much advance planning, and generally fit into a generic category that might be called 'enjoying nature or the outdoors.'

In summary, the simple enjoyment of the outdoor environment seems to be the pervasive motivation for visits to both Federal and State recreation areas. For day visits, the reported travel time was very nearly the same to both Federal and State areas. The median distance traveled was slightly higher to State areas, but mean travel distance was longer to Federal areas. The higher mean indicates that the majority of Federal sites are not as accessible as State sites. It also indicates that visitors to Federal areas are willing to travel greater distances. The lower median is probably

due to the urban Federal areas located primarily in the North region. As mentioned, the most likely length of stay for a day visit to a recreation area was about 3 or 4 hours, regardless of agency.

Overnight visits to Federal and State areas showed more differences than day visits. Reported travel time was about 50 percent longer to Federal areas (medians: 3 hours Federal, 2 hours State). Miles traveled was also considerably longer for Federal areas (medians: 130 miles Federal, 85 miles State). Length of stay for overnight visits, however, was not appreciably different between Federal and State areas. Median stay time was a little over 2 days for both Federal and State areas, while the means were both about 3% days. It is very likely that vacationers and retirees skewed this distribution. The typical length of stay for overnight visits to both Federal and State recreation sites is probably not as long as the **PARVS** data indicate.

USER FEES AND THE ELDERLY

The final section of this paper examines two of the most prominent issues facing recreation resource management today: user fees and the increasing elderly population. Subsets of the PARVS data set provide an examination of visitor characteristics related to these two important topics. The PARVS data set was weighted to represent the U.S. population over 12 years of age who indicated they were participants in any form of outdoor recreation. The subset of elderly respondents should therefore, be a fairly accurate profile of the typical elderly outdoor recreationist.

The subset of respondents who reported they would be willing to pay a user fee, however, may be biased by non-response. The portion of the PARVS instrument containing that information was a questionnaire that was returned via mail. Just a little over 20 percent of the total PARVS sample returned the mail-back questionnaire. Nevertheless, the comparison of persons willing to pay a user fee versus the entire sample is of considerable interest.

User Fees-The issue of user fees for publicly provided recreation areas, particularly at the Federal level, has received considerable attention recently (Binkley and Mendelsohn 1987; Driver and others 1985; Harris and Driver 1987; Siehl 1985). The PCAO (1986) Report suggests that "... local, State, and Federal recreation and resources management agencies charge visitors fees to supplement regular appropriations."

Table 12. --Ten most popular activities at State recreation areas for day and overnight visitors, by region¹

Activity	Percent	Activity	Percent
Day Visitors:		Overnight Visitors	
North:		North:	
Outdoor swimming	31	Developed camping	63
Picnicking	30	Walking	40
Sightseeing	24	Outdoor swimming	38
Walking	16	Sightseeing	34
Canoeing	14	Picnicking	33
Driving	12	Day hiking	23
Warmwater fishing	10	Warmwater fishing	22
Wildlife observation	9	Wildlife observation	22
Day hiking	21	Driving	20
Historic sites	7	Canoeing	19
South:		South:	
Sightseeing	43	Camping	60
Picnicking	42	Walking	56
Walking	37	Sightseeing	48
Swimming	24	Picnicking	38
Driving	22	Swimming	34
Museum	16	Dining	27
Family	14	Driving	27
Historic sites	13	Pool swimming	23
Swimming	12	Day hiking	21
Day hiking	11	Wildlife	20
RM/GP:		RM/GP:	
Picnicking	36	Camping	69
Walking	35	Walking	55
Sightseeing	32	Picnicking	48
Wildlife	30	Warm fishing	44
Museum	24	Sightseeing	39
Trail use	23	Swimming	33
Swimming	19	Motorboating	33
Driving	19	Driving	32
Warm fish	18	Family	22
Motorboat	16	Wildlife	22

¹No data available for Pacific Coast.

A wide variety of support exists both for and against the recreation user fees. It is beyond the scope of this paper to enumerate these. Our purpose is to compare the characteristics of PARVS interviewees who indicated support for user fees with the overall sample. The analyses are presented by agency and length of visit, but not by region of the country visited.

PARVS interviewees were asked to respond to the previously mentioned questionnaire which dealt primarily with trip expenditures. Included were two questions which asked, a) What is the maximum amount you would have been willing to pay for this year's vehicle pass to (the particular location they visited), and b) the same question, but for access to any of the agency's recreation sites. A response of greater than zero dollars to either question indicated at least implied support for recreation user fees. It was this group on which the descriptive analyses were performed.

Table 13 shows responses to the question 'If this year's price of an annual pass to (the location visited) had been \$___, would you have bought one?' Respondents were not given a choice of price; every seventh form had one of the prices listed in table 13. Overall, more than half of the sample would have been willing to pay \$5, but not \$10. A majority of both day and overnight visitors to both Federal and

State areas would have been willing to pay \$5. Only Federal overnight visitors were willing to pay \$10, but this group balked at \$15.

Table 14 reports the mean and median maximum amount that people would pay for an annual pass to 1) an individual site, and 2) all agency sites. For an individual site pass, both Federal and State day and overnight visitors were nearly the same—all had medians of \$5. For all site passes, the median went up to \$10 for both day and overnight Federal visitors and for overnight State visitors. Day use State visitors were willing to pay a median maximum of \$15. The fact that this group most likely comprises the highest number of repeat visitors attributes to the higher maximum value. It makes good economic sense that the resources that are used most often would demand the highest annual fees. However, this group (State day users) is also the one for which user fees would be most discriminatory because these sites are more accessible to indigent participants.

Reported annual income of those persons in support of user fees gives an indication of the socio-economic groups that may be adversely affected by the imposition of user fees. Those people who said they would be willing to pay a fee were considerably wealthier than the sample as a whole (fig. 6). The distribution of fee supporters was smaller than the total sample in the two poorest income categories

Table 13. --Percentage of PARVS respondents willing to purchase an annual pass to recreation sites where interview occurred, by agency and length of visit

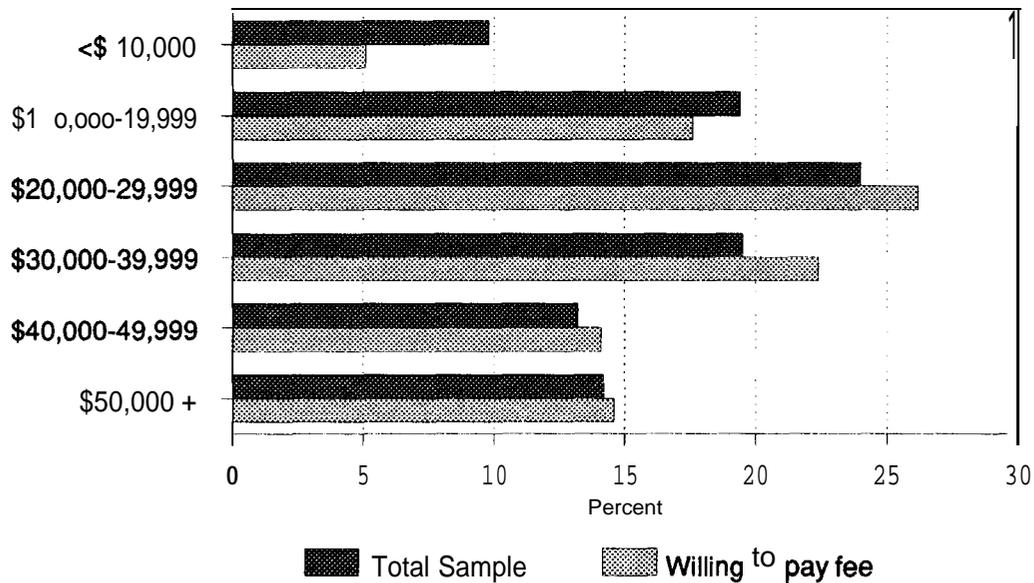
Fee	Day visits				Overnight visits					
	Federal		State		Federal		State		Total	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
\$ 5	83	17	41	14	82	19	80	20	83	17
10	59	41	60	40	59	41	60	40	59	41
15	42	58	48	52	45	55	46	54	47	53
50	35	65	35	65	73	27	30	70	37	63
100	18	82	26	74	13	87	11	89	24	76
	5	95	4	96	7	93	3	97	4	96

SOURCE: 1985-87 PARVS.

Table 14. --Maximum annual fee respondents would be willing to pay for access to recreation areas

Access	Day visitors		Overnight visitors		Total
	Federal	State	Federal	State	
	Mean (Median)				
One Site	\$13.81 (\$ 5.00)	\$11.17 (\$ 5.00)	\$13.54 (\$ 5.00)	\$10.43 (\$ 5.00)	\$11.96 (\$ 5.00)
All Sites	\$19.83 (\$10.00)	\$14.37 (\$15.00)	\$21.17 (\$10.00)	\$17.73 (\$10.00)	\$19.69 (\$10.00)

SOURCE: 1985-87 PARVS.



Source: 1985-87 Public Area Recreation Visitor Survey; n = 31,995.

Figure 6. -Percent of recreationists willing to pay an annual access fee, by annual family income.

Table 15.--Characteristics of PARVS respondents who indicated willingness to pay an annual user's fee

Character- istic	Day Visitors		Overnight visitors	
	Federal	State	Federal	State
				Mean (Median)
Travel Distance (miles)	153 (30)	87 (35)	279 (170)	204 (100)
Travel Time (hours)	4.4 (1.0)	2.8 (1.0)	6.7 (4.0)	4.8 (2.0)
Length of Stay (hours)	3.8 (3.6)	3.9 (4.0)	79.0 (80.0)	77.7 (70.0)

SOURCE: 1985-87 PARVS.

and larger in the four income categories over \$20,000. This does not necessarily infer that opposition to user fees is inversely related to wealth, however, it does demonstrate that individuals who say they would support user fees are wealthier than the average user.

The three characteristics reported earlier – miles and hours traveled, and duration of visit—are reported for fee supporters in table 15. Federal day visitors traveled slightly more median miles, but more than twice as many mean miles as the total sample. Their median travel time was 1 hour, as was the total sample's, but the mean hours traveled were more than double (4.4 to 2.0). Length of stay was not substantially different. All means and medians were between 3 and 4 hours.

Federal overnight visitors who supported fees traveled farther than the overall sample, spent more time traveling, and stayed longer at the site. State day visitors who supported fees also drove farther and slightly longer periods of time, but stayed the same amount of time as the total sample. State overnight visitors who supported fees drove farther and slightly longer, and also stayed longer at the site.

The point of these analyses is that persons who indicated they were in favor of user fees generally traveled longer and farther, and stayed longer than the sample as a whole. Whether this is because these individuals had more leisure time, more discretionary income, different preferences, or whatever, the reason is unknown. **The data** support the argument **against** user fees at those recreation areas most accessible to low income groups, the impaired or disabled, and other social groups who do not have the means for longer, more expensive trips. Such groups frequently live in the central cities of urban areas.

It is perfectly reasonable that the length of a recreation trip is a major determinant of willingness to pay a fee since as the trip length increases, the proportion of total costs a fee represents decreases. Thus, the characteristics of recreation trips are important information to the ongoing user fee debate.

Our Aging Population-The aging of the U.S. population is another important issue facing recreation resource planning and management. In 1982, the elderly (age 65 and over) made up 11.6 percent of the population. Middle-level projections call for this figure to increase 12 percent to 13.1 of the population

the jurisdiction of Federal, State, or local governments. Visitation data did not exist to analyze the local situation. Visitation data and user characteristics were examined for Federal and State recreation areas. A distinction was made between "visitor hours/days* to Federal areas, and 'visits.' Where visitor hours showed a flattening or leveling-off since 1977, visits (the entry of an individual onto a public land for purposes of recreation) were on a steady increase.

Visitor characteristics showed that day trips to recreation areas were generally short in duration and located close to home, regardless of the governing agency or region of the country visited. This supports the PCAO's major finding that demand for recreation is greatest close to population centers and will probably continue to increase. Overnight visits showed considerably more variation than day visits, both by agency and region of the country visited. The duration of visits at Federal and State sites did not differ nearly as much as the time and distance people traveled.

Sightseeing, walking and driving for pleasure, and picnicking dominated the lists of most popular activities by agency, length of visit and region visited. Developed camping, however, was the most participated in activity for State area overnight visitors. The popularity of these activities and others attests to the fact that a majority of recreation trips seem to be spontaneous in nature and do not require much advance planning. The popularity of sightseeing and driving for pleasure points out the importance of the automobile to outdoor recreation.

Finally, two important current topics to outdoor recreation management were addressed: user fees and the increasing elderly population. Analyses of PARVS subsets indicated some substantive differences between the characteristics of the total PARVS sample and 1) elderly recreationists and 2) those who would support an annual user fee. A thorough examination of visitation trends and the characteristics of visitors to recreation areas on public lands is essential information for effective outdoor recreation planning and management.

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TRENDS AND CURRENT STATUS OF PARTICIPATION IN OUTDOOR RECREATION

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Abstract- This paper takes a global approach to participation in outdoor recreation in the United States. First, a review and comparison of several past major national surveys provides some information on overall long-term trends in outdoor recreation participation, despite comparability problems. Second, a previously unpublished analysis of the multiagency 1985-87 Public Area Recreation Visitor Study provides current information on the recreation participation patterns of current users of Federal and State resource-based recreation areas. Finally, implications are provided based on the material presented.

INTRODUCTION

Since the Outdoor Recreation Resources Review Commission (ORRRC) in the early 1960's, Federal agencies and other organizations have examined national-level participation in outdoor recreation activities. The Resources Planning Act (RPA) Assessment of Outdoor Recreation and Wilderness requires such an examination. The material presented in this article was initially prepared for the RPA Assessment, and is provided here to permit wider distribution of the results as well as allow peer review and comment as to the conclusions reached.

Most users of public recreation areas could be said to hold a generic image of parks. They are not aware of, nor are they particularly interested in the variety of legal mandates, or the resulting complexity of administrative and organizational arrangements for providing recreation opportunities in public parks. Thus, the political and bureaucratic aspects of management are not likely to make a strong or lasting

impression on the leisure, social world of most park visitors (Haywood 1986). This paper, therefore, examines resource-based outdoor recreation without regard to the administrative area on which that recreation occurs, although recreation participation on Federal and State lands is the primary focus of this paper.

In this paper, we will briefly examine the trends in outdoor recreation participation in the past 25 years, focusing on an activity-by-activity comparison for the most popular resource-based outdoor recreation activities in the United States. Following that review, a more detailed examination of the current status of annual participation in outdoor recreation is offered, using the Public Area Recreation Visitor Study (PARVS) as our source of data. (This data set covers only Federal and State recreation areas, and it should be remembered that local and private lands support a very large amount of recreation participation, which is not discussed in this paper.) Finally, some interpretation of these results will be presented including opportunities for public recreation providers, barriers and constraints to implementing these opportunities, some suggestions for improving the information base, and some questions for discussion.

LONG-TERM TRENDS IN LEISURE

Leisure, or free time, is a basic resource for participation in outdoor recreation. It is commonly assumed that American's participation in recreation has increased because of increased free time that people now have available. However, there are few definitive long-term statistics on how much free time the public actually does have available, and there are indications that there has been a recent decline in leisure.

Robinson (1986) presented a review of several time-diary studies for the President's Commission on Americans Outdoors. He found that total free time has increased between 1965 and 1981, after a drop in free time between the 1954 and 1965 time-diary

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studies. The main gap in free time occurred between 1965 and 1974. Robinson's (1986) data are for 'regular' workweeks and he suggests that there are indications that these proportions may not hold during some periods of the year, such as vacations. It appears that to the extent that there has been a "recreation boom," it has occurred during such concentrated "blocks" of free time and much less so during regular workweeks during the year.

Some recent studies present a contrary picture in which leisure time is decreasing, and time spent working, commuting, and studying is increasing. The 1984 Louis Harris report on "Americans and the Arts" reports that "over the past decade, for the average American, the amount of leisure time has shrunk 31 percent, a loss of 8 hours per week." Harris defined work for survey participants as hours spent 'at work, housekeeping, or studies, including travel time to and from the job or school.' Leisure was defined as the amount of time respondents had available "to relax, watch TV, take part in sports or hobbies, go swimming or skiing" as well as attending entertainment events or visiting with friends.

In their final report on a 1986 telephone survey of Americans for the President's Commission on Americans Outdoors, Market Opinion Research stated: "The current pattern for three-fourths of American adults includes 1-2 vacations of a week or more and multiple numbers of mini-vacations." This survey also found that '3 out of 10 adults took six or more long weekend or mini-vacations during 1985 and another **one-fifth** took 4 or 5.' It appears that the extended vacation of 2 or more weeks is becoming less common, losing out to long weekends or other short blocks of time on several occasions throughout the year.

Although there is a recent trend toward declining leisure for the average American, the Harris Poll found considerable leisure differences depending on sex, age, ethnic group, and family status. The Harris report stated that Americans over age 65 report an average of 25.4 hours of leisure per week compared with a Baby Boom generation average of 16 hours per week. Further, in the latter group, women are reported to have 23 percent less leisure time than men. Among ethnic groups, while both whites and nonwhites report working slightly more than 43 hours per week, Blacks have 12.2 hours of leisure and Hispanics have 18 hours of leisure per week according to the Harris survey. There are several contributing social and economic causes for leisure time decline, including: 1) more women in the work force, 2) more two income families, 3) more single parent families, 4) pressures of work, job security issues, and 5) continuing/re-education.

LONG-TERM TRENDS IN OUTDOOR RECREATION PARTICIPATION

Since 1959, more than 30 nationwide recreation surveys have been conducted by public agencies and private companies. All of these surveys attempted to measure outdoor recreation participation rates and other variables affecting participation patterns. Any discussion of trends in participation uses some combination of data from these previous surveys.

Comparability Issues

Over the years, variations in methods of data collection and analysis of recreation participation have made it difficult to compare the information provided by different national-level surveys. Commonly, when individual land-management agencies have specific needs for recreation participation data, they have developed their own survey instrument and methods to best meet their needs. Generally, attempts have been made to provide comparability with past surveys; also, changes are made from previous instruments to clarify questions, add new categories, or otherwise improve the survey. As a result, there is a loss of consistency, and comparisons between surveys become more difficult.

It is difficult to draw comparisons among the large national surveys of Americans' recreation habits because of sometimes subtle differences in methods (Bevins and Wilcox 1980). The variations in research methodology include: the method of contact with persons being studied (personal interview, **telephone**, or mail), the time period during which the respondent is asked to recall activity participation (summer, winter, all year), the minimum age of respondent, and the position of the respondent in the household (individual or head) and recreating group (group leader or member).

Differences in the definitions of activities, question phraseology and ordering, and the number of activities suggested to the respondent also create problems of comparability. Many of the earlier surveys do not distinguish between developed camping, primitive camping, or backpacking. Boating is subdivided to canoeing, sailing, rowing, and powerboats in some surveys but not all. Swimming can also be confusing with subsets of pool-swimming indoors or outdoors, or swimming in other outdoor environments. The 1960 ORRRC study presented the respondent with a choice of 20 activities, while the 1982-83 NRS Survey presented 34 activities. The 1985-87 Public Area Recreation Visitor Study had a list of 53 activities,

with the option to include others not on that list. A comparison of popularity rankings between surveys is affected by the variation in the number of activities presented to the respondent.

Long-Term Comparisons of Participation Rates

Despite the above-mentioned comparability issues, trends are seen in certain carefully selected surveys. Participation data from the 1960, 1965, and 1982 National Recreation Surveys (NRS) are similar enough to be compared in many respects. In all three surveys the respondents were 12 years and older and the interviews were conducted in-home by the same agency, the Bureau of the Census.

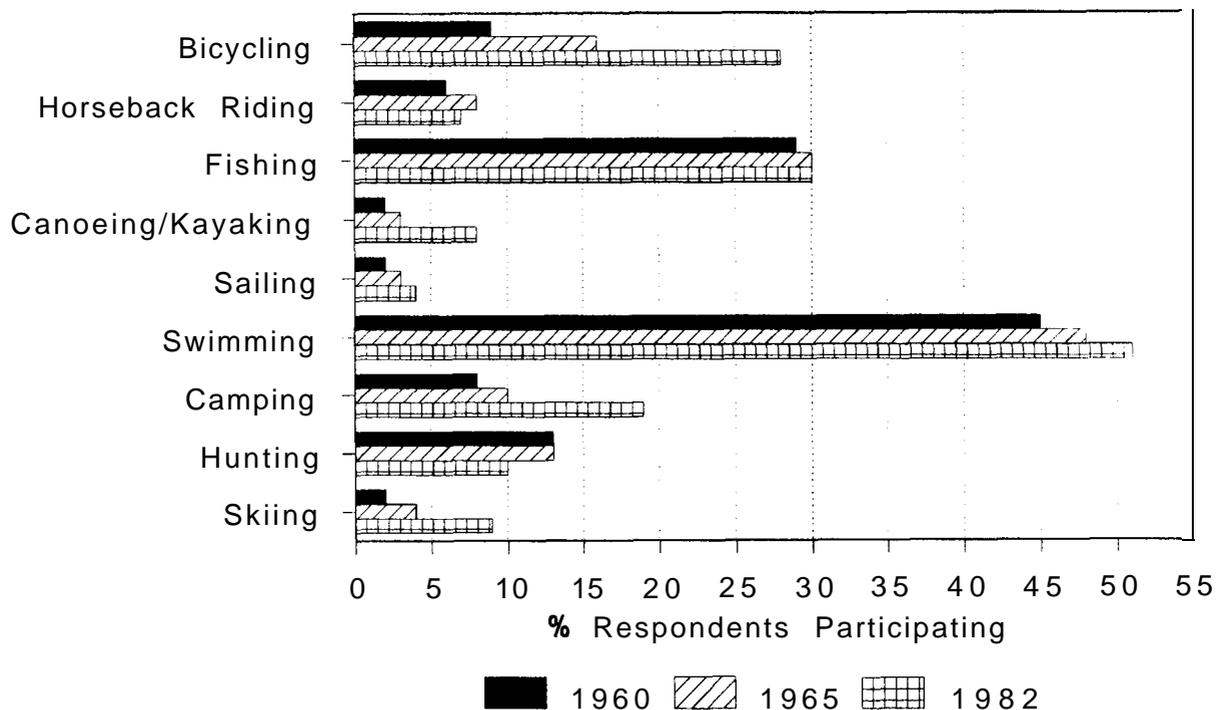
Because of subtle differences in questionnaire wording and activity definitions, the participation rates of only nine activities can be accurately compared across those three surveys. The respondents were asked if they had participated in any outdoor recreation activities during the previous 3 months. Snow-skiing and canoeing/kayaking made the most dramatic gains in participation rates in the 22 years (fig. 1). Only 2 percent participated in 1960, but the participation rate for these activities quadrupled by 1982. Bicycling was not far behind with a

tripling of its participation rate from 9 percent to 28 percent with an increase in adult participation in recent years.

Swimming was one of the most popular activities in 1960 and continued to be popular in 1982 with only a small increase, from 45 to 51 percent. In the 1982 NRS Survey, more people said they swam in outdoor pools rather than in other environments. Fishing and hunting have both remained popular and their participation rates have remained stable since 1960, with hunting declining only slightly.

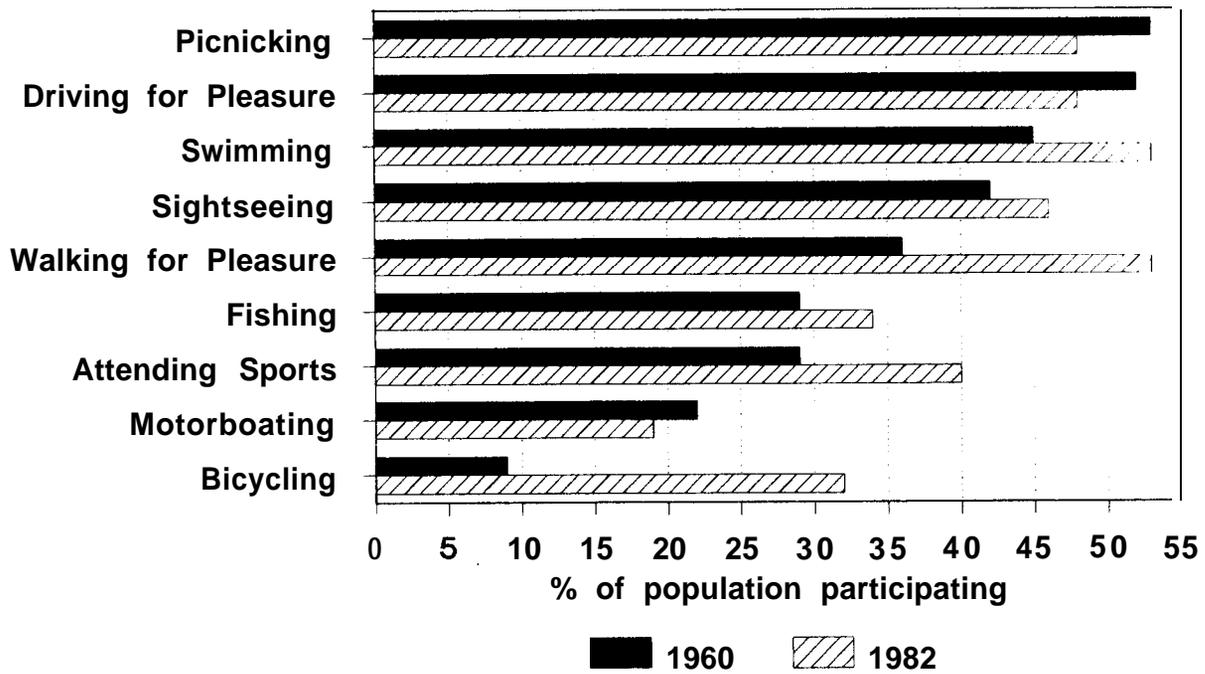
By comparing activities between the 1960 and 1982 NRS surveys, it is possible to include additional activities, and other trends become visible. The mix of popular outdoor recreation activities has also changed (fig. 2). In 1960, more than half of the U.S. population over age 11 participated in picnicking and driving for pleasure. In 1982, two other activities, outdoor swimming and walking for pleasure, were done by a majority of the population.

In evaluating these participation percentages, it is important to realize the population has grown almost 30 percent since 1960. The increased population means more potential participants. When looking at the percentage change in number of participants, the growth of some activities appears more dramatic



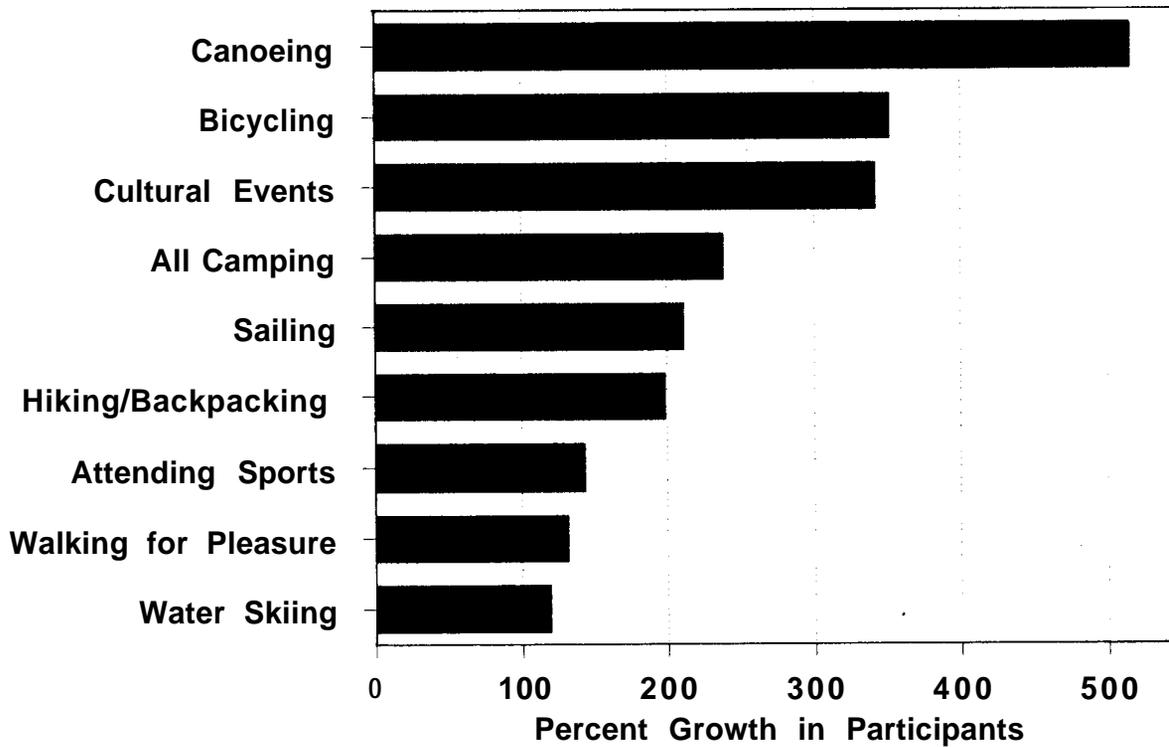
SOURCE: 1982-83 National Recreation Survey Final Report.

Figure 1. -Activity participation trends 1960-82 (summer seasons).



SOURCE: 1960, 1982 National Recreation Survey

Figure 2. -National population trends in participation in selected activities (12 years old and older), 1960-82.



SOURCE: 1960, 82-83 National Rec Survey

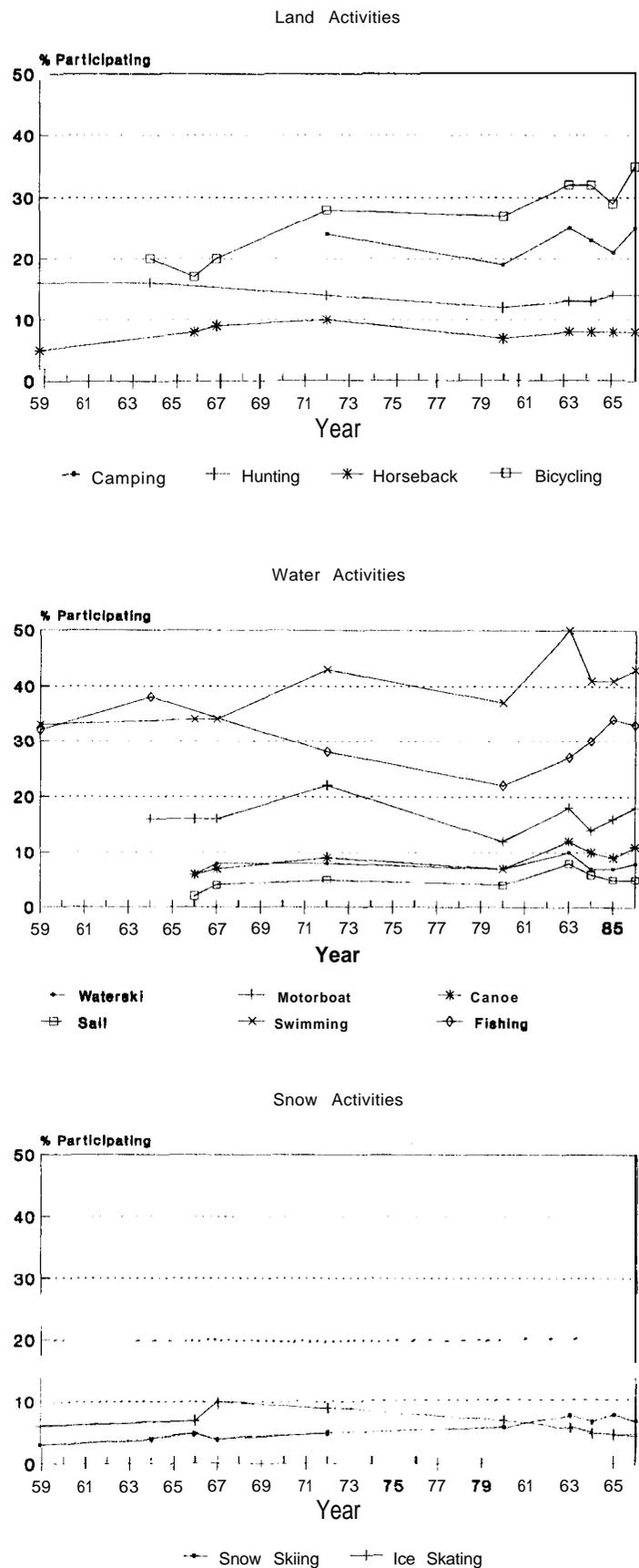
Figure 3. -Percentage change in number of summer participants in nine rapidly growing activities, 1960-82.

(fig. 3). Of the nine activities with the highest growth rates, more than half are physically demanding: canoeing, bicycling, water-skiing, walking, and hiking/backpacking. While some of the high-growth activities are more passive; e.g., attending outdoor cultural activities and sporting events, few are motor or energy dependent (fig. 3).

The Gallup Poll conducts annual surveys of adult participation in over 50 sports. The poll has been conducted continuously since 1959 and is one of the few sources of consistent long-term trend information. Respondents (over the age of 18) are asked to indicate which sport they have participated in within the last 12 months (Gallup 1986). Some of the observed trends are similar to the NRS findings. The results show a substantial growth of sports participation in the 27 years covered by the survey (fig. 4). Of the 12 activities considered here, all have greater participation rates now than when data were first collected in 1959, except for hunting and ice-skating which have declined only slightly. Swimming and fishing have held their positions as the most popular sports since the surveys began. In 1986, 43 percent of the respondents indicated participation in swimming and 33 percent were participating in fishing. Bicycling has gained in popularity over the years, from a 20-percent participation rate in 1964 to 35 percent in 1986 – higher than fishing.

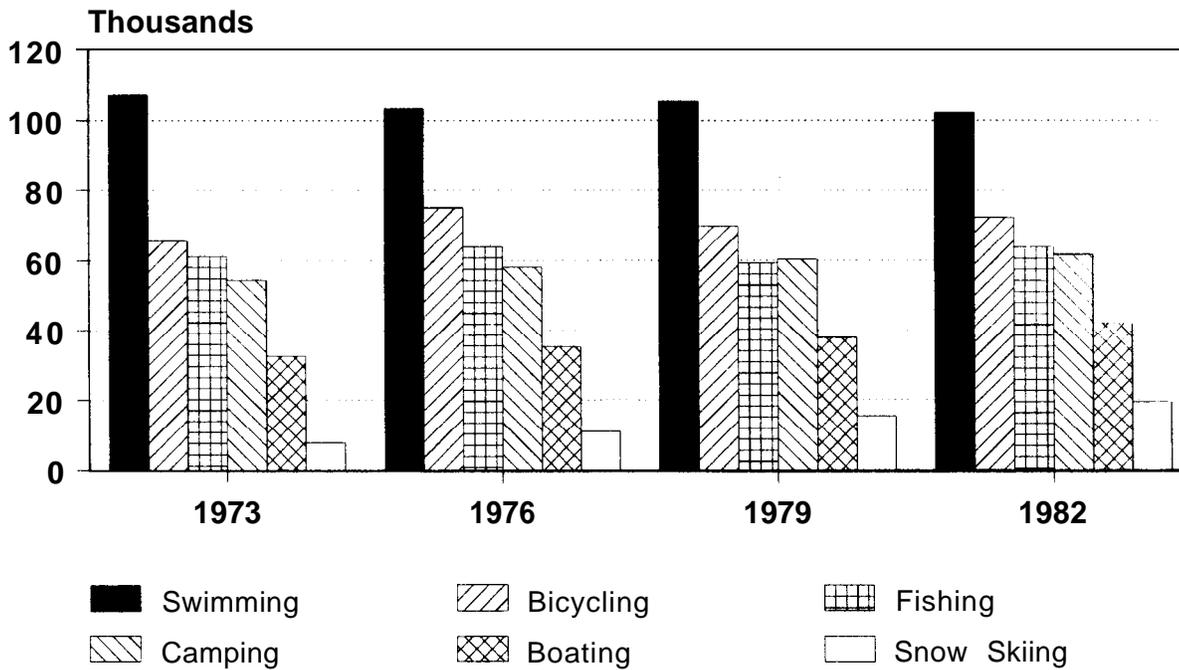
The Gallup Poll reports a high growth rate in general sport participation in the 1960's and the 1970's, and then a leveling off in the 1980's. Swimming, fishing, motorboating, horseback riding, water-skiing, sailing, and camping are maintaining their participation rates from the seventies. Hunting has shown a steady decline since 1959, and ice-skating has declined since the mid-1970's. Canoeing, bicycling, and skiing are continuing to grow into the eighties, though not as rapidly as in the earlier decades,

The A.C. Nielsen Company (reported in Clawson and Van Doren 1984) also monitored sport and outdoor recreation participation between 1973 and 1982. The highest growth reported occurred in snow-skiing (increased 27 percent), sailing (increased 23 percent), and soccer (increased 23 percent), which started with relatively low participation rates. The 10 most popular activities in 1982 were swimming, bicycling, fishing, camping, boating, bowling, physical conditioning, jogging and running, roller-skating, and pool and billiards. Nielsen reported participation rates for specific activities increasing and decreasing in a cyclic fashion. One would expect this as recreation behavior affected by fads.



SOURCE: Gallup Poll

Figure 4. -Long-term trends in outdoor recreation.



SOURCE: A.C. Nielsen. 1982. Ranking of popularity of participation in sports measured, 1973-1982. News release.

Figure 5. -Estimated number of participants in selected outdoor recreation activities, 1973-82.

The Nielsen results differ from the Gallup Poll in a few areas. Nielsen reports an increase in boating participation between 1973 and 1982, whereas Gallup reports a slight decrease. Bicycling has become much more popular according to Gallup, but Nielsen shows a stable number of participants over the same time period (fig. 5).

Relative Popularity of Activities

The relative popularity of activities can be compared across surveys. This is a useful method for obtaining trend data from unlike surveys. Popularity is based on a rank order of percentage of population participating in specific activities. Some caution should be used in comparing rankings because activity lists and activity descriptions vary between surveys. For example, in the 1960 NRS, the respondents were asked to indicate participation in 20 activities. In the 1982 NRS, there was a list of 36 activities from which to choose. Therefore any analysis should emphasize the relative popularity of activities, rather than comparing the actual number of participants determined by the various studies.

Five surveys conducted between 1960 and 1982 were chosen to compare popularity rankings (table 1). Picnicking was the most popular activity in all the

surveys except for the most recent. The most dramatic change is seen in bicycling, which gained in popularity over boating between 1960 and 1982. Swimming and walking for pleasure became more popular than picnicking and driving for pleasure. This corresponds to the observed trend toward a more active lifestyle for many Americans.

Table 1.--Relative popularity rankings of selected activities, 1960-82

Activity	Popularity rank by year and study				
	1960 ORRRC ¹	1965 NRS ²	1972 BOR ³	1977 BOR	1982 NRS
Picnicking	1	1	1	1	4
Driving for pleasure	2	2	2	2	4
swimming	3	4	4	3	1
Walking	4	3	3	-	2
Fishing	5	5	5	4	5
Boating	6	6	7	6	7
Bicycling	9	7	9	5	6
Camping	10	10	8	8	8

¹Outdoor Recreation Resources Review Commission.

²National Recreation Surveys.

³Bureau of Outdoor Recreation.

Note: This table uses data provided by Bevins and Wilcox (1980), to create relative popularity ranks for activities (1 = most popular) for the activities shown. This method assumes that each survey provides valid popularity ranks while allowing methodology differences among the cited surveys.

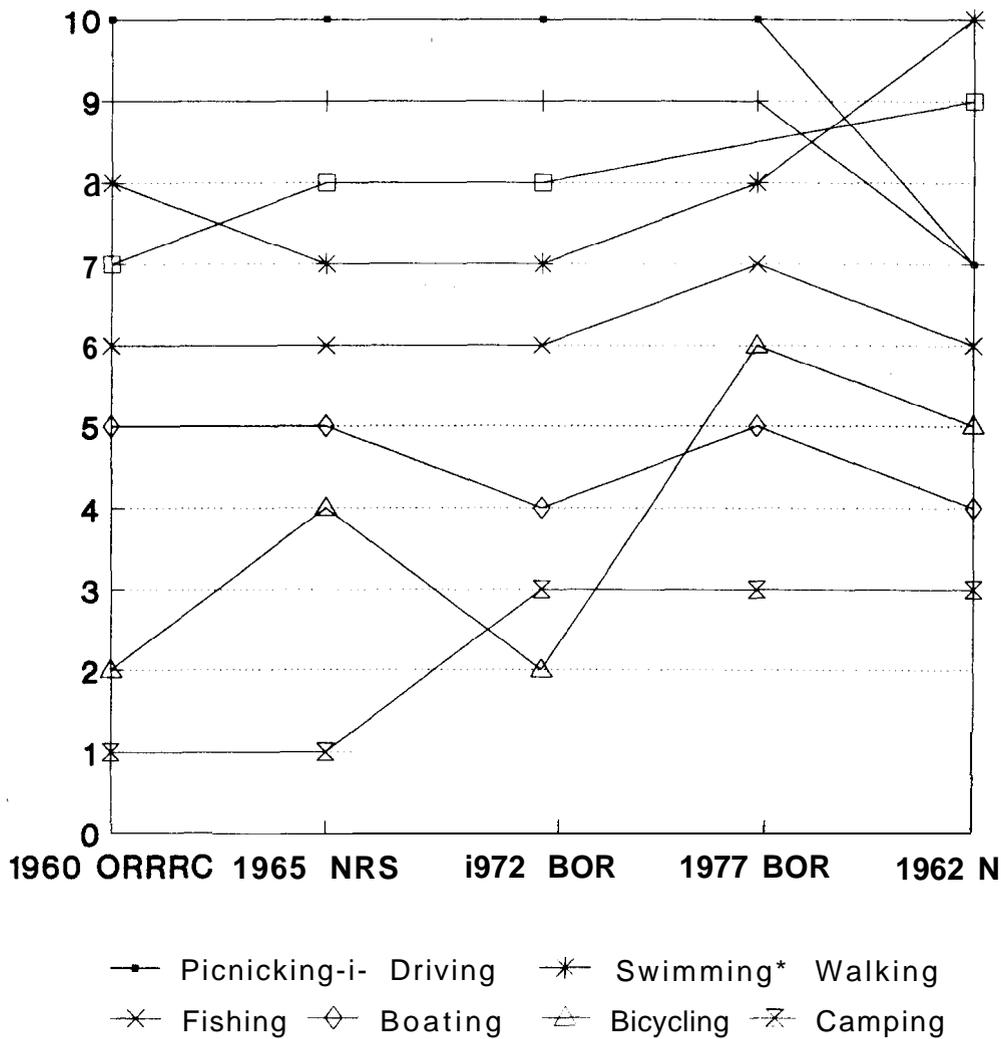


Figure 6. -Relative popularity rankings of selected activities, 1960-1982.

RECENT TRENDS AND CURRENT PARTICIPATION IN OUTDOOR RECREATION

The data source being used most heavily in the RPA Assessment for a description of current participation is the Public Area Recreation Visitor Study (PARVS). PARVS is an interagency onsite survey of visitors to Federal and State recreation areas nationwide. Five Federal agencies and 12 State agencies participated in this survey between 1985 and 1987, contacting over 36,000 visitors and resulting in almost 32,000 usable interviews using a complex survey instrument with over 1,100 variables. The origins of the respondents (using unweighted data) roughly approximate the geographic distribution of the population of the United States (fig. 6). Additional information describing the methods and purposes of PARVS has been documented by Cordell and others (1987). One of the many purposes of PARVS is to

provide an examination of the annual outdoor recreation activities of the visitors to public recreation areas represented by the sample.

Sufficient information is available in the survey instrument and other sources (such as the 1982433 National Recreation Survey and the National Park Service's Fee Reports) to allow weighting to provide an approximation of the annual recreation participation patterns of the recreating U.S. population. PARVS data are weighted to correct for an over-representation of overnight users, and weighted to represent the demographic characteristics of the U.S. population using information from the U.S. Bureau of the Census.

PARVS respondents reported individual annual participation in outdoor recreation activities. This participation was the basis for nationwide estimates of annual participation by residents over 11 years old. These data were developed through personal interviews with visitors to recreation sites, as opposed

to an origin-based sample of the population. As a result, annual profiles of the population had to be derived to adjust for population changes.

The procedure involved adjustment of the distribution of sampled PARVS respondents so that they proportionately represented the distribution of people over age 11 within defined population strata. Weighting these PARVS data in this manner was necessary to enable pooling across strata. Four types of population strata were recognized for each identified community: gender, age, urban or rural residence, and race. These characteristics were common to both the Census of Population and the PARVS sample.

Underrepresentation or overrepresentation among the gender-age-residence-race- defined strata was identified by comparing the percentage distribution

of respondents of the **PARVS** sample to the percentage distribution of the total population. Further adjustment was made to account for differences in probabilities of being included in the PARVS sample. The basic determinant of this probability differential was between day and overnight users and whether the interview site was Federal or State administered. Sampling rates and schedules differed among these sampling strata.

Each PARVS respondent was subsequently assigned a population-to-sample distributional ratio that weighted all data provided by each respondent. This made their responses proportionate to the national proportion of the population in the State matching the respondent's profile. These weighted responses then represented the equivalent of an origin-based survey for obtaining estimates of **year-**

Table 2. --Comparison of participation in outdoor recreation activities, **1977-87**

Activity group and type of activity	Percentage of participants participating at least once annually	
	1977 (households)	1987 (individuals)
Land:		
Camping (developed)	30	35
Camping (dispersed 1977)	21	--
(primitive 1987)	--	14
Driving off-road vehicles	26	9
Hiking	28	24
Horseback riding	15	9
Nature study/photography	50	36
Picnicking	72	46
Pleasure driving	69	45
Sightseeing	62	47
Water:		
Canoeing	16	14
Sailing	11	8
Other boating	34	9
Swimming outdoors	61	--
Outdoor pool swimming	--	50
Nonpool swimming	--	32
Water skiing	16	13
Snow and Ice:		
Cross-country skiing	2	7
Downhill skiing	7	10
Ice-skating	16	6
Sledding	21	9
Snowmobiling	8	3

Source: U.S. Department of Interior, Heritage, Conservation, and Recreation Services. **1977** National Outdoor Recreation Plan, from the Forest Service's 1979 Resources Planning Act Assessment; **1985-87** Public Area Recreation Visitor Survey.

Note: Sampling and methods were somewhat different between the two cited studies. The **1977** study reported percentage of households participating in outdoor recreation in the United States by type of activity. The **1985-87** study reports percentage participation of individuals who use resource-based public recreation areas.

round participation, socioeconomic characteristics, residence situation, population, and other attributes of subregional communities from which recreation trips were generated.

Trends Since the 1979 Assessment

Table 2 presents a basic comparison between outdoor recreation participation at the time of the last RPA Assessment and current participation. Some cautions are in order when making direct comparisons between the Federal Estate Visitor Survey (FEVS) used in the 1979 RPA Assessment of Outdoor Recreation and Wilderness and the 1985-87 Public Area Recreation Visitor Study (PARVS) used in the current RPA Assessment. Although care was taken to ensure comparability between the surveys, differences in the survey instrument and other survey methods may indicate some caution in interpretation of comparisons between the two studies. The FEVS reported percentage of households participating, whereas the PARVS reported percentage of individuals participating. As shown in table 1, the primary viable comparisons that can be made are also in popularity rank. Table 3 provides such a rank comparison and indicates relative increases in popularity in downhill skiing, swimming outdoors, canoeing/kayaking, water-skiing, and cross-country skiing, and relative declines in 'other boating' (includes all boating other than canoeing or sailing), driving vehicles off road,

sledding, ice-skating, picnicking, and pleasure driving. It appears that some of the more active recreational pursuits have become more popular, and some of the more passive activities have declined in relative popularity.

Current Participation in Outdoor Recreation

PARVS is the primary data set used in the RPA Assessment to describe current participation in outdoor recreation. PARVS is a rich data source, providing many analysis possibilities for annual participation in recreation activities. Space limitations prevent an exhaustive presentation of the findings of that study, but a synopsis of findings plus a sample of the detailed results for some representative activities will be presented here.

Table 4 provides an overview of two important aspects of recreation participation for 25 popular activities-the percentage of the population participating one or more times annually, and the median number days of annual participation by those individuals who participate. Table 5 provides median length of stay and one-way travel miles by the respondents' indicated "main" activity on site, for primary or single destination trips. Figure 7 presents a list of those activities most commonly participated

Table 3.--Rank order popularity of outdoor recreation activities, by percentage of population participating one or more times annually

1977 FEVS	1985-87 PARVS
1 Picnicking	1 Outdoor pool swimming
2 Pleasure driving	2 Sightseeing
2 Sightseeing	3 Picnicking
2 Swimming outdoors	4 Pleasure driving
5 Nature study/photography	5 Nature study/photography
6 Other boating	6 Camping (developed)
7 Camping (developed)	7 Nonpool swimming
8 Hiking	8 Hiking
9 Driving off-road vehicles	9 Camping (primitive 1987)
10 Camping (dispersed 1977)	Canoeing
10 Sledding	10 Water-skiing
11 Canoeing	11 Downhill skiing
Water-skiing	12 Driving off-road vehicles
Ice-skating	Horseback riding
12 Horseback riding	Other boating
13 Sailing	Sledding
14 Snowmobiling	13 Sailing
15 Downhill skiing	14 Cross-country skiing
16 Cross-country skiing	15 Ice-skating

Source: 1977 Federal Estate Visitor Survey; 1985-87 Public Area Recreation Visitor Survey.

Table 4.--Annual participation characteristics of selected outdoor recreation activities

Activity group and type of activity	Percentage of population participating one or more times annually	Median number of days of participation annually by those people who participate
Land-based activities:		
Sightseeing	46.9	12
Picnicking	46.2	6
Walking for pleasure	41.3	29
Driving for pleasure	38.4	19
Nature study/photography	36.2	13
Developed camping	34.9	7
Day hiking	23.8	5
Primitive camping	14.2	5
Other hunting	11.8	9
Backpacking	10.4	4
Big-game hunting	9.9	7
Driving ORVs	9.2	10
Horseback riding	8.6	2
Water-based activities:		
Swimming outdoors	50.3	17
Warmwater & saltwater fishing	30.9	10
Motorboating	22.2	7
Coldwater fishing	16.7	7
Water-skiing	12.9	4
Canoeing/Kayaking	13.9	2
Sailing	7.5	2
Snow and ice-based activities:		
Downhill skiing	9.8	4
Sledding	9.3	3
Cross-country skiing	6.5	4
Ice-skating	6.0	2
Snowmobiling	2.7	3

Source: 1985-87 Public Area Recreation Visitor Survey, compiled by the Outdoor Recreation and Wilderness Assessment Group, Athens, GA. Percentage participation figures represent percentage of the American public who use Federal and State recreation areas and participate in the activities listed. Days of participation figures are the median number of days of participation by those individuals in the sample who participate in the selected activity.

in by recreationists during their stays at the resource-based Federal and State recreation areas included in the PARVS sample.

As can be seen by these data, the various measures of participation do not necessarily result in similar rankings of activities. Swimming outdoors, sightseeing, picnicking, and walking for pleasure are the most "popular" activities in terms of the percentage of the population participating at least once annually (table 4). However, if one considers the number of

times participants engage in the activities, the ranking of "popularity" changes dramatically. By this second measure, the most 'popular activities are running/jogging, walking for pleasure, driving for pleasure, bicycling, and swimming outdoors. A third measure of popularity is the length of stay on site for the designated 'main' activity. By this measure, the most 'popular' activities are developed camping, big-game hunting, primitive camping, backpacking, and 'no main activity.'

Table 5. --Median length of stay and one-way travel miles of selected "main" outdoor recreation activities

Type of activity	Median length of stay (hours)	Median one-way travel miles (days)
Developed camping	75	81
Big-game hunting	69	70
Primitive camping	62	100
Backpacking	49	160
No main activity	48	98
Saltwater fishing	28	145
Cold freshwater fishing	12	79
Motorboating	11	53
Canoeing or kayaking	9	85
Wildlife observation & photography	7	171
Anadromous fishing	7	55
Warmwater fishing	6	39
Driving ORVs	6	69
Day hiking	5	56
Outdoor pool swimming	4	23
Other outdoor swimming	4	29
Sightseeing	4	79
Small-game hunting	4	30
Picnicking	4	30
Walking for pleasure	3	25
Driving for pleasure	2	20

Source: 1985-87 Public Area Recreation Visitor Survey, compiled by the Outdoor Recreation and Wilderness Assessment Group, Athens, GA. All figures represent responses related to the activity selected as the "main" reason for coming to the site. Length of stay was calculated by subtracting the arrival time from the departure time (or anticipated departure time), and converting to hours. Both sets of figures are for single destination or primary destination trips only.

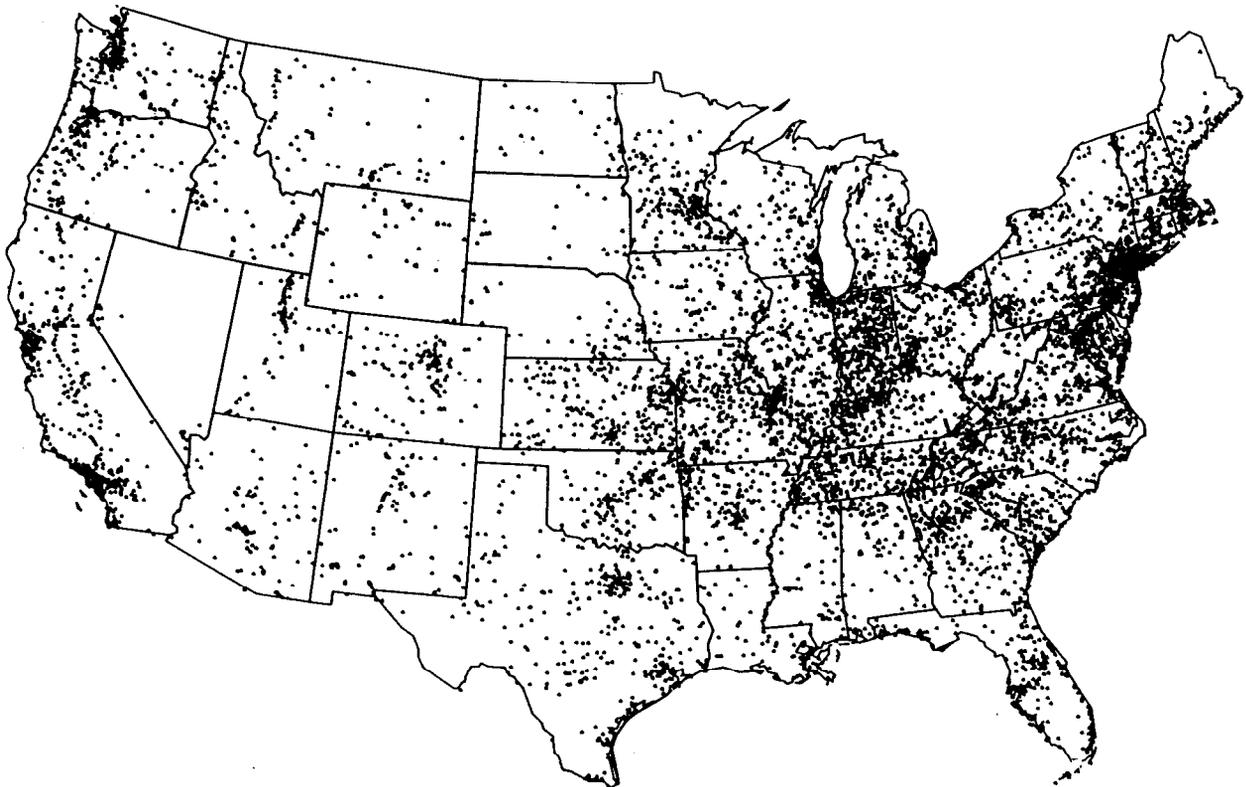


Figure 7. -Origins of all U.S. respondents interviewed in the 1985-87 Public Area Recreation Visitor Survey (PARVS).

Clearly, no single measure of recreation participation adequately measures popularity of the activity. Demographic characteristics such as age, gender, income, and region of the country in which one resides also are related to participation in outdoor recreation. As popularity of various activities may change according to these demographic or regional breakdowns, a clear picture of differences in participation is difficult to obtain. To provide a clear snapshot of the overall amount of participation and the characteristics of the participants, a figure containing six graphics was prepared as background material for each of the activities examined. These graphics were: percentage of the population participating, frequency of participation by participants, gender ratio of participants, age of participants (compared with the U.S. population), income levels of participants (compared with the U.S. population), and region of participation. A sample of these graphics representing sightseeing, walking for pleasure, water-skiing, and big-game hunting are presented in figures 8 to 11.

These figures provide some of the more important characteristics of participation in outdoor recreation. Clockwise from the top-left graphic of each figure, the first graphic represents the percentage of the U.S. population who participated at least one time in the previous 12 months in the activity. The next figure shows how many days per year those participants engage in the activity. Below that figure, a comparison of the age distribution of people who participate at least one time each year is made with the age distribution of the U.S. population. The bottom-right figure indicates the percentage of the PARVS respondents who participated in the activity according to the RPA region in which they were recreating. The bottom-left figure presents a comparison of the distribution of the annual family income (before taxes) of participants with the income distribution of the U.S. population. The final graphic presents a gender ratio of participants.

These graphic sets show that each of the example activities has a somewhat different clientele and pattern of participation. Figure 8 shows sightseeing to be a common activity across the U.S. population, with half of the participants participating at least 10

or more days each year. Sightseeing is a life-long activity, with a slight over-representation of individuals aged 25 to 35. People recreating in the Pacific Coast sightsee more commonly than in other regions, and individuals with midrange family incomes of \$20,000 to \$50,000 are common participants in this activity. Most participants in sightseeing are women, by a slight margin,

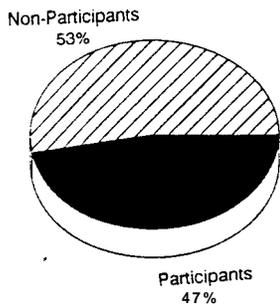
Figure 9 presents a similar capsule of participants in walking for pleasure. This is also a popular activity; individuals who participate tend to engage in this activity quite frequently-with 20 percent participating 120 days or more annually. This activity is also lifelong, more evenly distributed among the RPA regions, favored by mid-income individuals, and also favored by women.

Figure 10 provides statistics on an activity with a smaller clientele-water-skiing. Only about 13 percent of the U.S. population participates in water-skiing, and half of those individuals participate only about 4 days annually. A review of these graphics reveals that participants are largely young, more likely to be upper-income males, with somewhat higher percentages of participation in the Rocky Mountains/Great Plains region.

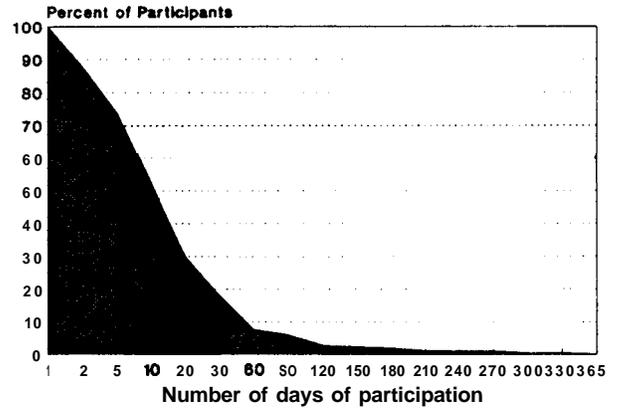
Big-game hunters are represented in figure 11. This activity also has a specific group of participants. About 10 percent of the U.S. population who use resource-based Federal and State recreation areas participate in big-game hunting. For this activity, the number of days of participation is limited by hunting seasons-only about half the big-game hunters participate over 7 days annually. The most dominant characteristic of these recreationists is the gender ratio, with less than 20 percent females. Those individuals under age 45 are overrepresented as participants, although many older individuals continue to hunt big game.

Space limitations prohibit additional examination of specific activities, but many more activities will be examined in the RPA Assessment of Outdoor Recreation and Wilderness and in a planned final descriptive report of the Public Area Recreation Visitor Study.

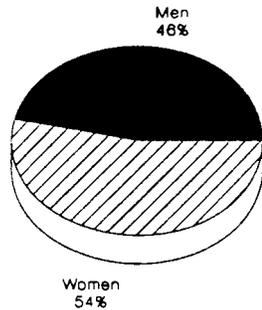
Percent of U.S. Population Participating in Sightseeing



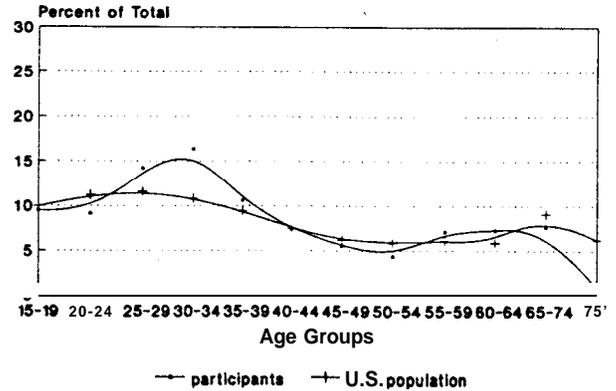
Frequency of Participation in Sightseeing



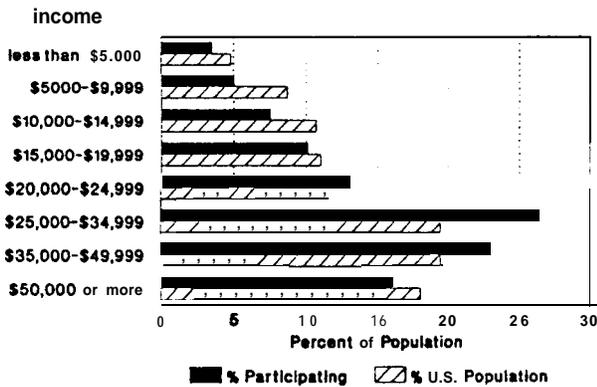
Gender Differences in Participation in Sightseeing



Age Differences in Participation in Sightseeing



Income Differences in Participation in Sightseeing



Percent of Recreationists Participating in Sightseeing During their Visit, by Destination Region

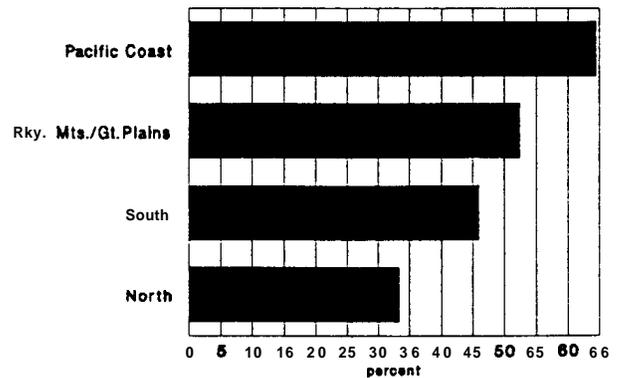
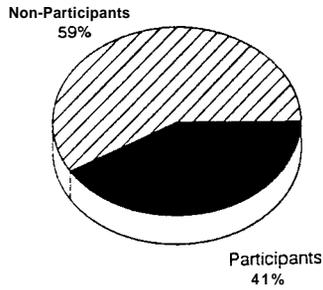
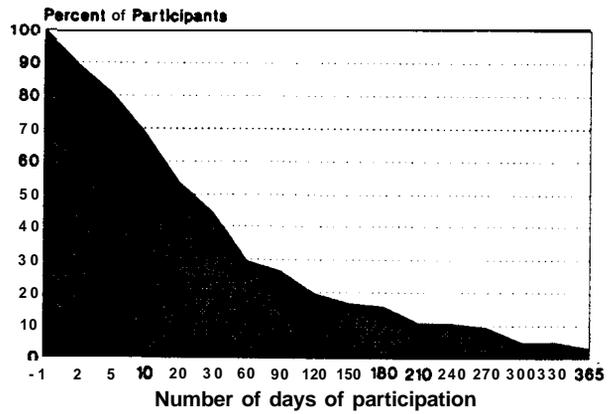


Figure 8. -Characteristics of participants in sightseeing.

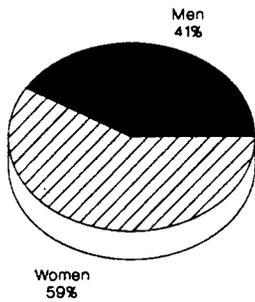
Percent of U.S. Population Participating in Walking for Pleasure



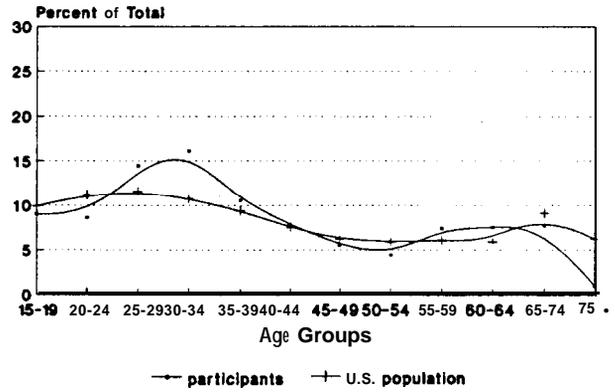
Frequency of Participation in Walking for Pleasure



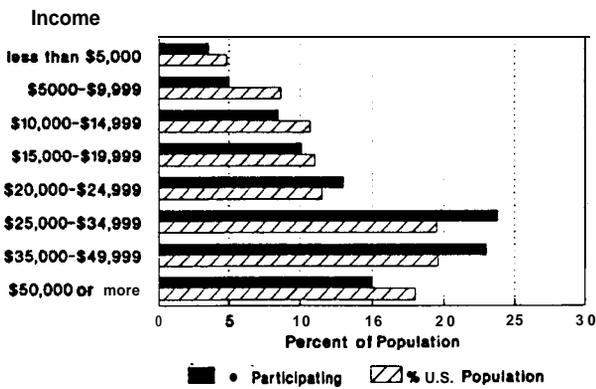
Gender Differences in Participation in Walking For Pleasure



Age Differences in Participation in Walking For Pleasure



Income Differences in Participation in Walking for Pleasure



Percent of Recreationists Participating in Walking for Pleasure During Their Visit, by Destination Region

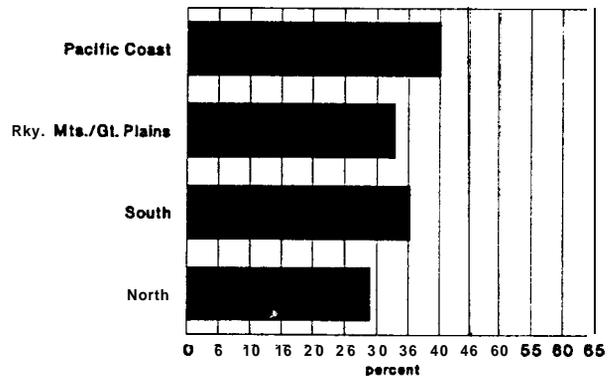
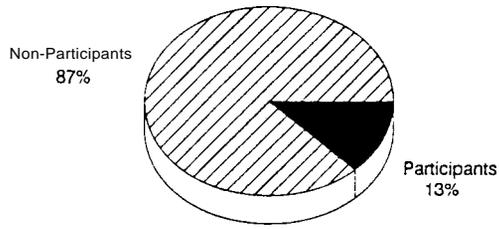
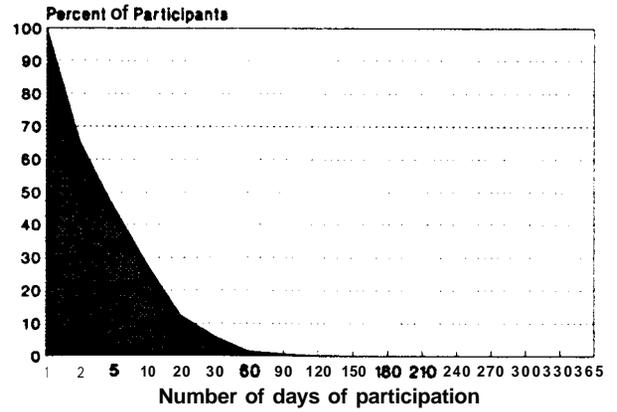


Figure 9. -Characteristics of participants in walking for pleasure.

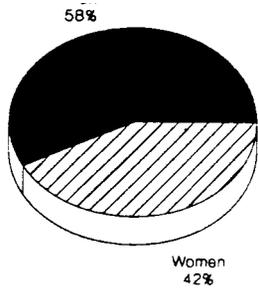
Percent of U.S. Population Participating in Water Skiing



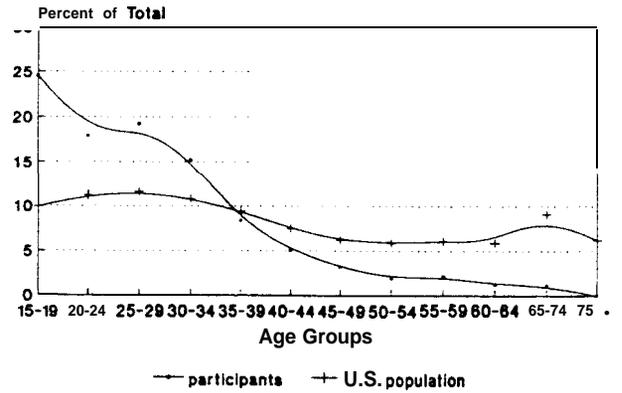
Frequency of Participation in Waterskiing



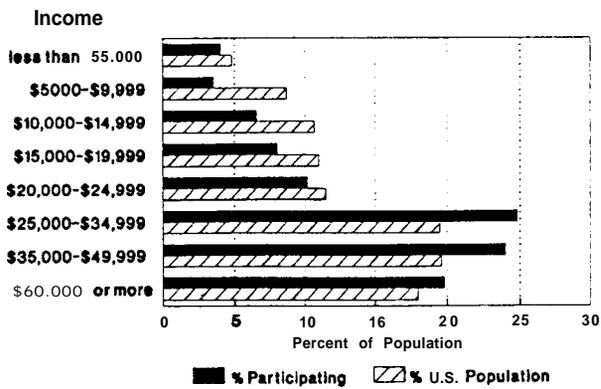
Gender Differences in Participation in Water Skiing



Age Differences in Participation in Water Skiing



Income Differences in Participation in Waterskiing



Percent of Recreationists Participating in Water Skiing During Their Visit, by Destination Region

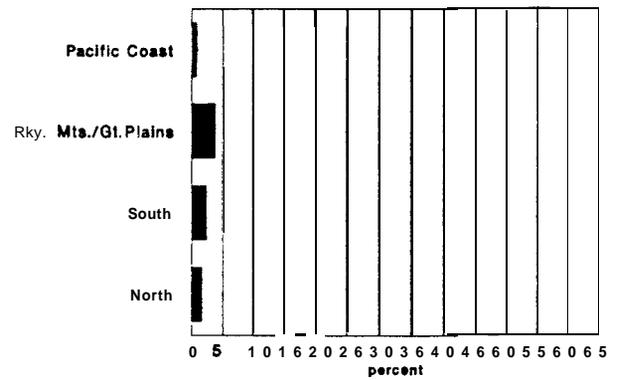
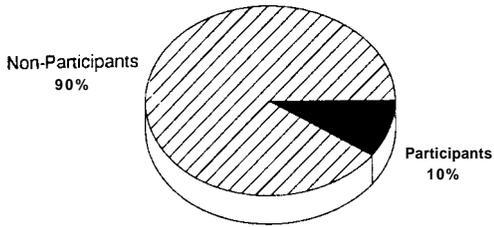
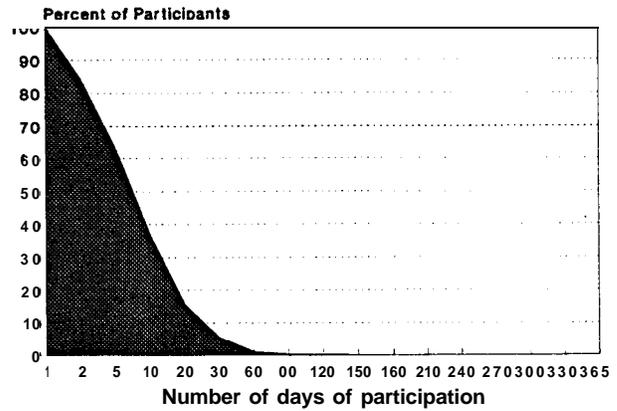


Figure 10. -Characteristics of participants in water skiing.

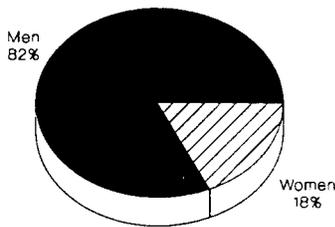
Percent of U.S. Population Participating in Big Game Hunting



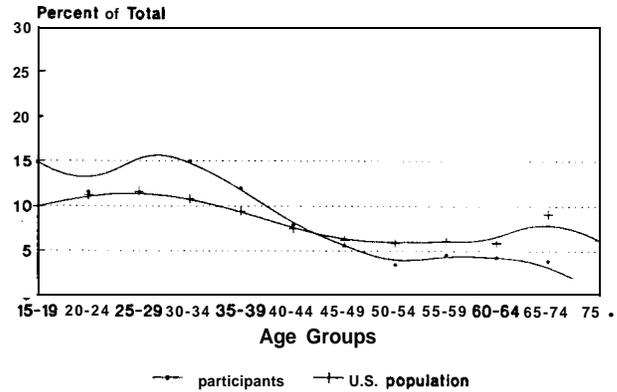
Frequency of Participation in Big Game Hunting



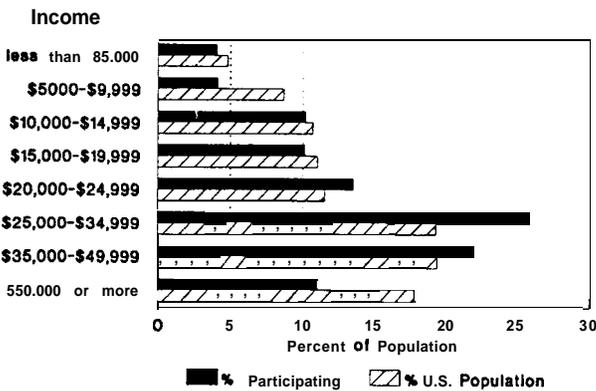
Gender Differences in Participation in Big Game Hunting



Age Differences in Participation in Big Game Hunting



Income Differences in Participation in Big Game Hunting



Percent of Recreationists Participating in Big Game Hunting During Their Visit, by Destination Region

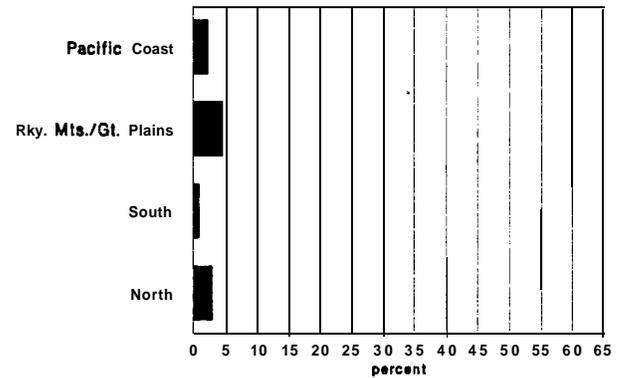


Figure 11. – Characteristics of participants in big-game hunting.

CONCLUSIONS AND INTERPRETATION OF RESULTS

Conclusions

Overall descriptions of participation in outdoor recreation such as presented in this paper are essential for identifying trends in participation and obtaining a better understanding of which segments of the U.S. population are being served by **resource**-based outdoor recreation opportunities. Some of the primary findings from this latest examination of recreation participation are:

- 1) Although the amount of leisure available for the average American has been increasing for many years, it appears that this trend has reversed recently, with declining amounts of leisure **due to changes** in societal structure.
- 2) Differences in methods used in different national surveys make trend identification very difficult, with only the most general conclusions possible.
- 3) There has been a gradual change in the popularity of outdoor recreation activities over the past 20 years, with the more active pursuits becoming more popular.
- 4) Swimming and walking for pleasure are now done by a majority of recreationists on State and Federal lands.
- 5) It appears that the extended vacation of 2 or more weeks is being replaced by more frequent but shorter trips.
- 6) Several measures of participation are necessary to give an accurate representation of the participants in any single activity.

Opportunity or Need for Improved Resource Management

Although this paper did not specifically address resource management issues, some observations are applicable to managers. There appears to be a continuing trend of increased participation in more active forms of outdoor recreation. Managers should be aware of this trend, and perhaps place additional emphasis on provision of these sorts of activities on their areas. Also specific activities may have very different clientele, with different needs. For example, while walking for pleasure is common across many strata of the population, big-game hunters are a

much more narrow group (considering demographic characteristics), and would require different management techniques.

Future Significance of the Topic

Identifying current outdoor recreation participation levels and patterns will continue to be an important area of investigation, especially for long-range planning. Data presented in this paper and in the RPA Assessment of Outdoor Recreation and Wilderness highlight differences in activity participation, depending on social characteristics. For example, some activities have specific clientele groups, such as big-game hunting (male dominated), and **water**-skiing (youth-oriented). Other activities are much more common throughout the general population, such as walking for pleasure and sightseeing.

With predicted changes in demographics of the U.S. population, some activities will likely be affected more than others, based on the above findings. For example, with an aging population, it is possible to draw the conclusion that youth-dominated activities such as water-skiing will decline in relative popularity, while other lifelong activities such as walking for pleasure will maintain or perhaps increase their current level of participation,

Barriers and Constraints

The issue of barriers and constraints can be addressed from several perspectives. First, collection of population-level data of this sort is very expensive, and may be prohibitive for any single agency or organization. However, the need for these sort of data will remain for all resource management agencies. In an era of reduced government budgets, the most cost-effective manner of data collection is through multiple-agency cooperative working arrangements, such as evidenced by the PARVS project.

Second, the data presented in this paper and the RPA Assessment illustrate the importance of sociodemographic constraints on participation. Age is the most obvious related factor – **recreationists** under about age 45 (depending on activity) are overrepresented in comparison with the U.S. population. For most activities, older individuals are strongly underrepresented as recreationists. For some activities, income seems to be an important restriction to participation, as does gender. There is little that recreation providers can do to alleviate these constraints, however.

Third, the regional differences in the resource itself either permit or prohibit participation in certain activities. In this paper, sightseeing was shown to be more popular in the Pacific Coast region than other regions. The RPA Assessment shows that other activities also have regional participation biases, probably indicating differences in supply and demand.

Guidelines for Improving Baseline

There is a clear need for long-term coordination of national data on outdoor recreation participation. **With** major and minor differences in survey instruments and methods, it is often very difficult to make comparisons between national surveys to develop long-term trends in outdoor recreation participation. Often, only the most general trend identification is possible. It is strongly recommended that future national studies pay careful attention to the work that has gone before, to make trend identification more precise in future studies. It is recommended that the Public Area Recreation Visitor Study be used as a benchmark for future national studies, which would use comparable methods and survey instruments, to allow identification of long-term trends.

There are many measures of recreation **participa-**tion, each with its own advantages. Participation should not be measured only by the percentage of the general population who participates one or more times annually. By itself this measure represents only a part of the story. Frequency of participation by those who participate is also an important indicator of popularity of an activity. Other measures may also provide clues of future participation. For example, the data presented here indicate that older individuals continue to participate in sightseeing more than many other activities. **With** an aging population, it is logical to assume that participation in sightseeing will increase relative to some of the other activities whose major participation group is younger people. The authors have concluded that the most useful form of presentation of participation data is to present several measures of participation for each activity considered, as has been demonstrated in this publication.

QUESTIONS FOR THOUGHT AND DISCUSSION

It seems that most research raises more questions than it answers, as was the case with this investigation. The following questions are provided to provoke the reader to think beyond the observations and conclusions provided above.

1) Data from this study show that fewer individuals participate in outdoor recreation as they age, but also that the population as a whole is more active than in previous years. As this age cohort grows older, will their more active lifestyle act to compensate for the general decline in participation as people age? In other words, will the future elderly be more active than the current population of elderly?

2) What innovative methods are available to compare marginally comparable data sets?

3) It is clear that to identify long-term trends in outdoor recreation, someone must have the responsibility for collecting data and maintaining comparability. Who should have that responsibility, and what sorts of data should be collected? Should the emphasis be on maintaining continuity of data collection, or improvements in methods?

4) Societal changes influence recreational use of public lands. When the children of today grow into adults, how will the changes in family structure, economics, and land ethic values influence their use of natural resources for recreation and other purposes?

ACKNOWLEDGMENTS

The authors gratefully acknowledge the PARVS Working Group (Forest Service, National Park Service, Corps of Engineers, Tennessee Valley Authority, National Oceanic and Atmospheric Administration, and State park agencies in Georgia, Indiana, Kansas, Minnesota, Missouri, New Jersey, New Mexico, North Carolina, South Carolina, Tennessee, and Virginia) for permission to use the full PARVS data set in this study, prepared for the RPA Assessment.

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SCIENCE AND TECHNOLOGY-THE WILD CARDS IN TOURISM STRATEGIC PLANNING

Elwood L. Shafer and George Moeller¹

Abstract.— Science and technology (S&T) outside the normal sphere of tourism research can dramatically affect demand and supply patterns within the tourism phenomena. S&T are often the wild cards in the tourism strategic planning game -appearing unexpectedly, creating entirely new markets, or causing further segmentation of current ones. Coping with the uncertainty of S&T is an essential aspect of forest tourism planning. This paper describes some of those S&T wild cards that were gleaned from over 100 popular and scientific articles involving: video, transportation, medicine, recreation equipment, the natural sciences, the built environment, and computers/robotics/space.

the Situation'; that is, to ask itself the question: What business are we really in (Iacocca 1984; Naisbitt 1982; Naisbitt and Aburdene 1985)? One of the businesses natural resource managers are in may not be what the profession has traditionally called the recreation business or even the leisure business, but rather; the tourism business. The classic definition of tourism is: Attracting visitors and catering to their needs and expectations (McIntosh and Goeldner 1984). From a historical perspective, therefore, tourism has been an important, integral part of natural resource management for more than half a century. As the demand for forest tourism has increased, consumer behavior has not necessarily conformed to classic economic and marketing theory-because of rapid and sometimes unexpected advances in S&T (Massey 1979; Naisbitt 1987).

INTRODUCTION

There's one thing public and private forest tourism managers have to prepare for in the future-the future. No matter what the future may bring, examining current and potential breakthroughs in science and technology (S&T) can help these managers get ready for the future. By exploring S&T- especially outside the normal sphere of recreation research – managers can anticipate the future needs and use patterns of forest tourists. Consequently, the tourism management solutions provided today may work tomorrow. Solutions that last will help sustain a positive customer perception of public and private forest tourism plans and programs and embody professional commitment to connect science and technology developed in the past with that which will exist years from now.

Modern managers and strategic planners have emphasized that every public or private organization that wants to prosper needs to invoke the "Law of

The conventional ways of looking at consumer behavior-especially in tourism – are becoming outdated very quickly. For example, it is no longer possible to predict the purchasing habits of consumers of almost any product or service simply by labeling a group as a new segment of the market. A world of paradoxes in tourism and leisure behavior is emerging where existing opposites operate simultaneously (Naisbitt and Aburdene 1985). Greater sameness and greater diversity, plus greater security seeking and greater risk taking occur side by side. For example, there are sky-diving accountants all over the place, campers who drive air-conditioned vans to 'rough it' in the woods, and recreationists who drive air-conditioned cars to air-conditioned gyms where they sweat as much as they can. The same individuals may shop at both K-mart and Neiman-Marcus, own a sizable investment portfolio and trade it with a discount broker, fill a BMW with inexpensive self-serve gas, and go to **McDonalds** at lunch and a four-star restaurant for dinner. Leisure lifestyle mosaics are often elusive, inconsistent, and contradictory (Fensom 1984; Massey 1979; Perry 1987; Plawin and Blum 1987; Smith 1985).

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Because of the tremendous amount of market segmentation that is occurring throughout the leisure and tourism industry, leading forecasters emphasize that the multiple-profile consumer is here to stay (McIntosh and Goeldner 1984; Naisbitt 1982). If any service industry provides anything without knowing how consumer tastes, preferences, and perceptions are rapidly changing because of new S&T, that industry is in for an expensive shock (Iacocca 1984). As a result: (1) the conventional way of looking at tourism behavior is not only outdated but dangerous and (2) new approaches for analyzing the market need to consider the effects of oncoming S&T on future demand and supply (Kaufman 1983; Miller 1986; Naisbitt 1987; Sivy 1985). Furthermore, in the tourism strategic planning game, many times it is the S&T outside the normal sphere of tourism research that can affect most dramatically tourism demand and supply patterns. Breakthroughs in these areas of S&T are the wild cards in the planning process. They often seem to appear on the scene unexpectedly and create entirely new markets or significantly segment current ones.

This paper describes some of the oncoming S&T that may have profound influences on tourism planning and development in the coming decades. Over 100 popular and scientific articles were explored in order to provide visions of how S&T will create new challenges and solutions in future tourism programming and planning. Areas of S&T examined include: video, transportation, medicine, recreation equipment, the natural sciences, the built environment, and computers/robotics/space.

VIDEO

Just as the invention of movable type in the 1400's made mass literacy possible and changed Western society from an oral to a written culture, so the video S&T of the 20th and 21st centuries will revolutionize traditional patterns of supply and demand for tourism.

Breakthroughs in video S&T over the next 10 to 20 years will have countervailing effects on tourism demand and the need to supply natural environments for tourism activities. The following expected scientific advances will allow individuals to enjoy various attributes of natural environments in their own homes and, consequently, may generate a stronger desire to visit the actual environments.

- Videocycles -a combination of a stationary exercise bike and a TV/VCR- will be used extensively by bikers at home to tour scenic routes in forested and urban environments, complete with exciting background music (Country Technology 1987-88).

- Image libraries will be available for home viewing that will contain all the world's best art. Inexpensive flat panel-display devices will be available, throughout the house, with a resolution so good that viewing a projection will be like looking at the original oil painting (Booth 1986; Long 1987).

- People will be able to create their own images and scenes on their TV screens; the viewer will be able to simulate just about anything. For example, if a person wanted to enjoy a raft trip down the Grand Canyon of the Colorado River, it will be possible to call up the image on a wall-size TV and with a raft at home the viewer will experience the sensation of the trip (Hartley 1987; Rochester 1986).

- TV images will rival 35-mm film quality and be wall-projection units. Digital TV will allow the viewer to become a participant in the actual production. For example, if a person put a wager on the wrong football team, he can take a picture of the quarterback, superimpose him scoring the winning play, and at least get the thrill of having the play turn out the way he wanted it to (Long 1987').

- sensavision TV will allow the viewer to feel temperature, humidity, smell, and to walk around in the scene because the whole room will be part of the TV set. With sensavision, viewers will be able to feel the thrill of victory or the agony of defeat in whatever activity they care choose (Long 1987).

- As simulators become more realistic, people will be able to enjoy the breath-taking thrills of high-risk tourism experiences such as sky diving, mountain climbing, or underwater explorations with scuba gear without leaving home (Anon. 1987).

Meanwhile, a few examples of video S&T at tourism locations that will help to increase demand and create a greater need to supply onsite facilities include the following.

- Video tapes will be used on location in specific recreational environments to train tourists to become more skilled at whatever they are doing-skiing, scuba diving, or sailing, for example-so participants can almost instantly apply what they have seen on videotape to their activity (Sybervision 1987).

- in-room checkout to menu-driven displays on guest room televisions will be commonplace in resorts and hotels (Cetron and Rocha 1987; McCoy 1987).
- Rather than read about a tourist destination in a travel guide, the average consumer will view travel video tapes of several potential destinations prior to making a decision about which trip to take (International Video Network, n.d.; Kennedy 1987).
- Existing flight simulators generally place a person behind the controls of comparatively tame private planes. In the future, computer programs will not only teach basic flying skills, but also provide instructions on advanced maneuvers and stunts. The characteristics of many different kinds of planes will be simulated-from World War I classics to rocket planes and experimental aircraft. Viewers will be able to put them all through their paces in the privacy of their own home (Electronic Arts 1987).

TRANSPORTATION

The overall effects of advances in S&T in transportation will be a greater increase in demand and supply for forest tourism activities. Future transportation will be faster, easier, and more comfortable.

- Cars will contain many of the sights, sounds, and comforts of home: Video map displays of the car's position, car phones, facsimile machines, lap-top computers that can send and receive data, answering machines, and sound systems for high-tech compact disc players (Cook 1987; Wiener 1987).
- Magnetic trains- trains that literally fly between cities on cushions of electromagnetism-will be making short trips (for example, Los Angeles to Las Vegas) faster and more comfortably than airlines can manage today (Black 1984; Lemonick 1987).
- A new x ray scanner will be used in airports to detect plastic weapons used by terrorists (Tracy 1986).
- The average price of a new car in the year 2020 will be \$70,000, with a gas mileage of 100 miles per gallon (Naisbitt 1986).
- An aerospace plane, about the size of a Boeing 727 and able to take off and land at regular airports, will fly coast to coast in about 12 minutes (Kristof 1987; Siwolop 1985).
- scheduled commercial flights from New York to Tokyo will take about 2 hours (Yeager 1986).

- A 25-passenger tilt-rotor aircraft will be used to provide short trips between major cities in Europe that are 600 miles or less apart. It will take off from downtown heliports and when aloft change to a conventional cruise flight; plus, it will cost half as much to operate but fly twice as fast as most helicopters (Siwolop 1987).
- Future commercial airplanes will be safer, cheaper to operate, more flexible in seating, and more comfortable (Scheffer 1987).
- Multiple transportation cars that convert to an airplane will be fuel efficient and economically accessible to the tourist (Hoyt 1986; Kocivar 1987).
- vertical takeoff and landing vehicles-that cruise 225 mph above daily traffic-will be used for everyday personal and commercial use (Moshier Technologies 1987).

MEDICINE

Major medical advances will enable people to live longer, healthier lives as science discovers new treatments for major disorders and even push back the frontiers of aging itself. Consequently, the forest-tourist population probably will be comprised of a greater proportion of more mature, physically active, healthier individuals who will seek a greater level of adventure and physical challenge than ever before. Some of those medical advances will include the following:

- Many of the diseases that plague humans today—cancer, arteriosclerosis, arthritis, diabetes, and many infectious diseases-will fade from the scene in the next 20 years because effective ways to prevent or treat them will be found (Bezold 1985; Carey 1985; Garr 1987; Kluger 1987).
- Genetic manipulation will help dispose of congenital defects that have plagued society for so long (Cetron and O'Toole 1982).
- **Research** in combating AIDS will allow science to deal more effectively with problems of the immune system, and out of this will come, among other things, a dramatic increase in the success and number of transplant operations (Carey 1986; Kluger 1987).
- In the next 20 years, there will be all kinds of transplants: heart, lung and brain-cell transplants (Long 1987).

● **There** will be an artificial liver, an artificial spleen, and an artificial pancreas (Cetron and O'Toole 1982).

● One great advance will be the discovery of some mechanism by which nerve tissue can be regenerated so that legions of paraplegics and quadriplegics can be rehabilitated (Long 1987).

● **A** portable, all-purpose weapon against bites from snakes, scorpions, fire ants, bees, and wasps will be in the form of a stun gun that short circuits the consequences of the bite (Franklin and Davis 1987).

● Nonaddictive pain killers- more powerful than morphine-will be commonplace (Pelt 1982).

● There will be medicines that improve and restore memory, stave off senility, cure Parkinson's and Alzheimer's disease, and heal spinal cords (Bezold 1985; Cusumano 1985; Kluger 1987).

● Medicines will be available that cure addictions to drugs and alcohol (Bloom 1985).

● **There** will be hormones for controlling weight, memory, and growth (Cetron and O'Toole 1982).

● Artificial hands, arms, and limbs will be available (Kashi 1987).

● **There** will be artificial blood that can be given to a person with any blood type and that carries none of the risks that human blood can (Pelt 1982).

RECREATION EQUIPMENT

Here, as in the case with video, S&T advances in recreation equipment will cause both increases and decreases in forest tourism demand and supply, but the overall effect will probably be more people spending more time, day and night, in forest environments at all times of the year.

● Outdoor recreation clothing, although extremely lightweight and breathable, will be resistant to cold, rain, heat, and tearing-allowing the user to wear just one outfit for all climates and conditions (Beercheck 1986; Doran 1986; Scherer 1987).

● Night-vision glasses will allow individuals to participate in outdoor recreation activities in the dark; off-road vehicles will be driven at night without headlights (Shaker and Finkelstein 1987).

● Electronic and other devices will be worn by outdoor enthusiasts to improve hearing, touch, sense of smell, strength, and coordination (Shaker and Finkelstein 1987).

● skycycles-one-person light aircraft with wingspans of a DC-9 jet-will be used to fly 25 miles or more at 15 miles per hour via pedal power (Ashley 1987).

● ultralight two-person aircraft will be popular for touring and soaring in the 1990's (Campbell 1986).

*Inflatable boats that can be stored in a closet, carried to the water in the smallest car, and used in places that are not accessible by conventional boat will be used extensively in the future (Bignami 1987).

● Laser tag, complete with space-suit uniforms and starelyte guns that fire harmless beams of invisible infrared light at opponents day or night, will increase in home and forest recreation environments (The Sharper Image 1986).

● Because more people can be expected to participate in tourism and outdoor recreation activities if they can quickly learn and enjoy the skills required, sports equipment manufacturers will invent new equipment that enhances participant success (Wendland 1986).

● Audio communication transceivers, that will fit in a shirt pocket, will be used by vacationers to report emergencies, communicate with their workplace or home, remotely turn on and off appliances at home, and participate in certain types of work (Lundberg 1985).

● Technology for extracting oxygen from seawater will be used to fuel underwater recreational vehicles for exploring shipwrecks and underwater environments (Ditlea 1987).

● Solar-powered bubbles (sunpods) will permit bathers to relax outdoors at home for an all-over tan even in below-freezing temperatures (Brody 1984).

● innovations in equipment will allow off-road vehicles to be converted for wheelchair riders (Nachivey 1986).

● supersubs will be developed as a kind of undersea tour bus with oversized windows and an interior like a passenger plane (Sitwell and Sedgwick 1984).

THE NATURAL SCIENCES

The overall impact of new S&T in the natural sciences will be to increase both demand and supply for forest tourism. Emerging technology will immensely improve the quality of natural environments, probably more so in the next several decades than in previous centuries. The resultant increase in environmental quality will stimulate demand and supply for leisure activities in natural environments.

- A chemical process will exist to embalm plants and young trees so they permanently can retain their lifelike appearance in home environments (Bronson 1987).

- Rainbow trout weighing as much as 100 pounds and maturing five times faster than normal will be developed through genetics research. Similar achievements will be realized for salmon, tuna, and other commercial fish (Anon. 1985).

@Techniques will be devised to communicate with one or more animal species that could eventually lead to the development of a universal translator device (Nobbe 1987b).

- **Science** will develop a grass that is self-weeding, can be grown in almost any climate or soil, needs no watering or fertilizer, and only needs to be mowed two or three times a year (Anon. 1987; Lawren 1987).

@Biotechnology will develop waste-eating bacteria to reduce or eliminate water pollution and toxic waste (Wallace 1987).

- **Hunters** in the United States will be able to hunt exotic wildlife from other parts of the world within a few hours' drive of their residence (Hass 1988).

- Marine biology research will provide a means to understand, predict, and perhaps even control the behavior of more useful or commercially valuable species, not just for human use but also for the species' own good (Nobbe 1987a).

@Extended weather forecasts of 2 or more weeks will be possible (Heckman 1987; Kiester 1986).

@Science will develop a practical way to make drinking water from the ocean (Bowker 1987; Glenn and O'Leary 1985).

THE BUILT ENVIRONMENT

S&T in the built environment will cause both increases and decreases in the tourism demand-supply phenomena. Some of the items that will create increases include the following:

- underwater hotels will attract the more adventurous leisure travelers who can peer at the undersea life through their bedroom windows (Barol and Belleville 1987).

- One-molecule thick glass that bends like Saran Wrap and molds into many shapes will be used to create tourism structures that blend esthetically in forest environments and have interiors with summer temperatures throughout the year (Huntington 1986).

- Geotextiles, a filament produced from a variety of sources to form a nonbiodegradable fabric, will be used to stabilize erosion of scenic forest roads and trails (Schmidt 1985).

*Energy-efficient earth shelters-those that use soil and sod for insulation-will be used in outdoor recreation facilities in hostile climates (Maranto 1987).

- Electrolytic accretion-a process that uses dissolved matter in seawater-will be used to build artificial reefs and grow startling, reeflike submarine cities (Lawren 1985; Hoban 1984).

On the other hand, certain other kinds of S&T related to the built environment will cause forest tourism demand to decrease.

- Many homes of the future will become self-contained islands in terms of leisure lifestyle and entertainment potential. Developers will build homes that cater to the individual recreational appetites of the buyer (Lurz 1985; Smay 1985; Sternlieb and Hughes 1985).

- The theme parks of the future will be **individual-experience** centers where technology will let people **role play...almost** anything. For example, a **Victorian-style** high-tech house is presently being constructed that transports visitors back into a romantic version of the previous century. The house includes a three-dimensional film theatre that employs vibrating chairs to simulate motion and a scent-projection state-of-the-art sound system (Simmons 1987).

- Restaurants will use spatial image projections in which holograms in the shapes of mystical figures will magically appear beside customers' tables to take their orders (Simmons 1987).

COMPUTERS, ROBOTICS, SPACE

The coming revolution in computers, robotics, and space will cause major changes in demand-supply conditions that stretch imagination to the limit.

- Fifty years from now, more of the world's surface may be used for farms, parkland, and wilderness because considerable quantities of industry will be moved into space (Asimov 1988).

@Robots will be built in the form of buildings that provide most of the services of modern hotels and that are run by an administrative computer (Barrett 1985).

- Robots will eventually occupy a large part in planning many tourism-related facilities and services—such as restaurants, landscaping, park design, and entertainment (Barrett 1985; Reeve 1987).

- Robots will be used to perform hazardous tasks such as rescue operations in remote environments (Anon. 1987; Kashi 1987).

- Artificial intelligence in human form will be used in educational courses designed to enhance human negotiation, management, and leadership **skills**—these machines will instruct, counsel, and evaluate the student's participation (Frاند 1987; Knasel 1986; Rogers 1987).

- Natural language software will be popular on mainframe and personal computers due to the higher fraction of novice users (Knasel 1986).

- computer programs that can draw conclusions will be used by tourism managers to help formulate the best program mix for clientele and to manage vast natural resources for a multiplicity of uses (Chait 1985; Kelly 1985).

- computers will make it possible to display and read almost any journal or magazine of particular interest to an individual—a mass medium tailored to the individual (Dolnick 1987).

- A pocket-size, voice-activated computer will be available that translates English into two or three languages (Stone 1986).

- conflict-negotiation computer games will be used by resource managers to define and choose alternative courses of action regarding tourism development versus nondevelopment in wild-land areas (Zweig 1986).

- Vandal-proofed computers will be installed at trailheads and along the trail to better explain the value of the environment and interpret what is being observed (McCann 1984).

- Computers eventually will possess artificial intelligence and mimic human senses and attitudes (Ditlea 1987; Rogers 1987, Waterbury 1987).

- A passenger module will be developed for the space shuttle that will carry passengers to an orbiting space hotel or act as a hotel module itself (Alcestis 1988; Davies 1985; Eskow 1986).

- Today's commercial airliner will be modified to become a space transport to deliver payloads to a low orbit for 90 percent less than the cost of a NASA shuttle flight (Lauren 1986).

- Eventually, it will be possible to create robotic immortality—a deathless universe in which life would go on forever by creating computer copies of our minds and transferring, or downloading, this program into robotic bodies. Once one copy of the brain's contents had been made, it would be possible to make multiple backup copies. This would allow anyone to embark on any sort of adventure without having to worry about aging or death. As decades passed into centuries, one could travel the globe and then the solar system and beyond (Dewitt 1987; Fjermedal 1986; Maranto 1987).

SUMMARY

To adapt to tomorrow's fast-unfolding world of forest tourism management, leaders at all levels must come to grips with a series of paradoxes, created by S&T, that may set some conventional management wisdom on its ear. The management principles managers have held dear in the past are undergoing relentless attack-and succumbing because of events in S&T that were unimagined even a decade ago. Today's successful forest tourism management leaders will be those who are most flexible of mind in adapting to new S&T. An ability to embrace new planning and management ideas, routinely challenge old ones, and live with paradox will be the effective leader's premier trait. Furthermore, the challenge is for a lifetime as new S&T will continue to emerge.

Essentially, the whole process of forest tourism management boils down to planning on uncertainty. Uncertainty is the complement of knowledge—the gap between what is known and what needs to be known to make correct decision. Dealing sensibly with uncertainty is not a byway on the road to responsible forest tourism management decisions — it

is central to it. To cope with future forest tourism planning, management, and research, **natural-resource** professionals need to be **renaissance**-thinking women and men. The need to imagine, perceive, and gauge the future are paramount professional attributes of the tourism professionals of tomorrow. The future forest tourism phenomena will be managed by today's professionals who look to the future and shape it into a strategic vision. The information presented in this paper has been aimed at helping create a genesis of that vision.

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Section 4.

Outdoor Recreation Demand Forecasting



METHODOLOGICAL ISSUES IN RPA FORECASTING

Daniel J. Stynes¹

Abstract – The present state of outdoor recreation forecasting is reviewed, current issues and problems are identified, and recommendations for improving recreation forecasting methods and their application are made.

INTRODUCTION

The primary job of this conference is to assess the state of forest and range outdoor recreation and wilderness resources relative to present and future demands. In this session we will focus on some of the analytical methods for going about this task. Methods are of more than academic interest, as alternative methods often yield substantially different results. Methods, theories, and models provide the basic frameworks for organizing a massive array of facts and converting these facts into useful information. If our theories, methods, and models are good ones, they provide guidance on questions to ask, where to look for answers, and sometimes the answers themselves. If they are bad ones, they pose the wrong questions, misdirect our attention and provide incorrect answers.

Given the inherent future orientation of planning and the need to anticipate future problems, opportunities, and decisions, our attention is drawn to the problem of forecasting recreation futures. For RPA we have the particularly difficult task of looking 50 years ahead, significantly further into the future than our past historical record. Although we will start with the very difficult problem of forecasting, we are hopeful we will be able to work our way back to some easier questions, the answers to which may provide some “benchmarks” to build upon.

THE PHENOMENON

Most projections of outdoor recreation supply and demand in the United States have their seeds in the ORRRC reports (1962). So do many of the methods. Major recreation forecasts in the United States tend to be associated with national recreation surveys, which provide a cross-sectional data base for estimating structural models; e.g., ORRRC (1962), Cicchetti and others (1969), Cicchetti (1973), Adams and others (1974), U.S. Department of Agriculture, Forest Service (1980b), Hof and Kaiser (1983), and Walsh and others (in press). Cordell and others (1985) review those studies published before 1985.

Recreation forecasting studies at regional (Abt Associates Inc. 1979; Scardino and others 1980) and State levels (Bevins and others 1981; Kalter and Gosse 1969; Schreuder 1977) have followed this same general approach, usually relying on structural models to forecast recreation participation. These structural models are based in econometric techniques, estimated from cross-sectional data and are generally best suited for short (less than 5 years) to medium range (5 to 10 years) forecasting. The models have been used in many instances to make quite long-range predictions.

Although econometric approaches have dominated recreation forecasting, the field has also borrowed to a lesser extent from technological and social forecasting (Martino 1972), and business and sales forecasting (Wheelwright and Makridakis 1985). Technological and social forecasting tends to be long range (more than 10 years) and to use more qualitative approaches such as the Delphi method (Moeller and Shafer 1983) and nominal group techniques (Delbecq and others 1975). Business forecasting tends to be short range and to rely more heavily on time series methods, including simple trend extension, moving averages, exponential smoothing, Box-Jenkins approaches, transfer functions, harmonic and Fourier analysis, and other related techniques.

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Reviews of recreation forecasting methods include Moeller and Echelberger (1974), Lieber and Fasemaier (1983 Section two), Cordell and others (1985), and Stynes (1986). Similar methods and problems are addressed in the tourism forecasting literature, which is reviewed by Uysal and Crompton (1985), Sheldon and Var (1985), and Calantone and others (1987).

THE CURRENT SITUATION

A quick summary of the present state of recreation forecasting is assembled by looking at six basic questions:

1. What to forecast? Recreation forecasters have devoted most of their attention to forecasting recreation activity participation or site use. There have been a few formal attempts to forecast supply, policy, and management variables, generally via qualitative methods (e.g., Domoy 1981; Moeller and others 1977), but these are fairly rare. National and regional plans, like RPA, generally do not forecast site specific demand as there are too many sites involved. More commonly they forecast activity participation. Prices, if included, are captured via regional indices of available opportunities, distances, or prices.

The supply side of the picture is significantly less well-developed. Historically, recreation planners have projected recreation use into the future, compared projected use with the current supply of opportunities, and estimated deficits or surpluses. Supply inventories often focus on those facilities and areas under the jurisdiction of the organization conducting the planning study and seldom go beyond a physical inventory. Inventories of recreation opportunities provided by other organizations are often omitted or too incomplete to provide a comprehensive and accurate picture of supply. This is particularly the case with the private and nonprofit sectors. Supply is often better treated as a controllable or partially controllable policy variable rather than one which can be projected independent of policy decisions. Handling of supply in an exogenous manner makes it difficult to incorporate the effects of changing supply on recreation participation, making use projections unrealistic during periods of changing supply conditions.

The supply side is further complicated by different perspectives on how to measure recreation supply and the theoretical framework for incorporating supply into forecasts and valuation procedures. Some view

supply in terms of physical inventories, others in terms of marginal cost functions, and others in terms of the opportunities available to a consumer at different prices (Harrington 1987). The difference between existing recreation market structures and the competitive model on which equilibrium between supply and demand is based is large enough to raise questions about the use of such models to arrive at "market clearing prices" (Fedkiw 1987; Kaiser and others 1987) or to allocate resources.

There have been few attempts to forecast recreation values either directly or via forecasts of demand and/or supply curves. More often, values are simply moved to present or future time periods via discounting formulas (Peterson, in press). Recreation researchers occasionally take time out to summarize broader changes in society, the economy, technology, etc., and to assess in a qualitative fashion the likely impacts of these changes on recreation, travel, and leisure. These futures assessments often identify quite different factors than those that we have been able to capture in quantitative forecasting models; e.g., changes in leisure time, family structure, work, technology, lifestyles, and societal values.

2. Who does recreation forecasting? Most recreation forecasting is carried out in conjunction with Federal, State, or agency planning, often because it is mandated by legislation or recommended in planning directives or administrative guidelines. RPA is one example of this as are the Nationwide Plans, and State SCORPs. Most quantitative recreation forecasts have been developed by econometricians with contributions also from geographers, transportation planners, and recreation survey researchers. There are very few people doing recreation forecasting on a regular basis. The tendency is to have technicians or consultants come in at 5- or 10-year intervals to estimate a model and develop a long-range forecast.

All too often this means that those developing the forecasts have at best a general picture of the decisions to which the forecasts are to contribute. Also, management is generally not directly involved in the forecasting process, and therefore does not fully appreciate the assumptions on which the forecasts are based or their limitations. It is often hard to trace decisions to the forecasts, and the forecasts often sit on the shelf until the next round of forecasting. Managers and policymakers are commonly included in qualitative futures assessments such as some of the strategic planning done at regional and local levels (Becker and others 1985; Dottavio and others 1985).

3. How **to forecast?** Economic or quasi-economic approaches have predominated. The most common approach is to estimate structural linear, gravity, or **logit** models of recreation activity participation from cross-sectional survey data. This is often done using a two-step approach which separates the incidence of participation from the frequency of participation (Cicchetti 1973). The paper by Walsh and others (In press) in these proceedings is an excellent example of the structural approach.

The alternatives to the structural modeling approach are qualitative methods and time series techniques. The Delphi method and nominal group technique are the best known of the qualitative methods within recreation, not counting more widely used 'seat-of-the-pants' and other ad hoc approaches. Qualitative methods tend to be used when appropriate data or theory to construct formal quantitative models are lacking, as is often the case in long-range forecasting. They are better suited than quantitative methods for involving **managers/policymakers/ decisionmakers** in the forecasting process. Examples of the application of qualitative methods to recreation forecasting include Moeller and others (1977), Hawkins and others (1979), and Domoy (1981).

Time series methods forecast by extending a historical pattern of observations. This requires a consistent set of observations suited to the problem at hand and assumptions that historical patterns will remain relatively stable over the forecast period. Time series methods are best suited to short-term forecasting and to monitoring and tracking. Within recreation, time series methods other than simple trend extension have not been widely used due to the lack of good time series data and limited training of recreation researchers in time series techniques (Stynes and Chen 1985). Studies applying structural models to time series data include Brown and Wilkens (1975), Allen and Dwyer (1988). With the exception of Oliveira and others (1983), who use distributed lag models to convert arrivals at wilderness areas into estimates of daily use and departures, time series applications in recreation have been largely limited to simple trend extension or linear regression models estimated from time series data.

Time series methods are more prevalent in the tourism literature (e.g., Chen 1988; Fritz and others 1984; Guerts and Ibrahim 1975; Stynes and Chen 1985) presumably due to a closer connection with business forecasting techniques and better time series data.

4. How **accurate are our forecasts?** Although accuracy is not the most important criterion for evaluating forecasts (usefulness in decisionmaking is the most important criterion), it is the question most often asked. Accuracy depends a great deal on what is forecasted, at what level of aggregation, and how far into the future. The predominance of quite long-range forecasts in recreation makes evaluation difficult. Few forecasts have been evaluated after the fact. Measures of goodness-of-fit for the data used to estimate a model are often poor indicators of forecast performance. This is particularly the case with models estimated from cross-sectional data.

A major forecasting study that has been evaluated is the ORRRC projections of recreation activity participation to 1976. Brown and Hustin (1980) found these forecasts consistently below estimates from the 1976 national recreation survey. The measured rates in 1976 were from 20 to 400 percent above the ORRRC forecasts. ORRRC used a structural model with socioeconomic variables as demand shifters. Model specification (variables included and functional form) proved to be the primary sources of error, as independent variables were forecasted quite accurately. Like most recreation forecasting models, many of the key determinants of change are missing from the model or not properly specified. ORRRC, like many other recreation forecasts, assumes constant rates of participation by socioeconomic subgroups, an assumption that simply has not proven valid over long time horizons.

The ORRRC forecasts, while quite inaccurate (at least based on the 1976 national survey estimates, which many believe to be somewhat inflated), were very useful as they correctly identified the direction of change and some of the key determinants of change. A considerable portion of the error in these forecasts can be attributed to the response of governmental authorities to the ORRRC reports, most notably major increases in the supply of opportunities for outdoor recreation, lowering the costs to consumers, and increasing the quality.

ORRRC also forecasted per capita visits to the National Park System (NPS) using a structural model. Stynes (1983b) notes that the forecast of 0.21 NPS visits per capita for 1976 is well below the observed rate of about one visit per capita in 1976, again due to a linear specification and the omission of key variables like changing supply of national parks.

Shorter range forecasts can be more accurate, because the assumption that variables omitted from the model remain constant is more likely to be valid. Also, there is usually less variation to explain over shorter time horizons. For short-term forecasting, simple time series methods can be quite accurate. For example, weekly and seasonal patterns of recreation use have proven reasonably stable over time and can be predicted quite well by regression models with dummy variables (Dwyer 1988) or harmonic models (Stynes and Chen 1985). Transfer function models developed by Chen (1988) to forecast monthly tourism-related employment in Michigan forecast up to a year ahead with errors of from 1 to 10 percent accuracy for different subregions of the State.

Taking a slightly different approach to forecast evaluation, Peterson and others (1985) reestimated a trip distribution model for the Boundary Waters Canoe Wilderness (BWCAW) area to examine the stability of the model over time. They found little change in gravity model parameters over a 7-year period. While the model explaining the distribution of trip origins across a 12-State region was stable, the model could not explain changes in the total number of trips, which seems to depend on more elusive factors such as consumer tastes and preferences, information about and images of canoeing and BWCAW, and an array of variables that might explain substitution of activities and sites. All of these are hard to capture in quantitative models.

5. When to forecast? The RPA process is typical of Federal and State planning related to recreation, with forecasts developed at 5- or 10-year intervals. The forecast horizon for RPA is 50 years with forecasts generated to the year 2040 in the 1990 RPA report. Forecasting should be more of an on-going activity of recreation organizations with greater attention to short- and medium-range forecasting.

6. **Why forecast?** The cynical answer to this question is because it is required. While mandated planning and forecasting often provide the stimulus to take time from more pressing problems, this is not the primary reason for forecasting. The purpose of forecasting is to improve decisions. For this reason, forecasts should be evaluated based upon their usefulness in decisionmaking, not their accuracy (Martino 1972).

The place to begin a forecasting study is therefore a clear understanding of the decisions now under consideration and those anticipated in the near and distant future. These should guide what is forecasted, when, how far into the future, using which methods,

with what accuracy and precision, etc. Much recreation forecasting has spent too little time understanding the policy and decisionmaking environment relative to the time spent on technical matters. The questions that drive forecasting studies are often too general to provide clear directions to technicians who generally develop quantitative forecasts.

For example, the RPA forecasts are guided by general questions about the current quantity of recreation and wilderness resources, long-run trends in demand, and the social, economic, environmental, management, and policy implications of these trends. These are helpful to orient a forecasting study, but do not provide sufficiently specific background to guarantee the forecasts will be useful for many of the more specific decisions to be made. It is especially important that the crucial management and policy variables be identified. If these variables are properly specified in forecasting models, the models can be very useful for evaluating alternative management and policy actions. When these variables are not identified, forecasting models only explain likely responses of recreation to general social and economic conditions, over which recreation organizations have very little control.

Greater specificity is often difficult due to limited information or lack of agreement on goals, policies, and methods. Also, for many questions we lack the data, theory, or methods to generate adequate answers analytically. Questions about both policy and methods usually become clearer as a forecasting study proceeds. To the extent that decisionmakers are not more intimately involved in forecasting studies, technicians may make incorrect assumptions about how results will be used and may be guided more by technical matters or convenience than the needs of decisionmakers. Too little of what is learned in forecasting studies is communicated by the final forecast or model. Most of the value of a forecasting study accrues to those directly involved in the study itself. To the extent that managers and decisionmakers are not more heavily involved in the forecasting process, many of the potential benefits of forecasting studies are often lost.

LIKELY FUTURES

How is recreation forecasting likely to change in the future? How should it change? We should not expect radical change over short time periods in methods as there are significant lags involved in changing procedures and methods. The reluctance to drop assumptions on which forecasts are based, even long after they have been shown to be false,

also slows the rate of change. **Ascher** (1979) finds this "assumption drag" to be prevalent in all areas of forecasting. Also, since methods for forecasting recreation are largely refinements or adaptations of methods handed down from fields with a longer history of forecasting, surprises are unlikely if we simply look around us.

Having argued this side of the case, let me also point out that fairly significant changes in methods for handling supply, demand, and value have taken place within recreation over the past 30 years. These changes have been driven in part by the need for improvements in methods and in part by changes in **policy stances** and decision agendas. The introduction, development, and refinement of the travel cost method is a good example, as is the shift toward contingent valuation methods in response to the need to value changes in quality. The recent interest in costs, market prices, supply, and the role of the private sector has also shifted the attention being given to different methods and caused us to rethink how we measure and forecast recreation demand and value. It is bringing needed attention to the supply side and structure of recreation markets (**Clawson** 1984; Daniels and Cordell, in press; Harrington 1987). Recreation forecasting in general has begun to make greater use of qualitative methods and to forecast a wider range of management, environmental, economic, and social conditions related to recreation. There has been a retreat from quantitative models.

Foreseeable future trends in recreation forecasting methods are basically extensions of these recent trends. The one overriding trend I foresee is a movement toward more comprehensive information systems. Multipurpose cooperative data-collection efforts (Cordell and others 1987) and greater sharing of data (O'Leary 1987) already are moving us in this direction.

Monitoring of trends and forecasting should be important parts of such information systems, and in many cases possibly the driving force behind them. Development of comprehensive monitoring and forecasting systems requires that we better integrate activities and methods that are presently carried out too independently. We also need to make some reallocations of effort toward clarifying information needs and evaluating what we have done in the past. I see five essential components of a comprehensive recreation forecasting system.

(1) The first step is to identify the key variables to measure and forecast, and to carefully trace how information about these variables and their interrela-

tionships contributes to management and policy decisions. This is both the most difficult and most important step. Any forecasting effort must begin with a clear sense of purpose and at least some clearly defined management, policy, and planning questions. We cannot measure everything, and there is a clear tradeoff between measuring a lot of variables poorly and inconsistently versus measuring a few regularly and well. The latter seems to be the place to start. Getting agreement on a smaller set of variables to measure regularly in a cost-effective manner will not be easy.

(2) Once we have identified the key variables, they must be measured on a regular basis over time and space and assembled into an information system. A system of accurate, consistent, and readily accessible historical observations will provide a firmer basis for short-term forecasts and will encourage greater use of time series methods. During the **1980's**, sufficient attention has been directed to trend issues to result in some significant improvements in our knowledge. The 1980 and 1985 National Outdoor Recreation Trend Symposia, the 1985 National Wilderness Research Conference, the PCAO **Literature** Reviews, and now this Benchmark Conference and the 1990 RPA effort have significantly advanced both what we know about recreation trends and maybe, more importantly, the organization and accessibility of this information. Obtaining a more accurate measure of where we are and where we have been is absolutely essential to improving our ability to forecast the future.

(3) Time series and structural models should be estimated from this data base and the resulting models should become an integral part of the information system (Jarvis and others 1987). The information system should include modules for forecasting that are readily accessed by decisionmakers. The forecasting models should provide information relevant to management and policy decisions, and the data base should be organized to satisfy the modeling needs. Time series models estimated from the trend data would provide short-range forecasts and means of tracking key variables. Structural models estimated from periodic surveys and time series data would provide medium-range forecasts and test relationships among variables. Such models help evaluate whether we are tracking the right independent variables and provide a theoretical framework for an overall forecasting system.

(4) Regular qualitative forecasting procedures are needed to assess long-range futures, to capture variables that cannot yet be incorporated quantitatively, to provide a vehicle for broader involvement of

decisionmakers and various publics, and to give feedback to modelers. Qualitative forecasts should be supported by the quantitative trend data and models, while also being aware of their assumptions and limitations.

(5) There should be an on-going program to evaluate all forecasts and forecasting models in terms of their accuracy, assumptions, and usefulness for decisionmaking. Such evaluations should guide a continuing program to refine and develop forecasting systems over time. Very few recreation forecasts or forecasting models have been carefully evaluated after the fact. Brown and Hustin's (1980) evaluation of the ORRRC projections is one exception. Recreation forecasting models are evaluated more often based upon fits to the data used in estimating them than their success in forecasting. Critical evaluations of past forecasting efforts should provide guidance for future efforts.

While some kind of comprehensive national recreation information system is certainly desirable, this may not be the place to start, as it cuts across too many organizations with different needs, resources, and institutional structures. Such a comprehensive system is more likely to be built up from smaller scale systems. Many Federal and State agencies as well as local and regional recreation authorities already have pieces of the system I describe in place or under development. The systems being developed by the Southeastern Forest Experiment Station to assist with the RPA effort include many of the components described above and illustrate the potential of a cumulative and integrated approach. We should continue to develop and refine these kinds of systems and hopefully devote more time and resources to these efforts. The key in most cases is assuring that the systems provide useful information back to those who feed data into the system and also to administrators and policy-makers who allocate the resources to develop and maintain information systems.

NEEDS

Needs may be divided into three areas: (1) human capital, (2) research and theory development, and (3) data and systems development. Improvements in recreation forecasting requires progress on all three fronts.

Training in forecasting methods and futures is needed for both researchers and decisionmakers. We have too few researchers working in the recreation

area with special training in forecasting. Decisionmakers, too, must have a greater understanding of futures and forecasting methods in order to properly interpret, evaluate, and apply the results of forecasting studies. Greater awareness of forecasting and forecasting methods will help decisionmakers become more directly involved in forecasting. Benefits from forecasting often stem as much from involvement in the forecasting process as from any particular forecasts that are made. The more decisionmakers can be involved in forecasting, the more relevant forecasts will be to decisions, and the more support there will be for forecasting activities. Insights gained during the process of forecasting will be applied in decision-making more often than forecasts themselves.

Improvements in forecasting will also require improvements in the two key inputs to forecasts, theory, and data. The need for more reliable data that are more consistent over time is a recurring theme within recreation and elsewhere. Perhaps of even greater importance is the need for improvements in theory to better focus and direct our attention to the most appropriate data. Recreation forecasting is constrained by a lack of solid theories of change over time. Research on diffusion, adoption, substitution, adaptation, and other change processes is sorely lacking within recreation. An overreliance on cross-sectional methods constrains our ability to understand change. Models which more fully consider changing time budgets, changing values, and changing opportunities are needed (Stynes 1981).

The technology for addressing most of our outdoor recreation planning and forecasting problems exists. It will, however, take many years for organizations to understand and apply these technologies within recreation. There will be significant conversion and retraining costs. More resources must be set aside for systems development over a fairly long period of time. While a great deal can be accomplished by more focused and coordinated efforts, some new resources will be needed, as recreation organizations cannot maintain existing operations while at the same time developing new systems to replace them.

The greatest impediments are institutional. With recreation cutting across agency, geographic, and public-private boundaries, cooperation, coordination, and standardization are difficult. Forecasting adds an additional need for consistency of activity and effort over time. Changing institutional structures, responsibilities, and personnel make it difficult to establish systems like those I've described above. Recreation information and forecasting systems must be institutionalized themselves to survive long enough to demonstrate their value.

A FEW PARTING QUESTIONS AND OBSERVATIONS

1. How much forecasting is useful? I think we could use more recreation forecasting on a more consistent basis. We should also adopt more of the "La Prospective" philosophy of forecasting (Godet 1982). This French school of forecasting looks at the future in more controllable terms. The future is not something we project independent of our own actions. Our forecasting methods tend to ignore the important role we play in shaping our future. More of our strategic planning should address what we want the future to be and assess what actions we should take to get there:

2. What is the proper balance between short-, medium-, and long-range forecasting? I think we should do more short- and medium-range forecasting. Long-range forecasts should devote less attention to forecasting recreation use and more to forecasting broader social, technological, economic, political, and environmental conditions that will influence recreation supply and demand.

3. What should we be forecasting? The answers to this must come from an understanding of the decisions we will be confronting in the future. The most important variables I foresee impacting outdoor recreation over the next 50 years are population size and geographic distribution, age and family structures, transportation modes and prices, distribution and amount of leisure time, roles of public and private sectors, fees for recreation, state of the economy, quality of the outdoor recreation environment, and the amount, quality, and price of substitutes for outdoor recreation.

4. At what level of detail/aggregation should forecasts be developed? I think we will increasingly need to further disaggregate our forecasts and analyses to be relevant to decisions. Recreation information must be disaggregated along at least three dimensions: spatial, temporal, and activity.

a. Spatial. Decisionmaking at the local level requires more disaggregated information. National, regional, and State averages often do not apply.

b. Temporal. The temporal distribution of use is increasingly important in management decisions. Annual use estimates are inadequate for many decisions. Increasingly, we will need estimates broken down by month, weekend vs. weekday, and even time of day in some cases.

c. Activity and market segments. The increasing specialization in recreation activities will require more narrowly defined categories of activities and market segments, as well as greater attention to quality variations in products and services.

5. Should our approach be top down or bottom up? Should forecasts be developed from national surveys and then disaggregated to regional and local levels or can recreation activity and trends be measured consistently on a regular basis at the local level and then aggregated up to regional and national levels? Should we rely on household surveys or onsite studies? I would answer "yes" to all of these questions. Multiple methods are required, although some sorting out of the proper role of these different approaches is surely needed.

6. Should we use quantitative or qualitative forecasting methods? Should quantitative methods use time series or structural models? Again, I argue for multiple methods with each serving the role for which it is best suited. I think more attention should be devoted to monitoring, short-term forecasting and time series methods. I would also encourage much wider use of qualitative forecasting methods, with decisionmakers more directly involved.

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LONG-RUN FORECASTS OF PARTICIPATION IN FISHING, HUNTING, AND NONCONSUMPTIVE WILDLIFE RECREATION

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Abstract—A *logit* model is used to estimate the proportion of the population of the United States who participate in (1) nonconsumptive wildlife recreation; (2) fishing for cold-water and warm-water species; and (3) hunting big game, small game, and migratory birds in 1980. The *logit* equations are then used to forecast the number of persons who are likely to participate in these activities from 1990 to the year 2040. Indications are that nonconsumptive wildlife recreation will be the fastest growing activity. The historic growth in fishing is expected to continue, although at somewhat lower levels owing to slower increases in population. Hunting is forecast to decrease in the long run, consistent with the preliminary findings of the 1985 National Survey.

the long run, due to changes in the determinants of demand. Advances in applied statistical estimation procedures and computers during the past decade make it possible to use more sophisticated forecasting techniques.

The purpose of this paper is to describe a recent statistical forecast of the recreation use of fish and wildlife resources through the year 2040 for the 1990 RPA assessment of the renewable resource situation. A *logit* model is used to forecast the proportion of the population of the continental United States who will participate in (1) nonconsumptive wildlife recreation; (2) fishing for cold-water and warm-water species; and (3) hunting big game, small game, and migratory birds. Participation will be shown to be a function of changes in population, a travel cost proxy for price and the price of substitutes, income, age, urbanization, and other socioeconomic characteristics of individuals, quality of the experience, and availability of resources.

The method is based on Federal guidelines (U.S. Water Resources Council 1983) which recommend that forecasts of recreation consumption be based on multiple regressions, providing coefficients to estimate how much each of the explanatory variables causes participation to vary. When one or more of the determinants is expected to change in future years, its effect on consumption can be estimated. This approach provides decision makers with the best available predictions of the amount and type of recreation use of fish and wildlife. National participation surveys are undertaken by the Census every 5 years, providing the data base necessary to update multiple regression forecasts of demand for fish and wildlife recreation.

INTRODUCTION

Forest management provides the opportunity for recreational use of fish and wildlife resources as one of several important outputs of USDA Forest Service programs. Since passage of the Forest and Rangeland Renewable Resources Planning Act (RPA) in 1974, Congress has required that assessments of alternative **50-year** management plans be prepared for each Forest Region every 5 years. In the past, RPA forecasts of participation in fishing, hunting and other **wildlife**-related recreation were based on projection of historic trends into the future (Wegert 1978). More recently, observers have begun to question whether the method should be relied upon for long-run forecasts since it assumes that whatever caused recreation use in the past will continue in the future. Estimates based on historic growth rates tend to become unrealistic in

REVIEW OF LITERATURE

While this is the first attempt to apply the *logit* regression model to estimation of the long-run participation in wildlife recreation, the approach has

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proven effective in the wildlife economic literature. Several studies have used data from earlier national surveys to estimate the proportion of the population that participates in wildlife-based recreation. In an exploratory study, Hay and McConnell (1979, 1981) used data from the 1975 National Survey to estimate a national equation for the probability of participation in the nonconsumptive recreation activities of observing, photographing, and feeding wildlife. Subsequently, Miller and Hay (1981) used the same data set to estimate a national equation for the probability of hunting, and a regional equation for the probability of hunting migratory waterfowl in the Central Flyway. These authors chose the **logit** model as theoretically and statistically superior to alternative techniques such as ordinary least squares (OLS). Vaughan and Russell (1981, 1982) used the 1975 survey to estimate a national **logit** equation for the probability of fishing, and a conditional equation for the probability of cold-water and warm-water fishing.

In draft reports to the U.S. Fish and Wildlife Service, McConnell (1984, 1985) explored the suitability of using the 1980 National Survey to estimate **logit** equations for the probability of hunting and fishing in the United States, and conditional equations to estimate the probability of deer hunting, duck hunting, etc. A **logit** equation for the probability of participation in wildlife recreation was applied to the choice between consumptive and nonconsumptive wildlife activities (Hay and McConnell 1984). Based on the 1975 survey, the authors observed that individuals who hunt often participate in nonconsumptive activities, i.e., a complementary relationship. Most recently, the 1980 survey was used to estimate a conditional probability model of participation in fee hunting on private land by 8 percent of the hunters (Langner 1987). These

studies constitute a benchmark from which to compare the reasonableness of the procedures adopted in this paper.

CHARACTERISTICS OF PARTICIPANTS: CURRENT SITUATION

Wildlife-related activities currently represent one of the most important forms of outdoor recreation in the United States. Table 1 shows that the most popular activity is warm water fishing, with nearly 17.4 percent of the population of 169.9 million persons 16 years of age and older participating in 1980. Approximately 4.1 percent participate in cold water fishing for species such as trout and salmon. By comparison, roughly 7.0 percent participate in some kind of hunting for big game (deer, elk, etc.), 7.3 percent for small game (rabbits, squirrels, etc.), and 3.1 percent for migratory birds (geese, ducks, etc.). Less than 1.5 percent of the population hunt for other types of animals such as fox and raccoon which are omitted from this study.

A reported 17 percent of the population take nonconsumptive trips for the primary purpose of observing, photographing, or feeding wildlife. Apparently, fish and wildlife have a special importance to people, not only because of the fishing and hunting they provide, but also because of their important ecological role in the environment (Shaw and Mangun 1984).

Table 1 illustrates several important economic aspects of wildlife recreation. Expenditures for the types of fishing, hunting, and nonconsumption wildlife-related trips studied amount to about \$16.9 billion per year. Participants report spending an

Table 1. Descriptive Statistics for Participation in Wildlife Recreation, United States, 1980

Variable	Unit of Measure	Participants					
		Nonconsumptive Wildlife-Related Trips	Fishing		Hunting		
			Cold Water	Warm Water	Big Game	Small Game	Migratory Birds
Number of Persons	Millions	28.8	6.9	29.5	11.8	12.4	5.3
Proportion of Population	Percent	17.0	4.1	17.4	7.0	7.3	3.1
Total Expenditures	Billion Dollars	\$4.0	\$1.5	\$6.3	\$2.8	\$1.7	\$0.6
Per Participant							
Trips	Trips/year	11	10	18	a	12	a
Days	Days/year	13	12	20	10	12	a
Expenditures	Dollars/year	\$139	\$314	\$275	\$236	\$135	\$120

Source: U.S. Fish and Wildlife Service (1982) and subsample estimates to separate fresh water fishing into cold water and warm water fishing.

average of \$120 to \$236 per year for hunting, \$275 to \$314 for fishing, and \$139 for primarily nonconsumptive wildlife-related trips. Expenditures represent primarily the variable or direct costs of transportation, lodging, added food, licenses, fees, and miscellaneous expenses. To a considerable extent, fishermen and hunters pay for public management programs through license fees and through excise taxes on equipment purchased while nonconsumptive users, for the most part, do not.

The level of participation is limited, of course, by legal and institutional restrictions, seasonal access, and availability of fish and wildlife. However, warm-water angler participation averages 20 days per year, primarily on single-day trips. By comparison, small game hunting averages 12 days per year. Participation in nonconsumptive wildlife-related trips is equal to 13 days per year. These wildlife-related recreation activities account for a substantial amount

of the estimated 100 days per year the average participant engages in outdoor recreation in the United States (Walsh 1986).

Table 2 compares the socioeconomic characteristics of participants and nonparticipants in wildlife recreation. Hunters tend to be younger white men with larger families living in nonurban regions with somewhat lower education and income. Anglers are somewhat older, more likely to be married, and to live in urban areas. More women participate in fishing than in hunting. More women than men participate in nonconsumptive wildlife recreation. Also, more nonconsumptive users live in urban areas with somewhat higher education and income than consumptive users. By comparison, nonparticipants in wildlife recreation are older, fewer are employed, with somewhat lower education and income. Fewer are married and household size is smaller. More are nonwhite women living in urban areas.

Table 2. Socioeconomic Characteristics of Participants and Nonparticipants in Wildlife Recreation, United States, 1980

Mean Value of Variable	Unit of Measure	Non-participants	Nonconsumptive Wildlife-Related Trips	Participants				
				Fishing		Hunting		
				Cold Water	Warm Water	Big Game	Small Game	Migratory Birds
Income	Thousand Dollars	18.0	23.6	25.0	21.1	22.3	22.1	26.1
Employment	Percent Employed	0.48	0.65	0.70	0.67	0.74	0.73	0.72
Age	Years	45.6	36.4	36.4	36.6	35.8	34.0	32.4
Education	Years	11.7	13.3	13.1	12.3	12.0	12.0	13.0
Marital Status	Percent Married	0.54	0.64	0.67	0.71	0.70	0.66	0.61
Family Size	Persons	2.8	3.4	3.2	3.4	3.6	3.7	3.5
Race	Percent White	0.81	0.91	0.95	0.93	0.97	0.96	0.98
Sex	Percent Male	0.44	0.48	0.70	0.69	0.89	0.92	0.95
Residence	Percent Urban	0.79	0.66	0.60	0.55	0.43	0.47	0.56
Sample Size		2,021	608	616	1,757	1,041	986	452

Source: Subsample estimates from the Census Survey reported in U.S. Fish and Wildlife (1982).

Table 3. Compound Annual Growth of Participation in Fishing and Hunting, United States, 1955-1980

Compound Annual Growth in ...	Freshwater Fishing	Hunting		
		Big Game	Small Game	Migratory Birds
Participation				
Proportion of Population	1.0	2.5	-0.2	0
Number of Persons	2.8	4.3	1.6	1.8
Days per Participant	1.0	1.3	2.0	-0.6
Total Days	3.8	5.6	3.6	1.2

Source: Calculated from data in U.S. Fish and Wildlife Service (1982; p. 134) using compound growth tables.

The demand for wildlife-based recreation activities is related to how many people choose to participate and how often. Table 3 illustrates the historic trend in consumption of fishing and hunting by persons 12 years of age and older for 25 years from 1955 to 1980. The data show that the compound annual growth in total days of freshwater fishing, for example, was approximately 3.8 percent. Population growth of 1.8 percent accounted for nearly half of this. The proportion of the population participating grew at a compound annual rate of only 1.0 percent, as did the average number of days per participant. By comparison, the compound annual growth in total days of small game hunting was 3.6 percent with an increase in the number of days per participant accounting for 2.0 percent or more than half. The proportion of the population participating actually declined at a rate of -0.2 percent per year. However, population growth more than offset the decline, so that the total number of persons participating increased by 1.6 percent per year. Table 3 also shows the variation in growth of big game and migratory bird hunting.

LOGIT REGRESSION MODEL

Decisions to participate in wildlife-related recreation activities represent a series of discrete choices. Individuals select from a finite set of alternatives to reach a decision about which activity they will participate in at a particular time and place. Binominal choice models with a 0-1 dependent variable are a particular type of discrete choice models which are frequently used in recreation research (Miller and

Hay 1981; Hay and McConnell 1984). The SPSS-X program uses the maximum likelihood technique to estimate a logistic regression of the form $\log \left[\frac{P}{1-P} \right] = BX$, where P = probability of participation; B = the vector of coefficients; and X = a vector of explanatory variables.

The pioneering studies of participation in outdoor recreation by Davidson and others (1966), Cicchetti (1972, 1973), and Cicchetti and others (1969) used ordinary least squares (OLS) procedures since algorithms for logit estimates were not widely available at the time. However, there are a number of problems in using the OLS approach. First, if the error terms are not normally distributed, heteroskedasticity results in inefficient estimators. Second, if the error terms are not normally distributed, t-tests of significance are meaningless. Third, predicted probabilities from the estimated equation are likely to range outside the 0-1 probability interval. Fourth, there are difficulties in interpreting the R² measure of goodness-of-fit. Finally, there are questions about the appropriateness of the essentially linear functional form.

The linear OLS model assumes that a unit change in a causal variable (X) always creates a constant rate of change in predicted probability (Y). It is usually more realistic to assume that change in an exogenous variable has less and less effect on probability as it approaches either zero or unity, resulting in an S-shaped logistic or "logit" curve. In some cases the OLS line and the logit curve are nearly coincident within the middle range of probabilities. In this event, both models would yield nearly identical probability

estimates. This is supported empirically by Smith and Munley (1978) who, in comparing the results of OLS and **logit** analysis, report little difference in their relative predictive performance or ability to identify key variables.

In other cases, the estimated probabilities obtained using a **logit** model and those obtained using OLS diverge substantially in the middle range of probability. In one such case, Bell and Leeworthy (1987) conclude that in terms of intra-sample predictive ability, OLS is superior to **logit** for the data set which they use. Thus, while there are theoretical reasons for using **logit** analysis, the choice of methodology remains unclear in applied research. In a practical sense, **logit** is somewhat less tractable than is the OLS regression technique. It is computationally more time consuming and expensive. Since the **logit** regressions error term is not based on the normal distribution, many of the familiar tests of significance do not apply. For this reason, it is difficult to judge the reliability associated with the forecasts of probability in the majority of cases.

SOURCES OF DATA AND RESEARCH PROCEDURE

The basic data for this study are from the 1980 National Survey (U.S. Department of the Interior, Fish and Wildlife Service 1982). This is the sixth in a series of surveys at 5-year intervals since 1955. It was conducted by the U.S. Bureau of the Census in two phases. First, a sample of more than 116,000 households nationwide were interviewed to determine who in the household had hunted, fished, or engaged in some nonconsumptive wildlife recreation in 1980. Information was obtained on the usual socioeconomic variables and days of participation in hunting and fishing. Also recorded were the annual days on trips primarily for the purpose of nonconsumptive wildlife recreation, i.e., observing, photographing, or feeding wildlife. Information on 340,000 household members 6 years of age and older was obtained from an adult member of each household. A 95 percent response rate was achieved. For purposes of this study, a subsample of 4,000 individuals 16 years of age and older was randomly drawn from the Census sample of users and nonusers.

In the second phase of the survey, detailed personal interviews were conducted with samples of 35,615 fishermen and hunters, and 6,949 nonconsumptive users identified in the first phase interviews. Detailed information was obtained on types of hunting,

fishing, and nonconsumptive wildlife recreation, destination, duration, and variable costs. The sample was limited to persons 16 years of age and older because of the length and complexity of the questionnaires. For purposes of this study, subsamples of individuals who participated in fishing, hunting, and nonconsumptive use were randomly drawn from the Census samples. Our study is limited to fish and wildlife related activities reported by individuals who live in the continental United States. Excluded are residents of the states of Alaska and Hawaii, and foreign travelers to the United States for the purpose of fish and wildlife related activities. Also excluded from the study are U.S. citizens who made trips abroad to hunt or fish during 1980. Participants are identified by their State of residence where most participation occurs, however, some participation may occur in other States as well as in the State where they live.

The Survey for 1980 did not directly differentiate between cold-water and warm-water fishing. We separated these two activities according to the catch of fresh-water fish species classified as either cold-water or warm-water species (Walsh and others 1987). Cold and warm-water fishing is limited to inland waters such as rivers, lakes, streams, and ponds. Excluded are the Great Lakes-Superior, Michigan, Huron, Erie and Ontario, tributaries and connecting waters, such as Lake St. Clair, and the St. Lawrence River south of the bridge at Cornwall, New York, and rivers that run into the Great Lakes (U.S. Department of the Interior, Fish and Wildlife Service 1982). Also excluded is all saltwater fishing in oceans, bays, sounds and tidal waters of rivers and streams.

The Census samples are designed to provide statistically reliable results at the State level for fishing and hunting and at the regional level for nonconsumptive activities. This results in disproportionate sampling of individuals from small States, urban areas, and by level of activity. Thus, the **logit** equations are estimated with a weighted log likelihood function, as suggested by Manski and Lerman (1977). The normalized weights used are derived from the sample expansion factors provided by the Census.

Estimating the probability of participation in an activity requires that the general population be sampled to include some who participate and some who do not. In this case, the telephone survey includes those who hunt, for example, and those who do not, but does not indicate what kind of hunting is engaged in. More detailed information is available from the follow-up survey by personal interview, i.e., whether they hunt for big game, small game, or migratory

Table 4. Definition of Independent Variables in the **Logit** Regressions

Variable Name	Definition	Unit of Measurement
Price	Average variable cost or miles per participant in respondent's region of residence	Dollars or miles
Cross-Price	Average variable cost or miles per participant in other fish and wildlife activities in respondent's region of residence	Dollars or miles
Income	Respondent's gross household income	Thousand dollars
Employment	Respondent worked for wages last week	1 = employed 0 = unemployed
Age	Age of respondent	Years
Education	Years of education completed by respondent	Years
Marital Status	Respondent's marital status	1 = married 0 = unmarried
Household Size	Number of persons living in respondent's household	Persons/household
Race	Respondent's household race	1 = white 0 = other
Sex	Sex of respondent	1 = male 0 = female
Residence	Respondent's place of residence	1 = urban 0 = rural
Success Rate	Average number of fish caught or wildlife bagged per day or season in respondent's region of residence	Number
Forest ^a	Forest land, public and private in respondent's state of residence	Million acres
Range ^a	Pasture and range land in respondent's state of residence	Million acres
Water ^b	Total fishable water in respondent's state of residence	Million acres
Cold Water ^c	Fishable cold water in respondent's state of residence	Percent
Warm Water ^c	Fishable warm water in respondent's state of residence	Percent
Habitat ^d	Migratory waterfowl habitat in respondent's state of residence	100,000 acres
Song Birds ^e	Maximum value of number of song bird species per ecological stratum in state of residence	Species
Big Game ^f	Population of big game in respondent's state of residence	Thousand Animals

^aU.S. Forest Service (1981).^bU.S. Fish and Wildlife Service (1968).^cVaughan and Russell (1982)^dU.S. Bureau of Sport Fisheries and Wildlife (1970).^eRobbins and others (1986)^fU.S. Fish and Wildlife Service (1983).

birds. Hence, the probability estimation is divided into two steps: (1) the probability that an individual engages in hunting of any kind, and (2) given that he/she hunts, the probability of hunting a particular type of wildlife. A similar procedure is followed for each type of hunting and fishing. For example, the probability of participating in cold-water fishing is estimated, conditional on participation in fishing. This assumes that the decision process is, first, whether or not to fish, and then what kind of fish to seek, as suggested by McConnell (1985). The proportion of the population who participate is modeled as follows:

- I. Fishing (First stage)
 - A. Cold water fishing (Second stage)
 - B. Warm water fishing (Second stage)

- II. Hunting (First stage)
 - A. Big game hunting (Second stage)
 - B. Small game hunting (Second stage)
 - C. Migratory waterfowl hunting (Second stage)

- III. Nonconsumptive use

These are not exclusive categories, since many individuals report that they engage in more than one type of fishing and hunting, and, in addition, take nonconsumptive wildlife recreation trips.

Table 4 defines the explanatory variables included in the equations. Most are standard socioeconomic measures and require no further explanation. Perhaps a brief comment on the proxy for price and quality of the resource would be useful. Economic theory suggests that more individuals will choose to participate in States or regions where average variable costs are lower. The specification of price adopted in this study is limited to interstate or regional variation. Omitted is the possible effect of in-state variation across individuals, which may also affect decisions to participate. Moreover, nonparticipants are likely to face a somewhat higher entry price than participants owing to fixed start-up costs. Another problem is that the variable costs reported by participants may not equal the total cost of participation. However, it is not likely that the amount that costs are understated would vary systematically across regions. For purposes of forecasting the behavior of individuals, their perceived travel cost or miles traveled is expected to explain actual behavior better than alternative measures that might be used.

The resource-related variables used in this study are based on State and regional level data from

sources other than the 1980 survey. They are assigned to each individual in the sample based on State of residence. Aggregation of the resource variables to the State or regional level is necessary because the available information on wildlife and fish resources does not permit the identification of the quantity of resources at any finer level (county, for example). Thus, the resource variables involve the implicit assumption that suitable resources are distributed so that typical residents in a State or region, both participants and nonparticipants, face a similar resource situation.

The second phase of the Census survey provides detailed information on the success rate in fishing and hunting. Within the institutional constraints on daily or seasonal catch or bag, success rate depends on the skill of individual participants and the availability of fish and wildlife. To isolate the effect of management programs on availability of fish and wildlife, it is necessary to hold the effects of individual skill constant. It seems reasonable to assume that individual skill would not vary systematically across States and regions of the United States. Thus, the average catch per site, State, or region can be used as an effective indicator of the quality of resource (Charbonneau and Hay 1978; Hay and McConnell 1984; Vaughan and Russell 1982;). Accordingly, the participation equations for types of hunting and fishing contain a variable, success rate, defined as the average number of fish caught or wildlife bagged per participant in the respondent's region of residence.

PROBABILITY OF PARTICIPATION EQUATIONS

Tables 5 and 6 present the estimated logit equations for participation in wildlife recreation. Table 5 estimates the probability that an individual will engage in any type of fishing, hunting, and nonconsumptive wildlife related trips. Table 6 contains estimates of the probability that individuals will engage in each type of hunting given that they hunt, or in each type of fishing given that they fish. The maximum likelihood coefficients are asymptotically consistent, normally distributed, and the t-test is a valid test of significance.

The equations show the estimated relationship between participation and 14 hypothesized determinants of demand. The coefficients for each of the independent variables represent the derivatives of the log of the odds (logit) of participation. The relationship of the explanatory variables to the

Tabk 5. **Logit Equations** for the Probability of Participation in **Fishing, Hunting, and Nonconsumptive Wildlife Recreation Trips, United States, 1980**

Variables	Description of Variables	Nonconsumptive Wildlife-Related Trips ^b	Total Fishing ^c	Total Hunting ^d
Constant		2.99045' (10.13) ^a	3.65911' (22.40)	3.99810' (23.08)
Price	Dollars or miles	-0.04895* (-2.02)	-0.00056* (-2.08)	-0.00069* (-2.31)
Cross-Price (1)	Dollars or miles	0.01230 (1.25)	0.00100' (3.19)	0.00124' (2.15)
Cross-Price (2)	Dollars or miles	0.00209 (1.18)	0.04346* (236)	
Income	Dollars/year (\$1,000)	0.00942'' (2.25)	0.01060* (3.09)	0.0059 1 (1.36)
Age	Years	0.02854* (3.81)	0.00190 (0.27)	-0.01269* (-8.58)
Age Squared	Years²	-0.00044* (-5.04)	-0.00015* (-2.00)	
Marital Status	1 = married 0 = unmarried	—	0.36033* (7.01)	0.17085' (3.55)
Household Size	Persons	0.02875 . (1.86)		0.09288' (6.35)
Race	1 = white 0 = other	0.36260. (4.27)	0.25801* (3.7 1)	0.46608* (5.95)
Sex	1 = male 0 = female	--	0.56336. (14.00)	0.13683. (3.25)
Residence	1 = urban 0 = rural		-0.19950* (-4.96)	-0.46669* (-10.71)
Resource Availability	Acres/Capita	0.00211* (1.78)	0.14687' (4.49)	0.00827' (4.60)
Probability	Percent of Population	0.135	0.212	0.167
Sample Size	Individuals	4,000	4,000	4,000

^aT-statistics are shown in parentheses below the coefficients. An . indicates that a variable is significant at the .10 level or above.

^bFor nonconsumptive wildlife-related trips: own price is specified as total annual miles per participant in the region of residence; cross-price (1) for hunting is total annual variable costs per participant in the region of residence; cross-price (2) for fishing is total annual variable costs per participant in the region of residence; income is per capita; and resource availability is total forest, pasture, and range land per capita in the state of residence.

^cFor fishing: own price for participants is their reported total annual variable costs, and for nonparticipants it is the regional total annual variable costs; cross-price (1) for hunting is total annual variable costs of participants and regional total variable costs for nonparticipants; cross-price (2) for nonconsumptive use is total annual miles in the region of residence; income is gross household income; and resource availability is total fishable water per capita in the state of residence.

^dFor hunting: own price is specified as total annual variable costs per participant in the state of residence; cross-price (1) for nonconsumptive use is total miles per trip by participants in the state of residence; income is gross household income; and resource availability is total forest, pasture, and range land per capita in the state of residence.

Table 6. Logit Equations for the Probability of Participation in Cold and Warm Water Fishing Conditional on Participation in Fishing, and Hunting for Big Game, Small Game, and Migratory Birds Conditional on Participation in Hunting, United States, 1980

Variables	Description of Variables	Fishing		Hunting		
		Cold Water ^b	Warm Water ^c	Big Game ^d	Small Game ^e	Migratory Birds ^f
Constant		3.75319 [*] (9.70) ^a	4.46183 [*] (10.29)	4.93365 [*] (19.03)	5.74007 [*] (25.96)	3.24927 [*] (7.11)
Price	Dollars or miles	-0.00163 [*] (-8.29)	-0.00413 [*] (-7.05)	-0.00313 [*] (-2.53)	-0.00272 [*] (-3.43)	-0.01561 [*] (-2.10)
Cross-Price (1)	Dollars or miles	0.00296 [*] (3.47)	0.00248 [*] (13.38)	-0.00185 [*] (-221)		0.00623 [*] (2.85)
Cross-Price (2)	Dollars or miles				--	-0.00083 (-0.48)
Income	Dollars/year (\$1,000)	0.00825 [*] (3.30)		-0.01025 [*] (-1.97)	-0.00112 (-0.47)	0.01406 [*] (557)
Employment	1 = employed 0 = unemployed	0.02146 (0.28)	0.08589 (1.01)		0.01894 (0.26)	-0.24949 [*] (-3.20)
Age	Years	0.00241 (0.97)	0.01892 (1.49)	0.03442 [*] (344)	-0.01087 [*] (-4.71)	-0.01023 [*] (-3.76)
Age Squared	Years ²	--	-0.00022 (-159)	-0.00037 [*] (-3.09)		
Education	Years	0.02220 [*] (2.11)	-0.01774 (-1.54)		-0.01651 [*] (-1.74)	0.06028 (5.61)
Marital Status	1 = married 0 = unmarried	-0.08492 (-1.05)	-0.04702 (-0.52)	--	0.01932 (0.25)	-0.09641 (-1.20)
Household Size	Persons	-0.04956 [*] (-2.09)	0.03316 (1.33)			-0.02420 (-1.17)
Race	1 = white 0 = other	0.05630 (0.39)	0.07386 (0.51)	0.38322 [*] (2.84)	0.06516 (0.45)	0.64380 [*] (3.18)
Sex	1 = male 0 = female	0.11703 (1.61)	0.07297 (0.95)		0.41890 [*] (4.54)	0.66523 [*] (5.36)
Residence	1 = urban 0 = rural	0.14198 [*] (2.11)	-0.05825 (-0.80)	-0.24539 [*] (-4.11)	0.06588 (1.07)	0.16260 (2.56)
Success Rate	Number of Fish or wildlife	0.03088 (0.34)	0.12151 [*] (2.22)		0.03963 (1.09)	0.10919 [*] (3.78)
Resource Availability	Acres or Percent	0.01233 [*] (7.11)	--	0.02488 [*] (6.54)		
Probability	Percent of Population	0.132	0.929	0.690	0.718	0.281
Sample Size	Individuals	2,212	2,212	1,445	1,445	1,444

^aT-statistics are shown in parentheses below the coefficients. An * indicates that a variable is significant at the .10 level or above.

^bFor cold water fishing, own price for participants is their reported total annual miles, and for nonparticipants it is regional total annual miles; cross-price for warm water fishing is the same as above; income is household income in thousands; success rate is regional average catch per day; resource availability is the proportion of cold water to total fishable water in state of residence.

^cFor warm water fishing, variables are defined the same as for cold water fishing; the cross-price variable is for cold water fishing.

^dFor big game hunting, own price is total annual variable cost per participant in the region of residence; cross-price for small game hunting is total annual variable cost per participant in the region of residence; income is per capita; success rate is regional average total bag per hunter; and resource availability is thousands of big game animals in the state of residence.

^eFor small game, own price is the total annual variable cost per participant in the region of residence; income is household income in thousands; success rate is regional average bag per day.

^fFor migratory bird hunting, own price is total annual variable cost per participant in the region of residence; cross-price (1) for small game hunting is defined the same; cross-price (2) for big game hunting is the same; income is household income in thousands; success rate is regional average bag per day.

probability of participation is nonlinear. The t-statistics, shown in parentheses beneath the coefficients indicate that several of the variables in each of the equations are significant at the 0.10 level or above.

Since the **logit** model is estimated by the maximum likelihood method, a coefficient of multiple correlation is not generated. However, an *W*-like measure can be calculated which gives an indication of the amount of the variation in the dependent variable which is explained by variation in the independent variables. The **logit** model correctly predicted whether an individual was or was not a cold-water fisherman in 64.5 percent of the cases, which is relatively accurate.

The price proxy has the correct sign and is significant in all of the eight regressions. The negative coefficients indicate that with future increases in travel costs, license fees, access fees, and other expenses associated with wildlife recreation, the proportion of the population participating would decrease, other variables constant. Although the proxy for price necessarily lacks precision, the coefficients suggest that participation in wildlife recreation may be price inelastic. Price elasticity indicates how much effect future expansion of public and private management programs, through increases in licenses, excise taxes, and access fees, would have on the proportion of the population that participates.

At least one cross-price variable for alternative wildlife recreation activities in the State or region of residence is significant in seven of the eight regressions. A positive coefficient indicates that an alternative recreation activity is a substitute and a negative coefficient indicates that it is a complement. The most important tentative finding with respect to cross-prices is that the general population seems to consider nonconsumptive wildlife recreation a substitute for hunting. This is indicated by (1) the positive coefficient for the cross-price of hunting in the nonconsumptive equation and (2) the positive coefficient for the cross-price of nonconsumptive trips in the hunting equation.

If hunting and nonconsumptive wildlife recreation are substitutes, it would have important implications for public policy. Increases in the price of hunting not only decrease participation in that activity but increase demand for nonconsumptive trips. Programs that improve access to (and reduce the price of) nonconsumptive wildlife resources will tend to increase participation in the activities of observing, photographing, and feeding wildlife, and reduce hunting pressures on wildlife populations. In the fishing equation, the

positive cross-price coefficient for hunting indicates that it substitutes for fishing. This suggests that recent increases in the price of hunting may have contributed to decreased participation in that activity and the increased demand for fishing.

Income is significant in five of the eight regressions. The positive coefficients for income shown in table 5 indicate that wildlife recreation is a normal good. This means that as future incomes rise, the proportion of the population participating in fishing, hunting, and nonconsumptive wildlife recreation also will increase, all else constant. The negative coefficient for income in the big game hunting equation shown in table 6 indicates that, given one is a hunter, the probability of big game hunting will fall as incomes rise. This reflects the changing relative preference of hunters for migratory bird hunting, which has a positive income coefficient.

Age, a measure of the physical ability and inclination to engage in wildlife recreation, is a significant explanatory variable in six of the eight regressions. The quadratic relationship between age and participation in fishing, big game hunting, and nonconsumptive wildlife recreation indicates that increasing age affects participation positively up to a point and then has an overall negative effect, other things being equal.

The residence variable is significant in five of the eight regressions. The negative coefficients for total fishing, total hunting, and big game hunting indicate that persons living in urban areas are less likely to participate in these activities than individuals in rural areas, other things being equal. This is due, in part, to limited access to opportunities in urban areas (Miller and Hay 1981). The positive coefficients for cold-water fishing and migratory bird hunting indicate that as urbanization increases, participants are likely to increasingly choose these activities,

Other demographic variables also are important. Race is positive and significant in five of the eight regressions. This means that whites are more likely to participate in wildlife recreation than nonwhites. The race variable is significant for consumptive wildlife recreation activities-total fishing, total hunting, big game hunting, and migratory bird hunting-as well as nonconsumptive wildlife recreation. Trends in racial mix indicate future increases in nonwhites who are less likely to participate in wildlife recreation. Not surprisingly, the coefficient for the sex variable is positive and significant in five of the eight regressions. This is consistent with the observation that more men participate in wildlife recreation than women.

Household size is significant in three of the eight regressions. The variable is positively related to participation in hunting and nonconsumptive wildlife recreation. Parents may introduce their children to these wildlife recreation activities. This would be consistent with family participation in most types of outdoor recreation (Walsh 1986). Education is significant in three of the eight regressions. It is positively related to participation in cold-water fishing and migratory bird hunting. It is negatively related to small game hunting.

Resource availability is significant with the expected positive sign in five of the eight regressions. The positive coefficient for available resources shows that participation in total hunting and fishing, big game hunting, cold-water fishing, and nonconsumptive wildlife recreation is expected to increase with improved resource management programs. Success rate is significant with the expected positive sign in three of the five regressions for types of fishing and hunting where data on success rate are available. The positive coefficient for success rate indicates that participation in cold and warm-water fishing and migratory bird hunting is expected to increase with improved resource management programs that enhance the quality of the fishing or hunting experience by increasing catch or bag rate.

PROJECTIONS OF THE EXPLANATORY VARIABLES

Table 7 shows the projections of the indicators for the explanatory variables for each decade from the base year of 1980 to 2040. The multiple regression method of forecasting relies upon projections of the determinants of demand, such as population, income, price, age, substitutes, and other demand shifters. The U.S. Bureau of the Census routinely prepares long-run forecasts for many of these determinants. An advantage of the uniform application of recognized and acceptable sources is that any two studies can be compared. However, other values are less readily available and must be projected using historic data from the Census and other agencies, as in Hof and Kaiser (1988). The population projections are from Spencer (1984). They represent the high, low, and medium assumptions of the 1990 RPA Assessment (U.S. Department of Agriculture, Forest Service 1986). Average household income before taxes is based on forecasts of per capita disposable personal income by Wharton Associates for the 1990 RPA Assessment. The range from low to high is proportional to the range in the previous RPA Assessment (U.S. Department of Agriculture, Forest Service 1981). Median age, percent of the population that is white, and percent that is male are derived from the same source as the population projections (Spencer 1984). The projections of employment are from the U.S. Department of Commerce, Bureau of Economic Analysis (1985). The range from low to high is assumed to be proportional to the range in income contained in the previous RPA Assessment (U.S. Department of

Table 7. Projections of the Indicators for the Explanatory Variables in the Logit Equations

	Year	National Population (Millions)	Median Age (Years)	Race (Percent) White	Sex (Percent) Male	Disposable Personal Income Per Capita (\$1000s 1982)	Employment (Percent Employed)	Education (Years)	Residence (Percent Urban)	Marital Status (Percent Married)	Family size (Number)	Average Variable Cost/Day (Dollars)
Initial Condition	1980	227.8	30.0	85.9	48.7	9.7	63.6	12.7	73.7	61.1	3.29	22.87
	1990	254.1	32.7	84.1	48.7	11.5	68.0	13.3	71.8	61.0	3.28	25.03
High	2000	281.5	35.6	82.4	48.7	14.5	70.4	13.9	69.9	59.9	3.27	27.25
	2010	310.0	36.8	80.7	48.7	17.3	67.9	14.6	68.0	59.8	3.26	28.96
	2020	340.8	36.7	79.2	48.7	20.4	64.1	15.1	66.1	59.7	3.25	30.32
	2030	369.8	37.3	77.7	48.7	23.7	61.8	15.7	64.2	59.6	3.24	32.07
	2040	398.5	37.1	76.4	48.7	21.8	59.3	16.3	62.3	59.5	3.23	33.83
Medium	1990	249.7	33.0	84.4	48.7	11.3	66.9	13.0	73.8	60.1	3.17	24.62
	2000	267.9	36.3	83.1	48.7	14.0	68.1	13.4	73.9	59.2	3.06	26.37
	2010	283.2	38.5	81.7	48.7	16.8	65.9	13.8	74.0	58.2	2.94	28.12
	2020	236.6	39.3	80.5	48.7	20.1	63.2	14.2	74.1	57.2	2.82	29.87
	2030	304.8	40.8	79.3	48.5	23.3	60.9	14.6	74.2	56.3	2.70	31.62
2040	308.6	41.6	78.1	48.5	27.3	58.5	15.0	74.3	55.3	2.58	33.37	
Low	1990	345.8	33.2	81.6	48.7	11.0	64.8	12.8	75.6	59.2	3.06	23.83
	2000	256.1	37.0	83.4	48.7	13.3	64.8	13.0	77.5	57.2	2.82	25.09
	2010	261.5	40.0	82.2	48.7	15.8	61.8	13.2	79.4	55.3	2.59	26.38
	2020	262.7	41.7	81.0	48.5	18.8	59.3	13.4	81.3	53.3	2.35	27.96
	2030	257.4	43.9	79.8	48.2	21.8	56.9	13.6	83.2	51.4	2.12	29.53
2040	246.5	45.2	78.6	47.9	25.5	54.6	13.8	85.1	49.4	1.88	31.13	

Agriculture, Forest Service 1981). The education projections are based on Census data reported in Hof and Kaiser (1983).

Projections of the proportion of urban residence are based on Census data. The low scenario assumes that the trend will continue upward at the 1960-80 average rate. The medium scenario assumes that the nominal rate of change from 1970 to 1980 will continue in future years. The high projection represents a reversing of the 1960-80 trend, based on the expectation that in the future, more people will want to live in rural areas rather than urban.

The projections for marital status also represent three assumed growth paths. The medium projection is a linear extension of the midpoint of the 1950-70 average rate of change. The low scenario represents a continuation of the trend at the full rate of decline. The high scenario assumes virtually no change in the married proportion of the population in future years.

The medium projection of household size is based on U.S. Census estimates of the 1940-80 trend. The low scenario assumes that family size will decline at twice that rate. The high scenario assumes that with population growth, family size will stabilize in future years with virtually no decline.

Price and cross-price estimates are based on projections of the historic trend in the average variable costs per day (in constant dollars) of fishing and hunting from 1955 to 1980, as reported by the U.S. Department of the Interior, Fish and Wildlife Service (1982). The range from low to high is proportional to the projected range in per capita disposable income (U.S. Department of Agriculture, Forest Service 1981).

The indicator for resource availability is set equal to 1.0 in the medium, low, and high scenarios. This assumes that resource availability will not change between 1980 and the year 2040. Sensitivity to alternative resource management programs is tested by assuming a 20 percent decrease and a 20 percent increase, consistent with projections of the availability of fish and wildlife resources (U.S. Department of the Interior, Fish and Wildlife Service 1968).

LONG-RUN FORECASTS OF PARTICIPATION

Figure 1 and table 8 show the forecasts of the number of persons expected to participate in fishing, hunting, and nonconsumptive wildlife recreation trips in the United States from the base year, 1980, to the year 2040. The forecasts are based on the **logit** regressions and the projections of the independent variables. The sample means of the explanatory variables are multiplied by their regression coefficients, summed and added to the constant term. The resulting value is then substituted into the **logit** formula. This yields the probability of participation or the proportion of the population participating in the base year, 1980. Then, the process is repeated with the mean value of each variable multiplied by the expected value of the variable in the future year. In the two-stage procedure, the forecast probabilities for total hunting and fishing, respectively, are multiplied by the second stage forecast for each activity. The resulting forecast of the proportion of the population participating is multiplied by an index of projected population in the future year compared to the base year. Then this is divided by the estimated proportion of the population participating in the base year. The result is a forecast of the index for the number of persons expected to participate in the future year compared with the base year.

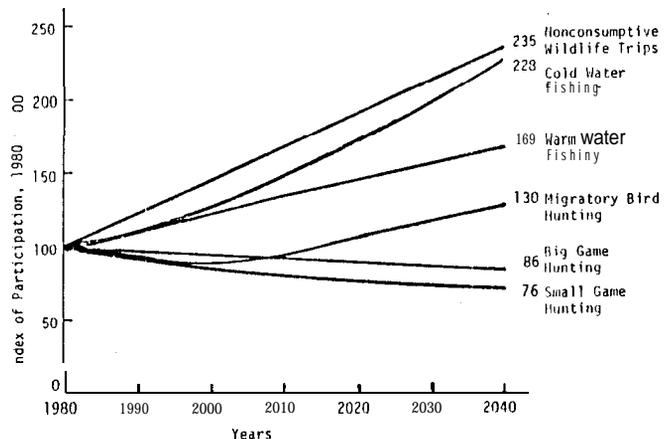


Figure 1.—Forecasts of the number of persons participating in major wildlife recreation activities under medium level population assumptions, United States, 1980 to 2040.

The results indicate that nonconsumptive wildlife recreation will be the fastest growing activity. The historic growth in fishing is expected to continue although at somewhat lower levels owing primarily to slower increases in population. Hunting is forecast to decrease in the long-run, consistent with the preliminary findings of the 1985 national survey. With 1980 indexed at 100, the number of persons participating in big-game hunting under medium level population

Table 8 Forecasts of the Number of Persons Participating in Fish, Hunting, and Nonconsumptive Wildlife Recreation Trips, United States, 1980 to 2040

	Year	Nonconsumptive Wildlife-Related Trips	Fishing		Hunting		
			Cold Water	Warm Water	Big Game	Small Game	Migratory Birds
Initial Condition	1980	100	100	100	100	100	100
	1990	124	114	115	105	101	101
High	2000	156	136	133	109	101	107
	2010	186	164	154	117	107	126
	2020	216	204	181	127	120	164
	2030	254	248	209	135	128	200
	2040	295	311	244	142	140	259
	Annual Growth Rate		1.819	1.909	1.498	0.586	0.562
Medium	1990	121	112	111	100	%	94
	2000	145	129	121	97	89	93
	2010	168	147	133	95	84	97
	2020	191	173	147	94	84	109
	2030	214	196	157	90	79	116
	2040	235	228	169	86	76	130
Annual Growth Rate		1.434	1.383	0.878	-0.251	-0.456	0.438
Low	1990	116	110	106	95	91	90
	2000	133	121	109	86	77	81
	2010	149	133	112	78	66	75
	2020	162	146	114	70	59	74
	2030	173	156	115	61	50	69
	2040	180	169	114	53	43	68
Annual Growth Rate		0.984	0.878	0.219	-1.053	-1.397	-0.641

assumptions for the year 2040, is forecast to decrease to an index of 86 and small game hunting to 76, while migratory bird hunting would increase to 130. This compares to a medium population forecast equal to an index of 135.5 for the same time period. Apparently, the number of persons participating in hunting will decrease despite the increase in population. By comparison, warm-water fishing is forecast to increase to 169, cold-water fishing to 228, and nonconsumptive wildlife recreation to 235. Also shown are the compound annual growth rates to facilitate comparison of these results with other research.

Statistical procedures are not currently available to estimate a 95 percent confidence interval around these point estimates. However, table 8 does show a range of forecasts in participation based on the low and high projections of population and other determinants of demand. The low and high forecasts result from inserting the low and high projections of the

variables into the equations. With 1980 set at 100, the number of persons participating in big-game hunting in the year 2040 ranges from a low of 53 to a high of 142, while small game hunting ranges from 43 to 140, and migratory bird hunting from 68 to 259. Thus, with the high population growth scenario, the number of persons participating in hunting would increase in future years.

MANAGEMENT IMPLICATIONS

The forecasts are sensitive to the availability of suitable resources; thus, they could be used to simulate the effect of management decisions. For example, setting the resource variable at 1.2 and 0.8 of the base case provides an estimate of the effect of changes in fish and wildlife management programs on participation.

Participation Index

Resources	Nonconsumptive Wildlife	Cold Water Fishing	Big Game Hunting
Base Case, 1.0	235	228	86
Increase, to 1.2	236	246	90
Decrease, to 0.8	234	211	82

This suggests that a 20 percent increase in suitable resources would increase participation in cold water fishing by 7.9 percent, compared to big game hunting which increases 4.6 percent, and to nonconsumptive wildlife recreation which exhibits almost no change. Hay and McConnell (1984) reported that resource availability was not a determinant of participation in nonconsumptive wildlife recreation. Their findings and those reported here may be the result of the inability to correctly measure resource availability rather than an insignificant or small effect on nonconsumptive participation.

Another indicator of the effectiveness of fish and wildlife management is success rate, i.e., the number of fish caught or wildlife bagged. For example, setting the success rate variable at 1.2 and 0.8 of the base case provides an estimate of the effect of management programs designed to achieve these levels of resource availability. The forecast of the index of the number of persons participating in the year 2040 changes as follows:

Participation Index

Resource Success Rate	Cold-Water Fishing	Warm-Water Fishing	Small Game Hunting	Migratory Bird Hunting
Base Case, 1.0	228	169	76	130
Increase, to 1.2	236	170	77	142
Decrease, to 0.8	221	167	64	118

This suggests that a 20 percent increase in success rate would increase participation in migratory bird hunting by 9.2 percent compared to 3.5 percent for cold-water fishing, and virtually no change in small game hunting. Neither the cold-water nor the small game coefficients for success rate are significant at the 0.10 level.

CONCLUSIONS

This study addressed the problem of forecasting participation in fishing, hunting, and nonconsumptive wildlife recreation in the long-run. Indications are that nonconsumptive wildlife recreation will be the fastest growing activity. The historic growth in fishing is expected to continue, although at somewhat lower levels. Hunting is forecast to decrease in the long-run, consistent with the preliminary findings of the 1985 national survey. With the expected slow-down in the historic increase in number of persons participating, fish and wildlife managers have an opportunity to emphasize programs designed to increase quality of the experience.

This study should be useful to natural resource managers and planners since some of the variables which affect participation can be influenced by public agencies, in particular the range in prices and supply of resources provided. Such information is essential in planning a suitable range of fishing, hunting, and nonconsumptive wildlife recreation opportunities.

The empirical estimates presented in this study should be viewed as tentative, first approximations to be verified or rejected by further study. Much more analysis is needed before we will understand all of the important determinants of participation in fishing, hunting, and nonconsumptive wildlife recreation. Further research is recommended using the 1985 national survey to test the reliability of the results reported here.

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PROJECTIONS OF FUTURE GROWTH OF OUTDOOR RECREATION IN THE UNITED STATES

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Abstract- The Renewable Resources Planning Act of 1974 (RPA) requires assessments of current and future forest and range demand and supply conditions. This paper reports the results of research which led to forecasting future recreation demand in order to meet the RPA mandate. The basic model was grounded in household production theory and the data were primarily from the Public Area Recreation Visitors Study (PARVS). Models for 31 land, water and snow-based activities were estimated and future growth of trip consumption by the American public to the year 2040 was developed. Results were estimates of expected consumption of outdoor recreation if recent past trends of the availability of recreational opportunities were to be continued into the future. By the year 2000, land-based recreation is predicted to increase 15 percent over the 1987 level. Water and snow-based activities will grow between 7 and 59 percent among the nine activities modeled.

INTRODUCTION

One of the most intriguing challenges to researchers and planners is to reliably forecast future demand for outdoor recreation. This challenge is particularly acute when the target is to understand likely futures at the national level. The Renewable Resources Planning Act (RPA) of 1974 requires such forecasting every 10 years in order to better plan programs for the Forest Service and other agencies concerned with forest and range management. The work reported in this paper was developed for the

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1989 RPA Assessment of Outdoor Recreation and Wilderness (U.S. Department of Agriculture, Forest Service 1988).

METHODS AND DATA

Conceptualization of the forecasting approach and data collection for the 1989 RPA Assessment were begun in 1982. The anticipated approach was to develop econometric models which would enable estimation and projection of market equilibrium levels of consumption of outdoor recreation. Adoption of this general approach led to initiation of both demand-side and supply-side data collection to support modelling which ultimately would lead to projections of future consumption of outdoor recreation by the American public.

The Model

The basic model structure was based on the aggregate household production model as described by Bockstael and McConnell (1981). In household production theory outdoor recreational trips (the basic consumption unit) are produced in a two-stage process. In the first stage of this production process, resource managers combine land, labor, capital, and technology to provide recreational opportunities. In the second stage, households combine these opportunities with personal equipment, information, skills, travel and other household inputs to produce recreational trips to the sites where the opportunities have been provided. At the point where household costs of producing recreational trips (supply curve) exactly equals (intersects) households' willingness to pay the costs of taking recreational trips (demand curve), an equilibrium is achieved. At this point of equilibrium, the marginal benefits of taking a trip are equal to the marginal costs to households of producing a trip. When resource managers, as providers of opportunity, and households, as both the consumers and producers of recreational trips, are considered

as actors within the same, larger market, estimates of general equilibrium consumption of outdoor recreational trips can be generated econometrically (Bergstrom and Cordell, in press). The advantage of this general equilibrium approach is that assumptions about both demand and supply determinants can be used to forecast the future. Past forecasting efforts have depended almost solely on demand-side determinants. Such resulting forecasts may not, then, reflect feasible or desired resource management options,

The Data

Supply data were developed from both original and secondary sources. Original supply data sources included the National Private Land Ownership Study and the Municipal and County Parks and Recreation Study (McDonald and Cordell 1988). Secondary sources included agency inventories, census files, directories of opportunities, and other existing hard copy or computer readable files. The result was the National Outdoor Recreation Supply Information System, a county-level file containing over 400 data elements describing recreational sites, facilities, and services in the United States. Many of these data elements were used in our modelling.

Demand data were from the Public Area Recreation Visitor Study (PARVS). PARVS was a cooperative venture (Cordell and others 1987) which generated origin-destination data describing number of trips, average trip costs and purpose of trips across a national sample of over 40,000 recreation site visitors. The dependent variable derived from PARVS was number of trips taken **away from home** by people in representative communities in the United States, to visit a recreation site for the purpose of participating in a chosen activity. A trip away from home is one of more than **15-minutes** driving.

Empirical Estimation Procedure

Future community-level consumption of outdoor recreational trips was estimated using a reduced-form, general equilibrium national model of the demand and supply of trips away from home. The model was specified to show the number of trips taken by community residents as a function of community and opportunity attributes. These attributes included:

LTRIPS = Natural log of the total number of trips to consume a recreational activity by people who live in the representative communities.

INCOME = Percentage of people in a representative community who had incomes greater than \$30,000 in 1987.

18TOMED = Percentage of people in a community who were between the ages of 18 and the median U.S. population age in 1987 (32).

PCTFARM = Percentage of people in a community who lived on a farm in 1987.

POPULN = Number of persons 12 years and older living in a community in 1987.

SUBS = An index of the spectrum of substitute recreational opportunities within an acceptable driving distance of a community which compete with (substitute for) particular opportunities for an activity as potential uses of people's non-work time and money.

OPPS = Amount of opportunities available for taking recreational trips away from home for a particular activity within the driving range of a community.

The above reduced-form household production model was estimated by regression analysis across a nationwide selection of 243 representative communities (counties). Models were developed for the 31 activities shown in table 1. The functional form selected was a semi-log, dependent variable model, selected because this form provided the most theoretically and statistically consistent fit of the data.

The estimated 31 regression equations had adjusted R^2 s ranging between 0.13 and 0.69. Checks for collinearity and consistency of signs on the estimated coefficients were instituted. In all models, theoretically correct signs resulted and in almost all instances the coefficients were highly significant.

The resulting cross-sectional models described equilibrium consumption of recreational trips in the United States for 1987. To obtain projections of future equilibrium levels of trip consumption, assumed future changes of the values of the independent variables for the years 2000, 2010, 2020, 2030 and

Table 1.--Nationwide numbers of recreational trips away from home and indices of future growth to 2040 if recent past trends of recreational opportunities are continued

Opportunity category and activity	Nationwide trips away from home (millions)	Percentage of 1987 trips in future years				
		2000	2010	2020	2030	2040
Land:						
Wildlife observation	70	107	113	120	126	130
Primitive camping	38	108	115	122	130	134
Backpacking	26	124	144	165	185	198
Nature study	71	99	101	103	107	108
Horseback riding	63	114	125	135	144	149
Day hiking	91	123	144	168	198	229
Photography	42	115	128	141	154	163
Visit prehistoric sites	17	127	148	173	203	236
Collecting berries, mushrooms etc.	19	110	120	132	149	169
Cutting firewood	30	109	118	130	144	161
Walking for pleasure	267	116	132	148	168	183
Running or jogging	84	131	160	192	229	260
Bicycle riding	115	124	146	170	197	218
Off-road driving	80	104	108	112	118	121
Visiting museums	10	118	134	152	172	187
Attending special events	74	115	129	144	161	175
Visit hist. sites/memorials	73	117	133	152	178	204
Pleasure driving	422	110	120	129	139	145
Family gatherings	74	121	139	160	182	202
Sightseeing	293	114	128	144	164	185
Picnicking	262	110	120	131	145	156
Developed camping	61	120	138	158	178	195
Water:						
Canoeing/kayaking	40	113	126	138	153	163
Stream/lake/ocean swimming	239	108	118	128	140	152
Rafting/tubing	10	123	151	182	229	267
Rowing/other boating	35	110	120	130	142	150
Motor boating	220	107	114	122	131	138
Water skiing	108	112	122	132	144	152
Pool swimming	221	135	166	200	237	267
Snow and ice:						
Cross country skiing	9.7	125	136	142	141	126
Downhill skiing	64.3	159	208	261	317	359

2040 were multiplied by their respective regression coefficients, and the products were summed. These sums represent estimates of future levels of recreational trip consumption. Future values of the demand-side factors were obtained from Wharton Econometrics (population and income) and from other credible sources tied to Census of Population data (U.S. Department of Commerce, Bureau of the Census 1986).

The predicted future values of the substitute index (SUBS) and recreation supply or opportunity variable (OPPS) represent special cases. Future values of SUBS were held constant to represent a non-changing situation with respect to per capita availabilities of recreational opportunities which substitute for activity i. OPPS was changed into the future at rates equal to recent past trends-since 1970. Some of these opportunities are increasing, others decreasing (table 2).

RESULTS

The forecasts of future consumption of outdoor recreational trips is shown in table 1. The forecast of number of future trips was converted to an index to represent percentage of 1987 trips. This simplifies comparison of projected growth rates among the 31 activities. The 1987 base number of trips for the US population (in millions) is also shown in table 1. Our assumption is that the projections shown are **the most likely future** for outdoor recreation in the United States – called “expected consumption.” This assumption rests on (1) the credibility of sources for the anticipated future changes in the demographic variables in the models and on (2) the strong likelihood that unless planned public sector or market-driven private sector changes in recreational opportunities occur, recreation consumption will continue to follow the course of recent past trends. This assumption has many policy implications and raises questions which must be considered as we move into the 21st century.

Table 2. --Percentage change of land, water and snow recreational opportunities if recent trends (1970-87) are continued into the future

Opportunities	Percentage change since 1987				
	2000	2010	2020	2030	2040
Land:					
Wilderness and other extensive roadless areas	-9	-15	-21	-26	-31
Undeveloped areas near roads	-12	-20	-28	-35	-41
Partially developed, roadless areas	-9	-15	-21	-26	-31
Intensively developed sites	8	15	22	29	37
Water:					
Wild and remote lakes and streams	3	6	8	9	10
Lakes and streams near roads	-3	-4	-6	-8	-10
Lake/stream sites adjoined by roads	8	15	22	29	37
Intensively developed water sites	12	23	34	47	61
Snow and ice:					
Wilderness and other roadless areas	-9	-15	-21	-26	-31
Undeveloped areas near roads	-12	-20	-28	-35	-41
Partially developed, roadless areas	-9	-15	-21	-26	-31
Intensively developed winter sports sites	17	28	36	43	49

Expected Consumption of Land-Based Trips

In general, across the land activities listed in table 1, continuation of the rates at which opportunities were made more or less available for public recreation over the past years since 1970 will lead to growth of expected recreational consumption. This growth is projected to accumulate across activities to about 15 percent by the year 2000. The expected consumption of land activities which are projected to grow most rapidly includes running/jogging (+31 percent), visiting prehistoric sites (+27 percent), bicycle riding and backpacking (+24 percent each), day hiking (+23 percent), and family gatherings and developed camping (+21 percent and +20 percent, respectively). In total, projected growth among these seven activities is just over 113 million trips per year by the year 2000.

The slowest growing of the land activities are nature study (-1 percent), off-road driving (+4 percent), wildlife observation (+7 percent), primitive camping (+8 percent), cutting firewood (+9 percent), and collecting berries, driving for pleasure, and picnicking (+ 10 percent each).

For the most part, the relative rankings by projected growth rate among land activities should remain as they currently are to the year 2040. The one dominant theme among the fastest growing activities is their dependence upon trail and developed site resources. Substantial growth of opportunities for these activities should lead to substantial increases in recreational trip consumption in future years.

The slowest growing activities mostly depend upon **roaded** and partially developed rural lands. Continuation of the recent downward trends of these resources will result in very slow rises in expected trip consumption as households must overcome shrinking space and access using different means and technology to produce their recreational trips and experiences.

Expected Consumption of Water and Snow-Based Trips

For the most part, expected consumption of water recreation trips should grow moderately with continuation of recent past opportunity trends. The exceptions are rafting/tubing (+23 percent by 2000) and pool swimming (+35 percent). Access, technology, and services associated with rafting and tubing types of activities (especially outfitters) have risen rapidly in recent years. So, too, have the number of

swimming pools. Continuation of these trends is projected to result in rapid growth of trips to utilize these opportunities. In fact, pool swimming is projected to increase to levels beyond that of stream, lake and ocean swimming by 2020. Motorized water recreation trips should grow slowly if recent trends are continued. Continuation of the moderate expansion of resources suitable for motorized water recreation (at a rate somewhat below population growth) is projected to generate approximately proportionate percentage rises in expected consumption of motorized water trips as reservoirs and lakes continue to be crowded at peak times.

The decrease of undeveloped and **roaded** rural lands in areas with good winter snowfall is projected to result in slower growth of consumption of cross-country skiing and similar dispersed activities. Actually, the consumption of dispersed winter recreation trips should rise moderately through 2010, and then if the loss of access to private and public lands continues, consumption would level and eventually decrease through 2040. If recent trends are continued, downhill skiing should continue to rise and do so rapidly if both new sites and new capacity are added. Development pressures from downhill skiing may actually contribute to some loss of cross-country opportunity.

OBSERVATIONS

Expected consumption growth of the activities shown in table 1 demonstrates the highly variable rates at which different forms of recreation may grow in the future if recent resource availability trends are continued. Following these trends into the future may, in many cases, match well what the public will likely prefer. But for some activities, recent trends of opportunities may not match public demand for recreation opportunities. Where they do not match, a course into the future that is different than continuation of what has been done in the past may need to be considered.

For wilderness and other extensive **roadless** areas, recent past trends have resulted in decreases of access and availability (table 2). Although wilderness designations are up, road development has reduced the amount of **roadless** area which is greater than 3 miles from access and which thus can substitute for protected wilderness opportunity. This same trend has been occurring with lands nearer roads, but which are still unroaded and undeveloped. Recent road and other development has removed area from **roadless** status, and this has had and will continue to have effect on availability of recreation opportunities. Even more dramatic has been the closure and posting

of private land. Closure of private land has had an especially noticeable effect on recreational opportunity availability of **roaded** and partially developed lands. This is true even though the amount of Federal, State, and local lands of this type has been increasing due to road construction and other development.

Developed land resources, picnic areas, campgrounds, resorts, nature centers, and golf courses, have been growing in both numbers and capacity. While some Federal sites have been closed or have faced reduced maintenance, local government and private sector resource investment and management has risen more than enough to offset Federal decreases.

Availabilities of remote and wild water resource opportunities have been increasing slightly in recent years (table 2). Designations of Wild and Scenic Rivers and increases in water quality and guide services have all contributed to offset road and other development. The net result has been a small increase of remote water resource availabilities. Some closure of private properties and development of public water areas has resulted in small decreases of availabilities of segments of lakes near to, but not immediately adjacent to roads. This same development, with added boat ramps, reservoirs, road crossings and boat rentals, has increased lake and stream resources adjoining roads. This increase has been at rates closely approximating population growth rates.

Intensively developed water sites have grown rapidly in recent years. Pools, marinas, piers, water amusement parks, and other developments have added to water recreation opportunities. As this development has occurred, resources available for remote or white water activities have decreased. Most of this development for water recreation **opportunities** has occurred within the private sector.

The implications of continuing recent past trends in the supply of recreational opportunities should be examined further. Among some opportunities the trend is up. Among others, the trend is down. These patterns affect how the American public **can** participate in recreation in the future. There is a need to

compare likely future availabilities of recreational opportunities with the quantity of outdoor recreation the American public might prefer. Such a comparison would facilitate more efficient allocation of resources to alternative recreation management programs and strategies. In a forthcoming publication, a methodology for estimating "gaps" between preferred demand and expected supply of recreational trips at the community level is proposed. The methodology for this comparison is described in Bergstrom and Cordell (In press).

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ESTIMATING RECREATION VALUES OVER TIME

George L. Peterson'

Abstract- Knowledge of how recreation supply and demand curves change over time allows prediction of future recreation values, even where recreation markets are imperfect. However, technical and institutional obstacles impede progress. Recreation products need more disciplined definition. Recreation supply side theory needs further development. Research is needed to describe the processes by which supply and demand change over time. Management and policy institutions need to decide, not predict, many key variables. Some important determinants of change are not predictable. Planning based on prediction of future consequences of present choices is popular but not necessarily the best planning strategy. Other strategies should be explored.

INTRODUCTION

The purpose of planning is to figure out how to reduce future entropy from the human point of view, to use reason and foresight to bring the future into better agreement with human objectives than if spontaneous processes were allowed to run their course. To this end, economic efficiency is a useful criterion for evaluating allocation of scarce resources. To measure economic efficiency, we need to know the streams of costs and benefits that flow through time from the alternative policy courses among which we must choose. The objective of this paper is to explore how and whether we can predict the monetary value of such future costs and benefits,

This paper focuses on the state of the art of cost and benefit valuation of nonpriced and extra market recreation at the national level. The problem is much broader, however, and much of the discussion is applicable to a broad range of imperfect market

goods and services of which recreation is simply an example. The main conclusions are:

1. It is possible to measure current demand side monetary benefits for things like recreation, even in the most difficult cases, given a good operational definition of the recreation product.

2. Not everyone believes #1.

3. The supply side of recreation economics is not well developed.

4. Several different definitions of recreation identify different products and respond to different policy questions. These products and definitions often are not clearly specified and separated, thereby making valuation difficult and misleading.

5. Explaining how to predict values over time is easy (in theory), but doing it is not easy. Time series data and explanations of temporal change are scarce. Some critical change agents behave in ways that are obscure.

6. We need to separate things we should predict from things we should decide and control.

7. Planning based on prediction of future values is only one way to prepare to meet and control the future. Another is to identify alternative future scenarios, prepare contingent plans, and update the scenarios and plans as the future unfolds. Still another is to preserve flexibility by avoiding irreversible commitments of rare and unique resources where future values are uncertain.

8. We need more research, but not until some answers get questioned.

9. It is hard to catch fish with your hands.

Following this introduction, the paper consists of five main sections. The first provides an overview of the current situation for economic valuation, The

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second identifies barriers to static valuation. The third reviews the current situation for prediction of values over time, and the fourth identifies barriers to value forecasting. The paper concludes with a discussion of research and policy opportunities.

This paper does not attempt to present an historical review of recreation valuation or to summarize recent or historical value estimates. Such information is already available in published or soon to be published works. For example, for an historical review of recreation valuation, see Peterson and others (1985a). Sorg and Loomis (1984) review and summarize value estimates dating from 1965 through 1982. Walsh and others (1988) and Walsh and others (in press) present a review of recreation value estimates from 1968 through 1988. Details of specific value estimates and valuation methods are available in publications cited by these documents. Work in progress at the Rocky Mountain Forest and Range Experiment Station utilizes data from the Public Area Recreation Visitor's Survey (PARVS) to estimate demand models and marginal and nonmarginal values by several activity categories for Forest Service Districts and Regions nationwide, including Alaska. Publications reporting the results of this study are in preparation.

There is no attempt, either, in this paper to predict present trends and future values. Such a task is beyond the author's ability for reasons described below.

CURRENT SITUATION: VALUATION OF RECREATION PRODUCTS

What is the Recreation Product?

Definition must precede measurement (Caws 1959). Without precise definition, measurement has no meaning. For valuation, definition has two components: 1) definition of the good that is the value object, and 2) definition of value. The definition of the good must allow measurement of how much we have (i.e., its magnitude). Magnitude measurement requires an operational definition that allows identification, observation, and comparison of different magnitude states. It also requires **standard** units of magnitude and standard methods for counting the units.

How we define recreation determines how easily we can measure magnitude and value. Valuation of recreation behavior or recreation facilities, for example, is easier than valuation of recreation experience, because recreation experience is not an observable

product. Measurement of magnitude or value for unobservable things is a very difficult technical task (Stevens 1959).

Magnitude measurement does not, however, solve the problem. Valuation requires definition of 'value' and observation of behavior that reveals how people trade value for magnitude. If the valuation criterion is money, valuation requires observation of exchanges between money and recreation.

So, what is recreation? Is it off-site and so-called 'nonuser' experiences and feelings? Is the recreation product an activity, an opportunity, a facility, a site, or an experience? Is its unit of magnitude an activity-day, a visitor-hour, a person-trip, a visitor at a site, or one **"util"** of warm, fuzzy feelings? Is demand for recreation direct final demand for sites and facilities, or is it demand for recreation experience obtained through household production (Becker 1965)? Is it derived from desirable overt, hidden, or societal products that require recreation as an input factor? The word 'Recreation' is obviously a catchall term that stands loosely for many different products. Before attempting to measure the magnitude and value of recreation, we must decide which product is the value object, and that depends on the policy application of the value information.

Many recreation products are extreme cases of heterogeneous and composite commodities. No two experiences, trips, or sites are exactly alike. For example, recreation sites vary in quality, which is a function of site characteristics, including congestion (Harrington 1987). Even the product of an easily observed recreation trip or visit is often a jointly produced composite. People often visit several sites. While at a site, most people engage in unique combinations of several activities, and they produce unique composite experiences. People also desire novelty or variety of experience as a good in its own right. In short, trying to measure the value of **"recreation"** without precise definition of the product is like trying to catch fish with your hands.

What Do You Mean by "Value"?

Monetary Valuation and Economic Efficiency

Just as 'recreation' means different things to different people, so too does **"value"** (Peterson and others, in press). Here it is used in the context of economic efficiency and monetary value, the amount of money a person is willing to exchange for the thing in question. Thus, a dollar's worth of candy has the same 'value' as a dollar's worth of education,

no matter how you may feel about equating the two. If you want to argue, you are playing on a different game board.

Even where there is agreement on the use of the monetary metric, there is sometimes disagreement on what constitutes an economic 'benefit.' Is it a tourist expenditure in a local market, a positive balance of payments in the local economy, an economic "multiplier derived from input-output analysis, a better job for uncle Joe, a redistribution of income to the poor through free public parks, or a "potential Pareto improvement' at the national level?

Welfare economics includes two basic concerns: 1) economic efficiency, and 2) income distribution. The first asks whether a proposed action produces more aggregate wealth than it consumes, without regard for who gains and who loses. The second asks to see the distribution of gains and losses among the people, and the answer allows judgment by political means of the fairness of that distribution.

The focus of this paper is economic efficiency at the national level, although the ideas and methods are applicable at any level of aggregation. We need to measure the kinds of recreation value that will allow evaluation of the relative economic efficiency of alternative allocations of resources. We need to know such values both for the present and for the future. For a more complete discussion of the topic of valuation for economic efficiency analysis see Peterson and Randall (1984) and Peterson and others (1987).

The Supply and Demand Model

Measurement and prediction of value are best understood in terms of the supply and demand curves of elementary economics as illustrated in figure 1. The demand curve describes the relationship between price and quantity consumed. On the demand curve, price is the consumers' marginal willingness to pay (MWTP), i.e., the amount of money bid for the last unit consumed, given quantity. In mathematical terms, the demand curve is the first derivative of total willingness to pay.

The supply curve describes the relationship between price and the quantity suppliers are willing to produce. On the supply curve, price is the suppliers' marginal willingness to accept compensation (MWTA), and quantity is the number of units offered for sale at that price. In a competitive market with many suppliers of a private good, the supply curve is the marginal cost curve, the relationship between quantity and marginal cost of production. Again, in mathemati-

cal terms, it is the first derivative of total cost. In an imperfect market, say one where a supplier has monopolistic power or where a government agency produces and subsidizes the good, the supply curve may not be the marginal cost curve.

Pure competition in private goods seeks equilibrium between supply and demand. That equilibrium occurs at the intersection of the demand and supply curves. At the quantity thus defined, the consumers' MWTP on the demand curve equals the producers' MWTA on the supply curve.

Under pure competition, individual producers and consumers are unable to cause price to change, and therefore all transactions take place at the point of equilibrium. In effect, consumers face a horizontal supply curve and producers face a horizontal demand curve. All units of the good are thus exchanged at the marginal cost price, and the value of a given transaction is simply price times quantity. Producers capture this total economic value through transfer payments from consumers, and the consumers retain no surplus.

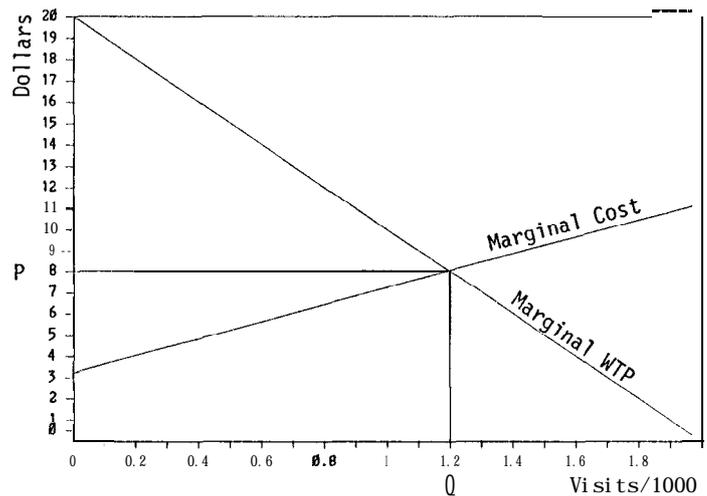


Figure 1. -Supply and demand equilibrium.

The simple and convenient scenario of figure 1 becomes more complicated when the market is imperfect. For example, a free market cannot allocate resources efficiently where some of the goods are nonrival or nonexcludable in consumption, Production of such goods is not attractive to private enterprise, although the goods may appear as externalities in private transactions. Natural or regulation induced monopoly also tends to corrupt the free market, as do inefficient government interventions. Many aspects of outdoor recreation on public land have such characteristics, so the free market is not very effective in setting and revealing efficient marginal prices (Randall 1983).

Another problem arises when a transaction is not marginal, for example, when it involves a change of price. Adding another tent site to a large camp ground probably is marginal, but adding or deleting a whole camp ground probably is not. Where nonmarginal change occurs, we need to know the demand and supply price of the whole change, and that involves movement on the demand or supply curve. The transaction no longer takes place at a single point of equilibrium. The price of such a change includes economic surplus for consumers or suppliers. Many of the recreation supply changes involved in government land management and allocation plans are not marginal, although there continues to be some effort to force fit marginal thinking to nonmarginal circumstances.

The locational lumpiness of some kinds of recreation opportunity violates the competitive market model in other ways, also. The textbook competitive market of microeconomics consists of a large number of ubiquitously distributed suppliers and consumers. The market is on a featureless flat plane where transportation cost is zero. Location is therefore not important. However, locational lumpiness of recreation sites makes travel cost a major component of total price. A significant change in the location of recreation opportunity or users causes a major change in price.

In a location and space economy (e.g., Alonso 1964, Losch 1954, Mills 1980, von Thunen 1926), spatial transaction cost intervenes strongly in the structure of the market. In effect, each recreation site becomes a unique good with its own market. Land rent varies by location as a function of intrinsic productivity, travel cost, and location of the consumer population. Because of different residential locations, different consumers face different supply curves for the same site. Recreation sites face downward sloping demand functions, and different sites face different demand functions.

The unique and publicly controlled nature of many recreation sites, such as wilderness areas and national parks, compounds these problems. Besides being in spatially lumpy markets where transportation cost is a significant part of price, such sites also have unique features that differentiate them strongly from other recreation opportunities. Thus, many recreation transactions take place under monopolistic conditions in an imperfect spatial market, rather than under the commonly misapplied pure competition model.

Hypothetical Equilibrium

In recognition of these problems, one purpose of government institutions such as the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974, as amended by the National Forest Management Act (NFMA) of 1976, is to identify imperfections in forest product markets and recommend strategies for improving the efficiency of public resource allocation. Achievement of this mission requires, among other things, demand and supply prices for marginal and nonmarginal changes in the supply of recreation.

When applied correctly, the competitive market model is a useful paradigm for thinking about such prices. If we knew the demand (**MWTP**) function and the supply (marginal cost) function, we could simulate efficient equilibrium. The hypothetical equilibrium identifies the efficient marginal cost price and the efficient quantity that would prevail if the market were able to function perfectly. Furthermore, hypothetical re-equilibration in the face of a nonmarginal supply or demand change reveals the new efficient quantity, the new marginal cost price, and the nonmarginal price of the entire change.

Assume that figure 1 illustrates a known demand curve and a short run supply curve for a given day at a specific day-use recreation site in an imperfect recreation market. Although actual quantity and price may be inefficient because of administrative control or other imperfect market conditions, the point of hypothetical efficient equilibrium reveals the social value of a recreation visit at the margin. Of course, to be correct, the supply and demand curves must include external costs and benefits, and both curves must describe the same product and market conditions.

The demand curve describes marginal willingness to pay for a visit to the site as a function of total visits. The supply curve describes the marginal cost of one more visit as a function of total visits. Note that the demand curve thus defined is not a trip demand curve. Rather, it is a visit or entry demand curve defined at the gate through which the visitor enters the site. Marginal WTP on this demand curve is the residual marginal bid after payment of all trip costs except the fee for entry to the site. Under the assumption that a visitor's response to a change in entry fee is exactly the same as her response to a change in travel cost, the demand curve in figure 1 is the "second stage" demand curve. Note also that the supply curve is not a market supply curve. It is strictly a short run site supply curve for the site in question, given fixed site capacity, and holding the

price, quality, and capacity of all other sites fixed. The 'equilibrium' thus defined is a short run partial equilibrium that is simply the site operator's supply response to his cost structure and a fixed exogenous demand environment.

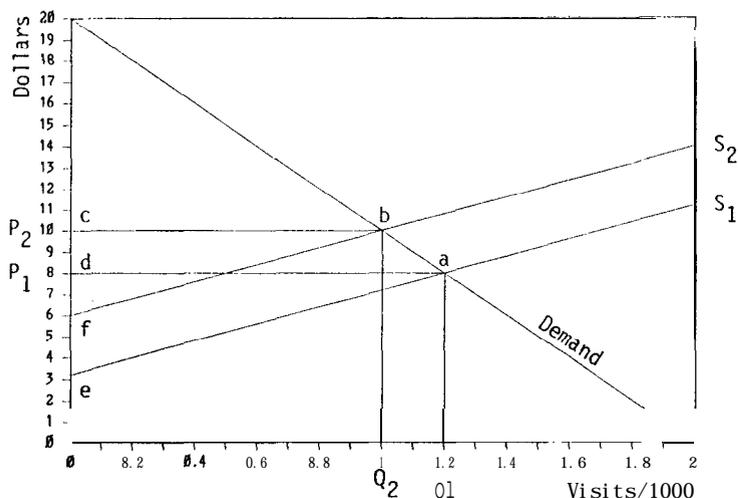


Figure 2. – Nonmarginal supply change.

Figure 2 illustrates a nonmarginal analysis. Assume the site described by the demand curve receives 1,200 (Q_1) visits per day at a price of \$8 (P_1) per visit. The fees for these visits total \$9,600. A proposed site plan calls for a fee increase of \$2 per visit. At the new price of \$10 (P_2), the number of visits declines to 1,000 (Q_2), and the fees total \$10,000. On the supply side, this price change means an increase of \$400 in total revenue. On the demand side, visits decline by 200. The amount of money the demand side is willing to pay to avoid the price increase is approximately the area "abcd." This area constitutes a loss of \$2,200 and is the net demand side price of the nonmarginal change from P_1 to P_2 .

Given a supply curve, similar analysis reveals the supply side price of a nonmarginal change. The definition of a recreation supply curve is not simple, but for illustrative purposes, assume the supply curves for this example are S_1 and S_2 in figure 2. The total cost of receiving Q_1 visits is the area under S_1 , between zero and Q_1 , or \$6,720. Total revenue at Q_1 is P_1 times Q_1 , or \$9,600. Profit is revenue minus cost or the area "eda" and comes to \$2,880. Similarly, the total cost of producing Q_2 units with supply curve S_2 is \$8,000, total revenue is \$10,000, and the profit (area "cfb"), is \$2,000. Net change in profit to the producer(s) of the recreation is \$2,000-\$2,880, a reduction in profit of \$880. Thus, the demand side is willing to bid \$2,200 to avoid the change, and the supply side is willing to bid \$880 for a total of \$3,080. This amount is the nonmarginal price of the change.

Thus, in order to measure marginal or nonmarginal prices for recreation in a short run partial equilibrium sense given a management action or a social change that affects supply or demand, we only need to know the before and after supply and demand curves at the site in question. In order to predict future prices for recreation, we only need to predict how these two curves change over time. Having such curves for a future point in time allows estimation of two kinds of prices: 1) the future price of a future marginal or nonmarginal supply change, and 2) the price of the nonmarginal change (if any) from present to future. Of course, it is necessary to specify the supply and demand curves in terms of inflation adjusted real dollars.

The above example applies both to simulated perfect 'equilibrium' in an imperfect market and to efficient 'equilibrium' under perfect competition. The nonmarginal problem is not unique to public goods or to imperfect markets. Nonmarginal supply changes also occur for private goods and competitive markets, and when they do, marginal prices are not adequate.

The hypothetical short run partial equilibrium question is: What would price and quantity be at the site if the supplier were able to operate efficiently? The actual recreation site market may be quite imperfect, for example, because of a government decision to charge no fee for recreation on a national forest where the marginal cost of that recreation is not zero or to offer transportation service at below marginal cost. Supply and demand curves allow estimation of supply and demand prices following the logic described above. Space limitation prevents inclusion of an imperfect market example.

The above illustrative analysis is deceptively simple, however. Short run site specific supply curves require knowledge of the production and cost functions, including external and congestion costs. Site specific residual demand curves are likely to be ad hoc and irregular because of idiosyncratic distribution of the market population. They must be derived by the second stage process from empirical travel cost models or observed directly through fee variation.

Defining the product as the trip and the market point as the place of the visitor's residence simplifies the demand side somewhat. The demand curve becomes the 'first stage' demand function. Such a demand curve may or may not be unique to each individual or origin, but is usually viewed as a generalized model of behavior, perhaps modified by personal or demographic variables or partitioned by market segment.

Viewing the problem from the trip origin, however, complicates the supply side, because of idiosyncratic distribution and heterogeneity of recreation sites and involvement of transportation services and other input factors. Because of the locational unevenness of recreation supply, different geographic locations face different supply curves, which generally will be upward sloping step functions. Given such supply and demand curves, hypothetical 'equilibrium' analysis of the type described above could yield marginal and nonmarginal information about the value of recreation trips, including an 'effective price' for recreation of the type proposed by Harrington (1987).

Methods for Demand Side Valuation

The theory and method of demand side valuation of nonpriced goods are well developed (e.g., see Freeman 1979; Hoehn and Krieger 1986; Peterson and others 1987; Randall **1984b, 1984c**) and have had extensive, though unsystematic, application. Current RPA policy for measuring recreation demand prices is an adaptation of the market equilibrium model (U.S. Department of Agriculture, Forest Service 1987).

There are three basic ways to estimate prices for imperfect market goods. The first approach proposes that prices observed in private recreation markets are transferable to the public sector (Fedkiw 1984). The second approach, sometimes called 'revealed preference'; derives recreation demand prices and demand functions from observations of real market transactions for substitute or complementary private goods. Examples are the "travel cost method" (TCM) and "hedonic pricing" (e.g., Mendelsohn and **Markstrom**, in press; Rosenthal and others 1984). Contingent valuation is an example of the third approach, which obtains estimates of prices and demand curves from observations of transactions in hypothetical markets (Cummings and others 1986; Randall **1984c**). Each approach has its own strengths and weaknesses.

BARRIERS TO VALUATION

Technical Barriers

Several technical obstacles impede practical application of the hypothetical equilibrium model. As discussed above, the recreation product sometimes lacks adequate identification and definition. **Without** clear and precise definition of the recreation product, and without standard units and methods for measuring its magnitude, trying to estimate supply and demand curves is a futile and misleading exercise.

Estimating the marginal cost of adding the capacity to accommodate an additional person at one time at a recreation site is not difficult. Measuring the marginal cost of an additional recreation visit at a given site in the short run (fixed capacity) is possible but not simple because of problems in measuring congestion cost. Describing the consumer's marginal cost curve for recreation trips from the point of origin with site location and capacity fixed is still more difficult because of the need to measure the cost of travel time, the cost of congestion, the cost of other consumer inputs to trip production, and because of the spatial discontinuity of recreation sites. Composite recreation experiences also present difficult marginal cost problems. The most difficult case, however, is the long run marginal cost curve for an entire region, as seen from the consumer's point of residence. General equilibrium analysis in the long run for a regional market is a challenging task (**Anas** 1988, Hof and Loomis 1988).

Heterogeneity and jointness in the recreation product compounds the valuation problem. Managers generally frame their questions in terms of the price of an activity-visitor-day such as of camping or fishing. There is, however, no such thing as pure camping or pure fishing. There may be a primary trip purpose in the mind of the consumer, but almost all outdoor recreation events are jointly produced composite experiences. Assignment of costs and values to the separate components of a jointly produced composite good requires allocation of joint costs. The contingent valuation or hedonic pricing methods offer promising approaches to such problems.

An alternative to estimating prices for separate components of recreation experience is to define the recreation good as the entire composite, that is, as a visit to a recreation site. Valuation of a whole visit is simpler than valuation of elements of a composite experience. Likewise, defining the good as a recreation trip, rather than as a destination, solves the multiple

destination problem. Such definitions solve the joint production problem, but they substitute for that problem a proliferation of unique goods.

Current practice in travel cost analysis throws away multiple destination data and uses only single purpose trips. Multiple purpose trips may substitute for single purpose trips, however. Failure to include them in the analysis may bias the result. Fortunately, some kinds of recreation trips tend to be predominantly single destination, thus allowing use of the travel cost method.

Some technical issues in valuation remain controversial. Economists argue among themselves about esoteric technical issues such as the validity of aggregate travel cost models. Economists and other behavioral scientists disagree about whether the valuation basis of normative microeconomic theory is consistent with human behavior (Hogarth and Reder 1987; Peterson and others 1988; Simon 1985). Such technical disagreements need resolution through research.

Institutional Barriers

On the institutional side, economists struggle with a credibility problem and, perhaps, an identity crisis. Apparently it is difficult to separate political objectives from technical facts, Policy makers tend to ask economic questions in terms that require joint technical and political judgments (Frey and others 1984). For example, 'Shall we use import tariffs to improve the balance of payments?' Such a question has two components: 1) Can import tariffs improve balance of payments? (a technical judgment) and 2) Is a tariff barrier a politically acceptable government intervention? (a political judgment). Likewise with recreation, two questions intertwine: 1) Is this number a valid measurement of the net contribution of recreation to national economic development? and 2) Do we want to invest more money into recreation that does not return revenue to the treasury?

The identity crisis is most likely to strike economists who believe benefit cost analysis should drive political judgments. A democratic society simply does not decide policy that way (Bolton 1967, Loomis 1987). Benefit cost analysis is one of many information systems feeding data into a pluralistic political decision process (Randall 1984b). On the other hand, it may also be a political tool used to filter and inhibit certain kinds of social programs that are difficult to justify in hard economic terms.

As if these problems are not sufficient, some of us stumble simply because we don't understand the very complex technical arguments. Understanding the recreation value problem requires well developed logical skills and sophisticated training in economics, recreation, and political science.

CURRENT SITUATION: FORECASTING RECREATION VALUE OVER TIME

One method alleged to 'predict' future value is to measure value now and apply compound interest formulas to calculate what the value will be at some future time if allowed to grow at the assumed interest rate. This is not the approach being considered in this paper. The problem faced here is to measure the values (WTP or WTA) people will assign to marginal and nonmarginal changes at a specified future point in time. If discounting formulas are applicable to such a problem, it is only to "move" values from one point in time to another, as when calculating present net value.

As explained above, estimation of recreation values at whatever point in time occurs either directly by contingent valuation or indirectly by revealed preference. CVM is just as applicable to a hypothetical future market as it is to a present one. However, one still must specify the correct future market conditions in the hypothetical question, Thus, the prediction problem remains.

The revealed preference approach requires prediction of future demand and supply functions from which to derive values. Virtually all estimates of such functions come from cross-sectional data, because most available data are cross-sectional. Time series data are expensive to acquire, and disciplined repetition of experiments over time is unpopular, although there are a few notable exceptions (Brown and Hustin 1980; Loomis and Cooper 1987; Peterson and others 1985b).

Use of cross-sectional models to predict future conditions faces two major obstacles. 1) **Cross-sectional analysis** is a snapshot of a process at one point in time and says nothing about how that process may be changing. 2) Use of a cross-sectional model to estimate future values requires prediction of the future state of the exogenous variables in the model even if the demand process is stationary.

For a more detailed review of these and other aspects of forecasting recreation values see Peterson

and others (1985a, 1985b). As an example, consider the following hypothetical aggregate recreation trip demand function:

$$Q_j = R \left[b_0 + b_1 A_j + b_2 I_i + b_3 S_i + b_4 C_{ij} \right] \quad (1)$$

where

Q_j is the number of visits to site j ,

A_j measures the quality or attractiveness of site j ,

I_i is the income of persons at location i ,

S_i is the substitute price faced by persons at i ,

C_{ij} is the price faced by persons at i for a visit to site j ,

P is the number of people at location i , and

b_0, b_1, b_2, b_3 and b_4 are estimated behavioral parameters.

The purpose of this purely hypothetical model is to illustrate and summarize the value forecasting problem. It does not represent any real recreation market.

Assume we estimate equation (1) from cross-sectional data for a set of recreation sites in a given market region and that we desire to use this demand function to predict future value. Now dissect the question into three parts:

1. The magnitudes of the exogenous variables P , I , S , and C ,
2. The magnitudes of the estimated behavioral parameters, and
3. The functional form of the behavioral process.

Any of these variables might change with time. The usual cross-sectional approach estimates the equation from cross-sectional observation of the dependent and exogenous variables. One then projects the exogenous variables to some future date and substitutes their future values in the model. The resulting equation allegedly describes the demand process at that future time.

Validity of the resulting values depends on the answers to several questions. 1) Are projections of the exogenous variables valid? 2) Have behavioral parameters changed? 3) Is the functional form constant? Although robust processes that exhibit

stable and predictable long term trends may drive changes in variables like population and income, substitute prices and travel costs depend on market forces and technological changes that may not be easy to predict. Complex, volatile, and poorly understood processes drive changes in behavioral parameters that depend on tastes and preferences. We must raise similar questions about the supply function, which is very sensitive not only to market forces, but also to unpredictable technological innovation.

Thus, the cross-sectional approach requires demanding assumptions, often based on conjecture. We need extensive research into the processes that cause the determinants of supply and demand to change over time. Given models that predict temporal change in these variables, value forecasting becomes easier. Simply substitute the appropriate changes into the supply and demand functions. These functions will shift to new positions, thus defining new values at the new future state and values of change from the old state. Then, these shifted functions can be used in hypothetical equilibrium analysis to predict future prices.

In theory it is simple. At the Rocky Mountain Station, we have a software package called **RMM/RMTCM** that can do the needed calculations (Watkins and others, in preparation). This program is a recreation market simulation that uses the previously published software of the Rocky Mountain Travel Cost Model (RMTCM) (Rosenthal and others 1986). The integrated package allows estimation of demand and supply models from exogenous data. It also allows calculation of marginal and nonmarginal values from these models (or from models obtained externally to the program) and values resulting from shifts in the demand or supply curves. Similar software is under development at the Southeastern Forest Experiment Station to analyze partial equilibrium from the point of view of trip origins.

The purpose of the **RMM/RMTCM** system is to allow value analysis of changes in recreation sites, such as changes in quality, fee, or capacity; demographic changes affecting the market population; or production changes affecting the marginal costs. It could also describe value changes over time, if we knew how to make temporal shifts in the supply and demand models. Making such an approach practical, however, requires more research.

BARRIERS TO FORECASTING VALUES OVER TIME

Some determinants of change are decision variables. Legislatures decide management budgets. Management institutions decide things like site quality, capacity, and location and how much effort to put into advertising and public education. They decide what price to charge and what regulatory or licensing policies to impose. All these things help to determine future value, and they are difficult to predict. Should we be trying to "predict" or decide such things?

Technological change also plays an important role. The only thing constant about technology these days is change. For example, consider transportation technology. Over a 5-year planning horizon transportation may be roughly constant, but a 50-year horizon will bring major surprises. In the 1920's when Lindberg flew across the Atlantic, who could have visualized intercontinental supersonic travel, instantaneous worldwide satellite communication, or men on the moon within 50 years? Who could have predicted transistors, micro chips, superconductors, and personal computers?

What about the Great Depression, the Second World War, Korea, Vietnam, the Arabian oil cartel, double-digit inflation, Central America, the Persian Gulf, and AIDS? The only certain thing about history, it seems, is that it is a sequence of unexpected events that intervene radically in human affairs. All such things are major factors in the demand and supply of recreation, which is, after all, a luxury good. Regarding such historical discontinuities, the challenge is a non sequitur: to predict the unpredictable.

At a more practical and immediate level, one of the most significant barriers to forecasting recreation values over time is an absence of good time series data and an apparent lack of interest in the problem among researchers (Peterson and others 1985b).

RESEARCH AND POLICY OPPORTUNITIES

Are We Trying to Answer the Wrong Questions?

The discussion thus far presumes that forecasting recreation values in the future is a legitimate goal, and that the best way to accomplish that end is through some empirically derived model. It may be a misguided fantasy. Phillip Boffey's (1967) "Systems

Analysis: No Panacea for Nation's Domestic Problems; Richard Bolan's (1967) 'Emerging Views of Planning,' and Doug Lee's (1973) 'Requiem for Large Scale Models' mark interesting turning points in the evolution of planning theory. At each of these points, there was an identity crisis when planners saw a carefully constructed Crystal Palace of idealistic fantasy begin to crumble. Is the ideal of predicting future values also a crumbling fantasy? The traditional planning model that derives optimal present choices from predicted future conditions is not the only way to think about the future, and it may not be the best way.

In his essay on 'A Silver Jubilee for Urban Transportation Planning' David Boyce (1980) states that transportation planners have been 'rather unsuccessful in anticipating the major problems and issues of our day.' In evaluating the Chicago Area Transportation Study that produced a plan for the 1980's from the perspective of the mid-1950's, he states:

The planning process which we have built is one which primarily reacts to problems rather than identifies and anticipates problems. ... The notion that travel or mobility might need to be constrained to conserve energy or reduce vehicle emissions had not been defined. Clearly, the 1980 plan for Chicago was defined to meet the objectives of the late 1950's, not the anticipated objectives of 1980. In this sense, urban transportation planning is not future-oriented, but rather uses the future as a construct to magnify and explore current problems,

In our efforts to plan and manage the national forest resources, are we retracing some of these steps abandoned by others? Are we simply preparing to meet an imaginary future that is a projected reflection of past patterns?

We need to decide now, and along the way, many things that affect the future value of recreation. Key questions need identification. We need to modify some institutions and create some new ones. We need to spend less time trying to predict things that we have the power and responsibility to decide. We also need to recognize that people, institutions, and nature are going to make surprising decisions along the way.

Planning based on prediction of the future is not flexible. Instead of trying to predict future values, should we be identifying alternative plausible scenarios and developing contingency plans? What if, like

the stock market crash of 1929, the crash of 1987 leads to a major economic depression, and recreation becomes an unaffordable luxury for a major segment of the population? What then will be its value, and what will be the public trust responsibility?

What if the tension in the Persian Gulf leads to a protracted third world war? During that war, recreation may not only be of little economic value, it may be illegal or impossible. What if business continues as usual into the future and recreation retains the same real value, compared with other things, that it has now, perhaps with a slight drift toward an aging population, an increasing percentage of leisure time, increasing rents for undeveloped land, and a decreasing supply of land available for recreation? What if arms control agreements between the United States and the Soviet Union lead to major reductions in the percentage of GNP allocated to defense? What should we be doing now to prepare to meet these possibilities? How likely are the different scenarios to occur, and is it possible to predict that likelihood?

Contingency Planning

Should we be playing football instead? Football is a game of contingency plans. There is a repertoire of strategic plays and tactical maneuvers drawn upon selectively as the game unfolds. The biggest plays are often opportunistic rushes by the quarterback through an unexpected hole in the defensive line. Should we spend more time developing a repertoire of strategic and tactical plays, and less time worrying about predicting at the start of the game what play the opposing team will use on the third down of the second drive of the fourth quarter? Is planning really an art of ad hoc opportunism and a science of 'muddling through' (Bolan 1967, Braybrook and Lindblom 1963, Lindbloom 1959), rather than a process of rational decision making based on sure information about the future (Friedman and Hudson 1974)?

The contingency planning model asks for specification of alternative future scenarios, with predictions of their likelihood, if possible. We then estimate values conditional on these various scenarios. For example, if we assume that a protracted depression will follow the stock market crash of 1987, we can predict that recreation prices will decline over time compared with the prices of other goods and services. On the other hand, an assumption of continued prosperity with increasing real income and leisure time leads to the prediction that real recreation prices will increase. Identification of such conditional trends over time allows development of contingent strategies and tactics.

Expert Systems Planning

How the alternative scenarios will unfold is a judgment call that requires continual revision and adaptive response. The conditional value projections may also require judgmental development by expert systems. One of the few permanent findings of planning theory is that 'planning is a continuing process.' As events unfold, judgments about the likelihood and consequences of future scenarios can change, leading to revisions in value estimates and future plans.

For example, consider an unpublished corporate planning study that was done for a major manufacturer of railroad freight cars in the early 1970's. One of the most important elements of the planning effort was to predict the **5-year** future of freight car demand for each product line. Researchers were unable to find any published studies giving reliable estimates of future markets. No credible models were available for making such predictions.

Careful thought led researchers to conclude that the future market depended on how efficiently railroads used existing equipment. That efficiency depended on a half dozen key variables, including some decisions the railroad companies would have to make. Utilization efficiency was a mathematical function of these variables, but the behavior of the variables themselves was so complex and arbitrary that prediction from empirical data or mathematical models was not possible.

Past trends for the key variables were shown to executives in the freight car manufacturing industry. In a structured questionnaire, these executives then made optimistic, realistic, and pessimistic judgments about conditions in 5 years. A mathematical simulation of the freight car market used the pooled judgments to obtain high, medium, and low estimates of the **5-year** freight car demand. These estimates thus were informed judgments conditioned on anticipated but implicit future scenarios.

The procedure was first applied in 1973 to a **5-year** planning horizon and then repeated each year thereafter. Annual repetition sensitized the pooled judgments and anticipated future scenarios to changing times. This continuing readjustment proved to be critically important as the consequences of the soon to occur oil embargo began to unfold.

While the freight car market analysis was under development in the summer of 1973, the researchers were also working on urban transportation planning research. A major cause of the critical urban transportation problems, it seemed, was too many big and fuel inefficient automobiles. One of the alternative future scenarios considered and rejected as infeasible was a national transition over the next 10 years to small fuel efficient automobiles. Ironically, due in part to the impending but unforeseen gasoline shortage of 1974, escalating gasoline prices over the next 10 years, and double digit inflation, the 'infeasible' transition occurred.

Keeping Options Open

Another approach worth considering is adaptive planning that preserves flexibility by keeping options open. One way to keep options open is to avoid irreversible commitments of scarce resources whose future values are unknown. For example, this approach seems to be the motivating philosophy behind efforts to preserve threatened and endangered species. A decision to use resources in ways that terminate the existence of a species is not reversible under foreseeable technology. Redwoods and sequoias, Hell's Canyon, archaeological sites, Yellowstone Park, and Glen Canyon offer (or offered) similar challenges. Perhaps such resources should be protected to keep options open in the future.

There are no simple answers. Trying to predict the future is a lot like trying to catch fish with your hands. They are never quite where they appear to be, they move very quickly, and even when you get your hands on one, it is so slippery you can't hang on. Researchers and practitioners need to get some better ways to fish for future values, or do something else instead.

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LOCAL GOVERNMENT OUTDOOR RECREATION SUPPLY

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Abstract—Although a number of focused studies of local park and recreation departments have been conducted, it has been difficult to assess the national status of local supply. The Municipal and County Park and Recreation Study, conducted in 1986, offered the first dataset upon which to base a national assessment. Local supply of outdoor recreation, while impressive, represents only a small proportion of its potential. For example, only about half of the total number of departments manage natural, undeveloped acreage, but that acreage currently totals over 450,000 acres nationwide. Additional local outdoor recreation land is likely to be needed in the future, particularly near rapidly growing urban areas. Federal, State, and private support will be needed at the local level if this rising demand is to be satisfied.

Local park and recreation departments are generally operated independent of other park and recreation departments, and may therefore deviate from a typical model. In comparison to Federal and State agencies that operate under standard administrative and management goals, policies, and procedures, local departments are legally and politically independent. Any study of local park and recreation departments is necessarily a study of thousands of service delivery systems, each with potentially different philosophies, resources, political and administrative structures, standards, and goals.

Until recently, the national configuration of local park and recreation departments was relatively unknown. Understanding the similarities and differences between departments could help the recreation profession in many ways, including more effective sharing of problems and solutions, improved technical assistance strategies, more effective national representation of interests, and improved ability to project a professional image.

Past efforts at studying local park and recreation departments were limited by resources, participation, methodology, coverage, and support. In 1983, the National Recreation and Park Association surveyed selected communities in an attempt to establish baseline standards for park and recreation facilities and sites (Lancaster 1983). This effort, along with individual State Comprehensive Outdoor Recreation Planning (SCORP) efforts, has provided valuable baseline information. From these early and ongoing efforts, increased attention to and understanding of local outdoor recreation supply has resulted.

In 1982 and 1984, the National Recreation and Park Association conducted separate studies of local recreation financing and budgets. In 1985, the Leisure Research Institute at Indiana University conducted a nationwide study of agencies serving a population of over 50,000, examining personnel and budgets.

INTRODUCTION

Local outdoor recreation resources and experiences encompass virtually the full range of outdoor recreation, with the possible exception of wilderness recreation. A recent estimate of local recreation use reported that three-fourths of American adults visited a local outdoor recreation area at least once in 1986, up from two-thirds in 1982-83 (Market Opinion Research 1986). From outdoor festivals and sporting events to nature preserves and overnight camping, local outdoor recreation provides a surprising variety of outdoor recreation experiences for a majority of Americans. According to the 1987 Managed Recreation Research Report, the average local recreation facility served 119,000 users in 1987.

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In 1986, Market Opinion Research (MOR) reported the outdoor recreation behavior of American adults, resulting in new information about the use of local outdoor recreation supply. This report represents the first available information about local recreation use nationally.

In its fourth year, the 1987 Managed Recreation Research Report (MRRR) provided information about local recreation in comparison with other recreation providers, such as universities, health clubs, and others.

The Public Area Recreation Visitors Study (PARVS), a nationwide study of American recreation use and demand, was conducted by a coalition of Federal and State agencies in 1986. PARVS provided estimates of demand for some kinds of activities provided primarily at the local level, such as organized sports.

While these reports have given insight into the nature and characteristics of local outdoor recreation, methodological and financial barriers continued to block a more focused and comprehensive effort at understanding local recreation supply.

The USDA Forest Service, as part of its national recreation assessment effort, became interested in local outdoor recreation supply to improve its assessment capabilities. The appointment of the President's Commission on Americans Outdoors provided additional enthusiasm and commitment to the study of local park and recreation departments. The MOR report is one product of this commitment. The relatively limited amount of nationwide information about this significant provider of recreation opportunity spurred the formation of the Municipal and County Park and Recreation Study (MACPARS) working group. The MACPARS working group developed a cooperative study process to assess the nationwide status and trends in local recreation supply.

Method

The National Recreation and Park Association's mailing list was used as a primary source of potential respondents. In addition, a State-level recreation professional worked cooperatively with MACPARS working group as a representative from his State. More complete mailing lists, where available, were used. A final list of 8000 names constituted the population to which questionnaires were mailed.

The response rate for the one-time mailing of the questionnaires was 18 percent. The data were weighted by population size and recreation budget

size to Census of Government data for communities over 25,000 population. For communities less than 25,000, the tabulated unweighted data were used.

CURRENT SITUATION

Local park and recreation departments number about 7000 across the United States. The majority of these departments, about 77 percent, are operated by a municipal government. Another 15 percent are county operated park and recreation departments.

Opportunities provided by local park and recreation departments are typically a dichotomy, reflected in the name, parks and recreation. In this paper the emphasis will be on parks, but some attention will be placed on developed sites and facilities, such as sports fields, golf, and outdoor swimming facilities. Medians are used as the measure of central tendency, to reduce the skewing effect of the relatively few very large metropolitan departments, and to more equitably represent the more numerous smaller departments.

Revenue Sources

Local property taxes fund the majority of local park and recreation operations, comprising a median of 65 percent of the total budget expenditures, as reported by 77 percent of the respondents. Other local taxes comprise a median of 25 percent (28 percent responding) and user fees comprise 19 percent (73 percent responding) of budget expenditures. Only 17 percent of local agencies reported Land and Water Conservation Funds (LWCF) in 1985, representing a median of 7 percent of their budget. In spite of this small percentage receiving these funds, 91 percent of MACPARS respondents favored the continuation of LWCF.

Despite the apparent emphasis on user fees as a supplement to tax-based budgets, the overall distribution of sources of revenue for local park and recreation departments had changed little up to 1985.

Budgets

The operating budget of a typical local park and recreation department in 1985 was \$335,000. For communities of less than 25,000 population, the typical operating budget was \$180,000. For larger communities, the operating budgets were \$650,000 (25,000-100,000 population) and **\$3,500,000** (over 100,000 population). These expenditures represent a

national per capita expenditure of \$17.00, ranging from \$19.00 in small communities to \$12.00 in the largest communities.

Capital budgets also varied dramatically by the size of the department's community. The smallest communities in 1985 reported a median of \$40,000 in capital expenditures. Medium and large communities reported capital budgets of \$134,000 and \$590,000, respectively. The typical department, including all community sizes, reported a median capital budget of \$75,000.

From 1982 to 1985, operating budgets and capital budgets rose by a median of 25 percent and 44 percent, respectively. This finding is somewhat surprising, considering the widespread belief that local departments were experiencing a fiscal crisis in the early and mid 1980's.

Personnel

Even though budgets rose between 1982 and 1985, the numbers of full-time, professional staff were constant with a median of seven per department. Seasonal staff numbers rose about 11 percent, however, from 36 to 40 staff per department. Small community-based departments reported a ratio of one permanent to six seasonal staff, medium sized communities reported a one to five ratio, and large communities reported a one to two ratio of permanent to seasonal staff.

The numbers of citizen volunteers rose between 1982 and 1985 about 13 percent, from a median of 40 per department to 45.

Facilities and Sites

The building blocks of a park and recreation department include budget, personnel, and capital development and maintenance. Without these resources, a local department's mission is formidable. Without land, facilities and sites, providing adequate outdoor recreation opportunities is almost impossible. The physical resources of a department define in large measure the opportunities and limitations of that department and community for outdoor recreation opportunity close to home.

Almost all departments manage some kind of sports field and playground area (91 percent). These types of facilities are often the first sites a young department manages, and may even pre-date the official creation of the park and recreation department. Sports fields remain one of the most important

resources of a park and recreation department, regardless of size. Nationally, the typical department manages 8 sports fields, but this reflects a range of a median of 5 to 40 fields.

Pools and golf courses represent large capital investments for local park and recreation departments. About half of departments nationwide operate swimming pools, and about 20 percent manage golf courses. As departments service larger communities, they are more likely to manage more than one of these big-investment facilities.

Outdoor basketball and tennis courts provide popular outdoor opportunities. Over 80 percent of all departments nationwide manage each type of facility. The median number of outdoor basketball courts and tennis courts are four and eight, respectively.

Nationally, the total land area managed by local park and recreation departments is estimated to be about 2.2 million acres. Including all types of park and recreation land, the typical department manages 160 acres. The smallest departments manage about 72 acres, and the largest manage a median of over 1,700 acres. These large differences in acreage may be misleading. On a per capita basis, the smallest departments serve about 132 citizens per acre, and the largest departments serve about 130 citizens per acre. These figures indicate a surprising consistency in service as represented by available acreage for park and recreation, regardless of community size.

Passive outdoor recreation sites represent a very different form of outdoor recreation opportunity. These sites are primarily natural, and are called passive sites because only occasionally are activities directed by anyone other than the participants. Examples include parks, trails, lakes, and campsites.

Due to historic emphasis on developed and directed activities, park and recreation departments are typically not noted as natural resource agencies. However, these departments have managed urban parks for decades. A growing urban society has promoted the need for more open spaces and natural areas near population centers. Therefore, as communities urbanize and grow, park and recreation departments seek to acquire and manage more undeveloped, open, and park land for local community use.

Nationwide, these natural, undeveloped recreation areas currently total over 450,000 acres of land, and about 60,000 acres of lakes. The typical department manages about 80 natural acres of land and 18 acres of lakes, representing a median range in natural areas of 35 acres for small communities to 550 acres

for large communities. The median range in size of lakes is between 11 acres for small communities and 70 acres for large communities. However, only about 3,600 departments manage natural areas and about 2,800 manage lakes. This represents less than half the total number of departments. Obviously, only a portion of the total supply opportunity is represented by these figures. The magnitude of the supply potential is not known, but it seems reasonable to assume that more than half of departments could manage natural areas for recreation.

Approximately 10,000 campsites (both RV and tent) are managed nationwide by local park and recreation departments. These campsites are operated by less than one in five departments (18 percent). About 15 percent of departments manage areas used for resident or day camps. These types of camps number about 1,500 nationwide.

Trails have received much attention lately as special opportunities for outdoor recreation, particularly near urban areas. Locally managed trails total about 30,000 miles nationwide. These trails are primarily for hiking (9,000 miles), bicycling (7,000 miles), and **fitness** (5,000 miles). The typical department manages about 5 miles each of hiking and bicycling trails, and about 2 miles of fitness trails. Fitness trails are much more widespread, however, with about half of the departments managing trails for fitness. About 2,400 departments manage hiking trails, and 1,400 departments manage bicycling trails.

Open-ended comments received as part of the MACPARS questionnaire indicated a universal concern for future outdoor resources. The maintenance of and acquisition of additional outdoor resources emerged as the top two issues of concern out of a given list of 17, regardless of community size. A major theme of the open-ended responses was that expanding development and its corresponding demand for land resources would create a crisis in parks and recreation in the future. In spite of other differences and viewpoints, on this issue MACPARS respondents emphatically agreed.

PROJECTED CHANGES

Regardless of community size served, local government park and recreation departments appear to possess a similar structure and emphasis. The smallest communities place a greater emphasis on team and youth sports, but as a community grows, recreation opportunities expand and diversify. Despite the hailed fiscal crisis in local government parks and recreation, operating and capital budgets rose between 1982 and 1985.

As urban population continues to grow, the acquisition and development of outdoor recreation land close to urban areas will become more critical. If the current ratio of 130 citizens per acre is to remain intact, the need for more land and facilities will certainly escalate in urban areas. This ratio will be harder to achieve, however, as this same urban population requires more land for other services, such as homes, schools, roads, and shopping areas. Local governments will find it more difficult to acquire, develop, and maintain expensive outdoor recreation sites and facilities, in spite of their growing budgets. While the current supply of passive outdoor recreation opportunities is impressive, it may represent less than half the potential for passive outdoor recreation opportunities at the local level. If natural resources are to be conserved for local outdoor recreation, park and recreation departments will need to move quickly to identify potential resources.

The stability in numbers of full-time professional personnel, if continued, may create a professional management crisis within these departments. The fields of natural resource management and outdoor recreation management require special professional training and experience. It appears that local government park and recreation departments are relying more and more on seasonal, part-time staff and volunteers to manage operations and provide recreation leadership. If professional staff numbers do not keep pace with the overall growth in departmental operations and resources, the quality of the programs, operations and management is likely to suffer.

Outdoor recreation facilities and sites are likely to remain important mainstays of park and recreation departments. Developed outdoor facilities, such as sports fields, courts, jogging tracks, and trails are likely to remain priorities for local park and recreation departments. While the private sector will provide some types of outdoor recreation for a certain market share, access to public outdoor facilities and sites will remain an expected right of local citizens.

SIGNIFICANCE OF PROJECTED CHANGES

Quality of life has become an important concept in the assessment of a local area's desirability for community hiring potential. Quality of life encompasses a range of variables, including economic, social, and environmental health. Outdoor recreation opportunity has played an important role in the quality of life index of communities, particularly in the social and environmental indices. It has recently become clear that outdoor recreation contributes significantly to the economic health of a community as well. Any

reduction in access to, availability, or quality of local outdoor recreation opportunity is likely to have a negative impact on community quality of life. Environmentally, outdoor recreation sites contribute to air and water quality, reduce soil erosion, provide wildlife habitat, and provide aesthetic relief in a human-built environment. **Without** a corresponding growth of natural areas held in conservation, developed lands may severely impact the environmental quality of communities,

OPPORTUNITIES

Local park and recreation department directors emphasized the importance of seed grants such as LWCF to their department's outdoor recreation programs. These grants provide the incentive to localities to allocate funds for outdoor site acquisition and development. It appears that increased budgets are being used more for maintenance and refurbishing old facilities, rather than for personnel or programming. Acquisition of land using these funds alone is typically not possible. These trends in budget allocation, along with the indications of growing demand for and shrinking supply of local outdoor recreation resources such as open space, underscore the importance of Federal and State incentive funds and technical assistance to local governments to assist with efficient allocation of scarce operational and capital dollars.

Partnerships may provide another part of the solution to the possible future supply crisis in local outdoor recreation. Private non-profit groups, such as the Rails-to-Trails Conservancy, have already begun to work cooperatively with local governments to acquire and protect resources. Private utilities may also set aside conservation easements and rights-of-way to be managed by local departments for public recreational use.

Even though recent studies, including the **MAC-PARS** effort, have provided valuable information about local outdoor recreation supply and demand, continued research is needed. In particular, a nationwide, comprehensive study of local outdoor recreation use and opportunity would provide needed trend data. This type of study would require a cooperative effort similar to the nationwide Federal, State, and local support that was necessary to complete MACPARS.

The importance of local outdoor recreation supply to American communities is evident. Local governments, financially struggling to provide a range of governmental services, have supported the maintenance of recreation opportunities, and have even

provided funds for expansion. With Federal and State assistance and private cooperation, local governments, along with direct citizen support, can significantly improve and expand local outdoor recreation opportunities. Without such assistance, they may only hope to maintain existing opportunities at the current level.

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ESTIMATING OUTDOOR RECREATION SUPPLY FUNCTIONS: THEORY, METHODS AND RESULTS

Steven E. Daniels and H. Kenneth Cordell¹

Abstract—A cross-sectional analysis of 47 Forest Service ranger districts provided estimates of marginal cost functions for 19 different recreation activities. The marginal cost functions are directly based on a hypothesized set of production functions for recreation provision. The results are seven supply functions that are linear and constant, four that are log-linear, and eight that show no relationship between use and cost. The latter eight are for activities such as hunting and fishing that depend more upon natural endowments than upon managerial inputs.

prices of substitutes – are fundamentally exogenous to the manager and information about these variables is of limited value. Unfortunately, most economics research in recreation has focused on demand and has essentially ignored these crucial managerial needs.

This paper extends the research in recreation supply by estimating supply functions for 19 activities provided by the USDA Forest Service. To the extent that other agencies operate similarly to the Forest Service, these supply functions can be applied elsewhere. These functions offer valuable information about the market clearing prices for recreation, as well as the potential revenue generated by an agency's recreation program.

The remainder of this paper is composed of background, methods, results, and implications/conclusions sections. The background section presents our definition of supply functions, describes the previous research on recreation supply, and discusses the value and limitations of our approach. The methods section presents our data and estimation procedure. The results section presents our findings, and discusses both their strengths and weaknesses. The implications/conclusions section explores some of the policy implications of the results, and raises interesting unanswered questions.

INTRODUCTION

The economic concepts of the supply of recreation have received scant attention from either economists or recreation professionals. The work on recreation supply to date can be roughly divided into three categories: inventory information, conceptual discussions of supply, and empirical studies of developed camping. None of these types of studies adequately addresses the fundamental economic forces that determine recreation supply.

The lack of economic research into recreation supply reduces the usefulness of existing recreation demand functions, which are strongly based in economic theory. It also means that recreation managers have little relevant economic information upon which to base decisions. The factors that managers control—capacity, maintenance, staffing levels—are all supply-side variables. Information about them would help managers operate their programs to minimize cost for a given level of service. The important demand issues—income, tastes and

BACKGROUND

This research is a marked departure from previous studies of recreation supply. The concept of recreation supply has typically been interpreted to mean the stock, or inventory, of recreation facilities. Perhaps the best example of this view is Cordell and Hendee (1982), which reported the physical availability of several types of recreational resources—wilderness, trails, campgrounds, etc.—and projected trends into the next century. An inventory approach ignores the economic forces affecting availability, forces that are clearly presented via the supply function.

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Supply functions are based directly on the physical aspects of operation, which are mathematically embodied in the production function. Duality, the relationship between production and cost functions, is a simple concept to visualize. Production functions describe how inputs such as land, labor, and capital can be combined to produce different levels of output, and also reveal the minimum input level associated with any output. The minimum cost of producing a specified output is obtained by multiplying the input quantities by their prices, and results in the cost function.

The important point of duality theory as it relates to recreation is that estimated or hypothesized cost functions should be based on basic production relationships. Doing otherwise ignores the economic fundamentals of inputs being combined into output, and the resulting cost functions are based on data correlations rather than on an a priori understanding of recreation provision.

A review of the previous recreation supply functions revealed that the production function/cost function duality was seldom considered. Most of the cost functions that have been estimated are for the production of campground recreation. The studies done by Reiling, Gibbs, Anderson, Schuster, and Tyre estimated cost functions, usually total cost functions, without explicitly considering the underlying production processes (See Gibbs and van Hees (1981); Reiling (1976); Reiling and Anderson (1983); Reiling and others (1983); Schuster and Gibbs (1983); Tyre (1975). These studies have been thoughtful and complete, but they would have benefited from the inclusion of duality theory.

Another important aspect of supply functions is that they are marginal cost functions, in which marginal is equivalent to incremental. The supply function therefore maps out the relationship between the changes in suppliers' costs of operation and the quantity produced. Equilibrating supply functions based on marginal cost with demand functions, which are marginal benefit functions, results in a production level that maximizes net social benefit. This maximization of net benefit is the basis of economists' preoccupation with supply and demand.

Several conceptual analyses of the marginal costs of recreation provision are available. Among the most thorough are Rosenthal and others (1984); Jubenville and others (1986); and Harrington (1987). The latter identified operating, congestion, and ecological costs as the major sources of marginal costs and presumed that all of these costs increase

as use increases, both in the short and long runs. This yields the eventually upward-sloping marginal cost curve that is the usual expectation.

Despite the conventional assumption that marginal costs have positive slopes, Daniels (1987) showed that marginal costs either decreased or were flat, at least for a set of developed campgrounds in Montana. This study did not include congestion or ecological costs because the facilities being examined were neither at capacity nor were they ecologically fragile. These issues might be unimportant in some cases, but the slope of the marginal cost functions should be estimated across a wider range of recreation sites and activities before general conclusions about the slope are possible.

Our research extends Daniels (1987) in two important directions. First, the number of activities is increased from 1 to 19. Second, the definition of costs includes congestion and ecological costs to the extent possible. Both of these extensions will increase the knowledge of recreation supply functions and also explore the issue of the slope of those functions.

These supply functions also offer some important insights into the relative scarcity of recreational opportunities and their cost. Natural resource economists have long hypothesized that as resources become increasingly scarce, the relative cost of the resources increases. We can thus measure scarcity by looking at relative prices, and can also look at intertemporal changes in scarcity by developing time series cost data. A number of long-term cost studies have empirically measured the latter relationship across broad groups of natural resources (Barnett and Morse 1963; Smith, 1979) and showed that various natural resources are becoming more abundant (most minerals), while others are becoming more scarce (notably wood products).

There are no adequate time series cost data for the provision of recreation, but a similar test of relative scarcity can be done using cross sectional cost data from different areas of the country where presumably different levels of recreation opportunity are available. A secondary goal of this study is to explore the interregional scarcity of recreational opportunities by estimating interregional cost variations.

Thus, this research is designed to improve upon previous research in four areas. First, it is based on a hypothesized set of production functions for the provision of recreational opportunities. Second, the resulting cost functions are marginal cost (supply) functions, which can be equilibrated with demand

functions to estimate market clearing prices and net social benefits provided by recreation. Third, it estimates cost functions for a wider variety of recreation activities than has been previously undertaken. Finally, it tests the relationship between the slope of the marginal cost functions and ecological and congestion costs.

METHOD

Theoretical Specification

Supply functions were estimated for 19 different recreational activities supplied by the Forest Service, based on cross-sectional data from the ranger district level (listing 1). The study can be characterized as a representative plant model, where cost functions are developed for the representative plant. The districts were assumed to be operating efficiently; that is, they combine inputs to minimize the cost for their levels of recreation provision. They therefore face the following constrained optimization problem of maximizing output, given their budgets:

$$\begin{aligned} \max \mathbf{A} &= \mathbf{A}(\mathbf{R}) & (1) \\ \text{s.t. } \mathbf{C}\mathbf{R} &\leq B \end{aligned}$$

where

\mathbf{A} = a vector of recreation activities
 \mathbf{R} = a vector of recreation resources
 \mathbf{C} = a vector of per unit resource costs
 B = budget constraint

This function has a dual cost function that is

$$\begin{aligned} \min C &= \mathbf{C}(\mathbf{C}, \mathbf{R}) & (2) \\ \text{s.t. } A &= \mathbf{A}(\mathbf{R}) \end{aligned}$$

where C is total cost.

The total cost function is therefore composed of output level, A , the inputs required for that output level, \mathbf{R} , and the per unit costs of those inputs, \mathbf{C} . Before the supply function can be estimated, recreation provision must be defined. What does the Forest Service actually provide: is it recreational opportunity, recreation use, or recreation capacity? Implicit in this problem is the decision of what units recreation supply is measured in.

Our model relates recreation supply to use. The relevant measure of output is therefore the recreation-visitor-day (RVD, 12 user hours). This approach makes it possible to equilibrate the resulting marginal cost functions with use-denominated demand functions.

This approach allows recreators to optimize the conversion of recreation opportunity (which arguably is all that the Forest Service supplies) into recreation activity. It is based on the economic precept of consumer sovereignty and the belief that the recreators' household production functions is the appropriate place for recreation production decisions to be made.

This approach is also consistent with Jubenville and others (1986), which established four classes of recreation-producing inputs: social inputs (affected by user choices) biophysical and managerial inputs (collectively termed the recreational opportunity), and exogenous inputs (uncontrolled variables such as weather). Our paper concerns problems of combining managerial and biophysical inputs to create opportunity. Unfortunately, opportunity alone does not create value to society; value occurs when the recreators utilize the capacity. Our method is, therefore, to measure the inputs that create opportunity, and measure that opportunity as it is captured in RVDs.

Data

Surveys regarding the cost of recreation provision and the stocks of recreation inputs were sent to the 62 USDA-Forest Service districts that participated in the Public Area Recreation Visitor Survey (PARVS), as well as to the administrative levels above those districts (appropriate Supervisor's, Regional and Washington offices). We received 47 useful responses. The activity data came from the RIM (Recreation Information Management) system.

The cost data for the c_i terms (ith term in \mathbf{C}) were derived by dividing the total district expenditure for resource i by the amount of resource i in the district. Values for both quantities were obtained from the surveys. Total district level costs associated with these resources were augmented by the amount of money the Supervisor's Office retained to manage these resources. This Supervisor's Office overhead was proportioned across districts and resources by using linear regressions through the origin, with stock of resources and use levels as possible regressors.

²This ignores the secondary questions of opinion and existence value, which we assume to be much smaller than direct benefits for most recreational opportunities.

Regression Procedure

The regressions fit the following general functional form:

$$c_i = C_i(c_{ji}, A_i) \quad (3)$$

where:

C_i = total cost of providing activity i

c_{ji} = per unit cost of resource j used to produce activity i

A_i = RVDs of activity i produced.

This function implies that for every recreational activity the Forest Service supplies, there is a unique relationship between the total expenditures on that activity, the level of provision, and the cost of inputs used in providing the activity.

Two specific functional forms were tested using our data, the linear function and the log-linear, or Cobb-Douglas. Neither are as flexible as more recent specifications such as the trans-log, but they are as powerful as our data would support. The functional forms selected for the total cost equations affect the possible shapes of the resulting marginal cost equations. The marginal cost equation is merely the first derivative of the total cost equation with respect to quantity. The marginal cost for a linear total cost function is therefore a constant and the marginal cost function for a log-linear function is non-linear; it monotonically increases (decreases) if the exponent on quantity is greater (less) than one. The functional forms we selected made it impossible to achieve the conventional u-shaped supply function.

Three other classes of regressors were tested in addition to those described above. These are:

1) the level of other recreational activities provided on the district,

2) dummy variables that divided the country into three "super regions":

East (USFS Regions 8 and 9), Pacific (Regions 5, 6, and 10), and Other (Regions 1, 2, 3, 4, and 5), and

3) biophysical characteristics of the districts.

The regressions had two objectives: to estimate parameters for the level of recreation provision that were significant and positive, and to maximize the adjusted R^2 value without over-specifying the equations. There were a total of 62 possible regressors

for each cost equation (listing 2). Since there are only 47 districts in our data set, it was impossible to run all of the regressors in one equation. More importantly, using only a fraction of the possible regressors could have produced over-specified models, since there are too few degrees of freedom in the error relative to the number of regressors.

The risk of over-specified regressions was overcome by minimizing the number of regressors in any equation. Regressors were included only if warranted by our knowledge of Forest Service recreation production. This method might have meant the omission of some significant regressors, and that the covariance structure of the regressors could be such that the omission produced bias in other parameter estimates. Both of these risks were viewed as less important than the risk of over-specification, which would have produced parameter estimates both sensitive to sample changes and unrepresentative of Forest Service districts in general.

Regional marginal cost functions were derived for the activities with successful regressions. This was accomplished by aggregating the marginal cost functions across all of the districts in the region, and increasing the fixed costs by the Regional and prorated Washington Office overhead expenditures. The regional marginal cost functions for the linear total cost functions are therefore graphed as horizontal lines, with a height equal to the district marginal cost, and a discrete point on the y-axis equal to the total regional fixed cost.

Aggregating the log-linear functions is similar to aggregating the linear functions, but the mathematics differ slightly. A single regional marginal cost function is derived by modifying the district marginal cost function to include both the larger level of production and the number of districts in the region. If the district marginal cost function is the following:

$$MC = Ab(RVD)^{b-1} \quad (4)$$

where:

MC = district marginal cost

A = estimated intercept

RVD = district RVD production

b = parameter estimate for total cost equation,

the resulting regional marginal cost function is

$$RMC = RFC/n(RRVD/n)^{b-1} \quad (5)$$

where:

RMC = regional marginal cost

RFC = regional fixed cost, aggregate of all administrative level; a function of A and Regional Office overhead

RRVD = regional RVD production

n = number of districts in the region.

This approach implies that any change in the amount of recreation supplied in any region is spread proportionally across all of that region's districts. The conventional economic approach would assume that production increases in Districts with the lowest costs and decreases in those with the highest costs. Our approach was used because it most closely approximates the actual behavior of the Forest Service.

RESULTS

The regression results are shown in listing 3. Of the 19 activities analyzed, there were 11 usable regressions (7 linear and 4 log-linear). Usable regressions were defined as having positive and significant parameter estimates for the activities' own RVD production. Adjusted R^2 values for the usable regressions ranged from 0.24 to 0.80, with an average of 0.45.

The regional dummy variables showed little difference in district costs between regions. Only in the regression for skiing and other developed recreation were there dummy variables significant at the 0.1 level or above. This supports the assumption that the costs of recreation provision are geographically homogeneous, which is consistent with our assumption that recreation management techniques were applied uniformly across districts. This result does not support the hypothesis of differential scarcity between regions.

Regional cost functions were derived for all of the successful regressions. Only a few of the 99 regional functions are presented here; figures I-4 show camping and picnicking for Regions 1 and 5. These activities and regions were representative of both regional differences and functional forms.

The eight activities with unsuccessful regressions still provided valuable information. Our definition of successful is somewhat narrow, since it is based only on estimating a significant positive parameter estimate for quantity. This criterion was necessary if

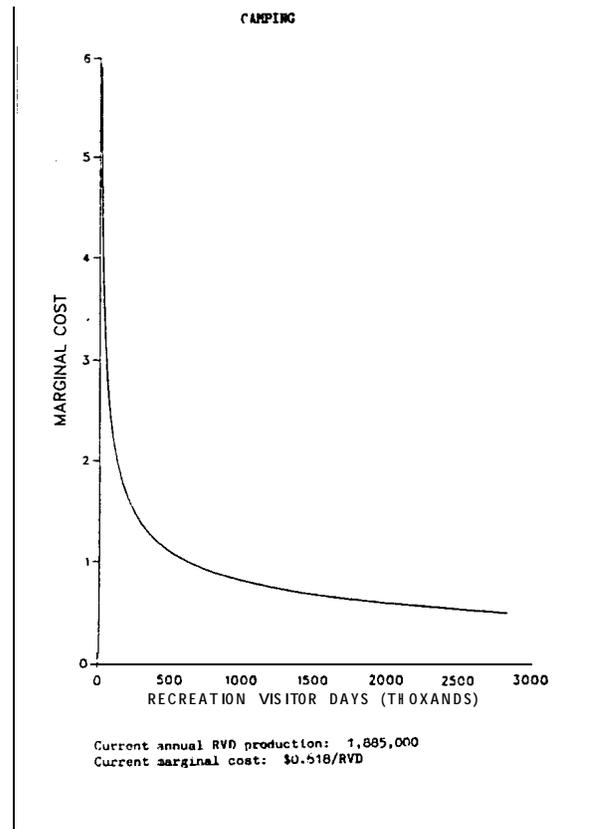


Figure 1.—Region 1 marginal cost curve.

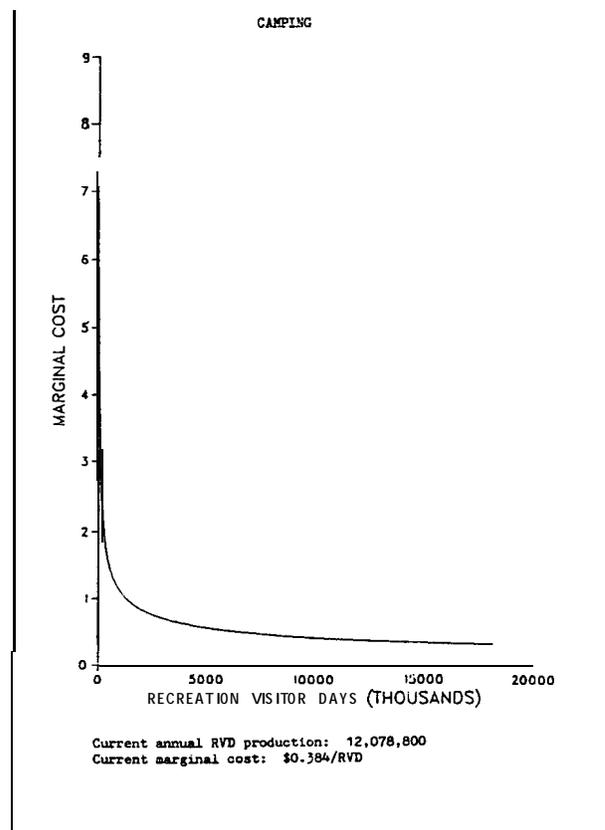


Figure 2.—Region 5 marginal cost curve.

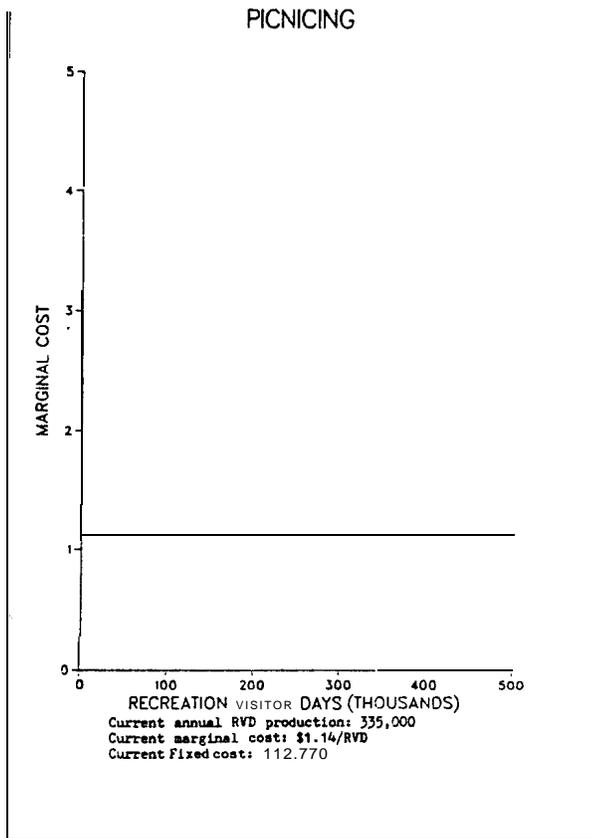


Figure 3. -Region 1 marginal cost curve.

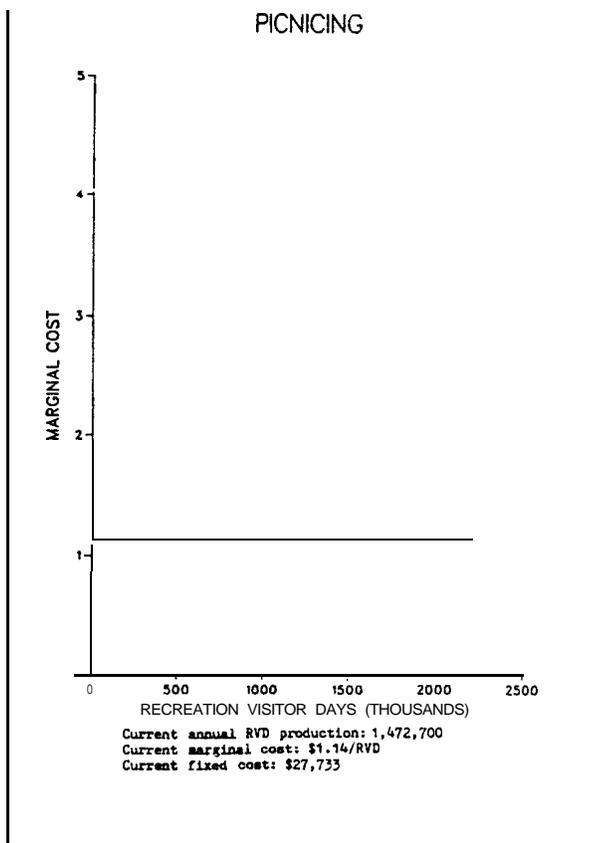


Figure 4. -Region 5 marginal cost curve.

we were to estimate meaningful marginal cost functions. However, the regressions without positive significant coefficients may indicate that the marginal cost of provision is zero rather than inestimable. Listing 1 shows that the unsuccessful regressions were for activities such as hunting, fishing, gathering forest products, etc. The costs to the Forest Service of providing these activities may be unrelated to levels of use. Hunting expenditures, for example, are primarily habitat related, and would not fluctuate with RVDs consumed, but presumably they increase the number or value of RVDs available (Randall 1987).

IMPLICATIONS/CONCLUSIONS

There were several noteworthy aspects to these results. First, the 11 successful district-level cost regressions explained a reasonable portion of the total variation in the expenditure differences across districts. These regressions support our basic hypothesis: that recreation provision by the Forest Service can be modeled using the conventional economic theories of supply. Second, the marginal cost functions showed that marginal costs did not increase as a function of use. To explore this result more fully, each activity was regressed against its RVD production in a log-linear model. If marginal cost was increasing, parameter estimates greater than 1.0 would have resulted. No parameters were estimated to be in this range; they were either equal to 1.0 (linear model), less than 1.0 (log-linear) or insignificant. This leads to the conclusion that, based on our data, the marginal agency costs of recreation provision do not increase as use increases.

If marginal costs do not increase, user fees based on marginal cost will not cover all of the costs of recreation provision. This means that the Forest Service must either charge an inefficient price or endure an operating deficit in its recreation program.

Third, our data failed to adequately address the questions of ecological and congestion costs raised by Rosenthal and others (1984). Including these costs more explicitly might have altered the slope of our marginal cost curves. This omission, combined with our restrictive functional forms, means that there is still considerable opportunity to improve upon our empirical knowledge of recreation supply.

Fourth, the unsuccessful regressions tend to involve undeveloped activities such as hunting, fishing, and canoeing. It is not surprising that economic factors have less influence on providing these activities than the provision of facility-intensive activities such as camping and picnicking. The ability to provide

undeveloped activities may be a function of a district's physical characteristics rather than its recreation budget. Nevertheless, it is still necessary to develop satisfactory supply functions for these undeveloped activities. There is a sufficiently important portion of the recreation produced on Forest Service land that the ability to adequately model the activities should be an important objective.

Finally, the data used also restricted our results. Additional data might have reduced the number of activities for which equations were not estimated. Also, functional forms that less restricted the slopes of the marginal cost functions could have been used, if enough data had been available. Our feeling is that more data would allow more confidence in the parameter estimates; the data set is the most ambitious developed to date. It has provided some new information into the costs of Forest Service recreation provision, but likely still contains some important insights that have not been recognized.

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LISTING 1

Dependent Variables

AUTO*	=	Total district expenditure on auto touring/sightseeing
CAMP*	=	Total district expenditure on developed camping
WILD*	=	Total district expenditure on wilderness use/hiking
OTHDEV*	=	Total district expenditure on other developed activities
RES*	=	Total district expenditure on resort use
PCAMP*	=	Total district expenditure on primitive camping
NAT*	=	Total district expenditure on nature study/photography
PIC*	=	Total district expenditure on picnicking
SKI*	=	Total district expenditure on snow skiing
CWFISH*	=	Total district expenditure on cold-water fishing
HIKE*	=	Total district expenditure on hiking
CANOE	=	Total district expenditure on canoeing
GATH	=	Total district expenditure on gathering forest products
ORV	=	Total district expenditure on off road vehicle use
OTHUN	=	Total district expenditure on other undeveloped activities
SWIM	=	Total district expenditure on swimming at designated areas
VIS	=	Total district expenditure on using visitor information facilities
WWFISH	=	Total district expenditure on warm-water fishing
SGHUNT	=	Total district expenditure on small game hunting
BGHUNT	=	Total district expenditure on big game hunting

*These dependent variables produced significant positive own-quality parameter estimates.

LISTING 2

Independent Variables

RESRVD	=	RVD production of resort and cabin use
VISRVD	=	RVD production of visitor information facility use
PICRVD	=	RVD production of picnicking
SWIMRVD	=	RVD production of swimming
CAMPRVD	=	RVD production of developed camping
AUTORVD	=	RVD production of auto touring/driving for pleasure
HIKRVD	=	RVD production of hiking
OTHDRVD	=	RVD production of other developed recreation
WWFIRVD	=	RVD production of warm-water fishing
CWFIRVD	=	RVD production of cold-water fishing
CANORVD	=	RVD production of canoeing
PCAMPRVD	=	RVD production of primitive camping
BGHRVD	=	RVD production of big game hunting
SGHRVD	=	RVD production of small game hunting
GATHRVD	=	RVD production of gathering forest products
ORVRVD	=	RVD production of off-road vehicle use
SKIRVD	=	RVD production of skiing
NATRVD	=	RVD production of nature study
RESCOST	=	per unit cost of resorts and cabins
VISCOST	=	per unit cost of visitor information facilities
PICOST	=	per unit cost of picnic areas
CAMPCOST	=	per unit cost of developed campgrounds
BCHCOST	=	per unit cost of developed beaches and swimming areas
OTHDCOST	=	per unit cost of other developed recreation sites
WWLKCOST	=	per unit cost of warm water lakes
WWSTCOST	=	per unit cost of warm water streams
CWLKCOST	=	per unit cost of cold water lakes
CWSTCOST	=	per unit cost of cold water streams

FORCOST	=	per unit cost of undeveloped forest area	OTHDSTK	=	stock of other developed facilities
RANCOST	=	per unit cost of undeveloped range area	OTHDPER	=	Percent of other developed facilities operated by concessionaires
WILDCOST	=	per unit cost of wilderness area	NWLKSTK	=	stock of non-wilderness warm water lakes
ROADCOST	=	per unit cost of forest roads	NWSTRSTK	=	stock of non-wilderness warm water streams
TRLCOST	=	per unit cost of trails	NCLKSTK	=	stock of non-wilderness cold water lakes
RESPB	=	Percent of resorts and cabins maintained below standard	NOCSTK	=	stock of non-wilderness cold water streams
VISPB	=	Percent of visitor information facilities below standard	WWLKSTK	=	stock of wilderness warm water lakes
PICPB	=	Percent of picnic areas maintained below standard	WWSTRSTK	=	stock of wilderness warm water streams
CAMPPB	=	Percent of developed campgrounds maintained below standard	WCLKSTK	=	stock of wilderness cold water lakes
ROADPB	=	Percent of forest roads maintained below standard	WCSTRSTK	=	stock of wilderness cold water streams
TRLPB	=	Percent of trails maintained below standard	WTRLSTK	=	stock of wilderness trails
BEACHPB	=	Percent of beaches maintained below standard	HIELEV	=	highest elevation in wilderness on district
OTHDPB	=	Percent of other developed recreation sites below standard	LOELEV	=	lowest elevation in wilderness on district
RESSTK	=	stock of resorts and cabins	WOCSTK	=	stock of ocean in wilderness
RESPERC	=	Percent of resorts and cabins operated by concessionaires	TMDOL	=	timber management budget
VISSTK	=	stock of visitor information facilities	RMDOL	=	range management budget
VISPERC	=	Percent of visitor information facilities operated by concessionaires	ROAD	=	forest road construction and maintenance budget
PICSTK	=	stock of picnic areas	TRAIL	=	forest trail construction and maintenance budget
PICPERC	=	Percent of picnic areas operated by concessionaires	DISTANCE	=	average distance from district headquarters to lands
CAMPSTK	=	stock of developed campgrounds	VOLUN	=	volunteer maintenance, service, and construction
CAMPPERC	=	Percent of campgrounds operated by concessionaires	HIDIST	=	highest elevation on district
ROADSTK	=	stock of roads	LODIST	=	lowest elevation on district
ROADPER	=	Percent of roads operated by concessionaires	NCFORSTK	=	stock of noncommercial forestland
TRLSTK	=	stock of trails	NCRANSTK	=	stock of noncommercial rangeland
TRLPERC	=	Percent of trails operated by concessionaires	CFORSTK	=	stock of commercial forestland
BEACHSTK	=	stock of beaches	FORHARV	=	acres of commercial forestland harvested
BEACHPER	=	Percent of beaches operated by concessionaires	CRANSTK	=	commercial rangeland

LISTING 3

District Level Activity Regressions

$$\text{LAUTO}^3 = 1.48 \begin{matrix} \dagger \\ (.74) \end{matrix} + .20\text{LVISCOST} \begin{matrix} \\ (1.87) \\ (.07) \end{matrix} + .27\text{LPICOST} \begin{matrix} \\ (2.56) \\ (.02) \end{matrix} + .42\text{LAUTORVD} \begin{matrix} \\ (2.48) \\ (.02) \end{matrix}$$

$$R^2 = .37 \quad F = 6.48 \begin{matrix} \\ (.00) \end{matrix} \quad \text{dfe} = 25$$

$$\text{LCAMP} = 4.50 \begin{matrix} \\ (2.70) \end{matrix} = .01\text{LPICRVD} \begin{matrix} \\ (-.07) \\ (.94) \end{matrix} + .57\text{LCAMPRVD} \begin{matrix} \\ (3.60) \\ (.00) \end{matrix}$$

$$R^2 = .24 \quad F = 7.79 \begin{matrix} \\ (.00) \end{matrix} \quad \text{dfe} = 41$$

$$\text{LWILD} = .78 \begin{matrix} \\ (.25) \end{matrix} + .21\text{LBGHRVD} \begin{matrix} \\ (.91) \\ (.37) \end{matrix} + .62\text{LHIKRVVD} \begin{matrix} \\ (2.50) \\ (.01) \end{matrix} + .04\text{LNATRVD} \begin{matrix} \\ (.18) \\ (.86) \end{matrix}$$

$$R^2 = .25 \quad F = 4.36 \begin{matrix} \\ (.01) \end{matrix} \quad \text{dfe} = 28$$

$$\text{LOTHDEV} = 3.79 \begin{matrix} \\ (2.63) \end{matrix} + .94\text{PACIFIC} \begin{matrix} \\ (2.29) \\ (.03) \end{matrix} + .11\text{LVISCOST} \begin{matrix} \\ (1.47) \\ (.15) \end{matrix} + .30\text{LCMPLOST} \begin{matrix} \\ (2.07) \\ (.05) \end{matrix} + .05\text{LPICOST} \begin{matrix} \\ (.68) \\ (.50) \end{matrix} + .22\text{LOTHDRVD} \begin{matrix} \\ (1.91) \\ (.07) \end{matrix}$$

$$R^2 = .32 \quad F = 4.21 \begin{matrix} \\ (.01) \end{matrix} \quad \text{dfe} = 29$$

$$\text{RES} = 2180.68 \begin{matrix} \\ (.48) \end{matrix} + .36\text{RESRVD} \begin{matrix} \\ (4.56) \\ (.00) \end{matrix} + 1.33\text{PICOST} \begin{matrix} \\ (5.85) \\ (.00) \end{matrix}$$

$$R^2 = .52 \quad F = 25.79 \begin{matrix} \\ (.00) \end{matrix} \quad \text{dfe} = 44$$

$$\text{PCAMP} = 1120.13 \begin{matrix} \\ (.37) \end{matrix} - .12\text{TRLCOST} \begin{matrix} \\ (-.11) \\ (.92) \end{matrix} + .24\text{PCAMPRVD} \begin{matrix} \\ (4.10) \\ (.00) \end{matrix} + .49\text{WILDCOST} \begin{matrix} \\ (1.19) \\ (.24) \end{matrix} + .47\text{ROADCOST} \begin{matrix} \\ (1.26) \\ (.22) \end{matrix}$$

$$R^2 = .30 \quad F = 4.47 \begin{matrix} \\ (.01) \end{matrix} \quad \text{dfe} = 29$$

$$\text{NAT} = 1163.09 + .05\text{PICOST} + .04\text{RANCOST} + .64\text{FORCOST} + .17\text{WILDCOST} + .26\text{NATRVD}$$

(1.11)	(1.76)	(.76)	(5.05)	(.72)	(1.86)
	(.10)	(.46)	(.00)	(.48)	(.08)

$$R^2 = .62 \quad F = 7.64 \quad \text{dfe} = 15$$

(.00)

$$\text{PIC} = -2180.65 + 10633.55\text{PACIFIC} + .17\text{PICOST} + .83\text{VISCOST} + 1.14\text{PICRVD}$$

(-.37)	(1.15)	(.78)	(1.19)	(4.43)
	(.26)	(.44)	(.24)	(.00)

$$R^2 = .36 \quad F = 7.01 \quad \text{dfe} = 39$$

(.00)

$$\text{SKI} = 2910.64 - 10059.15\text{PACIFIC} - 14.39\text{TRLCOST} + 1.65\text{RANCOST} + 1.34\text{SKIRVD}$$

(.91)	(-2.13)	(-2.56)	(.29)	(6.21)
	(.06)	(.03)	(.78)	(.00)

$$R^2 = .70 \quad F = 7.27 \quad \text{dfe} = 10$$

(.00)

$$\text{CWFISH} = 5700.32 + 83\text{WILDCOST} + 30.89\text{CWSTCOST} - .32\text{CWLKOST} + .03\text{CWFIRVD}$$

(1.66)	(1.53)	(11.35)	(-.15)	(.35)
	(.14)	(.00)	(.88)	(.73)

$$R^2 = .80 \quad F = 33.59 \quad \text{dfe} = 29$$

(.00)

$$\text{HIKE} = -8591.10 + .47\text{PICOST} + .16\text{HIKRVVD} + 1.66\text{WWLKOST} + .58\text{SGHRVD}$$

(-3.21)	(8.22)	(4.82)	(4.21)	(6.44)
	(.00)	(.00)	(.00)	(.00)

$$R^2 = .71 \quad F = 22.06 \quad \text{DFE} = 44$$

(.00)

³L denotes natural logarithm

⁴Numbers in parentheses in the first line below the regressions are the the t-statistics for the parameter estimates.

⁵Numbers in parentheses in the second line below regressions are the probabilities that the parameter estimates are not significantly different from zero.

⁶Probability values for the F-statistics.

MEASURING AND PROJECTING THE EFFECTIVENESS OF RECREATIONAL OPPORTUNITIES IN THE UNITED STATES

H. Ken Cordell, Donald B.K. English, and John C. Bergstrom'

Abstract- This paper develops an improved geographic measure of the availability of recreational opportunities -Effective Recreational Opportunities (EROS). EROS is an index of the amount and location of recreational/y available resources, facilities, and services measured relative to the number and location of population. In addition to indexing the current distributional situation, models were estimated to enable prediction of change in effectiveness of recreation opportunities that likely would result from future resource, population, public policy, and land-use changes. Descriptions of the current situation and likely future trends were developed for each of 72 categories of recreational opportunities, including those that are remote as well as those that are easily accessible and developed. The greatest future declines of opportunities are predicted for partially developed areas within 1/2 mile of roads.

INTRODUCTION

Since the early days of settlement of the United States, this country's pattern of existence has come full circle. Instead of scattered islands of civilization, we now have scattered islands of natural areas. As these remaining natural areas become more scarce, they require more careful protection and management. To do so we need a better understanding of the recreational and other values of natural areas and of their adequacy in meeting the recreational demands of the American public. Particularly needed is a better understanding of the effectiveness of the quantity and location of the recreational opportunities that natural lands and their developments represent, relative to the number and location of our national and regional populations.

In the 1960's and 1970's, demand for outdoor recreation opportunities increased and shifted dramatically. Governments at all levels responded to these demands by increasing the dollars, lands, and development available for outdoor recreation. Several systems were created for preserving irreplaceable natural resources under Federal jurisdiction, including the National Wilderness Preservation System, the National Wild and Scenic Rivers System, the National Trails System, and National Recreation Areas. Legislation was enacted to reduce air and water pollution and to protect cultural resources. Federal expenditures for recreation increased from \$75 million in 1960 to a high of \$1.4 billion in 1980.

Other major responses to demand growth since 1960 were seen among State and local governments, and in the private sector. State park systems expanded from 6.6 million to almost 10 million acres. Local government acres and areas available for outdoor recreation doubled. While these public land trends were occurring, private land and water areas were being developed, subdivided, closed, or otherwise changed. Some of this change had the effect of restricting public access. On the positive side, private recreation enterprises and facilities, including resorts, second homes, ski facilities, and theme parks grew tremendously. But over 55 million acres of private farm, forest, and range were converted to uses that precluded recreation.

Whatever the end result of all this change, it is our history. This history has left us a legacy that will have a great bearing upon our future. A tremendously important question about this future is whether the legacy of resources, facilities, and services we now have in place are adequate in quantity and are distributed appropriately to meet public demands for outdoor recreation. Another question that is perhaps more specifically relevant is whether future demands will be adequately met if we do nothing to alter the rates of change, either increases or decreases, at which resources are being made available for outdoor recreation.

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The most current forecast of the growth of recreational demand shows a wide range of projected growth rates between such activities as off-road vehicle driving and day hiking (Cordell and others 1989). Among all activities, growth projections imply a wide array of possible pressures for outdoor recreational resources, facilities, and services. Those activities projected to grow rapidly include downhill skiing, cross-country skiing, swimming, backpacking, visiting prehistoric sites, running and jogging, and day hiking. Each of these activities is expected to rise 30 percent or more by 2000, and they involved demands for added space and some facilities. Because these activities mostly require additional space, runs, trails and access, for the most part, large capital investments and development will not be the answer to meeting demand growth. It is the provision of space and access, as implied by projections, that will likely provide the greatest challenges for the future provision of recreational opportunities. Particularly acute will be the challenge of providing opportunities that effectively meet demand increases relative to the number and location of the populations generating those demands.

DIFFERING VIEWPOINTS OF RECREATION SUPPLY AND THE PURPOSE OF THIS PAPER

Twenty-six years ago, the Outdoor Recreation Resources Review Commission (1962) described the paradox of outdoor recreation resources. They noted that effectiveness, not inventories of acres or amounts of resources, is the more important concern in recreation supply analysis. Kind and location of resources, they maintained, is as much a part of the issue as is amount. Not much happened to address this issue until the early 1980's when Marion Clawson reported on his concept of Effective Acreage Equivalents, a concept he had much earlier advanced (Clawson 1984). Harrington (1987) refined the effectiveness measure of resource scarcity to account for costs incurred by both recreation consumers and the operators of recreation areas. He termed this improved conceptualization 'effective price.' In 1988, Daniels and Cordell explored the more traditional conceptualization of supply, that is, from the site management perspective. This traditional conceptualization recognizes that land, labor, capital, management, and technology are combined to produce various quantities of recreational opportunities at various costs.

In this paper we briefly describe conceptual and methodological advances made through work under-

way since 1982 for the Renewable Resources Planning Act (RPA) Assessment of Outdoor Recreation and Wilderness. This work builds upon the advances and implements the contributions of ORRRC, Clawson, Harrington, Daniels and Cordell, and others. We define a measure called Effective Recreational Opportunities (EROS) as a theoretically consistent and planning-relevant supply measure. This measure is also consistent with preceding viewpoints, including inventory and effective price. In this paper we also present results of a national application of the data and methodological advances as a part of the 1989 RPA Assessment of outdoor recreation and wilderness supply.

As with any measurement problem, the kind and precision of a measure to be selected depends upon the question(s) being asked. Regarding recreation supply, the questions typically are among the following three: (1) "Are we gaining or losing recreational opportunities per capita?" (2) "What are the relative availabilities of recreational opportunities among locations or groups?" and (3) "What kind and how much recreational opportunity should public agencies provide?" Effective Recreational Opportunities (EROS) can directly address the first two of these questions and greatly facilitates answering the third.

EROS starts with an inventory of the type and quantity of land, water, facilities or services aggregated to the county level. Such an inventory was developed for the United States for the 1989 RPA Assessment and is referred to as NORSIS, National Outdoor Recreation Supply Information System. NORSIS is composed of over 400 different resource inventory elements, covering both public and private sectors, and describing acres, miles, capacity, services, and related supply elements. Included are measures of total forest, farm, range, urban, and other areas. Especially delineated are portions of areas that are available for public recreation. Only the quantities of resources, facilities, and services **available** for public recreation are included in computing EROS. These quantities are weighted according to degree of relevance to each of 12 general types of recreational opportunities, from remote to developed, as described later.

To account for per capita amounts and spatial distribution, these county-level, relevance-weighted inventory data are next converted to per capita amounts and distance-decay weighted to reflect their locational advantage relative to the location of resident populations. The end result (explained in more detail in a following section) measures the relative amounts of recreational opportunities that are within a normal market radius and are specific to

different types of recreational environments available to people in any given location. An EROS index thus permits direct comparison of the relative abundance, or scarcity, or recreational opportunities among people living in different counties across the country. We computed EROS indices for each of the 12 classes of recreational environments for a representative set of 239 counties across the United States.

A Recreational Environment Classification System

Recreational resources are of three general types. **Land Resources** range from desert and prairie to forests and mountains. **Water Resources** include rivers, streams, lakes, pools, and ocean shorelines. **Snow and Ice Resources** are, in the majority of cases, a subset of land and water resources identified by degree of snowfall and subfreezing temperatures.

It is useful to discuss snow and ice separately because of their different resource management needs and temporal distribution of use.

Our classification system further arrays recreational resources by their distance from the nearest road passable to a two-wheel-drive passenger vehicle. Distance from this nearest road also characterizes resources according to their level of development, since wild lands are generally remote, and developed facilities are adjacent to or traversed by roads. Each class of resource-land, water, snow and ice- is subdivided into four categories identifying their level of remoteness or development. Type of resource and level of remoteness or development are combined to describe 12 recreational environments (figure 1).

The classes of recreational environments are described below by basic type of resource.

Forest and Rangeland Resources		Recreational Uses	
General Category	Recreational Environments	Recreational Uses	General Category
Land	<ul style="list-style-type: none"> • Wilderness and Remote Backcountry, 3 miles from Roads • Extensive Undeveloped Areas Near Roads • Roaded and Partially Developed Areas • Developed Sites 	<ul style="list-style-type: none"> • Wilderness and Other Non Motor Use > 3 Miles from Roads • Non Motor Backcountry < 3 Miles from Roads • Motorized Road and Off-Road Use • Developed Site Use 	Land
Water	<ul style="list-style-type: none"> • Wild and Scenic or Other Remote Lakes and Streams • Lakes or Streams Near Roads • Partially Developed Lakes or Streams with Roads or Crossings • Developed Water Sites 	<ul style="list-style-type: none"> • Wild and Scenic River and other Non Motor Motor Use > 1/2 Mile from Roads • Non Motor Use within 1/2 mile of roads • Motorized Use of Lakes and Streams • Developed Site Use 	Water
Snow & Ice	<ul style="list-style-type: none"> • Wilderness and Other Remote Backcountry, 3 miles from roads • Extensive Undeveloped Areas Near Roads • Roaded and Partially Developed Areas • Developed Winter Sports Sites 	<ul style="list-style-type: none"> • Wilderness and Other Non Motor Snow Use > 1/2 Mile from Roads • Non Motorized Use < 1/2 Mile from Roads • Motorized Road and Off-Road Use • Developed Site Use 	Snow & Ice

Figure 1. – Categories of recreational and wilderness resources and uses.

Land Resources-Wilderness and Remote Backcountry Areas are the most primitive and least disturbed class of land resources. These lands are either legislatively designated as wilderness or lie more than three miles from a road. Opportunities for solitude and nature-oriented recreation, such as backpacking, are available on these remote wild lands. Extensive Undeveloped Areas **Near Roads** border wilderness and remote backcountry and lie 1/2 to 3 miles from a road. Recreational opportunities in these areas are typically non-motorized and include such activities as backpacking, wildlife observation, and primitive camping. **Roaded** and Partially Developed Areas lie within 1/2 mile of a road, but are outside of heavily developed areas. This recreational environment is composed primarily of Federal, State, and private lands within 1/2 mile of **roaded** access. Most State forest land is in this category, as are nearly all forest industry lands and most non-industrial private lands. Forest roads and most trails are also on lands in this category, where both motorized and non-motorized recreational activities occur. Developed Sites principally encompass sites such as campgrounds and picnic areas. Other important developments include golf courses, resorts, and many local government sites such as playgrounds and athletic fields.

Water Resources- Wild and Remote Waters are primitive, free-flowing streams and bodies of water located more than 1/2 mile from a road. Most of the river segments which have been designated or are under study for inclusion in the National Wild and Scenic River System (NWSRS) are in this category. River trips, trout fishing, and canoe outings occur on this type of water. Lakes and Streams **Near Roads** include non-wilderness water bodies without direct road access, but which are located within 1/2 mile of a road. Lakes and streams near roads include ponds, beaches, and major portions of Federal and other reservoirs. Motorized boating and fee-fishing are among the principal uses of water resources near roads and with numerous **roaded** access points. This category of water bodies and their associated light development are termed Partially Developed Water Resources. Developed Sites include swimming pools, water parks, and marinas. Commercial, water-based recreational opportunities are included under this category of recreational resource.

Snow and Ice Resources-These winter-season resources are classified similarly to land environments. The distinguishing feature is sufficient snowfall to support a winter recreational season, generally 16 or more inches of snow annually, and temperatures low enough and for a long enough period to freeze the

surface of streams and lakes. Wilderness and Remote Backcountry winter areas with **16-or-more** inches of annual snowfall provide opportunities for snowshoeing and other solitude-oriented winter activities at distances greater than 3 miles from roads. Extensive Areas **Near Roads**, 1/2 to 3 miles, and **Roaded**, Partially Developed Areas, less than 1/2 mile from roads, provide opportunities, among others, for cross-country skiing, snowmobiling, ice fishing, and sledding. The two types of development most significant, in addition to the overall area receiving sufficient snowfall, are the trails and roads which facilitate winter recreation activities requiring open spaces, such as snowmobiling and cross-country skiing. Ski and other winter sport resorts characterize intensively Developed Winter Sports Sites where winter sports facilities and transport technologies are the emphasis.

Following this structure of recreational resources, the following section describes the process and data used to compute EROS (effectiveness) indices. In subsequent sections, regional comparisons and future projections of EROS are presented.

Procedures and Data

Development of a measure of Effective Recreational Opportunities involved the identification of relevant resources, land, water, facilities and services, for each of the 12 recreational environments shown in Figure 1. Next, data sources were located and needed data obtained, both primary and secondary. This process occurred over a **5-year** period, and much original data had to be developed where adequate secondary sources did not exist. Finally, computation of EROS indices involved a series of steps to standardize and weight the data, followed, finally, by deriving cross-sectional statistical models for use in developing projections.

Identification of Relevant Resources- Each of the 12 recreational environments describes a specific type of recreational opportunity. Data elements from the National Outdoor Recreation Supply Information System (NORSIS) were examined and classified to reflect their relevance to each recreational environment. Resources that were alike, except for different ownerships or management, e.g., Forest Service wilderness and Park Service wilderness, were combined, as were many other very similar and related resources, such as dude and guest ranches.

These lists of resources were then reduced to those that were either: (a) an integral and essential component of the resource base described by the

TRRAP category, such as the relevance of campgrounds as a developed land resource; or (b) relevant, but not critical, to an element of a recreational environment, such as the access services provided by guides and outfitters for excursions into wilderness areas.

Data Sources- County-by-county, the NORSIS data base was developed from numerous sources. Each major source and examples of specific sources used are presented below. Space guidelines for this paper do not permit greater detail.

Published Public Domain Data Sets-The Federal government collects and publishes a large amount of resource information on a county-by-county basis. Much of this data is developed through the efforts of the Bureau of the Census. Quinquennial data collected by the Federal Government includes the Censuses of Agriculture, Governments, Population, and County Business Patterns; the National Resources Inventory (USDA Soil Conservation Service); and Forest Inventories (USDA Forest Service).

Privately Collected Data-Several companies collect and market data dealing with a specific resource or type of recreational opportunity. For example, the Rand McNally Company and Woodalls each publish annually a campground guide from computerized data files that they each have developed. Another primary source included a national business listing of enterprises and organizations that advertise in yellow page telephone directories. Another example source included Ski magazine's list of downhill and Nordic ski areas.

Association Directories – Members of professional and trade associations are frequently listed and sometimes described in annual directories. Some of the associations that provided data to NORSIS included: National Association of Canoe Liveries and Outfitters, North American Gamebird Association, International Association of Amusement Parks and Attractions, and the American Camping Association.

Public Agency Data- Most primary data sources were developed for NORSIS because suitable secondary data were not available. These data were developed from samples and extrapolated to describe population-level amounts of resources for all counties in the United States. The two prominent studies included here were the Municipal and County Parks and Recreation Study (McDonald and Cordell 1988) and the 1986-87 National Private Land Ownership Study. Each of these nationwide studies required substantial investments, but provided much needed data describing access, facilities, and other dimensions of the recreational opportunities they represent.

Computation of EROS-The first computational step was to assign a weight of either 3, 1, or zero to each resource variable to reflect **degree of relevance** of each such variable to each of the recreational environments of Figure 1. These weights reflect the **relative degree** of importance of recreationally available resource as each contributes to the make-up of opportunities provided by each of the 12 recreational environments. These weights were subjectively assigned. Those resource variables (NORSIS data elements), which were integral and most directly relevant components of a particular recreational environment, received a weight of 3. Those that otherwise contributed, but were less directly relevant, received a weight of 1. Most data elements in NORSIS received a weight of zero for any particular recreational environment, indicating negligible direct relevance or redundancy with already included elements.

Second, for each county in the United States, an index of the **relative abundance** of each **relevance-weighted resource** that contributed to the recreational character of each environment was computed. To compute these intermediate indices of relative abundance, the amount of resource per capita was calculated using the most recent estimates of each county's current population. These per capita ratios, at the individual variable or resource level, were then rank ordered and the value at the 95th percentile for each variable was identified. A resource-per-capita index for each relevant resource was then computed across all U.S. counties by dividing each county's respective per capita amount by the national per capita value amount at the 95th percentile. This result was then multiplied by 100 across all counties and any values greater than 100 (i.e., those having amounts greater than the 95th percentile amount) were truncated to equal 100. This last step and the use of the 95th percentile were included to avoid the biasing influence that those few very high values would have on means and estimated parameters in subsequent cross-sectional regressions and other analysis steps. In addition, use of those few very high values, usually representing places like Alaska, to standardize the national set of indices would obscure important differences in the desired effectiveness measures for most of the rest of the country.

The resulting abundance indices for each individual resource variable were then multiplied by relevance weights (3 or 1). The resulting weighted resource variables for each recreational environment were then summed to produce a composite measure of the abundance of recreational resources for each county of the United States. As county-level sums, they were again standardized to a scale of 0 to 100 by dividing through all composite county values by

the one nationwide county value that was highest for each environment. For any one county, then, an index resulted to reflect the per capita abundance of recreational resources of a particular type, relative to the abundance in all other counties in the United States.

The third and final computational step was to convert these composite measures of resource abundance into EROS indices for all counties in the United States. This final step further transformed the data to reflect location of recreation resources relative to location of population. For each of the 12 categories of recreational environments, a recreation travel distance specific to that category was computed using travel data from a nationwide survey of public site users, the Public Area Recreation Visitors Study (PARVS). The travel distance or radius for each

Table 1.--Relevant travel distances that county populations in the United States are willing to travel for each of 12 categories of recreation environments

Recreational environment	Relevant travel distance
Land:	
Wilderness and remote back-country, 3 miles from roads	80
Extensive undeveloped areas near roads	75
Roaded and partially developed areas	80
Developed sites	95
Water:	
Wild and scenic or other remote lakes and streams	80
Lakes or streams near roads	60
Partially developed lakes or streams with roads or crossings	50
Developed water sites	40
Snow and Ice:	
Wilderness and other remote backcountry, 3 miles from roads	100
Extensive undeveloped areas near roads	100
Roaded and partially developed areas	200
Developed winter sports sites	250

Source: Public Area Recreation Visitors Study, 1986-87

category of environment was equal to the weighted average travel distance among activities occurring in each environment, as reported by those persons living within the distance that included the closest 75 percent of PARVS respondents. The PARVS data lacked sufficient sample size only for activities occurring in the developed snow/ice environment. As a result, this average travel radius had to be derived from travel distance data supplied by the National Ski Areas Association.

To compute the EROS indices, the relevant travel radius or distance for each of the 12 recreational environments were employed to identify which counties in the vicinity of each individual county in the national sample of 239 lay mostly within each travel radius. The identification criterion was whether or not the geographic center (centroid) of any nearby county was within this travel radius. Since travel radii were different among the 12 recreational environments (Table 1), the number of counties included for computation of each EROS index was also different. After identification of counties within the relevant travel radii of "central" or sampled counties was completed, a distance decay weight was applied to the composite abundance indices from Step 2. This decay weight reflects the lower accessibility and thus greater cost of trips to recreational sites lying farther away from the people living in each central county in the sample of 239. The weighting computation is represented by equation (1), below. For each of the central counties, the distance to all other counties, within the relevant radii of central counties, was measured using computer software entitled, Comprehensive Analysis of Recreational Environments (CAREN) (Berryman and others 1986). The resulting EROS values for each central county (i) and recreational environment (j) were computed as follows:

$$EROS_{ij} = \sum_1^k \frac{W_{jk} * (1 - D_{ik}/RTD_j)}{D_{ik}/RTD_j} \quad (1)$$

where:

$EROS_{ij}$ = Effective recreational opportunities index for central county i and recreational environment j,

D_{ik} = Distance between centroids of central county i and nearby county k within RTD_j ,

RTD_j = Relevant Travel Distance for recreational environment j,

W_{jk} = Weighted composite value representing relative amount of recreational resources relevant to environment j in county k,

k = Counties whose centroids are within RTD_j .

The result of the above computation is a summation of the supply of relevance-weighted resources (3 or 1) for each recreational environment, standardized on the bases of per capita amount relative to abundance in the rest of the United States. This summation aggregates the above county-level, weighted measures of amounts of resources after weighting them downward as they are farther from the recreation seeking populations living within each of the central counties. RTD_j , the travel radius, represents the greatest distance that a "satellite" county can be from the "central county." As D_{ik} becomes larger, the ratio D_{ik}/RTD_j approaches 1. As D_{ik}/RTD_j approaches 1, the weighting term, $1 - (D_{ik}/RTD_j) / (D_{ik}/RTD_j)$, approaches zero. This weighting term will always have a value less than 1 but greater than zero.

As a measure of recreational opportunity, EROS indicates **availability**, not only within the county of residence, but also from other counties within distances that people are willing to travel. As computed, ease of access (proximity) and competition from other communities for these sites are taken into account. An EROS index is, in a spatial context, a price-constant opportunity measure where the implicit access price includes both travel and congestion costs. Compared across the country, EROS indicates the current relative effectiveness of different types of recreational opportunities. Across time, EROS indicates relative gains or losses in effectiveness, which is a measure of relative abundance, and leaves the judgment of correctness or sufficiency to be determined by other criteria.

Regional Comparisons of Current Opportunity Effectiveness

Below is presented a description of the effectiveness indices for each of the 12 types of environments, remote to developed, within the land, water, and snow-and-ice resource categories of Figure 1. For the sake of brevity, only a brief description is presented. In general, these results reflect the fact that recreational opportunities are widely available to Americans, but that their type and quantity are unevenly dispersed across the country. Remote backcountry areas are heavily concentrated in the West; developed sites are greater in the East. Yet more people live in the East, and within any given region, some areas have more resources than others and resources in some areas are more conveniently located near populated places than others. These two factors, amount of resources available relative to numbers of people and location of resources available relative to location of people, define the effectiveness of opportunities.

The effective amount and location of available recreational resources, from remote wildlands to developed environments, is highly variable nationwide. In considering the supply of outdoor recreation, this variability is very important. Improvements in effective supply may as much be affected by changes in the sheer quantity of regional land and water available for recreation as by overall shifts in the location of opportunities relative to numbers of people and their location within a region. The more trips regional residents can take without having to expend more time and money for the average recreational trip, the more effective is the supply of recreation opportunities.

Land-Based Opportunities- Eighty-one percent of the population lives in the East where less than 5 percent of Federal recreation lands are located (except Alaska). State and local lands help make up for lack of Federal properties in the East even though they typically offer a different kind of recreational opportunity. Two-thirds of non-Federal public lands and private lands are east of the Rockies. Also, State and local lands generally are located closer to cities.

Even with the more prevalent State, local, and private lands in the East, the disparity in effective availability of recreational opportunities between East and West is extreme, although it varies by type of opportunity. Measured as an effectiveness index, which takes account of amount of resource, number of people, and location of resource relative to people, opportunities linked to land resources are 5 to 15 times greater in the Pacific Coast and Rocky Mountain Regions of the West than they are in the North and South. Wilderness and other remote land areas are about 15 times more abundant in the West than in the East. **Roaded** and partially developed opportunities in the West are nearly six times that of the East, as are developed land recreational opportunities. In addition, opportunities in all land recreational environments-from the most remote and wild to the most developed-are more abundant in the North than in the South, and in the Pacific Coast Region than in the Rocky Mountains (figure 2).

Water-Based Opportunities -The availability of fishable and swimmable surface waters in the United States correlates fairly closely with areas of population density. In 1987, the Environmental Protection Agency estimated that about three quarters of the nation's surface waters were clean enough for fishing and swimming. Further clean-up efforts provide the potential for expansion of water-based recreational opportunities. These efforts will have the greatest impact in high-density population areas, where waters tend to be privately or municipally owned, and historically, more heavily polluted.

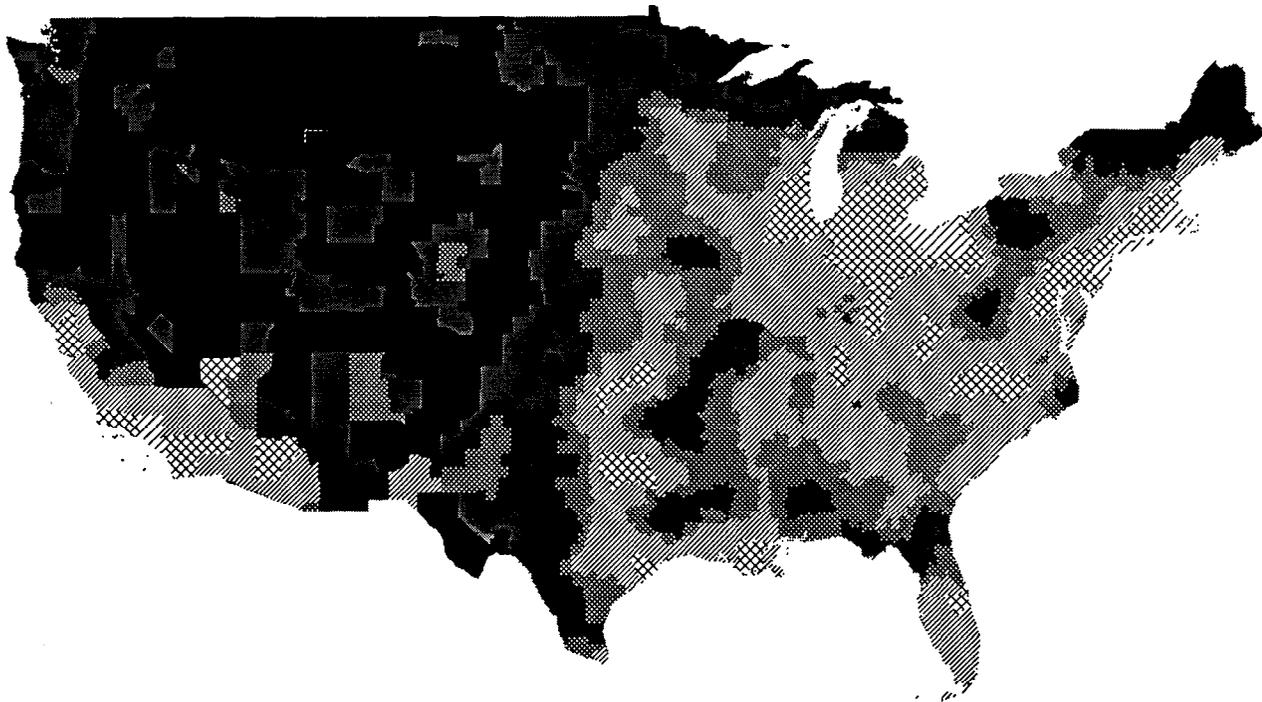


Figure 2. -Effective opportunities for roaded, partially-developed, land-based recreation in U.S. counties, base year 1987. Darker shades indicate greater opportunity.

Though our country's water resources are located closer to **where people** live than is the case for recreationally available land, there still are large differences in effectiveness between regions. Less extreme than for land recreational opportunities, the most remote of water recreation opportunities, such as wild and scenic rivers, is five to eight times more abundant in the West than in the East. Highly accessible, developed water recreational opportunities are two to six times more effectively abundant in the West than in the East. As with land opportunities, the more accessible and developed water opportunities are more prevalent in the Pacific Coast than in the Rocky Mountain Region. But there the likeness ends. The South overall has more effective water recreational opportunities than the North, and the Rocky Mountain Region has more wild and remote water opportunity than the Pacific Coast (figure 3).

Snow and Ice-based Opportunities -The distribution of winter recreational opportunities across the United States follows temperature gradients. Snowfall in the northern states and at higher elevations convert recreationally available land areas into winter snow opportunities for skiing, snowmobiling, snowshoeing,

and other activities. Effectively, there is about 12 times more backcountry snow opportunity in the West than in the North. The South, of course, has virtually none. Road accessible snow opportunities and developed winter sports sites differ less between West and North, although it is still at a ratio of about seven to one. The Rocky Mountain portion of the West has slightly more of all types of opportunities per capita than the Pacific Coast (figure 4).

Trends and Futures

In addition to comparisons between regions, this research has emphasized development of capability to speculate about future trends. As described below, the general approach to developing futures projections was to describe recent past resource trends (1970 to 1987 for this study), develop models that would enable forecasting the future effectiveness of the amount and location of recreational resources if these recent trends continue, and to then, estimate future change of effectiveness. The procedures and results are described below.

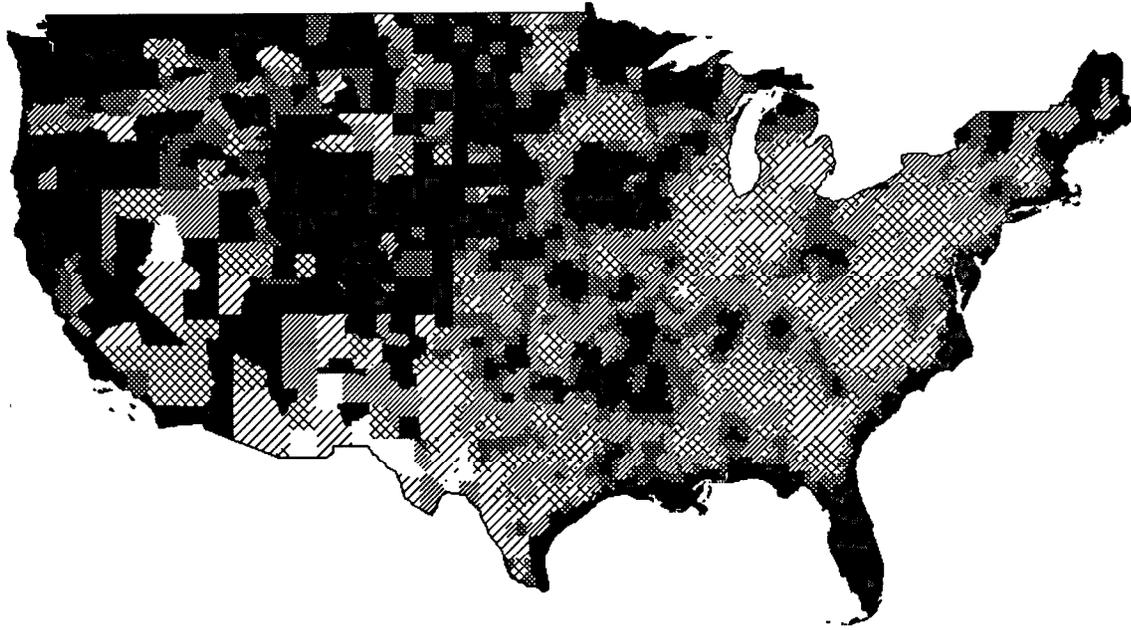


Figure 3. -Effective opportunities for roaded, partially-developed, water-based recreation in U.S. counties, base year 1987. Darker shades indicate greater opportunity.

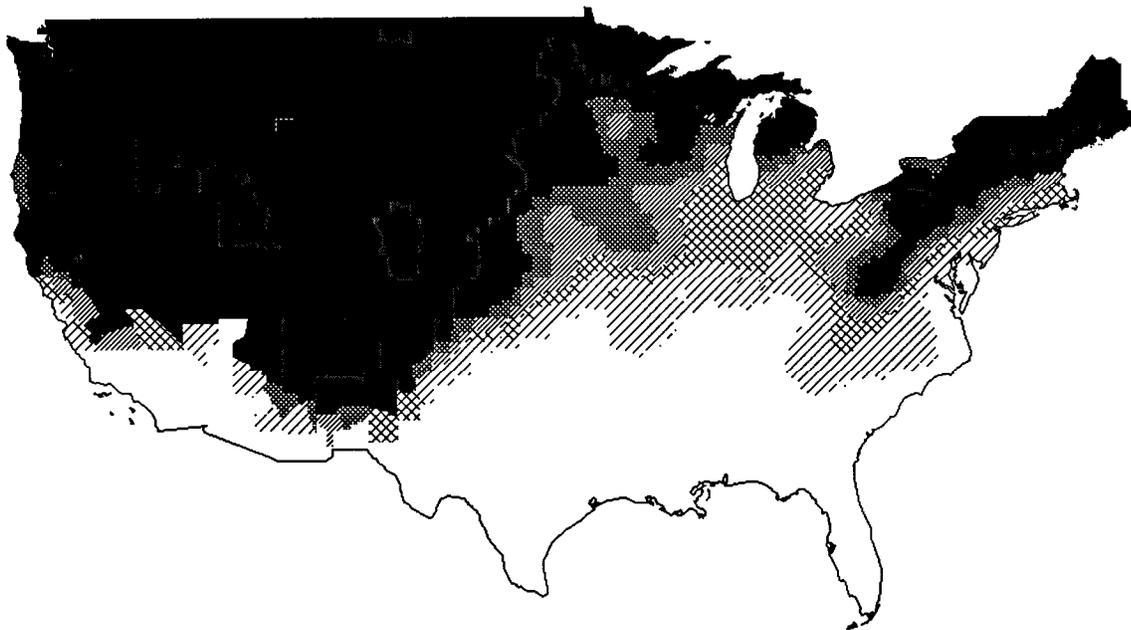


Figure 4. -Effective opportunities for roaded, partially-developed, snow and ice-based recreation in U.S. counties, base year 1987. Darker shades indicate greater opportunity.

Recent Past Trends of Resource Availability

The single most critical factor determining the degree to which recreational opportunities are effectively offered to the public is the availability of access to land and water resources. Next is the availability of facilities and development specific to certain types of outdoor recreation. As stated earlier, this research focuses, for the most part, on those resources and developments that are recreationally available. Since 1970, the amounts of available resources have changed, some dramatically so. Following is a brief overview of recent past trends of resource availability from 1970 to 1987. These trends are subsequently used as the basis for effectiveness projections.

Land Resources-Though land designated as wilderness has increased, road building and other land conversions have meant overall decreases in recreational opportunities in remote backcountry environments. Similarly, in 1987 there were 326 million acres of land farther than 1/2 mile from a road. In the years from 1970 to 1987, the amount of this less remote land resource decreased at an annual rate of about 2.9 million acres, -0.9 percent/year. **Roaded**, partially developed forest and range land recreational opportunities also have been decreasing. In 1987, there were 720 million acres in this land category within 1/2 mile of roads. Since 1970, the average annual decline in this category of land has been about 5 million acres, -0.7 percent per year. The reverse is true of developed recreational opportunities, such as picnic areas, campgrounds, nature centers, golf courses, and other recreational sites. Across all levels of government and in the private sector, developed, land-based recreational opportunities have been increasing at about +0.6 percent per year.

Water Resources-Since 1970, remote wild water available for recreation has increased slightly, at about 0.3 percent per year. This is in contrast with water areas adjacent to road access, which have decreased at about the same rate over the last few years. Declining access has been responsible. Highly accessible water recreational opportunities and developed water sites have grown in number since 1970, at between one-half to one percent per year. The growth of these opportunities reflects construction of launch ramps, bridges, equipment development, **piers**, and other developments and access improvements. This growth, however, has been slower than population growth.

Snow and Ice Resources-Recent past trends indicate gradual reductions in the per capita amounts of unroaded, remote land in areas where snowfall is sufficient for winter sports. Additionally, availability of **roaded** and partially developed areas where sufficient snowfall for recreation occurs has also been decreasing due primarily to private land closures. Developed winter sports sites, however, have been increasing fairly rapidly since 1970, but at a decreasing rate of growth. In the **1970's**, growth occurred through new site development. Since the late **1970's**, growth has largely occurred through better management and technology to increase capacity. For example, since the early 1980's, growth in ski lift capacity has been about 1.5 percent per year.

The above trends in availability of land, water, and snow and ice resources for outdoor recreation represent the most likely future trends for the United States unless a conscious public policy or private market change occurs that would alter these trends. The question then becomes, 'What will future effectiveness trends likely be if recent past resource availability trends continue and if population, economic, and other exogenous trends unfold in the future as they are currently projected?' The following sections address future trends. Table 2 presents assumed resource availability trends to 2020, assuming that annual rates of change from 1970 to 1987 were to continue.

Estimating Cross-Sectional Forecasting Models

Little precedent exists to guide the development of models that would enable forecasting effectiveness indices for future years. Thus, in specifying models it was assumed that future EROS values would be shaped by the same forces which currently determine the effectiveness of the amount and location of recreational opportunities. These forces include population, competing land uses, public financing available for recreational development and management, specific resources available and economic influences.

The general specification of the forecasting models was as follows:

$$\text{Effective Recreational Opportunities (EROS)} = f(a + \dots)$$

b1	Population density +
b2	Exogenous nonrecreational land uses +
b3	Exogenous economic influences +
b4	Public financial assistance for recreation +
b5	Recreation resource availabilities.

Table 2.--Estimated future trends in availability of land, water, and snow and ice resources and environments if recent trends (1970-87) were to continue into the future.

Resources and environments	Projected percentage change from 1987		
	2000	2010	2020
Land:			
Wilderness and other extensive roadless areas	91	85	79
Undeveloped areas near roads	88	80	72
Partially developed, roaded areas	91	85	79
Intensively developed sites	108	115	122
Water:			
Wild and remote lakes and streams	103	106	108
Lakes and streams near roads	97	96	94
Lake and stream sites adjoined by roads	108	115	122
Intensively developed water sites	112	123	134
Snow and Ice:			
Wilderness and other roadless areas	91	85	79
Undeveloped areas near roads	88	80	72
Partially developed, roaded areas	91	85	79
Intensively developed winter sports sites	117	128	136

Each of the 12 EROS cross-sectional models started with the same specification of independent variables, except for variables measuring recreational resource availabilities. Estimates of model parameters were derived using **stepwise** multiple regression. Multiple coefficients of determination ranged from 0.10 to 0.79 and models typically included from 5 to 18 variables. For each model there were 239 records representing the sampled counties. Details about the estimated models and model parameters are available upon request to the authors.

Available information to predict possible future changes of the significant variables composing each estimated model was synthesized to produce the assumed futures referenced in the following section. Following conventional procedures, assumed future average levels for the decades 2000 through 2040 across the 239 representative counties were used multiplicatively with the estimated model parameters to compute future values of **EROS_j**.

Assumed Futures-Assumed futures were as follows:

Population-population growth was derived from Wharton Econometrics projections (... 1988) provided to the U.S. Forest Service to the year 2040. The projected population levels show an average annual increase of 0.98 percent per year from 1986 to 2000, 0.71 percent from 2000 to 2010, 0.61 percent from 2010 to 2020, 0.43 percent from 2020 to 2030, and 0.24 percent from 2030 to 2040.

Exogenous Land Uses- Future land use changes exogenous to the authority of public recreation suppliers were projected at rates appropriate to each variable, mostly following recent past trends. Some land uses, such as industrial ownerships, will not likely change significantly in future years. Road, highway, and transportation development will likely change at one-half the rate that the U.S. population is projected to change.

Exogenous Economic Influences-Costs of construction, land, materials, capital, and labor were assumed to maintain a constant relative production relationship over time and to remain constant in real dollars over time. These variables were used in the models mainly to account for their effects on current geographic variation in amounts of recreation opportunities, and not for use as projection bases.

Public Finance-The amount of Federal and State transfers to local areas for parks and recreation, and the amount of local tax revenue, were assumed to remain constant over time when measured in inflation-adjusted dollars. The future values of these variables could be manipulated to simulate the effects of alternative future tax and transfer funding policies.

Recreation Resource Availabilities-The principal focus of the forecasting models was to enable examination of the effects of possible, policy-determined future changes in the amount of public and private recreational resources. For example, as the amount of Federal developed sites, local trails, resorts near public land, and other resources and facilities change, the effectiveness of opportunities also change. Continuation of recent past resource trends, presented in a previous section and in Table 2, is the assumed most likely future trend and is used to estimate likely future effectiveness indices for recreational resources.

Projections of Future Effective Recreational Opportunities

Figures 5a, 5b, and 5c illustrate the projections using the above-described forecasting models. These projections show one possible future scenario of trends in recreational opportunities-continuation of recent past trends in availabilities of resources, facilities, and services. These projections may imply continued growth, sometimes rapid, in order to stay on trend lines established over the past 18 years.

Figure 5b indicates that continuing recent past trends in the provision of access, facilities, and services would result in future gains in effective opportunities for both **roaded**, partially developed, and highly developed water opportunities. Continuing past trends in the face of population growth would only slightly diminish remote and wild water opportunities, as well as all types of snow- and ice-based opportunities. Effectiveness of land-based effective

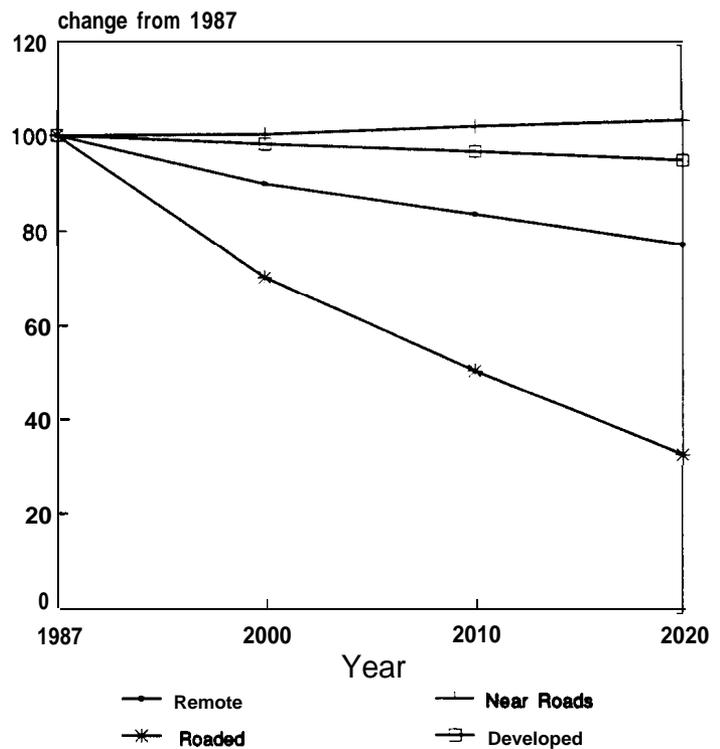


Figure 5a. -Projected trends in the effectiveness of amount and location of recreational opportunities-four land resource categories in the United States from 1987 to 2020.

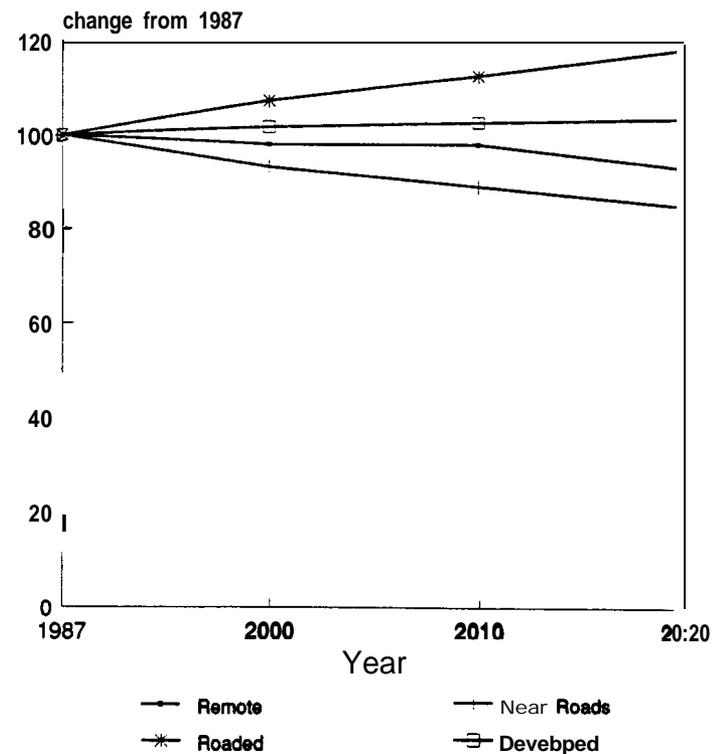


Figure 5b. -Projected trends in the effectiveness of amount and location of recreational opportunities-four water resource categories in the United States from 1987 to 2020.

recreational opportunities would be a different matter (Figure 5c). Continued closure of private land, population growth, land conversions, and rural land subdivision and occupancy for residential purposes could diminish **roaded**, partially developed land opportunities to as little as 60 percent of current levels in a little over 20 years. Wild, remote opportunities may diminish nearly 10 percent in this time. Developed opportunities would stay nearly constant, but this means that such opportunities would have to be increased by about the rate of population growth, the prevalent trend over the last several years.

DISCUSSION

Rising demand for outdoor recreational opportunities and increasingly diminished space for recreational pursuits make doubly important the need to develop tools for monitoring and comparing how effectively our scarce opportunities are made available. In this paper, Clawson's conceptualization of 'effectiveness' is adopted and refined to produce a methodology for examining the status of recreational opportunities. In addition, a procedure and models have been developed for forecasting future effectiveness. Applications of these methodological advances are provided for examining disparities in amounts of recreational opportunities among different communities or regions. Our estimates of the EROS indices also provide a benchmark for examining likely future availabilities of opportunities in a manner that avoids comparing 'apples and oranges.' Previous attempts at comparing across communities or across time usually have compared apples to oranges because they did not account for differences in populations competing for opportunities, differences in willingness to travel to use opportunities, and differences in mixes of available resources, sites, and development.

The EROS indices presented in this paper provide a very useful and practical tool for monitoring the recreational opportunity delivery system in the United States. Using EROS indices one can identify which populated areas are particularly low in recreational opportunities relative to the rest of the United States. The EROS effectiveness measures take account of the fact that recreational opportunities are comprised of a mixture of resources, sites, facilities, and services. Comparing one particular resource, such as miles of streams, cannot fully describe the set of recreational opportunities available for, say fishing, when lakes, ponds, and guide services also contribute to opportunity availability.

The methods and procedures developed here are in need of some improvements. Attention should be given to betterment of the data base and assurance

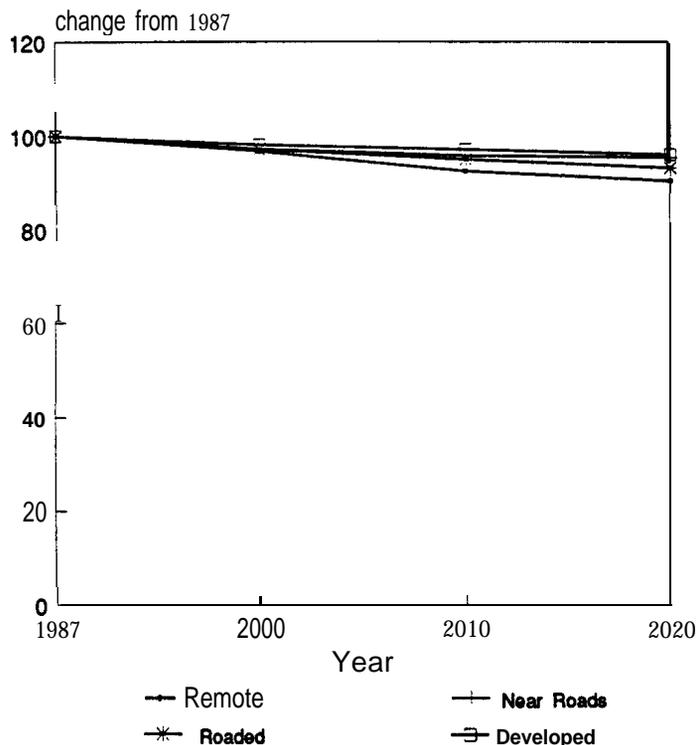


Figure 5c. -Projected trends in the effectiveness of amount and location of recreational opportunities – four snow and ice resource categories in the United States from 1987 to 2020.

of it being frequently updated. Attention needs to be given to the appropriateness of the weights applied to reflect relevance and distance from populated places. Also, further research is needed to improve the model specifications and, perhaps, to provide an alternative way of looking into the future. Overall, however, this first effort to develop and apply, nationwide, an effectiveness measure has shown great promise and has produced a very useful set of indices indicating the status of outdoor recreation supply.

As measured by EROS indices, some new insights have been gleaned through regional comparisons. In particular, it is usually surmised from simple comparisons of numbers of acres and sites that eastern regions have more developed-site opportunities. Yet, when differences in amounts of developed resources of all kinds, population numbers, willingness to travel, and proximity are considered simultaneously, Western regions are found to have over five times as much opportunity as do Eastern regions. This disparity is important and brings emphasis to the need for improved opportunity measures.

As measured by EROS indices, we also have been able to show the effects of permitting resource availability trends to continue into the future. The most critical projected decreases are shown to be in the **roaded**, partially developed land opportunities, where a large percentage of dispersed recreation activity occurs. The "raw" amount of **roaded**, partially developed recreational area is likely to decrease by about 15 percent in the next 20 years. Yet, when population growth, land-use changes, and other factors influencing EROS index values are considered, the effectiveness of the amount and location of **roaded**, partially developed opportunity is projected to decrease to about 60 percent of current levels, a much more severe opportunity loss,

In summary, it appears that Effective Recreational Opportunity indices provide a superior measure of the actual availability of recreation supply. EROS is more meaningful than raw totals of miles, acreages, or other counts of resources or sites. EROS is also a much better measure than that of units per capita. By incorporating a distance decay weight, as well as per capita quantity, a comparable measure results by having removed both population and resource distributional affects.

In application, EROS indexing may prove more practical, although not necessarily better, than effective prices as proposed by Harrington (1987). Effective price basically measures the relative value of recreational opportunities: values which are reflective of appropriateness relative to demand and of suitability of location. But computation of effective price requires much more data and essentially requires estimation of a set of demand models that reflect the distributional attributes of available recreational resources. Effectiveness indices, on the other hand, require only measures of resource quantities and location, population, and a national average willingness to travel. As such, computation for the purpose of benchmarking the status of recreation supply is relatively simple.

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Section 5.

Outdoor and International Recreation Demand

AN OVERVIEW OF THE RELATIONSHIP BETWEEN SOCIAL AND DEMOGRAPHIC FACTORS AND OUTDOOR RECREATION PARTICIPATION

Lawrence A. Hartmann and H. Ken Cordell¹

Abstract- The relationships between a variety of social and demographic characteristics and participation in outdoor recreation activities have been studied for many years. This paper presents an overview of the more commonly studied relationships, including age, gender, income, education, and occupation. Also discussed are the less commonly examined influences of disability, ethnic minority, and coparticipant group. In addition to a review of the available literature, previously unpublished descriptive data from the 1985-87 Public Area Recreation Visitor Study are presented. Social, environmental, and economic implications are also given.

turn. Social, environmental, and economic implications are given, with additional suggestions for future researchers.

USE OF SOCIAL FACTORS TO PREDICT RECREATION BEHAVIOR

Most modeling efforts designed to understand or predict recreation participation behavior have included basic social characteristics as elements of those models. Characteristics of the individual, characteristics of the resource, and willingness to pay for the experience are the three major dimensions of most national models of recreation participation (Hof and Kaiser 1983). There has been continued research into understanding recreation participation behavior and modeling participation since the last major investigation was conducted for the 1979 Resources Planning Act (RPA) Assessment. This research included investigations in motivations, nonparticipation, and improved statistical and methodological procedures. Crandall (1980) presents a list of 17 motivational categories for leisure participation. Romsa and Hoffman (1980) investigated reasons for nonparticipation, and found that among the most active social groups, inadequate recreation supply factors were the most important determinants of nonparticipation, then lack of time, and finally costs of participation. Boothby and others (1981) also investigated nonparticipation, and found that the most frequently cited reasons were loss of interest, lack of facilities, low physical fitness and physical disabilities, leaving a youth organization, moving away from the area, and lack of time. Jackson's (1983) study on nonparticipation determined 15 barriers to participation, including time, money, opportunity, knowledge, ability, overcrowding, lack of partners, shyness, and lack of transportation. Napier and Mauer (1981) considered local community factors, spillover-compensatory factors, and opportunity factors.

INTRODUCTION

The social and demographic influences on recreation behavior are many, and include both characteristics of the individual and his or her surroundings. Although distance to the resource, resource quality, and price of participation are commonly considered as important influences on outdoor recreation participation, social and demographic factors are also generally included in mathematical models of recreation participation behavior (Hartmann 1988a). This paper presents a literature review of the more commonly studied social and demographic influences on recreation behavior. Additionally, descriptive statistics from the multi-agency 1985-87 Public Area Recreation Visitor Study (PAWS) are presented for each examined factor. The influences of age, gender, income, education, occupation, race, disability, and coparticipant group on outdoor recreation participation are discussed in

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As social and demographic factors are important components of most models of outdoor recreation participation, the remainder of this publication will focus on the characteristics of individuals or their social surroundings, and their relationship to recreation participation. In addition to a review of the available literature, new data are provided from the 1985-87 multi-agency Public Area Recreation Visitor Study (Cordell and others 1987). Data were aggregated across all involved agencies (4 Federal agencies and 11 State agencies involved in provision of recreation opportunities, totaling 31,995 usable cases), and then social variables were examined.

CHARACTERISTICS OF THE INDIVIDUAL RELATED TO RECREATION PARTICIPATION

Individual socio-demographic characteristics have been used in all major choice behavior models. O'Leary and others (1982) conducted a review of over 100 recreation participation studies which used socio-demographic variables as predictors of participation, and the relative value of those variables as predictors (Mueller and others 1962; Burch 1969; Field & O'Leary 1973; Kelly 1974; and many others). Age, income, education, sex, place of residence, race, occupation, number of children, and marital status were examined. The two variables with the highest and most consistent relationship to participation were age (Mueller and others 1962; Hendee and others 1971) and gender (Mueller and others 1962; Ditton and others 1975), although these associations were fairly low. O'Leary and others (1982) reported that although these statistically aggregated independent variables provided correlations between an individual's lifestyle characteristics and participation in specific activities, these correlations provide little explanation because no theoretical conceptualization of the leisure phenomenon has **been established**.

The 1985-87 Public Area Recreation Visitor Study

PARVS Background

The 1985-87 Public Area Recreation Visitor Study (PARVS) substantially added to the quantitative research on demographics and activity patterns of users of Federal and State recreation lands. PARVS was an interagency study including (at the time of this writing) 4 Federal agencies and 11 State recreation agencies. Visitors to over 280 recreation areas nationwide were interviewed, resulting in almost 32,000 usable responses using a complex survey

instrument with over 1100 variables (Cordell and others 1987). Sites were selected by each agency according to their own needs, but generally represented their recreation area system. Groups were usually selected on a random basis (although in some cases, logistical restrictions necessitated a relaxing of this requirement), and individual respondents over age 11 within the groups were selected randomly as well.

This multi-agency study inventoried both on-site and annual recreation patterns of a representative sample of Federal and State recreation area visitors, as well as their travel patterns, annual recreation expenditures and current trip expenditures, and standard demographic characteristics of the randomly-selected respondent and each group member. Additional information describing the methods and purposes of PARVS has been documented by Cordell and others (1987). An overview of the demographics of the PARVS respondents in comparison with their recreation participation patterns is presented for initial review in this paper.

Limitations of PARVS

The reader should be advised of the limitations of this **dataset** before drawing conclusions which may extend beyond the limits of the data. First, the PARVS was conducted at the recreation sites sampled rather than being a sample of the entire U.S. population. Therefore, unweighted PARVS data represent people who use the sampled sites, rather than the general public. Second, the sample from which the data were drawn includes visitors to recreation sites from only four Federal agencies (Forest Service, National Park Service, Corps of Engineers, Tennessee Valley Authority) and State park agencies in 11 states (Georgia, Indiana, Kansas, Minnesota, Missouri, New Jersey, New Mexico, North Carolina, South Carolina, Tennessee, and Virginia). Data are not available for other Federal or State land management agencies, regional, county or municipal recreation areas, or private recreation area users. Although these data may represent users of Federal and State recreation areas in general, without including representative recreation areas from **all** land managing Federal and State agencies, it is inaccurate to say definitely that PARVS represents all people who use public recreation areas.

Some limitations are also specific to the topic of this paper: some possibly important demographic data, such as marital status, household characteristics and available leisure were not included in the PARVS instrument. Also, all data represent voluntary responses by the individuals selected. Therefore, if an

individual did not wish to reveal certain demographic characteristics, for example, family income or the presence of a disability, it was not recorded. In spite of these limitations, the PARVS provides the best currently available data covering the recreation patterns and demographic characteristics of users of Federal and State public recreation areas.

PARVS Weighting

Many sociological studies weight their data to place additional emphasis on certain portions of the data. In the PARVS project, it was found that some socio-demographic groups were underrepresented when compared to other national studies of recreationists. As the PARVS was conducted at the recreation site to represent the users of the recreation areas, and many of the other recreation studies were conducted by telephone to represent the general population, it was possible to weight the PARVS data to better represent the entire recreating public by using comparisons with other studies.

Sufficient information is available in the PARVS survey instrument and other sources (such as the 1982-83 National Recreation Survey and the National Park Service's Fee Reports) to allow weighting to provide an approximation of the annual recreation participation patterns of the recreating U.S. population. The origins of the respondents (using unweighted data) roughly approximates the geographic distribution of the population of the United States, indicating that a good geographic representation of the U.S. population was achieved, so no geographic weighting was performed. PARVS data are weighted to correct for an overrepresentation of overnight users, and weighted to represent the demographic characteristics of the U.S. population using information from the U.S. Bureau of the Census.

The weighting procedure involved adjustment of the distribution of sampled PARVS respondents so that they proportionately represented the distribution of people over 11 years old within defined population strata. Weighting these PARVS data in this manner was necessary to enable pooling across strata. Four types of population strata were recognized for each identified community: gender, age, urban or rural residence, and race. These characteristics were common to both the Census of Population and the PARVS sample.

Underrepresentation or overrepresentation among the gender-age-residence-race-defined strata was identified by comparing the percentage distribution of respondents of the PARVS sample to the percentage distribution of the total population. Further

adjustment was made to account for differences in probabilities of being included in the PARVS sample. The basic determinant of this probability differential was between day and overnight users, and whether the interview site was administered by a Federal or State agency. Sampling rates and schedules differed among these sampling strata.

Each PARVS respondent was subsequently assigned a population-to-sample distributional ratio which weighted all data provided by each respondent. This made their responses proportionate to the national proportion of the population in the State matching the respondent's profile. These weighted responses then represented the equivalent of an origin-based survey for obtaining estimates of year-round participation, socioeconomic characteristics, residence situation, population, and other attributes of subregional communities from which recreation trips were generated.

The PARVS includes most of the commonly used sociodemographic variables used in conjunction with outdoor recreation participation models. Below is a review of the variables of age, gender, income, education, occupation, race, and disability as they are related to recreation participation. Following a review of the available literature for each of these variables, current information obtained from the 198587 PARVS is provided. Note that the PARVS data presented in this paper are just a sample of the information available in the PARVS, due to space restrictions. Additional information will be provided in the forthcoming Forest Service's Renewable Resources Planning Act Assessment of Outdoor Recreation and Wilderness and subsequent technical supporting documents.

The Influence of Age on Outdoor Recreation Participation

Age has been shown to be perhaps the single demographic variable with the most conclusive relationship with recreation participation. Largely, as one gets older, one's physical abilities decline and participation in recreation changes from more physical to less physical pursuits, and eventually all outdoor recreation participation declines with advanced age. That older persons participate significantly less in physical recreation than younger persons has been well documented (Kenyon 1966; Snyder and Spreitzer 1973; President's Council on Physical Fitness and Sports 1973; Unkle and Eskridge 1977). O'Leary and others (1982) reported several studies which noted either a decrease in participation with age or a shift toward participation in more sedentary types of

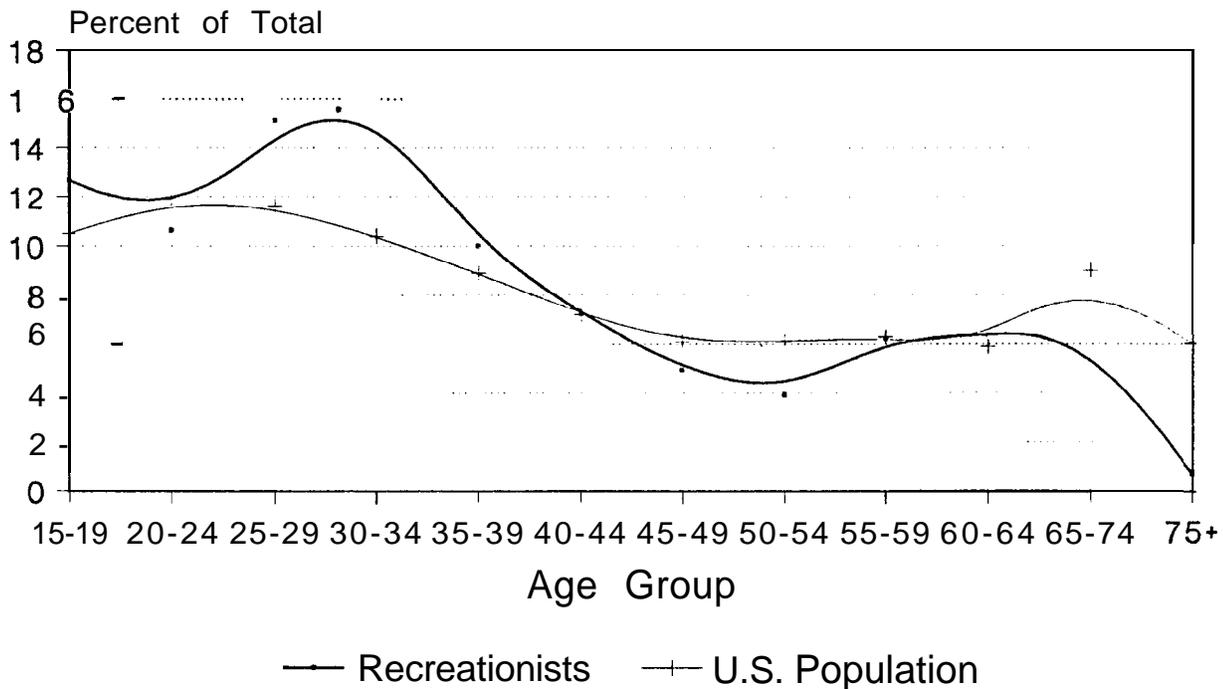
activities with increasing age, with the strength of the relationship varying with different studies. Zuzanek (1978) reviewed the literature on recreation participation and aging and noted a decrease in both number of activities and rates of participation with age. Babchuck and Gordon (1962) indicate that as age increases, affiliation and participation change from one type of social association to another. Their work indicates that there is a cycle of different associations related to recreation participation that parallels the life cycle.

There may be masking effects of age in relation to other variables, Unkle (1981) found a decline in participation with increasing age, but the effect of age on participation differs for females and males (discussed further in a later section). Also, participation was found to decrease faster with age for single persons than for married persons or those with children. Some barriers to participation increase with stage in the family life cycle, rather than simple biological age. For example, couples with young children had less free time than during some other life cycle stages (Witt and Goodale 1981).

Information from the PARVS tends to confirm much of the information above. Figure 1 shows that

individuals under age 45 are overrepresented as visitors to resource-based Federal and State recreation areas in the United States compared to the U.S. population. Table 1 provides a detailed accounting of the percent of individuals within 12 age groups who participate in each of 25 activities. This table shows that for some activities, such as water skiing, pool swimming, and backpacking, percent of the age group who participates at least one time annually declines with age. Other activities, such as developed camping, are relatively age-independent. Some activities, such as walking for pleasure, actually increase in percentage of the age group who participate as age increases.

Figure 2 shows the patterns of length of stay on site by age group of the respondent. Both means and median length of stay increased for older individuals, indicating that older individuals stay longer on site than do younger individuals, up to about age 75. Other data from PARVS (which are presented in the RPA Assessment of Outdoor Recreation and Wilderness) indicate that some older individuals tend to take long single-destination trips, which increases the mean travel distance. A similar pattern is shown for travel time.



SOURCE: 1985-87 PARVS, n=31,995; Census, 1986.

Figure 1.-Age of visitors to Federal and State recreation areas.

Table 1.--Annual participation in outdoor recreation activities, by percentage of individuals within each age group participating one or more times annually

Activity	Age group											
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-74	75+
	----- <u>Percent</u> -----											
Land activities:												
Backpacking	15.4	14.2	16.0	12.5	10.4	8.4	6.7	4.9	3.8	2.0	2.8	3.8
Camping in develop- ed campgrounds	32.4	32.6	37.6	38.6	38.1	36.1	33.8	36.9	32.1	33.6	31.4	17.4
Camping in primi- tive campgrounds	14.6	17.1	18.3	17.3	15.7	14.7	11.3	10.9	8.4	8.0	7.0	7.1
Driving vehicles or motorcycles off-road	16.7	13.5	11.2	7.2	8.6	7.3	6.4	4.8	4.7	2.3	3.6	1.5
Day hiking	18.3	25.3	29.8	29.1	27.9	26.7	23.1	18.7	20.8	14.9	16.9	12.2
Horseback riding	15.5	11.1	9.8	9.9	8.4	7.6	6.9	3.3	2.8	2.6	1.8	1.6
Wildlife observation & photography	26.3	32.2	38.4	41.9	41.2	40.7	40.3	38.8	39.5	39.7	35.6	30.1
Picnicking	38.2	45.0	50.5	55.2	52.6	48.2	45.6	44.3	43.5	38.2	36.4	45.6
Driving for pleasure	33.1	38.9	39.9	42.7	36.4	39.8	39.5	44.2	38.6	38.6	40.4	44.2
Sightseeing	35.7	41.2	45.0	50.2	50.5	48.9	53.6	53.4	54.5	54.5	55.3	47.3
Big game hunting	11.5	10.6	10.8	9.4	11.7	10.7	11.1	8.7	7.2	6.6	5.8	4.6
Waterfowl hunting	15.0	12.6	13.5	11.4	12.7	10.6	10.3	9.8	8.4	6.6	7.7	5.2
Walking for pleasure	30.1	34.3	40.6	43.8	44.4	45.8	47.5	47.6	50.3	49.7	49.5	43.6
Water activities:												
Canoeing or kayaking	19.1	16.8	18.5	16.2	14.5	13.6	11.2	7.3	7.3	5.0	3.1	4.8
Sailing	11.7	9.6	8.9	8.6	7.2	6.7	7.4	4.6	4.8	3.2	4.1	1.5
Outdoor pool swimming	68.8	60.1	56.9	58.4	54.7	49.6	42.4	32.5	34.0	29.9	21.8	14.8
Water skiing	25.0	21.8	16.4	12.6	10.8	9.1	8.4	6.5	4.4	2.6	2.2	0.4
Motorboating	26.5	24.5	23.3	22.4	22.7	22.4	22.2	22.1	19.9	17.9	13.3	16.0
Cold Freshwater fishing	15.8	15.3	18.6	16.8	17.8	16.7	16.2	15.2	13.9	12.4	15.8	14.5
Warm freshwater fishing	29.8	26.9	31.4	31.2	33.2	30.9	31.9	33.0	32.1	30.5	27.9	30.8
Snow activities:												
Cross-country skiing or ski touring	6.1	7.2	9.6	8.2	6.88	6.6	6.0	5.6	5.7	2.9	3.6	4.3
Downhill skiing	16.3	15.8	15.2	9.7	9.7	7.8	8.1	4.2	4.4	2.1	1.8	1.4
Ice skating	11.1	8.6	6.4	7.4	6.5	4.7	3.9	1.5	2.0	0.9	0.6	1.0
Sledding	20.4	8.8	10.3	11.2	10.8	6.5	5.4	2.8	2.2	1.7	1.1	1.7
Snowmobiling	6.1	3.9	2.9	1.8	1.9	2.0	1.9	1.7	1.8	1.5	0.7	1.9

Source: 1985-87 Public Area Recreation Visitor Survey, n = 31,995.

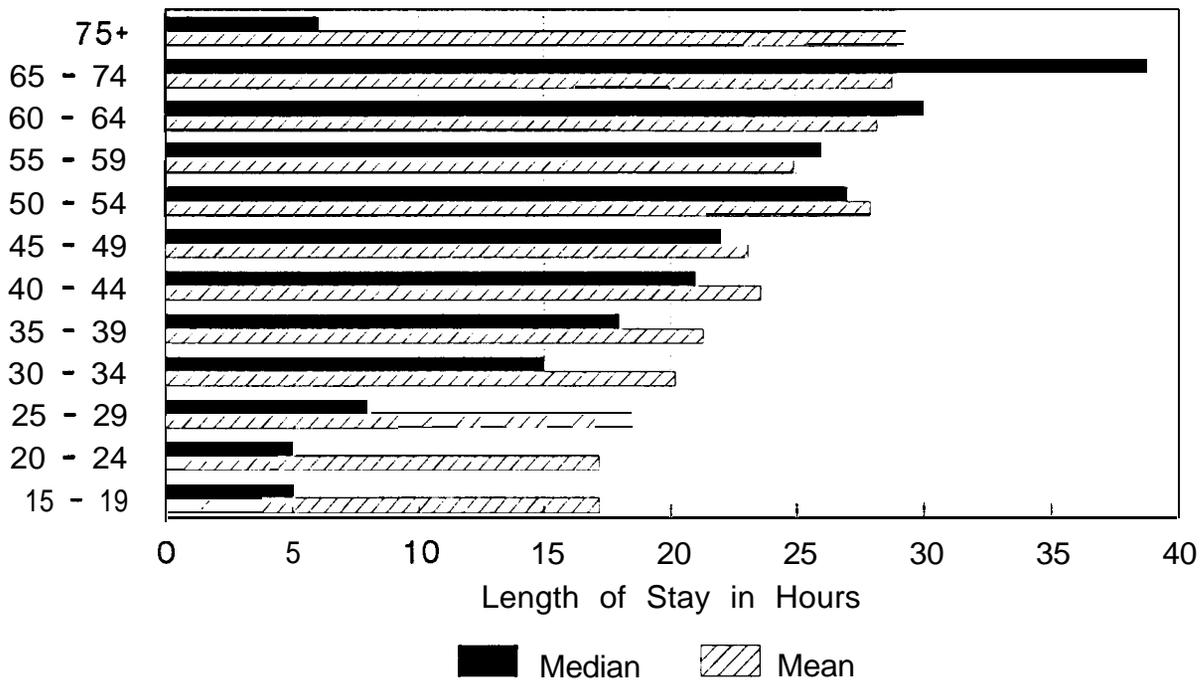
Note: An example of how to interpret this table is as follows: 15.4 percent of all 15-19 year old respondents in the PARVS project reported that they participated in backpacking at least one time during the 12 months prior to the date they were interviewed.

Several conclusions can be made from the data presented here. First, resource-based Federal and State recreation areas serve a larger share of the individuals under age 40 than those over that age. This underrepresentation of older individuals is slightly reduced during early retirement years. Second, activity preferences differ between young and old individuals, following a fairly gradual pattern. While participation in most outdoor recreation activities is less among older individuals, participation in some activities increases. Third, travel patterns among older individuals differ from younger individuals. Older individuals tend to travel further and stay longer at the recreation area than do younger individuals.

The Influence of Gender on Outdoor Recreation Participation

In most human societies, biological and cultural sexual identities are covariant elemental properties. The difference is that biological capacities are insufficient among many primates for complete social recognition of a particular gender. In other words, while sexual identity, like age, has a biological component, its **reality** in human societies emerges only through its social component. Like age, every individual member of a social group is also the possessor of a sexual identity (Cheek and Burch 1976). This sexual identity appears to be related to recreation behavior for many activities.

Age



Source: 1985-1987 Public Area Recreation Visitor Survey, n=31,995.

Figure 2. -Median and mean length of stay on site by respondent age group.

Gender has been shown to be a significant differentiating variable in several participation studies. Males apparently participate more frequently in strenuous activities than females, but a more equal balance between males and females exists in other outdoor recreation activities (O'Leary and others 1982). **Hendee** (1969) demonstrating the activity specific influence of gender by showing that males dominated hunting and fishing activities, but a more equal participation balance between males and females existed in other outdoor recreation activities. Although the amount of variance explained was relatively low, **Kelly** (1980) found that gender and family life cycle accounted for most of the variance in forest-based and water-based recreation. **Young** (1983), in analyzing wilderness participation, also found gender to be an important variable in explaining who would use the wilderness. In these studies, as in most studies of differences between females and males in recreation participation (e.g., **Unkle** 1981), females were found to participate less frequently than males in outdoor recreation. Not only did **Gentry** and **Doering** (1979) find differences in participation rates between males and females, but they found differences in their attitudes toward leisure activities.

Zuzanek (1978) summarizes several recreation surveys and concludes that: 1) the overall participation rates in leisure activities do not differ much between

men and women; 2) women take a somewhat greater part in cultural activities while lagging behind men in outdoor recreation, active sport, sport spectatorship, and home-gardening; 3) nonworking women show slightly higher participation rates than employed women in most leisure activities except going out to dinner, active sport, and sport spectatorship; 4) the total number of leisure activities in which women engage may be slightly smaller than that of men; and 5) the similarities in leisure participation rates between the sexes are more striking than the differences.

Like age, there may also be some interactive masking effects between gender and other socio-demographic variables. Presently, relatively little consistent information is available about physical recreation participation of females in different stages of the life cycle and with different role functions (**Unkle** 1981). Whatever the differences or similarities between female and male involvement in physical recreation, they are not static throughout adulthood (**Unkle**, 1981). **Kenyon** (1966) and **Robinson** (1967) reported that the decline in participation occurs earlier in life for women than for men. Results with reference to the influence of marital status and presence of children are not consistent. For example, **Robinson** (1967) reported that no significant relationship exists between either marital status or number of children, when age

and level of education are controlled. Hobart (1975), however, found that young, single persons have higher participation rates than their married counterparts. He also reported that marital status is a more powerful predictor of participation for young women than for young men. Hall's (1973) data indicated that for women, participation declines significantly with marriage. She further concluded that the presence of young children especially reduces participation of women. In a study of camping participation by Young and Kent (1985), females were more influenced by "important others" than were males. Males, on the other hand, were more influenced by their own

attitudes about going camping which were mostly positive, although not as positive as the females. Of the referents in that study, the beliefs of one's family were the most important in making decisions to camp.

Information from the PARVS provides current information on the recreation patterns of males and females who visit Federal and State recreation areas. Table 2 shows that some activities, such as big game hunting, are largely dominated by men, where others, such as camping in developed campgrounds, are nearly equal in gender ratio. Some activities, such as walking for pleasure, show that a higher percentage

Table 2.--Percentage of recreationist participating in outdoor recreation activities at resource-based recreation areas by respondent gender

Activity	Men		Women	
	Men participating	All participants	Women participating	All participants
	----- Percent -----			
Land activities:				
Backpacking	2.6	59.6	1.7	40.4
Camping in developed in campgrounds	15.9	50.1	15.1	49.9
Camping in primitive campgrounds	4.9	55.5	3.7	44.5
Driving vehicles or motorcycles off-road	2.5	66.8	1.2	33.2
Day hiking	15.9	48.4	16.2	51.6
Horseback riding	1.0	45.5	1.2	54.5
Wildlife observation & photography	17.4	44.3	21.4	55.7
Picnicking	24.9	40.2	35.3	59.8
Driving for pleasure	25.1	47.3	26.7	52.7
Sightseeing	43.6	47.1	46.6	52.9
Big game hunting	4.1	90.8	0.4	9.2
Waterfowl hunting	2.5	93.0	0.2	7.0
Walking for pleasure	28.4	41.0	38.9	59.0
Water activities:				
Canoeing or kayaking	6.2	54.6	5.0	45.4
Sailing	0.7	57.5	0.5	42.5
Outdoor pool swimming	23.6	42.6	30.3	57.4
Water skiing	2.4	55.2	1.8	44.8
Motorboating	7.1	60.7	4.4	39.3
Cold Freshwater fishing	6.9	61.9	4.0	38.1
Warm freshwater fishing	16.4	65.9	8.1	34.2
Snow activities:				
Cross-country skiing or ski touring	0.4	60.4	0.2	39.6
Downhill skiing	0.2	59.3	0.2	40.7
Ice skating	0.1	85.6	0.0	14.5
Sledding	0.1	69.2		30.8
Snowmobiling	0.1	67.6	0.0	32.4

Source: 1985-87 Public Area Recreation Visitors Survey, n = 31,995.

Note: An example of how to interpret this table is as follows: 2.6 percent of all males contacted in the PARVS project participated in backpacking during their recreation visit at the site where they were interviewed. Males comprised 60 percent of all recreation visitors contacted in the PARVS who participated in backpacking during their recreation visit to the area where they were interviewed.

of females than males participate. Differences in travel time and distance were minor.

The Influence of Income on Outdoor Recreation Participation

In a review of studies using income as a predictor for recreation participation, O'Leary and others (1982) found mixed results. They conclude: income does not condition recreation behavior-an individual must accept the patterns of a social class for it to reflect participation patterns in leisure activities. In other words, income does not form tastes, but rather limits their expression.

The following information from the PARVS describes recreation participation in comparison with the respondent's family income before taxes. Table 3 provides detailed information on the percentage of recreationists participating one or more times annually, by their family income. These data indicate that annual participation in some activities is relatively independent of income, such as walking for pleasure. Other capital-intensive recreation activities, such as sailing, are highly income-dependent. Curiously, backpacking has a higher percentage of participation in both low and high income groups, but less participation by middle-income groups.

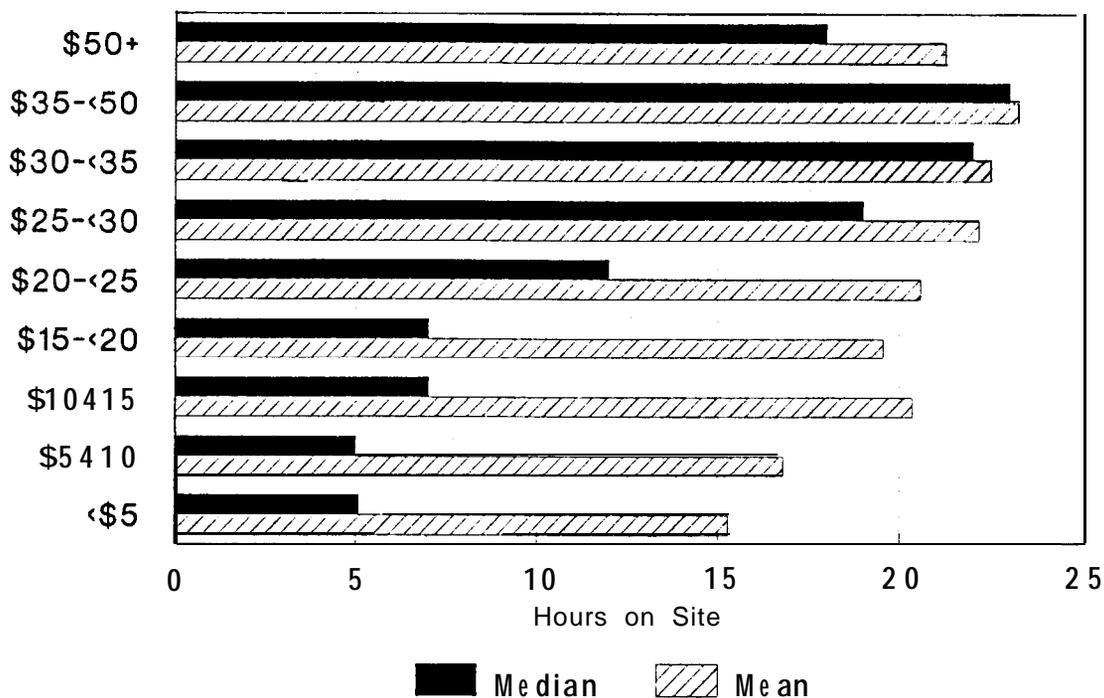
Table 3. --Percentage of recreationists participating once or more annually in outdoor recreation activities by family income

Activity	Family income (thousands)								
	Less than \$ 5,000	\$5,000-9,999	\$10,000-14,999	\$15,000-19,999	\$20,000-24,999	25,000-29,999	\$30,000-34,999	\$35,000-49,999	\$50,000+
	----- Percent -----								
Land activities:									
Backpacking	16.6	10.9	10.3	8.3	9.5	10.5	9.8	11.0	14.6
Camping in developed campgrounds	29.6	29.9	34.6	34.9	39.3	36.6	38.3	37.4	33.7
Camping in primitive campgrounds	15.8	16.0	15.1	14.5	16.0	14.8	14.8	14.5	14.0
Driving vehicles or motorcycles off-road	12.7	9.8	9.1	10.3	9.2	8.6	8.4	9.8	8.7
Day hiking	23.0	22.3	22.2	22.3	23.7	23.3	24.8	27.23	28.51
Horseback riding	11.6	9.1	7.9	9.3	7.6	7.3	9.1	8.62	10.01
Wildlife observation & photography	30.8	28.6	32.4	34.8	35.6	36.4	38.5	42.36	45.11
Picnicking	47.6	47.90	47.4	49.0	48.4	48.6	47.0	48.2	43.1
Driving for pleasure	35.1	40.73	41.0	41.1	39.4	41.4	37.6	39.9	37.9
Sightseeing	42.5	43.52	42.6	45.8	47.7	48.1	46.4	52.8	51.7
Big game hunting	9.4	8.24	12.3	11.0	11.5	11.8	11.1	10.3	7.6
Waterfowl hunting	10.9	11.30	12.7	14.7	13.0	12.6	13.0	12.4	9.8
Walking for pleasure	38.3	37.44	40.9	41.1	43.2	42.4	41.9	45.2	43.7
Water activities:									
Canoeing or kayaking	13.6	10.7	10.8	14.1	13.3	11.9	15.2	15.24	18.10
Sailing	8.0	5.5	4.8	5.7	5.2	6.0	7.8	8.10	14.80
Outdoor pool swimming	51.7	46.2	46.5	48.8	47.9	50.8	51.9	52.97	55.34
Water skiing	12.7	7.8	8.5	11.4	10.5	13.8	14.2	14.5	17.9
Motorboating	19.6	15.1	18.3	21.3	18.4	22.2	22.6	25.8	29.2
Cold freshwater fishing	17.0	16.9	16.7	16.9	17.4	18.4	18.0	18.6	16.1
Warm freshwater fishing	24.2	32.7	31.9	34.7	33.9	33.1	32.3	31.43	27.72
Snow activities:									
Cross-country skiing or ski touring	6.22	7.95	4.57	5.45	5.59	5.97	7.30	8.02	10.25
Downhill skiing	11.17	8.03	6.97	7.88	7.45	7.29	9.52	10.21	18.74
Ice skating	8.48	4.15	4.51	5.89	4.17	4.13	6.33	7.80	8.39
Sledding	9.92	7.69	7.70	7.21	9.25	7.58	9.96	10.98	10.78
Snowmobiling	2.85	3.46	1.86	2.58	2.29	2.49	2.68	3.17	3.44

Source: 1985-87 Public Area Recreation Study, n = 31,995.

Note: An example of how to interpret this table is as follows: 16.6 percent of all individuals interviewed in the PARVS who have annual incomes of less \$5,000 participated in backpacking at least once during the 12 months prior to their interview.

Income (x 1000)



Source: 1985-1987 Public Area Recreation Visitor Survey, n=31,995

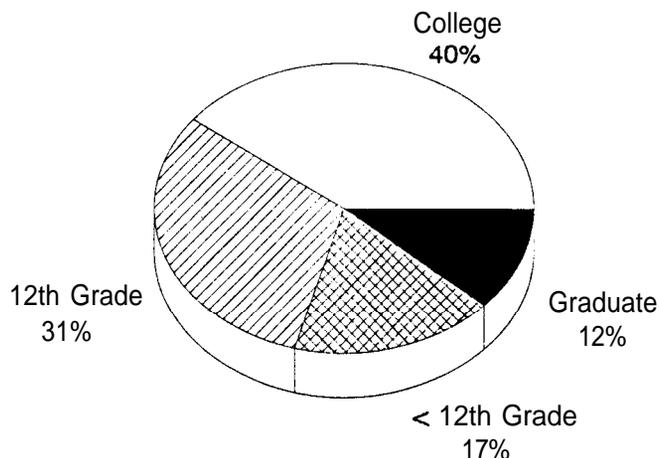
Figure 3. -Median and mean length of stay on site by respondent family income.

Figure 3 shows that individuals with higher family incomes tend to stay longer on site than others. Other PARVS data, not presented here, show that median one-way travel distance increases in the higher income groups. There may be intervening variables (such as age) other than income alone that account for these findings.

The Influence of Education on Outdoor Recreation Participation

In a review of the literature related to education and participation, Zuzanek (1978) concludes: 1) the rates of participation for most leisure and recreational activities and their spectrum increase almost linearly with growing level of education: 2) there may be a saturation point within this relationship at the very highest levels of college education: and 3) the few leisure activities which do not correlate positively with education include TV watching, radio listening, playing cards, special hobbies such as woodworking and knitting, attending sports events, and fishing and hunting. White (1975) found education, when used in combination with age and income, were the best predictors of recreation participation.

The PARVS also provides information on the recreation patterns of individuals who use Federal and State public recreation areas, by education group. Figure 4 shows that college-educated individuals are the largest group of users of Federal and



Source: 1985-1987 Public Area Recreation Visitor Survey, n=31,995

Figure 4. – Education levels of participants in resource-based public recreation.

Table 4.--Percentage of recreationists participating in outdoor recreation activities one or more times annually, by education level, and total participation by education level

Activity	Less than High School		High School		College		Graduate School	
	Within grade	Total participants	Within grade	Total participants	Within grade	Total participants	Within grade	Total participants
----- Percent -----								
Land activities:								
Backpacking	9.6	15.8	6.3	18.6	12.8	47.9	16.0	17.8
Camping in developed campgrounds	33.5	16.6	35.6	31.5	36.1	40.4	34.6	11.5
Camping in primitive campgrounds	11.6	14.1	12.9	28.0	16.1	44.4	16.4	13.4
Driving vehicles or motorcycles off-road	12.0	23.0	9.4	32.1	8.6	37.1	6.0	7.73
Day hiking	16.6	12.0	17.5	22.8	28.8	47.2	36.9	17.99
Horseback riding	12.3	24.1	6.8	24.0	9.1	40.3	8.8	11.62
Wildlife observation & photography	25.2	11.9	29.6	25.1	43.7	46.8	50.0	16.23
Picnicking	42.2	15.8	44.2	29.5	49.2	41.6	52.1	13.1
Driving for pleasure	33.1	14.8	39.2	31.3	41.7	42.1	39.2	11.8
Sightseeing	39.8	14.5	45.6	29.8	50.7	41.8	56.3	13.8
Big game hunting	12.7	22.4	12.3	38.9	8.3	33.0	4.8	5.7
Waterfowl hunting	14.2	21.3	14.0	37.7	10.0	34.0	6.9	7.0
Walking for pleasure	32.6	13.5	40.1	29.8	45.7	42.9	49.3	13.8
Water activities:								
Canoeing or kayaking	13.5	16.8	9.8	21.9	16.3	45.93	18.41	15.40
Sailing	6.5	14.7	4.1	16.7	9.7	49.19	12.82	19.43
Outdoor pool swimming	55.5	18.9	45.6	27.8	52.9	40.78	54.74	12.54
Water skiing	14.8	19.7	11.9	28.4	13.9	42.0	11.0	9.9
Motor-boating	21.8	17.0	23.3	32.6	22.6	39.9	20.0	10.5
Cold freshwater fishing	16.3	17.3	17.1	32.4	16.7	40.1	14.5	10.3
Warm freshwater fishing	35.2	19.8	36.2	36.5	28.0	35.7	21.2	8.0
Snow activities:								
Cross-country skiing or ski touring	4.75	12.41	3.36	15.73	8.05	47.58	13.82	24.28
Downhill skiing	9.91	16.99	5.70	17.51	12.22	47.45	15.63	18.04
Ice skating	7.74	22.00	3.75	19.07	6.85	44.09	7.76	14.85
Sledding	14.85	27.18	8.55	28.07	8.40	34.82	8.05	9.92
Snowmobiling	3.56	22.12	3.00	33.45	2.58	36.27	1.95	8.16

Source: 1985-87 Public Area Recreation Survey, n = 31,995.

Note: An example of how to interpret this table is as follows: of all respondents within the PARVS who had less than a high school education, 9.6 percent participated in backpacking at least once in the 12 months before they were interviewed. Those with less than a high school education comprised 15.8 percent of all recreationists in the PARVS who participated in backpacking at least once in the previous 12 months.

State recreation areas. Table 4 gives the annual recreation participation patterns of recreationists by education category. Figure 5 shows that high-school educated respondents stay the longest at the recreation areas where they were interviewed. Other data from the PARVS shows that highly educated visitors tend to travel farther to their recreation areas.

The Influence of Occupation on Outdoor Recreation Participation

Occupation has been used as a partial determinant of recreation participation in many studies, however, with mixed results, O'Leary and others (1982) reported that several authors recognize a general, positive relationship between the amount and type of recreation and participation, and white collar occupations. Cheek and Burch (1976), however, place relatively little importance on occupation as a

determinant of recreation patterns, other than as a means to provide income sufficient for participation in certain activities. Zuzanek (1978), however, provides an alternate series of conclusions from a review of the literature on occupation/recreation associations:

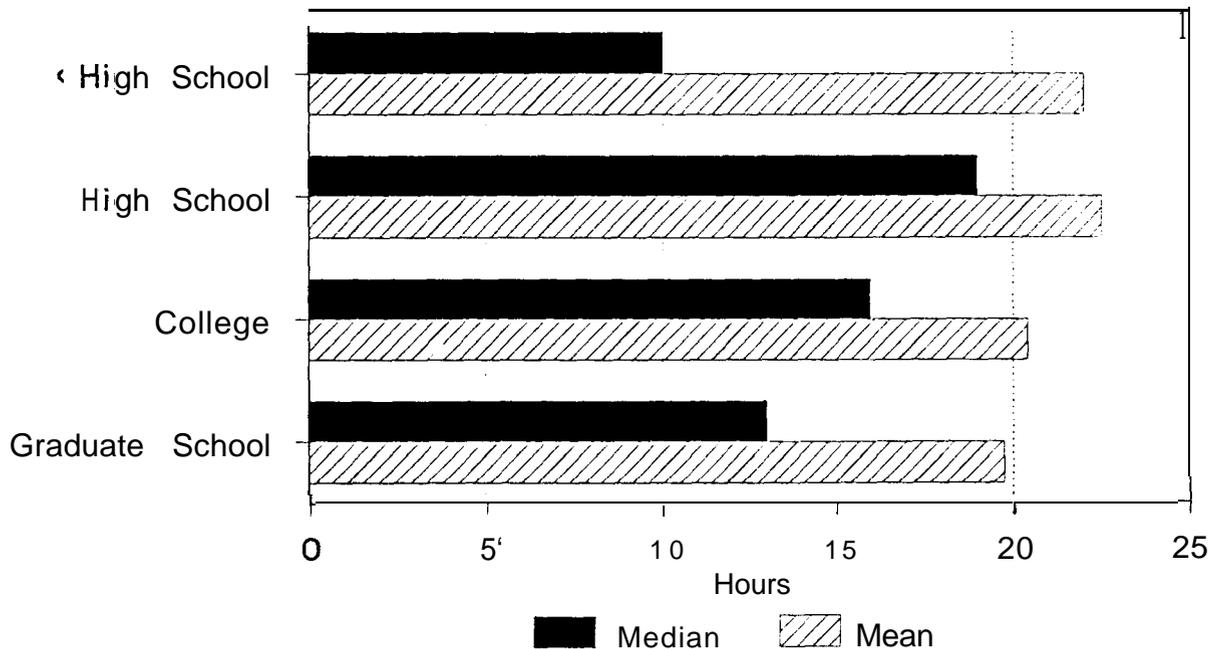
1) Participation in leisure activities is closely and positively associated with the social status and prestige of one's occupation. Professionals seem to be participating in a wider spectrum of leisure activities and at a higher rate than other occupational groups, while laborers and resource workers report the lowest rates of participation.

2) Although attempts to 'tie' leisure and recreational activities with particular occupations are subject to considerable disagreement between researchers, it appears that at least some activities acquire 'status' through association. Sailing, golf, bridge, participation in high arts, to name a few, usually carry a higher occupational and class status, while bingo, softball, attending drive-in theaters, wrestling, etc., are associated with the lower or lower middle class status. A large and probably increasing group of recreation activities such as swimming, camping, recreational driving, etc., seem to lack clear status characteristics.

3) Some authors argue that intrastrata differences in rates of leisure participation caused by the type of work, age composition of particular strata, etc., may be, on occasion, more pronounced than interstrata differences (Gerstl 1961; Wilensky 1963).

Overall, it seems that there is no consensus among recreation researchers as to the appropriateness of using occupation as a predictor of recreation participation, regardless of any apparent correlations. It is possible that other factors such as income and social status may be better measures, while occupation is only related secondarily, through these other factors.

Again, the Public Area Recreation Visitor Study (PARVS) provides current data on the relationship between occupation and recreation participation, PARVS asked the respondent to choose from among a list of general Census occupation categories for their type of occupation. A comparison of this information with the recreation participation patterns, specifically participation in the activity one or more times in the past 12 months, yielded the information presented in table 5 (in two parts). Although occupation was compared with mean and median length of stay on site and travel distance, these comparisons were inconclusive at this preliminary level of data investigation.



Source: 1985/1987 Public Area Recreation Visitor Survey, n=31,995

Figure 5. -Median and mean length of stay on site by respondent education, for primary or single-destination trips.

Table 5.--Percentage of recreationist participating once or more annually in outdoor recreation activities, by occupation

Main activity	Occupation							
	Professional	Farmers	Administers & managers	Kindred or clerical	Sales workers	Craft workers	Operatives workers	Service workers
	----- <u>Percent</u> -----							
Land activities:								
Backpacking	14.1	5.9	10.0	6.1	8.0	7.8	7.25	9.29
Camping in developed campgrounds	37.0	33.2	36.3	35.0	32.0	37.1	35.88	35.08
Camping in primitive, campgrounds	17.33	11.4	13.8	10.8	12.2	16.7	14.0	13.7
Driving vehicles or motorcycles off-road	7.6	13.2	a.1	6.1	9.3	10.6	10.7	9.4
Day hiking	32.0	16.2	23.7	22.9	17.2	18.7	15.1	21.1
Horseback riding	8.9	11.3	7.5	6.9	6.7	6.5	7.2	9.7
Wildlife observation & photography	46.3	31.1	41.6	33.4	34.5	32.1	27.6	32.0
Picnicking	49.8	34.7	46.2	49.3	44.4	42.5	41.4	49.3
Driving for pleasure	40.7	36.9	40.5	38.2	41.4	36.7	38.9	40.5
Sightseeing	52.6	48.7	50.1	49.3	46.0	43.2	44.5	47.6
Big game hunting	7.7	17.2	9.4	5.2	9.0	20.6	21.7	9.8
Waterfowl hunting	9.5	28.3	11.2	5.1	11.6	19.9	22.8	12.7
Walking for pleasure	46.7	30.2	42.5	50.3	40.1	32.7	34.4	41.5
Water activities:								
Canoeing or kayaking	17.4	11.5	14.2	a.7	10.7	12.1	10.5	14.0
Sailing	10.1	1.9	9.7	5.8	7.6	4.2	3.4	5.6
Outdoor pool swimming	50.8	41.6	50.4	50.6	50.6	40.5	42.8	53.3
Water skiing	12.3	10.9	13.4	9.6	14.2	11.0	10.9	12.7
Motorboating	22.4	23.1	24.1	19.7	23.4	23.8	23.4	22.9
Cold freshwater fishing	16.5	1a.3	1a.3	10.7	15.8	21.6	1a.4	15.3
Warm freshwater fishing	27.9	41.7	30.87	26.2	32.3	43.3	43.50	35.5
Snow activities:								
Cross-country skiing or ski touring	10.2	6.0	a.0	4.4	4.2	5.3	2.5	7.0
Downhill skiing	12.9	4.3	10.3	6.3	10.7	6.2	4.3	11.0
Ice skating	6.7	3.3	5.4	5.1	4.6	3.3	2.2	a.3
Sledding	8.0	9.3	6.9	6.6	6.9	7.6	7.3	11.4
Snowmobiling	2.6	9.8	2.3	1.7	2.3	2.5	2.6	3.6

Table 5, part 2.--Percentage of recreationist participating once or more annually in outdoor recreation activities, by occupation

Activity	Laborer	Transport equipment operatives	Armed Forces	Homemaker	Student	Unemployed	Other
----- Percent -----							
Land activities:							
Backpacking	7.5	5.5	13.0	4.3	16.9	7.6	5.7
Camping in develop- ed campgrounds	36.4	36.2	38.9	33.8	31.9	35.9	29.2
Camping in primi- tive campgrounds	14.4	15.9	13.6	10.4	14.4	13.4	8.0
Driving vehicles or motorcycles off-road	13.3	9.7	10.5	4.5	14.6	9.9	8.0
Day hiking	18.7	16.4	17.6	21.8	23.5	18.1	23.1
Horseback riding	7.5	6.7	7.4	6.0	16.2	5.4	6.2
Wildlife observation & photography	24.6	32.9	30.0	36.3	30.9	27.0	32.7
Picnicking	40.6	36.0	36.0	54.5	42.8	38.9	39.7
Driving for pleasure	41.0	33.4	35.0	45.0	31.4	35.0	40.6
Sightseeing	38.6	41.3	45.5	53.0	39.4	38.6	47.3
Big game hunting	20.0	19.3	13.0	5.0	10.4	8.7	12.0
Waterfowl hunting	21.5	18.2	16.0	5.6	13.4	7.5	11.7
Walking for pleasure	34.1	29.8	31.7	52.3	32.3	35.6	44.3
Water activities:							
Canoeing or kayaking	12.6	7.6	9.4	8.8	19.7	7.4	12.7
Sailing		5.1	7.2	3.9	10.6	6.1	5.6
Outdoor pool swimming	42.;	40.7	46.6	51.0	66.8	39.2	41.7
Water skiing	14.8	13.0	11.5	6.6	22.7	10.1	7.2
Motorboating	23.3	25.2	16.5	19.4	24.1	17.9	18.7
Cold freshwater fishing	22.6	22.3	14.5	13.3	15.9	17.1	18.2
Warm freshwater fishing	37.7	41.6	33.6	27.6	28.5	31.0	31.9
Snow activities:							
Cross-country skiing or ski touring	4.0	4.2	3.8	3.7	7.1	2.6	6.0
Downhill skiing	6.7	7.1	10.8	5.1	16.9	4.6	6.7
Ice skating	2.6	2.3	1.8	4.2	10.9	2.7	6.7
Sledding	8.5	5.3	3.9	9.0	18.6	5.1	8.4
Snowmobiling	2.2	1.4	0.7	1.4	5.5	0.8	3.4

Source : 1985-1987 Public Area Recreation Visitors Survey, n=31,995.

Note: An example of how to interpret this table is as follows: Part 1 of the table shows that 14.1 percent of those respondents in the PARVS who identified themselves as professionals participated in backpacking at least once in the 12 months prior to the date they were interviewed. Part 2 of the table provides similar information for an additional set of occupations.

The Influence of Race on Outdoor Recreation Participation

O'Leary and others (1982) cite several studies which report marked differences in rate of participation between blacks and whites. Most of the studies reported that leisure patterns were likely to be different among blacks and whites. Social class and opportunity were suggested as intervening variables in some studies. Hartmann (1988b) presents a review of the available literature on the effects of race/ethnicity on recreation participation, and concludes that blacks are underrepresented in resource-based, nonurban

outdoor recreation activities- insufficient information was available in the literature to reach conclusions concerning other racial or ethnic groups.

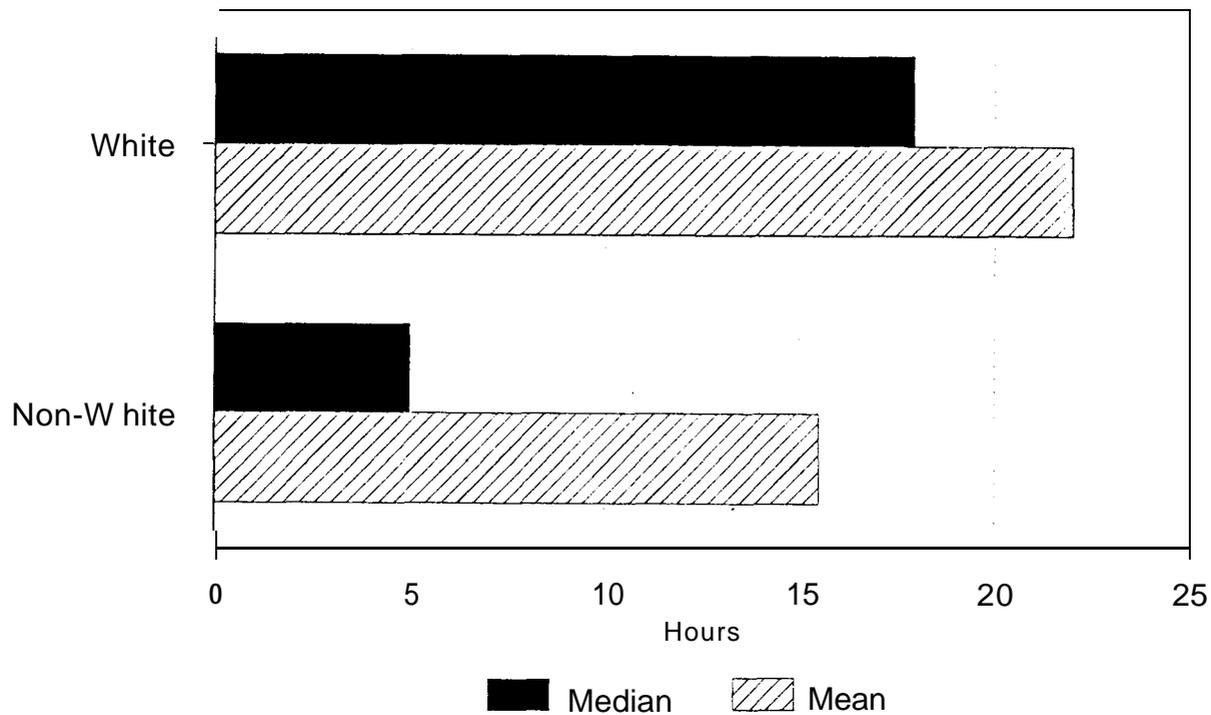
The PARVS provides information on the **differences** in recreation participation by **race/ethnicity**, using standard Census classifications of race. Percentages of the several categories of nonwhite users of Federal and State recreation areas are quite small, therefore the information presented below is categorized only by white/nonwhite. Table 6 displays this information. Figure 6 shows that there is a substantial difference between whites and nonwhites

Table 6.--Percentage of recreationist participating once or more annually in outdoor recreation activities, by respondent race

Activity	White		Non-white	
	Percent of whites participating	Percent of total participants	Percent of non-whites participating	Percent of total participants
----- <u>Percent</u> -----				
Land activities:				
Backpacking	11.0	92.5	6.5	7.5
Camping in developed campgrounds	36.9	92.3	22.4	7.7
Camping in primitive campgrounds	15.0	92.7	a.7	7.4
Driving vehicles or motorcycles off-road	9.4	90.9	6.9	9.1
Day hiking	25.2	92.1	15.8	7.9
Horseback riding	9.3	92.3	5.6	7.6
Wildlife observation and photography	37.9	90.6	28.7	9.4
Picnicking	46.3	87.0	50.6	13.0
Driving for pleasure	39.3	88.7	36.9	11.4
Sightseeing	48.7	89.7	40.8	10.3
Big game hunting	10.4	92.6	6.1	7.4
Waterfowl hunting	12.1	91.5	8.2	a.5
Walking for pleasure	42.7	89.4	37.0	10.6
Water activities:				
Canoeing or kayaking	14.7	92.1	9.2	7.9
Sailing	a.3	94.4	3.6	5.6
Outdoor pool swimming	51.9	89.2	45.9	10.8
Water skiing	13.9	93.8	6.8	6.2
Motorboating	23.5	92.6	13.6	7.4
Cold freshwater fishing	17.0	91.2	12.0	a.8
Warm freshwater fishing	31.7	90.1	25.5	10.0
Snow activities:				
Cross-country skiing or ski touring	7.1	94.7	2.9	5.3
Downhill skiing	10.6	92.1		7.9
Ice skating	6.5	93.1	3.5	6.5
Sledding	10.2	93.8	4.9	6.2
Snowmobiling	2.99	93.13	1.61	6.87

Source: 1985-87 Public Area Recreation Visitors Survey, n=31,995.

Note: An example of how to interpret this table is as follows: Of all whites contacted in the PARVS, 11 percent participated in backpacking at least once in the previous 12 months--whites comprised 92.5 percent of all PARVS recreationists participating in backpacking one or more times annually in the preceding 12 months.



Source: 1985-1987 Public Area Recreation Visitor Survey, n=31,995

Figure 6. -Mean and median length of stay on site by respondent race.

in terms of their length of stay on site. Nonwhites had a median visitation time of only 5 hours, while whites had a median figure over three times that. Other PARVS data not presented here show that mean travel time and distance was less for non-whites, as well.

The Influence of Disability on Outdoor Recreation Participation

Hartmann and Walker (In press) provide a review of the information available on disability and outdoor recreation participation. They conclude from both a literature review and additional data from the PARVS, that a far smaller percentage of disabled individuals participate in outdoor recreation activities than nondisabled individuals. (Please see that publication elsewhere in these proceedings for additional information.)

Group Differences in Recreation Participation

An individual's behavior may be quite different if he or she is recreating with family, a group of same-age friends, or alone. Most recreation behavior in **wildland**

settings occurs in group situations. The dynamics of group interaction, the effects of differing leadership styles, the balancing of conflicting interests among others, must all play a significant, if not dominant, role in choice behavior. Clark and Downing (1985) also refer to the importance of "group needs," resolving intragroup conflict about alternatives, and the desires of the group in recreation participation **decision-making** situations. Hartmann (1988a) provides a review of the available literature on the relationship of group influences and recreation participation.

Field and O'Leary (1973) found that including the social group in which one participates helps explain differential frequency of participation. They also discussed the concept of "interchangeable activities," that is, groups of activities which provide equal opportunity to achieve the participation desired for a given social group. Zuzanek (1978) investigated leisure behavior based on occupation and socioeconomic status. He found that money expenditures follow class lines, participation rates are more egalitarian across class lines, but amount of leisure time available is inversely related to social centrality and social status.

The Public Area Recreation Visitor Study also provides information on recreation patterns by coparticipant group types, for activities done on the recreation sites where they were interviewed. Table 7 provides a detailed accounting of the percentage of each group type that participates in various recreation activities. Most participants visited the PARVS sites in family or family/friendship groups, therefore for most recreation activities the most common group type was the family or family/friendship group. However, when comparing participation rates within

each group type, more meaningful comparisons can be made. For example, backpacking is more common among organized groups or solo recreationists than family groups, while the reverse is true for developed camping. Additional activities most commonly participated in by family groups (more so than other group types) include sightseeing, walking for pleasure, wildlife observation and photography, driving for pleasure, fishing, and motorboating. Activities most commonly participated in by friendship groups (more so than other group types) include sailing, downhill

Table 7.--Participation in outdoor recreation activities at Federal and State outdoor recreation areas by type of group

Activity	Family		Friends		Family & friends		Group or club		Solo	
	Group	Total	Group	Total	Group	Total	Group	Total	Group	Total
----- Percent -----										
Land activities:										
Backpacking	1.5	42.0	3.3	29.0	2.1	8.2	4.9	5.0	3.1	15.8
Camping in developed campgrounds	19.0	74.6	10.1	12.0	13.8	7.2	10.5	1.4	6.8	4.7
Camping in primitive campgrounds	4.9	58.8	4.9	21.0	4.3	8.1	5.7	2.8	3.7	9.3
Driving vehicles or motorcycles off-road	1.7	55.0	2.2	21.6	2.2	9.6	0.5	0.5	2.3	13.2
Day hiking	16.7	62.7	16.0	18.2	13.7	6.9	19.4	2.6	14.7	9.7
Horseback riding	1.1	58.3	0.9	14.9	1.8	12.7	0.9	1.7	1.3	12.4
Wildlife observation & photography	31.9	67.9	27.0	15.3	26.0	7.1	25.0	1.7	22.3	7.9
Picnicking	32.4	65.2	25.0	15.0	39.3	10.6	46.9	3.3	16.0	5.6
Driving for pleasure	28.1	66.2	24.5	17.5	21.5	6.8	9.1	0.8	21.4	8.8
Sightseeing	49.2	66.6	39.2	16.1	38.7	7.0	35.3	1.7	36.4	8.6
Big game hunting	1.3	35.9	3.8	32.0	1.7	6.3	0.0	0.0	5.3	25.8
Waterfowl hunting	0.7	38.0	2.8	16.2		9.0	0.5	1.1	3.2	35.7
Walking for pleasure	37.6	68.3	27.1	14.9	3.0	7.8	29.7	1.9	22.5	7.1
Water activities:										
Canoeing or kayaking	3.7	41.8	9.9	33.7	9.5	14.2	17.3	6.8	1.8	3.6
Sailing	0.6	57.2	0.7	21.3	0.4	5.8	0.2	0.8	0.9	14.9
Outdoor pool swimming	28.3	62.3	27.5	13.5	38.8	14.7	36.3	2.1	18.9	7.7
Water skiing	2.3	65.4	1.7	14.3	2.9	11.1	0.7	0.7	1.7	8.5
Motorboating	6.3	65.5	5.1	16.2	5.5	7.6	1.2	0.4	5.6	10.2
Cold freshwater fishing	6.0	65.8	4.7	15.5	5.7	8.3	3.0	1.1	4.8	9.2
Warm freshwater fishing	13.0	73.3	11.1	13.2	8.8	4.1	4.7	0.3	15.9	8.8
Snow activities:										
Cross-country skiing or ski touring	0.2	36.3	0.5	29.9	0.1	3.2	0.1	0.3	0.8	30.3
Downhill skiing	0.1	28.1	0.5	56.1	0.0	0.0	0.1	0.8	0.3	19.1
Ice skating	0.0	71.6	0.0	1.3	0.0	0.0	0.0	0.0	0.1	27.1
Sledding	0.0	40.2	0.1	28.9	0.0	4.2	0.0	0.0	0.2	34.7
Snowmobiling	0.0	28.6	0.1	27.2	0.1	20.9	0.0	0.0	0.1	23.2

Source : 1985-1987 Public Area Recreation Survey, n=31,995.

Note: An example of how to interpret this table is as follows: 1.5 percent of family groups interviewed in the PARVS participated in backpacking during their visit to the recreation area where they were interviewed. Forty-two percent of all PARVS respondents indicating they participated in backpacking during the recreation trip where they were interviewed belonged to family groups. It was inappropriate to make a comparison between group type and annual recreation participation as group type may change during other recreation experiences. Therefore, direct comparisons with the other tables presented in this paper must be made with caution.

skiing, and sledding. Common family/friendship activities are outdoor pool swimming, driving off-road vehicles, horseback riding, waterskiing, and snowmobiling. Common group or club activities are picnicking, day hiking, canoeing/kayaking, camping in primitive campgrounds, and backpacking. Common solo recreationist activities are warmwater fishing, big game hunting, waterfowl hunting, driving off-road vehicles, and cross-country skiing.

OTHER SOCIAL CHARACTERISTICS RELATED TO RECREATION PARTICIPATION

Others have made suggestions for improving recreation participation projection models. Field and O'Leary (1973) discuss the importance of social group in determination of recreation participation, and propose an analytic strategy in which social group variables (such as family groups, groups engaged in common leisure activities, or groups belonging to the same voluntary association) might be employed in conjunction with social aggregate variables (like occupation, income, education, age, and marital status) to enhance measurement of participation in leisure activities. Moeller and Echelberger (1974) and Young and Smith (1979) stress the need to understand human motivational factors that underlie recreation behavior.

Additional factors were considered to help explain outdoor recreation participation. Schreyer and others (1984) found that extent of previous participation can help explain diversity among users of the same environment. Napier and Maurer (1981) consider personal community factors, spillover-compensatory factors, opportunity factors, socio-economic factors, and personal characteristics in their investigation of participation. They were able to explain very little variance in their models, and suggest participation requires much more complex predictive models than the sociodemographic variables used by leisure researchers to date.

In the early 1980's there were several studies suggesting sophisticated procedures to model recreation participation. Witt and Goodale (1981) suggest nonlinear models for regression modeling, particularly relating to the family life-cycle variable. Yu (1981) offers a leisure demand projection model which combines several socioeconomic variables into a single score, and also advances the idea of a leisure typology, or prediction of demand by activity package rather than by individual activities.

CONCLUSIONS

Likely Futures

This paper makes no attempt to track trends, model current outdoor recreation participation or predict future participation. However, with the knowledge that the population is aging, and the information supplied in this paper about the recreational activities of older persons, one likely conclusion is that the activities favored by older persons, such as walking for pleasure and developed camping will continue or increase in popularity in the future. Conversely, those activities favored by younger individuals, such as waterskiing and backpacking, will decline in popularity.

Social, Environmental, and Economic Structures

The data presented above provide a current and clear picture of Federal and State recreation area users. Although no statistical tests were performed in this paper, the patterns found in the data indicate that Federal and State public recreation areas are serving a certain portion of the United States population: largely the young, white, well-educated, and able-bodied middle class. Older, nonwhite, lower income, the disabled, and the wealthy are found recreating on these lands in smaller proportions relative to their numbers in the U.S. population.

These findings raise some interesting questions. Why are some groups not using these areas as much as others? Some possible answers include personal preference, lack of opportunity, lack of transportation, lack of information about the resource, social and physical barriers, fear, insufficient disposable income, insufficient leisure, and many others. As the demographics of the U.S. population continue to change, some of the patterns found in the data may increase in prominence and emerge as social issues.

Because of time and space constraints, this paper did not address environmental or economic issues, although the data are available in the PARVS project to examine this area.

Opportunity or Need for Improvements

From the above discussion, it follows that the primary need identified in this paper is in identifying the reasons for the lack of population-wide use of these recreation lands. It may be found that the barriers to participation are beyond the control of the agencies managing these recreation areas. However, it may also be found that some actions could be taken to remove obstacles to participation.

Barriers or Constraints

The barriers to participation in outdoor recreation identified in this paper are dependent on the activity in question. Some activities, such as walking for pleasure, seem to have very few barriers. Other activities may have a variety of barriers, ranging from age, income, gender, and, probably, supply of the resource. It is likely that these barriers will continue in the foreseeable future, regardless of the actions taken by managing agencies.

Improving the Baseline Knowledge

The PARVS has provided a rich data source—perhaps the most information on the recreation patterns of visitors to Federal and State lands that has ever been available from a single source. This paper presents some of the first data from that survey, but the authors recommend that researchers continue to examine this fertile data base for more detailed descriptive explorations, hypothesis testing, and theory development. PARVS and other similar surveys are very expensive, and we as a profession should make the greatest possible use of this data source.

The information that is currently being extracted from PARVS will be very useful to recreation managers and policy makers. Analyses will provide detailed information on persons who engage in specific activities, regional differences in participation, the contribution of recreation resources to local and regional economies, participation patterns by specific user groups, and much more. Also, by using PARVS in conjunction with other data sources such as Census information, it will be possible to make comparisons of recreation users with regional or national populations.

Additionally, it is strongly recommended that the PARVS system be continued, to allow additional comparisons among regions, agencies, and various social strata. Currently, 3 years of data are available in the PARVS full data set. With continuation of this system, over time, longitudinal analysis will be possible.

The 1979 Renewable Resources Planning Act Assessment of Outdoor Recreation and Wilderness was largely limited by lack of extensive and reliable data. For this 1989 Assessment, much more comprehensive data are available, but advancements can still be made in this area by implementing standard measures of recreation participation (or accurate conversion factors) for all such data collection efforts. Although considerable advancements have been made in projections of future demand, supply, and

the resulting “gap”, the underlying theories used in understanding current recreation participation data (as discussed in this paper) are largely the same. The next step in the progression of understanding recreation behavior is further advancements in theory, using the data developed for this assessment.

Questions For Discussion

The data provided in this paper indicate that some segments of the population are participating in resource-based recreation much less than other segments. Some questions emerge:

- 1) Is it worthwhile for recreation researchers to seek to determine the reasons for these differences in participation?
- 2) What can and/or should resource managers do to help increase recreation opportunities for all segments of the population, if anything?
- 3) With an aging population, is it desirable to place more emphasis on those activities currently favored by older recreationists?

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SOCIAL FACTORS IN RECREATION PARTICIPATION AND DEMAND: IMPLICATIONS FROM NATIONAL SURVEYS

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Abstract—Among surveys conducted in the last 25 years to gauge the yearly outdoor recreation participation of Americans, most recent was the 1982-83 Nationwide Recreation Survey (NRS). It was designed to be as comparable as possible to the 1960 Outdoor Recreation Resources Review Commission participation surveys in order to ascertain change since 1960. This presentation focuses on 1982-83 NRS estimates of participation in activities included in the RPA analysis. Other surveys are discussed to point out how the information they contain allows for a better interpretation of the NRS survey. Trends, implications, and issues that relate to the surveys also are discussed.

OUTDOOR RECREATION PARTICIPATION

During the past 25 years, there have been several surveys to gauge the yearly outdoor recreation participation of Americans. Most recently, the 1982-83 Nationwide Outdoor Recreation Survey (NRS) was completed under the guidance of the National Park Service in cooperation with the U.S. Forest Service, Bureau of Land Management, and the Administration on Aging. Questions dealing with activity participation were designed to be as comparable as possible to the 1960 Outdoor Recreation Resources Review Commission participation surveys to ascertain change over the approximately 25 years between surveys. In 1986, another survey dealing with recreation participation was conducted by Market Opinion Research for the President's Commission on Americans Outdoors. Extensive surveys have also been conducted by the U.S. Fish and Wildlife Service in 1980 and 1985 describing in great detail the hunting, fishing, and

nonconsumptive recreation participation of Americans. Finally, the Gallup Survey has been asking basic questions about outdoor recreation activity participation since 1959 providing some basis for examining change through the 1980's.

Each of these surveys provides an important piece of information to guide us toward understanding the dimensions of participation and demand in this nation. For purposes of this presentation, activity participation from the 1982-83 Nationwide Recreation Survey will be presented, selecting the activities that are being used in the RPA analysis as the focus. Then, the other surveys will be discussed to point out how the information they contain allows for a better interpretation of the NRS survey. Finally, trends, implications, and issues that relate to the surveys will be discussed.

ACTIVITY ANALYSIS

Land-Based Activities

Backpacking

The 1982-83 Nationwide Recreation Survey (NRS) was the first nationwide survey to include backpacking. Although backpacking attracted only 5 percent of the total respondents as participants, the activity has become a major concern of land managing agencies since it often occurs in remote wilderness areas that agencies are just now learning how to manage. Backpacking attracts twice as many males as females and participation declines as age increases. Almost two-thirds of those involved in the activity have 4 or more years of college education. Otherwise, this pursuit is less sensitive to income probably because of the many young people who participate. Although there are some data suggesting that there has been a decline in backcountry use (U.S. Department of

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the Interior, National Park Service 1987), involvement in the activity will probably continue to be stable or increase slightly as more use is made of frontcountry.

Camping

Respondents who said they went backpacking, camping in developed or primitive campgrounds, or engaged in any other camping activity during the prior 12 months were counted as camping participants. It appears that camping as a whole has about doubled its population participation rate in the past 22 years although the way in which the activity is defined relative to the 1960 survey is slightly different. Self-identified campers-24 percent of the survey's respondents-are broadly distributed across the various demographic segments of the sample, including gender, education, income, and age. Camping is one of the most popular outdoor activities and 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. The reasons given for enjoying camping were predominantly appreciative (enjoyed nature and the outdoors: peace and quiet); change of pace (getting away from day-to-day living; doing something new or different); and social (being with family and friends; liking people who camp).

The same widespread participation pattern was characteristic of the component activities 'camping in a developed campground,' 'camping in a primitive campground,' and 'other camping.' The broad base of involvement in camping would suggest that it will continue to be an important outdoor activity in the future. The issue to be considered in the future is how various sociodemographic groups adapt their camping styles and what form the use of resources will take (more/less interest in developed or primitive use; what form of development will be sought; etc.).

Off-Road Vehicle Driving²

In addition to motorcycling, this aggregate of off-road motorized travel includes four-wheel drives, all-terrain vehicles, and beach buggies. It was not much of a factor in the 1960's 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 broadly distributed across the various categories of education and income. However, approximately twice as many males as females are involved, and there is a decline

in participation with advancing age. There are four times as many whites as blacks participating. The tendency of mostly young people to do this activity would suggest that while there will be participation in the future, the tendency should be for some decline as the population is shifted toward an older distribution.

Day Hiking

Hiking is a resource-oriented pursuit which shows substantial change since 1960 to a current participation rate of 14 percent. Participation is very widely distributed across the population. The activity is pursued by a similar percentage of males and females. Participation also remains high through age groups up to 60 and then it appears to drop off sharply. Similarly, the percent of those with 4 years of education or more participating is twice as high as those with less than four years of college (25 percent vs. 13 percent). Interest in hiking also appears to increase with rising income. Thirty-seven percent of the participants cited hiking as something they particularly enjoyed. The reasons given were predominantly in the appreciative and escape categories-enjoyment of nature and the outdoors (84 percent), solitude, peace and quiet, and getting away from day-to-day living or problems. Fitness (to get exercise or keep in shape) was cited as a motive by 42 percent of the self-identified hiking enthusiasts.

Since hiking is so broad based in terms of the demographics of those doing the activity and particularly in terms of age, the prospects for an upward trend in participation for the future seems likely. The question for the future will probably be where hikers will choose to seek opportunities and how that might influence agency resource allocations and rehabilitation programs.

Horseback Riding

More stable in its participation rate since the 1960's, horseback riding is typical of those activities that require substantial investments of time and/or money. Nine percent of the NRS respondents are participants. However, of those who went horseback riding once or more in the prior 12 months, 40 percent cited the activity as particularly enjoyed. The demographic distribution of horseback riders is rather typical of outdoor activities-younger people with higher participation; more involvement by those with higher education and income- but there are enough people involved from different backgrounds to suggest that any interpretation does not support an elite stereotype often associated with the sport. Also, by contrast to most forms of outdoor recreation, more women than men reported riding horseback.

²Includes motorcycles, but not snowmobiles.

Birdwatching or Other Nature Study Activities

Birdwatching, judged by rather even distribution across the demographic categories of respondents and the seasons of the year, is one of the most available of outdoor activities. The number of days per year in that participants engaged in this pursuit is substantial. Nature study is the only activity on the NRS list where participation actually increases across the entire age spectrum. Given this apparent availability, the reported population participation rate of 12 percent is surprising, as is the 7 percent of participants who cited this activity as particularly enjoyed. Comparison with other surveys indicates, however, that this is too conservative a picture. 'Birdwatching or other nature study activities' was included in the NRS to capture, as far as possible with 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.

The 1980 survey obtained population participation rates of 49 percent for primary nonconsumptive wildlife-related activities as a whole—whether residential or nonresidential. The rate for the residential segment was 47 percent, and that for the nonresidential was 17 percent. Even the low participation of youth in the NRS may be less of a cause for concern. This more detailed survey indicates that the proportion of the sample that participates in the nonconsumptive enjoyment of wildlife peaks in young adulthood (ages 25 to 34) with a slow decline thereafter. The newest information being reported for the 1985 national survey suggests that nonconsumptive interest has continued to grow when compared to the 1980 data and that interest in nonconsumptive activities has shifted out to be most popular in the 35 to 45 year age range (Mangun 1987).

Picnics

Forty-eight percent of the NRS respondents distributed across 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 (45 percent).

Driving for Pleasure

With summer participation rates of 53 and 52 percent, respectively, picnicking and driving for pleasure topped the list of activities in the 1960 National Recreation Survey. The 1982-83 12-month rate for both activities was 48 percent. The participation in pleasure driving across all population segments

continues to be impressive. With 35 percent participating, pleasure driving was the second most widespread activity among the age 60 and older group in the survey. Only walking for pleasure, with 42 percent, was cited by a larger number of senior citizens.

Sightseeing

Sightseeing has declined a bit since the 1960's judged by the 1982-83 12-month participation rate. Nevertheless, with 46 percent of the sample saying they went sightseeing in the prior 12 months, it is clear that this activity is still a very important part of the nation's leisure patterns. There is a slight tendency for participation to increase with more years of education and income. In addition, interest is maintained as the population ages. Otherwise, the activity is done widely by all population groups represented in the NRS sample.

Hunting

In 1980, 17.4 million Americans 16 years of age and older spent \$8.5 billion for 330.2 million days of hunting (US. Department of Commerce, Bureau of the Census 1982; U.S. Department of the Interior, Fish and **Wildlife** Service 1982). In 1980, there were about 18.8 million hunters that were 12 years of age or older, representing 10.2 percent of the people of that age in the population. In 1955, there were about 11.8 million hunters in that age group, representing 10.0 percent of the population of people 12 years of age and older (U.S. Department of Commerce, Bureau of the Census 1982; US. Department of the Interior, Fish and Wildlife Service 1956). This 10 percent compares favorably with the 12 percent participation rate identified in the NRS survey. The demographic pattern of hunters among NRS survey respondents shows about an equal number of people participating in age groups up through age 59, more hunters coming from middle income groups, and a slightly higher percent also coming from those with less than four years of college. Of the participants, 88 percent were male. It is also the most predominantly rural pursuit listed in the survey, with nonresidents of a Standard Metropolitan Statistical Area (SMSA) four times more likely to be hunters than central city people, and twice as likely as suburbanites.

The proportion of Americans who hunt, as well as those who fish, 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 12 percent of respondents hunted, the activity 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. Of the hunting enthusiasts, 71 percent cited enjoyment of nature and the outdoors as a motive. The social aspects were not frequently chosen by comparison with other outdoor activities. On the contrary, 30 percent cited solitude, rather than companionship, as a reason why they liked to hunt, while 46 percent said they hunted to get away from day-to-day living or problems.

Walking for Pleasure

Pleasure walking, with 53 percent of the sample participating, was tied with swimming as the most widespread activity in the 1982-83 NRS. The popularity of walking extends across all categories of the respondent sample, with 35 percent participating even in the lowest educational category. Participation in pleasure walking (42 percent) by the older respondents (aged 60 or more) greatly exceeded their involvement with any other activity in the survey. Seventeen percent of the walkers said they particularly enjoyed the activity, mostly citing fitness and enjoyment of the outdoors as reasons.

Water-Based Activities

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 with a higher propensity to participate tied to higher income and education levels. Gender differences are moderate, and boating participation holds up well through middle age. 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).

Swimming Outdoors

Outdoor swimming was already extremely popular in the 1960 survey with relatively little room for growth. There was a rise in the participation rate from 45 to 51 percent over the 22-year period. In this survey, a somewhat larger proportion of the respondents said they swam in outdoor pools rather 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. Self-identified swimming enthusiasts (18 percent of participants) tended to cite fitness (exercise, keeping in shape) and social reasons (being with family and friends; liking people who swim) as reasons for their preference.

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 shows that waterskiing is overwhelmingly a pursuit of youth and young adults and appears positively related to higher income.

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 as women fish, but otherwise the sport is well distributed across the various demographic categories. Participation is not related to income or education and persists as people grow older. 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. A much smaller number cited the prospect of catching fish as a motive, but this was not offered on the list of reasons and is, therefore, not directly comparable with the others.

Snow and Ice-Based Activities

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 1960's 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 (4 to 5 percent outside the South) has occurred from virtually a zero base. The demographic pattern of participation is similar to that for downhill skiing, except that it is markedly less popular with urban people and carries on into middle age.

Snow Skiing

Snow skiing, by contrast, has experienced growth in the interval between 1960 and 1982-83 with a quadrupling of the participation rate over a 22-year

interval. 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.

Ice Skating

By comparison with the 1960's, ice skating 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.

Sledding

Judged by the winter participation rates of 9 percent, sledding (which includes tobogganing, tubing-on-snow, etc.) has not changed 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 we had data for the under-12 population. Most of the other apparent demographic relationships of sledding participation (predominance of single persons in large households, etc.) are probably age-related.

Snowmobiling

Motorized over-snow vehicles have been used for several decades for transportation in regions with long periods of heavy snow cover. The recreational use of these machines was just getting started in the United States in the 1960's. The 3 percent of our respondents who said they went snowmobiling can be regarded as representing growth since 1960. The demographic pattern of snowmobilers is similar to that of the cross-country skiers, except that snowmobiling is only moderately upscale on the income, but not the education, yardstick.

OBSERVATIONS ABOUT THE NRS SURVEY

There are several observations we can make from this review of the NRS survey. First, for those activities that are comparable with the 1960 ORRRC survey, almost all indicate that the rate of participation has increased. However, there are a few activities in

which a small decline (2 to 4 percent) or no change in the rate has occurred. Care must be taken in thinking about this decline in the period since 1960, since there has been a substantial increase in the population in the interim. A 10 percent participation rate in 1960 and then again in 1982-83 translates to a change of five to six million in the number of participants involved in that pursuit. This same interpretation underlines the impact on resources when both a rate increase and population change are considered.

A second issue, the emergence of new activities, must also be studied. If we look at the activities in the 1982-83 survey that were not considered in 1960, we are generally talking about opportunities that are 'new' or which were so limited in 1960 they were unimportant. The observation we must make interpreting the results from the NRS is that there are many more activities that people identify, and our deliberations of the future should recognize that these will continue to emerge.

MARKET OPINION RESEARCH SURVEY

The results from the Market Opinion Survey done for the President's Commission appear to show higher participation rates for many of the activities that were outlined above. In the reports that were prepared by the firm for presentation (Market Opinion Research 1986) much of the focus for displaying participation was on those participants who reported participation "often" or "very often". In those cases where a direct comparison could be made between activities the MOR data were high (table 1). If the analysis had also included those who reported participating "somewhat" the values would have been even higher. Perhaps the most important information to be garnered from these participation values is that the relative rank of the activities are the same as that seen in the NRS information.

Another important finding from the MOR survey is that activities cluster together and can be interpreted as a 'bundle' rather than looking only at the individual activity. Five of the six activity groups identified in the data analysis are of interest-Spectator Outings (76 percent participate often); Fishing, Hunting, and Horsepower (37 percent participate often); Observing Nature (31 percent participate often); Water and Golf (48 percent participate often); and Winter Sports (11 percent participate often). In addition, the survey used motivational factors to identify five types of people participating in outdoor recreation. They

Table 1. --Participation rates reported from three national surveys

Activity	ORRRC	NRS	MOR
	-- - <u>Percent</u> - - -		
Land-based:			
Backpacking		5	17
Camping	8	24	45
ORV	-	11	-
Day hiking	6	14	27
Horseback riding	6	9	15
Nature study	14	12	35
Picnicking	53	48	76
Driving for pleasure	52	48	77
Sightseeing	42	46	77
Hunting		12	21
Walking for pleasure	33	53	84
Water based:			
Canoeing/kayaking	2	8	22
Sailing		6	15
Swimming-outdoors	4:	53	76
Waterskiing	6	9	27
Motorboating		19	
Fishing	29	34	51
Snow/ice based:			
Cross-country skiing		3	8
Downhill skiing		6	14
Ice skating		6	12
Sledding		10	17
Snowmobiling		3	24

included Excitement-Seeking Competitives (16 percent); Get Away **Actives** (33 percent); Fitness Driven (10 percent); Health Conscious Sociables (33 percent); Unstressed and Unmotivated (8 percent).

Although market research firms commonly use these kinds of grouping strategies, it is unusual to see them in studies describing the public sector recreation environment, particularly in surveys at the national level. Although somewhat of an oversimplification, the "Excitement Seeking Competitives" and the 'Get Away **Actives**' (49 percent) are probably most susceptible to those kinds of recreation found on lands managed by the land managing Federal agencies like the Forest Service, BLM, and some components of the National Park System.

The firm concluded that the data pointed out some important findings that had implications for the future. First, Americans consider themselves to be outdoor people. They report using parks a great deal. The 'baby boom' generation appears to have active outdoor lives, can be found overrepresented

in the 'Get Away Active' motivational group, and report great interest in **2- to 3-day** and long-weekend vacations. These persons are not the same as those who have gone ahead of them, but they are particularly interested in park usage and participation in the parent life cycle stages. While their **activities** may change with age, there is every indication that what they do will occur at higher levels than in previous generations. If adult participation affects the things their children do, then the children of these groups should also be expected to participate at high levels. However, what the baby boomers choose to do may not necessarily include all the same activities their parents did; and if the activity is the same, the way it is done may not be. This issue will become extremely important in the years to come.

GALLUP LEISURE ACTIVITIES INDEX

Since 1959, the Gallup Poll has been involved in asking Americans what 'sports' they have been involved with during the past year. For at least some of the activities that were described in the NRS survey and discussed above, Gallup describes trends in participation. In general, the rate of participation is very similar to the rates from the NRS survey (comparing 1982-83 data in the NRS with 1983 in Gallup) and the 1960 ORRRC survey (comparing ORRRC with the 1959 Gallup). When the 1986 Gallup is compared with the MOR survey, the Gallup data tend to be much lower, and the participation rates are very similar to those identified in the NRS.

The findings underline what was observed with the other surveys--there has been substantial growth in outdoor recreation in the past 25 years, but the sharpest changes occurred in the 1960's and the **1970's**, with some levelling off since then. The most important factors affecting participation include age, income, college education, and business or professional employment. The data reported reinforce the MOR results suggesting that the 'baby **boomer**' group is extremely active and will continue to be a major force in the future of outdoor recreation. Perhaps the more important observations to be made from the contemporary Gallup results are that while there are some gender differences, the eight favorite activities identified separately by males and females tend to **differ** in rank rather than in what **activities** are done.

1980 AND 1985 FISH AND WILDLIFE SURVEYS

The 1980 and 1985 Fish and Wildlife surveys of Hunting, Fishing, and Wildlife Associated Recreation provide some additional information on the magnitude of the wildlife-related opportunities. Since the 1985 data have only recently been released, it is difficult to do more than report a few general changes. In general, comparison of the two surveys indicates that there has been a significant increase in the number of people fishing, and the rate of participation; a continuation in decrease of hunters; and growth (+19 percent) in the number of nonconsumptive wildlife users (74 percent of the adult population, indicating some degree of interest, and 61 percent with a primary interest) (Mangun 1987). Although nonconsumptive use could almost be characterized as being pervasive because of the large number of Americans reporting interest, the group most highly represented are those in the 35 to 45 year age group. This is of particular interest since this was the same age group as the top end of the 'baby boomers' that were identified as being so involved in outdoor recreation in the earlier discussions of participation. The highest participation rates for hunting were in the 16 to 24 year age group, and for fishing it was 25 to 34 years of age.

OUTDOOR RECREATION TRENDS

The President's Commission on Americans Outdoors identified major trends which will affect the provision of outdoor recreation over the next 20 years. It also developed a list of present and future issues of significance to recreation providers and users. The diversity and scope of the issues testify to the need for a continuous monitoring of social and economic issues and their relationship to recreation. Each of these yet unresolved issues is accompanied by potential options. If left unresolved, some of these issues would seriously threaten the integrity of the outdoor recreation resources of this country. Perhaps more importantly, they may threaten the quality of life and economic well-being of the citizens of the United States.

From a historical perspective, people have always tried to guess or predict a favorite future. However, according to institutions that are quite involved with strategic planning, the real problem is not in selecting a favorite future, but in identifying the trends, events, factors, forces, and other elements which will define alternative futures.

DESCRIPTION OF TRENDS

Trend 1. Changing Social and Demographic Composition

Trend: Major changes in lifestyles and basic demographics will substantially alter the demand for and effective supply of recreation opportunities.

Background: One of the most important trends that will affect recreation, in terms of both users and suppliers, is the rapidly changing nature of American society. A great wealth of demographic data are available that identify these social changes; however, possible implications of these data to recreation have received little attention. The following represent some of the more significant changes that will occur.

1. **America is aging.** In 1910, the number of people in America over 65 years of age was less than 4 percent; in 1980 this proportion had risen to 11.2 percent. According to the U.S. Bureau of the Census, by the year 2030, 20 percent of the population will be 65 or older. Those 85 and older are the fastest growing part of the older generation-growing by 141 percent since 1960. Collesano (1984) suggests that by 1990 the life expectancy for women could go from 84 to 92.

2. **Population growth is occurring most rapidly in the South and West and in rural communities.**

For the first time in 160 years, the growth rate of rural areas is higher than for metropolitan areas. More specifically, the center of population in the United States has now crossed the Mississippi River and is expected to continue shifting south and west. In the last 10 years, the South and West accounted for 90 percent of all population growth in the United States.

3. **immigration into the United States will continue.** Through both legal and illegal routes, between 25 and 40 percent of the net population growth is currently from immigration. The new immigrants are not from Europe but are from Latin America, Africa, and South Asia. The trend setting States of California and Texas are one-fifth Hispanic. This population is growing faster and is younger than the general population. It has been suggested that these new immigrants will not go the 'melting pot' route. Rather, cultural diversity may be the new 'Americanization.'

4. We are in the throes of a demographic revolution of working women. According to John Naisbii, in his discussion of global trends, we are moving to a day when virtually all women will work except for a few months or years when they are raising children full time. Today's women workers are reinventing both career patterns and motherhood-and etching their new lifestyles on all aspects of society. Some of the more revealing figures associated with this shift are:

- a. In 1980, 45 percent of both spouses worked full time. By 2000 it will be 85 percent.
- b. The number of married women who are working with children under age 6 is increasing at an increasing rate. This constitutes an enormous experiment on the impact of reduced parental supervision on children.
- c. According to the Bureau of Labor statistics, for the first time professional women outnumber professional men, even though women account for only 44 percent of the work force (U.S. News & World Report 1986).

5. The basic family unit is in evolution. According to the American Council of Life Insurance, over half of the young children alive today will spend some time in single parent families before age 18, and one in two will marry and divorce.

Another important change in the family unit is household size. The average household size is decreasing (3.11 people in 1970 to 2.75 people in 1980). In the last decade, there was a 93 percent increase in singles living alone and a 50 percent increase in divorced persons living alone.

6. A major change is underway in the educational level of Americans. The average employee retiring from private enterprise today has a ninth grade education, while 70 percent of those entering the job market have college backgrounds.

7. Many Americans are more health conscious and may be able to participate in active recreational pursuits much later in life. We should not assume that the elderly of the 21st Century will have the same activity levels of today's elderly. In addition, the population about to retire are the first of a generation of Americans who have been thoroughly indoctrinated with the value of high nutritional and physical standards of health.

8. The 'baby boomers' (children born from 1946 to 1960) are entering middle age and becoming important consumers of recreation. Between now and 1995 people in the 35 to 44 year old age bracket will increase 38 percent from 14.5 to 21.6 million people. By 1995 people aged 45-54 are projected to increase 47 percent from 12.7 to 18.6 million people (Flanagan 1983).

9. 'Baby boomers' have been delaying marriage and children. The marriage rate is rising and the number of couples becoming first-time parents is increasing quickly, more quickly than normal because parents are older and thus will have less time in which to have children.

At the other end of the age spectrum are those people whose children have left or will soon leave home. There will be 10 million new "empty nesters" this decade as the population ages. However, when compared with the 16 million couples who will have new firstborns, which tie them to home and hearth, there will be a net deficit in the travel market of about 6 million travelers by 1990.

Implications: Some of the implications of these major social and demographic changes are:

1. Two-income and dual-career families, while having perhaps more discretionary income, often have less free time. Such households must plan and structure vacation time.

2. As both parents have entered the job market, the issues of child care and location of residence have become major concerns to the employees of recreational suppliers.

3. While there is more and more emphasis on dual income households, the home will take on increased importance in the future. Cetron (1985) suggests it will become the workplace for 25 percent of the labor force by the year 2000 and it will see more duty as a school, entertainment area, and hospital as technology advances.

Trend 2: A Healthy Economy

Trend: Barring any major global crises, the economy of the United States is expected to prosper the next 20 years.

Background: During the next 20 years, it is anticipated that this country will move into a more prosperous period. There will be reduced unemployment, lower inflation, and a rising standard of living;

but the economic base for these changes will be greatly altered. Cetron (1985) suggests that if we can solve the Federal deficit problem, the future looks bright—more goods, more leisure, longer lives. He does not see justification in talk about the great middle class having to adjust to a lower standard of living. Naisbii believes the ‘baby boom’ is being replaced by a ‘baby bust’, the consequence of which will be intense competition for a short labor supply. Collesano (1984) suggests that financially, ‘baby boomers’ are very optimistic, although they are not a particularly affluent lot—at least not yet.

Sivy (1985) believes that with wages increasing at a moderate 3 percent a year and oil costs declining, inflation will probably remain under control during the next 2 or 3 years. Beyond 1990, though, some investment strategists worry that inflation will revive, in large part because of the huge United States budget deficit.

Some specific economic changes that are occurring include:

1. The income distribution and occupational profile in the United States is changing. From World War II through the early seventies, the distribution of household income has looked like a pyramid, broad at the bottom and tapering off toward the top. Now, however, service sector jobs are broadening the lower half, the new employment in a few growth industries is expanding the upper half.

This is creating a dent in the middle of the pyramid because of a corresponding shift away from the middle class jobs in heavy industries; notably agriculture, manufacturing, and mining.

2. Important trends are also developing in major areas of consumer spending, like housing and personal transportation. Changes here are important because increases or decreases in their relative share of the household budget have massive impacts elsewhere. Hornback (1985) believes that if present indicators are what they seem, then home buyers have already turned toward ‘villas,’ ‘duets,’ ‘patio homes,’ ‘townhomes,’ and other euphemisms for a bungalow in order to cut housing costs. Square footage of new homes has dropped from the 1,700 square foot average of the 1970’s to less than 1,000 square feet.

3. The personal wealth of Americans will increase in the next 20 years when compared with today. A person’s real purchasing power, i.e., the amount of

goods and services that their income will buy after taxes are paid, will go up by 33 percent in the decade ahead.

Implications: If the economic picture described above holds true, events that might occur are:

1. There will be increased private sector involvement in traditional public recreational activities and services.

2. The ‘pay-as-you-go’ concept, or user fees, may be more utilized by public suppliers of recreation.

3. Smaller family size will result in more discretionary income.

4. Jobs available in recreation will increase as demand for recreation increases.

5. Dual family incomes will result in more discretionary income.

6. There will be growth in the private sector to fill recreational voids.

7. The budget deficits will mean that less Federal support will be available for public supplied recreation.

8. There will be increased numbers of people living below the poverty line, and the poor will comprise a greater proportion of the total population. However, the poverty population will remain diverse, with some families moving in and out of poverty, and others locked into it.

Trend 3: Increased Technological Innovation

Trend: During the next 20 years, technological advances will change at an increasing rate and will change many aspects of the provision and use of outdoor recreation.

Background: During the next 20 years, technological advances will change virtually all aspects of American life as we know it today. Many of these changes will greatly affect the providers and users of recreational services.

At one time, technological change was measured in terms of centuries. More recent advances such as hybrid corn, which doubled and tripled the yield per acre, took over 40 years to gain 90 percent acceptance by the farmer. This new corn was initially given away free to those willing to try it. Currently, it is said to

take about 7 years for a new innovation to become widespread in use. This means it will be virtually impossible for us to predict the types of innovation that society will face in the next 20 years. Nonetheless, some likely changes are:

1. Technological changes will cause disruption to most all organizations. The typical response of employees to a technological change is somewhere between 'sullen indifference' and 'explicit hostility.'

2. The number one export of the United States, in terms of dollars, is our knowledge and information, which will continue to grow. For comparison purposes, it exceeds agriculture, which is this country's number two export, by a two to one margin. America has a phenomenal dominance in this area, and it is predicted to maintain this lead.

3. There will be a proliferation of new equipment that will collect, store, process, analyze, and interpret information. The costs of these new types of equipment will drop such that users will expand to the millions. Computer literacy will increase among most Americans.

Implications: This improved technology could have the following implications for the recreation industry:

1. Improved technologies should increase the efficiency and productivity of recreational suppliers. The systems will allow the recreational suppliers to better serve the public, i.e., campground reservation systems, interpretation information, safety tips, etc.

2. Naisbii sees the possible beginnings of a significant growth industry for indoor parks such as those found in Houston and Minneapolis-St. Paul.

3. Hypersonic aircraft (scramjets) giving 1 hour access around the world are under development and expected to be experimentally operational by the mid-1990's (New Scientist, 12/5/85, p. 21). (Also called Trans Atmospheric Vehicles, TAV.) This could significantly alter travel and tourism patterns and bring us closer to a global economy.

4. Telecommunications will permit more and more people to work and play at home.

5. Advances in medicine and biotechnology will affect how we take care of ourselves and will prolong active lifestyles. New drugs will be more effective in treating mental illness. One can envision a new

balance between recreational activity to maintain physical strength and **agility** and reduce mental stress, and new kinds of medical approaches to prevent or treat physical and mental illness.

6. Other new technologies that might impact recreation include stronger, lightweight metals, fabrics, weather modification, and other technologies that could alter land and water environments.

7. The preferences of park users may shift from traditional recreational activities, such as hiking, camping, and sightseeing, to more interest in high technology activities. For example, rather than have a visitor actually climb a mountain, perhaps the "new high-tech" visitor would prefer a "simulated climb" in a visitor center.

8. New recreational equipment is being developed and older equipment is being modified such that its use will become more important. Some of the newer off-road vehicles (**ORVs**) are much less damaging to resources than the initial ones, but other newer types are now having impacts in areas previously unaffected.

9. Some of the new technologies in the construction area may greatly affect the type of facilities built in recreation areas. The Linn Cove Viaduct on the Blue Ridge Parkway, which relied on new spanning techniques to minimize the impact on the environment, is an example.

10. Some of the new technologies will have adverse environmental impacts. For example, a new technology associated with mineral extraction, i.e., coal liquefaction, can have impacts far removed from the extraction site.

Trend 4: Continued Concern for the Environment

Trend: Environmental degradation will continue to be a concern in the United States and will result in increased pressure to set aside public reserves for recreation and preservation.

Background: Never again will there be a time when this country will not have to worry and work hard to protect and improve its environment. Although progress has been made, environmental degradation due to habitat destruction, loss of biological diversity, soil erosion, toxic wastes, and air and water pollution will continue to be of major concern. Some of the major concerns are:

1. The future availability of recreation lands will be affected by changing patterns of land use. A factor funneling visitation into rural parks is the 'privatization' of forest and water areas that were formerly open to the public. Hunting, fishing, swimming, boating, hiking, picnicking and camping have been restrained and prohibited to some degree on private land, with closures up (from 26 percent in 1963 in New York, to 48 percent in 1980).

There is a sizable amount of land being held idle (not for agricultural, forest, mining, or other production). Much of this land is 'informally' being subdivided, i.e., broken up by owners rather than developers. This trend may amount to more land unavailable for outdoor recreation than creeping residential plots on the outskirts of metropolitan areas would account for.

2. Wetlands, native grasslands, estuaries, and other distinctive habitats have been and continue to be lost at an alarming rate due mainly to an expanding and suburbanizing population, expanded transportation systems, new settlements, dispersed industry, and an increased demand for recreation sites. For example, wetlands have decreased by an average of 600,000 acres per year. Barely half of this country's original wetland acreage remains today.

3. Of the 3 to 10 million species now living on earth, as many as 20 percent may become extinct by the year 2000, a figure comparable to losing one species per day. The impact of this loss of genetic potential will have far reaching effects on the future well-being of mankind.

4. Soil erosion, once thought to be under control, has again become a serious problem. In 1977, it was estimated that the continental United States lost about 3 billion tons of soil from fields under plow. This erosion may be costing our country nearly a billion dollars each year in terms of lost fertility and polluted and sedimented rivers and lakes. As a hungry world expands and farmland decreases, (an estimated million acres a year), the pressures on the land to produce will continue to rise.

5. Since 1950, our country has disposed of an estimated 6 billion tons of toxic wastes in or on our land, steadily increasing our potential exposure to substances that can cause cancer, birth defects, miscarriages, nervous disorders, and damage to the liver, kidney, or genes. The impact on natural ecosystems is still poorly understood. Although some progress has been made, a monumental cleanup task is warranted, in addition to future protective measures.

Due to legislation such as the Clean Air Act and Federal legislation governing water resources, the quality of air and water in some areas is improving. Much still needs to be done, however. There is growing evidence that wilderness, parks, and other pristine areas may be threatened by air and water pollution.

Implications: The implications of this environmental degradation to recreation include:

1. Increased demand for water will escalate conflicts between uses for energy production, domestic purposes, irrigation, industrial uses, fish and wildlife habitat, and recreation.

2. A lowering of environmental quality may result in decreasing use of affected areas for recreational activities.

3. There will be an increased need to set aside land in developed or developing areas specifically for recreation use.

Trend 5: Availability and Price of Energy Will Remain Speculative

Trend: The United States will be able to produce and purchase enough energy to meet the needs of the country during the next 20 years, but price changes are expected, both in terms of real dollars and as a percentage of disposable income.

Background: Our oil picture is chaotic. Between the shortages there are gluts. Some expectations are:

1. The United States will be able to produce and purchase enough 'energy' to meet the needs of our country during the next 20 years. There will, however, be price increases both in terms of real dollars and in percentage of disposable income. For oil specifically, its price will not skyrocket during the next 15 years. If anything, it will come down (Cetron 1985).

2. Maximum petroleum capacity is expected to be reached about the year 2000; however, for those dependent on wood for fuel, the needs will exceed the supply before the year 2000. The world's finite fuel resources—coal, oil, gas, oil shale, tar sands, and uranium—are theoretically sufficient for centuries, but they are not evenly distributed and the cost of extraction is extremely high.

3. The search for alternative energy sources will continue. The pledges of a number of countries to reduce sulfur pollution will continue to fuel the search for alternatives. Fluidcarbons, solar, and atomic sources will become more important.

Implications: The changing energy situation in the last 10 years has had many effects on the suppliers of recreation and on the users of recreational services. These may include:

1. Many existing recreational facilities have been modified and new facilities have been designed to be more energy efficient.

2. Providers of recreation have altered their operational patterns such as time of opening and seasonal use.

3. The consciousness of energy conservation among the providers of recreation has been greatly increased. Recreational use levels were not greatly affected by the energy situation in the 1970's, but there were changes in use patterns. For example, sites near urban areas received higher visitation levels than did remote sites. Also, users tend to stay at one site longer than in the past. It is expected that in the future the energy situation will affect recreation in many of the same ways as it has in the past 10 years.

Trend 6: Political Change and Accountability

Trend: There will be increased emphasis on referendum and grassroots politics, accountability of institutions, and partnership formation among public and private organizations,

Background: The political scene in the United States will change greatly during the next 20 years. Many of these changes will impact recreational efforts.

There are a number of significant issues related to this trend. Among the more significant are:

1. Confidence in political leaders is decreasing, and the complexity of the issues they are facing is increasing. Collesano (1984) has suggested that there is fairly widespread concern ~~that the~~ Federal government does not pay attention to what people want, and that leaders in Washington often cannot be trusted. We have a generation (the baby boomers) -representing almost half of the potential electorate- that is fairly dubious about its government and not fully committed to the major political parties.

2. The American public's expectations of government have shifted, and shifted dramatically. Again, Collesano believes the very generous psychology of entitlement has been replaced by a new psychology of protectionism – a lowered concern by individuals about government help to others, and increased concern that government protect and preserve the individual. For example, in 1968, 47 percent felt government should do more for racial minorities. It fell to 28 percent by 1982. The attitude that government should do more for people on welfare dropped from 32 percent to 28 percent. Even support for helping the poor declined.

3. The American public is submitting questions to the political process that have never been asked before. For example, Proposition 15 in California a few years ago asked the voter whether or not a nuclear plant should be built. We are voting not just for representation, but we are voting on smoking, abortion, prayer in schools, terminals for oil tankers, the color of street lights, and even on international issues relating to the Middle East. It is expected that we will vote on more and more of these issues rather than allow our elected representatives to exercise their judgment.

4. Several regions of the United States are experiencing population growth which will, in time, shift the political power structure of the country. **Other** regions are finding or losing wealth. For example, in a trend reversal, Naisbitt sees 1986 as the beginning of the rise of the waterbelt States. He sees the beginning of a dramatic economic and political renaissance in the Great Lakes, supported by an abundant supply of an invaluable resource: water. Between now and 2000, high growth is likely in pockets that have special resources-such as a **critical** mass of high-technology workers or skilled professionals. Forecasters often disagree as to which areas have the winning characteristics.

5. Minorities are developing into a formidable political force. For example, Hispanics are the fastest growing minority group in the country. What demands will this group make on future candidates who want their votes? In the next decade, women's groups will improve their record of the last 5 years in which their numbers in public office doubled. Overall, a political trend toward the center is emerging around the world.

Candidates will get their strength from special interest groups. Single issue politics will be the rule, rather than the exception, in the future. Special interest groups will pressure candidates to stand with them as never before.

6. There is more and more emphasis on cooperative ventures among public and private sectors. As prices rise, individuals and organizations search out new ways to beat the high cost of buying and owning. People are realizing that sole ownership of everything just isn't possible and necessary. Co-ownership or partnering could become an integral part of our lives with the sharing of everything from vacation homes, to jobs, to recreational equipment, or even clothing. This trend should grow as people understand they can pool their resources and gain strength from each other. This partnering could result in more effective and efficient use of private resources, and ultimately, the need for less public expenditures and lowering tax needs in certain areas.

7. The public is demanding more accountability, management efficiency, and cost effectiveness from the public reserves for recreation and preservation. Creative management principles will become more commonplace as information becomes available and therefore justification for change can be better developed. There will be demands for a different type of employee. Skills in statistical analysis, data sampling, information modeling, storage and retrieval methods will be the new 'tools of the trade.'

Implications: Implications to the recreation field include:

1. Suppliers of recreation may find that children right out of school may have more value to the organization than the employee with 20 years' experience.
2. Recreation agencies will have to become more attuned to the needs and desires of recreationists who provide vital funding.
3. The one common area where the political left and right, special interest groups, and minorities all reach some agreement is on the issue of being against big government and opposed to government regulations. New initiatives, totally different budget packages, and creative financing may be necessary for the acquisition, operation, and management of public recreational opportunities.

Trend 7: Changes in Transportation Systems

Trend: During the next 20 years, the transportation systems in this country will be heavily impacted by the recreational user and will become increasingly crowded. As a result, the quality of the systems will decrease while emphasis on group transportation and public/private partnerships will increase.

Background: According to the U.S. Travel Data Center, 81 percent of vacation travel in the United States is by car, truck, or recreational vehicle. However, over the years, there have been significant changes in how cars are used and operated. For example, the size of the average vehicle has decreased (from an intermediate in 1972 to mid-size in 1976, to a compact in 1983). Also, people are driving less (down 1,500 miles/year from 1972 to 1984) and keeping their cars longer (5.1 year average in 1984 and 3.6 years in 1972). Future trends in transportation include:

1. Radical change over the next 20 years will be unlikely in everyday transportation due to heavy investments required to build new systems. Not until early in the 21st century will major innovations in transportation appear. These may include such things as vehicles that drive themselves and electronic highways that enable high speed travel safely.

2. The private automobile will reign unchallenged as most people's preferred means of getting around. The car population is expected to jump by 25 percent by the year 2000. Cars will acquire more electronic gadgetry making them safer, easier to drive, and more comfortable. Engines will become more economical and less subject to breakdown.

3. Buses will continue to dominate public transportation (except in cities with subways) due to their lower cost and flexibility. Some cities will experiment with light rail transport, a successor to the old-time streetcars.

4. Airplane travel will tend to dominate long distance passenger travel and become relatively cheaper due to larger size of aircraft and other efficiencies.

Implications: The implications of these trends on recreation areas include:

1. More close-to-home recreation use will occur.
2. There will be shifts to alternative modes of transportation because of the difficulty of long-distance travel in small cars.
3. While the fate of the car is important to public use of recreation areas, cars are not the only means of transport to these areas. Passenger trains, ships, luxury buses will fill certain recreation niches. Bus tours to parks are expected to grow as long as the private car is reserved for other uses, e.g., going to work. Other modes of travel are also expected to

gain increased public favor, such as rental cars, trains, and numerous combination arrangements, e.g., train-bus-canoe trips to the Boundary Waters Canoe Area in Minnesota.

4. The substitution of other forms of transportation for the private car could become one of the most significant socioeconomic translations in the recent history of State and Federal recreation areas.

KEY RECREATION ISSUES

In considering these trends and the data that emerge from the surveys, one important factor could be how these might relate to short-run recreation issues. Staff representing the President's Commission on Americans Outdoors travelled to several locations throughout the nation to ascertain important issues that should be considered. At the end of the process, the information was presented to a 'capstone' group for review and discussion. The results of the field planning sessions and the votes assigned from all of the sessions follow.

ISSUE	TOTAL VOTES
1. Protection of resources and open space.	131
2. Conflicting uses of recreation lands and waters.	130
3. Roles of providers.	110
4. Liability.	88
5. Physical access to open space.	83
6. Funding operations, maintenance, capital improvements,	84
7. Alternative funding sources.	69
8. Benefits of recreation.	67
9. Acquisition of open space.	67
10. Land use planning.	54
11. Social access to open space.	52
12. Partnerships.	50
13. Data base needs.	48

The rank order of issues varied widely among the eight sessions, reflecting, among other things, the differences between large urban areas and smaller cities, and the lack or presence of extensive Federally managed lands.

A somewhat different set of rankings came from the Capstone session. The field sessions drew upon individuals within a given State or region, but the Capstone group was drawn from a national base, thus providing a different perspective.

The Capstone group was asked to 1) review the top ranked issues from the field sessions, 2) add any elements they thought were lacking, and 3) rank the new list in order of importance. The rankings, comparative rankings from the field sessions (in parentheses), and number of votes for each issue from the Capstone panel follow.

ISSUE	VOTES
1. Protection of resources and open space. (1)	19
2. Conflicting uses of recreation lands, waters. (2)	16
3. Funding operations, maintenance, capital improvements. (6)	15
4. Access (physical and social). (new)	14
6. Benefits of recreation. (8)	13
7. Acquisition of open space. (9)	13
8. Liability. (4)	12
9. Alternative funding sources. (7)	12
10. Public education. (new)	12
11. Partnerships. (12)	10
12. Physical access to open space. (5)	7
13. Land use planning. (10)	7
14. Social access to open space. (11)	6
15. Urban-rural imbalance. (new)	6
16. Understanding user needs. (new)	6
17. Data base needs. (13)	5
18. Unstructured recreation. (new)	3

Some principal differences in the rankings of the Capstone panel in comparison with the aggregate rankings from the field panels were an increased importance placed upon the need for funding and a lessened sense of concern with liability problems.

The discussion and analysis of access as a single issue also differed considerably from the way in which earlier panels had clearly separated physical barriers to access from sociological and economic constraints.

If votes for all three of the versions of access listed in the Capstone session (physical, social, and combined) were added, access would have ranked as the top issue. Moreover, if this combined approach were taken with all of the votes cast throughout the process, access would be the top ranking issue nationwide with 164 votes, edging out protection of resources and open space with 150 votes.

There is no explicit statement about technological change and the effects this might have on demands for recreation. This might be subsumed under the heading of conflicts or possibly under the heading of understanding user needs. Similarly, the demographic changes identified must also be broadly assumed to fit under the user needs or rural-urban imbalance category. A detailed examination of these relationships for the future might include the study of a matrix of issues and trends and an in-depth discussion of each cell.

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INTERNATIONAL TOURISM ON PUBLIC LANDS IN THE UNITED STATES

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Abstract—Public lands in the United States are major tourist attractions. Wilderness areas and natural beauty constitute an important part of the tourist industry. However, when considering recreation on public lands, the importance of international visitors has generally been overlooked. It must be recognized that public lands in the United States are a significant generator of international tourism. This paper is intended to present a profile of foreign visitors to public lands in the United States using the Public Area Recreation Visitor Survey (PANS). The paper then discusses some critical issues determining visitation level to public lands and offers broadly defined long-term goals for increasing and encouraging international tourism on public lands in the United States.

Although the amount of Americans' foreign travel still outnumbers international visitors to the United States, in the past few years the gap has narrowed significantly.

The United States is able to accommodate many more tourists than it currently attracts owing to the vast size of the country. The balance of in-tourist flow and out-tourist flow has economic implications. The United States ranks first among all other countries in international travel receipts and second in international travel expenditures (World Tourism Overview 1984). However, the United States still runs a deficit on international tourism services, although the deficit has been decreasing since 1972.

Travel exports are thought to account for approximately 5 percent of total U.S. tourism industry earnings (Liile 1980). Travel exports are also responsible for creating jobs. It is not possible to separate the jobs generated by foreign visits from those generated by domestic tourism, but it is estimated that over 5 percent of direct tourism jobs are solely attributed to international visitors, and tourism ranks among the top 3 employers in 40 States.

The expected decline of the U.S. dollar is likely to encourage more visitors to the United States. It has been found that exchange rates may have a significant effect on the extent of international travel (Gray 1966). The price of foreign currency is likely to influence visitors. Thus, if the price of foreign currency declines, visitors are likely to demand more services, other things being equal. For example, if the price of a vacation in the United States remained constant in the past two years in terms of U.S. dollars, but the price of the U.S. dollar declines significantly relative to the German mark in the second year, it would be expected that Germans would purchase more tourism/travel services from the United States in the second year.

INTRODUCTION

The United States was not considered a tourist destination until the early 1960's, but rather a source of tourists to other countries. From 1965 to 1975, tourist flow into the United States increased rapidly from 7.8 million visits to 15.7 million, a 7.2 percent annual growth rate. It then increased to 19.8 million visits in 1978, an 8.0 percent annual growth rate (International Tourism Quarterly 1980). The growth in international tourism from **overseas** visitors is even more dramatic. Between 1960 and 1981, **overseas** visitors to the United States increased 1,200 percent, from 0.602 million to 8.069 million (Stronge 1983).

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International travel has become a major export industry in the U.S. balance of payments. International tourism services are the third largest export industry in the United States (Liile 1980). In 1986, Americans and international visitors spent more than \$270 billion on trips, of 100 miles or more from home, in the United States. Total international visitors to the United States were estimated to reach the 23.1 million mark, with total earnings of \$16.9 billion in 1987 (Wynegar 1986). Tourism is bound to grow as an industry not only in the United States but throughout the world.

INTERNATIONAL TOURISM AND PUBLIC LANDS

Public lands in the United States are major tourist attractions. Watterson (1963) points out that wilderness areas and natural beauty constitute an important part of the tourist industry. A fundamental characteristic of tourism is that it involves people seeking a new experience to get away from the daily routine. This implies a 'unique' environment, often a natural area under government protection and management (Knopp 1980).

When considering recreation on public lands, the importance of international visitors has generally been overlooked. It must be recognized that public lands in the United States are a significant generator of international tourism. Although it is difficult to quantify the amount of tourism volume accounted for by visits to public lands, it is known to be substantial (Manning 1980). For example, in 1978 it was estimated that nearly 10 percent of the visitors to Yellowstone National Park were foreign travelers (Little 1980). The Outdoor Recreation Resources Review Commission (1963) indicated that one of the most important reasons for international travel to the United States is national park visitation. Many of our national parks are primary destinations for international visitors (Manning 1980).

Tourism on public lands has economic implications. International tourism on public lands results in a transfer of wealth when money earned in one country is spent in another. This also affects international trade and the balance of payments in individual countries (Manning 1980).

Few studies have focused on international visitors to public lands. For example, in June 1986, a **5-year** agreement was signed between Canada and the United States that allowed Tourism Canada and the U.S. Travel and Tourism Administration to undertake jointly funded travel market research in overseas

countries. The **survey** instrument included questions regarding national parks and wilderness areas in North America. [For a preliminary analysis of the study, please see Smith 1988; O'Leary and Uysal 1988.1

This paper is intended to present a profile of foreign visitors to public lands in the United States using the Public Area Recreation Visitor Survey (PARVS). The paper then discusses some critical issues determining visitation level to public lands and offers broadly defined long-term goals for increasing and encouraging international tourism on public lands in the United States.

METHODS

Data were collected via the Public Area Recreation Visitor Survey (PARVS) conducted in 1985-86. The survey involved on-site interviews with visitors completing visits to Federal and State areas. The analysis presented below considers foreign visitors as those indicating that they were not from the United States.

Some cautions are needed in interpretation of these data, as PARVS was not designed specifically for this purpose. First, PARVS was conducted only on a representative national sample of lands administered by 4 Federal agencies and a representative sample of State recreation areas in 11 States. No local or regional public recreation areas were included in the sample. Other than New Mexico, no western State park lands were included in the survey. Second, for logistic reasons, no attempt was made to interview visitors on bus tours. These tours could have been an important component of foreign visitation to these areas. Third, if the PARVS interviewer could not speak the language of a **nonEnglish** speaking foreign visitor, no interview was conducted. Except for a few cases, respondents could speak English. Finally, although the PARVS data set is quite large with over 36,000 visitor contacts, only 352 foreign visitors were interviewed.

Due to the relatively small sample size and the aggregate representation of international visitor data generated from PARVS, no attempt was made to use statistical tests. These existing limitations necessitated the use of descriptive analysis, and only the most broad generalizations were made from the findings.

RESULTS

Origin of foreign visitors

Table 1 describes the distribution of international visitors to U.S. public recreation areas. Not surprisingly, the largest population originates in Canada (43.8 percent). This is a reflection of the fact that Canada is adjacent to the United States. Also, it is likely that many Canadians drive their own cars rather than take a tour bus. The small percentage of visitors from Japan is surprising. Many Japanese visitors may have been omitted from the sample because of their tendency to take bus tours in the United States.

A comparison of the **PARVS** data with data from the U.S. Travel and Tourism Administration's 'In-flight Survey' (IFS) provides insights into the **representativeness** of the sample (table 1). The IFS looked at visitors to National Parks only, while **PARVS** included many other agencies, but the IFS still may provide insights. The IFS did not include visitors from Canada and Mexico, so the percentage of foreign visitors from **PARVS** is also presented excluding Canadian and Mexican visitors. Table 1 presents a comparison of the two data sources, which differ considerably. This may indicate that **PARVS** overrepresents visitors from western Europe and underrepresents most other countries, particularly Japan. Alternatively, it may indicate that western European visitors are more likely to visit public recreation areas other than National Parks than are other foreign visitors.

Figures 1 and 2 indicate the regions of the U.S. foreign visitors from various countries visited. In general, a higher percentage of international tourists from most countries visited the Rocky Mountain/Great Plains region than any other region of the United States. There are two exceptions to this trend. Visitors from the U.K. are relatively evenly distributed throughout the United States. Also, a higher percentage of visitors from Australia visited the Southeastern United States than any other region.

Visitor Profile

Table 2 provides information regarding the sociodemographic characteristics of international visitors to public lands in the United States.

Group **types-Foreign** visitor social group type patterns are similar to those of U.S. visitors. The most common type of group was families (70.9 percent). This was followed by friends traveling together (18.1 percent), solo recreationists (8.0 percent), and organized groups (2.2 percent). Group types of international visitors do not differ considerably from group types of U.S. visitors. Some differences are found in the percent of visitors traveling with family (61.3 percent for U.S.) and solo recreationists (10.7 percent for U.S.). Also, no foreign visitors reported a group type of family and friends.

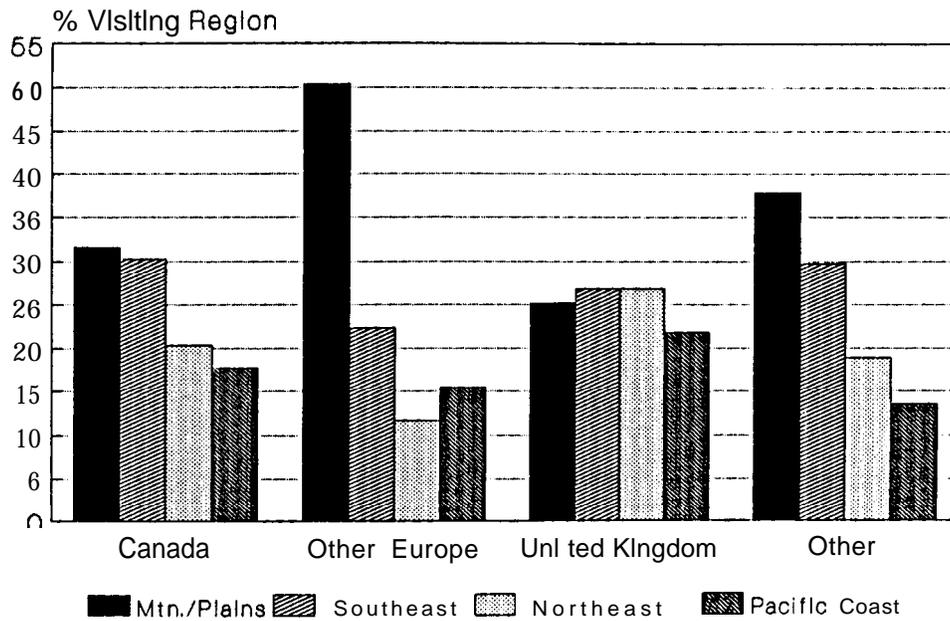
Income.--Over 70 percent of the international visitors had incomes of over \$20,000. This is similar to income patterns among U.S. visitors. It has been

Table 1.--Distribution of origins of foreign visitors

Country of origin	PARVS	PARVS	IFS	PARVS ¹
	(Sample size)			
		-- -- -- Percent -- -- --		
Canada	154	43.8	--	--
United Kingdom	57	16.2	14.6	29.8
Other Europe	103	29.3	34.0	53.9
Australia and Oceania	13	3.7	6.6	1.8
Mexico	7	2.0	--	--
Japan	2			1.0
Other Far East	6	0.6	19.7	3.1
Central and South America	5	1.4	2.5	2.6
Middle East	1	0.3	2.5	0.5
Africa		0.3	2.6	0.5
Other	4	0.9	3.4	1.6

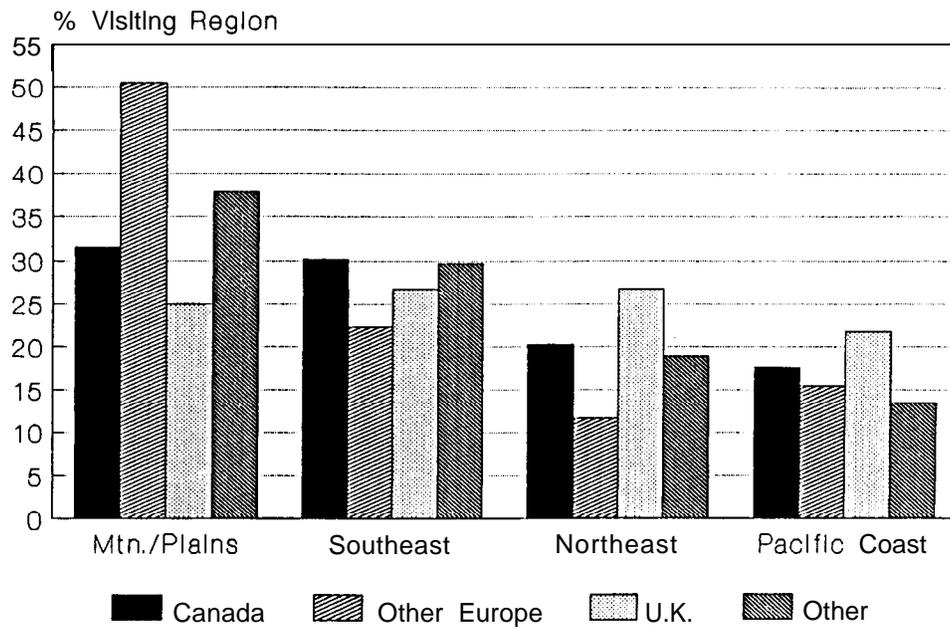
¹ PARVS data without Canada and Mexico.

Note: IFS refers to In-flight Survey conducted by CIC Research, Inc. for USTTA, U.S. Department of Commerce, Survey Report, October-December 1985.



SOURCE: Full PARVS data set, 1985-1986

Figure 1. -Origin of foreign visitors by RPA region visited.



SOURCE: Full PARVS data set, 1985-1986

Figure 2. -Region visited by foreign visitors by visitor origin.

Table 2.--Visitor profile on international tourism on public lands in the U.S. PARVS

Visitor profile	Foreign			Visitor profile	Foreign		
	sample size	Foreign	U.S. ¹		sample size	Foreign	U.S.
		<u>Percent</u>				<u>Percent</u>	
Social group types:				Employment status:			
Family	220	70.9	61.3	Employed full time	158	52.3	43.4
Group of friends	58	1a.1	1a.0	Student	36	11.9	13.8
Single individual	25	a.0	10.7	Self-employed	29	9.6	6.7
Family, and friends	--	--	a.0	Retired	28	9.3	10.6
Organized group	7	2.2	1.9	Homemaker	23	7.6	9.0
				Other ³	28	9.3	1.0
Gender:				Income			
Male	191	64.1	48.8	Less than \$5,000	14	5.1	4.4
Female	107	35.9	51.2	\$5,000	14	5.1	5.4
Education:				\$10,000 - \$15,000	18	6.5	9.2
17 years or more	92	31.3	11.5	\$15,000 - \$20,000	32	11.6	10.1
16 years (college)	a9	30.2	17.4	\$20,000 - \$25,000	28	10.1	12.4
13 to 15 years	48	16.3	23.2	\$25,000 - \$30,000	28	10.1	11.5
12th grade	42	14.2	29.7	\$30,000 - \$35,000	27	9.8	11.5
9th to 11th grade	14	4.7	13.9	\$35,000 - \$50,000	67	24.2	21.1
8th grade or less	10	3.4	4.4	\$50,000 or more	48	17.4	14.4
Age:				Usual occupation:			
Less than 25 yrs old	60	20.3	28.1	Professional, technical			
25 to 39 years old	110	37.3	44.2	or kindred workers	132	46.2	30.3
40 to 59 years old	92	31.2	19.3	Student	31	10.8	13.5
60 + years	27	9.2	a.5	Manager or			
Race:				administrator	25	a.7	9.4
White	274	90.4	87.9	Craft and kindred	21	7.3	5.8
Hispanic origin	10	3.3	3.9	Homemaker	21	7.3	9.8
Other ²	25	6.3	a.2	Armed forces	10	3.5	1.4
				Service workers	4	3.1	4.0
				Other ⁴	37	12.6	21.4

¹ Percentage of U.S. respondents to PARVS.

² Other includes Asian or Pacific Islanders, American Indian or Alaskan Native and Black, not Hispanic origin categories.

³ Other includes "not employed" and "employed part-time" categories.

⁴ Other includes clerical, sales, unemployed, laborer, except farm, operative and kindred workers, and transport workers.

demonstrated in previous studies that visitors to public lands tend to be in higher socioeconomic status categories, and this is the case for both international and U.S. visitors in the PARVS study.

Occupation and employment status-The majority of international visitors to the U.S. public lands are professional, technical, or kindred workers (46.2 percent). Many are also students (10.8 percent). Very few of the visitors are farmers (1.0 percent), operatives (1.0 percent), or transport equipment operatives (0.7 percent). A smaller percentage of U.S. visitors are professional, technical, or kindred workers (30.3 percent) or military personnel (1.4 percent). More U.S. visitors fall into the other category (21.4 percent). Differences among other categories are relatively small.

More than half of the foreign respondents (52.3 percent) to the questionnaire were employed full time, although very few were part-time employees. A fairly large number again reported being students (11.9 percent). The only major difference between U.S. visitors and international visitors is the percent employed full-time with fewer U.S. visitors falling into this category (43.3 percent). More U.S. visitors fall into the other category (12.6 percent).

Education-In general, as educational level of foreign visitors to the United States decreased, the frequency of visits decreased. Over 60 percent of the visitors were college graduates or above. Very few people without a high school diploma or their country's equivalent visited U.S. public lands. There are substantial differences in education levels between foreign and U.S. visitors. High school graduates constitute the highest percentage of U.S. visitors to public lands (29.7 percent).

Race – By far the majority of international visitors to U.S. public lands were white. Other races are very much underrepresented, particularly blacks who were not represented in the sample of foreign visitors. The race distribution of U.S. workers was very similar to international visitors.

Gender and age- Over 60 percent of the international visitors were male. Interviewed visitors' ages ranged from 12 to 81 years old. The age group of 25 to 39 had the highest frequency of visitors (37.3 percent), and nearly three quarters of all international visitors to U.S. public lands were between 25 and 59 years old. U.S. visitors were fairly evenly distributed between male and female with 48.8 percent and 51.2 percent, respectively. They also tended to be younger with a higher percentage less than 40 years old (72.3 percent).

Trip Profile of international Visitors

Recreational activities of international visitors – Respondents to the PARVS questionnaire were asked to choose their reasons for visiting the site where they were interviewed from a list provided. Foreign respondents top five reported reasons for visiting public recreation areas were: repeat visit (34.4 percent), scenic beauty (25.3 percent), to see an object or attraction (19.9 percent), other areas too crowded (19.3 percent), and convenient location (16.2 percent). Very few visitors were at a site to try a new area (3.7 percent) (Table 3). U.S. visitors' main reasons for visiting a recreation area differed considerably from foreign visitors reasons. The highest were: repeat visit (65.5 percent), convenient location (65.8 percent), other areas crowded (57.9 percent), and good facilities (49.2 percent). (Table 3)

Numerous activities were reported as being the main recreational activity influencing the visit to a site. The most common main activity reported by international visitors was sightseeing (35.1 percent). Many, however, reported that they had no main activity (29.5 percent). Visitors were also asked which activities they participated in. Over 70 percent of the respondents indicated that they participated in sightseeing, the most popular activity of foreign visitors. U.S. visitors differed from foreign visitors on both of these variables. (Table 3)

STUDY CONCLUSIONS

Although the data presented in this paper are limited in scope, and conclusions that can be made at this time are only of the most general nature, some potentially valuable interpretations of the results are still possible. Because of the nature of the study, visitors from western Europe may be overrepresented and visitors from other countries underrepresented. It appears that most visitors are from Canada and western Europe. Many Japanese visitors likely visit public lands as well, although they appear to be underrepresented in the PARVS data. The findings on international visitation to U.S. public lands may be helpful to park managers attempting to determine the backgrounds of visitors seeking recreation experiences on public lands.

The socioeconomic characteristics of international visitors tend to resemble characteristics of U.S. visitors. They tend to be white, well educated and of high socioeconomic status. Most visitors are traveling with family and visiting U.S. public lands for sightseeing.

Table 3.--Trip profile of international tourism on public lands in the U.S. PARVS

Trip profile	Foreign sample size	Foreign	U.S. ¹
		- - - <u>Percent</u> - - -	
Reasons for visiting an area:			
Repeat visit	103	34.4	65.6
Scenic beauty	75	25.3	24.4
To see object or attraction	59	19.9	19.8
Other areas too crowded	58	19.3	57.9
Convenient location	48	16.2	65.8
Good facilities	27	9.1	49.2
Group ² trip	18	6.0	18.1
Other ²	26	8.8	27.7
Main activities of visitors:			
Sightseeing	100	35.1	17.6
No main activity	84	29.5	16.9
Developed camping	27	9.5	11.8
Walking	14	4.9	2.3
Canoeing	10	3.5	2.0
Outdoor swimming	10	3.5	6.3
Primitive camping	6	2.1	2.2
Pleasure driving	5	1.8	1.2
Nature study/photography	5	1.8	3.5
Other ³	19	10.4	3.5
Level of sight participation: ⁴			
Sightseeing	247	70.2	43.5
Walking for pleasure	171	48.6	30.8
Pleasure driving	139	39.5	26.7
Picnicking	102	29.0	28.0
Developed camping	101	28.7	14.2
Day hiking	65	18.5	17.6
Nature study/photography	62	17.6	20.1
Primitive camping	34	9.7	
Backpacking	18	5.1	
Canoeing	14	3.9	--
Outdoor swimming	10	2.8	23.7
Other ⁵	48	12.9	--

¹ Represents percentage of U.S. respondents to PARVS.

² Other includes "personal reasons" and "to try new area" categories.

³ Other includes hunting, day hiking, picnicking, backpacking, sailing, motorboating, fishing, and horseback riding.

⁴ Percentages do not sum to 100 due to multiple responses.

⁵ Other includes sailing, motorboating, water skiing, horseback riding, off-road driving, and cold water fishing.

Although insufficient sample size prohibited analysis of the economic information available in PARVS, it is logical to assume that these visitors could provide a positive influence to local economies and have little detrimental environmental effect.

From a marketing point of view, an effective response would require better knowledge of the visitor and his/her travel behavior and characteristics. Knowing the characteristics of the existing international tourism market for public lands is important. Emphasis can focus on identifiable specific target markets. For recreational activities of international visitors, the general findings of PARVS suggest that the most popular activities are sightseeing, scenic beauty, and attractions. Such findings may be useful in developing specific vacation packages, advertisements, and travel brochures that emphasize scenic beauty and sightseeing on public lands in the United States.

DISCUSSION

In the broadest terms, tourism may include day visitors as well as visitors staying at destinations. It may include leisure and recreation travel, business travel, and holiday travel. Working with this broad definition of tourism, it is important to realize that tourism, focusing on activities at destinations, whether it be on public or private lands, is a very complex phenomenon. Existing and established policies for influencing visitors and their use patterns affect the activities that take place on public lands. On the market side, producers of transport, accommodation, catering and entertainment services are involved with travel marketing intermediaries such as tour operators and travel agents. On the supply side, activities at destinations are the concern of local and State authorities, the providers of infrastructure, and of supporting services such as water, electricity, campgrounds, etc. The quality and availability of resources are a critical element in the activities which take place. The actual tourism-related activities which take place on public lands seem to be the resolution of a network of forces, each one of which exerts some influence over supply and demand. The range of such forces is very wide indeed.

Although there has been substantial effort and cooperation between the National Park Service and the tourism industry at the national and local level (see for example: June 1987, issue of 'Courier' by NPS) as a part of public lands in the United States, little has been done to carefully assess the extent and nature of international tourism on public lands in general. Due to the lack of documented international tourism data on public lands, the necessary measures

to understand and influence use patterns of international tourism has not been well established in the United States.

Baker (1987) points out that as tourist interest and demand in publicly managed lands increase, the need of land-managing agencies to understand the extent and nature of use patterns becomes more acute. There is enough evidence to suggest that demand for outdoor recreation, as part of the inbound tourism/travel industry on publicly owned areas, is likely to increase in the coming years. The U.S. Travel and Tourism Administration projected a 12 percent growth of inbound travel in 1987 and a 2 percent rise in 1988. Tourism is bound to grow as an industry not only in the United States but throughout the world.

There appear to be at least three important interpretations stemming from the expected expansion of international tourism. First, in the next decade or so, real income per person throughout the world is likely to be much higher than it is today (Edgel 1985). As a result, a large amount of discretionary income will be available for activities such as pleasure travel. Second, as it grows in size, tourism is likely to become more sensitive to the policies of governments. Ingredients such as control of visas, passports, and foreign exchange have the ability to inhibit tourism. Alternatively, elimination of these ingredients will facilitate the flow of international tourism. Third, the economic impact of tourism is likely to be greater than it is today. International tourism is likely to become a more important part of the world economy resulting in: (1) a larger proportion of jobs, and (2) a greater impact on balance of payments.

The ability to capture a substantial proportion of the expected expansion in tourism and increase the level of international visitors to public lands will depend upon the recognition and establishment of several long-term goals.

1. Benefits sought by international visitors should be identified and evaluated in a systematic way. The key to retaining and increasing visitation is to ensure that the last visit has been satisfactory. Thus, international tourism development on public lands must strive to provide the highest level of visitor experience and satisfaction on the demand side.

2. International tourism on public lands must be based on the protection and wise use of an area's basic natural and cultural resources. Tourism should encourage the preservation of unique natural and historical environments; over-use and abuse of these resources can destroy the very foundation of tourism.

3. There is clear evidence that tourists can be influenced by information, The availability of recreation facilities and activities on public lands must be promoted through special events, interpretive programs, maps and special clubs in order to increase and influence the level of international visitation, By the same token, international tour operators should be provided with interpretive information and brochures about public recreation areas in the United States.

4. Cooperation between publicly-managed lands and the tourism industry at all levels should be expanded and encouraged.

At this time, insufficient information is available to make specific recommendations concerning improved management, legislation or policy, other than to recommend, encourage, and facilitate use of public recreation areas by foreign visitors. However, this is an area ripe with research opportunities (and obstacles). Even with over 36,000 contacts with visitors nationwide in the Public Area Recreation Visitor Survey, approximately 1 percent of the completed interviews were with foreign visitors. Clearly, this indicates that a different method of contacting foreign visitors is needed if further conclusions are to be made. If additional investigations in this area are to be made, the authors recommend development of methods which would contact bus or other tours, and that steps be taken to overcome any language difficulties. The portion of the PARVS instrument which is conducted as a mailed questionnaire proved unworkable for foreign visitors, although considerable effort was made to solicit responses from these individuals.

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Section 6.

Wilderness Resources and Their Recreational Uses



DEFINING WILDERNESS AS A RESOURCE: A FOUNDATION IN THE WILDERNESS ACTS AND OTHER LEGISLATION

Paul D. Weingart¹

Abstract – Through examination of wilderness legislation over the last 27 years, it is apparent that wilderness should be considered a resource and should be treated as such in management of the National Forests. There have been differences of opinion on the wilderness resource issue by agency managers, members of interest groups, and members of the general public. Recommended approaches for resolving this issue include education and training for both managers and the public.

INTRODUCTION

Since passage of the Wilderness Act on September 3, 1964, there have been various interpretations of wilderness by managers, members of interest groups, and members of the general public. These interpretations have ranged from wilderness as an activity, a place, and an experience, to wilderness as a resource.

Some felt that since wilderness was not included on the Forest Service multiple use shield along with the resources of Timber, Range, Wildlife, Water, and Recreation it was not part of multiple use and was not a resource. Some also felt that wilderness had no economic value and therefore could not be considered along with the other resources that were considered of economic value.

It is important to proper allocation and management of wilderness and other resources that wilderness be recognized as having equal value with the other resources, so in future allocations and management decisions wilderness can be viewed with equal stature and objectivity. Otherwise, wilderness will be

treated as a stepchild and not be given its rightful place as an equal in the spectrum of resources that make up our public lands.

This paper reviews and analyzes laws, definitions and interpretations to make the case that wilderness is indeed a resource and should be recognized as such.

DEFINING WILDERNESS AS A RESOURCE

A starting point for defining the wilderness resource is arriving at an acceptable definition of the term resource. In Websters' dictionary, several definitions are listed.

1. Something, that can be turned to for support or help.
2. An available supply that can be drawn upon when needed.
3. Available capital, assets.
4. The collective wealth of a country, or its means of producing wealth.
5. Money, or **any property** which can be converted into money: **assets**. (emphasis added)

In the past I feel we have interpreted 'resource' from its monetary orientation and quite often we still do. I think it is more important to think in terms of economic value rather than monetary or financial value. As some researchers have pointed out, all scarce resources that provide benefits to mankind have an economic value to society, while those economic resources that happen to be traded in the workplace also have a financial value to their owners. I would propose that wilderness **has economic value** and definitely is **an asset** as 'resource' is defined in the dictionary.

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Congress has given us firm direction and that direction tells us wilderness **is** a Resource! Following is a look at some of the legislation and the connection that can be made between 'Wilderness' and 'Resource':

In **Agriculture Handbook #453, The Principal Laws Relating to Forest Service Activities**, under the major heading of 'Occupancy and Use', there are subheadings of **General, Timber, Grazing, Water Resources, Wildlife, and Occupancy Permits**. Under the major heading of 'Renewable Resources' are subheadings of **Water, Fish & Wildlife Conservation, and Wilderness and Recreation**. The editors apparently thought of Wilderness as a resource.

In the **Multiple Use Sustained Yield Act of June 12, 1960**, it states 'In the administration of the National Forests due consideration shall be given to the relative values of the various resources in particular areas. The establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of this Act (16 U.S.C. 529).' This, of course, was prior to the Wilderness Act of 1984.

One of the issues that has cast aspersions on the credibility of wilderness as a resource is 'it is not multiple use'. But, the next paragraph in the **Multiple Use Sustained Yield Act** says (a.) Multiple Use means the management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people: making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions: **that some land will be used for less than all of the resources** and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, **and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.**' Wilderness fits well into that definition. Within the Wilderness Resource itself, quality water is provided as well as wildlife.

In the **Wilderness Act of September 3, 1964**, it states in Section 2 under 'Purpose', 'it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of **an enduring resource** of wilderness.'

In the **Code of Federal Regulations** pertaining to the wilderness Act, 36 CFR Ch. 11 under 293.2 'Objectives', it states "National Forest Wilderness resources shall be managed to promote, perpetuate, and, where necessary, restore the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration, and primitive recreation.' In 293.15 of the CFR 'Gathering Other Than Minerals', it states 'such permits may provide for the protection of **National Forest resources, including wilderness values.**'

Within the Act of January 3, 1975, which added considerable wilderness acreage in the East, there is another reference to Wilderness as a resource. In Section 2 (b), it states "... in order to preserve such areas as **an enduring resource of wilderness which** shall be managed to promote and perpetuate the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration, and primitive recreation. . ." etc.

In the **National Forest Management Act of 1976**, there is reference to wilderness as a resource. In Section 6 (e) (1) under "National Forest System Resource Planning", it states "... provide for multiple use and sustained yield of the products and services obtained therefrom in accordance with the Multiple Use Sustained Yield Act of 1960, and in particular, include coordination of outdoor recreation, range, timber, watershed, wildlife and fish and **wilderness.**' Under (A) in the same act it says 'insure consideration of the economic and environmental aspects of various systems of renewable resource management, including the related systems of silviculture and protection of **forest resources**, to provide for outdoor recreation (including wilderness), range, timber, watershed, wildlife & fish." In the **Alaska National Interest Lands Conservation Act December 2, 1980**, all references were back to the Wilderness Act (78 Stat. 892).

In October 1983, the First National Wilderness Management Workshop was conducted at the University of Idaho. There were almost 400 participants representing managers, educators, organizational leaders, legislators and many others who had a strong interest or stake in Wilderness. The focus was on Wilderness Management or "taking care of what we have." The workshops relevance to the issue of Wilderness as a resource is great. Craig Rupp, at the time Regional Forester of the Rocky Mountain Region, presented a paper on **Wilderness As a Special Resource**. Someone asked if the Forest Service had enough individuals who have been properly trained to manage wilderness as a national

resource. Chief Max Peterson replied in part by saying the agency will continue to strive to upgrade the wilderness resource in balance with all our resource management tasks.

The major product of the workshop was the development of a **5-year** action program put together by a steering committee of 11 people representing agency managers, academia, and wilderness advocate and conservation organizations. Out of 23 recommended actions, the steering committee chose 5 as the most important. Of these five, four specifically spoke of the wilderness resource in such statements as: 'respect for the resource', "be sure wilderness education material defines the wilderness resource and its values', 'focusing on the value of the wilderness resource', 'establish a basic course on wilderness as a resource', 'approaches to resource rehabilitation' and the 'perpetuation of the wilderness resource.'

Obviously, the concept of wilderness as a resource has a good track record if past direction is evaluated.

CONCLUSIONS

Dick Costley was Director of Recreation for the Forest Service when the Wilderness Act was passed, and he had the responsibility for seeing that the legislation was converted to Forest Service direction. He put together a task force of detailers who worked hard at that job. Bill **Worf**, one of those detailers, pointed out to Dick, that in part of the Act that spoke to **an enduring resource** of wilderness, it was clear that Congress had identified Wilderness as a distinct and unique **resource** of land. Dick agreed. Those students of the Act understood what congress was saying.

Why is it then that we still have some resistance in acceptance of Wilderness as a resource, both within managing agencies and with some of the special interest groups? I think that part of it is professional pride being tweaked at having Congress tell us how to manage **our** land. I know that is the case with some National Park personnel as well as Forest Service and other agency managers. Many managers feel manipulation for the best good, be it trees, grass, minerals, recreationists, etc., is our responsibility as professional managers. Many of us are uncomfortable with the sociopolitical aspects of

our management job. Amenity resources are harder to deal with! One of our past Chiefs of the Forest Service said, in reflecting on the Wilderness Act, "somewhere along the line the Wilderness folks began pushing to have it recognized that Wilderness is not a use but a resource.' He felt it was inconsistent to advocate this.

Many of the interest groups want maximum access and flexibility in their use of public lands. They feel that wilderness constrains some of those uses.

Resisting the recognition of Wilderness as a resource and a valuable multiple use stands in the way of effective communication and getting on with business. An objective determination of what resources are going to be managed and recognition of the tradeoffs must be made. Meaningful public involvement must be an automatic and instinctive way of doing business. Concentration on a positive program to provide opportunities and outputs people want and need must be pursued. Of course, these need to be within the capability of the land.

Managers and leaders in wilderness management need to take a proactive approach in the recognition of wilderness as a resource. It needs to receive strong direction from Agency top line managers and strong on-the-ground commitment. There will be more credibility with people outside the agencies when management are encouraged to accept wilderness as a resource, along with the other resources agencies responsible for managing.

One of the best tools for focusing on this job is the publication **Wilderness Management -A Five-Year Action Program**, referred to earlier. It focuses on the recommendations previously made and states the support of the four agencies having wilderness management responsibilities, as well as the support of organizations dedicated to wilderness management.

It is time to put in the past terminology and opinions that tend to divide and cause dissension. It is time to get on with the job ahead. That job is to positively and professionally manage the resources entrusted to management agencies by the people of the United States. One of those resources is Wilderness!

103 WILDERNESS LAWS: MILESTONES AND MANAGEMENT DIRECTION IN WILDERNESS LEGISLATION 1964-87

James A. Browning, John C. Hendee, and Joe Roggenbuck¹

Abstract—from 1964 through 1987, 103 wilderness laws were passed, and the National Wilderness Preservation System grew from 54 wildernesses and 9.7 million acres to about 89 million acres in 44 states. Congress has been conservative in altering the management direction set forth in the Wilderness Act of 1964. With some exceptions (and special management guidelines in certain wilderness laws), Congress has usually affirmed the management direction of the Wilderness Act of 1964, but has added some interpretation, clarification, and additional direction. More wilderness legislation is anticipated to establish new wilderness: 1) in Alaska—in national parks, national wildlife refuges, and in national forests; 2) in the 48 contiguous States—in national parks, on remaining national forest roadless areas, and on wilderness study areas on public lands managed by the Bureau of Land Management. Up to 30 million acres of additions to the wilderness system are anticipated, with possibilities existing for classification of up to twice that acreage. Wilderness allocations will continue to be a major influence on /and use for many years.

outlined procedures for adding areas to the wilderness system. During the 24 years from 1964 through 1987, 102 additional wilderness laws were passed by Congress and approved by the President. Through this legislation, Congress has classified nearly 89 million acres of wilderness. The wilderness classification legislation has generally reaffirmed the management guidelines in the Wilderness Act of 1964, but has included some interpretation, clarification, and additional direction.

WILDERNESS LEGISLATION TODAY: TRENDS AND TOTALS

Wilderness legislation includes 103 laws from 1964 through 1987. Some laws serve multiple purposes by classifying new wildernesses, adding to and/or deleting from lands in existing wildernesses, providing for wilderness study, or adjusting wilderness boundaries within the same law. Seventy-one laws classify new wildernesses and 29 laws add lands to existing wildernesses, with 22 classification laws also providing for wilderness study. Nineteen laws provide only for wilderness study, five make minor deletions in existing wildernesses, and two laws only change the names of wildernesses. Through this legislation, the National Wilderness Preservation System has grown from the 54 areas and 9.1 million acres established by the Wilderness Act, to 467 wildernesses totaling approximately 89 million acres in 44 states (fig. 1).

Among the 103 wilderness laws, 36 designate a single new wilderness, while 35 are omnibus laws—legislation that establishes more than one new wilderness. Fifty-seven laws supplement wilderness management direction beyond the guidelines and provisions in the Wilderness Act. Twenty-eight laws are State Acts, so-called because they focus primarily on one State and contain RARE II sufficiency/release language for the national forest lands within that State.

INTRODUCTION

The first wilderness bill was introduced in Congress by Senator Hubert H. Humphrey in 1956. Sixty-four additional wilderness bills were subsequently introduced and considered by Congress prior to the passage of the Wilderness Act, which was signed into law by President Lyndon B. Johnson in 1964. The Wilderness Act established the National Wilderness Preservation System (NWPS), defined wilderness and its basic management direction, and

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Growth of National Wilderness Preservation System 1964-1987

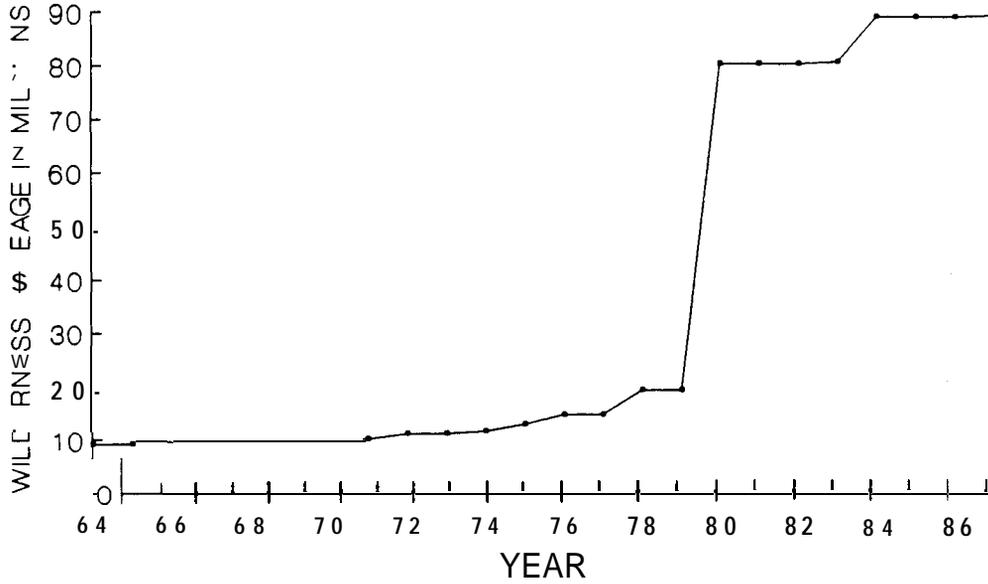


Figure 1. —Wilderness acreage per year.

Forty-two laws designate wilderness in the West (west of the 100th meridian), while 35 laws designate wilderness in the East. Only four laws designate wilderness in Alaska, but they classify more wilderness acreage than exists in the remaining 49 states combined.

The 88th Congress (1963-1964) passed only one wilderness law, the Wilderness Act. The 89th Congress (1965-1966) passed no wilderness legislation, but all subsequent Congresses passed at least five laws to establish wildernesses or to provide for wilderness

study (fig. 2). The 92nd Congress (1971-1972) passed 17 wilderness laws, with several of these laws providing only for wilderness study in new additions to the national park system. The 98th Congress (1983-1984) was the most active, passing 23 laws and establishing 179 wildernesses (fig. 3), with 18 of the laws being State Acts containing new RARE II sufficiency/release language on which Congress had reached agreement (Gorte 1987). The First Session of the 100th Congress passed two wilderness classification laws in 1987 and, at the time of this publication, the Second Session is considering several additional bills for 1988.

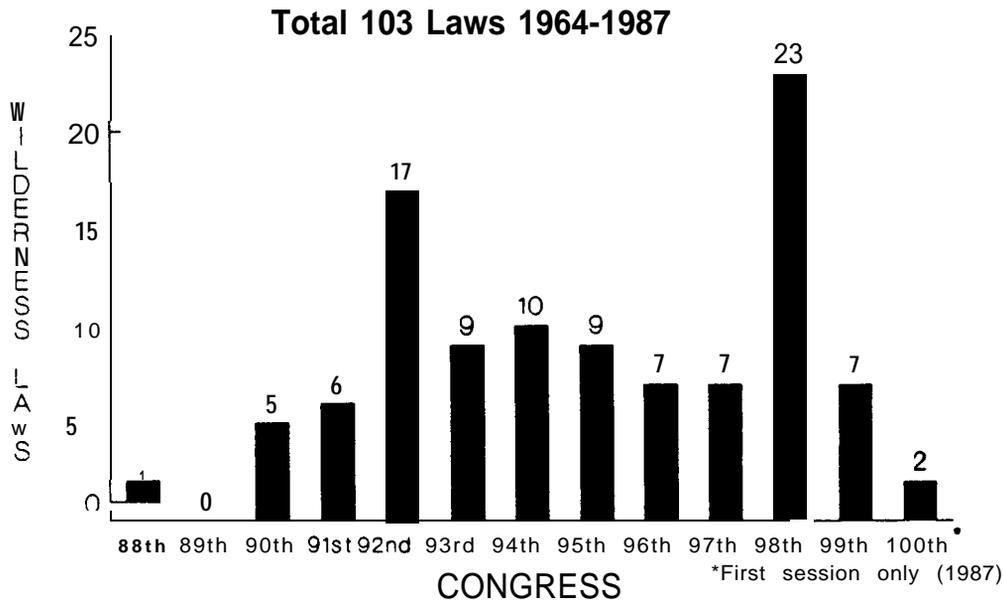


Figure 2. -Number of wilderness laws passed per Congress.

Total 467 Wilderness Areas

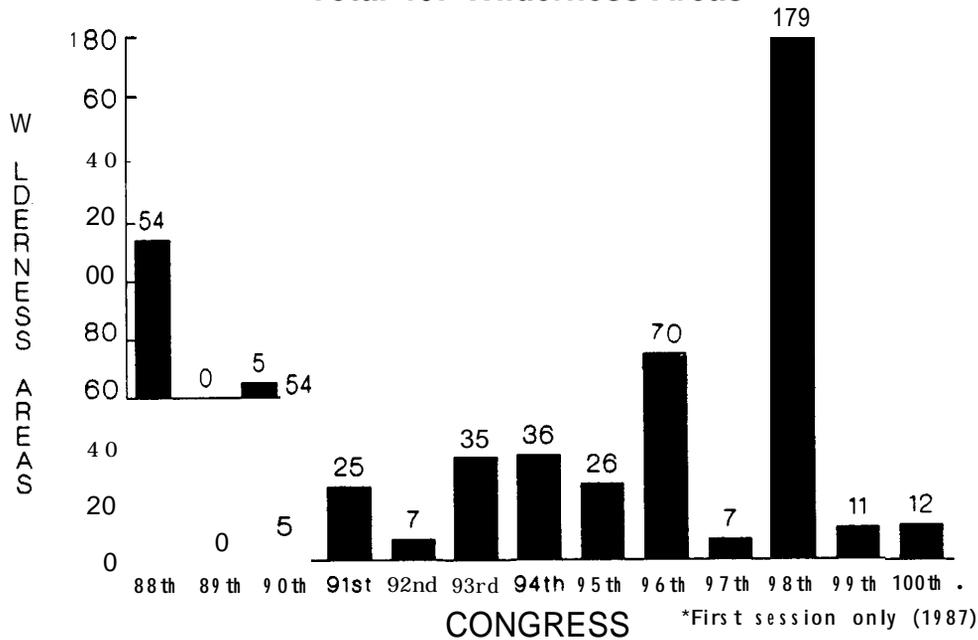


Figure 3. -Number of wilderness areas classified per Congress.

Twelve of the 13 Congresses from 1964 through 1987 have added land to the original 9.1 million acres classified in the Wilderness Act, but only one added more acreage than the 88th Congress (fig. 4). The 96th Congress (1979-1 980) classified approximately 60.7 million acres as wilderness, of which the Alaska National Interest Lands Conservation Act

(ANILCA) made up almost 56.3 million acres. The 98th Congress also classified about 8.6 million acres as wilderness.

Thus, wilderness has been a topic consistently dealt with by Congress for more than 30 years, since the first wilderness legislation was introduced in 1956.

Total 89 Million Acres

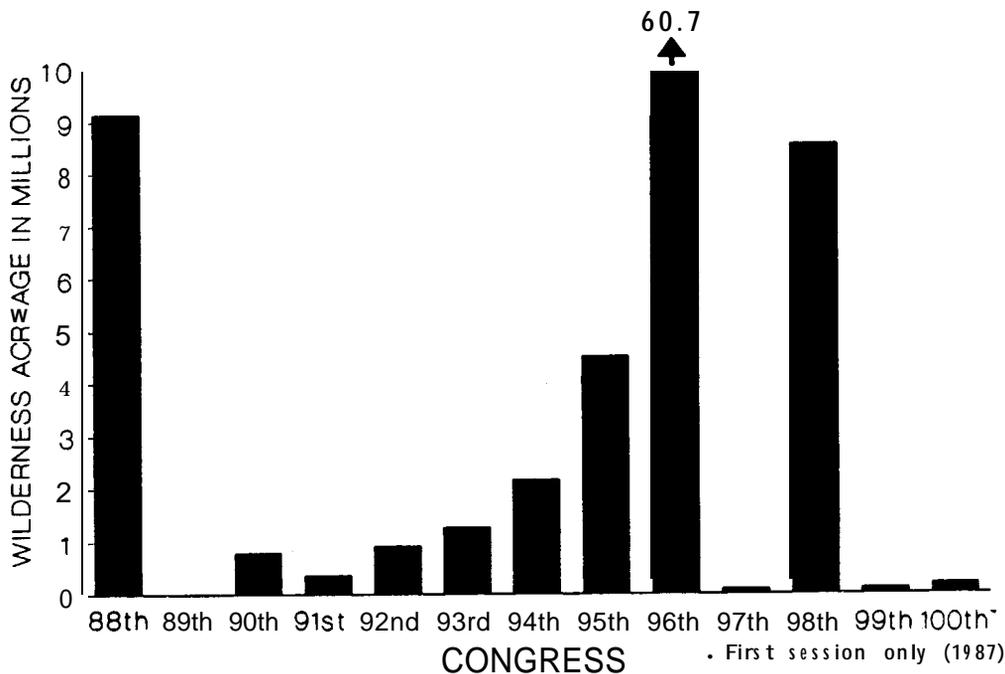


Figure 4. -Wilderness acreage classified per Congress.

MILESTONES IN WILDERNESS LEGISLATION

Six wilderness laws have set standards for wilderness classification and management and have interpreted the wilderness concept. These laws are milestones in wilderness legislation.

The Wilderness Act

The Wilderness Act (P.L. 88-577) of 1964 defined wilderness for the purposes of establishing and managing the National Wilderness Preservation System, classified 9.1 million acres of national forest lands as wilderness, and directed wilderness study of national forest primitive areas and roadless areas within the national park and national wildlife refuge systems. A key element of the Act was that the agencies' future wilderness study and review include public involvement in the form of public notices and hearings. This was a relatively new requirement at the time and began the process of widespread public involvement in wilderness allocation decisions that intensified during the Forest Service's roadless area reviews and continues today in the forest planning process (Hendee 1976; Hendee and others 1980). Additionally, the law specified that only Congress had the authority to classify future wildernesses in the NWPS.

The Wilderness Act provided management direction by prohibiting certain uses and allowing others. Prohibited were permanent and temporary roads, most commercial enterprises, motorized equipment and mechanical transport, landing of aircraft (where no established use existed prior to designation), and structures and installations-with exceptions for necessary administrative purposes and to protect pre-existing private rights.

Special provisions allowed for mining on valid claims and mineral development on leases established before December 31, 1983, with mineral prospecting and surveys permitted to provide information on mineral resources; water development projects with Presidential approval; livestock grazing; fire, disease, and insect control; and aircraft landings and motorboat use where established. Also allowed were certain commercial uses deemed compatible with the wilderness concept, such as outfitting and guiding.

So-called "Eastern Wilderness Act"

The so-called 'Eastern Wilderness Act' (P.L. 93-622) in 1975 added 16 wildernesses in the East, where only four national forest wildernesses previously existed. The Act also designated 17 wilderness study areas to be managed to preserve their wilderness qualities until Congress had sufficient time and opportunity to classify the areas as wilderness. While debating proposed wilderness bills, Congress addressed the issue of whether lands in the East should be managed in a 'wild areas system' under different standards from the National Wilderness Preservation System (Hendee and others 1978). The argument for a separate system was based mostly on the premise that roadless areas in the East had been severely modified by previous human use and consequently did not qualify for wilderness designation under the criteria of the Wilderness Act. This argument failed, and Congress eventually determined that designated roadless areas in the East should be included and managed as part of the National Wilderness Preservation System (S.Rep. 93-803). Thus, it is correct to refer to such designated areas as "wilderness in the East," and not as "Eastern wilderness." The legislation is referred to as the so-called "Eastern Wilderness Act" because it does not have a formal title and does not establish a separate Eastern system.

This Act authorized the Secretary of Agriculture to use condemnation to acquire private lands in the 17 wildernesses designated by the 'Eastern Wilderness Act.' Condemnation authority had not been provided in the Wilderness Act, but wilderness designated in the so-called 'Eastern Wilderness Act' contained many private inholdings. Congress believed that condemnation authority would help ensure that private owners used these lands in a manner compatible with the wilderness concept and would provide a means of acquisition if they did not.

The Federal Land Policy and Management Act of 1976

The Federal Land Policy and Management Act of 1976, or FLPMA (P.L. 94-579), provided for wilderness study and classification of lands managed by the Bureau of Land Management (BLM), a provision not included in the Wilderness Act. This law addressed many aspects of the management of these public lands and directed that roadless areas with wilderness characteristics be inventoried within 15 years to determine their suitability for wilderness classification. Suitable areas could be recommended to Congress for wilderness designation under the provisions of the Wilderness Act of 1964. The BLM thus joined the

Forest Service, National Park Service, and Fish and Wildlife Service as a partner in wilderness management.

The BLM's wilderness study areas were to be managed to preserve their wilderness characteristics, but existing uses such as mining, mineral leasing, and grazing were permitted to continue subject to regulations set by the Secretary of the Interior. Once classified as wilderness, the management provisions of the Wilderness Act pertaining to national forest wildernesses would generally apply.

The Endangered American Wilderness Act

The Endangered American Wilderness Act (P.L. 95-237) was passed in 1978, partly in response to perceived shortcomings of RARE ('roadless area review and evaluation') I. This was the Forest Service's first comprehensive 'post-Wilderness Act' review and evaluation of remaining national forest roadless areas to identify those areas suitable for possible wilderness study or classification. The Endangered Wilderness Act added 16 areas to the NWPS, primarily including areas either excluded from the RARE I inventory of roadless lands or not recommended for wilderness study or classification after their review—thus the name "endangered wilderness." The Forest Service's "purity" requirement for wilderness classification, including its 'sights and sounds doctrine' that wilderness should be out of sight and sound of civilization, came under intense Congressional scrutiny during committee hearings. The 'sights and sounds doctrine' was deemed contrary to Congress's desire to establish wildernesses near large cities (H.Rep. 95540). Much of the Congressional debate focused on RARE I's criteria for recommending only 274 wilderness study areas totaling about 12 million acres from the 56 million acres inventoried in 1449 roadless areas.

By passing the Endangered Wilderness Act, Congress further established that areas previously influenced by man should not be precluded from consideration for wilderness classification, nor should roadless areas near major cities, as they could provide much-needed primitive recreation for the nearby population. In such areas, boundaries were even drawn to provide adequate trailheads and facilities for the large number of wilderness visitors that were anticipated (H.Rep. 95540). Congressional committees addressed the interpretation of the Wilderness Act concerning certain uses, activities and management, and endorsed the Forest Service's plan to conduct RARE II, a second comprehensive roadless

area review and evaluation (Weaver and Cutler 1977). Generally, these Congressional committees supported a less stringent view of classification and management criteria than were being applied by the Forest Service at the time.

The Alaska National Interest. Lands Conservation Act

The Alaska National Interest Lands Conservation Act, or ANILCA (P.L. 96-487), was passed in 1980 after many years of debate, and provided management direction for the large tracts of Federal land in Alaska. ANILCA was the first Act to pass both houses of Congress that contained RARE II sufficiency/release language (Gorte 1987). The law declared that Congress had performed its own evaluation of RARE II roadless areas in Alaska and had decided to designate some lands as wilderness, to release some lands to nonwilderness multiple uses, and to hold other areas for wilderness study or further planning. The law added over 56 million acres to the NWPS, most of it in units of the national park system and national wildlife refuge system. Millions of additional acres were authorized for further wilderness study within the national parks and wildlife refuges and the Chugach National Forest, while special guidelines were included for wilderness recommendations about public lands in Alaska managed by the BLM.

Congressional committee hearings closely examined the unique natural environments in Alaska, exemplified by the State's vast size and predominately undeveloped condition (H.Rep. 96-97, Part 1). Subsequently, Congress provided in ANILCA special provisions for wildernesses in Alaska to allow certain motorized use and access, along with maintaining existing wilderness cabins and establishing new cabins where administratively authorized. Provisions for subsistence uses of natural resources applicable to other wildlands in Alaska were also included for wilderness, and the Act provided for establishment and maintenance of structures for aquaculture purposes and temporary construction and use of facilities for hunting and fishing, and modification of existing timber sales contracts that applied to certain newly designated national forest wildernesses.

The "Colorado Wilderness Act"

The 'Colorado Wilderness Act' (P.L. 96-560), passed in 1980, was important because Congress referred to House Committee Report 96-617 for explicit management direction for livestock grazing. This management direction had far-reaching effects, since the committee report required that livestock grazing

in all national forest wildernesses should be managed according to the report's management provisions that were offered as interpretation of the Wilderness Act grazing provisions (Wilkinson and Anderson 1987). The law also prohibited the establishment of buffer zones around wildernesses; directed a review of fire, disease, and insect control measures and policies in Colorado's wildernesses; and included RARE II sufficiency/release language for roadless areas in Colorado. The "Colorado Wilderness Act," by including reference to the accompanying committee report on management direction, thus brought a degree of closure to Congressional debate over wilderness management policy and its application that had begun with consideration of the Endangered Wilderness Act several years earlier.

MANAGEMENT DIRECTION AND SPECIAL PROVISIONS IN WILDERNESS LEGISLATION

In the Wilderness Act, Congress provided a foundation from which management direction could be shaped, recognizing that wilderness requires management to protect its wilderness characteristics and values. As the National Wilderness Preservation System evolved, Congress generally has refused to amend management provisions in the Wilderness Act of 1964, except for a minor amendment made in the "Boundary Waters Canoe Area (BWCA) Wilderness Act" (P.L. 95-495) of 1978 to provide for new management direction in the area (Bloedel 1987). Mostly, Congress has clarified management direction or made special provisions for particular areas through legislation and committee reports. For example, the 'Colorado Wilderness Act' (P.L. 96-560) further defined grazing management through a House committee report, but the Act and accompanying committee report expressly stated that the provisions did not amend the Wilderness Act.

During the past 23 years, a large body of wilderness management information has been developed. Agencies have developed regulations, management policies and plans, and numerous agency training workshops and conferences have been held. There have been many research studies of resource conditions, wilderness use, and effects of management. A textbook has been written on wilderness management; national conferences on wilderness research and management have been held, and a national wilderness management plan has been developed. One challenge of wilderness management has been to understand and interpret Congressional direction in the Wilderness Act and

subsequent wilderness classification laws, and to devise and implement principles and policies that adhere to perceived legislative direction. This has often been difficult and ineffective.

While Congress has been very conservative in changing the management direction of the Wilderness Act, Congressional leaders and Congressional reports have more frequently addressed management concerns. In 1977, Senator Frank Church of Idaho stressed that managing agencies use a 'rule of reason' to interpret Congress's intent in the Wilderness Act and "do only what is necessary" to manage wildernesses to protect wilderness characteristics and still provide for 'human use and enjoyment' (Church 1977). One House of Representatives report further suggests that a strict or "pure" interpretation of the Wilderness Act of 1964 is inappropriate for allocating or managing wildernesses, due to individual differences among wildernesses (H.R. 96-97, Part 1). Moreover, one Congressional leader expressed the view that if management conflicts between Congress and the managing agencies become too great in the future, Congress may provide more explicit management guidelines and directives in wilderness legislation (McClure 1985). These pronouncements of Congressional leaders and Congressional committee reports, although lacking the force of law, may influence agency policy.

Management Direction

Management direction as defined in this monograph includes those provisions in wilderness laws that affirm or modify the management direction of the Wilderness Act for application to a specific wilderness or group of wildernesses in the case of omnibus laws. Following is a review of wilderness management direction included in legislation subsequent to the Wilderness Act of 1964.

Mining

Mining in wilderness is an extremely complex legal issue and a topic in numerous legal books and articles (Coggins and Wilkinson 1987; Loop 1986; Wilkinson and Anderson 1987). Following is a general overview of mining provisions in wilderness classification laws, but readers must beware that other laws and agency **authority** and regulations complicate the issue.

Issues of mining and mineral leasing are most often addressed in national forest and BLM wildernesses since national parks and wildlife refuges were normally withdrawn from such activities when **estab-**

lished. Mineral exploration on national forest lands is even more complex in the East, where subsurface rights are mostly privately owned and the Forest Service must estimate the impacts of exploration and potential mining in classified wildernesses as individual cases arise (**S.Rep.** 98-614). The U.S. Government Accounting Office reports that in future wilderness legislation, Congress may need to consider the acquisition of private mineral rights in existing wildernesses in the East or permit mining in these areas (U.S. Government Accounting Office 1984). Also, the Forest Service may need to evaluate and inform Congress of the extent and acquisition costs of private mineral rights of potential wildernesses in the East.

The Wilderness Act (P.L. 88-577) permitted mineral prospecting and surveys to occur in national forest wildernesses, 'compatible' and 'consistent' with protection of the wilderness resource, to provide information on the mineral resources in such areas. Mining and mineral leasing on national forest wildernesses could occur until December 31, 1983, but mining on valid claims and mineral development on leases established before that date could also continue or begin at a future date (Gorte 1988b; **Hendee** and others 1978). Mining on valid claims and mineral development on leases existing at the time of wilderness designation may also occur on those wildernesses established after the 1983 deadline (Gorte **1988a**).

Any mining activities in national forest wildernesses today are subject to certain requirements and regulations set by the Secretary of Agriculture to define a valid claim and to protect wilderness characteristics (Loop 1986; Matthews and others 1985; The Wilderness Society 1984; Wilkinson and Anderson 1987). FLPMA (P.L. 94-579) directed that mining be administered in BLM wildernesses in generally the same manner as in national forest wildernesses. Congress typically excludes from wilderness classification those national forest and BLM areas with high mineral potential, but exceptions have been made in some wilderness laws, as the following examples indicate. These exceptions and special provisions allowed wilderness designation of the area to proceed despite mineral potential or activity.

The 'Boundary Waters Canoe Area (BWCA) Wilderness Act' (P.L. **95-495**) established the BWCA Mining Protection Area that prohibited mining of federally owned minerals in the wilderness and on adjacent nonwilderness lands. This Act also set certain restrictions on mining of nonfederally owned minerals within the Mining Protection Area. The Central Idaho

Wilderness Act of 1980 (P.L. 96312) established a "special mining management zone" in the Frank Church-River of No Return Wilderness to allow for cobalt exploration and mining. In establishing that wilderness, Congress elected to try to minimize the adverse environmental effects of mining while also protecting **critical** bighorn sheep **habitat**, rather than excluding the land in question from the wilderness.

Coal deposits were a major concern in the Cranberry Wilderness of West Virginia, and provisions were made to acquire all nonfederally owned mineral interests and to permit exploration activities and drilling in the wilderness to determine the value of nonfederally owned minerals, subject to guidelines set by the Secretary of Agriculture (P.L. 97-466). Congress also provided special provisions for phosphate leasing and mining in the Florida Wilderness Act of 1984 (P.L. **98-430**), with procedural steps for Presidential and Congressional approval of the need to mine phosphate. A Senate committee report for the Florida Wilderness Act expressed hope that future restoration technology would be better able to reduce environmental deterioration caused by phosphate mining (**S.Rep.** **98-580**). In the Texas Wilderness Act of 1984 (P.L. **98-574**), Congress classified the Indian Mounds Wilderness, despite active oil and gas drilling, thus leaving the Forest Service to mitigate the damage to wilderness characteristics caused by such activities (Evans 1986).

Motorized Use

Congress has not tampered with the Wilderness Act provisions allowing private and State government inholders to maintain their existing access rights and permitting minimal motorized use for necessary administrative purposes. But wilderness allocation laws and accompanying committee reports have provided specific qualifications and instances where the use of aircraft (planes and helicopters), motorboats, snowmobiles, and other types of motor vehicles will be allowed. For example, motorboat use is specifically allowed for recreational purposes by the "Okefenokee Swamp Act" (P.L. 93-429; **H.Rep.** **93-872**), for private access in one wilderness by the Florida Wilderness Act (P.L. **98-430**), and for both purposes by the "BWCA Wilderness Act" (P.L. **95-495**); the "BWCA Wilderness Act" also permits snowmobile use for grooming ski trails near resorts and for access to two remote locations in Canada; and landing of aircraft where previously established is affirmed by specific wording in the Central Idaho Wilderness Act (P.L. 96-312). Helicopter use is permitted to service vault toilets in certain wildernesses by the Endangered Wilderness Act (P.L. 95-237) and the Utah Wilderness Act (P.L. **98-428**), and other forms of motorized use

are mentioned in the Arizona Wilderness Act (P.L. **98-406**), California Wilderness Act (P.L. **98-425**), Utah Wilderness Act (P.L. **98-428**), and the Wyoming Wilderness Act (P.L. **98-550**). ANILCA (P.L. 96487) provided for a wide array of motorized use, including snowmobiles, motorboats, and aircraft.

Committee reports have also addressed Congressional intent and interpretation of motorized use associated with recreational access (**H.Rep. 93-872**), fish and wildlife management (**H.Rep. 96-97, Part 1; H.Rep. 94-1562**), watershed protection and flood control projects (**H.Rep. 98-1019, Part 1; S.Rep. 98-581**), and grazing activities (**H.Rep. 96-617**).

Grazing

Livestock grazing and other wilderness management policies in national forest wildernesses were reviewed by Congressional committees in the 95th (1978-79) and 96th (1980-81) Congresses. The result was House Committee Report 96-617, which accompanied the 'Colorado Wilderness Act' (P.L. 96-560) and provided interpretation and clarification of grazing provisions in the Wilderness Act. The 'Colorado Wilderness Act' directed that grazing management in Colorado wildernesses be guided by this report, which stressed its interpretation that the Wilderness Act provided for continuation of existing grazing use, the maintenance and construction of supporting facilities, including 'fences, line cabins, water wells and lines, and stock tanks,' and temporary use of motorized equipment to repair facilities and for emergency purposes. As mentioned earlier, these provisions were mandated by the committee report to apply to grazing activities in all national forest wildernesses.

Several subsequent laws, including the Arizona Wilderness Act (P.L. **98-406**), Utah Wilderness Act (P.L. **98-428**), Wyoming Wilderness Act (P.L. **98-550**), Nebraska Wilderness Act (P.L. **99-504**), and 'El Malpais Wilderness Act' (P.L. 100-225) in New Mexico, also indirectly refer to the guidelines in House Report 96-617. The 'El Malpais Wilderness Act' grazing provisions are somewhat significant because they apply to a BLM wilderness, and not a national forest wilderness. Additionally, several of these laws provide for administrative review of existing grazing policies to ensure that they are consistent with that report. The 'New Mexico Wilderness Act' (P.L. 96-550) addressed grazing directly in authorizing additional fencing as provided in the grazing allotment management plan for livestock in the **Cruces** Basin Wilderness.

Buffer Zones

In 1980, a Congressional committee examined the issue of buffer zones around national forest wildernesses (H.Rep. 96-1 126) and pointed out that Congress takes great care in determining and establishing wilderness boundaries with the intent that only lands within the boundaries be managed as wilderness. Similarly, a Senate committee report (**S.Rep. 98-465**) stressed that nonwilderness activities should not be restricted or prevented in areas adjacent to wildernesses simply because such activities can be seen or heard from within the wildernesses. Such restrictions applied by the Forest Service were formerly referred to unofficially as the 'sights and sounds doctrine,' part of the agency's 'pure **criteria**' for wilderness to ensure high standards for designation and management. The "New Mexico Wilderness Act' (P.L. 96-550) in 1980 was the first law to **prohibit** buffer zones, and subsequent laws contain similar provisions, including the 'Colorado Wilderness Act' (P.L. **96-560**), Oregon Wilderness Act (P.L. **98-328**), Washington Wilderness Act (P.L. **98-339**), Arizona Wilderness Act (P.L. **98-406**), Utah Wilderness Act (P.L. **98-428**), Arkansas Wilderness Act (P.L. **98-508**), Wyoming Wilderness Act (P.L. **98-550**), Pennsylvania Wilderness Act (P.L. **98-585**), Virginia Wilderness Act (P.L. **98-586**), and Michigan Wilderness Act (P.L. 100-184).

Fish and Wildlife

Fish and wildlife protection has long been associated with wilderness classification, and the presence of fish and wildlife is considered an integral part of wilderness for hunting, fishing and other recreational purposes. Fish and wildlife professionals often argue against wilderness designation, as it is perceived to preclude the use of many modern wildlife management techniques. Many committee reports stress the importance of preserving fish and wildlife in individual wildernesses.

One House of Representatives committee report (**H.Rep. 98-40**) addressed the need to balance management activities with the protection of wilderness characteristics. This report stresses that management agencies have authority to maintain water supply facilities, restore natural vegetation, utilize prescribed burning, enhance and restore fish populations, and use motorized equipment to fulfill fish and wildlife management objectives. Congress reaffirmed such intent in ANILCA (P.L. 96-487) and provided for fisheries research and enhancement, and motorized use and access for subsistence hunting and fishing purposes. The Central Idaho Wilderness Act permitted

access to manage bighorn sheep along mining roads authorized in the 'special mining management zone' in the Frank Church-River of No Return Wilderness. The Wyoming Wilderness Act (P.L. 98-550) permitted occasional motorized use to manage bighorn sheep in the Fitzpatrick Wilderness, and the Endangered Wilderness Act (P.L. 95-237) authorized a fish and game research program to help protect these resources in the Gospel-Hump Wilderness and surrounding nonwilderness lands.

Fire, Insect, and Disease Control

Fire, insect, and disease control measures are specifically permitted by the Wilderness Act, but concern has been expressed about limitations that might be placed on control measures in wilderness. One House committee report (H.Rep. 95-540) stressed that control measures include 'the use of mechanized equipment, the building of fire roads, fire towers, fire breaks or other pre-suppression techniques where necessary, and other techniques for fire control.' Wilderness legislation also affirms that such protective measures can be applied in wilderness. The Endangered Wilderness Act (P.L. 95-237) stipulated that fire control measures should be properly utilized to protect watersheds in two California wildernesses. The "Colorado Wilderness Act" (P.L. 96-560) directed administrative review of current policies for fire, disease, and insect control in Colorado wildernesses to ensure that these policies were consistent with Congressional intent and were adequate for protection of adjacent nonwilderness lands.

Facilities and Structures

In several wilderness allocation laws, Congress permitted facilities and structures for different purposes. In 1969, two existing dams were included in the Desolation Wilderness established in California (P.L. 91-82). A Congressional committee previously debated whether the use and management of these dams would severely degrade the wilderness or detract from its surroundings (S.Rep. 91-97). Two reservoirs were also included in the Indian Peaks Wilderness in Colorado in 1978 (H.Rep. 95-1460). The use of sanitary facilities, such as vault toilets, was specifically provided for in the Endangered Wilderness Act (P.L. 95-237) and the Utah Wilderness Act (P.L. 98-428) to protect watersheds in several wildernesses. The Central Idaho Wilderness Act (P.L. 96-312) permitted construction of water supply facilities in certain areas. The installation and use of 'weather modification special equipment,' such as snow gauges, and water quality and quantity measuring instruments was endorsed in a House committee report as beneficial to furthering

the 'scientific, educational, and conservation purposes' of wilderness, and to protecting watersheds and "preserving the wilderness character" in some cases (H.Rep. 95-540). The Vermont Wilderness Act (P.L. 98-322) permitted the maintenance of trails and shelters along the Appalachian Trail and associated trails. "Hydrologic, meteorological, and telecommunications facilities' needed for flood warning and control purposes were permitted in specified wildernesses in the Arizona Wilderness Act (P.L. 98-406) and Utah Wilderness Act (P.L. 98-428).

ANILCA (P.L. 96-487) permitted the construction and maintenance of new and existing cabins in Alaska wildernesses, temporary construction and use of facilities for hunting and fishing, and also provided for fish hatcheries and weirs to improve fisheries. As mentioned earlier, the 'New Mexico Wilderness Act' (P.L. 96-550) permitted construction of additional fencing for grazing purposes in the Cruces Basin Wilderness.

Special Provisions

Special provisions have been included in wilderness laws to provide specific guidelines for allocation and management based upon unique circumstances of local or regional concern. Following is a discussion of some of these special provisions.

Sufficiency/Release Language

Through sufficiency/release language in wilderness classification laws, Congress has assumed a partial role in resolving the question of which remaining national forest **roadless** areas are eligible for further wilderness review and which lands are released for other uses. Since its inception in 1980, Congress has consistently applied sufficiency/release language on a State-by-State basis. ANILCA (P.L. 96-487) was the first law to contain sufficiency/release language, but such language has since evolved and has been applied in 27 subsequent laws.

Sufficiency language was constructed by Congress in response to the California v. Block lawsuit that invalidated the RARE II Final Environmental Impact Statement information for California and prevented development on those **roadless** lands recommended for nonwilderness uses (Baldwin and Gorte 1984; Gorte 1987). Sufficiency language states Congress's conclusion that the information in the RARE II Environmental Impact Statement for a particular State or section of a State is adequate for Congress's review, and that no further Statewide **roadless** area reviews will be conducted by the Forest

Service in that State, nor will there be judicial review of the decision releasing the national forest lands for nonwilderness uses. In other words, **roadless** area reviews have been 'legally and factually sufficient,' and lands not designated for wilderness, wilderness study, or further planning are 'released' for possible nonwilderness use.

Release language has generally been debated in two forms: "hard" and "soft: In its strictest form, hard release language would permanently release **roadless** lands not designated as wilderness, or for wilderness study, from further wilderness consideration unless authorized by Congress (Baldwin and Gorte 1,984). Hard release language might also require nonwilderness multiple use of released lands, although such interpretation might be argued (Baldwin and Gorte 1984; Gorte 1987). Although "hard" release language has not yet been included in wilderness legislation, various industry groups have advanced permanent or 'hard' release in testimony on wilderness bills.

Soft release language provides that the wilderness option for RARE II nonwilderness **roadless** areas will not be considered again by the Forest Service during the development of the initial forest plans in accordance with the National Forest Management Act (P.L. **94-588**), but may be considered during the revision of these plans (Baldwin and Gorte 1984; **S.Rep.** 96-914). Before the initial plans are revised, the Forest Service is permitted to manage lands not designated as wilderness, wilderness study, or for further planning for nonwilderness multiple use (Gorte 1987; **S.Rep.** 96-914). Also, released lands do not necessarily have to be managed to protect their wilderness characteristics. Under provisions in the National Forest Management Act (P.L. 94-588) and Forest Service regulations, **roadless** areas that remain when the forest plans are revised at the end of each subsequent 10-year planning period must then be reconsidered for wilderness classification in the planning process for the next forest plan (The Wilderness Society 1984; **S.Rep.** 96-914).

From 1980 through 1983, soft release language of this type has appeared in six wilderness laws, including the Alaska National Interest Lands Conservation Act (P.L. **96-487**), "New Mexico Wilderness Act" (P.L. **96-550**), 'Colorado Wilderness Act' (P.L. **96-560**), "Charles C. Deam Wilderness Act' (P.L. 97-384) in Indiana, "Paddy Creek Wilderness Act' (P.L. 97-407) in Missouri, and "West Virginia Wilderness Act" (P.L. 97-466).

In 1984, continued pressure from development interests led to some alteration and clarification of

soft release language (Gorte 1987). The result was 'compromise' release language stating that released lands not designated as wilderness would be managed for nonwilderness multiple use in accordance with the National Forest Management Act (P.L. **94-588**), but protection of a **roadless** area's wilderness characteristics would be allowed if this decision was made in the planning process (Gorte 1987; **S.Rep.** 98-416). Thus, protection of these lands for potential wilderness consideration was placed on the planning process. Congressional committees also clarified the circumstances under which forest plans could be revised, which further clarified the timing of wilderness reviews (Gorte 1987; **S.Rep.** 98-416; **S.Rep.** 98-463). Since 1984, 22 wilderness laws have contained this "compromise" version of soft release language.

Miscellaneous Special Provisions

These include a variety of provisions not falling under other categories. For example, the 'Sawtooth Wilderness Act' (P.L. 92-400) and the 'Hells Canyon Wilderness Act' (P.L. 94-199) both established wilderness within national recreation areas and provided condemnation authority to acquire nonfederal lands, while also withdrawing the areas from further mining, subject to valid existing claims. The Alpine Lakes Area Management Act of 1976 (P.L. 94-357) authorized a special study of the Enchantment Area within the wilderness to determine the area's best management. A special study to consider including Indian Peaks Wilderness into Rocky Mountain National Park was authorized by the Indian Peaks Act (P.L. **95-450**), and the 'BWCA Wilderness Act' (P.L. 95-495) directed that airplane flyovers be controlled according to the guidelines of an earlier Presidential directive. The Virginia Wilderness Act (P.L. 98-586) called for a combined State and Federal air quality study of designated wilderness study areas. The 'El Malpais Wilderness Act' (P.L. 100-225) reserved water rights for the wildernesses designated by the Act with certain special provisions.

WILDERNESS LEGISLATION: A VIEW OF THE FUTURE

The frequency of wilderness classification legislation has declined since 1984, with only nine laws being passed, but during this time wilderness classification has been a highly visible issue in several parts of the country. Despite the establishment of a nearly 89-million-acre National Wilderness Preservation System, wilderness allocation legislation will remain a land-use issue for many years, and several major wilderness classification efforts are anticipated.

Alaska

The National Park Service is currently completing wilderness review of 18 million acres in 13 national parks in Alaska that were designated for wilderness study by ANILCA (Beal and Rabinowitch 1987). In these reviews, public comment about wilderness designation has been solicited and meetings have been held in more than 40 Alaskan communities. Draft wilderness proposals are expected in 1988 and will receive further public review before final wilderness recommendations are made.

The Fish and Wildlife Service is also currently reviewing potential wilderness additions for national wildlife refuges in Alaska in compliance with directives provided in ANILCA. At least 55 million acres have been reviewed in 16 refuges, and approximately 3 million acres in seven refuges are expected to be recommended for wilderness classification.

Under ANILCA, a wilderness study area was specifically designated in the Chugach National Forest of south-central Alaska to be reviewed for possible wilderness classification. This review has been completed and led to a 1.7 million-acre wilderness recommendation (Wilhelm 1988).

National Park System Units in the 48 Contiguous States

Numerous national parks, including Yellowstone, Olympic, North Cascades, Canyonlands, Big Bend, Glacier, Great Smoky Mountains, and Rocky Mountain, contain large **roadless** areas that have yet to be classified by Congress as wilderness. Almost 8.8 million acres have been recommended to Congress for wilderness classification from these national parks and 13 other national park units in the 48 contiguous states (Chidlaw 1988). About 6 million acres in 17 other national park units are also being studied for their wilderness potential.

By tradition and law, these national park areas are protected from allocation to alternative uses and development activities such as timber harvesting, mining, and livestock grazing. Thus, environmental interests promoting wilderness classification have focused on national forest and BLM areas. As remaining national forest **roadless** areas are either designated as wilderness or released from further wilderness consideration and as the BLM wilderness review is completed, a renewed effort to complete wilderness designation in these national parks is anticipated.

National Forest Roadless Areas and Released Lands

Conflict over wilderness proposals is intense in Idaho and Montana. Wilderness debate over **roadless** areas has the potential to continue for decades in Idaho where national forest plans, as proposed, would leave 85 percent of the State's current 9.4 million acres of **roadless** lands intact at the end of the current 10-year planning period, at which time they may again be considered for wilderness (University of Idaho 1987). In Montana, where 3.4 million acres, or 20 percent of the State's national forest land, have already been classified as wilderness, current legislative proposals call for additions of 1.3 million acres (Gorte 1988c). While Idaho and Montana are a current focus of wilderness legislation, other western states also have areas where the wilderness question remains.

Furthermore, Congress has passed 28 wilderness classification laws that have included soft release language, and about 21 million acres of national forest **roadless** areas remain in 23 states (excluding Alaska, Kentucky, Nebraska, and Michigan) (Gorte and Baldwin 1987). The reconsideration for wilderness designation of at least some of these lands is certain to be an issue in the future when release provisions under current national forest plans expire.

Bureau of Land Management Wilderness Study Areas

The Bureau of Land Management is completing its wilderness review called for by the Federal Land Policy and Management Act of 1976 (P.L. 94-579) and scheduled for completion in 1991. During their inventory and review, the BLM identified 795 wilderness study areas totaling nearly 25 million acres from the BLM **roadless** area inventory as containing wilderness characteristics. Tentatively, the BLM is considering recommending 10 million acres for wilderness classification by Congress (Porter 1988). After the BLM's final recommendations are made, Congress must still consider and classify selected areas as wilderness.

CONCLUSION/PREDICTIONS

Wilderness legislation has been a major influence on land-use planning for 23 years, during which time six pieces of milestone legislation defining wilderness and 97 other wilderness laws have been passed. The result of all this legislation has been the establishment of 467 wildernesses in 44 states, creating a

vast 89-million-acre system. Congress has rarely provided special management direction, and when addressing management issues has generally affirmed the direction in the Wilderness Act as providing for resolution of most issues. An exception is the "Boundary Waters Canoe Area (BWCA) Wilderness Act," which contained a variety of explicit provisions for coordinating management of the **BWCA's** unique wilderness features. Congressional reports accompanying wilderness laws have most often provided the necessary clarification and interpretation of the Wilderness Act.

The 89 million acres of wilderness already classified would surprise the original authors of the Wilderness Act, who anticipated a NWPS of only **40-50** million acres (Church 1977). Yet 30 million acres or more of wilderness may be added to the NWPS from the **roadless** areas in Alaska, national parks in the 48 contiguous States, remaining national forest **roadless** areas and those under soft release, and the Bureau of Land Management wilderness study areas.

For at least another decade, and perhaps for two or three decades, it is likely that wilderness legislation will continue to be a major natural resource issue. We expect it will focus first on remaining national forest **roadless** areas, national parks and wildlife refuges in Alaska, then BLM wilderness study areas, and finally the national park **roadless** areas in the 48 contiguous States. As national forest planning cycles are completed in the next decade, another focus of activity may evolve from the expiration of release provisions for certain national forest **roadless** areas.

We expect a continuation of the trend in wilderness laws toward omnibus legislation covering more than one area in individual States, and the inclusion of more language to affirm and clarify management direction and address local concerns. Congress will increasingly have to address smaller areas, those previously modified to some degree, and areas with strongly competing alternative uses. To resolve some of the very difficult wilderness allocations and management issues in the future, a variety of special provisions, exceptions and compromise provisions are likely to be proposed for wilderness classification. The evidence suggests that Congress will generally hold the line on proposals for major exceptions and unique provisions in wilderness laws.

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NONFEDERAL WILDERNESS, WILD, AND NATURAL AREAS IN THE UNITED STATES-A SURVEY

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Abstract-Nonfederal wilderness, wild, and natural areas are inventoried by requests for data mailed to likely owners and managers. Number and acreage of tracts meeting criteria are tabulated by State, region, size of tract, and ownership category. The characteristics of the inventoried tracts are described and compared with the characteristics of areas in the National Wilderness Preservation System. Characteristics compared include purpose, size, distribution, degree of naturalness, and values to the American people. Trends in the preservation and management of nonfederal wilderness and natural areas are discussed, and some useful research questions are proposed.

INTRODUCTION

Much has been written and said about wilderness in the National Wilderness Preservation System (NWPS) since its inception in 1964. The community of individuals and organizations devoted to the cause has spent much time, energy, and money in the effort to save wilderness by adding it to the System. Studies have been made, hearings have been held, and lawsuits have been pursued, all in an effort to add more areas and acreage to the Federal System. We even distinguish the areas in the NWPS by calling them capital "W" Wilderness. And the effort has not been in vain. The total, as of January 1987, comes to 474 areas and 88,953,628 acres (U.S. Department of the Interior, Geological Survey 1987). All of this activity has been attended by considerable publicity, especially in the conservation community press. Members of the many organizations and other

wilderness advocates are quite familiar with the Wilderness Areas in their State and often in their region.

Given the map and comprehensive list published by the Geological Survey in 1987, **McMahon** might say to Carson, "That list has all the wilderness in the entire country; there's not a single acre of wilderness that is not on that list." To which Carson might reply, "No, bear's breath, there's more." And indeed there is more, much more. Most of us are aware of the Adirondack wilderness in New York, and some of us may be aware of other State wilderness areas. Or, perhaps, we have read that a paper company has given a large tract of swamp to a prominent conservation organization. But, for the main part, any area that is not a part of the Federal System is not well known, or, if it is, it may be considered less than equal to a Federal Wilderness, regardless of its size or qualities. But the truth is that many State wilderness areas are very large, very wild, and very pristine, and are every bit as 'good' as Federal Wilderness.

Another category of **wildland** that provides many of the same values as wilderness is the natural area.² Natural areas may be owned by the Federal government (in which case they were excluded from consideration in this paper), State or local governments, colleges and universities, corporations, private, nonprofit organizations (**PNPO's**),³ or private individuals. They differ from wilderness areas in several ways-size, number and distribution, degree of

*Natural area is a generic name adopted by the author to include all areas with similar characteristics and purposes; specific names include Natural Area Preserves, Natural Heritage Areas, and Research Natural Areas. Some have no specific or categorical name-they are just called preserves or natural areas.

'These organizations are frequently referred to in the literature as NGO's for Nongovernment Organizations. The authors felt that private, nonprofit organizations would be more meaningful to a greater number of readers.

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protection, and purpose-which will be discussed in detail in a later section. On the other hand, they and their close relatives, the nature centers, were included in this inventory of wilderness-like areas because they provide many of the same benefits and values as wilderness, and they may provide a substitute resource for people seeking a wilderness experience.

State wilderness areas and natural areas comprise most of the nonfederal property in this inventory. There are other, miscellaneous areas that are included, such as Maine's Baxter State Park, and the Allagash River Wilderness Waterway in the same State.

The uses of this inventory are manifold. The primary use of the information, the original instigation for the work, is as a part of the 1988 Resources Planning Act (RPA) Assessment, the decennial review of forest and wildland resources assembled by the U.S. Forest Service. The study will also provide participants in the National Wilderness Colloquium and National Outdoor Recreation and Wilderness Forum with a better understanding of the nonfederal wilderness and wilderness-like resource- its magnitude, distribution, characteristics, utility, and outlook for growth. Another value of the survey is to indicate to the wilderness and conservation community in general the considerable extent of the resource (which is not widely appreciated-see table 55), as well as to guide those interested individuals toward a goal of preserving at least one example of each ecosystem in the nation, and establishing other preserves so as to prevent the extinction of any species of flora or fauna.

While the study, in a general way, points up the value of such areas to science, it stops short of an inventory of 'elements,' the array of plant and animal species, communities, and ecosystems that is a guiding criterion for much natural area preservation. This information is available from the Nature Conservancy (TNC) through its Natural Heritage Data Centers in each State. Nor does the study identify specific tracts, although the tabulations were summarized from information that listed individual tracts by name. A logical next step in sophistication of the data is to enter each tract into a Geographic Information System database, with State coordinates defining the boundaries of each tract. The descriptive information on each tract could be entered as well. The Nature Conservancy has also begun this work for areas in its inventory, using latitude and longitude instead of State coordinates (The Nature Conservancy 1987a).

The two primary objectives of this study were:

1) to inventory nonfederal wilderness, wild, and natural areas, and to summarize the data by State, size of tract, and ownership category;

2) to describe several characteristics of the areas: their purpose, their relationship to the standards of the Wilderness Act of 1964 and the NWPS areas, their size, distribution, and degree of naturalness, and their values to the American people.

The criteria for inclusion in the inventory were as follows:

1) Land that is not owned by the Federal government;

2) Land that is owned by a State or local government which has preserved it from development or manipulative management by a State law or local ordinance;

3) Land that is owned by a public or private college or university which has specifically and publicly preserved it from development, manipulative management, or manipulative research;

4) Land that is owned by a corporation which has specifically and publicly preserved it from development or manipulative management;

5) Land that is owned by a private, nonprofit organization which has, through legally and publicly stated intent or deed restriction, preserved it from development or manipulative management; and

6) Land that is owned by one or more private individuals who have, through a publicly recorded life tenancy agreement or a legal purchase option to a State or local government or private, nonprofit organization, preserved it from development or manipulative management.

The above are stated as criteria, but should be considered as basic guidelines. Many tracts of land do not neatly fit the criteria, yet were deemed to qualify for inclusion. At the same time, some tracts ostensibly fit the criteria, but were excluded for one reason or another. The authors have tried to describe examples of these exceptions at appropriate points in the paper. For a more thorough discussion of the criteria problem, the reader is referred to Crispin (1980). The important factors in most exceptions were intent, lack of interference with the natural processes or their natural restoration, and absolute

restriction of mechanized intrusions. Of less importance was permanency of dedication, which is very difficult to determine—laws can be changed by the next legislature, and decisions of corporation directors and university regents can change with the membership of the governing bodies. Deed restrictions are likely the most trustworthy mechanisms for preservation of land.

The study was aimed at nonfederal wilderness, wild, and natural areas that have been dedicated for preservation. Specifically excluded were ordinary State parks, wildlife management areas, and State forests, unless these entities or parts thereof were dedicated as preserves and protected from development, commodity resource extraction, and mechanized recreation. Trails for nonmechanized travel are the only general exception to the exclusion of management activities. Also excluded were areas owned by the Federal government but leased to one of the five types of owners listed above. Likewise, tracts that were protected by less than fee simple deeds, such as conservation easements, were excluded.

This paper will describe (1) the collection and tabulation of the data, (2) the scope and limitations of the data that may affect their interpretation, (3) the nature of the tracts, utility to potential users, and comparison with Federal wilderness, (4) the values of the tracts, particularly in relation to the various sizes and objectives of dedication, (5) the current trends and prospects for additional areas, and (6) opportunities and constraints to growth. Finally, it will list some potential research questions into the relationship among visitors to Federal and State wilderness and natural areas.

METHODS

The data for this paper were obtained from several types of sources. First, the U.S. Forest Service's⁴ National Outdoor Recreation Supply Information System (NORSIS), provided some data on State wilderness areas. Second, a major source of information resulted from a letter of inquiry sent to those State agencies deemed most likely to have information on wilderness, wild, or natural areas in their State. Similar letters were sent to all private organizations which were known or guessed to have a natural areas protection program. The "Conservation Directory" (National Wildlife Federation 1987) was consulted for likely agencies and organizations. Replies to

these letters often offered other names, agencies, and organizations which the correspondent knew to be involved in wilderness, wild, or natural areas, and these leads were followed up.

Another source was from the published literature. SOUTHFONET, the U.S. Forest Service literature search service at the University of Georgia, was asked to search for information published after 1970 on nonfederal wilderness, wild, and natural areas. Although the search provided a lot of out-of-date and nonpertinent information, it did give a few key items. A major find, the very comprehensive work by Radford and others (1981), explained and illustrated the ecological diversity classification system, which is the basis for selecting natural heritage areas in North Carolina. Also, the search revealed the existence of the relatively new Natural Areas Journal (NAJ), which was helpful in several ways. George Stankey's 1984 article on State wilderness helped to identify those States from which a positive reply to the mailing could be expected. An NAJ editorial by George Fell (1983), on the philosophy behind natural area protection, supported the rationale for including the natural areas in the inventory by discussing several values that are shaped by wilderness and natural areas. A second paper by Stankey (1987), on values of natural areas to science, further strengthened that decision.

An unexpected but important source of literature is comprised of brochures, directories, and promotional material sent in response to the letters of inquiry. Especially noteworthy were the natural area directories from Ohio, Missouri, Washington, and Indiana, as well as from the Trustees of Reservations and the Natural Lands Trust. A Michigan correspondent sent information concerning a directory of that State's natural areas that began as a Master's thesis and was subsequently published in its entirety in the "Michigan Botanist" (Crispin 1980). This publication was extremely helpful, not only in interpreting the data from Michigan, but in defining quite precisely what constituted a natural area and what was considered to be adequate legal protection. This and the other State natural area directories were also useful sources of values, of restrictions on use, and of the history of the natural area movement within a State or organization. Most of the information on nature centers was obtained from the Directory of "Natural Science Centers" (Natural Science for Youth Foundation 1984).

⁴U.S. Forest Service's Southeastern Forest Experiment Station, Outdoor Recreation and Wilderness Project at Athens, GA.

Data were cross-checked wherever possible to eliminate duplications, nonconforming areas, or otherwise unusable information. Within each State, each tract was assigned to one of five ownership categories, and to one of six size classes. Data from each State summary were aggregated by standard region (tables 1-4), and then summarized for all 50 States (table 5). The ownership categories were selected partly to reflect the degree of protection and permanence one might expect for the areas. State areas are protected by law, in most cases; the private, nonprofit organization tracts are mostly protected by deed covenant, which is as good or better than State law. Privately held tracts are often protected by a life tenancy, or a legal option to a private, nonprofit organization. The other two categories are less well protected, although they, too, are considered permanent. Tracts protected by conservation easements, development rights easements, or leases, while probably quite safe, were not included; areas merely registered as a natural heritage area were likewise excluded.

The size classes were selected somewhat arbitrarily. The 5,000-acre break matches the Federal guidelines. The 1,000-acre break matches the smallest minimum size for any State wilderness or wild area (Missouri). The 25,000-acre break compares roughly to the 36 square miles in a congressional township. The 100-acre and 100,000-acre breaks seemed to be useful for describing to the reader the true nature

of the tracts. Hindsight would have created an under-10-acre category as well; it could be argued that areas of less than 10 acres should have been excluded from the inventory.

NATURE OF THE DATA

A one-word description of the data would be variable. Each State keeps records differently, and each responded somewhat differently to the request. The trusts and other private, nonprofit organizations are also slightly different from one another. In this section, both the quality of the data received and the gaps left by data not received will be described.

The State wilderness and wild areas are probably quite accurately reported. Although the acreage, and in some cases the number of areas, do not agree very well with Stankey's 1984 data nor the NORSIS data, most of the differences are explainable. For example, New York's Adirondack Park has several categories of **wildland** (Adirondack Park Agency 1985); NORSIS included only the areas called "wilderness," while Stankey apparently included a category called "wild," and possibly others. In this study, the 'wild' areas were excluded due to permitted development, but the one 'canoe' area was included since its description closely matches that of the 'wilderness' areas.

Table 1.--Number and acreage of nonfederal wilderness, wild, and natural areas, by ownership and size class, in Pacific Coast Region¹

Size class (Acres)	Ownership class					Total
	State	Local ²	PNPO ³	Private ⁴	Other ⁵	
< 99	38/1,650	14/365	44/1,419	40/820	12/277	148/4,531
100-999	69/26,672	11/3,439	40/12,501	9/2,359	4/577	133/45,548
1,000-4,999	22/46,984	4/11,376	13/29,376	2/3,518	3/7,576	44/98,830
5,000-24,999	14/151,230	1/5,711	2/29,925		1/5,230	18/192,096
25,000-99,999	5/234,519		1/54,500			6/289,019
> 100,000	2/448,320					2/448,320
Totals	150/909,375	30/20,891	100/127,721	51/6,697	20/13,660	351/1,078,344

¹Pacific Coast Region includes Alaska, California, Hawaii, Oregon, and Washington.

²Local includes counties, cities, school districts, regional authorities, etc.

³PNPO = Private, nonprofit organization.

⁴Private includes only private individuals.

⁵Other includes industry, banks, universities and colleges (both public and private).

Table 2.--Number and acreage of nonfederal wilderness, wild, and natural areas, by ownership and size class, in Rocky Mountain Region¹

Size class (Acres)	Ownership class					Total
	State	Local ²	PNPO ³	Private ⁴	Other ⁵	
< 99	4/191	6/352	16/499	9/444	7/315	42/1,801
100-999	21/8,857	9/2,398	25/10,642	8/2,939	8/2,978	71/27,814
1,000-4,999	5/9,150	3/4,734	9/15,731	8/18,306		25/47,921
5,000-24,999	4/60,269		7/75,595	1/8,712		12/144,576
25,000-99,999	1/27,601		2/103,889			3/131,490
> 100,000						
Totals	35/106,068	18/7,484	59/206,356	26/30,401	15/3,293	153/353,602

¹Rocky Mountain Region includes Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah, and Wyoming.

²Local includes counties, cities, school districts, regional authorities, etc.

³PNPO = Private, nonprofit organization.

⁴Private includes only private individuals.

⁵Other includes industry, banks, universities and colleges (both public and private).

Table 3.--Number and acreage of nonfederal wilderness, wild, and natural areas, by ownership and size class, in Southern Region¹

Size class (Acres)	Ownership class					Total
	State	Local ²	PNPO ³	Private ⁴	Other ⁵	
< 99	39/1,568	17/459	77/2,772	17/394	22/713	172/5,906
100-999	68/32,313	18/6,135	59/22,314	13/4,407	15/4,018	173/69,187
1,000-4,999	53/133,628	4/7,585	17/40,297	4/11,548	6/14,642	84/207,700
5,000-24,999	27/324,464	2/24,979	7/71,611	1/18,000		37/439,054
25,000-99,999	4/145,306	1/26,380	3/125,597			8/297,283
> 100,000						
Totals	191/637,279	42/65,538	163/262,591	35/34,349	43/19,373	474/1,019,130

¹Southern Region includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

²Local includes counties, cities, school districts, regional authorities, etc.

³PNPO = Private, nonprofit organization.

⁴Private includes only private individuals.

⁵Other includes industry, banks, universities and colleges (both public and private).

Table 4.--Number and acreage of nonfederal wilderness, wild, and natural areas, by ownership and size class, in Northern Region¹

Size class (Acres)	Ownership class					Total
	.State	Local ²	PNPO ³	Private ⁴	Other ⁵	
< 99	314/12,839	201/6,709	739/ 24,561	322/8,113	107/3,316	1,683/55,538
100-999	316/104,515	118/36,210	394/118,172	60/16,351	35/10,926	923/286,174
1,000-4,999	83/195,098	18/36,734	41/82,504	9/21,737	6/11,815	157/347,888
5,000-24,999	29/345,521	2/19,550	2/23,350	1/6,045	2/45,480	36/439,946
25,000-99,999	14/606,695			1/48,519		15/655,214
> 100,000	5/777,317					5/777,317
Totals	761/2,041,985	339/99,203	1,176/248,587	393/100,765	150/71,537	2,819/2,562,077

¹Northern Region includes Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin.

²Local includes counties, cities, school districts, regional authorities, etc.

³PNPO = Private, nonprofit organization.

⁴Private includes only private individuals.

⁵Other includes industry, banks, universities and colleges (both public and private).

Table 5.--Number and acreage of nonfederal wilderness, wild, and natural areas, by ownership and size class, in United States

Size class (Acres)	Ownership class					Total
	State	Local ¹	PNPO ²	Private ³	Other ⁴	
< 99	395/16,248	238/ 7,885	876/29,251	388/9,771	148/4,621	2,045/67,776
100-999	474/172,357	156/ 48,182	518/163,629	90/26,056	62/18,499	1,300/428,723
1,000-4,999	163/384,860	29/ 60,429	80/167,908	23/55,109	15/34,033	310/702,339
5,000-24,999	74/881,484	5/ 50,240	18/200,481	3/32,757	3/50,710	103/1,215,672
25,000-99,999	24/1,014,121	1/ 26,380	6/283,986	1/48,519		32/1,373,006
> 100,000	7/1,225,637					7/1,225,637
Totals	1,137/3,694,707	429/193,116	1,498/845,255	505/172,212	228/107,863	3,797/5,013,153

¹Local includes counties, cities, school districts, regional authorities, etc.

²PNPO = Private, nonprofit organization.

³Private includes only private individuals.

⁴Other includes industry, banks, universities and colleges (both public and private).

In Pennsylvania, **NORSIS** received information only on the areas designated "wild" by the legislature; two other candidate areas that were not legislatively approved due to outstanding mineral rights were included in this study. In Michigan and Maine, the areas of the Porcupine Mountains State Park and Baxter State Park, respectively, were counted in their entirety by the **NORSIS** and **Stankey** inventories, while this inventory counted only those portions of the parks which have been dedicated to wilderness.

Information on the State-owned or **State**-recognized natural areas was likewise quite good, but variable in detail. Some States sent data only on State-owned property, while others sent information on all dedicated natural areas, along with the ownership category. Some States provided information on use restrictions on individual tracts, some on the program as a whole, and some didn't send any.

The trusts and other private, nonprofit organizations were quite cooperative, and several correspondents sent additional information on their organization's philosophy and management policy. The major problem with the trust lands is determining whether the land is wild or managed. Many of the tracts were working farms, or were managed to maintain the pastoral character of the landscape. Where these situations were identifiable, they were excluded, but very likely many were not discovered. Two sizable natural areas were excluded because the trust owners allowed dune buggies on the beach.

Nature centers are a difficult category to interpret. Most have some land that would qualify as natural, and all have some land that is obviously developed. In most cases, an arbitrary 50 acres were deducted to allow for the developed portion. Most centers associated with State or county parks or with arboreta were excluded altogether. Also, the information in the Natural Science for Youth Foundation (NSYF) Directory is admittedly incomplete. Ownership was not stated, and the areas were assigned to the most likely category. Many entries did not indicate an acreage and so were excluded.

The Nature Conservancy sent data that were different in many ways from any other private, nonprofit organization, and they will be discussed separately. TNC, as it is often called, sent a large computer printout containing information on the over 2,000 properties it had dealt with over the years, including those it owned and those it had conveyed to others. The printout was accurate to 1984, when the organization changed its record keeping methods; more recent data were unavailable. According to Frank Boren, President of TNC, they are presently protecting

an average of 1,000 additional acres each day.⁵ At that rate, the 1984 data have become quite obsolete. Nevertheless, for some States, the data supplied are the best available, so they were used.

The TNC printout listed, by State, the tract name, its acreage, and its owners. Many tracts were held by more than one owner, and in several cases the co-owners were in different ownership categories. The property was arbitrarily assigned to the category of the first owner listed, unless a better solution was evident. Also, in cross-checking tracts from the TNC list with State lists, serious discrepancies in acreage were often discovered. Assumptions were made about each tract to approximate the most accurate answer, but in many cases, the acreage was tabulated arbitrarily; no property was tabulated twice, however.⁶

Another limitation of the data is the difficulty in differentiating fee simple deed properties from easement holdings. Properties that are protected by easement or lease were excluded, but undoubtedly, there were some that went undetected. Also, some tracts abut others, making a single reserve in practice where two or more are in the inventory. Conversely, other tracts may be a group of several separate tracts. These situations affect the quality of the reserve in several ways, including perceived remoteness to a visitor, as well as minimum home range for an animal species. It should be noted, however, that the same conditions are occasionally found in the NWPS. Two examples are the Bob Marshall-Scapegoat-Great Bear group in Montana and the Joshua Tree Wilderness Area in California; the former are listed as three individual wilderness areas, but since they are contiguous, they actually form one large wilderness area; the latter is actually seven separate parcels, the largest of which has two sizable inholdings (U.S. Department of the Interior, Geological Survey 1987).

Probably the most serious problem associated with the inventory is uncollected data, either from a lack of response to the letter or from the authors being unaware of the existence of wilderness or natural areas. Nonrespondents will be recontacted and other land-owning organizations will be queried

⁵In a speech by Frank Boren at the World Wilderness Forum at Denver, Colorado, September 12, 1987.

⁶Possible reasons for such discrepancies are many. TNC's tract may have included portions that were not natural, or could have included investment property that was sold separately. Also, the State could have acquired the total natural area from two or more sources, one which was TNC. Whatever the truth is, the discrepancies tended to cancel each other, so that the resulting total was not greatly affected.

as their existence becomes known; as new data are received, they will be added to the RPA Assessment. Even so, a 'complete and up-to-date' inventory is an unattainable goal. There is no feasible way to canvas all the local governments, colleges, and universities, to get a complete list of their dedicated natural areas. Likewise, there are more than 600 local trusts (Pryor 1986), and numerous larger trusts. Without a directory, there is no way to contact them.

Corporate owners of reserves are a little easier to identify, since most are paper or timber companies. Many of the larger companies were contacted, but it is suspected that some are reluctant to release the information. The data for the corporate owner category are misleading, since they do not reflect the sizable tracts of land transferred from corporate to PNPO, State, or Federal ownership. Most timber based companies prefer not to hold land that is essentially not profitable. Rather, they prefer to give or bargain-sell it to another ownership category. The Great Dismal Swamp in North Carolina and Virginia is a notable example, but a great many other tracts, large and small, have been placed in a permanently protected status under other ownership.

A similar statement could be made for private, nonprofit organizations. The Nature Conservancy, in addition to owning and managing natural areas, has transferred many of its tracts to public ownership. The Trust for Public Land has protected 346,000 acres in 373 tracts, yet does not own or manage any land. Many other examples could be given.

Another large category of land that should be recognized is the land that has been intentionally excluded from the inventory, yet may provide the same benefits as that which was included. A few of these lands have already been mentioned, but others have not. Examples include the Wisconsin Wilderness Lakes (Germain 1984), the Adirondack (Adirondack Park Agency 1985) and Catskill Wild Forest Areas (New York State Department of Environmental Conservation 1985), and the Pinelands National Reserve in New Jersey (Good and Good 1984). These are, for the most part, rather large areas that are essentially wild, but because of permitted nonconforming management practices or visitor use (salvage cutting of timber, snowmobile trails, etc.), or because of vagueness of protection status, they have been excluded. Crispin (1980) appended a list of areas she considered but rejected for inclusion in her inventory of Michigan's natural areas. Such a list on

a national scale would be an enormously time-consuming endeavor. Also, when one backs away from a strict interpretation of wilderness and natural area definitions, one is faced with a 'continuum of wildness' that ends in New York City's Central Park. Which areas to include in such an inventory of near-wilderness and nearly-natural areas would be an unanswerable question. Nevertheless, such areas do exist, they do have meaning and value, and they should not be overlooked entirely in any study of wilderness or wilderness-like land. It is hoped, but not expected, that no such exclusions from this inventory were due to ignorance of the true situation.

CHARACTERISTICS OF THE TRACTS

The intent of this inventory was to include only areas that have been formally dedicated to the maintenance of a wilderness or natural environment. That criterion has been followed, with certain exceptions, and has insured that the areas are reasonably comparable to the NWPS areas. Except for size and other characteristics based on size, the variation in physical characteristics among the nonfederal areas is probably no greater than the variation within the NWPS.

State wilderness and wild areas are quite similar in all respects to their Federal counterparts. Many States have used the same or similar definitions in their wilderness legislation as is found in the Wilderness Act of 1964 (Stankey 1984), except for the Federal size limitation of 5,000 acres-Missouri allows 1,000 acres, Pennsylvania, Wisconsin, and Michigan allow 3,000 acres, California allows 5,000 acres, and New York requires a 10,000-acre minimum. On the other hand, these minimums have been more closely adhered to by the State legislatures than is the case with the Congress; several nonisland areas of less than 5,000 acres, including at least one of less than 1,000 acres, have been accepted into the NWPS (U.S. Department of the Interior, Geological Survey 1987).

The degree of 'wildness' on State areas varies greatly, as it does on Federal areas, Pennsylvania allows roads (but no new roads) and utility rights-of-way: on the other hand, the legislature disallowed one of the largest and wildest areas in the State because some of the mineral rights were privately owned. New York's Adirondack wilderness areas are quite likely wilder and less developed than any Federal areas in the eastern States. The Adirondack area also has a much longer history of protection, and its purity often has been fiercely defended against

encroachment of any kind. Michigan's Porcupine Mountains wilderness contains the second largest virgin forest in the East, after the Adirondacks (Crispin 1980).

The inventory had been planned to include State wild and scenic rivers, and the letters to State officials asked for such information. So few States responded, however, that not much meaningful information was obtained; notable exceptions are Ohio and California. Ohio's Wild and Scenic Rivers are described in the same directory with the natural areas, indicating that the State's officials regard the two resources as quite similar, and probably of interest to the same people. This is also obvious from the descriptions of the rivers. Rather than describing the canoeability of the rivers, which is the primary concern of most visitors to the National Wild and Scenic Rivers, the emphasis is on the more intellectual topics of history, geology, biology, and natural beauty. The California correspondent likewise ignored the canoe and raft users of the rivers, but, instead of relating to a naturalist's interests, the attention was almost solely on the fishing opportunities. Both States used selection criteria and restrictions that were similar to those in the Federal system.

In comparing wilderness areas and natural areas, one could begin with a definition of wilderness, Bloedel (1987) has expertly condensed the familiar definition in the Wilderness Act of 1984 to three conditions:

1. It is a place not controlled by humans, where natural ecosystem processes operate freely, and where its primeval character and influence are retained.
2. It is a place not occupied or modified by mankind, where humans are merely visitors and the imprint of their work is hardly noticeable.
3. It is a place with outstanding opportunities for solitude or for a primitive and unconfined recreational experience.

The first two conditions could be applied to a definition of natural areas with no change. The third item, however, is not applicable to natural areas. Although many natural areas do offer 'outstanding opportunities for solitude,' none offers an 'unconfined recreational experience' of the type we are accustomed to enjoying in wilderness areas. Natural area designation is primarily and sometimes solely (Washington State Department of Natural Resources 1987) for the purpose of preserving plant or animal species, critical habitat, or an example of an ecosystem, whereas the Federal and State wilderness areas are

largely the result of political decisions, with selection criteria that include the social objectives of recreation and solitude (Scott 1984). Several States and The Nature Conservancy have programs of selection based on 'elements.' An element is a terrestrial or aquatic ecosystem, a special plant or animal species, or a rare geologic feature (Polunin and Eidsvik 1979; Radford and others 1981; Washington State Department of Natural Resources 1987). Each element in the State is identified and given a priori ranking for protection, and each protected natural area is identified as having protected one or more of the listed elements. The goal is to locate and protect all the elements not yet protected.

Most States are not as strictly oriented to scientific objectives as is Washington. Most have adopted three main objectives for natural areas -scientific study, environmental education, and low impact recreation, including 'activities such as nature study, bird-watching, hiking, and nature photography' (Ohio Department of Natural Resources 1987). Scenery is included as an objective in Tennessee and several other States (Tennessee Department of Conservation 1985). The Trustees of Reservations, possibly the oldest such private organization in the nation, 'is dedicated to preserving properties of exceptional scenic, historic, and ecological value' in Massachusetts (Trustees of Reservations 1986). This broad goal is typical of the trusts and other **PNPO's**. Many of the private organizations select land because of its outstanding naturalness and attractiveness in a region otherwise very developed or altered by commodity resource use.

Natural areas usually offer opportunities for environmental education, and Ohio has specifically designated interpretation as the primary objective of several areas (Ohio Department of Natural Resources 1987). In this regard, such areas tend to merge with nature centers in objective and function. While the primary purpose of nature centers is education, most also have dedicated at least part of their property to preservation of nature; the rules of visitor use are also generally the same as for natural areas.

Secondly, most natural areas are more natural and enjoy better protection than wilderness. Karel (1984) opined that much of the Federal wilderness in the East is on land that 'would not qualify as natural areas in most State systems.' Natural areas have stricter rules for selection and visitor use, and may attract a different type of visitor. Recreation of the sort enjoyed by the usual wilderness seeker is not an objective, nor is it permitted. Ohio has a long list of regulations, written in the purest of legal language, that **prohibit** everything from rock climbing to drinking

alcoholic beverages. Most States and organizations forbid camping, fires, picnicking, pets, motorized vehicles, straying off the trail without written permission, and collecting anything. Many States have different rules for different areas, and a few areas are off limits to any public visitation. Hunting is sometimes permitted, sometimes not.

Likewise, natural areas receive no development except trails and trail head parking; a few offer restroom facilities. Managers of areas that have prairie remnants often practice prescribed fire to maintain the prairie vegetation. This manipulative practice was accepted by this inventory, since many NWPS area managers recommend the same treatment to control artificial fuel accumulation; however, those areas where fields were mowed or grazed to maintain an historic pastoral landscape were excluded from the inventory.

Another reason for the better protection of natural areas from misuse is the proprietary interest in them by local naturalists, who in all likelihood were the people who worked and sometimes paid to protect the resource. Often, the "saving" of a tract of land is the *raison d'être* for the formation of a local nature organization. The Michigan Nature Association began just this way 35 years ago, and now owns 4,800 acres on 103 tracts in all parts of the State (Michigan Nature Association 1984).

The actual degree of protection received by natural areas and State wilderness areas varies widely by ownership and the managing agency. A few natural areas that receive relatively large numbers of visitors are staffed; at the other extreme are areas that are off limits to visitors and may be inspected annually for boundary maintenance and evidence of disturbance. The financial health of the owning agency or organization, the degree of interest taken by those responsible for the area, and the history of abuse of the area are all factors that help determine the degree of protection received.

The situation is not a great deal different with the Federal wilderness areas. Although all four Federal wilderness agencies are guided by the same 1965 Wilderness Act, the actual management and protection of the Wilderness Areas varies considerably among the agencies. The National Park Service has been traditionally more protective of the wilderness character of its lands than has the U.S. Forest Service. The latter allows much greater freedom of travel and choice of activities (e.g., off trail travel, fire building, campsite location) than does the Park Service. This difference in wilderness management policy is an extension of the historic role of the two agencies.

Variation within the agency may also be significant. An illustration involves a trail crossing a stream in a Southern Appalachian National Forest Wilderness Area. At the time of establishment of the Wilderness, there was a substantial, but appropriately designed, wooden foot bridge across the stream. The District Ranger interpreted the Act to mean there should be no bridges, and the bridge was removed. The next Ranger thought the wilderness character could be better preserved with a bridge, and a simple, but appropriate, foot log was emplaced. A hand cable was added later for safety. When this bridge was destroyed, a third Ranger installed an elaborate, poorly designed, and very inappropriate wooden bridge. This extreme lack of consistency may be the exception, but some inconsistency in the interpretation of the Wilderness Act is to be expected.

Protection of wilderness and natural areas from changes in policy or law is inherently more variable in the nonfederal areas, simply because there are 50 States and hundreds of other owners, all having slightly different laws, objectives deed interpretations, and degrees of managerial dedication to preserving the resource values. And there is an equal number of legislatures, boards, commissions, and trusts whose frequent membership and leadership changes create possibilities for changes in law or policy.

The Federal areas, on the other hand, are largely guided by interpretation of the 1964 Act by the four managing agencies. While attempts have been made by the Federal administration to either remove areas from the Wilderness System or to ignore the Act's restrictions on development, client organizations have been successful in preventing the changes. There have been no such serious challenges from Congress.

A third major difference is in the number and distribution of natural areas compared with the Federal Wilderness Areas. There are several times as many natural areas as there are Wilderness Areas. More importantly, in the East, where the population is dense, the landscape is thoroughly altered, and Federal Wilderness is scarce, there are many more natural areas than in the West, where Federal Wilderness is relatively abundant. By their numbers and distribution, and in spite of their generally smaller size, they offer an easily accessible place to escape from the artificial environment.

The fourth and most obvious difference between natural areas and wilderness is size. Over half of the natural areas are less than 100 acres (table 5), and many are less than 10 acres. On the other hand, many natural areas would easily qualify for the NWPS

if they were Federally owned; the largest is over 60,000 acres. Size and location interact to affect an area's protection from unauthorized uses. Size is also a strong determinant of wildness, and, to a lesser extent, naturalness. The effect of size on values and benefits will be discussed in the next section.

Corporately owned wilderness and natural areas are quite varied in size and other characteristics. Westvaco maintains several small natural areas that have been developed more or less as environmental education sites for public use. Bowaters Southern is well known in the forest industry for its Pocket Wilderness Areas- tracts from 100 to 700 acres whose scenic and recreational values outweigh their value for timber production. Until recently, Buckeye Cellulose owned a 3,000-acre tract of wilderness along the lower Suwanee River in Florida.

Most privately owned wilderness and natural areas are small, usually less than 25 acres, and many are not available for public use, or require explicit permission for entry. A notable exception is Grandfather Mountain, a privately owned 3,500-acre tract in North Carolina's Blue Ridge Mountains that may be the nation's only commercially successful wilderness. A few hundred acres adjacent to the public highway are operated as a tourist attraction, while the remainder can be visited only by a rugged trail that sometimes becomes a wooden ladder fastened to a cliff. Dayhikers pay only the basic entrance fee for the entire attraction, while backpackers pay a modest extra charge (Johnson 1983).

A COMPARISON OF VALUES

The many human values of wilderness have been enumerated many times before, beginning perhaps with Catlin and Thoreau, and more recently summarized by Hendee and others (1978), Bloedel (1987), and Nash,⁷ to name a few. Likewise, the values of natural areas have been frequently described (Hinds 1979; Olson 1984; Thorn and Iffrig 1985). This section will very briefly review and compare values provided by the State and Federal wilderness areas with those offered by the generally smaller natural areas.

Most of the values of wilderness areas are also provided by natural areas. Both types of areas are valuable to science, in at least three ways:

1) As a comparison or control with other areas altered by use or development;

2) As a preserve of genetic material that has evolved without artificial assistance or hindrance;

3) As a reservoir of plant and animal species that may, at some future time, be of great value to humans for food or medicine.

Stankey (1987) has written a thorough discussion of scientific values in wilderness. A noteworthy observation is that since he did not set a specific minimum acreage for a wilderness area, from the standpoint of its value to science, ostensibly he would include natural areas in his definition.

Stankey did discuss the effect of size of area on biological integrity, and an area's value as a species reservoir is directly related to the spatial requirements of the species. The larger the range of the species, the less the value of the small natural areas. At the extreme, in the case of mountain lion or caribou, all but the largest Federal wilderness areas (or the Adirondacks) are inadequate. On the other hand, natural areas of 100 acres are generally able to maintain the medium-sized mammals (fox, squirrel, skunk, etc.). Some plant species can be protected on even very small sites. For plants or animals, however, the smaller the site, the less likely it is that natural events can be relied upon to maintain the successional stage required by the species, and therefore, the more necessary artificial manipulation becomes (Morse 1987).

The effect of tract size on ecosystem and species preservation has been the topic of much discussion and speculation among biologists (e.g., Harris 1984), and is a key element in the developing science of landscape ecology (e.g., Forman and Godron 1986). Lewin (1984) reports on a major research effort to find the relationship between tract size and species distribution, Forty tracts of Brazilian wilderness 1 hectare, 10 ha., 100 ha., 1,000 ha., and 10,000 ha. in size, will be studied for 30 years for plant and animal species compositional changes, edge effects, and chain effects (e.g., loss of ants leads to loss of ant-eating birds). If it can survive the Brazilian political, social, and economic environment, the 'Minimum Critical Size of Ecosystems Project' promises to yield some very useful and interesting information.

⁷In a speech by Roderick Nash at the World Wilderness Forum at Denver, Colorado, September 11, 1987.

In spite of Nash's admonition to exclude recreation as a wilderness value, recreation is in fact a major value of wilderness, as well as of natural areas. Whether people visit wilderness in order to hike and camp, or they hike and camp in order to enjoy the wilderness is a question that is difficult to answer, and may never have been asked; perhaps there is an indivisible synergism at work. But wherever the truth is, people do value the experience of hiking and camping in wilderness and other natural environments. They enjoy the psychological values described by Nash, which are probably wilderness dependent, and they enjoy the challenge of physical exercise often associated with wilderness travel, although it is not wilderness dependent.

Many of the psychological values associated with wilderness recreation may be enjoyed on natural areas as well, but those values deriving from physical exercise are very limited. Long hikes are impossible, camping is prohibited, and getting off the trail is discouraged if not banned. These restrictions effectively prevent a visitor from getting remote from human development—"out of sight and sound of civilization"—which for many is the essence of a true wilderness experience.

Of course, accessibility and lack of remoteness can be an advantage, in that it allows more people to enjoy the natural environment more frequently. With proper management, including prohibition of camping, horses, dogs, fires, etc., the smaller, close-in areas can provide most of the benefits of larger areas, even including solitude. One should remember that Thoreau's Walden was essentially a small natural area, close to the Village of Concord and not far from the City of Boston. In addition, by providing what might be called a mini-wilderness experience, the smaller areas protect the larger wilderness areas from much of the overuse they might otherwise get. Also, most visitors to even the smallest natural areas have an ethical kinship to wilderness seekers, and they are a likely source of valuable support for wilderness preservation.

Wilderness areas and, to a lesser extent, natural areas are valuable as examples of the wilderness faced by our pioneer ancestors. Our national character was forged in the contest with wilderness, and each generation should be introduced to and reminded of the pioneers' constant struggle for existence. Similarly, in wilderness and in the larger natural areas, visitors can experience the sense of vastness and emptiness that the pioneer knew.

Finally, any natural or wilderness area provides opportunities to appreciate nature in ways that are impossible on developed or managed land. Our mental health may be positively affected by preventing or overcoming stress associated with our fast-paced civilization. One can relax and enjoy the simple pleasures of contemplation, inspiration, or even worship. At the same time, one can learn to appreciate the truly good aspects of our modern, mechanized, electrified, and computerized society. When one spends some time away from unnatural sources of power, communication, or personal comfort, one returns home with a sharpened perspective of what is music and what is noise.

Both wilderness and natural areas are valuable as natural laboratories for environmental education; for this purpose, natural areas probably have the edge, since they are more accessible. Nature centers are frequently natural areas that have been dedicated to the major objectives of education, rather than preservation. Although the two objectives are not mutually exclusive, nature centers require some development, such as an interpretive building, road, parking lot, and utilities. Depending on the specific program, there may be some environmental manipulation for demonstration or for maintenance of successional stages. Nevertheless, the area preserved in natural conditions is nearly always substantial, and visitors to nature centers seek and find the same experience as on an undeveloped natural area.

TRENDS IN NONFEDERAL WILDERNESS AND NATURAL AREAS

The literature on natural area preservation and wilderness preservation does not indicate any formal or direct relationship between the establishment and growth of the National Wilderness Preservation System and the establishment and growth of the natural area preservation movement. Two possible relationships may be surmised, however. In the more likely situation, the two movements may have nearly coincided in time because they were being propelled by the same need. People who were aware of and alarmed by the growing scarcity of undeveloped, unmanaged areas were likely the source of both movements. The differentiating factor was the specific objective of each group. One group was concerned with the preservation of wildness, which subsumed the preservation of nature, while the other was concerned with the preservation of nature, i.e., species and communities, with the concept of wildness being given much less, if any, consideration.

A second possible scenario recognizes only one undifferentiated group of activists who worked to preserve both wilderness areas and natural areas. Perhaps a few individuals could claim allegiance to both movements, but, there is no evidence to indicate that this happened on a large scale. On the contrary, the literature contains few names that are familiar to both movements. George Stankey's (1984) paper in the **"NAJ"** on State wilderness is the exception rather than the rule.

In addition to the environmental movement sparked by Rachel Carson's book in 1962, it is quite likely that a major impetus to the natural area movement has been the income tax provision for a charitable deduction of the accrued value of property. People who owned tracts of land but who really did not want to liquidate the timber had an option that allowed some remuneration but still preserved the environment. The Nature Conservancy, regional and local trusts, State and local governments took advantage of the situation to protect millions of acres on thousands of individual tracts. A more recent technique that is becoming popular is the State income tax refund check-off program (Ohio Department of Natural Resources 1987).

Natural area preservation has been with us at least since the Trustees of Public Reservations⁸ was formed in 1891, but only since 1950 has it attracted serious attention. In that year, the Ecologists Union, which had been engaged in natural area preservation on a case-by-case basis, became The Nature Conservancy. TNC then embarked on a planned effort to acquire examples of ecological communities and to protect species by acquiring critical habitat (Fell 1983). The movement grew slowly at first. In 1951, Wisconsin passed the first State legislation for natural area protection; in 1963, Illinois began the first State system of dedicated natural areas; in 1976, South Carolina became the first State to establish a cooperative natural heritage program with TNC; in 1978, the Natural Areas Association was formed; and the 'Natural Areas Journal' was begun in 1981 (Fell 1983).

Much additional evidence exists to indicate the natural area preservation movement is young and still growing. The recent birth of the 'Natural Areas Journal,' the newness of the State natural area directories (Ohio and Washington-1 987, Indiana and Missouri-1 985, Michigan-1 980) and the speed at which they become obsolete, the number of States that are just now getting their program underway, and the growth of Research Natural Areas on the

national forests (Juday 1986) are just some of the indicators of a youthful movement. The phenomenal growth of The Nature Conservancy is another indicator. A "progress report" in the November/December issue of **"TNC Magazine"** (The Nature Conservancy 1987b) compared the first six months of 1987 with the same period of 1986: a 28 percent growth in overall contributions, a 43 percent increase in contributions from individuals, an 86 percent increase in unrestricted gifts of \$1,000 or more, a 46 percent increase in corporate gifts of cash, and an 808 percent increase in the cash value of corporate gifts of land. Individual memberships increased by 12 percent during the same period. The Nature Conservancy now has a Natural Heritage Inventory program in nearly every State and is moving toward the goal of identifying and protecting each natural element in each State (The Nature Conservancy 1987b). The Nature Conservancy believes the problem of the loss of endangered species and ecosystems can be solved in 15 to 20 years by acquisition and other site protection methods (Nutter 1984).

Although the natural area movement is still gaining momentum, the rate of acquisition will begin to wane after 10 to 20 years. The rationale for this prediction is that, as the list of unprotected elements is reduced, the more difficult it will be to locate and acquire the properties containing them. The possibility also exists that some of the elements may disappear or become totally unavailable before they can be acquired. Frank Boren, President of TNC, alluded to this problem when he said that, although TNC was adding 1,000 acres a day to the protected category, that figure must rise if we were to have an example of each element in a protected status.⁹

Natural area protection is not limited to one example of each of the elements, and replication is both desirable and expected. Also, as "second growth" forests mature, they too will become attractive to new generations of nature admirers; even then, more old fields will succeed into more "second growth" forests, and there will always be more land to be added to the total. Therefore, while the rate of natural area acquisition will eventually decline, it will not come to a nearly complete stop as the State wilderness preservation movement will do.

The number and sizes of State wilderness areas will increase slowly, if at all, in the near future. Most of the States with large, unroaded tracts already have reserved them in a wilderness program. Those States with a large State forest system, such as

⁸The name was changed to Trustees of Reservations in 1954.

⁹In a speech by Frank Boren at the World Wilderness Forum at Denver, Colorado, September 12, 1987.

Michigan and Pennsylvania, have the option of removing land already **roaded** and managed to a wilderness status, but this is very unlikely to happen. An investment has been made in those forests, their quality is steadily increasing, and the States will soon be enjoying the benefits of well-managed forests. To abandon that investment would not only be illogical and uneconomic, it would be politically unwise.

The Nature Conservancy has provided much of the impetus to put and keep the movement in high gear. They are able to work almost as a **quasi-government** agency, to provide a reasonable and reachable goal of preservation, to define the criteria for natural area selection, and, perhaps more important, to attract the people with the wealth to give land or pay for the acquisitions. Other State-wide and local organizations have emulated them or followed their lead. The Michigan Nature Association described earlier is but one of hundreds of successful citizen organizations. The Nature Conservancy's success in protecting tracts, their lead in establishing **criteria**, and their ability to cope with the organizational variety presented by the 50 States have clearly established the organization as the leader in natural area preservation. In light of this, the call for a "uniform system of National Biological Accounts" in the report of the President's Commission on Americans Outdoors (President's Commission on Americans Outdoors 1987) is very puzzling, akin to a plea for the re-invention of the wheel. Instead, TNC should be recognized for its leadership, and should be given every appropriate assistance in its pursuit of the goal of protecting at least one of every species and natural community in the nation.

Another movement that is just now being born and will soon increase in importance for nonfederal wilderness and natural areas is the acquisition of corridors, including mountain ridges but especially river floodplains, to link existing nodules of natural areas, parks, forests, and other undeveloped land into a network of linear natural areas. These corridors will often reach into and through cities and towns, allowing urban residents the opportunity of experiencing a natural environment without traveling great distances. The term **greenway** has been used in recent years to describe this corridor concept, especially since the report of the President's Commission on Americans Outdoors (President's Commission on Americans Outdoors 1987), but the term **trailway** is really more descriptive, since these corridors will be more like wilderness than like parks, and their major development will be trails.

Even before the PCAO hearings, biologists had been recommending the protection of existing -corridors and the establishment of new corridors of natural environment to combat the problem of habitat fragmentation (Harris 1984). In response to that need, at least one State has begun an acquisition program aimed at increasing the quantity and quality of wildlife habitat; the effort will be directed, at least partially, at floodplains.

Floodplains are an attractive target for several reasons. One, since they are unsuitable for residential, industrial, or commercial development, they have a relatively low commercial value, and more area can be acquired per dollar. Secondly, they are often continuous (unbroken), allowing a physical link between points. Thirdly, although they do not offer great diversity in habitats, they are rich in fauna and flora, and the presence of the stream helps to ensure the continuous existence of those populations.

Mountain and ridge crests are also desirable sites for natural corridors, and the Appalachian Trail corridor is an excellent example. Ridge lines are more frequently broken by roads, however, and the ridges themselves are rapidly becoming high priced real estate. Also, many of the mountain crests, both east and west, are already in public ownership. Further major ridgeline acquisition would be very costly and probably not economically justifiable. Individual ridge tracts will continue to be protected, but not in any systematic way.

The **greenway** movement will contribute to the preservation of natural areas and wilderness in two ways. One, at least some of the greenways will be established in areas relatively remote from population centers (for example, along a river between two cities). These greenways may themselves be dedicated natural areas and, in any event, could provide an experience not unlike a wilderness experience. The people who visit an urban or suburban **greenway** may forgo a visit to a natural area or wilderness area, thus reducing the social and environmental impact on those areas. This is not to imply that urban greenways will provide a wilderness experience; rather, that many people visit wilderness areas for an "outdoor experience" that they can't get elsewhere, because there isn't any elsewhere. The value of greenways to wilderness and natural areas will be lessened to the extent that the greenways themselves become crowded with visitors, or become overwhelmed by joggers, cyclists, or other users who would destroy the illusion of a natural or wild environment.

The use of nonfederal wilderness and natural areas will undoubtedly increase. Unfortunately, there are few data on numbers of visitors to support that prediction. It is based on the belief that people will become dissatisfied with the crowded conditions in many of the Federal wilderness areas. As they search for less crowded areas, they will discover the less well known State wilderness areas. They will also discover that solitude and natural environments exist outside of wilderness, and will discover what the nature seekers and bird watchers have known all along, that, for day use, nearby natural areas, nature centers, and river floodplains are an excellent substitute for wilderness.

ADDITIONAL OPPORTUNITIES AND CONSTRAINTS

The separateness of the advocacy groups for the three categories of wild lands -federal wilderness, State wilderness, and natural areas- has thus far not been a problem. Each group had its agenda, and each has been fairly successful. Now, however, there needs to be more interaction, more cooperation, and most important, a mutual appreciation of the values of all three types of wild land.

All three groups need to redirect some of their efforts, energy, and attention to the protection of corridors. This may be accomplished by a combination of fee or easement acquisition and floodplain protection ordinance. The groups should cooperate with wildlife and game interests to further increase their political influence.

One of the problems, at least in some States, is the ignorance of public officials and even some conservation commissioners on the value of **preserving** natural areas. People who occupy these positions of influence tend to be pro- development, but anti-science, anti-nature, and anti-aesthetics. **Wildland** advocacy groups should pay more attention to who gets elected and appointed. Many rear-guard defensive battles may be prevented by a little more aggression in the right places.

If and when the Federal government restores the Land and Water Conservation Fund, as PCAO has recommended, a unified wilderness and natural area lobby should steer at least a substantial part of the fund toward land acquisition for natural area protection, rather than allot all the money to developed recreation facilities.

The "wildland lobby" should also support renewed emphasis on cleaning up the rivers. Sewage disposal facilities and water quality monitoring has paid off very well; the gains should be maintained and increased.

NEEDED RESEARCH

In all the copious literature, in all the correspondence with State, PNPO, and trust representatives, one major gap in our knowledge is easily recognized. Wilderness research seems to be reasonably balanced between physical, biological, and ecological topics on the one hand with social, psychological, and aesthetic topics on the other. Natural area literature, however, appears to be nearly all on the biological and ecological aspects. This may be due to the movement's youthful stage of development, where the preservation of natural areas is more immediately important than their management and use. Indeed, recreational use of natural areas is perceived by some to be a great danger (Fell 1983). Few correspondents had any visitor-use data, although most letters and promotional material included information on permitted and forbidden activities.

The above-mentioned gap in our knowledge is the lack of information on the natural area visitor. One reference stands out (although an exhaustive search was not made) -Olson's study of visitors to Ohio's natural areas, and his comparison of them with visitors to Federal wilderness areas (Olson 1984). He found a remarkable similarity between the two groups in sex, age, income, education, professions, and membership in conservation organizations.

This information, if it is generally true, is potentially very useful to wilderness managers, who may at last find an audience sufficiently concentrated to make some of the off-site educational techniques really feasible. But first, Olson's work needs to be replicated and expanded. Specifically, the following questions need to be answered:

1. a) Are visitors to natural areas aware of (NWPS) Wilderness?
b) Do visitors to natural areas also visit Wilderness?
c) What is the attitude of natural area visitors toward Wilderness?
2. a) Are visitors to Wilderness aware of natural areas?

b) Do visitors to Wilderness also visit natural areas?

c) What is the attitude of Wilderness visitors toward natural areas?

3. What, if any, is the relationship between Wilderness visitors, natural area visitors, and those attempting to establish greenways and trailways?

4. What is the opinion of Wilderness visitors on the quality of nonfederal wilderness? of natural areas?

5. What type of organizations do Wilderness visitors belong to, compared with natural area visitors?

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WILDERNESS RECREATION SUBSTITUTES: THE POTENTIAL OF LANDS OUTSIDE THE NATIONAL WILDERNESS PRESERVATION SYSTEM

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Abstract— The availability of lands outside the National Wilderness Preservation System that may provide wilderness-type recreation opportunities is approximated. Acreage of these lands is estimated and broken down by managing Federal agency (for Federal lands), or level of government (for nonfederal lands). Recreationists' perception of recreation substitutes are examined, based on readily available data. Suggestions for future research are given.

This paper will not try to answer these questions completely. Instead, it will present an initial, nationwide attempt to inventory non-NWPS lands that retain some, if not all, of the primary characteristics of *de jure* wilderness.² These lands should encompass most of the potential alternative sites for wilderness-type recreation. The second issue of recreation substitution behavior will be addressed, albeit indirectly. It would be preferable to present data on actual substitution behavior, but this is not possible from existing nationwide databases. As a first step in this direction, data on recreationists' perceptions of substitutes will be presented, as will a more in-depth look at the theoretical issues involved.

From a management perspective it would be helpful to know if, or to what extent, unroaded lands outside the NWPS alleviate crowding, conflict, or excess use on wilderness lands. Some empirical investigations into this idea have been done with generally positive results. Although some reservations linger, it seems clear that substitution does occur and that it should be addressed in wilderness management plans (e.g., Brown and others 1987; Cole and others 1987; Lucas, 1980). Irrespective of the stumbling blocks that these studies suggest might lie ahead, this paper begins with the presumption that a national assessment of the substitution potential of non-NWPS lands is a useful idea and is feasible at least in principle. Yet, as with almost any new direction, the initial stages are fettered with problems of concept definition and data availability. This time is no exception.

As noted above, for a non-NWPS inventory there is the issue of where to draw the definitional (and thereby actual) boundary. Some wilderness substitute

INTRODUCTION

Baseline information on wilderness is important to a better understanding of future changes in the nationwide supply of and demand for wilderness recreation. Equally important are data on lands outside the National Wilderness Preservation System (NWPS). It is logical to ask what, if any, of the demand for wilderness-type recreation can be met on lands that have not been formally designated as wilderness under the 1964 Wilderness Act. Although there have been some significant additions in recent months, as of January 1987 there were about 88.8 million acres currently in the NWPS (U.S. Department of the Interior, Geological Survey 1987). An informed hunch is that there are at least this many acres outside the NWPS that are similar enough to provide high quality wilderness-type recreation. Whether or not people use these lands as substitutes for NWPS lands is still unknown. Thus, the question of recreation substitution as it applies to wilderness lands is really two-fold. First, how much wilderness-type land exists and, second, to what extent do recreationists actually make substitutes?

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²Throughout this paper the term wilderness will be used to refer to lands in the NWPS. Where it is important to distinguish between these formally designated lands and others that are of the same character, it will be done through the use of terms such as 'defacto,' '*-type,' or some other explicit means.

lands are defacto wilderness and may become part of the NWPS at some future date.³ Others meet only part of the definition for inclusion but can offer recreational opportunities of sufficiently high quality to make them reasonable substitutes (particularly for less 'purist' oriented recreationists). Unfortunately, data do not exist to easily identify all lands in either of these two categories. Even though the two types of substitute lands are grouped together in the data below, the past successes of the wilderness preservation movement suggest that most of the lands reported below fall into the latter category. This notwithstanding, the analysis below is also forced to rely on some crude measurement devices. As will be seen the original <databases are often developed for other purposes and/or the data may be self-reported and thereby are colored by agency policy directions, It is hoped that reporting such data will not alter the overall conclusions, even though confidence in the validity of parts as they relate to the task at hand may be questionable at times.

Similarly, the second aspect of the overall question (substitution behavior) has confusing, muddled definitional waters. Wilderness recreation, per se, is not merely a function of NWPS designation. Precisely because the primary focus is on a behavior, wilderness recreation, the substitution process may be defined in terms of the motivations of visitors. Nonetheless, the criterion necessary to define activity substitutes in motivational terms have yet to be agreed upon by researchers. And, as might be expected, a consistent nationwide database of this sort doesn't exist either. Our overall approach is to summarize what **is** known about substitutability as an experience-based phenomenon and, **as** part of this task, to develop a first-cut inventory of the lands upon which the recreational experiences depend, even if the two cannot be closely linked with the data available. This makes a somewhat disjoint presentation, and the reader is asked to integrate seemingly disparate and rough-cut ideas. It is hoped that, despite this, some consistent sense of the next research steps will emerge.

BACKGROUND

If the research focus is broadened to more than just wilderness recreation experiences, two basic approaches to recreational substitution are dominant in the literature. Researchers have approached it as a problem of either area substitution or experience

substitution. The essential distinction is whether a person goes to a new area for a given experience or maintains an interest in the original area and changes his/her experiential objective(s). Data are presented below that address the concept of substitutability from each of these perspectives. Under the first approach is the issue of how much substitutable land may exist. It seems safe to assume that many, if not all, of the primary experience values associated with the use of NWPS lands are available to visitors of the areas that have some of the characteristics of wilderness. As pointed out in another paper, 'with proper management ... the smaller, close-in areas can provide most of the benefits of larger areas, even including solitude' and thus function as reasonable substitutes for NWPS lands (Cook and English 1988). Nonetheless, this involves something of an act of faith in that only rarely have people actually measured substitution behavior, per se. It is presumed that if it 'looks like wilderness' people going there are likely to have what they would term a 'wilderness experience: By counting acres that have wilderness qualities you can begin to assess the potential to provide these experiences at non-NWPS places.

More progress has been made on the experience substitution idea. As a general topic, this type of research goes back about 20 years. In 1969, Moss took what has been a fairly standard approach and factor analyzed participation in recreation activities. He then asserted that activities that mathematically grouped would be substitutable in as much as they probably meet similar drives or needs. However, this and similar work, seems to run counter to the viewpoint that wilderness recreation is more or less unique and relies on an individual's state of mind. Or as Nash (1973) put it, that wilderness 'produces a certain mood or feeling in a given individual ... One man's wilderness may be another man's picnic area.' Despite such view points, the 'activity grouping' approach has been continued. Later studies such as the one by **Hendee** and Burdge (1974) also followed this mathematical modelling paradigm.

Irrespective of the relative merits of factor analysis, hierarchical clustering, **MANOVA**, etc. these approaches are basically attempts to group activities based on geometric or mathematical similarities in the data. Usually, the analyses are based on variables that either measure amount/frequency of participation or the subjective importance of the activity. The primary criticism of this approach is that none of the studies explicitly addresses substitutability as a function of similarities among any of the constituent parts of the activity (e.g., social norms, psychological outcomes). Instead, these approaches rely on common sense, or face validity, of the similarities for any given activity type/category across individuals. With the increased

³In fact, given the time lag from data collection to analysis, some of these lands are already in NWPS. The data are current as of January, 1987. Wilderness bills passed in the last session of Congress are not included.

understanding of the social-psychological dimensions of recreation that has emerged over the past 20 years it is reasonable to now reassess this approach. And, as noted below, some people have done so.

A radically different theoretical approach that emerged at about the same time was an application of classical economic theory. In the key article by Cordell (1976) the concept of substitutability is defined by acre-to-acre elasticity based on supply and demand determinants. That is, he reported the mathematical relationships among variables such as average family income, percentage of land in golf courses, or density of residential structures and used these as predictors of substitution behaviors. Clearly, this approach is vastly different from the activity-based substitution definitions of other researchers. Despite its solid theoretical underpinnings this line of research has not been carried forward. Analyzing demand from a paradigm of indifference curves and elasticities is apparently not as appealing as viewing it from the more commonly understood perspective of psychological variables such as motivations, need fulfillment, or desired experiences.

Complicating today's picture further is the recent criticism of past approaches to substitutability especially the **activity-based**, mathematical models. This is in part because most social scientists have neglected the econometric formulation in favor of more familiar theoretical social-psychological ground. However, even this more common approach to substitutability has been appropriately criticized because it relies on similarities in actual use patterns to represent essential features of the recreationist's substitution decision process. If someone skis as often as she fishes, it may make the two activities cluster together and thereby be judged (by researchers) to be substitutes when, in fact, the two are 'apples and oranges' in the mind of the recreationist as far as outcomes or benefits are concerned.

Concerns about the adequacy of the "traditional approach to activity-substitutes began to appear by the late 1970's (Becker 1976; Christensen and Yoesting 1977). Recently, the whole question of just what makes an activity substitutable has been raised many times (e.g., Baumgartner and Heberlein 1981; **Iso-Ahola** 1986; Vaske and others 1988; Vaske and Randall 1984). Most recently, one study seems to have summarized the concern well by concluding that even though a substitute activity may be similar to the first choice activity, the substitute may have quite different perceived qualities (Manfredo and Anderson 1987). They added that they had found a lack of relationship between the similarity of an activity/substitute pair and the importance of the constituent attributes of one or another of that pair.

From which they concluded that substitutability is 'appealing in concept but untenable in practice.' In particular, they assert that specialized users (in their case fly-fishermen) have fewer substitutes than generalized categories of users (e.g., campers). However, the problem that their data point to may be caused by the way that activities have been treated theoretically, as much as a fundamental flaw in the overall logic of substitutability itself. In summary, recent studies have focused on a number of substantive problems, but at this point it is hard to choose from among competing theoretical explanations, largely due to the simplicity (some might say crudeness) of the basic variables employed. And there is no compelling reason to drop this line of investigation as 'untenable.' Better tests are needed first.

For wilderness users then, researchers must decide whether 1) all users (or some subset, e.g., backpackers) make similar substitutions (or better yet exactly same) by virtue of their group membership (*sui generis*) or 2) whether we need to focus on specific, situated experiential outcomes that inhere in each recreationist independently. Then, it will be possible to deal with the adequacy of substitutes in a more highly differentiated fashion (and if the latter choice is made, which theoretical approach will be most productive). Studies of wilderness users have shown quite different patterns of motivation from place to place (Lucas 1980; **Stankey** and Schreyer 1987) or even within one wilderness area (Absher 1981). Such geographic variation in experience expectations must be addressed in order to more accurately operationalize the concept of substitutability, however defined.

Finally, the empirical analysis in this paper will have to be based on existing data sources. The measures available are extremely crude relative to these questions, but raising these issues will sensitize us to the type of conclusions that can be made at this point about area or experience substitution potential, and at the same time point us in the right direction as far as further work that is needed.

METHODS

The empirical information presented below came from three primary sources. The data about recreationists' substitution preferences are from the 1987 Public Area Recreation Visitors Study (PAWS). PARVS is a nationwide database of over 35,000 cases taken from on-site interviews and **mailback** questionnaires.

However, within this study the Recreation Opportunity Spectrum (ROS) and wilderness site information exists only for interviews conducted on Forest Service lands. Even though not originally gathered for this task, the ROS encoded areas are consistent with the need for information about the wilderness-like characteristics of non-NWPS lands. After case weighting, the total possible n for this segment of the PARVS database is 5,243.

Estimates of unroaded acreage in various land ownership were compiled as part of the National Outdoor Recreation Supply Information System (NORSIS) effort. The data available include acreage of a given unit and the miles of developed roads it contains. For this paper the NORSIS data were put through a simple mathematical algorithm to subtract wilderness lands and an acreage equivalent to a mile-wide corridor (i.e., roughly equivalent to lands one half mile to either side of their roads) for each mile of road reported to be associated with each tract of land. This subtracts 1) lands already in the NWPS and therefore not substitutable for them; and 2) a very rough estimate of lands that are not likely to produce wilderness experiences due to their proximity to development. Both the PARVS and the NORSIS databases are products of the Southeastern Forest Experiment Station's Recreation and Wilderness Assessment Project at Athens, GA. The acres of wilderness land, even though included in the NORSIS database, are taken from the compilation done by the U.S. Geological Survey (U.S. Department of the Interior, Geological Survey 1987) and are accurate as of January 1987. Any discrepancies between the NORSIS inventory and the USGS one are likely to be due to reporting errors and/or date of

the initial report from the agency. Visual inspection of the two lists shows them to be nearly identical in acreage.

RESULTS: EXPERIENCE SUBSTITUTES

First, will people look for substitutes? Table 1 cross-classifies the wilderness status of the interview site and the ROS categorization of the land. In theory, wilderness designation should only occur on lands under primitive (P) or semi-primitive nonmotorized classes (SPNM). Only 10 percent of the wilderness interviews occur outside of these two ROS categories. By definition P and SPNM lands are the lands most likely to offer substitutes for wilderness recreation opportunities. There are 608 cases in these two categories. Of this total, 283 or about 46.5 percent of the interviews are in non-NWPS sites. This suggests that about half of all P or SPNM recreation occurs outside designated wilderness. Even though the data are weighted on a nationwide basis, such a direct extrapolation to all Forest Service lands is not warranted without caution: the PARVS database is much larger and the ROS data naturally refer only to interviews on Forest Service lands where the ROS classification has been applied. Some Forests in Montana, for instance, have yet to apply the ROS classifications to their lands even though we are certain that substantial proportions may fall into P or SPNM classes.

Nevertheless, if this pattern holds elsewhere as well, substantial wilderness-type (P and SPNM) opportunities exist outside the NWPS. This sounds like a bonanza of unrecognized potential wilderness

Table 1. --Respondents by ROS categories and wilderness status of site (PARVS data)

Wilderness status	ROS categories							
	Primitive		SPNM ¹		Other		All	
	n	%	n	%	n	%	n	%
Nonwilderness	110	29.6	173	73.0	1,850	90.0	2,139	80.0
Wilderness	261	70.4	64	27.0	208	10.0	533	20.0
Total	371	100.0	237	100.0	2,064	100.0	2,672	100.0
Row percentage	(13.9)		(8.9)		(77.2)		(100.0)	

¹Semiprimitive nonmotorized.

Table 2.--Wilderness recreationists' perception of available substitute areas by main activity (PARVS data)

Activity	Substitute mentioned?					
	No		Yes		Total	
	n	%	n	%	n	col. %
Backpacking/ primitive camping	39.2	66.8	19.5	33.2	58.7	8.7
Water-based recreation	24.2	34.2	46.5	65.8	70.7	10.4
Nature-oriented activities	22.5	63.1	13.2	36.9	35.7	5.3
Day use and day hiking	332.1	73.2	121.5	26.8	453.7	67.0
Fishing	22.6	57.3	16.8	42.7	39.4	5.8
Hunting	11.6	39.7	17.6	60.3	29.2	4.6
All activities	452.1	66.8	225.1	33.2	677.3	100.0

experiences, but managers should proceed with caution. Before we suggest adding yet more recreationists to these areas it will be necessary to investigate the conflict or displacement potential that might exist if the existing users are in fact seeking nonwilderness experiences and thus are perhaps in some way incompatible with additional users who are. Or vice versa, are many of the people who use nonwilderness areas there because they feel that that is where the best wilderness experiences, with the fewest other people, are available?

A second point to be made from the data in table 1 is that these nonwilderness lands are substantially more likely to be in the SPNM class than in the primitive category. This is especially true outside of Alaska and more so the further east you look in the lower 48 States. Ignoring the lands in the 'Other ROS' category, over 80 percent of all wilderness interviews were on primitive lands. In contrast, less than half as many (38.8 percent) of nonwilderness visitors were in Primitive as opposed to SPNM sites. This seems to belabor the obvious that wilderness is mostly Primitive class lands, but it reinforces the conclusion that, on average, there are qualitative differences between NWPS lands and the potential substitutes presented here. If these differences are important in a causal way to wilderness experiences, then the nonwilderness lands cannot be thought of as replacements on an acre-for-acre basis. Such qualitative differences need to be explored.

The data in table 2 report visitors' perceptions of the availability of substitutes for wilderness, broken out by main activity reported. Overall, 33.2 percent of all recreationists stated that they knew of a substitute for the wilderness site they were visiting when interviewed. From the data it is not possible to differentiate whether or not the substitute site is another wilderness area. That notwithstanding, about two-thirds of the people felt that they did not have a ready substitute for that particular site.

This proportion varied by activity. Backpackers/primitive campers (8.7 percent of all users) and nature-oriented recreationists (5.3 percent of all users) were roughly the same as the overall proportion (33.2 percent and 36.9 percent named a substitute, respectively). The day hikers were the largest category of users (67 percent of all respondents) and were the least able to name a substitute site (73.2 percent "no"). At the other end of the spectrum, water-based recreationists (10.4 percent of all users) named a substitute location about two-thirds of the time (65.8 percent). Consumptive activities (hunting and fishing, 8.6 percent of all users) were alike in that substitutes were named slightly more often than the average: about 50 percent of the time, overall.

Again, a methodological digression is in order: the number of cases in the table is a small percentage of the overall PARVS database. Only about 12.9 percent of PARVS' 5,254 wilderness respondents are

in the table. Even so, it seems reasonable to conclude that there probably are large variations in the perception of substitutes from one activity to the next. Managers may wish to be sure of the substitution potential of an area relative to one or another group of users in particular. Secondly, it also seems safe to say that, in general, substitutes are not commonly thought about (or at least admitted to). Thus, knowledge and/or intended use of ready substitutes may be a major barrier to the substitution potential of those lands that do have the physical potential to serve as such.

RESULTS: INVENTORY

Table 3 presents a summary of the NORSIS data on lands greater than a half mile from a road, or a reasonable equivalent thereof when that wasn't calculable. The half mile breakpoint was chosen because it conforms to the published definition for SPNM lands under the ROS classification scheme and, as we have seen, a substantial percentage (27 percent) of wilderness recreation occurs on this type of land. The data suggest that there are very substantial amounts of land that can be characterized

Table 3. --Potential wilderness substitute lands' by agency and by approximate Forest Service region, NORSIS data, in 1,000's acres

Region	FS	NPS	FWS	BLM ²	State ³	Local ⁴	Total
1	7,702	1,086	110	502	22	6,276	15,698
2	12,627	2,407	0	1,447	334	13,277	301093
3	11,266	2,038	160	3,408	130	3,151	20,154
4	22,751	2,237	0	10,094	154	2,268	20,155
5	7,197	2,043	0	7,355	989	2,477	20,061
6	7,382	1,883	4	2,886	123	2,260	14,538
105	5,519	1,366	0	0	2,865	0	9,749
8	1,516	2,108	362	0	8,484	1,173	13,644
9	2,499	747	145	0	998	36	4,425
Total	78,460	15,914	782	25,692	14,099	30,919	165,866

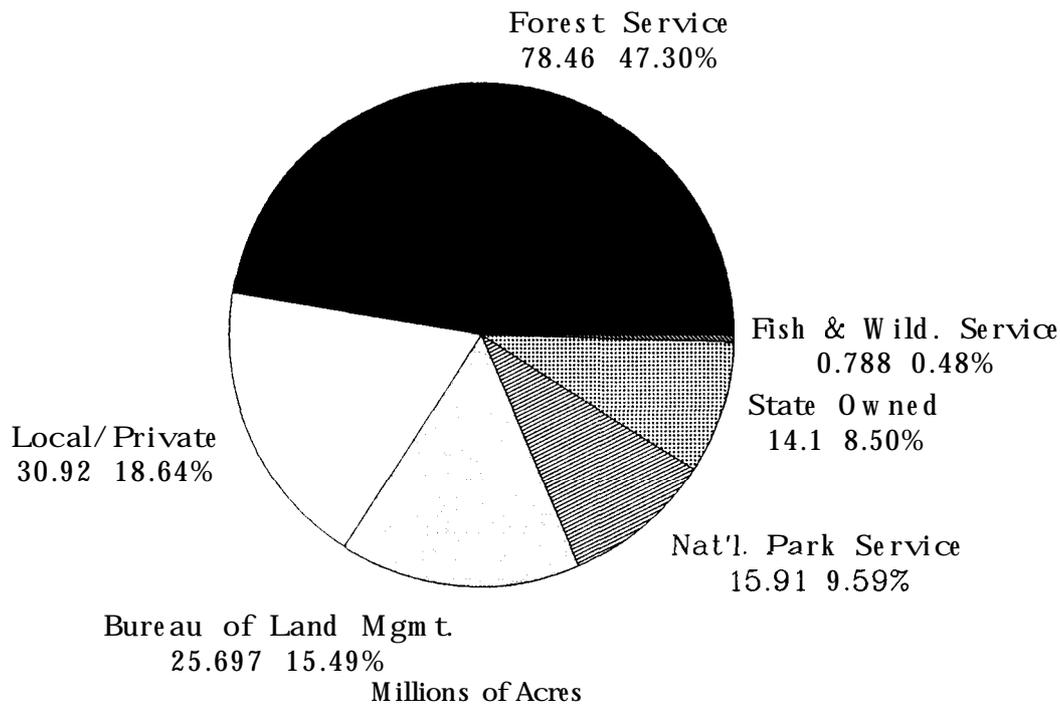
¹ Estimates of lands more than one-half mile from a road.

² WSA's and natural areas combined: no adjustment for roads or other developed features.

³ All types of State lands. When possible, adjusted for road miles. Mostly state park acres.

⁴ Private, nonindustrial lands open to the public and nature conservancy lands.

⁵ Intentionally out of order to preserve RPA Assessment region order. There is no Region 7.



National Outdoor Recreation Supply Information System (NORSIS)

Figure 1. – Distribution of potential wilderness substitution lands by agency ownership.

as potentially substitutable: about 166 million acres. This is roughly twice the acreage currently in the NWPS (88.8 million acres) and in some cases may under-report available acreage. This is suspected for the BLM because the NORSIS data from them is essentially only their Wilderness Study Areas (WSA). Also, the distribution of the 166 million acres is not uniform across regions or ownership categories.

Figure 1 displays the ownership pattern of these lands. Of the 166 million acre total, 18.7 percent are owned and managed by local governments, nonprofit agencies, or nonindustrial private ownership. Another 8.5 percent are in State ownership, almost all under a State park classification. The remaining 72.8 percent are Federal lands with the biggest share under Forest Service jurisdiction (47.3 percent overall). Only the Fish and Wildlife Service has what must be termed as negligible acreage (0.47 percent).

The regional categories in table 3 roughly conform to Forest Service regions, but since the data is on a State-by-State basis, this is not exact. Figure 2 displays this on a map. For instance, note that the Idaho panhandle is presented with the rest of the state in Region 4, whereas it is actually in Forest Service Region 1. This the only major acreage difference caused by this nonstandard partitioning.

What is the overall picture for substitution on non-NWPS lands? The largest single contribution to the pool of potential substitutes is Forest Service lands in Regions 2, 3, and 4, local and 'other' lands in Region 2, and BLM lands in Region 4 (cf. table 3). These five entries combined encompass over 42 percent of the lands listed. All of these are in the Rocky Mountain/Great Plains macro region (Regions 1, 2, 3, and 4). Areas of densest population, such as California and the eastern U.S., are relatively less well supplied with substitute wilderness areas. But these two areas are not equally 'disadvantaged' by lack of substitutes. In the case of California, many acres are in the NWPS (about 6 million acres), whereas the entire 20-State Eastern Region (9: actually geographically, it's only the Northeast plus the Midwest) has only 1.4 million acres. As expected, Regions 2 and 4 account for 40.75 percent of the acres, and Region 9 contributes only 2.67 percent. Note that omitting Alaska (Region 10) does not alter the picture that much. The only anomalous contribution is the 8.4 million acres in State ownership in the South (of a total 13.6 million acres State owned). Part of the explanation for this is that Texas and Florida each have undeveloped tracts as State parks that exceed a million acres each.

SUMMARY

The data suggest that there are substantial lands outside the NWPS that may provide wilderness-type recreation opportunities. From the available data it is estimated that about two-thirds of the available unroaded acreage in the United States is outside the NWPS. And nearly half of this land is under Forest Service management. State, local, and private lands also manage a significant percentage of the total.

Clearly, the future trend is for this substitutable base to decrease. This is, in part, due to the obvious changes from urban development, resource development, or growth in nonwilderness. Another cause of this decrease will also occur: as the wilderness movement continues to be successful in adding more acreage to the NWPS, the potential substitutability of the residual lands can be expected to be reduced. The tables incorporate many high-quality acres whose NWPS status is yet to be decided. For example, the data included Olympic National Park's nearly one million acres of backcountry, almost all of

which is high quality wilderness. Most, if not all, of this will likely be put in the NWPS at some point in the future. Or consider the vast tracts of land in Utah, Nevada, or Arizona that the BLM manages. They have not been put in the NWPS either. Yet all of these are in the substitutable lands database (even if not in table 3). Other acreage, such as the State lands in the Southeast, may have large tracts of high quality State park land (as in Texas or Florida), but in general the wilderness experience potential of nonfederal lands is not great throughout the country. Most of the holdings are in tracts that offer fine recreation but not a pristine wilderness experience. The bulk of the other lands shown in the table are in scattered tracts of various sizes, generally much smaller. It is not reasonable to expect them to substitute on a 1:1 basis for high quality NWPS acreage found elsewhere in the same Region.

The inventory process used here is only an approximation. Better information should be obtained on **roadless** areas, especially in relation to the type of experiences they might provide. Because this

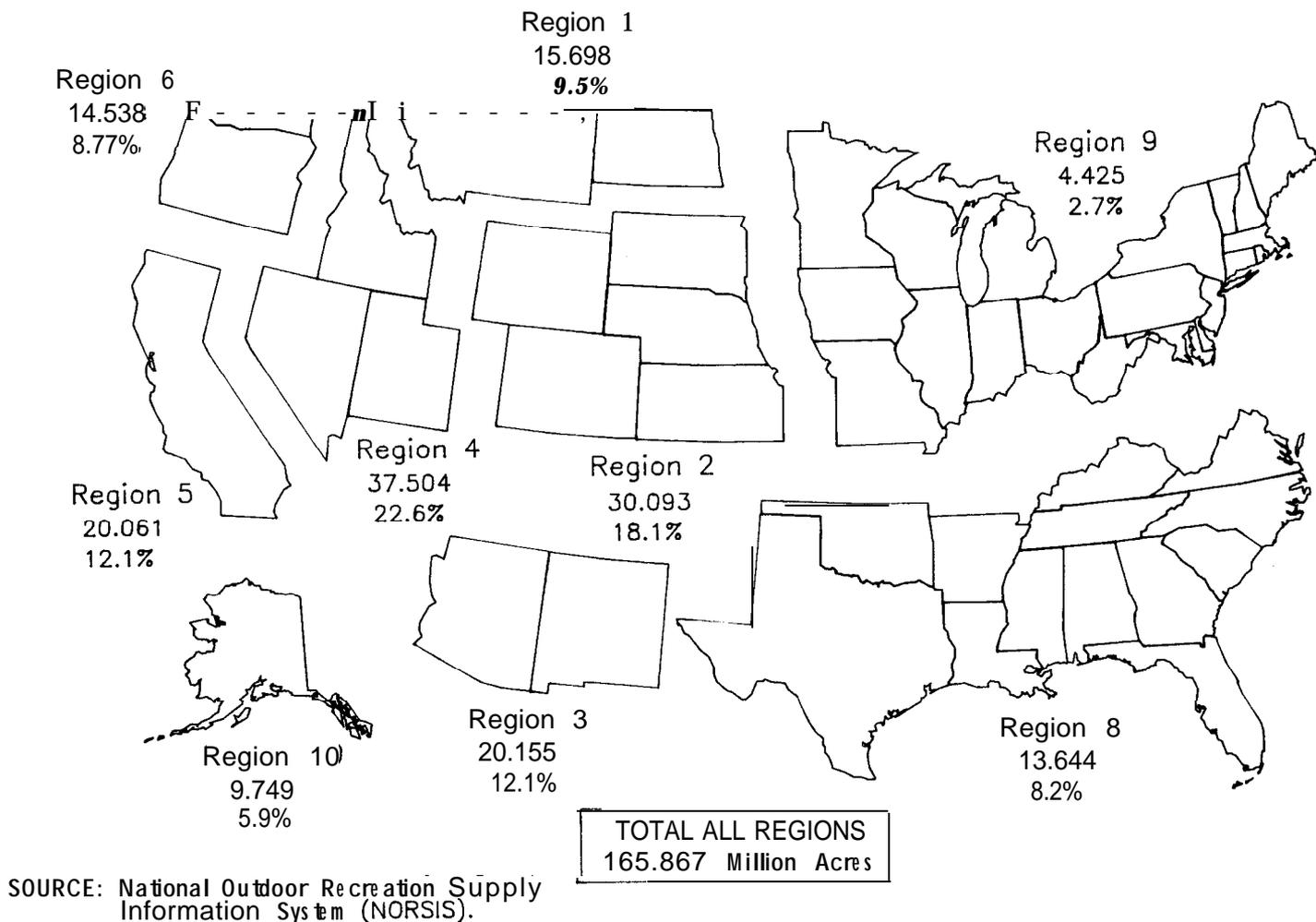


Figure 2. Potential wilderness substitute lands, by approximate Forest Service regions: millions of acres, percent.

would be a large undertaking it seems logical to focus attention on situations where the need for substitutes is the greatest. Examples might be individual forests or parks with overuse problems, or entire regions where an integrated approach might be tried. There is also an opportunity for this sort of analysis to be incorporated into management plans or carrying capacity formulations. This might be part of an integrate carrying capacity that would seek to estimate decision effects on one wilderness (defacto or NWPS) in a delineated system of recreation opportunities. The need for relatively detailed, accurate information suggests that inventories that are compiled for the task are required, rather than simply a secondary analysis of available data, as was done here. Nonetheless, it may be possible to add critical variables to existing databases such as NORSIS to extend them to this purpose.

Finally, because substitutability relies on visitors' perceptions, it may be that very few of the 165.8 million acres in table 3 are currently seen as substitutes, This idea was supported by the data in table 2, which suggest that only about 33 percent of all wilderness visitors can readily name a substitute. Moreover this result is quite variable by activity with dayhikers the least likely to name a substitute. More needs to be done on this idea. The data are suggestive, but not conclusive. Still unknown in this context are the reasons why a particular site was chosen, or what attributes are the critical attributes for another area to be a substitute. Unfortunately, we can only raise these issues in this paper.

Overall, recreationists' preferences and/or expectations will have to change before substitution can be widespread. Of course, information campaigns may raise this threshold of known substitutes. But to what extent this can be successful in part depends on the inherent qualities of the land as well as people's willingness to accept available substitutes. Much work needs to be done to assess the experiential characteristics that are critical to this process of substitution and the nature of the substitution decision process.

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WILDERNESS RECREATION USE: THE CURRENT SITUATION

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Abstract, The total amount of recreational use of the National Wilderness Preservation System is currently at about 14.5 million visitor days per annum. Trends indicate a stable or declining overall use; use on a per acre basis is declining. The common stereotype of the wilderness user as young, wealthy, urban, leisured, and a nonresident of the State or region is largely incorrect. The one characteristic that does sharply distinguish wilderness users is their very high education level. Use patterns in wilderness also differ from commonly held perceptions. Size of individual user groups is small, and getting smaller. Most visits are day-use only. Distribution of use is highly skewed toward weekends and summers, but the trend is toward increased dispersal of use across time and space. Higher impact and consumptive activities like hunting and horse use are declining as a percentage of total use.

trade-offs and allocation decisions about the proper mix of wilderness and other human values to be produced on public lands.

This paper provides a summary of the current use and user situation in the NWPS, indicates trends in use characteristics, and concludes with an assessment of the policy, planning, and management implications of the data. Throughout the paper, we lean heavily upon a state-of-knowledge review of the topic from the National Wilderness Research Conference at Fort Collins, Colorado in 1985. Readers are referred to that paper for more detailed information (Roggenbuck and Lucas 1987). In this paper, we touch only briefly upon changes in trends of wilderness recreation use, and leave the thorough and important discussion of those surprising findings to Lucas and Stankey (1988), who follow us at this benchmark conference.

INTRODUCTION

An assessment of recreational visitation to the National Wilderness Preservation System (NWPS) requires an understanding of three basic components of wilderness use: the total amount of use, characteristics of that use (e.g., when it occurs, where it occurs, and size of user groups), and characteristics of the users (e.g., age, gender, and income). Knowledge of these user variables, and trends of their change, are also required if legislators, policy makers, planners and managers are to intervene in the system to increase the flow of wilderness benefits to the American people. Finally, use information is a necessary, but not sufficient, condition for making

TOTAL AMOUNT OF WILDERNESS RECREATION USE

In 1986, between 14 and 15 million visitor days of recreation use occurred on the 89.9 million acre NWPS (table 1). Most of this use (11.2 million visitor days) occurred on national forest wilderness, the only agency that separates use estimates of wilderness from other dispersed recreational use. The National Park Service in 1986 reported 0.88 million backcountry overnight stays for parks with wilderness or wilderness potential. This is probably equivalent to about 1.8 million 12-hour recreation visitor-days. Day-use data for national park backcountry are generally unavailable, but day use is high in virtually all wilderness-often accounting for more than half of all wilderness visits (Roggenbuck and Lucas 1987). For example, unpublished use data for Yellowstone National Park in 1975 showed about 100,000 backcountry day-use visits and 65,000 overnight stays. Assuming about 150,000 12-hour visitor-days for the

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Table 1. --National Wilderness Preservation System (NWPS) acreage and use (1986)

Agency	Areas	Acreage	Visitor days
	<u>Millions</u>	<u>Millions</u>	
Forest Service	338	32.5	11.2
National Park Service	66	37.8	about 2.7
Fish and Wildlife Service		19.3	.28 (1978)
BLM	.24	.37	.05 (1978)
Total	457	89.97	between 14 and 15

65,000 overnight stays, and around 60,000 12-hour visitor-days for the 100,000 day users, this means that total visitor days of day-use of the Yellowstone backcountry was just under half of the total overnight visitor days (Hendee and others, in press). If the day-use to overnight use ratio of Yellowstone backcountry is typical, then all national park wilderness and backcountry use amounted to about 2.7 million visitor days of use in 1986.

There are almost no use figures for Fish and Wildlife Service and Bureau of Land Management Wilderness, but use there is very light. Based on a 1978 survey of agency managers, Washburne and Cole (1988) estimated recreation use on FWS wilderness at 0.28 million visitor-days, and BLM primitive area use at 0.05 million.

Trends in backcountry and wilderness use indicated rapid growth in the 1950's and 1960's, often exceeding 10 percent annual increases. Growth slowed in the late 1960's and 1970's to 3 to 5 percent average annual increases. Indeed, by 1976, overnight stays in national park wilderness and backcountry had peaked, and 1986 use was only 62 percent of that highest use year. Use of national forest wilderness has fluctuated a great deal in the 1980's, some years increasing and some years decreasing. However, the use levels of national forest wilderness have only remained at this level because of the addition of new areas to the NWPS. Use levels of the core areas of the NWPS established by the 1964 Act peaked in 1979, and current use is 87 percent of that level (Lucas and Stankey 1988). Overall, because national forest use dominates the Wilderness System, use for the System as a whole peaked at about 16 million visitors days in 1985, and was down to below 15 million in 1986.

WILDERNESS USER CHARACTERISTICS

Within this and the use characteristics section to follow, two kinds of data will be presented. The first is a description of the wilderness user and use characteristics as they were found at the time of the study cited. Visitors to more than 30 wilderness areas located throughout the country have been surveyed (Roggenbuck and Lucas 1987), so we have considerable confidence in making statements about the NWPS. However, we caution that some regions, e.g., the deep South and much of the Southwest, have been little studied, and virtually all studies were completed between the mid-1960's and the mid-1970's. Our review has less sensitivity to any changes in use patterns and user characteristics in the last decade. Also, since the summarized studies were completed by many authors working at different times, often with differing objectives and using different data classifications, the precision of the data varies a great deal across studies. For this reason, we report only replicated and general patterns.

Secondly, where we have data that suggest changes in use patterns or user characteristics across time, we will acknowledge those trends. However, we have less confidence in the generalizability of these data. Thus far, only one study has compared use and users in a given area across two points in time. That was for the Bob Marshall Wilderness Complex (a complex that includes the Bob Marshall, Great Bear, and Scapegoat Wildernesses), where Lucas (1980, 1985) studied use and users in 1970 and 1982. Other indications of trends come from comparisons of different areas surveyed in the mid-1960's and the late 1970's. Changes found might be due to area differences rather than trend shifts across time, but several studies have shown that wilderness use and users are strikingly similar across areas and regions (Boteler 1981; Lucas 1980; Roggenbuck 1980; Timm 1980).

The Wilderness User Stereotype

A common stereotype of wilderness users portrays them as young, wealthy, athletic, urban, travelling long distances to visit the wilderness, and leisured enough to have large blocks of free time necessary for foot travel into wilderness (Hendee and others, in press; Norgaard and others 1979; Stankey 1971). This stereotype is so widely shared that it has formed the basis for opposition to additional wilderness allocations in Congressional testimony (Hendee and others, in press), and fostered management regulations to limit length of stay in wilderness as one means to reduce congestion in wilderness and allocate use more equitably among potential users. In this paper, we will summarize the scientifically drawn surveys of wilderness user characteristics, and will attempt-once and for all-to put to rest the user stereotype and the erroneous policy and management decisions that have flowed from it.

Age

Wilderness users do tend to be young, younger than the general population, Roggenbuck's and Lucas's (1987) review of about 30 wilderness user studies showed that between 25 percent and 40 percent of wilderness visitors to most areas were between 16 and 25 years of age. The percentage of the general U.S. population in this age category was just under 20 at the time of the various studies. Wilderness visitors in the 26 to **35-year-old** category represented from about 20 to 40 percent of all use, but only about 15 percent of the U.S. population falls into this age bracket. However, middle-aged people are also commonly found in wilderness, often in larger percentages than exist in the general population. For example, 36 to **45-year-olds** make up about 10 to 20 percent of all wilderness users and about 11 percent in the general population. About 10 percent of the US. population is between 46 to 55 years of age; the percentages of wilderness users in this category ranges from about 10 to 15 percent. Only in the post **55-year-old** age bracket are wilderness users substantially underrepresented. About 20 percent of the general population and between 5 and 10 percent of wilderness users are past 55. Wilderness-use studies indicate that between 0 and 25 percent of all wilderness visitors are below 16 years of age; for most areas this percentage is between 5 and 10 percent. These numbers suggest that children too are underrepresented, since about 25 to 30 percent of the general population is in this age bracket. However, wilderness user studies likely underestimate use by children, because individuals below 16 are often excluded from wilderness sampling frames.

Gender

Roggenbuck and Lucas (1987) reported that between 70 and 85 percent of the visitors to the wilderness areas surveyed are male. Males are, therefore, overrepresented in wilderness, but women represent a significant minority-often 25 percent. Also, because some studies only collected data about the party leader and since the party leader is most often a male, women are underrepresented in some study samples. Finally, there is some evidence to suggest that the percentage of women in wilderness is increasing. For example, Lucas (1985) reports that the proportion of female visitors to the Bob Marshall wilderness grew from 20 percent in 1970 to 30 percent in 1982.

Place of Residence

Visitors to wilderness areas are generally from the state in which the area is located. Such in-state users usually number from 66 to 75 percent, but for lesser known areas and for all Forest Service wildernesses studied in California, this percentage exceeded 84 percent (Roggenbuck and Lucas 1987). In addition, Lucas (1985) has reported that wilderness visitors often come from the State's region closest to the wilderness area. For example, 60 percent of all visitors to the Bob Marshall Wilderness Complex were from Montana, and 54 percent of all its visitors were from northwestern Montana-the region where the areas are located.

Wilderness areas in the East that have been studied tend to have more out-of-state visitors. For example, about half of all visitors surveyed in the Boundary Waters Canoe Area and the **Allagash** Wilderness Waterway in Maine were from out-of-state. This likely reflects the smaller size of eastern States, the relative scarcity of wilderness resources there, and high demand.

Finally, a few areas with national and international reputations, like the Great Smoky Mountains and Yosemite National Parks and their backcountries, have high nonresident use- sometimes amounting to more than 65 percent. These areas, however, are the exception and not the rule.

Urban/Rural Residence

Most visitors to wilderness areas are from urban areas, as are most Americans. Indeed, the percentage of urban users of wilderness is a remarkably accurate representation of the States or regions from which the visitors come. For example, Lucas (1985) found that 50 percent of the Montana visitors to the Bob

Marshall Complex were from urban areas; 51 percent of the Montana population is urban. About 90 percent of the visitors to the Desolation Wilderness in California, a highly urbanized State, were urban residents (Lucas 1980). In southern California, with many large cities in the region, over 90 percent of the wilderness visitors come from cities with over a million people (Hendee and others 1978). Finally, Lucas (1985) reported that 74 percent of the out-of-state visitors to the Bob Marshall Wilderness Complex were urbanites, a proportion equal to that of all the U.S. population.

Hendee and others (in press) have recently noted one difference in the urban-rural nature of wilderness users versus the general population. Wilderness visitors are much more likely to have grown up in rural areas or small communities. In his 1970 study of visitors to the Bob Marshall Wilderness Complex, Lucas (1980) found that about 21 percent more visitors had grown up in rural surroundings than currently live there—about twice the size of the national shift from rural to urban residents for that time period. By 1982, the trend toward movement to urban areas had slowed considerably, but 7 percent more wilderness visitors to the Bob Marshall Complex had previously lived in rural areas than currently lived there. This shift was again about twice as large as that for the general population.

Education

The feature that most distinguishes wilderness users from the general population is their high education. In almost all areas studied, at least 40 percent of wilderness visitors have completed college (Roggenbuck and Lucas 1987). In many areas, the number exceeded 50 percent. This far exceeds the schooling of the U.S. general population, where 11 and 18 percent completed college or attended graduate school in 1970 and 1980, respectively. In most areas, the proportion of wilderness visitors going to school beyond college was greater than the proportion of the U.S. population that goes beyond high school (Lucas 1980). Also, the education levels of wilderness users reported in studies are artificially low—as compared to the general population—because wilderness surveys often include people down to ages 14 or 16. They have not yet completed their education. In contrast, general population surveys only include people 25 years of age and older.

Occupation

In almost all of the 20 or so wilderness areas where occupation has been studied, the most common visitor was a professional or technical worker (Roggenbuck and Lucas 1987). Their numbers usually represented 30 to 40 percent of all wilderness visitors, or about four times the national average. In some areas in the East, like the Appalachian Trail and the Boundary Waters Canoe Area, percentages exceeded 60. Students were the second most frequent visitors, numbering from 20 to 33 percent for most areas. Students thus are also overrepresented in wilderness, because only about 4 percent of the U.S. population was students in 1980. Homemakers and clerical, sales and service workers (many of whom are female) were the most underrepresented in wilderness.

Interestingly, in the only study where use and users of the same area have been compared across time, Lucas (1985) noted a drop in the percentage of students and homemakers by about half between 1970 and 1982. In 1970, students made up about 17 percent and homemakers equalled about 9 percent of all users of the Bob Marshall Wilderness Complex. These numbers dropped to 11 percent and 4 percent, respectively, in 1982. Numbers of people in these categories in the general population did drop slightly during this time period, but not enough to explain the change among wilderness visitors. The drop in student participation likely reflects an attitude change about the desirability of wilderness recreation. The reduction in participation by homemakers is more difficult to explain, given the general increase in wilderness use by women. Perhaps there is a growing tendency for women who were homemakers and who visited wilderness to seek employment outside the home—and thus move to a different occupation category.

Income

Wilderness visitors have above-average incomes, but so do most outdoor recreationists (Roggenbuck and Lucas 1987). Their moderately high incomes likely reflect the high educational and/or professional occupational status of most wilderness users. Variation in income across areas is, however, very high. For example in the early 1970's, 16 percent of the users of the Cabinet Mountain Wilderness (Montana), 21 percent of the Cranberry backcountry (West Virginia) users, 40 percent of the users of four California wildernesses, and 46 percent of the Desolation Wilderness (California) visitors had family incomes of \$15,000 or more. About 23 percent of the general U.S. population had family incomes this high at the

time of the wilderness studies. These figures suggest that average income of users of some areas are at or even below the national average, but income for other areas far exceed it. These differences largely reflect the variation in the general population's income in the States in which the areas are located. Thus, the incomes of the Cranberry area users don't seem high compared to the national average, but they still exceed the State average for West Virginia.

The relatively high incomes of wilderness visitors have led some to suggest that wilderness is only used by the wealthy. Data on use and users do not, however, support this notion. For most areas studied in 1970, from one-third to one-half of all users had family incomes below \$10,000 at a time when the median U.S. income was about \$9,000 (Lucas 1980). In addition, we have already demonstrated that most visitors to wilderness come from the region within the State where the area is located, so travel costs are typically low. Finally, typical expenditures for wilderness visits are low-usually about \$10 per day in the early 1970's (Lucas 1980; Stankey 1971).

Club Membership

While some have suggested that wilderness visitors represent a relatively small cadre of people committed to wilderness protection, data on user membership in conservation organizations refute this notion. For almost all areas that have been studied, conservation club membership numbered only from 20 percent to 35 percent (Roggenbuck and Lucas 1987). And among these club memberships, fewer than half- usually only about a third-belonged to organizations like the Sierra Club or the Wilderness Society that were oriented toward wilderness preservation. Most of the remaining club members belonged to rod and gun clubs or some other outdoor activity group (Lucas 1980). Exceptions to these findings were a few areas in the Appalachians and in New England, where conservation organization membership was somewhat higher-as high as 57 percent in the Joyce Kilmer-Slickrock Wilderness of North Carolina.

Previous Wilderness Experience

The previous use history of most wilderness visitors can be characterized by a few words: high experience, frequent visits, and short stays. For most western areas studied, 70 percent to 90 percent of all visitors had made at least one previous trip to a wilderness area (Roggenbuck and Lucas 1987). This percentage was somewhat less in the East, where wilderness areas are fewer and typically more recently established. Variation in the number of times the

study area had been previously visited was high. For many areas, the number of people who had no previous visits to the area where they were surveyed was 30 or 40 percent, but this percentage reached 60 percent for some areas. At the same time, many areas also had between 20 percent and 30 percent of their visitors who had made six or more visits. Visitors averaged three or four wilderness visits a year, and spent a total of 6 to 10 days in wilderness (Lucas 1980).

Type of Group

The family is the most common type of group within wilderness, often comprising about 40 percent of all groups (Roggenbuck and Lucas 1987). Wilderness user trend studies have shown that the predominance of the family is growing, and is spreading more evenly across seasons of the year and travel methods. Lucas (1985) reported 1970 horse users and fall visitors of the Bob Marshall Wilderness Complex more frequently to be groups of friends. By 1982, family groups were as common in the fall as in the summer, and the proportion of family groups and groups of friends were similar for horse users and hikers. Also, almost half of the groups studied have contained children. Finally, when groups containing family members and friends are added to those composed solely of family members, family groups almost always exceed 50 percent.

Groups of friends are the second most common type of wilderness user group, frequently numbering from 30 to 40 percent. For a few areas like the Great Bear in Montana, with its large hunter contingency, or the Fitzpatrick in Wyoming, with its high use by outdoor education groups, friendship groups exceed 50 percent.

Use of the wilderness by organized groups or clubs and by lone individuals is low everywhere. Solo hikers seldom equal 10 percent of all user groups, and for the organized groups, like Boy Scout or Girl Scout groups, the number is usually below 5 percent.

WILDERNESS USE PATTERNS

Group Size

Wilderness visitor groups are typically small, and getting smaller. The average size for National Forests is four to five people; and for National Park lands, the number is two to three individuals. For virtually all areas, two to four person groups account for 50 percent to 75 percent of all parties (Roggenbuck

and Lucas 1987). Two-person groups are the most common. As mentioned earlier, lone individuals are rare in wilderness- usually numbering fewer than 10 percent of all visitor groups. National Park wilderness does, however, tend to have somewhat more solo hikers than do Forest Service wildernesses. Finally, groups larger than 10 people are completely absent in some areas, and account for about 5 or 6 percent in several others. Only rarely do such large groups exceed 10 percent, and then only in such areas as the San Geronio in California with its nearby summer youth camps.

In the one study, which compared use patterns of the same areas across time, party size has dropped dramatically (Lucas 1985). In 1970, groups in the Great Bear and Scapegoat Wildernesses averaged 5.2 and 5.6 individuals, respectively. By 1982, these numbers had declined to 3.8 and 4.4. During this time period many wilderness managers had implemented group size limitations to 10 persons, but this does not seem to account for much of the reductions in average party size. Few parties had previously exceeded 10.

Length of Stay

A surprising use characteristic, and one which sharply refutes the wilderness stereotype, is the short length of stay of most wilderness visits. For the majority of areas, the most common visit is for one day or less (Roggenbuck and Lucas 1987). Even for large western wildernesses, the one-day visit is often the most common. For example, Lucas (1980) found that more than 60 percent of all visits to the Cabinet Mountains and Mission Mountains Wildernesses and the Spanish Peaks Primitive Area of Montana were for one day. Even in the very large and nationally known Selway-Bitterroot Wilderness of Idaho and Montana, 48 percent of all visits were for a day or less. Trips of a week or more are almost nonexistent; half of all the western areas studied had no sampled trip of this length. Average length of stay for most areas across all regions of the country is 2 to 3 days.

Exceptions to the typically short lengths of stay are those areas with disproportionately high horse, canoe or hunting use, or high use by outdoor education schools. For example, the Bob Marshall and Great Bear wildernesses are well known for horse use and hunting attractions, and their average length of stay is 4 to 5 days. Outdoor education schools likely explain the longer stays in the Popo Agie, Bridger, and Fitzpatrick Wildernesses in Wyoming.

Length of stay is also getting shorter in wilderness. For example, Lucas (1985) found visits to the Bob Marshall Wilderness Complex averaged 5.7 days in 1970; by 1982, trip length had decreased to 4.7 days. This decline is probably due to the presence of proportionately more hikers, fewer horse users, and fewer hunters in wilderness in recent years. Far fewer horse users and hunters than hikers are one-day users.

Method of Travel

The vast majority of wilderness visitors are hikers, except for the Boundary Waters Canoe Area and a very few horse-oriented wildernesses in the West. In the East, hiking is the only method of travel for many areas. The Boundary Waters Canoe Area exception has 75 percent paddle canoeists, 21 percent motor boaters or motor canoeists, and 4 percent hikers. Even in the Rocky Mountain West, horse parties usually comprise fewer than 20 percent of all groups. In those few areas, like the Bob Marshall, the Great Bear and perhaps the Teton, where horse use is at or above 50 percent, hiking use is increasing relative to horse use. For example, the Outdoor Recreation Resources Review Commission (ORRRC) study (1962) estimated that 90 percent of all Bob Marshall visitors were horse users in 1959. By 1970, this number was 59 percent (Lucas 1980), and in 1982, there was an even split between the horse users and hikers (Lucas 1985). Indeed, the shift away from horse use and toward hiking use was the biggest change that Lucas (1985) found in his comparison of 1970 and 1982 use and users of the Bob Marshall, Great Bear, and Scapegoat Wildernesses. In 1970, horse users were the clear majority in this three-area complex. By 1982, the situation had reversed, and hikers had become the most common users (Roggenbuck and Lucas 1987).

Time of Use

Most wilderness use occurs during the summer months, generally accounting for 60 percent or more of all use (Roggenbuck and Lucas 1987). Even for areas with high amounts of fall hunting, like the Great Bear or the Bob Marshall, the majority of all use occurs during the summer. For alpine areas, and many National Forest Wildernesses of the West are alpine, this use characteristic suggests high concentrations of use during July and August, because snow makes many trails impassible until late June.

Within this general trend of high summer use, certain areas have short peaks of intense use in other seasons. The first week or two of hunting season

causes sharp climbs in use in a few western wildernesses, and the fall color season makes October a high use time in New England and the Southern Appalachians. Spring is the most attractive use period in some areas of the South, Southeast, and the lower elevations of wilderness in the Southwest and Southern California. Finally, winter use of wilderness is little studied, but it appears to be light. However, it is much more common than a decade ago, and it seems to be growing.

Like most outdoor recreation, wilderness use is concentrated on weekends. For example, Lucas (1980) reported that two-thirds to three-fourths of all visitors to the nine western areas he studied in 1970 entered on a Friday, Saturday or Sunday. Weekend concentration levels in the accessible San Geronio and San Jacinto Wildernesses in California were also severe in the early 1970's (Hendee and others 1978). Fears that even higher concentrations of use would be found in the wilderness areas in the East have not, however, materialized. In the Great Gulf Wilderness, three National Forest wildernesses in the Southeast, and the Great Smoky National Park in the summer, weekday use accounted for 40 to 68 percent of all use (Roggenbuck and Lucas 1987). This diminished weekend peaking may simply reflect the later dates of the Eastern studies. Lucas (1985) has reported that in 1982, weekend use accounted for 58 percent of all use of the Bob Marshall Wilderness Complex, down from about 70 percent for the three areas in 1970. This shift away from weekend peaking of use may be a response to educational efforts by management agencies to obtain greater dispersal of use across time and area.

Distribution of Use Among Areas

Wilderness recreation use is extremely variable across areas. In 1984, 11 National Forest wildernesses (the Boundary Waters Canoe Area (MN), John Muir (CA), Frank Church-River of No Return (ID), **Absaroka-Beartooth** (MT), Indian Peaks (CO), Alpine Lakes (WA), Weminuche (CO), Selway-Bitterroot (ID-MT), Desolation (CA), Bridger (WY), and Emigrant (CA)) received 41 percent of the total recreational use of the 165 Forest Service areas. One area, the Boundary Waters Canoe Area Wilderness, reported 1,252,700 visitor days-or more than 12 percent of total national forest wilderness use. Heavily used areas tend to be located near population centers, often in the Southern Appalachians, New England, Minnesota, and California.

Limited National Park Service backcountry use data also reflect uneven distributions of use. In 1984, Yosemite, Kings Canyon, Sequoia and the Grand

Canyon all reported close to or over 100,000 backcountry overnight stays. At the same time, several National Park Service wilderness-like areas, including Badlands, Big Thicket, Craters of the Moon, Death Valley, Katmai, and Lava Beds, reported fewer than 1,000 overnight stays. Some wilderness areas reported no use (Roggenbuck and Lucas 1987).

The estimates of visitor-days of use per acre also demonstrate extremely variable use. For example, while the average visitor-days of use per acre for National Forest wilderness was 0.31 in 1984, use of North Carolina wildernesses averaged 5.24: Indiana, 2.36; Tennessee, 2.29; Georgia, 2.07; Minnesota, 1.16; and New Hampshire, 1.07. Proximity to population centers alone was not an adequate predictor of use, because many areas in the populated East, like Hell Hole Bay in South Carolina and **Bradwell Bay** in Florida, with their swamps and frequently flooded forests, have 0.05 visitor-days per acre or less. Roggenbuck and Lucas (1987) have suggested that area size, character of the resource, presence of attractions, managing agency, time of establishment as wilderness, extent of area access, season and year, trail system configuration, type of user, and tradition all influence amount of use.

Intra-Wilderness Use Distribution

Typically, use within a wilderness, as reflected in use of trailheads, trail segments, and camping areas, is also distributed very unevenly. In his study of nine wilderness areas in the West, Lucas (1980) generally found that about one-fourth of all the access points accounted for 80 percent or more of all use. In all areas, except the Selway-Bitterroot Wilderness, just three trailheads accounted for at least one-half of all use. In Yosemite National Park backcountry, 4 percent of the trailheads received 68 percent of all use. Use of trailheads within wilderness areas in the East seems more evenly distributed.

Some recent data suggest that use is becoming more dispersed. For example, Lucas (1964) reported that 52 percent of all paddling canoeists in the Boundary Waters Canoe Area originated from one access point. In 1974, seven of the **BWCA's** 70 entry points accounted for 70 percent of all use. In 1976 the trend toward greater use dispersal was reinforced by the adoption of quotas by entry points. Thus, when use was reported for 88 entry points in 1984, the top 10 accounted for 51 percent of all use (Roggenbuck and Lucas 1987). In 1970 in the Bob Marshall, Great Bear, and Scapegoat wildernesses, between 7 percent and 25 percent of the entry points to these three areas accounted for 80 percent of all use. In 1982, this amount of use entered at 33 to 45 percent of the areas' trailheads (Lucas 1985).

Use of the various trail segments within an area is also highly variable, because of trailhead location relative to population centers, ease of road access to trailheads, location of attractions within the area, extent of trail development, trail configuration within the area, and distance from the wilderness periphery. For example, even though the Spanish Peaks Primitive Area had one of the most evenly distributed trail use patterns among the areas that Lucas (1980) studied, about 50 percent of all the visitor-miles of travel occurred on 10 percent of its trail miles, Thirty percent of the trail miles had 70 percent of all use. In the Boundary Waters Canoe Area, paddling canoeists are 40 times more likely to see other parties on some lakes than on others (Lime 1975).

Camping also tends to occur at attraction points in the backcountry, typically at such places as lakes, streams, or viewpoints. Concentration, however, seems somewhat less pronounced than at trailheads or along trail segments, perhaps because of the greater need for solitude in campsites. Still, in the Desolation Wilderness of California, 16 percent of the campsites accounted for over half of all overnight use; the least used half had only 18 percent of all use (Hendee and others 1978). Lucas (1985) reported that many campsites in the Bob Marshall Wilderness Complex received fewer than 30 nights of use per year, while several had 120 nights of use (or almost constant occupation during the visitor-use season). Finally, winter camping use-while much lighter than in the summer-is apparently even more concentrated. Hughes (1985) reported greater concentration of use at shelters in the Smokies backcountry in winter than in summer; and among shelter use, there was greater use concentration at fewer shelters.

Activities

Fishing (where possible), photography, nature study, and swimming (particularly in the Southeast and California) follow hiking as the most common activities in wilderness. Hunting is prevalent in some areas, but is always less than what might be expected. Even in such hunting hot spots as the Bob Marshall and the Great Bear wildernesses, just over 30 percent and 40 percent, respectively, of the sampled visitors hunted. Even in the fall hunting season, most visitors are not hunters.

In a study of activity trends in the Bob Marshall Wilderness Complex, hiking, fishing, and photography remained important across 1970 and 1982 users (Lucas 1985). Of these, only fishing declined, and that only slightly. Hunting was the only activity with a substantial change, and it dropped sharply in percent of total visitation.

SUMMARY

The amount of recreational use of the NWPS appears to have stabilized or is declining. In the 1980's, use of Forest Service wilderness has increased some years and dropped in others. The overall result has been a generally stable visitation trend. However, on a per acre basis, use is declining. For example, in 1975 there were 15.4 million acres of Forest Service wilderness with 7.5 million visitor days of use, for an average of 0.49 visitor days per acre. By 1986, Forest Service wilderness had increased to over 32 million acres and 11.2 million visitor days, for an average of 0.35 visitor days per acre. This represents a sharp reversal in use trends, for in recent decades wilderness use had been increasing rapidly.

The common stereotype of the wilderness users as young, wealthy, urban, leisured, and a nonresident of the State or region is largely incorrect. Wilderness visitors are young, but so too are most outdoor recreationists. Also, people in their thirties, forties and early fifties are found in wilderness in equal or greater proportions than exist in the general population. Women are a sizeable minority in wilderness, and their numbers seem to be growing. Most wilderness users live in urban areas, but so do most outdoor recreationists and so do most U.S. citizens. Most wilderness visitors come from the region within the State closest to the wilderness. Thus, travel time and cost to the wilderness visitor are not high. The family group and the group made up of family and friends are the most common kind of wilderness user. Also, the use of the wilderness as a family recreational resource seems to be increasing. Income of families of wilderness visitors are higher than average for the States within which they live, but only moderately so and typically not any further above State income averages than for other outdoor recreationists. Most wilderness visitors are in professional and technical occupations; students are the second most numerous. However, a recent trend study of wilderness users suggests that the proportion of students is dropping significantly. Wilderness users do not seem to be an elite group of zealous resource preservationists or outdoor adventurers. Typically, fewer than 30 percent of an area's visitors belong to conservation organizations, and most of the memberships are with rod and gun clubs and not the traditional wilderness advocacy groups. The one characteristic that does sharply distinguish wilderness users from the general population and other outdoor recreationists is their very high education levels. The nation's higher education system with its many courses and outing clubs promoting wilderness appreciation seems to have fueled the

demand for wilderness use (Hendee and Roggenbuck 1985). Whether this relationship is one of direct causality is, however, unknown. For example, some other variable or variables may have caused both the interest in wilderness coursework and the increased visitation to wilderness.

Use patterns in wilderness also differ from commonly held perceptions, and trends suggest continued change away from the stereotype. Size of individual user groups in wilderness is small, and getting smaller. However, the lone individual is rare. Privacy and intimacy in small, closely knit groups are the norm, not complete solitude away from all others. Length of stay is surprisingly short, with most visits being day-use only. Trends suggest that the average length of stay is getting shorter. Distribution of use across time and across areas is highly skewed, with most use occurring on weekends during the summer on a small percentage of wilderness areas. However, there is considerable evidence suggesting that use is beginning to disperse. Weekday use is becoming more common; winter use is increasing, and there is less concentration of use at attractions which can become impact and conflict zones within wilderness. Finally, the higher impact and consumptive recreational activities in wilderness are declining as a proportion of total use. For example, limited data suggest that horse use is declining, fishing is stable to slightly declining, and hunting as a percentage of total use is dropping sharply.

IMPLICATIONS

The above review of wilderness use and user characteristics suggests that managers, planners, and policy-makers should view wilderness in a new light. We believe that six changes in the meaning of wilderness and destroyed myths about wilderness use must be attended to.

First, the need for additional wilderness allocation **on the basis of recreational use demand** is dropping. Use has stabilized or dropped in recent years. Population demographics suggest that use may decline even further. For example, the proportion of the U.S. population over 55 years of age and the proportion of blacks and Hispanics in the population are increasing. These population groups are **underrepresented** in wilderness. This does not, however, mean that we have enough classified wilderness everywhere. There are many other legitimate reasons for wilderness protection besides recreational use, such as protection of representative examples of natural ecosystems and protection of endangered

species. Also, the greatest recreational use of wilderness is the vicarious user (Driver and others 1987), and we haven't even addressed that important user here. The number of vicarious users-those people who dream of wilderness, spend money to view wilderness literature and films, and spend time and money supporting the wilderness allocation process- is probably increasing in the general population. Policymakers need to give greater consideration to these off-site and nonrecreational demands for wilderness.

Second, the benefits of wilderness **recreation** use accrue primarily to individuals in the region immediately surrounding the wilderness. People do not travel far to wilderness. Therefore, it is important to have a NWPS with individual units distributed widely throughout the country. One could argue that wilderness, like iron ore deposits, is where it exists. However, others have argued that wilderness has more to do with wrinkles on the brow than wrinkles on the landscape (Nash 1982). The history of wilderness allocation in the country favors the latter position-as evidenced by the so-called Eastern Wilderness Act (PL 93-622), the Endangered Wilderness Act (PL 95-237), and the Forest Service RARE II study criteria. Data on wilderness use and users confirm this philosophy, and the National Park Service, the Bureau of Land Management, and the Fish and Wildlife Service should follow the lead of the Forest Service in bringing the wilderness to the people to the largest extent possible.

Third, the use of wilderness and the role of wilderness in the American cultural context have matured. Wilderness recreation and protection have become legitimized. Wilderness is no longer a fad. Thus, we no longer see the sharp increases in recreational use of wilderness, but we see increasing use and support for wilderness by the 'common man; i.e., the middle and upper middle class American family. This suggests broad-based political support, and managers have the opportunity **to view**, and must view, the business of protecting wilderness and providing visitor services over the long haul.

Fourth, because wilderness use has stabilized or is declining and because user behavior appears to be becoming more sensitive to wilderness values, the task of wilderness management should be easier in the future than in the past. This has two important implications for management. Managers can now confidently and enthusiastically begin to focus on wilderness **quality**. **Now**, more than in the past, managers have an opportunity to know their clientele, define high quality wilderness experiences, and shape

use and users to protect the wilderness resource and its human benefits. Next, managers will have the opportunity to focus on the delivery of benefits to people- to improve quality of life and thereby develop supportive constituencies. This contrasts sharply with the past when many managers- rightly or wrongly- felt compelled to focus attention on crowding, conflicts, impacts, and use and user restrictions, and thereby often incurred the displeasure rather than the pleasure of constituents (Burch 1984).

Fifth, some of the surprising wilderness use patterns suggest that we don't have a very good understanding of the benefits of wilderness recreation. As the focus of wilderness management shifts more and more toward quality rather than quantity, and toward individual human benefits rather than broad societal outputs, this lack of knowledge will increasingly become a sore spot. For example, many wilderness philosophers and advocates suggest that people need considerable time in wilderness before they can begin to attain such spiritual and mental benefits as time-environment fusion, feelings of oneness with the earth, and feelings of stability and relaxation through connection with ancient rhythms and our ancestral past (Olson 1972). Yet, most of our wilderness visits are for one day or less. Is the NWPS now providing the optimum mix of wilderness benefits? Should planners and managers intervene to shape the attainment of benefits, as in the past they intervened to reduce impacts?

Sixth and last, education- because it is the key indicator of the wilderness user- appears to play the pivotal role in wilderness allocation, planning, and management. While education is very important in fueling wilderness demand (Hendee and Roggenbuck 1985), we don't yet fully understand that process. We need to find these answers. We do know that wilderness users are highly educated; and as such, will have influence beyond their numbers in the political process, will actively be involved in wilderness planning processes, and will expect high quality management. The high educational levels offer a unique opportunity for wilderness suppliers and recipients to work closely together for mutual benefit. The manager-generated information-education programs to reduce impacts or disperse use in wilderness represent one success story that almost certainly reflects the high education levels of the wilderness user. Other opportunities building on high education levels also exist. For example, wilderness users are likely to seek and process more, and more complex, information when they choose recreation sites to visit. Managers can influence user decisions to the mutual benefit of both parties through the provision of appropriate information. For instance, they might

be able to shift use from heavily-used areas to under-used wilderness. Finally, as wilderness managers shift their focus from responding to the negative impacts of great quantities of visitors to the provision of individual human benefits, they may want to advertise their high quality areas and service. After all, building supportive constituencies who receive personal benefits from resource management and use will increasingly become a prerequisite to agency well-being. When that time comes, communications with existing and potential wilderness users will become increasingly important, and knowledge of education levels will be an important variable in identifying, shaping, and responding to the needs and opinions of this important clientele group.

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SHIFTING TRENDS IN WILDERNESS RECREATIONAL USE

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Abstract- Wilderness recreational use grew rapidly during most of the post World War II era, but growth has slowed or reversed recently. National park backcountry use began declining in the 1970's and national forest use slowed or declined in the 1980's in many areas. Reasons are unclear, but an aging population and changing interests are the most apparent causes. This change has implications for wilderness allocation and management.

INTRODUCTION

Wilderness recreational use has grown greatly over the last 40 years (fig. 1). Growth has often been considered inevitable, and references to "burgeoning growth," "explosive increases," and so on have commonly been made by managers and interested individuals. Continued rapid growth has been assumed in most discussions of the need for additional wilderness, impacts to ecosystems, crowding, and the need for regulation and control of use.

But the rate of increase in wilderness recreational use has been slowing for some time, and recently it has leveled off and even declined in many areas. This shift in wilderness use trends has not been widely recognized. It will be described, possible reasons for it will be explored, and policy and management implications will be considered.

WILDERNESS USE DATA SOURCES

Of the four agencies that manage lands in the National Wilderness Preservation System (NWPS), Forest Service wilderness use data are most complete and cover the longest period. Total use, including

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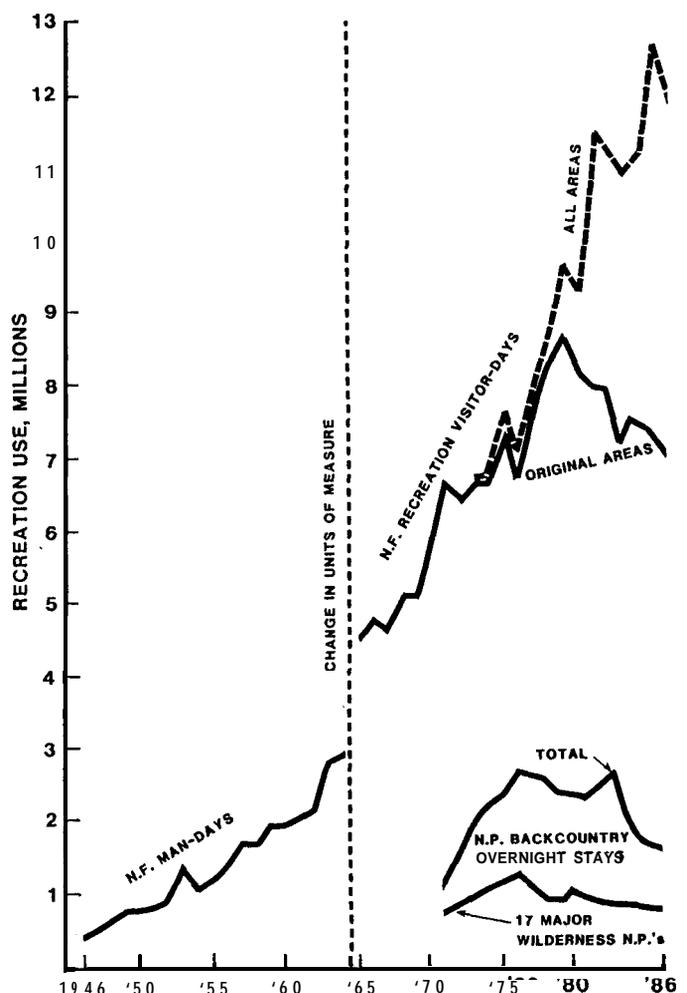


Figure 1.-Trends in recreational use of national forest and national park wilderness and backcountry, 1946-86.

overnight and day use, has been estimated for each wilderness and primitive area since 1946, and some data go back to 1941 (Elsner 1985).

National Park Service data are more limited and cover a shorter period. Data are not available specifically for designated wildernesses, but, since 1971, overnight stays in backcountry have been reported. Most national park backcountry (roadless,

undeveloped areas) provides use opportunities similar to those found in national forest wilderness. However, although day use is common in many wildernesses, often & counting for a majority of visits (Roggenbuck and Lucas 1987), it is not reported for national park backcountry.

Recreational use of wildernesses managed by the Fish and Wildlife Service and the Bureau of Land Management is minor and data are scarce (Washburne and Cole 1988). This discussion will omit both.

Besides variation in units of measure and length of records, the National Park Service and Forest Service wilderness recreation data also vary in accuracy. Park Service figures probably are more accurate than Forest Service data for most areas, although both have serious problems.

As use figures are aggregated for large regions or for the Nation, errors probably cancel out to some extent and remaining errors have a diminished effect on large amounts of more reliable data. Particularly at the national level, we think wilderness use data are good enough to be worth analyzing, but with some caution. Trends are most reliable if considered over a period of years, rather than emphasizing change from one year to the next. Although we could wish for better data, these are all we have, and we will discuss them without repeated warnings of the need for caution, first for national forests, then for national parks.

TRENDS IN NATIONAL FOREST WILDERNESS USE

Table 1 shows the growth in national forest wilderness use from 1946 through 1986, roughly by decades. Changes in definitions of the units for reporting use between 1964 and 1965 make it impossible to compare directly the growth rates over the 40 years. During the 18 years from 1946 through 1964, however, use grew sevenfold, at an average annual growth rate of 11.5 percent. In the 21 years following passage of the Wilderness Act, use has increased more than 2-1/2 fold, averaging 4.4 percent per year. Lately, growth has slowed even more. From 1981 through 1986, use grew only 5 percent, or, on an average annual basis, less than 1 percent per year. During the 1980's, year-to-year changes have been negative more often than positive.

In recent years, part of the increase in use stems from the addition of new wildernesses. At the time of passage of the Wilderness Act in 1964, the national

Table 1. --Growth in total National Forest wilderness use, 1946-86

Year	Use	Average annual change
		Thousands
		Man-days ²
1946	406	--
1955	1,175	12.5
1964	2,872	10.4
		Visitor-days ³
1965	4,522	--
1975	7,802	5.6
1986	11,233	3.4

¹Includes use of primitive areas.

²A man-day was defined as one person present for 1 day, but quarter days varied: one-quarter was 15 minutes to 3 hours, one-half was 3 to 5 hours, three-quarters was 5 to 7 hours, and a full man-day was 7 to 24 hours. Thus, man-days cannot be converted to visitor-hours or visitor-days.

³A visitor-day is defined as one person present for 12 hours.

forests contained 88 units reporting wilderness use. This included 54 areas designated as wilderness by the Act and 84 primitive areas, managed as wilderness pending review for possible wilderness classification. Over the years, all but one of these primitive areas have been reclassified as wilderness. Many new areas also have been added to the NWPS; at present there are 330 national forest units in the NWPS. To trace underlying trends in wilderness use, it is necessary to consider this major expansion in the number of units reporting use (Petersen 1981).

To do this, we can separate the growth of recreational use of the original 88 units, the 'core system,' from that of new areas (fig. 1). The size of the core system has been relatively stable, although some areas have been expanded. Since 1965, the rate of annual growth in use of the core system declined steadily:

<u>Years</u>	<u>Average annual change</u> (<u>Percent</u>)
1965-70	5.3
1970-75	4.5
1975-80	2.3
1980-86	-2.4

From 1965 through 1986, use of the core system has grown at an average annual rate of 2 percent, about half that reported for the total national forest wilderness system. Since 1980, use has declined. The peak year of use of the core system occurred in 1979; in 1986, use of the core system was 87 percent of 1979 use.

Still, in absolute terms, the growth in national forest wilderness use is impressive (fig. 1), exceeding that for many other forms of recreation taking place in the national forests. As a percentage of total national forest recreation use and, for comparison, as a percentage of national forest developed campground total use, wilderness use has grown steadily except in the last year for which data are available:

<u>Year</u>	<u>Percent of total use</u>	<u>Percent of campground use</u>
1941	0.4	2.2
1946	1.2	5.1
1951	1.8	--
1956	2.0	--
1961	1.9	7.2
1964	2.1	9.0
1965	2.8	13.3
1970	3.7	16.9
1975	4.0	19.9
1980		23.0
		37.0
1986	5.6	34.4

Wilderness use has increased its share of national forest recreation in most of this period, despite recent slower growth in wilderness use because most other types of national forest recreation also have leveled off or declined since 1980.

TRENDS IN NATIONAL PARK WILDERNESS USE

Change in national park backcountry use is shown for 5-year periods in table 2. -During the first 5 years following 1971, use grew rapidly, more than doubling from 1.1 million overnight stays to a peak of 2.6 million in 1976. This was followed by a long decline (fig. 1). Reported use in 1986 was less than in 1973, despite a 20-percent growth in the number of units reporting backcountry use. From 1976 through 1986, national park backcountry use declined about 37 percent, while in the same period national forest wilderness use (including new areas) grew nearly 65 percent. (Use of the core system grew only 4 percent.) There is little association between the patterns of change in annual use for the two wilderness-managing agencies; from 1971 through 1986, there are only 5 years when the changes reported by the two agencies were in the same direction, up or down.

Table 2. --Changes in total overnight stays in National Park backcountry, 1971-86

<u>Year</u>	<u>Overnight stays</u>	<u>Average annual change</u>
	<u>Thousands</u>	<u>Percent</u>
1971	1,096	--
1976	2,609	18.9
1981	2,330	-2.3
1986	1,645	-6.7

The decline in national park backcountry use is further confirmed by examining the year of peak use and contrasting it with 1986. As table 3 indicates, in 17 national parks with significant backcountry or wilderness portions, the peak year of use in 12 instances was before 1980 and in only one case was it as recent as 1982. In Shenandoah National Park, for example, 1986 use was only 32 percent of the 1973 peak.

The decline in national park use is not limited to the backcountry. All recreational overnight stays in the national parks declined 8 percent from a peak in 1977 through 1986, but backcountry stays declined more.

Table 3. --Peak year of wilderness use, National Park areas¹

National Park	Peak year of overnight backcountry use	Percentage of peak year use occurring in 1986
Yosemite (CA)	1971 ²	48
Everglades (FL)	1973	61
Olympic (WA)	1973	39
Shenandoah (VA)	1973	32
Denali (AK)	1976	91
Grand Canyon (AZ)	1976	45
Great Smoky Mountains (NC-TN)	1976	55
Grand Teton (WY)	1976	44
Glacier (MT)	1977	49
Rocky Mountain (CO)	1977	56
Mount Rainier (WA)	1979	76
Voyageurs (MN)	1979	76
King's Canyon (CA)	1980	54
Sequoia (CA)	1980	56
North Cascades (WA)	1981	65
Yellowstone (WY-MT-ID)	1981	57
Big Bend (TX)	1982	89
Total overnight backcountry use, all National Parks	1976	62

¹Based on annual National Park Statistical Abstracts.

²This was the year before backcountry permits were issued and data may be unreliable. The annual National Park Statistical Abstracts show 1972 with almost as much use as 1971. but van Wagendonk (1981) shows 1975 as the peak, with about the same use as 1971 and 1972. with 17 percent more use than shown in the Statistical Abstracts.

For comparative purposes, data for more than 20 national forest core system wildernesses (chosen mainly by elimination of those areas that showed such extreme fluctuations from year to year that the data seemed unreliable) are also shown (table 4); three show 1986 as the peak year, but a number are similar to the national park areas, with most reporting their peak year as 1982 or earlier.

TRENDS IN RELATED ACTIVITIES

Examining the growth in activities associated with wilderness use provides mixed results when compared to trends in wilderness recreational use. For example, membership in the Sierra Club grew from 84,000 in 1970 to 344,000 in 1983, a rate of nearly 12 percent annually, and many other environmental organizations also grew rapidly (Hendee 1984). In contrast, the National Sporting Goods Association described the traditional outdoors market as a mature, or perhaps declining, market. Furthermore, national forests in Montana and northern Idaho, and some other areas as well, indicate fewer volunteers for wilderness work and fewer applicants for wilderness ranger positions.

We must conclude, therefore, that wilderness use, like participation in many other recreational activities, has begun to stabilize. Much of the apparent growth is accounted for by the rapid expansion in the number of units that report wilderness use, primarily those under national forest administration. This growth, however, results largely from bookkeeping, as new areas with a history of recreational use are tabulated as wilderness. Previously, their use was included within some other recording category.

POSSIBLE REASONS FOR SLOWING GROWTH

Many factors can be considered as potential causes of slower growth. Possible reasons are complex and uncertain, but an aging population and changing tastes appear to be key factors. We will examine these and other factors and try to judge their roles.

Table 4.--Peak year of wilderness use, selected National Forest core system wildernesses¹

Wilderness	Peak year of wilderness use	Percentage of peak year use occurring in 1986
San Geronio (CA)	1966	49
Three Sisters (OR)	1973	76
Desolation (CA)	1974	74
Hoover (CA)	1975	26
John Muir (CA)	1975	33
Pecos (NM)	1978	91
Mazatzal (AZ)	1978	64
Bridger (WY)	1979	38
Sawtooth (ID)	1979	71
Great Gulf (NH)	1980	53
San Jacinto (CA)	1980	26
Selway-Bitterroot (ID-MT)	1981	65
Mount Jefferson (OR)	1981	93
Jarbridge (NV)	1981	69
Bob Marshall (MT)	1982	82
Absaroka-Beartooth (MT)	1982	77
Boundary Waters Canoe Area (MN)	1982	74
Eagles Nest (CO)	1983	71
Linville Gorge (NC)	1984	47
Teton (WY)	1985	80
Cloud Peak (WY)	1986	100
High Uintas (UT)	1986	100
Glacier Peak (WA)	1986	100

¹Based on annual summaries of wilderness use from the Forest Service national office.

Changing Age Structure

Virtually all studies of recreation participation point to age as one of the most powerful predictive measures of future participation (Marcin and Lime 1977; McCool and Frost 1987). However, English and Cordell (1985) found that recreation participation rates for older age groups have risen steadily since 1960, a fact that suggests that the normal dampening effects of increased age on recreation participation

might be less in the future than in the past. One of the most fundamental changes in American society today is the increasing age of the population. As the following tabulation shows, the increase, especially recently, has been substantial, but with uneven effects in different age categories (table 5).

Although the population is aging, changes in the age classes of people who visit wilderness the most are not striking. The number of people in the 18-24

Table 5.--Increases in United States population with selected percentage changes, 1960-85

Age group	Total population				Percent change	
	1960	1970	1980	1985	1970-85	1980-85
	<u>Millions</u>					
Under 18	64	70	63	63	-10	0
18-24	16	24	30	28	17	-7
25-34	23	25	37	42	68	14
35-44	21	23	26	28	39	23
45-54	21	23	23	23	0	0
55 and over	32	39	47	51	31	9

age class has declined slightly since 1980, but the 25-34 class, the most inclined to visit wilderness of any age class in many areas, increased throughout the period (especially in the 1970's when use grew rapidly). The 35-44 category, also common wilderness visitors, grew, especially in the 1980's, as the "baby boomers" moved up a step. Decreases in the under 18 and increases in the 55 and over classes should have had little effect because neither age class is a major wilderness user in most places. The decrease in numbers of children and teenagers is likely to reduce potential wilderness use in future decades, however.

Population age trends are a partial explanation of slower growth in wilderness use, but clearly not the whole story. One analysis concluded that projected shifts in the age structure, by themselves, would lead to a future rate of growth for several national forest wildernesses in Montana approximately half that for the 1970's and early 1980's (Polzin 1987).

Changes in Population Distribution

While changes in the age structure of the population have the potential to affect trends in total wilderness use, spatial changes in population distribution could affect trends in specific regions. Changes in population distribution, however, show little relationship to changes in wilderness use. For example, from 1975 to 1985, the population of California grew 22 percent and classified national forest wilderness acreage more than doubled, but recreational use during this same period fell 29 percent. Backcountry use of national parks in California also declined sharply. The large migrations to the South and West during the 1970's are not matched by significant growth in wilderness use in those areas.

Constraints on Leisure Time

Contrary to the conventional idea that leisure time will expand in the future and make it possible for people to enjoy more recreation, leisure time appears to be contracting. From 1975 to 1984, the median workweek increased from 43 to 47 hours, and leisure time per week shrank from 24 to 18 hours (President's Commission on Americans Outdoors 1986). Another factor that may affect likely wilderness visitors is the increase in households in which both spouses work (Hornback 1985). From 1975 to 1986, the number of married women working at paid jobs grew 32 percent (U.S. Department of Commerce, Bureau of the Census 1986). Although the discretionary income of such households increases, the coordination of vacations and free time between spouses often is difficult because of differing work schedules.

Effects of System Expansion

One possible explanation for the declining use of long-established core-system wildernesses in both national forests and national parks might be the large increase in the size of the NWPS. A prospective wilderness visitor now has 445 established wildernesses to choose from, 316 of which were added in 1980 or later. Although some of the decline in use of older areas is likely attributable to dilution of demand due to system expansion, the effect is probably limited for several reasons.

First, the market population is not fixed. If a new area is classified as wilderness, many of the visitors to it are the same people who visited the area before it was so designated. The wilderness is new, in an official sense, but the land and its recreational attractions were always there. Other visitors could be new entrants into the market, perhaps nearby residents attracted by the publicity generated by wilderness designation. This last group exemplifies the so-called "designation effect," the stimulation of demand that some think results from calling an area wilderness (McCool 1985). Although new areas might divert some use from older areas, they would be expected to add to total use of the system, thus accelerating the rate of growth in use, not causing it to slow down, as has been happening.

Second, growth of wilderness recreation opportunities is less impressive if acres are considered rather than number of areas. The almost 57 million acres of new wilderness in Alaska are best left aside because their great distance from most of the U.S. population results in light use. The wilderness system in the conterminous 48 States now includes 32 million acres, about double the pre-1980 total. But most of the acreage growth outside Alaska occurred in one year, 1984—too recently to help explain the decline from use peaks for core system areas in the 1970's and early 1980's.

Third, some of the growth in acres and numbers of areas in the NWPS results from shifts of national forest primitive areas to wilderness, or official designation of portions of a national park as wilderness. In both cases, the recreational use was already being counted. There is little basis for any designation effect because these areas have long been specially designated and widely perceived as wilderness even though not technically so classified, and we have defined them as part of the core system. This type of system growth appears unrelated to dilution of demand.

Fourth, the new areas generally are less attractive as recreation sites than the older wildernesses. New areas usually are smaller and have less spectacular scenery. Although the Wilderness Act clearly indicates that wilderness has many purposes besides recreation, the original national forest wildernesses and the national parks were established mainly because of scenic quality, natural attractions, and recreation potential. These original areas commonly are perceived as the crown jewels of the wilderness system, and many of the new areas are not strong competitors for visitors.

Finally, whatever effect major expansion of the wilderness system may have had on past use of older areas, its future effect probably will be less. The recent large expansion of the system (over 300 areas and 71 million acres added from 1980 through 1985) is not likely to be duplicated in years to come.

Effects of Changing Educational Levels

The most distinguishing socioeconomic characteristic of wilderness users is their high educational level (Roggenbuck and Lucas 1987). Trends in number of Americans enrolled in colleges and universities suggest lessening impetus for growth in wilderness recreation. Enrollment grew rapidly in the **1960's**, increasing 126 percent from 1960 through 1970. Growth slowed to 32 percent from 1970 through 1980. From 1980 through 1985, enrollment grew only 10 percent, with older students, over 24, accounting for most of the increase—another reflection of the aging postwar 'baby boomers.' This likely has contributed to slower growth in wilderness use.

Changing Gasoline Cost and Supply

The impact of changing gasoline prices on travel for wilderness recreation does not appear significant. First, during the 1973-74 oil embargo, when gasoline prices rose sharply, use of national forest wilderness continued to grow (although the rate of growth slowed). Second, in recent years, increases in the price of gasoline have not kept up with inflation, in effect, making gasoline cheaper. Despite this, the use trend has been downward.

Availability of gasoline has been a problem from time to time, but typically this has been a localized and temporary situation, usually before the recent slowdown in growth of use. Most wilderness visitors originate from areas relatively close to the wilderness, and it seems unlikely that either energy cost or availability problems would have a significant effect on overall use.

Changing Interests and Preferences

The socioeconomic variables examined here, particularly age and perhaps education, appear to explain only part of the declining rate of wilderness recreation participation. Thus, the question is whether public interest in wilderness is beginning to wane. Was the rapid growth witnessed in the 1960's and early 1970's simply a function of the heightened interest in the environment that characterized that period? Could declining rates of participation be partly a reflection of increasing dissatisfaction among users?

First, wilderness probably is not losing broad public support. A national survey by Opinion Research Corporation in 1977 found strong public support (Cordell and Hendee 1982). A more recent statewide poll conducted in Montana (Utter 1983) also found strong support—almost 85 percent of the respondents favored designation of wilderness. Although these cross-sectional studies do not permit an assessment of the trends in public attitudes toward wilderness, they nevertheless suggest that there is a high and continuing interest in wilderness preservation. (Perhaps the "yuppie" lifestyle supports the **concept** of wilderness, but not its actual **use**.)

Second, we can examine general population surveys of recreation participation to see how involvement in wilderness-related recreation activities is changing. The mixture of activity definitions and methodologies makes it difficult to interpret these results. However, it appears that in recent decades the percentage of U.S. citizens participating in wilderness-related activities has remained relatively stable at about 5 percent. Thus, the proportion of the population whose recreation interests might likely be met in wilderness settings does not appear to be changing greatly, although the frequency or length of visits may have changed.

Third, there appears to be little likelihood that rising dissatisfaction is leading to declining use levels in wilderness. Most studies of wilderness users report high levels of satisfaction (Van Horne and others 1985). Lucas (1985) found Bob Marshall wilderness visitors surveyed in 1970 and 1982 about equally satisfied. Furthermore, he found that in 1970 over one-third of the experienced visitors found conditions worse than on earlier trips, but in 1982 only 16 percent felt this way. We are not aware of any similar studies of national park backcountry visitors, although their large declines in use and generally greater regulation of visitors raise speculations about possible effects of dissatisfaction.

Finally, it is possible that the declining rates of wilderness recreation participation might be a function of the increasing levels of diverse recreation activity by many people. Van Horne and others (1985) report that since 1960 the percentage of the population participating in many activities has risen. At the same time, data from the National Recreation Survey also indicate that although 18 percent of the respondents said they were spending more time at present in outdoor recreation, 33 percent said they were spending less (Van Horne and others 1985). What these data may suggest is that there is simply not enough time to do the increasing number of things people might want to do, including wilderness recreation.

An analysis of entry into wilderness recreation by new participants, dropout of former participants, and changes in amount of participation by active wilderness recreationists, modeled after the study of camping by Kottke and others (1975), would clarify the changes taking place and the role of preferences. Limited data of this sort are available for backpacking and day hiking (Van Horne and others 1985). In the previous 2 years, 17 percent of all backpackers started the activity—a good recruitment rate, and only 5 percent stopped backpacking. Persons who said they expected to start backpacking in the next 2 years equaled 14 percent of the current backpackers. Day hiking figures display a similar pattern of good recruitment, little dropout, and considerable potential future participation. None of this suggests declining participation.

Changing Patterns of Wilderness Use

Lengths of stay have become shorter in some areas, and groups have become smaller (Lucas 1985), which would reduce visitor-day totals. Day use may have become more common relative to camping use, but day use is unreported for national park backcountry and, because it is difficult to measure, might go underreported for national forest wilderness.

Effects of Limiting Use

Use limits have been imposed in some areas in both national parks and national forests in the last decade or two, including the most heavily used wilderness of all, the Boundary Waters Canoe Area Wilderness. This could slow or eliminate further growth in use, but could it lead to declines? Van Wagendonk (1981) examined this question in Yosemite National Park and concluded that use limits did not account for declines in backcountry use, although they did lead to changes in the timing and spatial distribution of use.

Changing Wilderness Images

Perhaps the image of wilderness recreation has changed in ways that might contribute to slackening use. Many visitors probably feel pressures to use wilderness with minimum impact. This is generally a positive development, but it may create anxiety about what to do and guilt about mistakes that may have been made that take away some of the free and easy pleasures of an earlier, more innocent era.

Many areas also have more regulations. In addition, giardia infection has become widely recognized as a problem in wilderness waters. A decade or two ago, visitors might have relaxed with clear consciences around a roaring campfire next to a high mountain lake, perhaps sipping clear, cold water dipped from the lake. Now they might get a ticket from a wilderness ranger for camping too close to the lake, or for having a campfire, and catch diarrhea from the water. If this shift of image is common, it might help explain recent trends. Conceivably, some visitors might even be choosing to restrain their own use of wilderness as their contribution to wilderness protection.

QUESTIONABLE USE DATA

The more we have worked with agency wilderness use estimates, the more we have become aware of their serious shortcomings. The leveling off and declines in reported use are so widespread that there seems little doubt about the direction of change, but its magnitude, especially for individual areas, is questionable. For example, the official wilderness annual use report from the Forest Service national office shows peak use of the Boundary Waters Canoe Area Wilderness in 1982, with 1986 use only 74 percent of the peak (table 4). But, other figures issued by the Superior National Forest, which manages the area, show 1981 as the peak and 1986 use as 99.6 percent of peak use. Two sets of use figures for Grand Canyon National Park show similar divergence.

Wild swings in reported use of individual areas from year to year are common, particularly for national forest wildernesses. Many of these fluctuations are so large that it seems impossible that they represent real changes; estimation errors must be large and common. For example, the Galiuro Wilderness in Arizona reported 28 times as much use in 1976 as in 1975. These kinds of inconsistencies hamper research, but more important, they devastate professional management. Should managers relax because use of a particular wilderness is plummeting or gear

up for a crisis because use is exploding? For some areas, it appears impossible to decide as the answer switches from year to year. For example, the Eagle Cap Wilderness in Oregon reports use shifts that remind one of a yo-yo. From 1979 through 1986, use repeatedly dropped by half or more one year and doubled or tripled the following year. These examples are not isolated instances. There are many other puzzling examples from most parts of the country.

Improvement in the accuracy of use estimates seems essential. This will require commitment to develop reliable technology, transfer it to managers, and apply it carefully (Watson and others 1987).

REASONS FOR SLOWING GROWTH UNCLEAR

Trends in wilderness use present a complex pattern, but the inescapable conclusion is that onsite recreational use is flattening or declining. The reasons underlying this trend are not clear, but it seems likely that a combination of changes in the sociodemographic structure of society, particularly an aging population, and changes in social preferences and tastes are important parts of the explanation.

This slowing trend should not be seen as inconsistent with the general trends forecast for other outdoor recreation activities. Clawson (1985), for example, speculates that the rate of increase in outdoor recreation activity for the next 25 years will be more on the order of 4 percent annually, as opposed to the 10 percent rates found in the past 25 years. Jungst and Countryman (1982) project wilderness use to 2020 to grow at a rate between 2 and 7 percent, depending on the prediction model used and the assumptions about the independent variables used in the models.

Wilderness use will undoubtedly remain an important form of recreation in the national forests and national parks. Despite the apparent decline in national park backcountry use, it remains about 7 percent of total national park overnight use. As noted earlier, wilderness use in the national forests has increased its share of the total recreation pie, now accounting for more than 5 percent.

IMPLICATIONS OF SLOWING GROWTH

A Chance for Managers to Catch Up

If the changes in wilderness use continue, they carry with them some important implications for the management of such areas. Stable or lower use might represent an opportunity for wilderness managers to "catch up" with problems that a few years ago looked overwhelming. Not only are growth rates slowing, but trends in the character of use and users also hold promise for reducing impact levels. This includes a shift toward activities having lower impacts (for example, a shift from horse use to hiking), smaller groups, greater visitor knowledge of how to minimize impact, and a reduction in littering (Lucas 1985).

The Wilderness Allocation Debate

For years many people have cited rapidly growing recreational use as a reason to designate more wilderness. This now appears to be an uncertain foundation. Wilderness has many purposes besides recreation; lack of growth in recreational use suggests that other important functions such as ecosystem representation, scientific activities, and vicarious enjoyment will need to become more central to debates over whether certain lands should be wilderness.

Reconsider Management Policies

Many wilderness management policies were adopted when use was growing rapidly and in anticipation of massive future growth. Use rationing, assigned campsites, length of stay limits, camping setbacks from water, bans on taking in cans or bottles, and other policies often adopted to head off serious problems before use got out of hand may now merit reconsideration in light of reduced use and possible future declines. Perhaps visitor freedom can be increased and the quality of visitors' experiences thus enhanced.

Quality deserves special emphasis. Although available measures suggest no decline in satisfaction generally, there are many opportunities to raise satisfaction with specific aspects of wilderness visitors' experiences. Stable use suggests a sophisticated, demanding market that will challenge the skill of wilderness managers.

Managers might even consider some promotion of appropriate wilderness use. This would be an about-face from recent policies that have sought to avoid stimulating use, but if managers believe

wilderness provides important benefits to visitors and that use of some areas has declined more than necessary, it may be worth advertising opportunities for appropriate wilderness experiences.

Increase Understanding of Trends

Formulation of long-term wilderness policies needs to be based on a better understanding of trends in recreational use and of factors associated with changes in use. The past confidence that use was increasing and would continue to do so should be abandoned. The future seems highly uncertain. The downtrends are recent and short term in most places. Use could rebound or sink lower (like the stock market), Better use estimates seem essential to track trends, and increased knowledge of the reasons for ups or downs would help develop policies that fix the situation. For example, changing age structure has very different policy implications than dissatisfaction with trail maintenance or restrictive regulations.

Slow growth or even declines in wilderness use do not imply a decline in the importance of wilderness. Wilderness is not intended to be primarily a recreation area. The visitor numbers game can be a dangerous trap. Many people have used past growing use as an easy argument for more wilderness or larger budgets for management and research, but slackening use can help solve crowding and impact problems and increase the effectiveness of improved management. Good results from management are less likely to be buried by ever-increasing use and proliferation of problems. This should provide additional motivation to increase our efforts to manage and protect the wilderness resource for all of its values.

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WILDERNESS RECREATION DEMAND AND VALUE: AN ASSESSMENT OF EXISTING KNOWLEDGE AND RESEARCH NEEDS

Cindy Sorg Swanson and George L. Peterson'

Abstract—This assessment of existing knowledge and research needs on the demand-side of wilderness economics presents a review of demand-side economic theory from the perspective of total value, including use value, option value, quasi-option value, and existence value, a summary and critique of the travel cost and contingent valuation methods for estimating demand-side values, a summary of the current status of knowledge in water quality, wilderness, wildlife, and air quality, and a review of research needs in the areas of wilderness products, markets, production and supply, demand and valuation, and price and rationing policy.

INTRODUCTION

This paper is an assessment of existing knowledge and research needs in wilderness recreation demand and value. The scope includes (1) the theory of wilderness demand-side economics and valuation, (2) a review and critique of the travel cost and contingent valuation methods for estimating demand-side values, (3) an assessment of current knowledge of on-site economic value for water quality, wilderness, wildlife, and air quality, and (4) a statement of research needs. The scope excludes noneconomic valuation. It also excludes demand modeling and forecasting, except as implied by the valuation methods.

The theory of wilderness demand and valuation is developed from the perspective of "total value," and includes the components of use value, option value, quasi-option value, and existence value. The section on research needs is necessarily general and brief. Covered topics include wilderness recreation products, markets, production and supply, demand and valuation, and price and rationing policy.

OVERVIEW OF DEMAND-SIDE WILDERNESS ECONOMICS

A wilderness area represents many things to many people and many of the values people hold are not directly related to actual interaction with the resource. Most wilderness areas in the United States are free (or charge a minimal fee) for access; therefore, even the value associated with use cannot be readily measured by observing the price for access. How, then, can the full economic effect of a policy which effects a nonmarket good be captured and measured?

Consider a single household whose preferences are expressed by an ordinal utility function (U) which fulfills the preference assumptions of completeness, reflexivity, transitivity, and increasing and continuous overall goods. The household maximizes utility over a vector of activities (Z) that yield satisfaction (Randall 1987a);

$$\max U = F(Z).$$

These activities are produced by the household comparing not only market activities (X) but also nonmarket activities. Therefore, the household production function for activities using a natural resource (wilderness), Q , is given by

$$Z = g(X, Q/T)$$

where:

X = goods and services other than Q , and

T = household production technology.

Since the Hick's compensating measure of consumer surplus uses initial level of welfare as the reference level it is the appropriate measure of welfare change under the Potential Pareto Improvement criteria. As such, the household minimizes expenditures subject to a given level of utility.

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$$\min_x \Sigma(PX + \lambda(\bar{u} - F(Z)))$$

where: PX = vector of prices for commodities X , and

$$Z = g(X, Q/T) \text{ and } Q \text{ is at its initial level.}$$

Solving the minimization problem results in compensated demand curves which can be substituted into the objective function to obtain the expenditure function

$$E_q(P, Q, U)$$

The derivative with respect to Q yields an inverse demand equation for Q ;

$$dE/dQ = -E_q(P, Q, U)$$

If a measure of total value associated with the wilderness were desired, we can integrate over the without wilderness to the current level of the wilderness and obtain the compensated measure of welfare;

$$TV = \int_0^{Q^0} E_q(P, Q, U) dQ$$

The Total Value Curve can also be represented **diagrammatically** as shown in figure 1 (Brookshire and others 1980; Randall 1987a). The origin represents the individual's initial welfare position and using this as the reference level, compensating measure of consumer surplus can be measured directly. The total value curve holds utility constant and therefore represents an indifference curve between income (Y) and the amenity (Q). For example, the compensating

measure of an increment of the wilderness amenity from Q^0 to Q^1 is read from the figure directly as $Y^0 - Y^1$ which is willingness to pay for an increment from Q^0 to Q^1 . Alternatively, if faced with a proposed decrement in the amenity level, the household would demand a payment of $Y^+ - Y^0$ to leave it indifferent between Q^0 and Q^- .

The total value framework above is consistent with the Potential Pareto Improvement criterion since compensating measures result. Before addressing other issues relating to total value it is useful to explicitly define the components which make up total value of an environmental good. These components are not mutually exclusive and often overlap; however, for ease of explanation they can be categorized into, use, option, quasi-option, and existence value. Each are briefly discussed below.

Use value is most readily understood and can be measured using a variety of methods. Any activity which takes place in conjunction with an environmental resource can be thought to generate use values. As such it is possible to infer use values by observing the transactions of goods and services which require use of the environmental resource. This type of interaction is referred to as weak complementarity and is the basis for the Travel Cost Method. As will be discussed in more detail later, the majority of applications of the weak complementarity only capture a portion of use values; often referred to as direct or primary purpose use. Other components of use can include (Randall 1987b): incidental use, off-site and non-participant uses.

Option value is most easily thought of as an insurance premium since it is an adjustment to welfare which reflects future uncertainty. The notion was first introduced by Weisbrod (1984) and has seen much subsequent discussion (Bishop 1982; Graham 1981; Schmalensee 1972) on the restriction of the sign associated with option value. Option price is defined as current willingness to pay for the option of future use and is related to option value in the following manner.

$$OP = ES + OV$$

where:

OP = Option Price,

OV = Option Value,

ES = Expected Surplus, and

= Expected Value of Future Use (riskless).

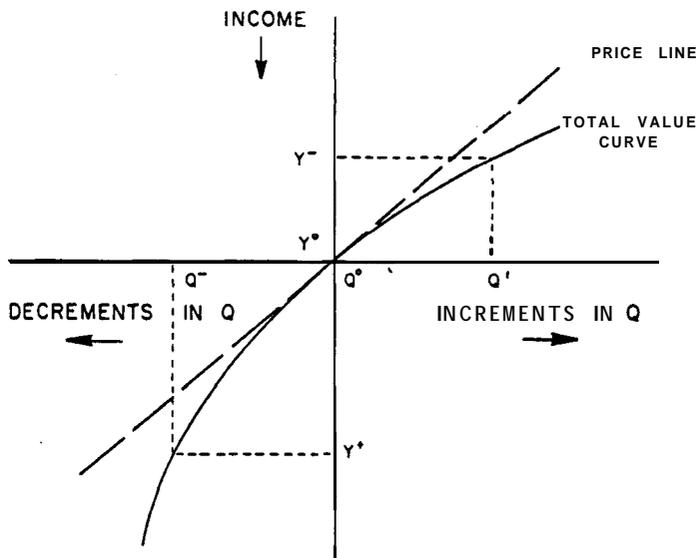


Figure 1. -Total value curve.

Bishop (1982) shows that when demand is certain but supply uncertain, then option value is always positive. Additionally, Freeman (1984) concludes if demand is uncertain due to uncertainty of future income, option value is negative for risk adverse individuals and further option value may be large.

Graham (1981) defines a fair bet point which is appropriate to policy analysis, however, since it is not easily observable he suggests option price as the "second best" alternative. The discussion therefore of the sign of option value is not relevant to the estimation of total value in a policy context.

The introduction of Quasi-option Value can be credited to Arrow and Fisher (1974) and Henry (1974) and deals with the value of future information in current decisionmaking. The concept is most often used in reference to an irreversible policy decision which' can be undertaken now or delayed one time period. If the policy action is delayed and new information is available at the beginning of the next time period then there is value associated with the delay. Hanemann (1982) suggests that quasi-option value will be large for decisions involving "all or nothing" policy states and not well defined for incremental decisions. Issues relating to wilderness preservation may be incremental in some situations and thus quasi-option value may be viewed as small and not critical to estimation of total value. However, for policies implicating large land areas or critical habitats, quasi-option value may be quite large and therefore a critical component of total value.

For a remote and unique wilderness resource, existence values may represent the largest portion of total value. Krutilla (1967) and Krutilla and Fisher (1975) were perhaps the first to suggest the economic concept of existence value:

"There are many persons who obtain satisfaction from the mere knowledge that part of the wilderness of North America remains even though they would be appalled by the prospect of being exposed to it."

Subsequent to this broad definition, several authors have attempted to refine the definition in order to allow clear delineation of total value concepts and allow empirical measurement.

Randall (1987a) uses the household production function to define existence value as;

$$Z = g(O, Q/T).$$

Existence value is generated by **Q** alone with no elements of **X** involved in the current time period. Activities involving **X** and **Q** in previous time periods seems necessary to generate a production technology, **T**, for existence value in the current time period. Randall and **Stoll** (1983) feel existence value can be broken into 2 components; bequest and intrinsic values. Bequest values are conceived as the values generated from knowing **Q** will be available to future generations. Knowing **Q** is available for others to use is referred to as intrinsic-value. Drawing from Krutilla's (1967) argument that irreversibility and uniqueness are necessary to existence value, Randall and **Stoll** (1983) point out that these are not necessarily true. On a local level, existence values may exist for nonunique resources such as a local State park which provides a wilderness escape for a local city. Further, Brookshire and others (1986, 1987) suggest existence value has two components; one economic and the other ethical. Only the economic component can be directly incorporated into a benefit-cost analysis,

If economic valuation is to capture the full spectrum of a wilderness experience whether on-site or off-site it is critical to incorporate all components of total value. As suggested above, a study which measures only on-site, primary purpose values may grossly underestimate the full value of a resource, particularly if the wilderness is visually unique or houses the last remnants of species of flora and fauna. The problem of measurement is further complicated when choosing the units of measurement. On-site values are most often measured on a trip basis. Measurement of option, quasi-option, and existence values on a trip basis would be nonsensical, and aggregation to obtain a total value measure is not possible. Further, management planning (USDA's **FORPLAN**) uses values based on a 12-hour recreational visitor day (RVD) and as currently practiced, valuation techniques do not apply to an RVD in a straightforward manner. As will be suggested below, the Contingent Valuation Method can be applied directly to obtain an estimation of total value of a proposed project or an existing area, usually on a monthly payment basis, but translating this into a daily value is not possible. Either method or management must be modified.

Another issue related to total value which is particularly relevant to wilderness has to do with quality factors. Often, studies will report the average value of, for example, hiking, camping, or hunting in a particular area or region, No reference is made to the setting of the experience; as if these activities are supplied and experienced in a homogeneous

manner. In the case of wilderness, nothing could be further from the truth. The quality or setting of the experience is perhaps the most important variable of the experience, and, therefore, should be explicitly incorporated and reported in a study. All methods of nonmarket valuation can easily incorporate quality variables, and have more recently begun to include variables which reflect setting as it relates to quality. The issue of quality is also critical when considering substitute sites. Wilderness areas are often unique unto themselves and supplying a perfect (or even imperfect) substitute site is often not possible. Encroachment or destruction of a wilderness therefore may have more significant impacts than merely diverting use to another area. If another comparable area is not available, then the full loss in total value is much more extreme.

Before discussing methods to measure total value, perhaps it would be useful to first ask the question: 'Are there markets for these products, and how do they work?' Both of these questions are legitimate and many people have suggested that the competitive, free market solution is the way to go in recreation allocation. A brief explanation of why the market solution is not appropriate to wilderness allocation is useful at this point.

In a perfectly competitive market, prices often reflect economic value, and if a proposed policy will affect only small quantities of outputs when compared to the total, then the measure of value can be found by multiplying price by the quantity change. This can be seen by again referring to figure 1. The dashed line through the origin is the market price line and for small increments and decrements in Q , the price line and total value curve nearly coincide. Thus measurement error is minimal when price is used as a proxy for total value when quantity change is marginal. However, as quantity changes get larger so does the error associated with using market prices. Unfortunately, policy effects are often nonmarginal or markets exhibit attenuated ownership in the form of property rights not being fully specified, nonexclusive, nontransferable or not fully enforceable (Randall 1983). In addition to many goods and services not exhibiting nonattenuated ownership, they may also face nonrivalry in consumption. Nonrivalry violates competitive market conditions since the consumption of the good or service by one individual does not diminish the availability of the good for another individual's consumption. A wilderness experience is an example of a good which is both nonrival and nonexclusive and thus violates the conditions of a competitive market. Finally, for values such as option, quasi-option, and existence, a competitive market which captures these values as revenue could not

be developed, and while the wilderness resource exhibits high total value, it would not be profitable for a market firm to own and operate. Market prices (when they exist) do not represent efficient measures of value in these cases of nonmarginal changes, nonexclusion, nonrivalry, and inability to capture (as revenue) total value.

When markets fail for any of the above reasons, the public sector often steps in to provide the good or service. The public sector often manages a resource with two considerations in mind, those of equity and efficiency. Equity is concerned with who benefits from public policy and how distribution of income and resources flow from one sector to another as a result of policy changes. Efficiency is concerned with providing a net increase in national income as a result of policy. If the gainers from a policy could (hypothetically) fully compensate the losers then the policy is considered efficient and should be undertaken. While the focus of this paper is on efficiency issues, it should be noted that equity issues may dictate the appropriateness of a policy. Often employment is the issue of concern, and, in that case, appeal to a benefit-cost analysis which is purely an efficiency criterion is inappropriate.

With efficiency in mind, this section will discuss how measures of economic value can be derived for wilderness using the Travel Cost Method (TCM) and the Contingent Value Method (CVM). This will be accomplished as follows. The discussion will start with a basic single-site travel cost model and then build on this model to include: travel time, substitute measures, choice of appropriate variables, and functional form of the regression. The discussion will end with an overview of the advantages and disadvantages of the method. Next, the Contingent Valuation Method will be discussed. This will be accomplished by considering survey data collection requirements, sources of error, and data analysis. The advantages and disadvantages of CVM will be discussed. Finally, a general comparison of the two methods will be made.

The Travel Cost Method

The Travel Cost Method (TCM) estimates demand for a recreation site based on observed variations in distance traveled and quantity of trips demanded for that site. From these variations it is possible to infer how a group of people would respond to increases in the cost of travel to the site. Since the demand curve is derived using increases in current prices, TCM measures net willingness to pay or consumer surplus. Total (gross) willingness to pay for a site can be obtained by adding current prices (expendi-

tures) to the TCM estimates of consumer surplus. In addition, TCM assumes that an individual's primary purpose for traveling to a site is to recreate at that site. Therefore, a trip to visit relatives where you stop on the way to do a few hours of fishing would not qualify for analysis using TCM.

Consider a single site, such as camping in the Shoshone National Forest. Develop origins of travel to that site, such as counties and assume travel distance (costs) to that site is the same for all individuals in origin i .

The first step involves estimating the trip demand curve for the camping trip. In order to be able to derive this curve, there must be variations in prices (or distance) for individuals visiting that site. The estimated equation will be of the form;

$$V_i/N_i = f(TC_i)$$

where:

V_i = number of trips by residents in origin i
($i = 1, k$),

N_i = population of origin i , and

TC_i = average roundtrip travel cost from origin i to the site.

Trips per-capita is measured as a function of average roundtrip distance from each origin to the camping site. The 'per-capita' specification adjusts for differences in population sizes of counties of origin. The second step involves estimating an aggregate demand curve function which shows estimated trips by all recreationists at various prices. This effectively involves adding a hypothetical fee to the trip demand curve and determining how the associated trips to the site decrease. Since each origin has a different population size, visits per capita is estimated for each origin from the trip demand curve and then multiplied by the origin's population size. The resulting trips are then summed across origins to arrive at a total visitation rate. Total visits can then be expressed as:

$$V(P) = \sum (V_i(P)/N_i) * N_i$$

This basic model highlights the fundamental concepts of TCM but it does not incorporate all theoretically relevant variables. Some of these will now be considered.

As the model exists, adding a hypothetical fee to a close origin results in the same total costs as those faced by someone in a more remote origin. Not only do those living farther away have higher costs per trip but also expend more time getting to the site. There is an opportunity cost associated with this additional time, and therefore we would not expect visitation from the close origin and the far origin to be the same when both face the same travel costs. Since individuals in the close origin spend less time traveling to the site, more trips will occur from that origin given the same travel cost.

Although there is no consensus on how to value travel time, the U.S. Water Resources Council (1979, 1963) recommends one-third of the wage rate. This is the mid-point of values of travel time found by Cesario (1976) in a review of the transportation planning literature. This value is not intended to measure wages foregone due to travel, rather, it includes the deterrent effect of scarce time on the decision of which site to visit.

As the price to a site increases, individuals may decide to go to an alternative camping area. A comparison is made between the two sites in terms of travel costs, quality, and services offered.

Most often, not accounting for the ability of individuals to visit a substitute site results in an overestimate of benefits associated with the primary site. In order to incorporate substitute sites and therefore quality measures, a Regional (Generalized) Travel Cost Model (RTCM) has been developed (Cesario and Knetsch 1976). This method requires extensive data to allow estimation of trips per capita of the form:

$$V_{ij}/N_i = f(TC_{ij}, S_i, Q_j)$$

where:

V_{ij} = number of trips by residents in i to site j ,

N_i = population of origin i ,

TC_{ij} = average roundtrip travel cost (including a measure of travel time),

S_i = measure of substitute sites available to origin i , and

Q_j = measure of quality at site j .

Quality measures can include acres of wilderness, number of backcountry permits (congestion), miles of streams (variety/congestion), or any important physical or biological variable associated with the sites. Substitutes may include travel cost to the next best site, total permits at the next best site, or acres of wilderness at the next best site. For wilderness areas, specification of quality variables may be critical

to value estimation and may further indicate availability or inavailability of an adequate substitute site. Once this regression system has been modeled, the second stage proceeds as before; successively higher prices are added until zero visits are observed.

It should be obvious that RTCM involves far more data and more involved computer modeling. Not only is it necessary to collect data relevant to Shoshone National Forest, but also data on other camping areas. It should also be obvious, however, that RTCM more accurately captures the interaction of available camping sites. Using RTCM, a demand equation for a single site can be obtained by plugging in the quality characteristics for the site of interest. This single site demand curve is preferable to the "basic" model because substitute sites have been incorporated. By including site characteristics it is also possible to value the change in economic value associated with changes in site characteristics (Anderson and Bishop 1986).

The discussion of substitutes and quality measures was presented in general terms without specifying which measures to choose or how they should enter the model. A complete RTCM should include travel costs, travel time, income, substitutes, and quality, but how they are measured is often a matter of trial-and-error depending on statistical properties of the resulting regression equations. Unfortunately, inclusion of different variables can have a strong effect on the resulting value estimates.

The choice of functional form can also be data dependent. Vaughan and Russell (1982) suggest that the natural log of visits per capita is better than a linear form because of the pattern by which trips per capita fall off at higher travel costs. Bowes and Loomis (1980) suggest taking the square root of each origins' population which corrects for heteroskedasticity resulting from larger populations exhibiting larger variances. As with the choice of variable inclusion, choice of functional form is often left to statistical analysis of the regression equations.

The primary advantage of TCM is the ability to use secondary data and thus avoid the time and expense of primary data collection. Campground receipts, hunting and fishing licenses, or trailhead self-registration forms can often be supplemented with census data routinely collected by the State, and the Department of Transportation's estimates of vehicle mile costs. Most often, per capita income and standard mid-size car cost per mile are used. Additionally, the inclusion of quality variables allows valuation of changes in management practices which alter quality.

Some of the disadvantages of TCM have been mentioned: inclusion of travel time, specifying substitutes and quality measures, and choice of functional form. In addition, TCM does not work well for large sites with several entry points, multi-purpose trips, multi-destination trips, sites which have capacity constraints, or measuring off-site benefits such as option, existence, or bequest values. This latter restriction may be of particular relevance to wilderness areas which exhibit large off-site values. In these cases, TCM provides a gross underestimate of total value.

The Contingent Valuation Method

The Contingent Valuation Method (CVM) elicits value data directly by designing an exchange situation in which individuals can price the total value of a current (proposed) policy impact. By confronting individuals with various cost increases, a demand curve can be derived for the particular policy issue. Since the question is based on current expenditures, net willingness to pay can easily be derived and the area under the demand curve represents net willingness to pay (consumer surplus) for current conditions or for a proposed change in conditions,

Survey Format

CVM collection of willingness to pay can be broken into five parts (based on Hoehn and Krieger 1986):

1. Presentation medium
2. Description of policy impacts
3. Method of provision
4. Method of payment
5. Bid elicitation procedure

Each part is discussed below.

Surveys can be implemented in a variety of ways, including; person-to-person, mail, telephone, computer simulation, or some combination of these. Often the presentation is aided by the use of graphs, diagrams, quality ladders, or photographs. It is important to provide individuals with information which will help them understand how they will be affected by a policy or how their participation may be altered by a policy.

In order for CVM results to be reliable it is essential that policies be fully described. This means the survey must not be biased, misleading, or inconsistent with

actual alternatives. The use of aids in the presentation often facilitates clear policy description. Schulze and others (1982) used photographs depicting actual levels of emissions, ambient pollution loadings, and perceptible haze levels in photographs of atmosphere in the Grand Canyon. Individuals were asked net willingness to pay for a specific improvement in air quality, and the photographs accurately depicted these changes. Brookshire and others (1979) used photographs depicting changes in elk **habitat** which would result from mining in Western Wyoming. Hunters were asked willingness to pay to avoid the depicted habitat degradation. A clear description of policy impacts allows individuals to more easily weigh the effects of, a policy on their activities and willingness to pay.

How the policy is presented can often effect the values elicited. The survey should avoid specific links to an agency, and, therefore, keep the survey general enough to avoid focus on any specific agency and keep the focus on the environmental issue. A policy which will be implemented by the Department of Defense may generate much different values than a policy which does not specify an agency. The survey may result in valuing the ability of the Department of Defense to implement a policy rather than the actual policy.

As with method of provision, the method of payment can move the survey focus from the policy to the payment vehicle used to collect dollar estimates of willingness to pay. In the past, studies have used electric bills, lump sum taxes, user fees or sales taxes. Sometimes the vehicle is not realistic in that a person who rents may not pay electric bills, and, therefore, willingness to pay via electric bills is not a realistic vehicle for value elicitation. Additionally, respondents may not believe the money will actually be used for implementation of the proposed policy. Rather, they may see electric bill increases as another example of utility companies getting rich at the expense of the working class. Current studies (Tolley and others 1987) avoid a payment vehicle focus by avoiding reference to a specific payment vehicle. Instead, willingness to pay is collected via a lump sum cost of the policy which will take the form of generally higher taxes and prices. Again, focus of the survey is moved away from the payment mechanism and directed toward the actual policy.

The bid elicitation procedure is the process through which value data are obtained. Several formats can be implemented. The first asks individuals to directly state their maximum willingness to pay for the policy. This method is called the open-ended format.

The second format states a fixed amount and the respondent accepts or rejects the policy for that particular policy/payment pair. This technique is referred to as the dichotomous choice method.

The third format is used in combination with the first or second format. Once an initial bid is obtained, the surveyor increases the amount to successively higher levels ($\$B + \C_1 , $\$B + \C_2) until a "no" response is elicited. The final "yes" bid is recorded. This method is called an iterative bidding procedure and is intended to force individuals to fully analyze their preferences and therefore state a maximum willingness to pay.

From the above discussion it is obvious that much care must be taken in the design of a CVM survey. The potential to inadvertently bias willingness to pay bids must be recognized and surveys must be designed to avoid potential biases. The sources of error (bias) can be summarized as three types (Anderson and Bishop 1986; Cummings and others 1986; Hoehn and Krieger 1986):

1. Hypothetical bias
2. Information bias
3. Strategic behavior bias

These are summarized as follows.

Most people's initial reaction to CVM is, 'Ask a hypothetical question, get a hypothetical answer.' Surveys must be designed so individuals feel their response will have some impact on policy decisions. Such a bias can be minimized by careful description of the policy which allows individuals to evaluate the gains and losses of the proposed policy. Using survey aides minimizes errors in perception and comprehension by providing information to help a respondent fully absorb a range of impacts. Often a policy will involve complex and unfamiliar changes, such as the effects of minimum stream flows in a river basin. In order to allow the respondent to fully grasp **policy** implications, time must be allowed for the respondent to review policy aspects and weigh how recreation activities and market good purchases will be rearranged. Minimum stream flows will improve fishing and therefore mean a respondent may want to fish more, but what activities will he/she have to decrease in order to have more fishing time? In addition, how will minimum stream flows affect water bills, etc.? A survey must convey realism and allow time for comprehension.

Information bias arises as individuals formulate an expectation of policy impacts subject to information in a CVM survey. In one sense, the value elicited should be sensitive to the information conveyed since a small change in policy should be reflected in a change in willingness to pay. However, there are certain aspects of the survey which should not affect the bid elicited.

In the bid elicitation procedure, if an iterative bidding procedure is used, the first bid obtained may have an effect on the final bid stated. If the initial bid and the final bid are correlated, then **starting point bias** is present. Using dichotomous choice with no iterative bidding can be implemented but data analysis is more involved; requiring an understanding of **logit** model analysis. Alternatively, starting point bias often results from respondent fatigue and can be minimized if iteration is done quickly.

As mentioned under method of payment, **payment vehicle bias** can result in unintended information bias. If possible, avoid specific reference to an agency or a specific payment mechanism, pose the questions as a lump sum tax or a general increase in prices.

Strategic behavior is said to occur when an individual attempts to influence the survey outcome by not revealing a true value. Such a bias can be minimized if the survey is designed in a dichotomous choice framework such that the policy will be implemented if a majority favor the policy/payment pair and individual payment will be equal to the per person cost of implementation. This type of questionnaire design is similar to referendum voting and is said to be incentive compatible (Hoehn and Randall 1988). Even when incentives for truth-telling are not explicit, little evidence exists to suggest strategic behavior occurs (Schulze and others 1981).

Once the survey has been implemented accounting for the above considerations, data analysis is fairly straightforward. A decision rule must be made as to what bids are considered outliers of the data set and which zero bids are protest bids. Some systematic methods (Desvousges and others 1988) exist for identifying high bid outliers. Zero bids made in protest to the survey and not as a true willingness to pay must not be included in the analysis. The survey should include a question which asks whether the zero bid is in response to the survey, a true expression of willingness to pay, or a bid given because of the difficulty in arriving at a value.

As mentioned previously, dichotomous choice survey data analysis involves an understanding of

logit model analysis. This is a relatively new method for CVM analysis, but some guidelines exist (Bishop and others 1988; Hanemann 1984). For other survey data designs, analysis often involves merely determining a mean value of willingness to pay.

Often socioeconomic variables such as income, experience, age, residence, or visitation rates are collected. These variables allow systematic hypothesis testing of the relationship of willingness to pay to various variables. CVM results are more credible when hypotheses are supported. Measurement of these variables also allows development of bid curves (see Brookshire and others 1980), but as was found for TCM, inclusion of variables often depends on statistical properties rather than theoretical properties. Finally, if the appropriate variables are collected, a TCM model can be developed and values compared across methods.

The primary advantages of CVM are the ease of data analysis and the fact that it does not require on-site participation. The latter advantage means CVM can be used to measure option, existence, and bequest values. TCM requires visitation and therefore can not be used for off-site measures of value. At this time, CVM is the only method which can measure total value. In addition, CVM can be used to measure the values associated with specific proposed policy impacts. The time and expense of implementing a CVM survey is the primary disadvantage of this method. Considerable expertise is needed in survey design, and the actual implementation can involve many people over an extended period of time. Another, in our opinion, unfounded disadvantage is the reluctance of many agencies to 'believe' the results from a CVM study. While the reluctance is lessening, TCM is much more widely accepted.

Both TCM and CVM are methods to derive the economic value associated with wilderness resources. Since markets do not accurately capture or measure these values, prices can not be used as a measure of economic value and therefore these alternative methods are necessary.

CURRENT STATUS

Measurement of on-site recreation values has been the focus of extensive research (Sorg and Loomis 1984). In these studies, regardless of the method, the definitions associated with on-site use have been fairly consistent. These definitions do not, however, quantify specific aspects of a wilderness

experience, therefore, wilderness values can only be broadly inferred. Currently, emphasis is on identifying, defining, and measuring off-site recreation values. Since most individuals do not visit wilderness areas, the major component of total value is existence value, and studies of existence are discussed below (drawn from Brookshire and others 1986, 1987). As with on-site use values, existence values are estimated without specific regard to the wilderness quality/experience. Empirical studies are grouped by the resource addressed to allow direct comparison within a specific resource setting.

Water Quality

Desvousges and others (1983) used CVM to measure existence values for water quality in the Monongahela River basin in Southwestern Pennsylvania. The questionnaires included several aids for clarification: a map of the river basin, a water quality step ladder; a description of activities associated with each water quality step. To elicit existence value for users and nonusers in regard to willingness to pay to avoid a deterioration of water quality, two questions were asked. The first asked willingness to pay each year to keep water quality at a **boatable** level even if the respondent would never use the river. An average value of \$42.12 was elicited. The second existence value question asked willingness to pay for a period longer than the respondent's lifetime. The value is not reported.

Cronin (1982) surveyed households along the Potomac River in the Washington, D.C. metropolitan area in the fall of 1973 to determine user and nonuser willingness to pay for four levels of improvement in water quality in the Potomac River. A nonuser was defined as any individual who did not participate in swimming, boating, fishing, hiking, bicycling, camping, or picnicking near the Potomac River. The nonuser value does not represent existence value exclusively because it may also encompass option value.

To measure water quality values for the South Platte River basin, Greenley and others (1981) used an iterative bidding procedure. Household residents in Fort Collins and Denver, Colorado were sampled by means of personal interviews during the summer of 1976. Respondents were shown color photos of three stream sites and the degree of heavy metal pollution at each site was described. Existence values were gathered based on a scenario of willingness to pay to improve and maintain water quality at a level where no heavy metals were present and mining development would not take place. Yearly average

willingness to pay bids of \$24.98 and \$6.00 were derived for sales tax and water fee payment vehicles, respectively.

Mitchell and Carson (1981) used CVM to value water quality for US. waterways. They divided values into two categories: recreation use benefits and intrinsic benefits (which included indirect, option, and existence values). An indirect benefit is that added benefit imparted by clean water to an activity indirectly associated with water. This personal interview home survey began with questions regarding recreational use of fresh water. Then a water quality ladder (similar to that used by Desvousges and others 1983) depicting four levels was shown, and possible uses and activities at each level were delineated. To establish a point of reference, each respondent was asked which level represented water quality in a nearby river, lake, or stream. Then, before respondents were questioned regarding willingness to pay, via taxes and higher prices, for improvements in water quality they were reminded that they already pay for water quality improvements, via taxes, sewer fees, etc. For a fishable level of water quality, an average value of \$111 per year per household is reported.

Gramlich (1977) provided an indirect measure of existence value for water quality throughout all the nation's rivers, using an iterative bidding procedure with a fixed starting point of \$20 per year. Households in the Boston area surrounding the Charles River watershed were sampled during the Fall of 1973 to determine willingness to pay for guaranteed water quality improvements to a swimmable level for three scenarios: (1) throughout all the Nation's rivers (including the Charles River); (2) throughout the Charles River; (3) throughout all of the Nation's rivers (excluding the Charles River). It is doubtful any household could visit all rivers; therefore, a large component of the values reported would incorporate existence values. However, because the survey did not explicitly discuss all values associated with a swimmable water quality, the values derived would vary, depending on each individual's interpretation of the question's meaning. An average value of \$30.54 was reported for the Charles River, a value of \$55.43 for all the Nation's rivers (including the Charles River) and a value of \$25.49 for all other rivers (excluding the Charles River).

Wilderness

Walsh and others (1982, 1984) measured recreation, option, existence, and bequest values for wilderness in the State of Colorado. During the summer of 1980, Colorado households were surveyed, via mail, on willingness to pay for current levels of wilderness and for proposed increases in the **availabil-**

ity of wilderness as depicted on enclosed maps. The open-ended questionnaire utilized willingness to pay into a special wilderness fund as the payment vehicle. Average existence and bequest per year per household values for the current 1.2 million acres of wilderness were \$4.87 and \$5.01, respectively; for 2.6 million acres, these would be \$6.56; for 5 million acres, \$8.86 and \$9.10; and for 10 million acres, \$11.14 and \$11.46.

Wildlife

Brookshire and others (1983) measured option and existence values for increments in the supply of Bighorn sheep and Grizzly bears in Wyoming. A CVM mail survey was used to randomly sample Wyoming resident elk, deer, and antelope hunters on willingness to pay annually for such increments. The payment vehicle was a Bighorn sheep (or Grizzly bear) stamp similar to the duck stamp currently used to preserve wetlands. To isolate existence value, respondents were asked if they ever planned to hunt the species in question. If they did not, they were then asked if they ever planned to view the animal. A second negative answer was followed by questions on existence value willingness to pay. For a **5-year** time horizon, an average per person existence value of \$24.00 and \$7.40 was reported for Grizzly bears and Bighorn sheep, respectively. A **15-year** time horizon resulted in values of \$15.20 and \$6.90.

Stoll and Johnson (1984) measured existence value associated with the Whooping Crane (an endangered species). The survey was administered from December 1982 through March 1983 using two distribution methods. A mail survey was sent to residents of Texas, Los Angeles, Chicago, New York, and Atlanta, and the same survey was handed out to users of the Aransas National Wildlife Refuge in Texas. The existence portion of the survey used a closed-ended CVM to elicit willingness to pay, via contributions, to a foundation that would purchase and maintain refuge land for species preservation. Annual average existence values of \$9.33, \$1.03,

and \$1.24 were reported for refuge visitors, Texas residents, and out-of-state residents, respectively.

Boyle and Bishop (1985) sampled 1,000 Wisconsin residents by mail to obtain a total value measure associated with preservation of bald eagles and striped shiners in Wisconsin. Existence value was explicitly restricted to **nonuse** values based on altruistic motives. The payment vehicle was contributions to a preservation foundation, similar to that used by **Stoll** and Johnson (1984). Reported values were separated according to whether or not the respondent contributed to the State's Endangered Resources Donation Program. Nonviewer bald eagle mean values were \$18.02 and \$11.84 for contributors and **noncontributors**, respectively. Striped shiners means were \$5.66 and \$4.16 for contributors and noncontributors, respectively.

Air Quality

Schulze and others (1980) and Brookshire and others (1985) measured preservation values associated with air quality in the national parklands of the Southwest. During the summer of 1980, residents of Denver, Los Angeles, Albuquerque, and Chicago were shown sets of photographs depicting five levels of regional visibility in Mesa Verde, Zion, and Grand Canyon National Parks. The photos depicted various levels of sulfur dioxide emission. Respondents were asked to specify willingness to pay to prevent a plume from being seen in a pristine area. Preservation value is described by two components: use value and existence value. The latter is attributed to individuals who might never visit the Grand Canyon region but still value visibility simply because they wish to preserve a national treasure. Visitors may also wish to know that the Grand Canyon maintains pristine air quality even on days when they do not use it. Table 1 shows the results of the survey for mean preservation values in dollars (Schulze and others 1980). Nonuser existence values were not separated out.

Table 1. --Air quality willingness to pay

City	Grand Canyon	Other Southwest National Parklands	Plume avoidance
Albuquerque	4.09	4.14	4.25
Los Angeles	5.14	4.50	2.84
Denver	3.72	2.89	2.89
Chicago	9.06	7.10	4.32

DIRECTIONS FOR FUTURE RESEARCH ON WILDERNESS DEMAND AND VALUE

Research needs and unsolved problems in wilderness demand and value fall into five categories:

1. Wilderness recreation products,
2. Wilderness recreation markets,
3. Wilderness recreation production and supply,
4. Demand and valuation,
5. Price and rationing policy.

This section presents a brief discussion of some research needs in each area.

Wilderness Recreation Products

Outdoor recreation products are not well understood and wilderness recreation is a worst case situation. In part, this problem is due to inadequate knowledge. In part, it is a problem of sloppy thinking and inadequate rigor in defining words and ideas. 'Recreation' is a catch-all term. At one extreme the product may simply be access to sites or facilities. A person passing through a gate, so to speak, is one unit of the product. At the other extreme it may be a subjective and unobservable recreation experience. Forms of observable behavior such as trips or activity-days lie between these two extremes. Non-recreation products of wilderness, such as those associated with option, existence, and bequest value, are even more difficult to define and less well understood.

The definition problem is aggravated by the heterogeneous and composite nature of most outdoor recreation events. A trip to a recreation site jointly produces a composite set of experiences and activities. Each recreation site and each composite experience is an unique product, and defining the "trip" as the product does not solve this problem. People often seek economies of joint production by combining several destinations in a multiple purpose trip. Estimating the value of such a trip is easy, but decomposing that value into the several destinations or components of experience is an unsolved and perhaps unsolvable problem.

There are several different definitions of the recreation product, because there are several different recreation 'products,' each of which is relevant to a different kind of policy or management question. We need to decide which products relate to what questions, those products then need to be defined in operational terms so that product quantity, quality, and price can be measured. Some products, such

as recreation experience, are so poorly understood that product definition and measurement are major challenges requiring extensive research.

Given previous definitions, however, there still is need for development and refinement of measurement methods. The question, 'how much of the good has been produced,' requires not only clear and precise definition of the good in operational terms, but also standard units and methods of measurement. Measurement of recreation quantity currently is a collection of things like recreation visitor days (RVD's), recreation activity days, wildlife user days (WFUD's), persons at one time (PAOT's), trips, visits, acres of land, units of a given facility (e.g., number of campsites or picnic tables, miles of trail), and who knows what. These measures often are misapplied and misunderstood. Measurement of recreation quality is primitive and largely unsuccessful.

Wilderness Recreation Markets

A wilderness recreation market is one of strongly differentiated public or quasi-public goods produced and consumed in a spatial economy under monopolistic competition with government intervention. Sites tend to be unique and locationally lumpy, creating the condition of spatial economics and monopolistic competition. Each site therefore tends to be a separate market with a unique demand function. Where the population of users is locationally dispersed, each potential visitor to a given site faces a different price and a different substitute environment. Many opportunities and facilities are supplied noncompetitively by government and rationed by means other than efficient pricing. Wilderness recreation on public land is generally nonpriced or underpriced because of: (1) political preferences and traditions, (2) impossibility or high cost of fee collection, (3) unknown and/or external marginal cost, or (4) zero marginal cost.

The theories and paradigms needed to understand wilderness recreation markets are available, but have not been integrated or applied effectively. Three bodies of knowledge are required: (1) the theory of nonrival, nonexcludable, and/or government supplied or regulated goods (Randall 1984); (2) the theory of spatial markets (Abelson 1979; Anas 1982; Losch 1964; Mills 1980; von Thunen 1826); and (3) the theory of product differentiation and monopolistic competition. Wilderness recreation has characteristics that fall into all three categories. These bodies of knowledge need more effective integration into an improved framework for analyzing and managing wilderness recreation resources.

Wilderness Recreation Production and Supply

The theory of recreation supply is incomplete. Effective measures of the relative scarcity of outdoor recreation corresponding, for example, to price in a competitive market, are not available. Current measures of supply are ineffective and misleading. These problems prevent evaluation of the adequacy and efficiency of wilderness recreation resources (Harrington 1987).

Inadequacy of supply-side theory also prevents estimation of supply functions needed for marginal and nonmarginal valuation in benefit-cost analysis. Public agencies produce forest and **wildland** recreation in a hierarchical framework of multiple public objectives. Public investments in recreation resources thus serve and are motivated jointly by numerous purposes (Hof and others 1985; **Rideout** and Hof 1987). For example, production of recreation sites and facilities on national forests tends to benefit from and contribute to timber and wildlife management. Roads built for timber harvest create access for recreation, and timber harvest may enhance or impair wildlife habitat. Jointness in production at this level prevents cost allocation and evaluation of investment productivity (Bowes and Krutilla 1979; Duerr 1960; Herfindahl and Kneese 1974; Hof and others 1985), thereby contributing to such problems as the 'below cost timber sale' controversy.

In the specific wilderness context, on-site recreation is only one of several motivations behind wilderness designation and preservation. Other purposes include research, protection of habitat for threatened or endangered species, cultural preservation, and preservation of indigenous ecosystems. It is difficult, therefore, to separate the production cost of wilderness recreation from the cost of serving other public objectives.

At the 'household production' level, individuals invest time, money, travel, effort, equipment, and skill, in combination with sites and facilities supplied by the government, to produce wilderness recreation (Becker 1965; Harrington 1987). Recreation events and experiences seldom if ever are single purpose. While wilderness managers want to know the value of single activities that occur at their sites, visitors jointly produce composite experiences that consist of several activities. Or, they jointly produce visits to several destinations on a single trip. Such joint production makes it difficult or impossible to estimate demand-side value in the terms requested by wilderness management and policy institutions. At

the extreme end of household production, some people derive satisfaction and value simply from knowing that wilderness exists (Bishop and others 1987; Boyle and Bishop 1987; Fisher and **Raucher** 1984; Peterson and Sorg 1987; Randall 1987a; Randall and **Stoll** 1983).

It is easy to count acres of wilderness, but because of inadequacy of supply-side theory and measurement method, we do not have an effective inventory of wilderness supply as it pertains to recreation opportunity (Harrington 1987). Consequently, it is difficult to evaluate the adequacy of existing resources or to plan for future needs. Our understanding of the interaction of public and private recreation markets also is inadequate. How do public policies and publicly managed wilderness areas affect the private recreation sector? Are governments providing services that are more appropriately handled by private enterprise? Is government intervening efficiently to correct imperfections in the recreation market?

Demand and Valuation

The demand-side theory of recreation economics is well developed but intriguing questions have begun to challenge the theory, and serious problems confront practical application. Credibility of demand-side valuation methods for nonpriced recreation is not well established in management and policy circles. Demand-side valuation is severely hampered by the heterogeneous and composite nature of recreation products. Jointness in production of multiple destination trips and composite recreation prevents estimation of demand-side value. Many available studies of wilderness demand and value are ad hoc and not generalizable. Data are sparse and expensive to collect. Substitution in forest and **wildland** recreation is not well understood. The effect of congestion and other site characteristics on the quality and value of recreation experience currently is an unsolved research problem (Freeman 1979; Freeman and **Haveman** 1977; Harrington 1987). Very little is known about the variation of demand and value over time (Peterson, in press; Peterson and others 1985).

An example of the theoretical challenge is the need for reconciliation between: (1) the behavioral axioms and propositions of microeconomic theory, (2) theoretical implications of empirical measurements of economic value, and (3) behavioral propositions of their disciplines, such as psychology (Peterson and others, in press; Peterson and others 1988; Simon 1985). For example, economic theory predicts that willingness to pay (**WTP**) and willingness to accept compensation (**WTA**) should be equal except

for income effect, which for most recreation cases should be trivial. Empirical experiments show substantial differences that are inconsistent with economic theory (Fisher and others 1988; Gregory 1986; Knetsch and Sinden 1984). Some economists argue that inadequate experimental methods cause the empirical discrepancies (Gregory 1986). Some behavioral scientists contend that economic theory is inconsistent with human behavior and that such differences are real and expected (Tversky and Kahneman 1981).

For these reasons, research on wilderness demand and valuation is needed in the following areas:

1. Further develop the theory of recreation demand and household production for imperfect markets, and heterogeneous and composite products.

2. Improve and validate economic valuation theories and methods as applied to wilderness, and reconcile theoretical and empirical discrepancies. Conduct basic research on human economic behavior to determine whether microeconomic theory adequately describes behavior, and/or whether behavior is appropriate.

3. Develop a better understanding of substitution in wilderness demand. Develop improved demand function specifications that adequately incorporate substitute prices. Explain the choice process by which people make the decision to substitute, and develop rigorous and practical methods for estimating a substitute price index for wilderness.

4. Develop valid and reliable data and data collection systems for monitoring wilderness participation and estimating wilderness demand models.

5. Estimate and catalog generalized wilderness demand models as well as valid and reliable estimates of marginal and nonmarginal wilderness demand prices.

6. Describe and explain changes in wilderness participation, demand, and value over time and develop effective forecasting techniques, theories, and models.

Pricing and Rationing Policy

Pricing public sector outdoor recreation for efficiency, revenue, and rationing is not well understood in policy circles (Rosenthal and others 1984). Part of the problem is institutional, because such things are legislatively and politically controlled.

Although the economic theory of pricing and price rationing is well developed (Musgrave and Musgrave 1973; Winston 1985), application to wilderness recreation is not.

Four problems stand in the way: (1) Identification of efficient marginal cost price is hampered by inadequately defined products and inability to specify demand and marginal cost. Wilderness recreation is not a competitive market commodity, and markets cannot be relied on to set efficient prices. Prices must be determined analytically, and such analysis requires knowledge of the demand and marginal cost functions. (2) Technical pricing issues frequently are intermingled with political concerns, such as concern for equity and income redistribution, as in "free" education. (3) Public recreation resources often are involved in multiple purpose resource allocation decisions that occur at several levels in the political and administration hierarchy. Efficiency therefore requires multiple part pricing, a topic not well understood or accepted in recreation resource management (Guldin and Kroon 1987). (4) Use of price to regulate or ration the quantity demanded is not well established in the public sector, although it is the "natural" means whereby private goods are rationed in the private sector.

Because social and political objectives may be intermingled in decisions about allocation of public recreation resources, it is important to understand the distributional impacts of pricing policy. However, such impacts are not understood. For example, the fixed location of wilderness areas and their concentration in the Western States discriminates against large numbers of low income people through travel cost. The distributional impacts of entry fees for such sites are of little social interest, except to the local population. Fees may be strong distributional agents, however, within urban areas where the transportation cost is a negligible part of total price.

A related aspect of recreation pricing that is not well understood is subsidy and below-cost income transfer. Cost allocation is difficult because of jointness in production and hierarchical resource allocation to multiple public purposes. It is not often clear where or whether there is income transfer. Where marginal cost is zero and price is set below the marginal cost, excess demand is the result, costly nonprice rationing is needed, and income gets transferred. Income transfer obviously is a political decision, but such a decision cannot be effective without good technical information about the income transfer implications of alternative policies.

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THE CHALLENGE OF MANAGING WILDERNESS IN AN ERA OF CHANGE

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Abstract— Wilderness management is confronted with a number of obstacles. While funding is an obstacle, others are the focus of this paper. The paper identifies these obstacles and suggests specific actions needed to overcome these and improve the quality of management.

INTRODUCTION

Management of wilderness is entering an era of change. Like other components of our culture, new ways of doing things are rapidly replacing old customs and traditions. Our beliefs about natural resources, their function in society, and how they should be used and managed are a part of this cultural transformation. The significant change in both manager and visitor attitudes toward the role of fire in wilderness settings is one illustration. In a study of visitors to the Selway-Bitterroot wilderness conducted in 1971, **Stankey** (1976) found that 56 percent favored a policy of fire suppression in wilderness. A followup study in 1984 revealed a major shift—only 17 percent supported this type of fire management policy (**McCool** and **Stankey** 1986b).

Wilderness, as a land designation, is a cultural institution; as such, its meaning—and management—reflects the social and cultural norms dominant at any given point in time. For example, when Yellowstone National Park was established in 1872, it was termed a ‘pleasuring ground.’* Now we recognize the park as an irreplaceable component of an intricate regional ecosystem, where the role of humans is minimal,

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***Nathaniel P. Langford** even proposed that islands in Yellowstone Lake be garnished ‘with the attractions of cultivated taste and refinement’ (**Langford** 1972).

and natural processes, including the full array of predator-prey relationships, may operate unimpeded by those ‘cultivated tastes’ of American society.

As our culture evolves, we can expect a parallel evolution in definitions of wilderness. Wilderness is not necessarily the biophysical aspects of the environment but rather is, as **Nash** (1985) has argued, ‘... a state of mind. It has more to do with mental than physical geography.’ **Such** changes in definitions are not new to wilderness:

From roughly the last decade of the 19th century through the first two decades of the 20th century, a great transition occurred in America’s attitude toward wilderness. . . This period of transition featured a gradual rethinking of the relationship between wilderness and society, characterized then, as well as now, by conflicting interests and competing values of the worth of wilderness (**Stankey** and **Schreyer** 1987).

Such changes carry significant implications for amenity resources and their management (**McCool** 1988). For example, the view of wilderness as a static (and beautiful) landscape is giving way to the notion that it is a dynamic (and sometimes ugly) place that is valued because freely operating ecological processes generate landscapes that are natural, shifting, complex and, to some extent, unpredictable. The beauty that we behold here is not totally one of the product, but also one of process. And, we have changed our attitudes toward animals considerably since the time that **Albright** and **Taylor** (1928) wrote about National Park Service rangers:

The rangers have grown to love all wild life except those predatory species which they so often observe destroying young antelope, deer, or elk . . . Winter patrolling introduces an added element of sport into the lives of the rangers in trapping and shooting of predatory animals . . . One of the Yellowstone rangers . . . sets his quota at one hundred coyotes each winter.

The belief that some native animals are good and others bad has been replaced by an appreciation for the intricacies of predator-prey relationships. Wilderness comes not only from the lack of permanent human occupation, but also from our commitment to noninterference in natural events. How we perceive the wildness of these places in a period of change, and thus the protection of the integrity of that wildness are the fundamental sources of the obstacles to improving wilderness management.

Brown and others (1987) have noted that during periods of change, particularly, more than one interpretation of wilderness may exist, and there may be conflict among interpretations. Thus, how we manage wilderness to protect, restore, or enhance these values not only reflects these social transitions, but also becomes an important part of the process of change.

Intrinsic to the process of change is the inevitability of conflict. Conflict has always been a natural outgrowth of pluralistic America. However, conflict borne of cultural change also engenders new rules for resolving conflict. Thus, the process to deal with conflict and change becomes as important as the changes themselves.

These factors suggest that wilderness managers must be perceptive, sensitive, and creative in order to retain their relevancy, effectiveness, and leadership. In this paper, I wish to explore what I feel are fundamental obstacles to improving the quality of wilderness management in an era of rapid cultural change, discuss opportunities to improve wilderness management, and suggest appropriate Forest Service responses.

OBSTACLES TO WILDERNESS MANAGEMENT IN AN ERA OF CHANGE

There are numerous obstacles confronting the principal land managing agencies in their relatively new role as wilderness managers. These obstacles cannot be considered independent of each other: to a large extent, they reflect different aspects of the same problem, and in general have developed out of changing social values and perceptions of wilderness.

Lack of Understanding of the Meaning of Wilderness

There are approximately 470 areas designated as 'wilderness' under the provisions of and amendments to the Wilderness Act, the Eastern Wilderness Act, the Federal Land Management Policy Act, and the Alaska National Interest Lands Conservation Act. Numerous other areas are managed by the National Park Service as wilderness, and many others will be designated wilderness when Bureau of Land Management administered lands go through the allocation process in the 1990's.

Unlike that of many other natural resources, the concept of wilderness is based on a specific philosophical tradition, rooted in the romanticist writings and transcendentalism of the 19th century. Understanding the origins of this tradition, how it has evolved, and the historical and philosophical context of current conditions is essential to the success of wilderness management; that is, it is difficult to develop the management sensitivity needed to recognize and resolve future problems without comprehending the traditions and contributions of the past. Yet, few of the hundreds of designated wildernesses have managers with training in wilderness philosophy and history. Two examples will help clarify how understanding of philosophical traditions is important to wilderness management.

Trails are vital to recreational use of wilderness. However, many of today's trail systems originated from the need to access wilderness for administrative and fire suppression purposes, and for a much lower level and different type of use. Consequently, many trail systems are no longer appropriate and need a comprehensive evaluation of their suitability for recreational use. Managers can make four decisions about trails: location, construction technique and standard, maintenance level and frequency, and type of recreational use. Too often, such decisions are based solely on technical and engineering **criteria**. Each of these decisions should include consideration of the philosophical and historical traditions of wilderness, as well as the values for which the wilderness was established. For example, the decision to construct a trail may involve consideration of the level of solitude to be provided in a specific area, or it may include an analysis of how recreational use will affect endemic threatened or endangered species. The specific trail construction standard used reflects the type of recreational opportunity provided in that part of the wilderness. And, there may also be places in wilderness left without trails so that individuals must rely on competent backcountry navigation skills and therefore may enjoy the opportunity for high levels of challenge.

History itself is an important value of wilderness and serves as another example. The Forest Service has a rich tradition of backcountry and wilderness management dating back to 1924, when the **Gila** Wilderness was established in New Mexico. That tradition serves as an important model for the stewardship challenges of the future. Unfortunately, through a process of incremental decisions and changes, much of that tradition is being rapidly depleted. If you walk into a backcountry ranger station in the West, where such stations have been present for 50 years, you will be confronted with a jumble of 29th century technologies. It is common to see a wilderness ranger hauling foodstuffs in by horseback, cooking meals over a propane-powered stove, and then washing dishes by the light of a fluorescent fixture using stored solar energy. The argument for such technology has been efficiency rather than appropriateness; few recognize that unnecessarily lost skills and traditions are significant and irretrievable costs to wilderness management. Understanding wilderness philosophy would help managers make explicit decisions about retaining historical values and traditions rather than continue the current series of incremental, implicit decisions.

Lack of Creativity and Accountability in Wilderness Management

Management of wilderness is an important and sensitive task. Wildernesses are special places, and they demand proper attention and adequate protection. In an era of change, organizations must be creative in order to maintain leadership, prevent preemption of administrative discretion, manage conflict, and preserve credibility when attempting to meet this mandate. Unfortunately, bureaucracies tend to reward uniformity over creativity, favor caution over risk, discipline failure rather than recognize innovativeness. I have noted elsewhere that there are considerable personal and bureaucratic tendencies that stifle creativity in wilderness management (**McCool** 1986). Being creative implies taking risks. Taking risks carries with it the potential for failure. Organizations must be willing to tolerate occasional failure if they wish their employees to be successful, innovative, and productive.

The responsibility for managing wilderness and achieving certain objectives must be also written into job descriptions to develop accountability. Assigning responsibility also means accountability. We must build into job performance evaluations how well specific goals in wilderness management are met.

Poor Knowledge About Natural Processes and Clientele

Wildernesses are complex, dynamic ecosystems. We are only now beginning to identify, let alone understand, the complicated interactions among the flora, fauna, and ecological processes endemic to any one area. We have made considerable progress in grasping the role of fire as a shaper of the vegetative mosaic. But how much do we understand about the more subtle ecological consequences of naturally occurring fire such as the effect on nutrient cycling and its impact on fish populations?

Only recently have we identified how changes in air quality may affect the biotic environment, and we have yet to understand how other forces of **nature**—avalanches, earthquakes, insects, animals, weather patterns, floods—interact. More complete understanding of natural processes can also help us use wilderness as the scientific baseline from which we can compare or contrast the effects of contemporary civilization. However, our perceptions of these processes appear to be based more upon how they impact specific components of the resource than the wilderness itself.³

We know far too little about the people who use wilderness and how they use it. For example, reliable data describing how much recreational use occurs in wilderness settings are difficult to find (**Lucas and Stankey**, In press). The literature on benefits and visitor attitudes is only now beginning to be cumulative (**Driver and others** 1987; **Stankey and Schreyer** 1987). Certainly, our ability to manage wilderness is influenced by our knowledge of what people seek from it.

Failure to Recognize the Implications of Change for Wilderness Management

I've noted how our society is in a state of turmoil as it shifts from one set of values to another and the implications of these shifts for wilderness management. The old ways of 'doing business' simply are no longer acceptable. For example, affected publics now demand legitimate involvement in land management decisions: the old process of writing plans in ranger station basements and then 'going public' causes additional and unnecessary conflict (**McCool**

³Incidentally, we still often refer to the effects of unusual natural events as 'damage' to certain components of wilderness, as when a flash flood 'damages' fish habitat. The flood may impact the habitat, but the term 'damage' suggests a value judgment. This rather narrow viewpoint probably reflects our tendency to look at wilderness as a recreation area, our knowledge about ecological process, and our level of enlightenment about wilderness philosophy, history and purpose.

and Ashor 1984) and in many cases produces plans that cannot be implemented. Intimate, ongoing public involvement in wilderness management can be conducted with real results in terms of improved quality of management and better chances for implementation,

The land manager is now more of a facilitator than an omnipotent decision-maker (Lee and Burch 1986). What this means is that managers help people identify what they want (goals, outcomes) and then work with them to help achieve those goals. In terms of wilderness management, this suggests that managers must clearly identify their publics, the benefits these publics seek from wilderness, and how the wilderness setting can be managed to maintain, enhance or restore those benefits.

Focus on Carrying Capacity as a Solution to Recreation Impact Problems

Recreational carrying capacity has been a dominant theme in wilderness management and research for over two decades. Unfortunately, a definition of recreation management problems that relies on the carrying capacity concept is an obstacle to wilderness management for several reasons. First, the carrying capacity literature has demonstrated that neither biological nor social impacts are linear functions of use levels. Our understanding of the use-impact relationship indicates that it is anything but direct and linear (Cole 1987; Graefe and others 1986; Merriam and others 1973). Biophysical impacts and opportunities for solitude are affected by numerous influences, and amount of use is only one of these. By continuing to look to carrying capacity and use limits to solve impact problems, managers are directing their attention to the question 'How many is too many?' The technical literature and management experience tells us that this approach is no longer appropriate, and its continued use is an obstacle to solving many of the complex recreation-induced problems confronting managers.⁴

While the Wilderness Act mandates that 'outstanding opportunities for solitude' be provided, it does not state that the solution is to limit use, as implied by the notion of carrying capacity. Rather, the Wilderness Act directs managers to maintain, restore or enhance acceptable social and environmental conditions in wilderness settings. Management systems that focus on identifying acceptable or desirable conditions are now available.

⁴I strongly suggest that the time has come for us to consider dropping the term recreation carrying capacity from the vocabulary of wilderness management.

Lack of Training of Wilderness Managers

Most managers of wildernesses are especially well trained in biological sciences or in natural resource extraction activities such as range, wildlife, or timber management. This training generally emphasizes economic utilization of biomass rather than preservation of naturally functioning ecosystems for important nondollar benefits and uses. Often, the fundamental rationale for natural resource management activity is neglected in undergraduate curricula, which instead concentrate on intricate biological details. Training of wilderness managers encompasses several areas in addition to the basic biological and natural sciences: human ecology, social psychology, conflict management, public administration, organizational behavior. The ability to integrate diverse technical subjects is fundamental to the task.

About 90 million acres are currently designated as part of the National Wilderness Preservation System. How do we manage these 90 million acres? How do we train former timber harvesting specialists, wildlife biologists, and range managers to protect these places? Importantly, there exists no comprehensive, systematic, and continuing education program for wilderness managers that will help develop and implement appropriate management policies.

Increased Number of Areas with Nonconforming Uses

One of the major challenges to improved management of wilderness is the tendency to designate areas that include nonconforming uses. These are uses and practices that normally conflict with the free operation of ecological processes or are inconsistent with wilderness philosophy. Examples include dams and water diversions, power lines, resorts, grazing, mining, aircraft, roads, mechanized means of transport, oil and gas wells, fire suppression, and timber harvesting under special circumstances.⁵ These uses are allowed in many wildernesses because of compromises made during the legislative process,

These compromises send a mixed signal to managers: the areas are wilderness, but the nonconforming use is allowed to continue, making it difficult to protect wilderness values, as mandated by the Wilderness Act. Such situations represent a clear conflict arising from cultural transitions—the old values, still entrenched colliding with, but not yet yielding to the accepted conventions of the future.

⁵Hunting and fishing, while traditional recreational uses of wilderness, could also be viewed as nonconforming because they interfere with natural population dynamics.

Dealing with and mitigating such conflicts in objectives does require that we develop a more complete understanding of how these uses affect ecological processes. For example, to what extent does grazing by domestic livestock change vegetation composition as opposed to what would occur with grazing by native species? Or, how important is the change in stream regimen induced by small irrigation reservoirs?

Tendency to View Wilderness as a Recreation Area

Wilderness is a special place, one that contains values which depend on unmodified natural environments where ecological processes operate freely. These values are well documented in the polemical literature and, to some extent, are substantiated by the, technical and scientific literature. They include spiritual, personal renewal, solitude, learning, appreciation of the natural environment, scientific, historic, aesthetic, and many other values, including recreation. Perhaps because of its pervasiveness, especially in the original components of the Wilderness System, as well as the problems it forces managers to address, recreation has come to dominate managerial thinking about wilderness.

One example is the tendency to view wilderness as a place to hunt and fish. Another example is the overriding attention given to the issue of recreational use and carrying capacity in the literature of wilderness management. The focus on recreation has carried with it an unintended yet unfortunate neglect of other significant values that we are only now beginning to identify (Driver and others 1987). While some of us feel that we know what processes occur in predominantly natural settings, our understanding about the linkages among the various natural processes and the intricate, often subtle (yet important) and sometimes fragile consequences, is actually confined by limited integration of research experience. How the use of wilderness can be managed to protect this wilderness mirrors our knowledge of these items. For example, the tendency of managers defining terms such as 'resource damage' as impacts on individual biotic or abiotic components (i.e., soil) rather than on the total wilderness resource itself (i.e., wilderness) suggests incomplete awareness of wilderness as process.

OPPORTUNITIES FOR IMPROVING WILDERNESS MANAGEMENT

The obstacles identified above are not without solutions. It should be noted that improved management depends more upon recognizing the obstacles, identifying how to capitalize on current conditions and trends, and having the commitment to take specific steps to achieve identified goals than on large influxes of revenue. While shortages in funds to manage wilderness will always be a concern, much can be done to make the present budgets more effective. There are several opportunities that currently exist that, if taken advantage of, can lead to removal of obstacles.

Social Change Provides an Opportunity to Develop Leadership

The significant change in social values and norms provides a real opportunity for improving wilderness management. For example, it is clear that the traditional method of land management planning — rational-comprehensive planning — may no longer be appropriate and is itself responsible for its own failure (McCool and Ashor 1984; McCool and Stankey 1986a). Our publics demand legitimate involvement in planning. They want to be involved from the beginning, not just to review a draft plan as part of some formal environmental assessment procedure.

The public continues to maintain a high level of interest in wilderness. As the debate over allocation winds down with the end of the 29th century, more attention will be placed on management. Indeed, many conservation groups have already developed specific policies or statements with respect to wilderness management.

This increased interest in management by the public provides a significant opportunity for wilderness managers to get to know their clientele, to gain a more valuable understanding of wilderness philosophy and history, to develop more responsive management plans, and to write plans with broader political support for implementation. In turn, the publics would come to understand and appreciate the complexity of wilderness management and the problems posed by nonconforming uses. Interested groups could afford managers with immediate feedback about changes in wilderness conditions, as well as the political acceptability of proposed management actions. This would be an authentic learning experience for both the affected publics and wilderness managers as they learn to act as partners.

The decentralization in decision-making accompanying Toffler's (1980) Third Wave provides additional opportunities for improving wilderness management. By acknowledging the legitimacy of decentralization and "bottom-up" decisions, central offices play a significantly different role than those in industrial society. The leadership function is now one of facilitating the field in achieving quality decisions, not dictating standardized solutions to seemingly similar, but in reality different, problems. In addition, central offices can communicate to field managers a new spirit of confidence, encourage creativity and experimentation, and accept the fact that occasionally a failure will occur.

New Management Systems can Improve Wilderness Management

When dealing with recreational induced problems in wilderness, managers have four options: (1) do nothing; (2) make decisions on an ad hoc basis; (3) limit or disperse use; or (4) use a comprehensive decision-making framework (McCool and others 1987). Given the nature of social change, knowledge developed from wilderness research, and the mandate of the Wilderness Act, only the fourth option is really acceptable.⁶ Several new management systems now provide effective decision-making frameworks. These include the Limits of Acceptable Change wilderness planning system (Stankey and others 1984, 1985), the Visitor Impact Management system (Graefe and others 1984), and Shelby and Heberlein's Social Carrying Capacity model (1986).

Each of these management systems emphasizes identifying acceptable and desirable social and environmental conditions within any given wilderness. Each provides a process for developing specific, explicit and quantifiable standards of acceptability. Each requires that conditions be monitored to determine the outcomes of management actions. Although not all the issues associated with these frameworks have been completely resolved (Haas and others 1987; McCool and others 1987), each holds a distinctive promise of effectively confronting wilderness management issues. Both the LAC and VIM methods are also applicable to nonrecreation issues inside and outside of wilderness. And, each may be combined with new approaches to public involvement (Ashor and others 1986; Stokes 1988) to provide meaningful opportunities for constructive public comment.

⁶Limiting or dispersing use may be identified as a technique as a result of the planning process. This is distinguished from suggesting these techniques as panaceas.

RESPONSES TO OBSTACLES IN AN ERA OF CHANGE

There are five specific responses that the Forest Service could initiate that would help improve the quality of wilderness management over the next decade. The cost of these responses would be minimal, yet the benefits would be substantial.

Develop a Wilderness Management Training Program

Training is needed to improve the quality of wilderness management. Training is needed in all areas: philosophy and history, natural processes, conflict management, understanding wilderness clientele and their needs, and public involvement techniques. The Forest Service should develop, in conjunction with leading universities, a continuing education program that will eventually encompass all wilderness managers. The continuing education program should be one that builds upon itself, that is, first year participants will cover one set of topics, second year participants a related, but more advanced set, and so on. It should be comprehensive, so that over time an individual becomes thoroughly exposed to all aspects of wilderness management. Another component of this would be annual updates of recent research.

Initiate A New Spirit of Public Involvement

Toffler has indicated that participatory democracy appears to be one of the values of the future. The litany of appeals, demonstrations, and litigation the last several years over Forest Service plans and actions certainly indicates a level of dissatisfaction among the affected publics. Public involvement that allows and encourages early resolution of issues during the planning process, constructive comment on proposed actions, and open discussion of goals and problems can be helpful in producing plans that can be implemented (Ashor and others 1986). This type of public involvement means more than holding a few meetings, and asking for comment; it requires a fundamental change in attitude about the usefulness and role of the public in the planning process. Such public involvement must be continuous, developed prior to the point when insurmountable conflicts arise, and recognize that plans be developed in partnership with the public, in order to create ownership in it.

Developing a new perspective on public involvement will require disposing of current myths and attitudes toward one's role as a planner, and a

redefinition of what successful planning means. It will also require that managers accept affected publics as meaningful partners in planning. The Forest Service could take a leadership position in encouraging this type of planning.

Develop a New Administrative Climate Which Encourages Accountability and Creativity

The literature of organizational behavior and industrial psychology is filled with references on job performance, productivity, and satisfaction. I encourage the Forest Service to examine how it views the managerial function, how it rewards excellence, and how it recognizes innovation. If we have learned one thing out of this literature it is that administrators must understand the fundamental motivations for work if an organization is to be successful. Certainly, it is important in an era of change for administrators to create a climate in which employees are motivated to excel and to be creative. Part of the process of creating this new climate may be to give upper- and mid-level managers training in new concepts of employee supervision and motivation.

Job descriptions should include wilderness management as a key element. And, achievement of management objectives should be considered as part of annual performance evaluations and step and grade salary increments.

Encourage Managers to Develop Wilderness Management Plans

With management systems like LAC and VIM available, the Forest Service should encourage application and evaluation of the utility of these systems in resolving both recreational and **nonrecreational** problems. With implementation of these systems, monitoring of wilderness conditions – always an important job – now has an easily understood rationale, and provides systematic feedback as to the success or failure of specific management actions. These systems could easily be integrated with new approaches to public involvement and high technology, such as Geographic Information Systems, to produce wilderness management direction that is acceptable, feasible, and implementable. These decisionmaking frameworks also suggest how research on various aspects of wilderness can be integrated into wilderness management in a more effective way than we have in the past (Lucas and Stankey 1985).

Enhance the Role of Research in Wilderness Management

Research plays essential roles in improving the quality of wilderness management. Without the research to provide the knowledge about wilderness ecosystems, clientele, and **benefits**, it is unlikely that management can maintain, enhance or restore the values for which wildernesses have been established. The ability of research to assist management is dependent on several factors, including that of funding. Lucas (1987) has pointed out that:

It seems only reasonable to presume that the production of new knowledge, solution of important problems, and technology transfer from researchers to managers reflect in general the resources devoted to wilderness related research.

Research and researchers serve several functions in wilderness management: (1) production and dissemination of new knowledge, (2) assisting in problem identification, (3) and technology transfer. The level of resources devoted to each of these functions has not kept pace with the expansion of the National Wilderness Preservation System (Lucas 1987). The current capability in technology transfer, particularly with respect to Limits of Acceptable Change lags far behind the demand. The Forest Service should consider strengthening its wilderness research program, and embarking on a new program of technology transfer in wilderness management. This latter suggestion would enhance the continuing education program recommended earlier.

Wilderness management has come a long way from the days when it involved only fire patrol and trail maintenance. Today's manager is far more sophisticated and has a greater range of tools to use in the management job than has been available in the past. This has helped managers respond to the immediate needs, but the decisive issue is will these managers be able to exercise the leadership needed to meet the demands of the early twenty-first century? Social change certainly implies greater flexibility in management as well as a larger wilderness management tool chest. The question for wilderness management agencies is, are they willing to take actions *now* to develop the tool chest needed later?

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WILDERNESS VISITOR MANAGEMENT PRACTICES: A BENCHMARK AND AN ASSESSMENT OF PROGRESS

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Abstract—In the short time that wilderness visitor management practices have been monitored, some obvious trends have developed. The managing agencies, however, have appeared to provide different solutions to similar problems. In the early years, these problems revolved around concern about overuse of the resource and crowded conditions. Some of those concerns exist today, but they may be overshadowed by feelings that inadequate budgets and workforce are the primary hindrances to wilderness management. The differences in solutions used are largely due to differences in policies guiding the various agencies. Continued monitoring of wilderness visitor management practices is needed.

Wilderness management in the United States is relatively young. The Wilderness Act of 1964 (P.L. 88-577) established legislative protection for 9.1 million acres (54 areas) that prior to 1964 were only partially protected. Legislation over the subsequent years has increased the amount of land in the National Wilderness Preservation System to just over 89 million acres. The 470 units exist in 44 States and are managed by four Federal agencies. Only the USDA Forest Service, the USDI National Park Service, and the USDI Fish and Wildlife Service were intended to manage wilderness at the time of the original Wilderness Act. Subsequent legislation in 1976 (P.L. 94-579) added the USDI Bureau of Land Management as a potential wilderness management agency.

As new wilderness areas have been designated recently (the number of designated areas has nearly doubled since 1983), new wilderness managers have necessarily come into existence. The quality of wilderness recreation opportunities depends upon how well current and future wilderness managers

are able to do their part. This paper assesses wilderness visitor management practices in the United States. As part of the Benchmark 1988 Assembly, this paper looks at past and current situations and points out opportunities and needs for improved management, policy, education, research, and legislation. It identifies barriers or constraints to needed improvements and suggests ways that our baseline of knowledge can be improved.

HISTORY OF WILDERNESS VISITOR MANAGEMENT

In the literature, studies of wilderness visitor management are newer than wilderness management itself. Documenting what wilderness managers are doing and thinking dates back less than 10 years (Bury and Fish 1980; Fish and Bury 1981; Godin and Leonard 1979). The studies during that time emphasized assessment of interagency differences in how use control was viewed and what problems managers encountered.

Godin and Leonard (1979) used survey information from 35 Forest Service and Fish and Wildlife Service wilderness managers to determine the eight most serious management problems. They concluded that only one problem was consistently considered serious by at least half of the managers contributing responses: site deterioration attributable to overuse of the resource. Eighty percent of the managers said this was a serious problem. The second most mentioned problem, by 40 percent of the managers, was confusion over the meaning of wilderness. Not only were visitors confused with restriction of permissible actions, but managers did not seem to be in harmony with legislation and agency policy. Some managers reported that the appropriate wilderness ethic was lacking in much of the user public and in a substantial portion of managers.

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The remaining six of the eight problems were boundary designations (31 percent), user conflicts (29 percent), vehicle and other equipment use (23 percent), disaster control (17 percent), disagreement between legal uses and the wilderness concept (17 percent), and the lack of wilderness resource and use data over time (11 percent).

Bury and Fish (1980) and Fish and Bury (1981), through a 1978 survey of wilderness managers, identified several differences in management among the agencies. They described the National Park Service (NPS) wilderness managers as more likely to initiate use of control measures to prevent anticipated resource damage. At the time of the survey, 84 percent of NPS areas had use control of some type in place. NPS wilderness managers frequently assigned campsites and limited the number of people who could enter an area at a given time. Fish and Bury (1981) cited **USDI** policy that extensively reviewed regulatory controls available. In this policy review of alternatives for controlling use levels and impacts, little mention was made of indirect methods of use control. This policy and subsequent management actions taken reflect the National Park Service's historical commitment to maintain balance in their dual charge of resource preservation and visitor access.

National forest managers were more likely to defer use control until problems of overuse appeared as a result of resource change or visitor complaints. Fish and Bury (1981) found that 66 percent of national forest wilderness areas had programs to control use. In 1978 the approach most widely used by the Forest Service was to minimize regulatory control, opting for more indirect use control methods such as providing public information on impacts of behavior and alternative places to go.

The U.S. Fish and Wildlife Service, in contrast with the other two management agencies, does not place priority on recreational access. In fact, this agency is much more likely to initiate use controls because recreation use interferes with other values of wilderness (Fish and Bury 1981).

Washburne and Cole (1983) surveyed all National Wilderness Preservation System Units in 1980; exploring much more than the extent of use controls. They concluded that most of the National Wilderness Preservation System components shared common problems, Resource degradation and loss of solitude were reported as problems in a majority of areas. They found, however, that consistent responses to common problems were rare. There appeared to be major differences in how the Federal agencies

responded to these similar problems. Like Fish and Bury (1981), they reported that the National Park Service typically had more aggressive visitor management programs. More national parks had established carrying capacities and had initiated regulations to control the amount and types of recreational use in wilderness. On the other hand, the U.S. Fish and Wildlife Service and the Bureau of Land Management were characterized as particularly passive wilderness administrators. Few areas administered by these agencies had established carrying capacities, and regulations were very rare.

Washburne and Cole (1983) reported that use of national forest wilderness areas was more often believed to exceed carrying capacity than use of NPS areas. The national parks, however, were more likely to ration use to maintain optimal use levels, Crowding and resource damage were more pronounced on national forests than in the national parks, but the resource preservation objectives of NPS led to control before damage occurred. In 1980, Washburne and Cole (1983) saw a need for increased management action for national forest wilderness areas.

Shortly after Washburne and Cole surveyed all National Wilderness Preservation System areas in 1980, Roggenbuck and Watson (1981) intensively examined wilderness management in the two eastern Regions of the Forest Service. Their interest was to further establish a baseline of information for identifying management problems and measuring progress toward Regional objectives.

As found in earlier studies, Forest Service managers in the two eastern Regions regarded crowding, the need for carrying capacity estimates, and the need for use dispersal methods as their most serious problems. Even though crowding was perceived to be a problem by 13 of the 29 managers responding, only 3 areas had an imposed use ceiling and no manager assigned campsites. Six managers did report alteration of access routes to the wilderness to modify use, and 12 reportedly had programs to disperse use. Carrying **capacity** estimates had been produced for 5 of the 20 areas. Managers also reported little use monitoring or environmental impact monitoring despite their reports of overuse and crowding in many areas.

Additional problems frequently cited included vandalism, off-road recreation vehicles, budgets, and workforce in the South (Region 8). Site impacts and the need for information on amount of use occurring were most frequently cited, after crowding and use dispersal problems, in the Eastern Region (Region 9).

THE CURRENT SITUATION

Robertson (1984) provided some more recent information on wilderness management in the Southwestern Region of the Forest Service. Managers reported overcrowding and overuse as major management problems, exceeded now, however, by inadequate funding. The need to establish carrying capacities was mentioned, but infrequently, despite low frequency of having established estimates of carrying capacities.

Watson and others (1987), recently surveyed 38 Forest Service wilderness managers in the Southern Region. In this attempt to update the 1981 Forest Service wilderness manager study, overuse of wilderness was again overshadowed only by the need for increased funding and workforce, just as in the western study by Robertson. Only 5 of 38 managers reported programs to disperse use, and only 6 of 38 have established estimates of recreational carrying capacity. In both the East and West, about half monitor the amount of use received, but most are not satisfied with the accuracy of estimates that are being produced.

The need for reliable estimates of use cannot be overemphasized. The National Forest Management Act does not specifically mandate wilderness use monitoring. There are regulations (36 CFR 219.18(a)), however, that require 'periodic estimates of the maximum levels of use permissible.' These estimates imply upper limits of wilderness supply. These estimates of permissible use levels would be related directly to actual use levels experienced, and subsequent impacts. Accurate measurement of use is therefore necessary (Watson and others 1987).

Current information on management practices of other agencies is not available. There has been successful testing of lighthanded management methods more recently in NPS backcountry (Huffman and Williams 1987, Krumpe and Brown 1982, Peine 1988), possibly suggesting a greater acceptance of this approach than in the past, though follow-up adoption has not been evident.

OPPORTUNITIES AND NEEDS

Forest Service District rangers usually have many responsibilities besides wilderness management, and these concerns likely reflect general cutbacks in availability of funds and people in the face of increased demands on District resources. District level budgets in general would likely have to be increased to provide the staff support that District managers would like for wilderness management.

But, in this time of great budget demands, the more appropriate need may be for education. Managers need to be educated in effective management of wilderness within budget and workforce constraints. In 1983 Washburne and Cole indicated that the Forest Service needed more active wilderness management. More recent studies have shown that there are still needs for establishment of use monitoring systems, estimation of acceptable levels for social interactions, and programs to change user behavior to reduce impacts.

The opportunities to improve wilderness management are abundant. One of the most important is probably the opportunity for information exchange about management practices. The rapidly increasing use of computers opens new doors for information exchange. Information on specific management strategies that has previously been printed and subject to limited distribution can now be available to many, accessible through computer networks. For example, the recent publication 'Managing Wilderness Recreation Use: Common Problems and Potential Solutions' (Cole and others 1987) provides evaluations of alternative management practices used to solve common wilderness management problems. This information could be made available to personnel in a computerized form. Within the Forest Service, personnel could access such information through the Data General System. External users could be provided access to the information through a call-up service or mail-out diskette. Continuous update of information could occur, and recording of user feedback would be beneficial.

"Wilderness Management -A Five Year Action Program' (University of Idaho 1983) emphasized the need for educating the public about wilderness values. Increased emphasis on telling visitors why programs are initiated or continued would likely improve compliance with adopted practices. Also, increased cooperation with membership groups, such as the Wilderness Society and the Sierra Club, on management issues should lead to more mutually acceptable practices.

Use monitoring systems exist. However, the technology needs to be evaluated and communicated to managers. Emphasis is highly desirable concerning integrated systems that include cost effective sampling plans and methods for accomplishing data analysis. New technology has produced mechanical use measurement devices that can be calibrated fairly precisely for application in a variety of environmental and user situations. Photography and visual observation methods of checking accuracy and compliance

have been tested and reported. Of great importance to managers will be the accuracy and costs of systems reviewed.

The Limits of Acceptable Change (LAC) (Stankey and others 1985) framework for wilderness planning and management brings together years of carrying capacity and public involvement work. Currently, managers apparently need methods of establishing management objectives and dealing with social and environmental overuse and abuse problems. The diffusion and adoption of LAC or the Visitor Impact Management Framework (Graefe and others 1987) in wilderness management offers tremendous opportunity for increased consistency in management and methods for evaluating progress. Increased understanding and adoption of these planning and management concepts should also lead to increased emphasis on social and environmental monitoring systems.

CONSTRAINTS OR BARRIERS

Effective technology transfer channels among Forest Service wilderness managers have been documented by considerable research. Roggenbuck and Watson (1981); Watson and others (1987); Watson and Roggenbuck (1983) suggest that wilderness managers will be most responsive to information channels originating within their respective Regions. Memos, letters, and other interpersonal communication from a Region's wilderness specialist or from the Forest Supervisor's office can help delineate important management ideas from the barrage of information that District rangers receive about the many aspects of their job. Also, training sessions that incorporate and demonstrate cost effective procedures for monitoring use and impacts, educating visitors, and sharing information among managers promise to be productive technology transfer tools.

The greatest barriers to improved wilderness management are managers' perceptions of the prohibitive cost of programs. Innovative methods that are not cost prohibitive must be developed, evaluated, and presented to managers through personal and localized channels (Watson and Roggenbuck 1983).

FUTURE STRATEGIES TO INCREASE KNOWLEDGE

There is a noticeable lack of information on wilderness management in agencies other than the Forest Service. A joint effort by all concerned agencies to assess wilderness management is strongly recommended between now and the 1995 Renewable Resources Planning Act (RPA) update. The intention would be to provide updated information on management policies and practices of agencies other than the Forest Service.

Continued monitoring of problems all wilderness managers face is also recommended. Managers are going to be more receptive to technology transfer tools that address problems that they acknowledge exist. If problems of low priority to the managers need to be addressed, a campaign must be undertaken to increase the perceived importance of selected problems. This situation exists now with the need to increase use of existing visitor use estimation procedures. If managers do not perceive use estimation as an important activity, they will not be particularly responsive to attempts to transfer use estimation technology.

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Section 7.

Social Psychological Dimensions of Recreation Participation



ATTITUDES OF VISITORS TOWARD OUTDOOR RECREATION MANAGEMENT POLICY

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Abstract – Understanding visitor attitudes about management policy helps administrators not only understand the types of opportunities being sought, but it may also help translate broadly written policy guidelines into specific on-site actions. The paper summarizes visitor attitude research about six management issues: heavy-handed versus light-handed techniques, use-limit policies, activity controls, developments, information and fees and charges. Synthesizing such research is difficult because of the lack of a unifying conceptual approach, differing methodologies and definitions, and general absence of replication studies. Recommended actions to improve the efficacy of visitor attitude research are made.

INTRODUCTION

If we can make one conclusion about what people seek during their leisure time it is that what they pursue is in a constant state of change. For example, how Americans perceive **wildland** recreation resources has moved from the concept of a "pleasuring ground," as articulated in the 1872 act establishing the Yellowstone Park, to the concept of wilderness as a place where the human presence is minimal and the dynamic elegance of freely operating natural forces can be contemplated. As the American culture has continued to evolve away from the values and traditions of the late 19th and early 20th centuries, we have seen a corresponding growth in the variety of activities pursued as well as an expansion in the role of recreation that, in turn, has been accompanied by an increasing diversity in the types of outcomes participants seek.

In attempting to meet this changing role and shifting demand, resource managers have learned

that the motivations for recreational engagements, preferences for different levels and types of site attributes, and attitudes towards management greatly influence levels of visitor satisfaction and, consequently, the flow of benefits to the public.

The interface between the activities visitors seek and the satisfactions derived from those activities is the recreation setting, because it is here that activity occurs, and it is here too, that the conditions present within the setting contribute to varying levels of visitor satisfaction. The attributes of recreation sites are, in fact, an important part of any visitor's experience, because they influence the activities in which individuals engage, how satisfying those engagements are, and even whether or not the activity is physically possible. Although the literature of recreation satisfaction mystifies many, it has helped establish the principle that the relationship between site attributes and visitor satisfaction is anything but clear and linear (Probst and Lime 1982; Williams, in press).

The concept of a spectrum of site attributes which, in turn, leads to a continuum or spectrum of opportunities (Clark and Stankey 1979; Driver and Brown 1978) has been one of the key advances in improving the quality of outdoor recreation management in the United States. The spectrum is commonly described as variance along three types of site attributes: (1) biophysical- the landscape character and amount of human-induced modification visible; (2) social- the type, number, and location of encounters with other recreationists; and, (3) managerial- the amount, type, and visibility of management actions including information, regulation, and enforcement.

Understanding visitor attitudes (or predispositions to act) toward management actions- their benefits, consequences, costs and values- can help managers more effectively provide opportunities for satisfactory recreational experiences. Managerial actions in recreational settings are particularly significant because, potentially, they directly infringe upon the recreationist's desire for autonomy and freedom of

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choice-values that are essentially synonymous with the definition of recreation itself. Levy (1978), for example, defines recreation as consisting of three components, one of which is internal locus of control, that is, 'the degree to which individuals perceive that they are in control of their actions and outcomes.' Obviously, numerous management actions (such as use-limit policies, group size limits, fixed backcountry travel itineraries, and prohibitions on such activities as wood fires) may potentially intrude upon this freedom through restriction or regulation of visitor choice or behavior.

In this paper, we explore research concerning visitor attitudes toward outdoor recreation management policy. Our objectives in doing so include creating a better understanding of the use of information about visitor attitudes in managing recreational opportunities, identifying what visitor attitude research suggests to management about the acceptability and effectiveness of differing techniques, and recommending methods to strengthen visitor attitude research.

THE IMPORTANCE OF VISITOR ATTITUDES FOR RECREATION MANAGEMENT

Social science research in recreation includes many similar and overlapping fields of inquiry. Considerable effort has been expended developing measures of expectations – or the expected social-psychological outcomes from engaging in recreational experiences (e.g., Knopf 1988). Such research has developed a better understanding of what people seek during recreational engagements and potentially allows managers to more effectively develop higher quality opportunities. Related to this line of inquiry is the emerging area of research on the social and psychological benefits of recreational engagements (Driver and others 1987).

Another important area of research has focused on achieving higher levels of knowledge about visitor preferences toward site attributes (MacKay and McCool 1986). Information about what people seek in terms of the attributes of the setting has immediate implications for management, and, ultimately of course, benefits the visitor. This research has strongly emphasized biophysical attributes, except in wilderness settings where an extensive collection of studies has involved social attributes (Roggenbuck and Lucas 1987).

Researchers have also attempted to develop a greater understanding of visitor attitudes toward a variety of recreation management policies. Again, many studies have focused on wilderness and primitive recreational settings and were directed primarily at visitor attitudes toward use-limit policies and activity controls (Brown and others 1987; Stankey and Schreyer 1987).

All three lines of inquiry have helped managers develop the insight and tools necessary to provide opportunities for high quality recreation experiences. This paper, however, deals only with visitor attitudes toward management policies and techniques.

It is important to understand visitor attitudes for at least four reasons. First, attitudes influence behavior. While there continues to be a sizeable debate about the attitude-behavior relationship, we believe the evidence demonstrates that attitudes are one of the factors influencing individuals to behave in certain ways in recreational settings (Fedler and Kuss 1986). While attitudes may not be entirely predictive of behavior, they do help, when properly measured, identify predispositions to act (Fishbein and Ajzen 1975). Knowledge of visitor attitudes, then, can help managers understand visitor behavior in recreation settings.

Second, knowledge of visitor attitudes can help translate broadly written policy guidelines and objectives into more specific and useful management direction in situations where there may be wide latitude in discretionary authority to act. One obvious illustration is the Wilderness Act. The broadly written goal of providing opportunities for 'primitive and unconfined recreation', for example, provides initial guidelines for policy makers, but requires translation into more explicit direction for management. Stankey's (1972) research identifying wilderness purists has helped advance the notion of identifying and managing for the normative standards of a specific user population rather than reducing management to the 'lowest common denominator' (Schreyer 1976).

Third, knowledge of visitor attitudes can directly influence the managerial component of the setting. Research on visitor attitudes toward management policy can help identify actions that not only will be effective but also will reduce the intrusiveness of the action into the recreation experience. Additionally, information about visitor attitudes toward management policy can help structure the managerial component of the setting so recreational opportunities can be enhanced, maintained, or restored. For example, research on visitor attitudes may reveal the degree

of social control visitors expect in any given recreational setting. Schreyer and others (1976) found that a majority of river floaters in Dinosaur National Monument favored controls on visitor use such as river trip scheduling, campsite assignments and overall seasonal limits on use. This type of information can help managers implement necessary rules and regulations.

Fourth, attitudes about management policy can help establish normative preferences or tolerances for specific techniques or actions. This information can be useful in developing realistic policies, identifying actions that visitors will accept rather than reject, and determining what type of education may be necessary to inform visitors of the rationale and need for potentially intrusive techniques. In their study of visitors to Glacier National Park during the annual bald eagle migration, Frost and **McCool (1988)** learned that 'most visitors accepted a variety of restrictions on their behavior (such as limits on where the eagles could be viewed) because the benefits of the restrictions – reduced impact on eagles-were readily apparent. This research also suggested to managers the need to continue to inform visitors of the rationale for such restrictions.

WHAT VISITOR ATTITUDE RESEARCH TELLS MANAGEMENT

Identifying and synthesizing research on visitor attitudes in recreation settings is, indeed, a formidable task. Results are found not only in numerous journal articles, symposia proceedings, and other outlets, but there is also no overall organizing or conceptual framework uniformly employed by researchers. Innumerable methodologies, theories (or lack thereof), settings studied, and a dearth of replication characterize this field of study. As a result, much of this research is tempered by such cautions as 'however', 'on the other hand', or 'it depends', making conclusions difficult to construct as well as tenuous to apply.

In our review of the literature, we attempted to use the concept of the Recreation Opportunity Spectrum (ROS) to organize our conclusions. It was our hope that given the assumptions ROS makes about the linkages among activities, settings and outcomes, we would be able to discover some type of consistent pattern. Several studies have demonstrated relationships between visitors in specific ROS settings and expected outcomes. These studies suggest, as hypothesized, that individuals seek settings that they expect will permit or enhance achievement of certain outcomes. However, research

that identifies relationships between preferences for individual setting components (including attitudes toward management actions) and expected outcomes is limited. Where researchers have investigated this, their results have not been all that helpful. For example, Utter and others (1981) reported only one statistically significant correlation of 26 studied between river floaters' preferences for a variety of use allocation techniques and the importance of stress-release/escape as an expected outcome from the floating experience. Given the intrusiveness of this technique and the sizable controversy about use allocation (**Buist 1981; McCool and Ashor 1984**), this finding is a disappointing reminder that the ROS concept needs more refinement and study.

During our review, we were impressed by the striking variation in visitor attitudes not only among activities within a given setting but within any particular activity across geographically different settings. People's opinions about management depend upon the activity; the type of outdoor setting with its physical, social, and managerial conditions; the types of visitors attracted to a place; and, their social and experiential characteristics. This tremendous variation in attitudes, while making sweeping conclusions difficult, does suggest an important recommendation to management: developing standardized solutions to seemingly similar problems is inappropriate. In addition to legal mandates and constraints, management actions should reflect local conditions, the regional, historical and social context of the problem, resource conditions, site management objectives, and the attitudes of current and potential visitors.

Visitor attitude research dealing with management policy has encompassed at least six themes. We will briefly describe each of these themes and then identify the conclusions research allows us to make.

Research on Heavy-handed vs. Light-handed Management Actions

Researchers, managers and visitors have argued that management should emphasize the use of light-handed techniques whenever possible over more heavy-handed or intrusive ones (**Lime 1976; Lucas 1982, 1983; McCool 1976; Wuerthner 1985**). While this theme dominates many recommendations for management and is intuitively appealing, research neither has been directed at confirming the existence of a light-handed – heavy-handed continuum nor has it established where on the continuum any given policy may be placed.

Some research, however, appears to suggest that in certain situations visitors prefer, or at least accept, relatively heavy-handed techniques. Research indicates that users will accept overall limits on use in both wilderness and river recreation settings, if social or ecological impact problems are evident (Brown and others 1987; **Stankey** and Schreyer 1987) and if a clear benefit and rationale accompany the restriction (Frost and **McCool** 1988). There is some feeling also that restricting access to a resource and minimizing regulation of **onsite** behavior may be acceptable to visitors in some situations.

These results should not be interpreted as a mandate to employ heavy-handed techniques across the board, but suggest they may be acceptable to visitors if a careful analysis of the problem is followed by fair implementation and enforcement and explanations of the rationale to visitors (Lucas 1983). Clearly, it would be helpful if some research attention could be directed toward identifying situations and conditions where visitors found heavy-handed techniques acceptable or desirable.

Research on Use-Limit Policies

Research on limiting levels of visitor use has been a major topic in wilderness and river recreation settings as a result of rapid increases in visitation in the 1960's and 1970's as well as legislative mandates to provide opportunities for solitude. Understanding visitor attitudes toward use-limit policies is important because this potentially intrusive technique directly determines access to highly valued resources and influences opportunities for solitude. As noted above, it appears that, in general, visitors will accept limits on use if there is a clearly defined problem. However, the more controversial issue is how such limits will be administered when more people want to 'get in' than the limit allows.

Research indicates that attitudes toward techniques of distribution or allocation vary by user type and situational characteristics. Wilderness users, for example, generally prefer queuing approaches while many river floaters prefer reservation and lottery techniques. Even this finding must be tempered by differences within types. For example, river floaters on commercial trips prefer reservation systems over others while floaters on noncommercial trips prefer lotteries (Utter and others 1981). It appears that preferences are directly influenced by the kind of system in-place at the area studied and the experience of visitors with other systems elsewhere.

A study illustrating the diversity of attitudes is reported by Shelby and others (1982). They investigated visitor attitudes in two wilderness and one river situation toward five different rationing systems (pricing, reservation, lottery, queuing, and merit). River runners were the most likely group to agree that a reservation system would have little or no effect on their chance of obtaining a permit, that the reservation system is fair and acceptable, and that they would be willing to try the system. They also were more likely to try a lottery than the backpackers. Backpackers, on the other hand, viewed pricing more favorably than the river runners. All three groups strongly disagreed with the statement that a merit system is fair, but the backpackers were *more* willing to try a merit system than the river runners.

This line of research indicates several conclusions:

1. There is generally no association between a setting and attitudes toward use-limit policies. This is primarily because of the diversity of expectations visitors may hold in any one setting. Expectations, and the saliency of certain attributes, are more likely associated with attitudes than settings (Schreyer and Roggenbuck 1978; **Stankey** and **McCool** 1984).
2. Attitudes vary by recreational activity.
3. Attitudes vary according to the degree to which visitors affected by a use-limit policy recognize a biophysical or social impact problem.

Research on Activity Controls

Another line of inquiry deals with attitudes toward management controls on visitor activity once the recreationist enters the site. These controls and restrictions include limitations on where people may camp or travel, the necessity of securing a permit to camp or float, and prohibitions on campfires. Again, the research shows an incredible diversity in opinions. For example, Schomaker and Knopf (1985), describe results of research on users of 38 rivers across the United States. Respondents were asked to indicate the degree of opposition or support for 21 management actions, including requiring people to carry out their trash, prohibiting motorized watercraft, prohibiting wood fires, providing more access points, and assigning time of day when groups could launch. On only a few items did they find consistent support or opposition. Such diversity in attitudes toward activity controls also is supported by Lucas' (1980) study of visitors to nine wildernesses.

An apparently heavy-handed technique, fixed itineraries for backcountry travel, is not favored by

either wilderness or river floaters (Anderson and Manfredo 1986; Lucas 1985), but visitors are apparently willing to accept them if this is a condition of entry into the area. Fixed itineraries assume that visitors will comply with them, but a variety of factors including weather, trail conditions, and personal capability, work against compliance. Fixed itineraries may solve some ecological impact problems but they carry with them the negative consequence of concentrating people at campsites, precisely the place in the backcountry that people prefer over all others to have privacy and solitude. Finally, fixed itineraries also are more likely to be accepted in national park backcountry – where visitors normally expect, high levels of social control- and rivers where campsites may be scarce.

Research on Attitudes Toward Facilities and Developments

Considerable research has been conducted in a variety of settings to assess attitudes toward recreation facilities and developments. Most of this research is fairly consistent in findings: Visitors tend to prefer the current level of development and generally oppose expansion in number and types of facilities, with the exception that in more developed settings, visitors prefer cleaner restroom facilities.

Again, however, such conclusions must be tempered by the great variation in responses. For example, Lucas (1980) reported that for a variety of developments- bridges across small streams, pit toilets, fireplaces, and horse corrals- visitors to the nine wildernesses he studied gave widely mixed responses. On other items, such as high standard trails and bridges across dangerous streams, the response was more consistent- most everyone favored them. In river settings, research shows that if visitors desire more facilities, they prefer them to be located at existing access and development sites, rather than placing them at previously undeveloped locations along the river (Anderson and Manfredo 1986; Schomaker and Knopf 1985).

Research on Attitudes Toward Information

Some research has been conducted on visitor attitudes toward the use of information as a management tool- what most researchers, managers and visitors would agree is a light-handed action. How effective information is depends partly on use of it by visitors, which probably varies considerably. For example, Dowell and McCool (1983) found that only 29 percent of the visitors to the Bob Marshall Wilderness had contacted a Forest Service office

prior to planning their trip even though most visitors had never camped in the area before. Yet, research indicates that information is an acceptable tool to visitors in basically all types of settings. Nevertheless, as Schomaker and Knopf found, there is no consistently high level of agreement about types of information desired. The kind of information people might seek or that managers provide varies in desirability. Dowell and McCool found that most visitors rated accurate maps and guidebooks as desirable, while explanatory signs in the wilderness were opposed by over 40 percent of the sample and desired by just over one-third. Results from Anderson and Manfredo (1986) also showed resistance to the use of agency information within an area.

Information about minimum impact behavior is generally acceptable in many settings. A number of studies have found that such programs can be effective in changing knowledge levels as well as behaviors (Dowell and McCool 1986; Oliver and others 1985; Robertson 1981). Information dealing with use distribution, which occurs off-site as well as on-site, also varies in acceptability and effectiveness (Lime and Lucas 1977; Lucas 1981).

A number of factors influence visitor attitudes toward the use of information. These include previous experience in the area and elsewhere, type of social group and level of specialization (Huffman and Williams 1986; Williams and Huffman 1986). Clearly, this means that managers must know their clientele if they wish to make information an effective management tool.

Research on Fees

With the increased interest in using fees to augment recreation management budgets, understanding attitudes toward these actions assumes greater importance. There appear to be two major questions: (1) the acceptability of imposing entrance fees and user charges, and (2) the acceptability of differing prices, Howard (1987) concluded his literature review on this subject by stating:

Despite a persistent conventional belief that users oppose higher fees, research results consistently show that most participants would be willing to pay substantially higher user fees for most publicly provided recreation activities.

Research as well as management experience suggest, again, that if users see a specific benefit -such as improved trail maintenance, more facilities- they will favorably react to a fee. Fees which appear to “disappear into the general fund” probably will not

be supported. At what level should fees be set? This is an important question, and again, it is related to local situations and perceived benefits.

RECOMMENDATIONS RESULTING FROM VISITOR ATTITUDE RESEARCH

From this research, we offer four recommendations for recreation resource management:

1. Avoid rapid and significant departures or deviations from the status quo. Major shifts require substantial agreement among the affected publics about **the** immediacy of the problem that requires such change. Major changes in management direction may be perceived by visitors as a loss in the type of recreational opportunity being provided. Continuous and intimate public involvement in the management **situation** (McCool and Ashor 1984) may help educate both managers and visitors about the necessity of the change as well as how significant the change may be. Incremental changes will be more acceptable to the affected publics, assuming they are a component of a systematic management process.

2. Information and education programs are useful, acceptable, and can be effective (Roggenbuck and Berrier 1981; Dowell and McCool 1986) if properly designed and targeted to specific problems and clientele. Visitors will accept, and indeed, look forward to receiving information about specific areas, although the type of information they need varies depending on the kind of experience they seek, their previous experience in the area and in similar activities elsewhere, and in the level of specialization. In undeveloped recreational settings, information is more readily accepted and used if it is provided off-site and well ahead of the visit or at access points.

3. Avoid heavy-handed, authoritarian techniques to control or limit use. While, as we have pointed out, there is some acceptance of these approaches, intuitively they conflict with the very nature of recreation. Often, the problems these techniques are designed to resolve are not simple linear functions of use level (Cole 1987) and may seduce managers into a management regime and set of issues they are ill-equipped to handle (McCool 1986).

4. Visitors will accept heavy-handed use controls if local resource or social conditions warrant such severe actions. Visitors apparently are willing to trade off reduced freedom for specific benefits, if a consensus exists about those benefits. Again, this suggests a continuing public involvement program that will educate visitors about the necessity of such actions.

STRENGTHENING THE USEFULNESS OF VISITOR ATTITUDE RESEARCH

The review of literature in the previous sections, while not comprehensive, was intended to represent the various lines of inquiry researchers have pursued on visitor attitudes and the general conclusions one can make about the implications of such research. And, while there is considerable research in this field, certain limitations are obvious. In this section, we suggest ways in which future research on visitor attitudes can be strengthened to improve its overall utility in managing for quality recreational opportunities.

Improve the Theoretical Basis of Research

We echo Lee's (1977) observation that much of the research conducted in the area of outdoor recreation management is nontheoretical. While some underlying conceptualization of visitor attitudes must guide all such research, rarely is the paradigm used explicitly reported or described. The lack of theoretical foundation significantly limits research in several ways. First, the model upon which research is based should have real world applications. The lack of a well developed model reduces the utility of the research to managers. Second, the research paradigm leads to hypotheses which then lead to hypothesis testing. The result of the hypothesis testing process advances understanding of a particular phenomenon. Finally, the iterative deductive-inductive reasoning process that comes with development, application, and testing of theories, models, and concepts is a requisite for advancement of science.

Non Site-Specific Research is Needed on Visitor Attitudes

The dominant limiting factor in understanding and using research on visitor attitudes is its **site-specific** nature. Most studies are conducted only once, and only at one recreation site. Because recreationists are most easily sampled at sites, nearly all research on visitor attitudes has been conducted on visitors to recreation sites. This has led to two significant weaknesses. First, the researcher is limited in ability to generalize about attitudes of visitors at other sites which may be characterized by similar site attributes or use conditions. Even though these sites may appear to be similar, the types of visitors that use the area, their belief systems, and cultural values may vary considerably. Thus, the research is limited in its utility. Second, because site attributes form much of the basis for selecting recreation areas, individuals seeking recreational experiences not supported by the site are unlikely to be tapped in a

site-based study of attitudes. Thus, the full range of visitor attitudes- and their relation to behavior- is not explored.

Multi-Site Research. Would Help Improve Understanding

At the same time we suggest research that is not site-specific, we also recommend studies of visitors at multiple sites, using similar theoretical and methodological orientations. These types of studies allow us to make comparisons of how users in different settings respond to the same set of management actions (Knopf and Lime 1984). By comparing and contrasting responses, we learn more about what people seek in specific settings, how they respond to proposed changes in management attributes, and the potential for regional recreation management (Bruns 1984; Schreyer 1985). Examples of this kind of study include Lucas (1980), Schomaker and Knopf (1985), Shelby and others (1982), and Stankey (1973).

Studies of Trends in Attitudes are Needed

Most studies of visitor attitudes are single, one-time case studies and are limited in potential for comparative analysis. However, tastes and preferences as well as attitudes often change over time. For some subjects, such changes may be influenced by broader sociocultural shifts, while for others, change may be directly related to visitor knowledge, increasing sensitivity to resource conditions, or changes in the local situation. Thus, the cross-sectional case study, while useful in the short-run, does little to tell us about what happens over a period of time. Few studies have examined how visitors in a setting change attitudes over time. Where this has happened, the information has been illuminating. For example, Lucas (1985) compared visitors to the Bob Marshall Wilderness in both 1970 and 1982. He found some significant changes in both perceptions of problems and attitudes toward some management actions. McCool and Stankey (1986) found significant shifts in attitudes toward wilderness fire management policy over a 13-year period.

Examine the Relationship Between ROS and Visitor Attitudes

We noted earlier the lack of research scrutinizing relationships between visitor attitudes toward management actions in relation to the location of a place along the Recreation Opportunity Spectrum (ROS). This is an important issue, because it bears directly upon the validity of the ROS concept itself. An example would be the attitude of visitors toward use-limit

policies. We hypothesize that visitors in primitive settings- where the value of autonomy may be highest-would oppose such policies with greater vigor than those in more developed settings. Confirmation of this hypothesis would reinforce current definitions of the ROS. Lack of support, however, might lead to a new line of research about recreational settings.

If our hypothesis is confirmed, still other questions arise. For example, is there some type of continuum underlying the ROS other than the primitive-developed one? Under what conditions are visitors willing to support use-limits and activity controls? Are these conditions associated with specific kinds and conditions of site attributes? What types of trade-offs are people willing to accept? That is, are people willing to accept a limit on use if there are higher levels of solitude? How do people deal with inconsistencies in settings? Are such inconsistencies (for example, a highly developed highway access to a remote wilderness trailhead) ignored, a source of dissatisfaction, or do they result in a sort of product shift? These questions are important to answer if we wish to continue to use ROS as a framework for management.

Visitor Attitude Information Requires a Decisionmaking Framework

Although researchers produce information about visitor attitudes, managers must find some way to use that information when formulating and implementing policies. Managers are frequently confronted with the situation of having information about visitor attitudes, but not knowing how to use it when making decisions. We feel the most efficient use of visitor attitude information is made when it can be incorporated into a decisionmaking framework.

A number of decisionmaking frameworks for dispersed recreation management have been proposed. These include the Visitor Impact Management System (Graefe and others 1984), the Social Carrying Capacity approach (Shelby and Heberlein 1986), and Limits of Acceptable Change (Stankey and others 1984, 1985). The decisionmaking framework enhances the utility of visitor attitude information by suggesting the type of attitude information needed as well as how and when it can be used during the management policy formulation process.

An excellent example of how research on visitor attitudes was used in a decisionmaking framework is the Recreation Management Direction for Montana's Flathead Wild and Scenic River, adopted in March 1986 (U.S. Department of Agriculture 1986). One of the objectives of this management direction was to develop specific indicators and accompanying

quantitative standards of the acceptability of intergroup encounters. This information was needed as part of the Limits of Acceptable Change planning system. For example, information was provided by McLaughlin and others (1984) that helped identify the importance of solitude on different segments of the river as well as preferences for encounters with other groups. These data led to the development of an explicit standard of acceptability for intergroup encounters: 'An 80 percent probability of no more than four encounters per day.' By monitoring encounters, managers can determine the effects of differing levels of use and can implement management actions to prevent unacceptable levels of encounters from occurring

Management actions, while designed to preserve resources, enhance opportunities, and reduce conflict, can negatively impact the visitor. Use of management techniques requires an understanding of how the visitor perceives such actions as well as the objectives for which the site is managed and the expectations of the visitor. Management actions, particularly those which limit, control, or restrict visitor activity, may directly interfere with the nature of recreation itself. Such management actions are designed to secure uniformity rather than enhance diversity. Fortunately, most management policies are not irreversible. This characteristic distinguishes managerial attributes from biophysical attributes. Mistakes can be corrected, policies refined, effectiveness monitored, changes made. But only through an understanding of visitor attitudes can this be accomplished successfully.

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QUALITY IN RECREATION EXPERIENCE

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Abstract – Quality in recreation is reviewed as it relates to recreation places and experiences. Delivery of quality recreation opportunities is discussed focusing especial/y on recreation opportunity spectrum and limits of acceptable change processes. This is followed by a review of how we have traditionally approached understanding quality in recreation experience and what we need to study to more thorough/y understand the concept. Greater examination of recreational habitats, the role of information, and recreationists' backgrounds and behavioral scripts would be helpful.

Quality in recreation experience is a complex topic. It embraces three concepts over which recreation professionals have struggled for some time. Rather than continuing the debate, I will state how recreation, experience, and quality are viewed in this paper and then move on to a review of what we know and what we need to know to provide opportunities for quality recreation experiences.

RECREATION EXPERIENCE

According to Driver and Tocher (1970), recreation is a **type of human experience based on intrinsically rewarding voluntary engagements during nonobligated time**. With this definition, emphasis is put on the rewards from participation in activities, not on the activities themselves. This general definition fits well with a definition of experience as **the result of being engaged in an activity**. Recreation experiences then are realizations of intrinsic outcomes from engaging in recreation activities (Brown 1983). If we camp, we might realize outcomes related to understanding nature, to affiliating with our camping group,

and to developing woodsman skills; whereas if we play tennis, the salient outcomes might be exercise, affiliation with one other, and development of self-confidence. Recreation in both cases is characterized by the specific outcomes which are realized and those that are salient to the individual make up the recreation experience. Individual outcomes are specific types of experiences which in combination are the recreation experience.

Besides the writings of Driver and Tocher (1970) and Brown (1983) already cited, many other authors have approached the definition of recreation experiences similarly (Hendee 1974; More 1973; Roggenbuck 1980; Schreyer and others 1976; and Wagar 1966). Also, it is consistent with both Lancaster's (1966) concept of consumer behavior and the expectancy-value theory of social psychology (Lawler 1973).

RECREATION QUALITY

Given the experience-oriented definition of recreation which has been used, quality is seen as relating to the quality of experience which is realized. In his seminal paper in 1966, Wagar suggested three guiding principles for recreation management. He first noted that recreation management is done to provide benefits to people. Second, he stated that recreation behaviors (activities) are done to realize outcomes. Third, he suggested that the quality of recreation experience depends upon how well desired outcomes are realized. Quality in this context, therefore, depends upon which specific experiences are salient to recreationists and the extent to which they are realized. Quality can be affected by management to the extent that management influences realization of desired experiences through its manipulation of information and opportunities for recreation.

Considerable recreation research has been structured around these notions, but a direct test of them necessary to define quality in recreation is lacking. Quality has remained an abstraction which

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is implicitly accepted in the recreation research community. Since quality is removed from operational aspects of recreation management and is an abstract consequence of behavior, research often has contributed to understanding it, but has not directly led to defining it.

PRODUCTION OF EXPERIENCE AND QUALITY IN RECREATION

Over the past 25 years researchers have increased our understanding of the factors involved in the production of recreation experiences and of quality recreation. Their work has progressed from independent looks at behavior, natural resources, social situations, and psychological concepts such as motives, perceptions, and outcomes to integration of these elements into more holistic concepts of recreation production and management and of recreation as a human phenomenon.

Many researchers have contributed to our understanding of how recreation experiences are produced. Major early contributions were made by the work of Wager (1951), Burch (1964), Lucas (1964), Wagar (1964, 1966), and Tocher and others (1965) among others, but integration of their ideas into models of production did not emerge until the 1970's. In 1975, Driver and Brown published a paper hypothesizing the consumer choice processes which lead to realizing recreation experiences. This was followed by a model of the kinds of decisions which must be made by management (Brown and other 1976; Brown 1977). Then, emerging from a workshop focused on measuring and improving effectiveness of public outdoor recreation programs was a model which depicts the production of recreation benefits from raw recreation resources and recreationist inputs (Driver and Rosenthal 1988; Brown 1984). This model depicts recreation experiences as intermediate products in the production of benefits from recreation.

The production of recreation benefits begins both with recreationists and raw recreation resources. Land, labor, and capital are combined to produce opportunities for recreation, but recreation does not take place without consumers of these opportunities. Consumers enter the recreation situation with past experiences, knowledge, skills, equipment, time, and other resources. Nature and managers provide places where recreation activities might occur and recreationists select those opportunities which they believe will fit their desires. In using recreation opportunities, recreationists are producing recreation experiences which in turn are used in producing benefits from recreation. In summary, nature and managers produce

places for recreation and recreationists produce use, experiences, and benefits. The quality of experiences can be influenced by input factors provided by managers, as they can be influenced by natural forces, but to a considerable extent the quality of experiences depends upon choices made by recreationists and how they use the many factors of production.

DELIVERY OF QUALITY RECREATION OPPORTUNITIES

While recreation opportunities are only one input to quality recreation experiences, they are one of the factors controlled by managers and often have important influences on recreation experiences. One of the early statements about recreation opportunities was J.V.K. Wagar's (1951) writing about recreational variety. He suggested that a variety of opportunities was necessary to meet the needs of a diverse public. His writings were followed by those of his son, J.A. Wagar (1963, 1964, 1966), Burch (1964), Lucas (1964), Tocher and others (1965), and others who argued similarly based upon observation and empirical study.

During subsequent years, managers faced with an ever increasing demand for outdoor recreation opportunities sought to meet needs in effective and efficient ways. At times, as Clark and Stankey (1979) have noted, this led to a reduction in recreational variety and a decrease in the ability to meet the desires of many recreationists. This result counters Wagar's (1966) notion that quality in recreation depends upon how well desired outcomes are attained. If the opportunities necessary to meet the desires of recreationists are not provided, according to Wagar's premise, quality must be less than optimum and possibly declining.

During the 1970's two things happened which refocused attention on providing recreation opportunities to ensure recreational quality. At that time recreation research had matured to the point where observations were being made about the change in recreation opportunities, and researchers were beginning to conceptualize the nature of the recreation phenomenon (Brown and others 1973; Clark and others 1971; Driver 1976; Driver and Brown 1975, 1978; Driver and Tocher 1970; Hendee and others 1971; Hendee 1974). Secondly, Federal legislation was passed which required new initiatives in integrated land management planning. These spurred the search for ways to better integrate recreational demands and opportunities into resource management plans. The outcome of these two forces was rearticulation of recreational variety through a spectrum of recreational opportunities.

Building upon observations from research, Driver and Brown (1978) suggested that there are at least four different kinds of recreationist demands. There are demands for participation in recreation activities, for settings in which to recreate, for specific experiences from recreational participation, and for benefits from recreational experiences. This articulation has helped to broaden our conception of recreation opportunities from a focus on either recreation activities or places to a multidimensional concept incorporating recreation activities, places (settings) and experiences, all of which facilitate gaining recreation benefits. Thus, recreation opportunity has been defined as **the chance to** engage in specific recreation activities in specific settings to realize probable and desired recreation experiences (Driver and Brown 1978).

At about the same time, Clark and **Stankey** (1979) observed both how recreational places had been changing without clear direction and that a framework for recreation management decisions was needed to guide recreational change. They also suggested that recreational places were the focus of most management attention and that the character of these places (attributes of the recreational setting) were important in providing a variety of recreation opportunities to meet a variety of recreationist desires.

The observations of Driver and Brown (1978) and Clark and **Stankey** (1979), when combined with the land planning requirements of the National Forest Management Act and the Federal Land Policy and Management Act, and with earlier ideas put forth by Marshall (1937), Wagar (1951), Wagar (1963, 1964, 1966), Burch (1964), Lucas (1964), **Tocher** and others (1965), **LaPage** (1967a), and others led to development of an operational system for planning, using the concept of a recreation opportunity spectrum (ROS). The concept and the planning system are best articulated in **Stankey** and Brown (1981) and Driver and others (1987). Some important pitfalls, limitations, and realizations about this approach are laid out in Clark (1982), Manning (1985), and Driver and others (1987).

In terms of delivery of quality recreation opportunities the ROS approach does several things. First, it provides a framework for identifying and defining recreation opportunities. Second, it requires specifying the conditions under which different opportunities are provided, and third, it provides guidance for carrying out allocation and management decisions and the subsequent evaluation of those decisions and practices. Since recreation opportunities are an input to the production of recreation experiences, being able to see clearly the characteristics of different

opportunities and to provide a variety of opportunities enables delivering opportunities which fit the desires of different groups of recreationists. Then, when relevant opportunities are available, those seeking to participate in outdoor recreation have one necessary ingredient for producing quality recreation experiences.

While the ROS helps us realize how to provide recreation opportunities which can lead to quality in recreation, a second framework has been developed which aids planning for delivery of quality recreation opportunities. The Limits of Acceptable Change (LAC) framework was borne from extensive research and conceptualizing about carrying capacity and from articulation of the ROS framework. Two streams of information came together to develop a process for planning and managing for quality recreation opportunities.

Some of the more pertinent literature regarding recreational carrying capacity is Wagar (1964); **Stankey** (1971, 1973); Lime (1977); Burch (1984); Graefe and others (1984); Schreyer (1984); and Shelby and Heberlein (1984, 1986). These and many other writings lead us through a search for a holistic model to guide recreation management. Generally, they deal with the social aspects of recreation and the effects of numbers, kinds, and behaviors of others on recreation experiences. A general question is asked about the point at which the number of recreationists decreases the quality of some defined recreation experience. The point at which aggregate net quality declines is viewed as the capacity of the recreation opportunity and strategies are developed to regulate the amount or distribution of use to ensure maintaining opportunity for the desired recreation experience. Management tools from very subtle behavioral tools to very coercive regulatory tools are available to keep use within capacity (Gilbert and others 1972).

A few authors (Anderson and Brown 1984; Knopp and others 1979; Lucas 1973; Peterson 1974) have suggested that physical-biological and managerial factors also are important in discussion of carrying capacity and some research, most notably that of researchers such as Merriam and Smith (1974), Cole (1982), and Leonard and others (1985) has been devoted to these questions. Still, a preponderance of carrying capacity research has focused on social issues in carrying capacity (Burch 1984; Graefe and others 1984; Schreyer 1984; Shelby and Heberlein 1986).

With the articulation of ROS, with extensive research on carrying capacity, and with the need for integrated research planning (including recreation), thought shifted from the usual carrying capacity question of “how much is too much?” to one of “how do we provide recreation opportunities which can be used in producing quality recreation experiences?” This question is related to the former but leads to a broader set of questions and answers and to more encompassing management. Answers to it require that we define an array of opportunities, specify those features of the environment which are indicative of the opportunity, and establish standards which indicate minimum acceptable conditions for each indicator. Once standards are established, we can know if conditions are approaching these standards and thus the limits of change which are acceptable. This concept of definitions, indicators, standards, and observations is fit into a planning framework in the **LAC** model proposed by **Stankey** and others (1985): Using that framework we are able to specify how quality recreation opportunities might be provided through planning and management activities and how we can monitor and evaluate whether or not we continue to meet our goal of providing desired opportunities for recreationists.

OUR APPROACH TO UNDERSTANDING QUALITY

Trying to understand quality recreation usually has focused on either the perceived quality of environmental features or the degree to which expectations have been met. Either the neo-classical model of economic behavior or the behaviorists’ satisfaction model has been used to evaluate quality in recreation opportunities and experiences.

Several studies of environmental features have been undertaken to identify significant features or their conditions, Hunt (1968) identified variables affecting tourist behavior in Logan Canyon, Utah. Lime (1971) elicited perceptions of campground features in Minnesota. Willis and others (1975) showed the differential value of lake-side versus nonlake-side campsites. Lucas (1964) characterized perceived boundaries between developed and backcountry recreation opportunities. Peterson (1974) identified features of a wilderness environment and user evaluation of them. Knopp and others (1979) characterized environments and their relationship to satisfaction, and Anderson and Brown (1984) showed how environmental factors affect displacement in an area. Wernnergren and Fullerton (1972) showed which features of deer hunting environments resulted in

higher economic values. Finally, among many other works, **LaPage (1967b)** was able to show what features are necessary for high quality private campgrounds.

An even longer list of studies represents the look at satisfaction. Many of these studies focused on the role of crowding and congestion in satisfactory experiences, often to the exclusion of other factors. Some of the earliest work on this topic was Lucas’ (1964) examination of users of the Boundary Waters Canoe Area where he identified differential effects of motor boaters, motor canoeists, and canoeists on each other. **Hendee** and others (1968) evaluated the perceived effects of management actions on user satisfaction for Northwest wildernesses. **Stankey** (1971, 1973) followed with a look at users of four wilderness/primitive areas and attempted to assess the effect of encountering others on user satisfaction. Fisher and Krutilla (1972) examined the satisfaction notion from an economic perspective for the Spanish Peaks Primitive Area. Several other studies were undertaken during the 1970’s with some such as Lee’s (1977) raising questions about either the model itself or the way its parameters were being defined and measured. Such criticism led especially to better definition and model articulation, and work on questions of social conditions such as crowding, congestion, and privacy proceeded. Many of these studies are reviewed in Graefe and others (1984), Manning (1985), and Shelby and Heberlein (1986). Included in this topic are studies such as Vaske, and others (1980, 1982), Shelby (1980), Shelby and Colvin (1982), Shelby and others (1983), Heberlein and Vaske (1977), Absher and Lee (1981), Becker (1981), Manning and Ciali (1980), Twight and others (1981), West (1981), Ditton and others (1982, 1983), **Hammitt** (1982, 1983), **Hammitt** and others (1984), and **Gramman** and Burdge (1984).

One thing which characterized nearly all studies related to use and satisfaction, and nearly all dealing with environmental character is their focus on specific factors rather than a more holistic characterization of place or experience. Two studies of a somewhat broader nature are the cognitive mapping and behavior sequence study of Knopf (1979) and Knopf and Barnes (1980) and the recreation opportunity preference study of Brown and Ross (1982). Knopf and Barnes described how users of Gettysburg National Battlefield cognitively processed and moved through the environment, and whether or not they understood it based on this processing and behavior. Brown and Ross attempted to integrate desired experiences with both descriptions of recreation settings and activities in determining which settings were perceived to provide satisfying experiences. To better understand what we mean by quality in

recreation experiences, more studies such as these which tend toward the Gestalt, rather than the pieces, will likely prove valuable.

WE NEED TO STUDY MORE TO UNDERSTAND MORE

Three areas of investigation would lead to much greater understanding of quality in recreation experiences. We **need to understand better the relationships between recreational habitats and quality as perceived by users**. A major future issue is how do we create and maintain habitats for people. We **need to understand better the role of information in forming expectations and in regulating the realization of experiences**. Managers, outfitters, conservation organizations, and many others produce and supply information that can affect perceptions of quality. We **also need to understand better the backgrounds and behavioral scripts of recreationists which help to regulate perception of quality in experience**. The effects of the context of recreation engagement, social and economic constraints, past experience, and culture are only partially understood, and in some cases not even recognized.

Recreational habitats have been the subject of study, some of which has been noted previously. Usually, however, they have not been perceived as habitats for people, but rather in their discrete attributes. Both scientists and managers often have approached the understanding of recreation places from the perspective of isolating the importance of individual attributes of the environmental, social, and managerial situations. An alternative approach would be to assess the impact of a more holistic characterization of the recreation place on the perceived quality of the recreation experience. Greater attention to observations of environmental psychologists such as Sommer (1969) and Kaplan and Kaplan (1978, 1982) might prove enlightening.

Recreational habitats are only one of the variables affecting recreation experience (Knopf 1988; Brown 1984) but they are within the responsibility and potential control of managers. Understanding their roles in recreational experiences and better understanding how they can be characterized should enable more effective provision of recreation opportunities and enable raising the quality of recreational experiences.

The roles and functioning of information about recreation activities, places, and experiences and about recreation in our culture can be understood

better, thus enabling use of information to enhance opportunities to realize desired recreation experiences. Information provided by managers, outfitters, conservation groups, movies, one's recreation companions, and others can affect greatly both expectations and realizations of experiences. Information can influence images of activities, places, and experiences and it can aid in successful functioning in recreation habitats. It also can be used to legitimize recreational engagement and investment in our culture and thus affect recreation choice and behavior.

While there has been some study of information in recreation (Brown and Hunt 1969; Dowell and McCool 1988; Fazio and Gilbert 1974; Huffman and Williams 1986; Lime and Lucas 1977; Roggenbuck and Berrier 1981), our understanding of how it affects experiences of recreationists is not very complete. As with a better understanding of recreation environments, if we better understand the functioning of information we should know better how we might facilitate realization of high quality recreation experiences.

The backgrounds and perceived roles of recreationists have long been believed to be important factors in recreation choice, behavior, and realization of experiences. These factors have been prominent in the literature about recreation behavior (Klausner 1969; Driver and Brown 1975; Knopf 1983), and they have underlain a lot of our study of recreation preferences and behaviors. Recently, there has been renewed interest in them as evidenced by studies such as those by Schreyer and Lime (1984), which have shown the importance of past experience as a factor in realization of recreation experiences. With the evidence which is now beginning to surface it would appear that much more understanding of background, experience, and perceived role variable in recreation behavior would be very useful in understanding what makes quality in recreation experience.

CONCLUSION

Researchers and managers both consider quality an important notion. It has been roughly characterized, but there has been little study of the concept so that we know when high quality has been realized. At best, we know only a little more than that quality in experience depends upon the correspondence between what is desired and what is realized. Since recreationists demand activities, settings, experiences, and benefits with varying degrees of consciousness, quality will depend upon how well recreationists can do what they want, where, when, with whom, and then realize desired experiences and benefits.

The delivery of information and recreation opportunities to enable realization of quality in recreation experience is limited by our lack of understanding about what is necessary. However, we are learning about recreationist behavior, tastes and preferences, and factors which regulate realization of recreation experiences, and frameworks for planning and management, such as ROS and LAC, are providing managers with tools to better meet recreationist desires.

Still, considerable understanding needs to be obtained to more effectively assure the provisions of opportunities for quality recreation experience opportunities. Our understanding would be significantly aided if we focused more attention on recreational habitats, roles of information, recreationist characteristics and roles, and how information, recreational places, and recreationists interact to produce quality recreation experiences.

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GREAT EXPECTATIONS AND THE LIMITS TO SATISFACTION: A REVIEW OF RECREATION AND CONSUMER SATISFACTION RESEARCH

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Abstract- The concept of satisfaction is a widely used measure of recreation quality. The origins of recreation satisfaction are discussed including the major resource factors that appear to influence satisfaction. Issues in measurement and conceptualization are identified as they have been addressed in both recreation and consumer behavior. The review leads to some suggestions for future research in satisfaction including: more rigorous definition of comparative standards, broadening the attitude-preference focus of satisfaction research to address a wider spectrum of emotional content, and a greater appreciation for the limits to satisfaction as a construct of recreational quality.

Employing a commodity analogy of satisfaction in recreation resource management has been attractive because managers of natural resources have a tendency to define recreation as a product like timber, water, and wildlife. But despite the popularity of the consumer satisfaction metaphor, recreation in wildland settings may not fit easily into the commodity oriented production models that resource management has been based on for most of this century. The struggle to incorporate recreation into the commodity framework is evident in the effort to establish commodity or market prices for what is essentially a public, nonmarket good (Walsh 1986). Unlike timber and water, managers of recreation resources cannot observe market behavior to evaluate quality.

Given this commodity framework, managers have pursued satisfaction as an alternative measure of quality and management effectiveness. Satisfaction appears to have important advantages over another, all too frequently used, alternative- measuring the quantity of people using a resource. Quantity is a measure of efficiency and not effectiveness. In recreation, efficiency (quantity provided) and effectiveness (quality provided) are often negatively correlated; perhaps more than in other spheres of production and service.

The purpose of this paper is to examine the concept of satisfaction as a basis for evaluating recreation quality. The review builds on the premise that the potential and limits of satisfaction as an evaluative approach may be better understood through a review of consumer behavior research. The first section addresses the origins of satisfaction research within recreation resource management. This section summarizes what we know about the major sources of satisfaction including crowding, goal attainment in consumptive and nonconsumptive recreation activities, and resource impacts. In addition, the methodological and conceptual origins of recreation satisfaction are highlighted. The major conceptual issues underlying satisfaction measurement are

INTRODUCTION

Quality has been the consistently stated goal of outdoor recreation management (Manning 1986) and satisfaction has been consistently advocated as the most appropriate surrogate of quality (LaPage 1968; 1983). As a result visitor satisfaction is one of the most studied topics since the Outdoor Recreation Resources Review Commission (ORRRC) reports. LaPage and other early researchers (Bultena and Klessig 1969; Wagar 1963) were largely concerned with customer satisfaction associated with the use of public and private campgrounds where the expectation of a service was prominent. In this context, satisfaction seemed to make a reasonably good indicator of quality. In more recent years the concept of satisfaction that these early efforts popularized has been invoked to evaluate the quality of recreation in wildland and undeveloped settings (Ditton and others 1981; Peterson 1974).

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reviewed in the second section. Most of these issues involve the relationship *between* alternative comparison standards and product or experience outcomes in evaluating satisfaction. The final section includes some suggested revisions to the satisfaction model which include approaching recreation as experience and broadening the attitude-preference focus of satisfaction research to include a wider spectrum of affect, emotion, feelings, and ultimately self-identity. The paper concludes with a commentary on the inherent limits a commodity view of recreation places on our understanding of recreation quality.

ORIGINS OF SATISFACTION RESEARCH

Scope and Definitions

An important first question that must be addressed is to define more precisely what is meant by satisfaction research and how it differs from other approaches to evaluating management performance and recreation quality. Though satisfaction has been the primary means to evaluate quality, within the broader context of environmental psychology there are numerous ways to assess environmental quality (Canter 1983; Craik and Feimer 1987; Craik and Zube 1976). For example, landscape beauty (Schroeder and Brown 1983) has been suggested as an alternative measure of recreation quality. Satisfaction research can be distinguished from more general interests in evaluation in that satisfaction research has focused on the subjective nature of responses to recreation opportunities and the individual differences in these responses.

Satisfaction has many definitions. From Webster to satisfy is "to grant fully the wants, wishes or desires of." Satisfaction is the 'gratification of appetite or desire' or 'contentment in possession and enjoyment.' In describing wilderness quality, Stankey (1972, p. 93) wrote it 'can be judged only by examining the extent to which motivations and objectives of the visitor. .. are fulfilled.' LaPage (1983 p. 280) described a quality outdoor recreation experience as 'one that meets or exceeds each visitor's expectations.' Within recreation satisfaction research, the most widely cited definition is provided by Bultena and Klessig (1969, p. 349): 'satisfaction ... is a function of the degree of congruency between aspirations and the perceived reality of experiences.' Collectively, these definitions reduce to some statement about the extent to which expectations, needs, goals, values, desires, wishes, beliefs, or some other anticipatory cognitions are fulfilled or not fulfilled. This comparative process has been operationalized in terms of expectancy models of attitudes, principally the formulations by

Fishbein and Ajzen (1975) as **extended and** applied in consumer satisfaction (Oliver 1980) and need theories of job satisfaction (Lawler 1973).

Sources of Satisfaction/Dissatisfaction

Crowding

Despite considerable effort we have accumulated only modest knowledge of the major sources of dissatisfaction. One of the most important and thoroughly investigated has been the effect of crowding, or human encounters, on satisfaction. Interest in crowding has been especially important within more primitive, unconfined forms of recreation where the goal is presumed to be some form of solitude. Unfortunately, the hypothesized effects of use levels and encounters on satisfaction have not been evident. Graefe and others (1984) reviewed 36 studies measuring different dimensions of crowding (density, actual contacts, reported contacts, perceived crowding) and satisfaction. Of the 14 studies measuring the correlation between actual density and satisfaction, only two showed a significant correlation and both were in the positive direction. In 21 studies measuring the relationship between reported contacts and satisfaction, three found significant relationships, but only one was in the expected direction. The more objective measures of encounters and use levels, however, did seem to be correlated with perceived crowding. The most consistent findings pertained to the link between perceived crowding and satisfaction in which 8 of 12 studies reported significant negative correlations. Thus, use levels and actual encounters appear to have an indirect effect on satisfaction through their influence on perceived crowding.

The impact of crowding, and particularly density, has also been examined in the context of hunting. Heberlein and others (1982) observed in an experimental study that higher densities were evaluated negatively (hunters would prefer to see fewer other hunters), but because the presence of more hunters resulted in more game sightings, success and satisfaction were actually higher. Similarly, in a study of waterfowl hunters, the number of contacts with other hunters was positively correlated with satisfaction, but perceived crowding was negatively correlated (Vaske and others 1986).

Goal Attainment and Specificity

A second source of satisfaction/dissatisfaction has to do with goal attainment, particularly the degree of hunting or fishing success. Early research **suggest-**

ed that satisfaction in consumptive forms of recreation was not very dependent on harvest success, but instead was linked to outcomes such as experiencing nature, social companionship, and opportunities for new experiences (Vaske and others 1986). However, research has reported a positive correlation between game seen, shots taken, and satisfaction (Vaske and others 1982) and between perception of fish biting, others' success as well as personal fishing success, and satisfaction (Graefe and Fedler 1986). Further, in a review of 13 studies, Vaske and others (1982) found large differences in reported satisfaction between consumptive (hunters and anglers) and nonconsumptive (hikers, campers, rafters) recreationists. Consumptive recreationists consistently reported lower satisfaction than nonconsumptive recreationists. The authors suggested that differences were related to goal specificity. A hunter, for example, armed with a clear goal, but relatively low probabilities of success, is more likely to report lower satisfaction than his or her nonconsumptive counterpart who has less specific but more readily achievable goals.

A recent study of bird watching (Applegate and Clark 1987) further illustrates the role of goals in consumptive and nonconsumptive recreation. The authors hypothesized that because the goals are more explicit for bird watching (observing and keeping track of bird species, much like consumptive recreation), lower satisfaction would also be reported among bird watchers. Overall, however, bird watchers were more like nonconsumptive recreationists in their patterns of high satisfaction, with only the more competent bird watchers reporting significantly lower ratings. The authors offer the explanation that the more competent bird watchers were most like consumptive users in that they had very specific goals (adding that rare bird to their life list). With such specific goals the competent bird watcher had a greater probability of being disappointed. In general, results from studies of consumptive recreation indicate that satisfaction is lower, more easily predicted, and varies more in consumptive recreation than for nonconsumptive recreation. Furthermore, based on more recent studies, potential for harvest success appears to be more important to satisfaction than previously thought (Graefe and Fedler 1986).

Resource Impacts

Perceived crowding and consumptive success are not the only determinants of satisfaction. Many other sources of dissatisfaction appear to be linked to evaluations of resource impacts, particularly littering (Stankey and Schreyer 1987). In a study by McCool and Peterson (1982) the most common dissatisfier, after human encounters, was littering (reported by

57 percent of the respondents). Other studies have made similar reports. Downing and Clark (1979) reported that 92 percent of respondents mentioned littering as a management problem and 37 percent mentioned vandalism. Knopf (1982), reporting data from the National River Recreation Study (Lime and others 1981), found that the most common problem reported by participants was littering, with 54 percent of all respondents across 38 rivers indicating that it was at least a slight problem. Other use-related impacts have also been shown to affect satisfaction. For example, in a study of Boundary Waters Canoe Area visitors, Anderson (1980) reported that, in addition to seeing litter, having to camp at heavily used sites and seeing peeled bark on trees were among the most negatively rated conditions.

Research on the factors that contribute most to satisfaction or dissatisfaction can provide managers with feedback indicating the extent to which they are providing desired setting conditions. In summarizing the factors affecting wilderness satisfaction, Stankey and Schreyer (1987) concluded that the presence of others (including perceived impacts of others such as littering) is the most negative factor in many settings. They also conclude, however, that dissatisfaction depends as much on individual differences in motivation or previous experiences as on the objective conditions of the environment. The topic of individual differences has received a great deal of theoretical attention in consumer behavior and is a topic that will be developed in a later section.

Methodological and Conceptual Origins

Initial criticism of satisfaction research was linked to the relative lack of attention devoted to the measures of satisfaction per se (Ditton and others 1981; Shelby and others 1980). Frequently subjects were simply asked to rate a single item measure of general or overall satisfaction (Dorfman 1979; Manning and Ciali 1980; Nielson and Shelby 1977). To overcome the reliability and validity limitations of such a measure, efforts were made to develop Likert-type multiple item satisfaction scales (Ditton and others 1981, 1982; Lime and others 1981). The approach taken by Ditton and others (1981), based on the National River Recreation Study questionnaire, has been found to be highly reliable (Graefe and Fedler 1986; Vaske and others 1986), although its generalizability across some contexts has been questioned (Schomaker and Knopf 1982a, 1982b). Alternative wording and intermixing satisfaction items with other questions apparently affects satisfaction scores. However, context effects are likely to be observed on any type of scale. The fact that such investigations have been done on satisfaction attests to the rigorous

efforts to improve satisfaction measurement. The currently popular six-item version has reported alpha levels ranging from 0.79 to 0.89. (Graefe and Fedler 1986; Vaske and others 1986).

While approaches to measuring satisfaction have ranged from broad unidimensional measures to multiple item scales, theoretical models of satisfaction have sought to identify the determinants of satisfaction with a particular recreation outing. Models of satisfaction can be linked to two themes of outdoor recreation research that have dominated the past 20 years: the multiple satisfactions paradigm and norm based models growing out of crowding and carrying capacity research.

Multiple Satisfactions

In addition to the development of multiple-item general satisfaction scales many studies have addressed satisfaction in terms of separable components (Propst and Lime 1982) or motives (Noe 1987), or what Mannell (1986) termed 'post-hoc satisfaction.' The idea that recreation is motivated by multiple sources of satisfaction has dominated much of the thinking about recreation experiences and has served as the model linking major variables of interest in recreation planning and management; motivation, choice, satisfaction, and benefits (Driver and Brown 1975).

Satisfaction is measured by how well a leisure activity is perceived to fulfill basic needs, motives, or experiences. Extensive lists of "multiple" satisfactions have grown out of the interest in recreation motivation (Driver 1977; Tinsley and others 1977), spawning a plethora of studies on their psychometric properties and structure (Driver and Knopf 1977; Rosenthal and others 1982; Tinsley and Kass 1979; Tinsley and others 1981; Williams and others 1988) as well as their distribution and importance across activity and setting categories (Knopf and others 1983; Williams and Knopf 1985). In fact, the multiple satisfactions approach has been so pervasive that it is arguably the dominant research paradigm in recreation resource management.

Vaske and others (1986) have expressed concern over the motive or separable components approach to satisfaction in light of attitude research which has shown little consistency between general attitudes and specific behaviors (Ajzen and Fishbein 1977; Heberlein and Black 1976). Because predictions from the general satisfactions motivating participation to the degree of satisfaction received from a specific outing may be unreliable, Vaske and others (1986) argue that the multiple satisfactions approach must

be more directly tied to a specific outing. Thus, in at least certain applications, the multiple satisfactions approach perhaps is better described as identifying the experience attributes that are important to various activity participants (Hendee 1974; Potter and others 1973) and the differences that subgroups of participants within an activity place on various aspects of the sport (Hautaloma and Brown 1978). As a general approach, multiple satisfactions does not measure participant satisfaction, but measures instead the elements of the experience that are generally valued.

The criticism raised about the multiple satisfactions approach being too general has been addressed to some degree by employing the same attitude theories on which the criticism is based. Drawing on expectancy theory (Fishbein and Ajzen 1975; Lawler 1973; Vroom 1964), participants are assumed to engage in recreation activities with the expectation that their action will lead to certain rewards or satisfactions (Schreyer and Roggenbuck 1978). An "expectancy" represents the probability that a recreation activity or setting will provide a particular experience attribute. Assuming people are motivated to participate in recreation to satisfy multiple experience expectations, satisfaction (or the lack of it) may be represented by the degree of discrepancy (Schreyer and Roggenbuck 1978) or incongruence (Peterson 1974) between expectations and outcomes, or as a ratio of outcomes to expectations (Iso-Ahola 1980). Overall satisfaction for any particular occasion is determined by summing across a list of experience attributes (motives), the positive and negative discrepancies between attribute expectations and outcomes, hence a multiple satisfactions interpretation is given to recreation experiences (Connelly and others 1986; Ditton and others 1981; Dorfman 1979; Hendee 1974; Peterson 1974; Schreyer and Roggenbuck 1978). While the exact specification of this model varies somewhat from study to study, the general reliance on beliefs (as subjective probabilities of attribute occurrence (Fishbein and Ajzen 1975); or as probabilities that a particular act will be followed by a particular outcome (Lawler 1973) makes the discrepancy model of recreation satisfaction analogous to the belief-based information processing and satisfaction models that have dominated consumer behavior (Bettman 1979).

Norm Based Models of Satisfaction

As described earlier, many satisfaction studies have been inspired by the desire to document the effects of crowding and identify carrying capacities. Discontent (ii not dissatisfaction) over the inability to show a negative correlation between crowding-related variables and satisfaction (particularly in primitive or wilderness settings where crowding would be expect-

ed to be a major source of dissatisfaction) and the positive correlations sometimes observed in other contexts (i.e., hunting) has caused investigators to re-evaluate the standards used to judge satisfaction. Thus, where the multiple satisfactions paradigm has focused on experience expectations as the comparative standard, crowding researchers have turned to personal and social norms as 'contact preference standards' that determine crowding and satisfaction (Manning 1985; Shelby 1981; Shelby and Heberlein 1986). A normative approach has also been employed to establish evaluative standards for ecological impacts of primitive campsites (Shelby and Harris 1985; Shelby and others, in press).

According to Shelby and Heberlein (1986), "A contact preference is a normative construct based on shared beliefs about the appropriate number and type of encounters for a particular setting. It is a social norm which characterizes a group and is derived from individual or personal norms' (p. 74). The idea is that normative standards regulate behavior and define what is acceptable. Sometimes these norms are formalized as written rules of play, or policies of use or access such as permit systems, but in the case of most outdoor recreation, the normative standards are based on an informally arrived at consensus of personal norms. Research on contact preference standards represents an effort to formalize 'what is informally present in the minds of visitors and managers' (Shelby and Heberlein 1986, p. 75).

An important premise of the normative approach is that no standard can be identified without some agreement by participants about the kind of experience to be provided. The approach has been to develop 'encounter preference curves' (Shelby and Heberlein 1986). Rather than just asking what the optimal number of encounters is, an encounter preference curve reveals the extent to which there is a range of acceptable encounters and the degree of 'crystallization' (agreement) around the norm. To establish the social norm, respondents are asked to think of the recreation experience in different social settings. For example, in a study of Grand Canyon norms, Shelby and Heberlein (1986) instructed subjects to respond by imagining the Canyon as wilderness (unaffected by man), semiwilderness (solitude not expected), and undeveloped (meeting others is part of experience). For each setting, subjects indicated the **highest** level of encounters they would tolerate before the desired experience was no longer present. These questions were included in the evaluation of different types of social encounters such as contacts with other boaters on the river,

near camp and so forth. From preference curves constructed with these data, the social norm for a given experience objective may be derived.

While the standard for evaluating satisfaction is no longer linked to expectations of encounters, by tying what is desirable and appropriate to some broader social consensus, some might argue that we have simply returned to linking capacity to the hypothetical relationship between encounters and satisfaction that has been shown to be unrelated to actual encounters and satisfaction (Graefe and others 1984; Manning and Ciali 1980). The movement away from an expectation approach to a normative approach, however, does have its merits, many of which can be related to the theoretical arguments for a norm based approach that have emerged in consumer behavior.

SATISFACTION IN CONSUMER RESEARCH

Recreation research on satisfaction has made extensive use of theoretical approaches and methods from disciplines studying analogous questions. Considerable important work has addressed job satisfaction (Staw 1984), life satisfaction (Schuessler and Fisher 1985), home and community satisfaction (Marens and Rodgers 1975) as well as how various domains of satisfaction interact and contribute to overall well-being. One such discipline that bears most directly on recreation is consumer satisfaction.

An essential feature of almost all satisfaction research in consumer behavior is that satisfaction results from a comparative process- the discrepancy between preconsumptive and postconsumptive product attitudes and perceptions. Within consumer behavior, however, several different and complex functional relationships have been proposed between various antecedent constructs and satisfaction, and a number of different comparison level constructs have been defined (Cadotte and others 1987; Churchill and Surprenant 1982; LaTour and Peat 1979; Oliver 1980; Olson and Dover 1979; Swan and Trawik 1981; Tse and Wilton 1988; Woodruff and others 1983).

Functional Relationships

Contrast Theory

Contrast theory is essentially a simple discrepancy approach in which satisfaction is a function of an initial standard or reference point and some discrepancy from the initial reference point. Derived from Helson's (1964) adaptation-level theory, contrast

theory suggests that consumers will compare actual performance of a product to their expectations about performance. The level of expectation about a product outcome can be seen as an adaptation level, although **cognitions** other than expectancies (i. e., norms, desires, etc.) could form the basis of an adaptation level. Thus, what Oliver (1980) calls **positive disconfirmation occurs** when performance exceeds the adaptation level and **negative disconfirmation occurs** when performance is less than the adaptation level. In practice, individual discrepancies or disconfirmations are summed across multiple product attributes to get an overall measure of satisfaction.

The central concept of discrepancy or disconfirmation has been addressed in two different ways in the literature. In recreation, discrepancy has been measured as the observed difference between ratings of realized and desired experience attributes (Dorfman 1979). In consumer behavior this is described as a subtractive or **inferred measure of disconfirmation (Swan and Trawick 1981)**. The more common approach in consumer behavior is to measure perceived or **subjective disconfirmation (Oliver 1980; Tse and Wilton 1988)**. In describing subjective disconfirmation, Oliver (1979) argues that consumers make explicit judgments about whether a product performed 'better than' or 'worse than' expected. While inferred and subjective disconfirmation represent alternative approaches to measuring the same construct, in application they produce different results. For example, subjective disconfirmation was found to better explain satisfaction for nondurable products and inferred disconfirmation to better explain satisfaction with durable products (Churchill and Surprenant 1982).

The most widely accepted model based on the contrast theory has been developed by Oliver (1980). This model has two important features that tend to be overlooked. First, it focuses on subjective **disconfirmation**. Second, unlike most of the formulations suggested in the recreation literature, Oliver's model hypothesizes that satisfaction is an additive function of expectations (comparison level) and perceived disconfirmation between expectation and performance. Oliver (1979) suggests that an even greater amount of variance in satisfaction is explained when the expectation level is included in the model along with subjective disconfirmation. Both of these features (subjective disconfirmation and satisfaction as a function of both the level of expectations and the degree of disconfirmation) have been largely overlooked in the recreation literature.

Consistency Theory

The second major approach has grown out of the research on the effects of expectations on perceived product performance independent of satisfaction. The basic premise is that some form of distortion takes place in the perception of product or experience outcomes (product performance) in order to make these perceptions consistent with expectations (LaTour and Peat 1979; Olson and Dover 1979). Building on cognitive dissonance theory (Festinger 1957), research attempts to identify the magnitude and direction of cognitive changes that reduce the inconsistency created by disconfirmation of expectations. Similar to cognitive dissonance, **assimilation-contrast theory** (Sherif and Hovland 1961) sees expectations as an anchor for the judgment of product performance. A postconsumption outcome may be perceived either closer to one's preconsumption expectations (assimilation) or more discrepant from expectations (contrast) depending on the degree of discrepancy or disconfirmation (Olson and Dover 1979). If discrepancy is not too large assimilation occurs such that 'expectations higher than obtained outcomes should result in higher performance judgments (and therefore greater satisfaction) than if expectations match obtained performance. Similarly, expectations lower than obtained outcomes should result in perceptions of poorer performance (and less satisfaction) than if expectations match obtained outcomes' (LaTour and Peat 1979, p. 431). Only if discrepancy is very large does the "contrast" effect occur. Thus, assimilation-contrast theory represents a refinement of contrast theory with contrast effects occurring only when the discrepancy between expectations and obtained performance is extreme (LaTour and Peat 1979).

An assimilation-like process might account for the consistent observation that outdoor recreation participants almost always report high levels of satisfaction (Propst and Lime 1982; U.S. Department of the Interior 1979) and is essentially what Schreyer (1979) describes as a denial mechanism, in which participants deny the condition of discrepancy by raising their perception of outcomes (see also Ditton and others 1981). The recreation literature, however, appears to have addressed both the "misperception" of the outcomes, in the form of denial, and in addition, a 'product shift' which involves the misperception of expectations (Ditton and others 1981; Manning and Ciali 1980; Schreyer 1979). The notion of a product shift (e. g., changing the priority attached to anticipated outcomes such as the number of social encounters), does not appear to be addressed in consumer research perhaps because of its focus on perceptions of tangible product attributes and the experimental manipulation of product expectations.

Contrast Versus Consistency

Even though LaTour and Peat (1979) found several problems interpreting the evidence in support of consistency models, they speculate that under certain conditions expectations will have some influence on the consumer's post-consumption beliefs about the performance of a product (i.e., distort product performance judgments). Distortion would occur only when the consumer is uncertain about the level of the attribute possessed by the product. This conclusion is supported by basic research in **assimilation-contrast** theory which suggests that the assimilation effect is stronger when the attribute dimensions are ambiguous- i.e., poorly defined attributes lacking explicit anchors (Sherif and Hovland 1961). In such cases where attributes are ambiguous (i.e., the consumer is uncertain of their performance) the assimilation effect is hypothesized. The contrast effect would be expected when attribute performance is unambiguous, which LaTour and Peat (1979) argue, is generally the case within consumer behavior (i.e., gas mileage, handling, and reliability of automobiles). This helps to explain recreation satisfaction differences observed along the consumptive-nonconsumptive continuum. The nonconsumptive recreationists have only ambiguous attributes on which to form a satisfaction judgment, therefore the assimilation effect produces high satisfaction. Consumptive and other highly goal directed recreationists employ less ambiguous attributes and have more explicit anchor points that lead more directly to contrast effects.

The potential for consistency effects with recreation experiences raises important questions about the role of expectations in satisfaction. The process of assimilation associated with raising expectations may have the effect of raising satisfaction (or reducing dissatisfaction if there remains a negative discrepancy). While this may seem at first counter-intuitive, there is some logic to it that has to do with the direct role product *outcomes* may have on satisfaction,

The Direct Role of Product Performance

LaTour and Peat (1979) find it odd that satisfaction researchers have largely ignored the role of evaluations associated with obtained product attributes. In several instances, product or experience outcomes themselves have explained more variation in satisfaction than discrepancy, disconfirmation, or various other complex measures (Churchill and Surprenant 1982; Dorfman 1979; Sobel and McGuire 1977). LaTour and Peat (1979) build a strong logical argument that consumers' evaluations of product attributes themselves may account for more of the variability in satisfaction than would the confirmation

or disconfirmation of expectations about those attributes. A couple of examples illustrate the problem with expectancy based standards. First, the logic of expectancy confirmation would invite the strategy of managers or marketers lowering expectations for a setting or product and having the users then discover a superior outcome than expected leading to greater satisfaction. Obviously low expectations also affect motivation and would therefore reduce consumption or participation. In another instance, if a person is forced by some circumstance to choose what is known to be an inferior product (low expectations), according to LaTour and Peat he or she is still likely to be dissatisfied even if the product performs up to expectations because of his/her unfavorable evaluation of its attributes in the first place. Finally, in the case of a product in which the manufacturer creates unreasonably high expectations, yet the product is still superior to others, LaTour and Peat argue we would still anticipate reasonable satisfaction. Obviously, expectations do play a role in satisfaction, but **confirmation/disconfirmation** of expectations alone is not enough to predict satisfaction,

In addition to the logical argument presented by LaTour and Peat (1979), two theoretical reasons for a direct link between performance and satisfaction are suggested by Tse and Wilton (1988). The first has to do with cognitive dissonance strategies. Product performance perceptions will dominate in the postconsumptive evaluation if the psychological costs of adjusting the product performance cognition in line with a preconsumptive anchor exceeds the costs of not adjusting the performance cognition but modifying the preconsumptive anchor. Such a strategy would be more likely after a very good (or bad) experience. The second explanation has to do with the consumptive motive. If learning from the experience is an important motive (as in experiencing a new product or activity), then whenever the product performs well a consumer is likely to be satisfied regardless of the preconsumptive comparison standard and discrepancies from it.

Comparison Level Issues

Despite the potential direct role of product perceptions, the notion that satisfaction is a comparative process is almost axiomatic (Oliver 1979). However, the question of what forms the comparative standard remains an issue at least for some. The proposed standards have included desired, preferred or ideal (can be), equitable or deserved (should be), and minimal (must be), in addition to expected (will be) (Miller 1977).

Oliver (1979) makes a good case for the use of expectations as the comparative standard in consumer satisfaction based on 'marketplace behavior,' but in the process casts some doubts about the appropriateness of expectations as the comparison standard for public resource-based recreation. While consumers can express what they 'would like,' these ideal products according to Oliver are rarely available in real markets. Further, Oliver sees no reason why consumers would consider a product below minimum tolerable levels. The equitable or normative "should be" is not as easily dismissed, but its shortcoming according to Oliver (1979, p. 2), is that it 'necessarily involves considerations of equity, personal values, cultural norms, socioeconomic and political philosophy, and quality of life.' The marketplace, however, does not respond to equity (what a product should do) but expectations of what a product will do. The contexts where equity has been explored (e. g., life satisfaction, job satisfaction, neighborhood satisfaction) represent long-term commitments where the standards for comparison and discrepancies arise from **"nonmarket"** forces. 'It is this short-term perspective and well-defined marketplace-generated 'expectations' which distinguish consumer satisfaction from other emotional facets of life' (Oliver 1979, p. 2).

The Normative Approach in Consumer Satisfaction

However appropriate the expectancy standard for recreation satisfaction, the normative standard has its supporters in consumer research. For example, in a model proposed by LaTour & Peat (1979) the comparison level is not simply a weighted sum of attribute expectations, but the weighted sum of (1) attributes of the product personally experienced in the past (a form of expectations), (2) attributes known through the experience of significant others (a social comparison), and (3), expectations created based on the unique characteristics of the present interaction (such as those created by guidebooks, ranger information, etc.). In addition, this information could come from experience of products or opportunities other than the one selected; for example, **product-based** as opposed to brand-based norms (Woodruff and others (1983). Thus, the evaluative standard is defined more from social exchange theories (Thibaut and Kelly 1959). In a sense the person compares performance to what one deserves given the current and similar situations, and what others are known to have received in similar situations.

In another example, Woodruff and others (1983) propose an "experience-based norm" model in which prior product experience influences a performance norm, a brand attitude (affect or feeling toward a brand), and a brand expectation. In addition the

latter two variables influence perceived product performance (i.e., create the potential for an assimilation effect). Thus, performance norms represent comparison standards, but do not affect perceived product performance directly. Carrying this idea further, Tse and Wilton (1988) found empirical evidence that consumers simultaneously use multiple comparison standards (including norms and expectations) in forming satisfaction judgments. Similarly, the consumptive situation is an important factor in determining which standard is used (Cadotte and others 1987). For example, Churchill and Surprenant (1982) found that satisfaction processes differ across durable and nondurable products. Apparently no one standard will always be best for explaining satisfaction.

These findings in support of norm-based models of satisfaction would seem particularly relevant to recreation. For example, Cadotte and others' (1987, p. 313) conclusion that the comparison standard is "rooted in one's **total** experience with the focal and related brands' would certainly apply to recreation participation. Disconfirmation may be linked to the discrepancy between performance and performance norms in much the same way as Shelby and other researchers (Manning 1985; Shelby and Heberlein 1986) describe crowding in terms of normative standards in which the situation (experience goals) must be considered.

While the consumer behavior literature has devoted far more attention to the theoretical aspects of comparison level issues in satisfaction research, recreation has avoided much of it, in part because expectations have been much more broadly interpreted from the beginning. The reasons may have to do with the ambiguous character of recreation "product" attributes. Thus, in recreation there has been a certain looseness in the use of the term 'expectation' relative to consumer behavior as a descriptor of the comparison level. For example Dorfman (1979) explored alternative notions of the comparison level in outdoor recreation by examining the impact of various combinations of attribute importance (value), perception (performance), preference (desire), and expectation on satisfaction. Similarly Peterson (1974) measured congruence between "perception" and "aspiration." In Dorfman's (1979) comparison, perception (alone or weighted by importance) was the only significant predictor of satisfaction. When subtracted from perceptions (performance), neither expectations nor preferences predicted satisfaction as well as perceptions alone, however, the preference comparison standard was more highly correlated with satisfaction than was expectation.

Construct Validity: Cognition or Emotion?

Probably the most important emerging issue regarding consumer satisfaction research is construct validity. The issue spans concerns for whether satisfaction is anything more than a brand attitude (LaTour and Peat 1979) or refers to a full range of emotions (Westbrook 1987), and whether satisfaction refers to the product or the consumptive experience (Woodruff and others 1988). Some have gone so far as to question the entire belief-based information processing paradigm that has dominated satisfaction and consumer behavior for some time (Holbrook and Hirschman 1982).

Research has addressed satisfaction as a purely cognitive process leading to an emotional (satisfaction) state. According to Hunt (1977, p. 459) 'Satisfaction is not the pleasurable nature of the experience, it is the evaluation rendered that the experience was at least as good as it was supposed to be: For example, in a cognitive assessment a respondent would be asked: 'Were the rapids on your float trip fast and exciting enough?' According to Westbrook (1980; 1987) a separate question is the emotion attached to the cognitive assessment: "How did those rapids make you feel?" With satisfaction scales typically anchored using the terms 'satisfaction' and 'dissatisfaction' it is not clear what these terms are measuring with respect to affect or emotion. Thus, Westbrook (1987) argues that positive emotions such as contentment, delight, pleasure, joy, and interest should be linked to positive disconfirmation and negative emotions such as anger, frustration, disgust, and contempt should be associated with negative disconfirmation.

In addition, Woodruff and others (1983) observe that there is no reason to assume that confirmation/disconfirmation will vary directly in magnitude and direction with the gap between performance and the comparison level. For example, the assimilation/contrast effect represents a zone of indifference around the norm (Woodruff and others 1988). Only when there is sufficient arousal (often a function of degree of involvement, Oliver and Bearden 1983) will there be an emotional reaction attached to the discrepancy (Woodruff and others 1988).

Another aspect of the construct validity issue is whether measuring affect toward a consumptive experience is more appropriate than affect toward the product itself (Woodruff and others 1988). Theoretical mechanisms used to explain the affective, emotional or feeling tone of experience involves cognitive appraisal of the causes of a particular affective state (Westbrook 1987). In effect, emotions

are "explained" or assigned a cause. Causality may be "attributed" to the stimulus, the individual, or the situation. In the context of consumptive experiences, the pattern of attributions (i.e., to the product, provider, individual, or situation) may be associated with different emotions. Westbrook (1987) suggests that positive affect is generally linked to the stimulus (product). Different negative emotions on the other hand, may be attributed to the product or provider (anger, disgust, or contempt), the individual (guilt or shame), or the situation (distress or sadness).

In the context of recreation the issue of causal attribution may be even more significant. To what extent does a participant in a recreation context assign affect to the provider, the self, or the situation? Although empirical research is lacking, the nature of attributions regarding satisfaction with recreation experiences may be quite different than the attribution process for satisfaction with commodities. In many instances in recreation the consumer is the producer (Roberts and others 1988) and the extent to which the provider (i.e., the Forest Service) is held responsible for "performance" is uncertain. Moreover, with recreation it is often the situation (things over which the provider and the participant have little control, i.e., the weather, bears and insects, or other people) that people find undesirable (Knopf 1982; Peterson 1974).

The most serious challenge to the construct validity of satisfaction comes from a number of challenges to the general belief based model (the cognitive consumer) that has dominated consumer behavior (Bettman 1979). These challenges revolve around questions of product involvement, emotion, and symbolism. First, cognitive models rely heavily on the assumption of an involved information-extracting individual seeking the correct decision on a product. Olshavsky and Granbois (1979) present evidence that many purchases do not involve decision-making at all, even on first time purchases. Moreover, concepts involving brand loyalty and political decision making suggest a consumer or decision maker that is muddling through rather than maximizing utility (Kassarjian 1982). In low involvement situations the self-perception framework (Bern 1972) may be a more accurate reflection of how satisfaction beliefs are derived from product experience (Scott 1981). Accordingly, individuals 'come to 'know' their own attitudes, emotions, and other internal states partially by inferring them from observations of their own overt behavior and/or the situation in which this behavior occurs' (Bern 1972, p. 2). **To use Bern's own example, if asked whether I like brown bread, I might respond, 'I guess I do, I'm always eating it:**

Second, those representing the "experiential view" (Holbrook and Hirschman 1982; Solomon 1983) have made similar comments in criticizing the belief based, information processing model in consumer behavior. These consumer researchers are concerned by the lack of attention given to consumptive phenomena such as playful leisure, sensory pleasures, daydreams, fantasies, aesthetic enjoyment, and emotional responses. Consumption is regarded as a 'primarily subjective state of consciousness with a variety of symbolic meanings, hedonic responses and aesthetic criteria' (Holbrook and Hirschman 1982, p. 132). In essence, they have argued that issues of the consumer's experience, emotion and such things as fantasies and the symbolic functions of consumption need to be addressed in addition to, if not in place of, the attitude-belief formation process which does not capture these aspects.

Finally, investigators have argued that subjective experience associated with the consumption of products is important in the process of structuring or maintaining self-concept and social reality (Belk 1988; Haggard 1988; Solomon 1983). In the social/symbolic view of consumption, products are used to assign or affirm meaning and identity to oneself. According to Schlenker (1984) there are several 'mechanisms' people use to affirm their self-identity. These include displays of signs and symbols, selection of self relevant tasks and hobbies, as well as social interaction and cognitive strategies that elicit and interpret self relevant information. Thus, through careful selection of certain products consumers may affirm some aspect of their identity. Similarly, through the choice of recreation activities and the display and use of outdoor equipment or other symbols of participation, recreationists may affirm self-identity. The importance of outdoor recreation as an opportunity for self-affirmation is discussed in some detail by Williams and others (1989).

Summary of Consumer Satisfaction Research

Consumer satisfaction, like recreation satisfaction, has been conceptualized as a cognitive appraisal of the degree to which a product or service performs relative to a subjective standard. The level of the standard differs among individuals and groups depending on a wide range of previous experiences including experiences with the given product and similar products, experiences of comparable social groups and even experiences in other spheres of life (Olander 1977). Satisfaction involves two important antecedent constructs; the comparison level and perceived or inferred disconfirmation. The relationship between these, however, turns out to be exceedingly

complex because: (1) the impact of contrast and consistency effects depends on the type of product and the relative "costs" of dissonant cognitions and (2) consumers potentially make use of multiple comparison standards that include expectations and various product and experience norms. In addition, some have come to question the validity of the satisfaction construct. Within consumer behavior the notion of "product" satisfaction is evolving from an attitude toward a multiattribute cognitive entity to the emotional and symbolic meaning assigned to an object or experience.

CONCLUSIONS

Some Research Recommendations

The recreation and consumer behavior literatures, despite little if any cross-referencing, seem to address many of the same issues. An important difference, however, and one that recreation research may still benefit from, is that the consumer literature has tended to address satisfaction with greater depth and theoretical rigor. Of course the volume of the effort may account for some of this. Hunt (1983) reported that in the 10-year period from 1972 to 1982 over 600 papers in consumer behavior had addressed satisfaction. Moreover, consumer researchers often work within an experimental paradigm that allows the manipulation of expectations and measurement before and after consumptive experiences.

Still, much of the knowledge gained from consumer research can be applied to recreation satisfaction. First, recreation research has relied almost exclusively on an inferred (subtractive) approach to measuring discrepancies or disconfirmation. The exception has been in the crowding literature where respondents are sometimes asked to report the extent to which actual encounters were "more than" or "less than" expected (Roggenbuck and Bange 1983). Moreover, inferred approaches raise important methodological problems. The first problem is that difference variables are notoriously unreliable (Overall and Woodward 1975; Prakash and Lounsbury 1983). The second is an overspecification problem (Weaver and Brickman 1974). Two variables (expectancy and outcome) are being used to define three constructs (expectancy, outcome, and disconfirmation).

Second, recreation has been rather “loose’ in defining and employing comparison standards. Expectancy and norm-based approaches have established theoretical underpinnings, but these have not been closely followed in many cases. Moreover, the normative standard has been used more as a basis for making carrying capacity decisions than as a comparison standard in satisfaction research.

Third, the role of consistency versus contrast in recreation satisfaction is largely unknown despite a few attempts to address it (Manning and Ciali 1980). In fact, this is one area in which the nature of recreation experiences may have quite different implications for understanding satisfaction, given that contrast effects depend to a large extent on the degree to which “product’ attributes are perceived “unambiguously’ along dimensions having explicit anchors.

Finally, the role of emotion and attribution processes have not been explored. To make satisfaction relevant to management we need to know more about how feelings and emotions associated with a recreation experience are differentially attributed to the product, the individual, and the situation. How recreationists attribute satisfaction is perhaps the most important research question from the satisfaction paradigm. Here again, the special character of recreation experiences is critical, foremost because recreation may not fit the product or commodity metaphor. Economists recognize that recreation is unusual in that it is self-produced (Walsh 1986) and consumer researchers have suggested that in leisure, like craftsmanship, satisfaction can come from the production process itself (Roberts and others 1988). This question of how recreationists make attributions about the quality of their experiences perhaps most clearly exposes the limits of the commodity metaphor.

The Commodity Metaphor and the Limits to Satisfaction

The limits to satisfaction have to do with the adequacy of the commodity view of recreation. When we assume recreation is a product of land management activities such as cultivating fish and game for eventual harvest, the product metaphor leads us to evaluate recreation satisfaction in a manner similar to the way consumer researchers attempt to determine the momentary satisfactions with the consumption or use of a product. Unlike consumer goods, however, recreation is not a product of a distant corporate machine- though at times recreation service providers seem to want to move in that direction (Dustin and

others 1987). If recreation is largely self-produced, whose performance is to be evaluated; the performance of the participant or the managing agency?

Managers are presumably interested in satisfaction as a way to evaluate the quality of recreation resources and management activities. Implicit in multi-attribute commodity oriented models is that product performance discrepancies reflect the quality of the product. In effect, product performance judgments imply the attribution of quality to the product because the product possesses the attributes. In the recreation context, however, many of the attributes are not clearly attributable to the resource or the efforts of management. To the extent that recreation is ‘produced’ by the participant, many of the important elements may not be under the control of management. Further, to the extent that recreation is dependent on the weather and other situational factors, many of the important elements may be independent of participant and management control. It becomes difficult to distinguish between performance of the resource itself and the performance of the participant in creating a successful recreation experience. While the quality of the resource is important and we should not back away from our commitment to resource quality, the lesson here is that the ultimate arbitrator of satisfaction is the participant – happiness lies with the self.

Recreation experiences might be more usefully described as transactional in nature. Or as Littleton and others (1976 p. 187) describe “... that product of an active endeavor by an individual to create for himself a situation within which he can optimally function and achieve his own pattern of satisfaction.” Yet management is based on the assumption that it is delivering a product, working more or less exclusively with the supply end of the process. It is as if recreationists bring little to the site other than expectations. With such a strong emphasis on products and outcomes of recreation management (rather than how the participant shapes the experience) we run the risk of creating the illusion of experience engineering (Mannell 1985) and environmental determinism (Schreyer 1985; Williams and others 1988). In contrast, the transactional perspective suggests that the recreationist actively creates the recreation experience, through a transaction with the physical and social setting, including what the recreationist brings to the process in terms of use history, perceptions, companions, skills, equipment, identities, hopes and dreams (Berger and Schreyer 1986; Williams 1986). In a transactional perspective more consideration is given to the meaning assigned

to the place and the behavior, and the participants knowledge and skill in experiencing it.

The commodity metaphor also leads to a view of recreation as consummatory behavior emphasizing extrinsic fulfillment of needs (consumptive leisure). Satisfaction as a comparison of what one gets relative to what everyone else has, in many ways, is the antithesis of leisure. In leisure, the value is in the doing, the being, the activity itself. Intrinsic enjoyment is in the doing not in the fulfilling-especially when the standards for fulfillment have so much to do with social norms. It may not be appropriate to call this satisfaction. Satisfaction may not even be a desirable goal for public policy (Olander 1977). The solution has to do with understanding the intrinsic value of opportunities. Put another way, we need to insure that opportunities exist for intrinsic enjoyment and self-expression. Clearly, not all recreation engagements are expressive self-produced affairs, Many participants may be out in the woods for instrumental purposes, but there is a danger of placing too much emphasis on the successful fulfillment of needs or wants.

To summarize, there is a larger context of quality that is lifestyle. The quality of a single recreational outing cannot be measured for the experienced, advanced participant by whether the goal of sighting a rare bird or running a new river was accomplished. Quality is better understood as the extent to which a recreation engagement succeeds as an expression of one's self. This context of quality is not captured by a normative satisfaction measure that emphasizes relative worth in place of that worth having. That worth having is derived from expressive **self**-affirmation, valuing the experience of production and not the production of value, valuing the hunt and not necessarily the harvest, valuing the process and not necessarily the product.

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THE SPECTRUM OF CONFLICT IN OUTDOOR RECREATION

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Abstract – Outdoor recreation conflict is one of the most common and difficult problems with which recreation planners and managers must contend. Recreational activities are an important aspect of a quality life, driven by some strong participation goals and motives, and conflict is bound to happen when goal interference occurs. To prevent potential conflict from occurring, it is necessary to identify and understand the causes, levels, and means of prevention of recreational conflict. This paper reviews the broad spectrum of factors underlying the major causes of recreational conflict, the various levels (i.e., user to user, user to manager, etc.) of conflict, and the spectrum of recreational opportunities (ROS) as a means of analyzing and managing conflict potential. The paper stresses the need to address the causes, levels, and management of outdoor recreation conflict before it reaches the political and legal arena of conflict resolution. Once conflict resolution reaches the costly political and legal process, it is basically out of the hands of the recreation planner and manager.

recreation managers must contend. It is a complex problem that recreation resource managers have not been trained to deal with, and one which is seen far too often as only a space allocation problem.

Conflict in outdoor recreation is often simplistically viewed as competition between two different activity groups for the same resource area, e.g., competition for space between snowmobiler versus skier, horseback rider versus hiker, and powerboater versus canoer. While it is true that ample space to separate these user groups will solve most conflict, it is not space per se that is the cause of recreational conflict.

Research has tended merely to describe conflict situations, with few attempts made to systematically define and study basic causes of conflict situations (Jacob and Schreyer 1980): For example, if lack of ample space is the cause of conflict, why do hikers hate horseback riders but not vice versa? Research has also concentrated on user to user conflict, while devoting far less attention to other levels of recreation conflict, such as among and between community, agency, manager, and user (Liile and Noe 1984). What is needed is a theoretical basis for defining and scoping the boundaries of recreational conflict, a framework for analyzing the different levels of recreational conflict, and a planning-management conceptualization for potentially solving conflict in outdoor recreation areas.

The purpose of this paper is to address the above mentioned concerns, as follows:

1. To offer a conceptual basis for defining and scoping the causes and antecedent conditions of outdoor recreation conflict.
2. To present a framework for relating and describing different levels or categories of conflict in outdoor recreation.
3. To analyze various aspects of recreational conflict within the framework of the Recreational Opportunity Spectrum (ROS), and analyze ROS as a planning-management tool for resolving conflict in outdoor recreation areas.

INTRODUCTION

Leisure is now estimated to constitute one-third of our daily time and lifespan (Chubb and Chubb 1981). For many Americans the most precious use of this leisure is the pursuit of outdoor recreation activities. There is a sound basis in the quality of life literature for recreation having an ever increasing importance in adding meaning to people's lives. The activities that many people pursue during their leisure are valued more highly than their work activities. With such value and importance placed on recreational activities by people, it is no wonder that conflict occurs in outdoor recreation, whether it is between the Wilderness Society and a Federal agency, between recreation manager and visitor, or between different user groups. Conflict in outdoor recreation is one of the most common and difficult problems with which

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CONCEPTUALIZING OUTDOOR RECREATION CONFLICT

Whether defined at the individual, interest group, or agency level, **conflict can be defined as goal Interference attributed to the behavior of others.** The rewards of outdoor recreation participation are valued by individuals, and any interference in obtaining those rewards can lead to conflict. Because outdoor recreation is believed to be strongly goal oriented, interference with goal achievement due to others is a common conflict occurrence.

Jacob and Schreyer (1980) provide an excellent review of the conflict literature to that time, and theoretical conceptualization of conflict. As they point out, goal interference does not necessarily equate with conflict. For goal interference to lead to conflict, the interference must be attributed to another's behavior. For example, bad weather, the fish not biting, or your forgetting to pack appropriate equipment, may interfere with your fulfillment of planned recreational goals, but this is not defined as conflict since it can not be attributed to another. However, there are situations where no one else is directly responsible for the goal interference **but it** is blamed on others- a process of scapegoating where a pseudo source of goal interference is identified. Feelings of personal frustration or failure sometimes cause the displacing of the locus of responsibility on others, causing a conflict situation (Aiiport 1958).

Other concepts discussed by Jacob and Schreyer worth reviewing are goal incompatibility and visitor dissatisfaction. Goal incompatibility is the major source of goal interference, however, differences between people over the means of attaining the same goal or the resources required may lead to conflict. Concerning visitor satisfaction, it is important not to equate recreationist dissatisfaction with recreational conflict. While most conflict leads to visitor dissatisfaction, not all sources of visitor dissatisfaction are conflict generated.

Recreational conflict is also far too often conceptualized as being an asymmetrical situation, where one type of user (skier) is in conflict with another (**snowmobiler**), but the reverse is not true. More and more we find that recreational conflict is not a static, asymmetrical situation, but a dynamic interactive process where an asymmetrical situation will evolve toward symmetrical interference, where both parties involved exhibit bad feelings (Jackson and Wong 1982).

As a conceptual framework for setting some boundaries on outdoor recreation conflict, Jacob and Schreyer offer **four factors** and **ten propositions**

related to conflict to guide us. While my intent here is not to discuss each of these, I feel it is important to outline each of them. I encourage readers to go to the original source for a full discussion of the items.

Factor I

Activity Style = the personal meanings attached to the set of behaviors constituting a recreational activity (i.e., intensity of participation, status, definition of quality experience).

1. The more intense the activity style, the greater the likelihood a social interaction with less intense participants will result in conflict.

2. When the private **activity** style (intrinsic orientation) confronts the status conscious activity style (extrinsic), conflict results because the private activity style's disregard for status symbols negates the relevance of the other participant's status hierarchy.

3. Status based intra-activity conflict occurs when a participant desiring high status must interact with others viewed as lower status.

4. Conflict occurs between participants who do not share the same status hierarchies.

5. The more specific the expectations of what constitutes a quality experience, the greater the potential for conflict.

Factor II

Resource Specificity = the significance attached to using a specific recreation resource for a given recreation experience.

6. When a person who views the place's qualities as unequaled confronts behaviors indicating a lower evaluation, conflict results,

7. Conflict results when users with a possessive attitude towards the resource confront users perceived as disrupting traditional uses and behavioral norms.

8. Conflict occurs for high status users when they must interact with the lower status users who symbolize a devaluation of a heretofore exclusive, intimate relationship with the place.

Factor III

Mode Of Experience = the varying expectations of how the environment will be perceived.

9. When a person in the focused mode (specialist) interacts with a person in the unfocused mode (generalist) conflict results.

Factor IV

Tolerance For Lifestyle Diversity = the tendency to accept or reject lifestyles different from one's own.

IO.' If group differences are evaluated as undesirable or a potential threat to recreation goals, conflict results when members of the two groups confront one another.

Summary- Jacob and Schreyer offered these four conflict factors and ten propositions as a foresight for recognizing potential conflict in recreation. 'In failing to recognize the basic causes of conflict, inappropriate resolution techniques and management strategies are likely to be adopted. The traditional tendency to define conflict as confrontation between activities has left the sources of recreation conflict unrecognized far too long (Jacob and Schreyer 1980:378).'

LEVELS OF RECREATION CONFLICT

Conflict in outdoor recreation is generally characterized as confrontation between different activity groups, a user to user conflict over preferred and appropriate use of a resource area. Three characteristics are primarily responsible in influencing the degree of conflict between outdoor recreational activities (Bury and others 1983:401):

(1) The spatial or temporal proximity of the activities (i.e., crowding).

(2) The degree of environmental dominance inherent in each activity (i.e., consumptive vs nonconsumptive activities).

(3) The extent of participants' dependence on technological products (motorized vs nonmotorized equipment).

Crowding and exceeded carrying capacities are a logical source of conflict, as too many people commonly lead to goal inference for the recreationist. Concerning dominance over environment and dependence on technology, Bury and others 1983 have presented a conceptual model where recreational activities can be categorized as to conflict potential, based on these two factors (fig. 1). For example,

Dominance over environment	High	Strenuous hiking	Orienteering	Mountain climbing Downhill skiing			Cross country ORV-motorcycle scramble Power boat racing
			Cross-country skiing	Rapids running	Sailboat racing	Hang gliding	Snowmobiling Scuba diving
			Bow & arrow hunting	Fishing	Rifle hunting		Water skiing
			Canoe touring	Sailboat cruising	Tent camping with small motorcycle	RV Camping with small motorcycle	
			Rockhounding Walking	Backcountry camping hiking	Campground tent camping	Bicycle touring	RV Camping camping
	Low		Nature study		Nature photography		Driving for pleasure
		Dependence on technology					
							High

Source:
Bury et al.
1983

Figure 1. -A conceptual model of recreational conflict.

cross-country ORV-motorcycle scrambling ranks high on both environmental dominance and technology dependence, while nature study ranks low on both. The analysis of activities on these two factors and the placement of them on the grid can be instructive for identifying users with differing activity goals.

Conflict in outdoor recreation goes far beyond the user to user level, and it is important to analyze these levels, for conflict resolution occurs at each. Liile and Noe (1934) suggest there are four sources of recreation conflict, including visitors, managers, local officials, and local residents. These sources interact in multi-dimensional ways, leading Liile and Noe to propose an interactive model for conflict (fig. 2).

A brief example of the type of conflict that may occur at each of the nine levels will be offered:

1. Visitor to Visitor – Liile explanation is needed here, for this is the typical hiker vs ORV, canoe vs powerboat, skier vs snowmobile conflict. However, power equipment does not have to be the source of this type of conflict. Trout fishermen may be as odds with swimmers over proper use of a resource. In all cases, the two groups do not share the same values regarding the 'proper' use of the recreation resource, and this value conflict has been known to develop into more overt forms of conflict.

2. Visitor to Management-Visitors often cause impact and conflict upon both management and the resource. An obvious example is that of resource degradation, such as campsite impacts, littering, and inappropriate use of scarce resources (endangered species). Visitors often do not have the resource ethic knowledge to use resources wisely, and are therefore at conflict with management.

3. Visitor to Community-Recreation, particularly in the form of tourism, can become an "attractive nuisance" for nearby communities. The very attractiveness of the Great Smoky Mountains National Park and the birth of gateway cities such as Gatlinburg, Tennessee, means that nearby towns will suffer periodic problems with traffic flow, parking availability, littering, and other functions of crowds. In more rural areas, the influx of 'foreigners' are at conflict with the traditional lifestyles of 'locals.'

4. Management to Visitor-Visitors are not always the source of conflict: management often is the originating source. Restrictions on use is a common example here. Users may feel they have the right to use wilderness without obtaining a permit, or even if a given number of visitors are already using the resource. Management is charged with resource protection, yet recreationists want 'freedom of choice' when recreating and therefore balk at the idea of not being allowed to use all areas of a park or forest.

"Source" of Impact

"Recipient" of Impact

	Visitors	Park	Community
Visitors	1 Visitor - Visitor	2 Visitor - Park	3 Visitor - Community
Park	4 Park - Visitor	5 Park-Park	6 Park- Community
Community	7 Community - Visitor	8 Community - Park	9 Community - Community

Source: Little and Noe 1984

Figure 2. -Interaction model for various levels of recreation conflict.

5. Management to Management-Just as different visitor groups may have different sets of values regarding the proper use of the resource, so may management personnel from different backgrounds have different values and beliefs regarding the management of resources. Management of fire and insects in wilderness is an example, where some resource managers feel strongly that both fire and insects need to be managed on an ecosystem basis, even in wilderness zones. 'Stocking of fish' in wilderness lakes is another conflict issue among recreation-resource managers.

6. Management to Community – Management of recreation resources and use often conflicts with how local people from surrounding communities have traditionally used these areas. Newly formed parks that **prohibit** hunting, collecting of ginseng, picnicking on the roadside, and the use of short-cut roads are resented because local community residents have long considered these "territorial" rights. In these situations, management is interfering with the recreational goals of local residents as they have traditionally learned to use resource areas.

7. Community to Visitor- Many national parks, such as Great Smoky Mountains and Rocky Mountain, have gateway cities that detract from the **wildland** recreation experience of many visitors. The highly developed tourist economies and gaudy visual displays of these areas are in conflict with the nonurban experience that many visitors are seeking. Noise and visual impacts on the boundary of parks/ forest also detract from solitude expectations of visitors within the interior of some areas.

8. Community to Management-Special interest groups, community officials, and even influential community citizens can place pressures upon management of nearby resource areas that result in conflict. Community interests may force management of nearby recreation areas to allow community events that are considered inappropriate by management. Some examples are the annual raft race in the Chattahoochee River National Recreation Area and the National Kayak Competition on the Tellico River in the Cherokee National Forest. Conflict resolution is often necessary to arrive at an agreeable solution concerning these demands upon recreation management agencies.

9. Community to Community- Business interests within communities and among adjacent communities may be at odds in receiving concession contracts for recreational services. Competition among outfitters can be fierce and lead to recreational conflict, particularly when it comes to allocation allotments.

The purpose for discussing and illustrating the matrix of conflict level offered by Liile and Noe has been to emphasize that conflict in outdoor recreation is not simply a user to user confrontation over the spatial allocation of recreational activities. Conflict commonly occurs at each of these levels and it is important to recognize this potential. Only by being aware of the full spectrum of conflict potential can recreation managers aim to prevent conflict situations from reaching the costly political and legal arena of conflict resolution.

MANAGING RECREATIONAL CONFLICT WITHIN THE RECREATION OPPORTUNITY SPECTRUM

Now that we have considered some of the major causes of outdoor recreation conflict, and the many levels at which conflict can occur, it is time to consider a scheme for preventing and managing conflict.

The Recreation Opportunity Spectrum (ROS) is an organizing framework for setting recreation management objectives (Driver and others 1987). One of those objectives could be the reduction of outdoor recreation conflict. In this portion of the paper, recreation conflict will be analyzed in view of the ROS framework; it will be suggested that ROS should assist in conflict prevention and even resolution.

The ROS framework adopts the viewpoint that recreation resource managers produce recreation opportunities and that recreationists use these opportunities to produce recreation experiences and benefits for themselves (U.S. Department of Agriculture, Forest Service 1982). Within ROS, a recreation opportunity has three components: an **activity**, a resource setting, and a experiential component. Using these three components, a recreation opportunity is defined as the opportunity to participate in a desired recreation activity within a preferred type of setting to realize desired and expected experiences. For example, people participating in a variety of recreation activities of a chosen style (cross-country skiing **versus downhill**) in chosen settings (wilderness versus developed ski areas) will realize preferred and satisfied experiences (exercise, companionship, etc.). These opportunities for activities, settings, and experiences range across a spectrum from modern-urban to primitive (table 1).

Table 1.--Recreation opportunity spectrum¹

ROS class	Activities engaged in	With specific recreational settings	To realize certain experiences
Primitive (P)	Viewing outstanding scenery Enjoying unique and/or unusual environments Hiking Cross-country ski touring and snowshoeing Horseback riding Canoeing Sailing Other nonmotorized watercraft use Swimming Diving (skin or Scuba) Fishing Photography Camping	Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other area users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Motorized use within the area is not permitted.	Extremely high probability of experiencing considerable isolation from the sights and sounds of man. independence, closeness to nature, tranquility, and self-reliance through the application of woodsman skills in an environment that offers a high degree of challenge and risk.
Semiprimitive nonmotorized (SPNM)	Snowplay Hunting (big, small game, upland birds, and waterfowl) Nature study Acquiring general knowledge/ understanding Unguided hiking General Information	Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but are subtle. Motorized use is not permitted.	High, but not extremely high, probability of experiencing the above listed natural environment elements.
Semiprimitive motorized (SPM)	All of the activities mentioned in above classes plus the following: Motor-driven ice and snow craft ORV touring Power boating	Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but are subtle. Motorized use is permitted.	Moderate probability of experiencing the above listed natural environment elements, except that there is a high degree of interaction with the natural environment. Explicit opportunity is available to use motorized equipment while in the area.
Roaded natural, appearing (RNA)	All of the activities mentioned in above classes plus the following:	Area is characterized by predominantly natural-appearing environments with moderate evidences of the sights and	Above equal probability to experience affiliation with other user groups and for isolation from sights and sounds of man.

Table 1.--Recreation opportunity spectrum ¹ --Continued

ROS class	Activities engaged in	With specific recreational settings	To realize certain experiences
	<p>Picnicking Gathering forest products Auto touring Water skiing and other water sports Automobile camping Trailer camping Viewing interpretive signs Organization camping Lodges Power boating Resort-commercial public services Resort lodging</p>	<p>sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.</p>	<p>Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities associated with more primitive type of recreation are not very important. Practice and testing of outdoor skills might be important. Opportunities for both motorized and nonmotorized forms of recreation are possible</p>
Rural (R)	<p>All of the activities mentioned in above classes plus the following: Competitive games Ice skating Scooter-motorcycle use Bicycling Spectator sports Jogging Passive use of developed parks and open space Picnicking Outdoor concerts</p>	<p>Area is characterized by substantially modified natural environment. Resource modification and utilization practices are primarily to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of man are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate densities are provided for a way from developed sites. Facilities for intensified motorized use and parking are available.</p>	<p>Probability for experience affiliation with individuals and groups in prevalent as is the convenience of sites and opportunities. These factors are generally more important than the setting of the physical environment. Opportunities for wildland challenges, risk-taking, and testing of outdoor skills are generally unimportant except for specific activities like downhill skiing, for which challenge and risk-taking are important elements.</p>
Modern-urban (MU)	<p>All of the activities mentioned in above classes</p>	<p>Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are</p>	<p>Probability for experiencing affiliation with individuals and groups is prevalent, as is the convenience of sites and opportunities. Experiencing natural environments, having challenges and risks afforded by</p>

Table 1.--Recreation opportunity spectrum --Continued

ROS class	Activities engaged in	With specific recreational settings	To realize certain experiences
		<p>to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of man, onsite, are predominant. Large numbers of users can be expected, both onsite and in nearby areas. Facilities for highly intensified motor use and parking are available, with forms of mass transit often available to carry people throughout the site.</p>	<p>the natural environment, and the use of outdoor skills are relatively unimportant. Opportunities for competitive and spectator sports and for passive uses of highly man-influenced parks and open spaces are common.</p>

¹ The Recreation Opportunity Spectrum (ROS), with associated activity opportunities, recreational setting requirements, and experience opportunities that are highly probable for each spectrum class. This is a table of general descriptions of the three components of the spectrum classes. There might be specific activity exceptions to these general characteristics.

Source: USDA (1982).

When analyzing recreation conflict in light of ROS, it is obvious that the two concepts are related. Jacob and Schreyer's (1980) conceptualization of conflict, particularly the factors of **activity style**, resource specificity, and **model of experience**, correlate well with the three ROS components of **activity, resource setting, and experience**. In fact, most causal factors related to conflict can be discussed under the three broad components of activity, resource setting, and experience. The same thought processes and analyses that are required for classifying activities, resource settings, and experience outcomes under the ROS framework will serve to classify many of the causal factors of conflict that occur. Following is an analysis of how **some** factors underlying recreation conflict might be classified under the ROS system.

Activity

Type and Style-Certain types of recreational activities just are not compatible from a safety standpoint. Deer hunting and hiking, motorboating and swimming, and similar activities have to be zoned for the safety of visitors. Styles of camping, such as tent versus recreational vehicle camping, need to be separated due to noise and equipment requirements (Bond and Ovellette 1968; LaPage 1967a, 1967b). Tent campers resent the noise of RV compressors, while RV campers commonly resent the lifestyle of many young tent campers. Status and social class conflicts certainly fall into this class, as indicated by the work of West (1977). ROS is based on the principles of resource inventorying, mapping and area classification, and zoning to provide for a diversity of uses without undue user conflict.

Specialization -- Over the life-time of participation in an activity or due to the character of certain individuals, people tend to specialize in the way they recreate (Bryan 1977; Donnelly and others 1987; Roggenbuck and others 1980). Specialization occurs in terms of equipment, resource setting, commitment, style of participation, etc., and how one views the appropriateness of other users and the activii style selected. The specialization within fishing (from the **canepole** bluegill fisherman to the dry-fly trout fishermen) or within wilderness camping (weekend shelter user to the through hiker on the Appalachian Trail) is a common cause for conflict. ROS provides opportunities for the specialist, particularly toward the semi-primitive and primitive ends of the spectrum.

Mode of Travel -At issue here is the appropriateness of machines and motors in outdoor recreation environments. For some visitors, outdoor recreation is a means to escape the mechanized-urban world;

for others the machine is a means of escaping into the **unconfines** of the outdoors (Bury and others 1976; Jackson 1957). Many factors are at play behind judging the appropriateness of travel mode in outdoor recreation, including psychological motives for participation (Driver and Knopf 1976; Knopf **1983**), consumptive versus nonconsumptive attitudes (Knopf and Tyger **1973**), wilderness attitudes (**Hendee** and others **1971**), and the simple principle of effort extended (i.e., tired backpackers commonly resent the easy travel of horseback riders). While most mode-of-travel conflict starts out as asymmetrical (only one-way conflict) (Jackson and Wong **1982**), the conflict resolution process, if political or public, commonly evolves into a symmetrical relationship where both sides are at conflict. Using the ROS process to plan mode of travel activities can lead to the prevention of conflict, and the eventual confrontations characteristic of public conflict resolution processes.

Resource

Crowding-Crowding conflicts are both resource and experience based, but under our ROS classification are placed under resource, for crowding by definition deals with density, and density translates to numbers per unit area (Heberlein 1977). Visitor definitions of crowding vary by activity and resource setting, and their expectations and feelings as to what use levels are appropriate in what areas are instrumental in evaluating crowding as an interference to recreation satisfaction (**Hammitt** 1983). The ROS classifications from modern-urban to primitive take density and crowding into consideration, offering guidelines for level of interaction within each of the spectrum classifications.

Possessiveness and Affiliation With Resource—

People who have used a resource for many years (repeated users) and those who live adjacent to a resource (locals) commonly display a possessive attitude toward the resource. The visitor's affiliation with the resource is often very strong, to the point that 'it is their place by virtue of knowledge and familiarity (Lee 1972): The resource becomes a special, a unique place, not because of its physical **qualities**, but rather, due to memories, tradition, and familiarity of place (Jacob and Schreyer 1980; Tuan 1977). Because of this attachment with place, 'outsiders' are viewed as 'taking over the area' and have no right to do so (Driver and Bassett 1975). Such feelings cause conflict at several levels within the **Little** and Noe (1984) model. For example, possessive users resent outside users, feel they should have a major say in management of the area,

and even view the resource area as a community property. ROS is of little assistance in preventing this type of recreational conflict.

Resource Character – Many resource areas, and perhaps even settings, can be classified for their tolerance toward or capacity to handle conflict situations. As an example, river areas and in particular river rapids, are recreational environments prone to conflict. Rivers are restricted corridors that concentrate users, making it more difficult to classify the resource into a broad spectrum of **use** zones that can accommodate large numbers of users with varying activity styles, preferred resource settings, and desired experience outcomes. However, the ROS process does require that resources be inventoried and classified according to their recreation resource character. The ROS concept can also be applied at different levels of resource classification (i.e. million acre wilderness or a 30 mile stretch of river corridor). Once the resource is classified and zoned according to its character, management prescriptions can be developed to protect that character. Thus, ROS provides a scheme for recognizing and managing resource character, which should reduce conflict for users requiring different levels of resource character for their leisure activities.

Experience

User Behavior-The behaviors displayed by various individuals, groups, and types of users are a source of much recreation conflict. Outdoor recreation is a 'shared' phenomenon, often resulting in shared beliefs (norms) of how activities ought to be carried out in commonly perceived resource settings. For example, most dry-fly, brook trout fishermen have shared feelings and expectations as to how the activity should be conducted, and what behaviors are appropriate. Most activity groups have a set of appropriate behaviors that are shared. Thus, they are quick to recognize 'inappropriate' behaviors, and this is a major source of recreation conflict.

The social structure of groups often determines their shared beliefs concerning appropriate behavior. Teenage groups desiring a high degree of interaction, affiliation, and social oriented behavior are commonly at conflict with adult groups seeking a passive, isolated, and nature oriented experience. Yelling, loud radios, and littering are common associates of teenage recreation that are little appreciated by adult recreationists and resource managers. The **modern-urban** and rural end of the recreation opportunity spectrum allows for more socially oriented behaviors and experiences. Group and organizational camping fits this end of the spectrum, while remote camping is more suited to the primitive side of the spectrum.

Use Patterns-Size of group and mode of travel are two important use pattern issues that are a major source of conflict in **wildland** recreation. Wilderness backpackers find large groups of hikers and **horseback/trailbike** riders inappropriate in wilderness areas. They argue that these types of use in wilderness detract from the solitude and primitive experience that backpackers seek (Hendee and others 1978). Wilderness backpackers commonly desire size limits on group size and separate trails for hikers versus horse/bike riders. Group size and mode of travel are also conflict issues on wild and scenic rivers. ROS does not address these use pattern issues directly; it does indirectly through activity classification. For example, wilderness camping is placed at the primitive end of the ROS but no provision is made for small versus large groups or foot versus horse travel within the primitive category of the spectrum. However, the ROS concept can be applied at various levels, and perhaps adapted to deal with other issues than activity, resource setting, and experience. The concept of resource inventory, classification, and zoning so as to provide a diverse spectrum of recreational opportunities can be applied to trail management as well as broad scale land management.

Participation Motives- Because outdoor recreation is goal oriented (Le., to bag a deer, catch fish, find a peaceful, tranquil environment, develop outdoor skills, etc.), recreationists usually are motivated to participate in activity situations that offer a good possibility of fulfilling these goals (Driver and Tocher 1970). They anticipate the opening day of trout fishing season, have expectations for the experience, and are motivated often by very strong feelings when engaging in this annual event. However, the expectations and participation motives of canoeists, on the same river as the trout fishermen, are likely to be quite different from those of the fishermen. The method, behavioral actions, and intensity with which both groups are driven to fulfill their expected goals will likely vary. Thus, the goals and participation motives of each group of users may be at odds with each other, result in goal interference, and, recreation conflict.

The "experience" component at ROS is based on motivation theory and recreation motivation research (Driver and others 1987). ROS provides a means to classify, zone, and manage recreation lands in an attempt to provide opportunities where differing participation motives can be fulfilled. However, outdoor recreation behavior and motivation behavior are both complex, and it is impossible for ROS to eliminate motivation-caused recreation conflict. ROS does offer a process for analyzing recreational lands in a way that should reduce potential conflict situations.

SUMMARY AND CONCLUSIONS

This paper has attempted to review the broad and varied spectrum of conflict in outdoor recreation. There is a broad spectrum of psychological and social factors that serves to describe potential situations for conflict occurrence. There is also a spectrum of levels at which recreation conflict can occur, from the user to the surrounding community. And finally, there is the spectrum of recreation opportunity (ROS) framework that offers a means for planning and managing recreation lands so as to prevent potential recreation conflict situations from occurring. ROS is not a complete solution for managing outdoor recreation conflict, but the concept does address the major conditions necessary for conflict, social contact, and resource character.

Because outdoor recreation, and leisure in general, are important aspects of a quality life and are continuing to increase in popularity, the potential for recreation conflict is likely to increase. To this extent it is essential that the recreation planning and management process strives to understand the causes, situations, clientele, and prevention of recreation conflict. Being able to understand and identify conflict potential could be a valuable asset for the recreation planning/management process. It can serve to reduce the number of conflict situations that evolve into interest group battle grounds that eventually have to be resolved in political arenas.

This paper has not concentrated on the specific and complex issue of conflict resolution. More and more conflicts seem to be ending up in the legal courts for resolution. Special interest groups and institutions are heavily involved with the conflict resolution cause. The purpose of this paper has been to address the causes, levels, and management of outdoor recreation conflict before it reaches the stage of political and legal means of resolution. As stated by Jacob and Schreyer (1980:378), 'once recreationists have allied themselves with interest groups and causes, conflict resolution becomes a costly political and legal process over which the resource managers may have little control. Therefore it is imperative that the potential for conflict be recognized at a stage where preventative actions may be taken.'

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SOCIAL PSYCHOLOGICAL CARRYING CAPACITY

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Abstract-Social psychological carrying capacity is a management concept that incorporates both scientific and judgmental elements. It involves a wide range of variables that influence the quality of the outdoor recreation experience. Use of the concept has progressed from an initial concern with "finding the carrying capacity" to a new emphasis on identifying and maintaining the conditions that will produce the desired quality experiences.

INTRODUCTION

in 1964, Wagar defined carrying capacity as 'the level of recreational use an area can withstand while providing a sustained quality of recreation.' Implicit in this definition, as well as other writings of this time, was recognition of at least two components of carrying capacity: a quality environment and a quality recreational experience. Since that time, the concern for maintaining a quality recreation experience in the face of increasing numbers of visitors has generally been identified with the term, social psychological carrying capacity (or social carrying capacity). The concept has evolved considerably, however, over the years and social psychological carrying capacity has different connotations today than it did 20 to 25 years ago. A definition reflecting more current concepts and viewpoints identifies social psychological carrying capacity as the 'level of use beyond which experience parameters exceed acceptable levels specified by evaluative standards' (Shelby and Heberlein 1986).

The evolution of social psychological carrying capacity came about during a period of burgeoning recreational use of natural areas. Literally hundreds of studies have addressed various aspects of social carrying capacity in a wide variety of outdoor

recreation environments. A number of recent publications provide in depth summaries of this literature (Graefe and others 1984a, 1984b; Manning 1985; Shelby and Heberlein 1986; Stankey and Schreyer 1987). This paper will not repeat the detailed literature reviews provided in these previous articles. Instead, it will attempt to identify the dominant themes and trends evident in existing literature related to this topic. To accomplish this, the paper discusses four major principles that encompass the major findings and conclusions of research conducted to date.

PRINCIPLE 1

Social psychological carrying capacity involves a wide range of variables that may influence the quality of the outdoor recreation experience.

One of the major conclusions that can be derived from research related to social carrying capacity is that there is no single predictable response of visitors to varying use levels. Rather, visitors are affected by a series of interrelated impacts which result from recreational use of a given area (fig. 1). Recreational use leads most directly to tangible outcomes, like contacts between visitors and impacts on the natural environment. These social and environmental impacts, in turn, can lead to a variety of perceptual and behavioral responses by visitors.

It is useful to view the various items shown in figure 1 as potential types of impact to the experience and to recognize that several sequential levels of impacts may occur. First order impacts (contacts between users and resource impacts) may contribute to any combination of impacts within the next level (i.e. perceived crowding, dissatisfaction, perceived resource impacts, and conflicts between users.) But not all of these impacts will necessarily occur in all situations. When they do occur, the various impacts may tend to reinforce each other. For example, a person may feel more crowded if he/she perceives the environment to be degraded or if he/she experi-

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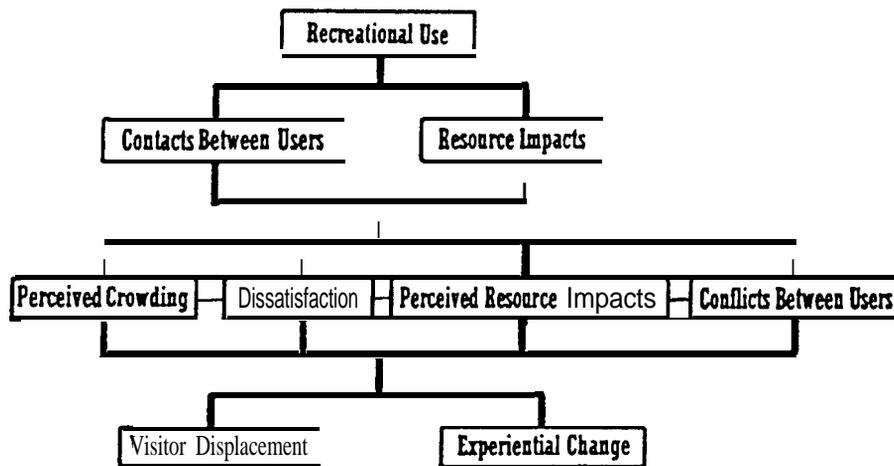


Figure 1. – Social impacts of increasing recreational use.

encesconflicts with other visitors (Stankey and Schreyer 1987). On the other hand, some forms of impact may act to offset or cancel out other impacts. The perception of crowding may be reduced, for example, if a person responds by moving to a different environment (displacement) or by changing his or her perceptions of the experience (experiential change).

Since social psychological carrying capacity ultimately is concerned with the quality of the recreation experience, it must incorporate consideration of all of these potential impacts to the experience. A common shortcoming of most previous carrying capacity studies is that they have typically considered only a subset of these indicators and thus have provided an incomplete picture of what is happening in a given situation.

PRINCIPLE 2

Social psychological carrying capacity is a management concept or framework, not a scientific theory.

There is, generally, consensus in the literature that carrying capacity is most appropriately viewed as a management concept or tool, a means toward the end of providing a certain type of quality experience. The initial concern with 'finding the carrying capacity' is gradually being replaced with an emphasis on identifying and maintaining the conditions that will produce the desired quality experiences. For example, current management frameworks like the Limits of Acceptable Change (Stankey and others 1985) and Visitor Impact Management (Graefe and others 1987) address the concerns that originated in the carrying capacity concept, yet barely mention the term 'carrying capacity.'

Carrying capacity management frameworks recognize that the implementation of social psychological carrying capacities requires value judgments as well as scientific information. Virtually everything written about carrying capacity in recent years has recognized that it is not simply a matter of research. Carrying capacities cannot be determined in the absence of value judgments that specify the type of experience a given area is attempting to provide.

In spite of widespread recognition of the necessary role of value judgments, the task of incorporating judgments into the decision making process has remained difficult. Fortunately, several recent publications have addressed this issue. Shelby and Heberlein (1986) provide a useful framework that clearly delineates the scientific and judgmental components of carrying capacity. Their framework includes a descriptive component, which is concerned with documenting relationships between use-related variables and their corresponding impacts, and an evaluative component that incorporates value judgments about the desirability of various use impacts. The descriptive component is further broken down into two important types of variables: management parameters (e.g., use level) and impact parameters (e.g., crowding and the other types of impacts shown in fig. 1). The evaluative component identifies the types of information that can be used in selecting the appropriate levels of relevant impact parameters (for example, for deciding how much crowding is too much).

While many authors (e.g., Hendee and others 1978) have stressed the importance of developing management objectives that clearly specified the type of experience to be provided, managers often seem reluctant to write such objectives. In response,

current visitor management frameworks, such as the Limits of Acceptable Change and Visitor Impact Management, include explicit steps that isolate the evaluative aspects of the capacity question. Both of these frameworks feature a step-by-step process for identifying unacceptable conditions, probable causes of these conditions, and alternative management solutions. Some of the preliminary steps in these processes require selecting indicators and corresponding standards to identify the conditions that are judged to be acceptable in a given situation. These steps are designed to provide a mechanism to assist in incorporating necessary value judgments into the visitor management process.

PRINCIPLE 3

Relationships between visitor use levels and impacts to the experience are complex and mediated by a variety of background and situational factors.

Shelby and Heberlein (1986) suggest that determining social carrying capacities requires knowing the relationship between use levels (and other management parameters) and relevant impact parameters. This is true because it is not possible to manage for a specified level of impact without understanding how the impact parameters are affected by visitor use.

Research indicates that the relationships between use and the quality of the visitor experience are not as simple as the original carrying capacity concept implied. Impacts to the outdoor recreation experience are, by definition, a consequence of recreational use. But the strength and nature of the relationship with use intensity varies widely for different types of impacts, and under differing circumstances, for a given type of impact. Numerous studies have challenged the fundamental hypothesis underlying social psychological carrying capacity, namely that increased visitor density would reduce the quality of the recreation experience. Instead, studies have shown that the amount of use affects the quality of the experience differently for different people. It appears that use level influences the experience primarily through a series of mediating variables and in combination with other factors.

One of the most important factors affecting use/impact relationships is the inherent variation in tolerance among individuals and user groups. Put simply, all people do not respond the same way to encounters with other visitors. The importance of solitude varies for participants in different activities and depends on many different background character-

istics, such as previous experience, motivations and attitudes (Graefe and others 1984a; Stankey and McCool 1984; Wagar 1964). Manning (1985) suggests, for example, that prior experience affects crowding perceptions and norms either through refinement of tastes or by virtue of exposure to lower density conditions during earlier participation.

The response of recreationists to contacts with others also depends on the characteristics and behaviors of those encountered. A given individual may be quite tolerant of contacts with one type of user (e.g., hikers) and very intolerant of contacts with another user type (e.g., off road vehicles). The extent to which one type of use impacts another depends upon the norms visitors use to evaluate the appropriateness of specific behaviors they encounter. Method of travel and group size are the most visible cues for determining the extent of perceived similarity between different user types.

Visitor evaluations of their recreation experiences are also influenced by environmental and situational factors. In other words, the response of a given individual to a particular type of contact may also depend on the time and location of the contact. For example, encounters at a trail head or on a trail are typically viewed more favorably by visitors than encounters with similar numbers of people within sight or sound of one's campsite (Hendee and others 1978; Stankey 1973).

In sum, the relationships between use levels and various impacts to the experience are neither simple nor uniform. Yet these relationships are the basic building blocks for social psychological carrying capacity.

PRINCIPLE 4

For any given area, there is no inherent single carrying capacity; rather these will be a range of capacities corresponding to various objectives for the area.

It is clear from the foregoing discussion that carrying capacity is a relative concept. The answer to the question, "what is the carrying capacity" of a given area, should never be an unqualified single number. The answer should always be, "it depends." It depends on evaluative considerations; what are the objectives and the corresponding impact standards for the area in question? It also depends on scientific information: what is the nature of the relationship between use and the relevant impact indicators? Finally, it depends on activity and site-

specific issues; what type of use and what particular times and places are under consideration?

This does not mean that it is impossible to determine social psychological carrying capacities. It does imply that it is important to consider carrying capacity in very specific terms. It also implies that, in cases where there is no relationship between the number of visitors and the relevant impact indicator(s), the question of capacity is not applicable because the problem is not associated with use level. In other cases where use/impact relationships are weak or indirect, as has been found in many studies, other management strategies, focused specifically on factors that are contributing to the problem conditions, may be more effective than attempting to determine carrying capacities.

A common theme in the literature suggests that carrying capacity should be approached from a systematic perspective that considers each recreational area as part of a larger system of areas. A range of carrying capacities is an important element of such a systematic approach to recreation management. Providing a diversity of opportunities to meet the wide diversity of tastes among outdoor recreationists should be a goal of recreation management now and in the future (Stankey and Manning 1986).

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MAKING BARRIERS MANAGEABLE: A CALL FOR THE USE OF PARADIGMS IN BARRIERS RESEARCH

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Abstract- The central premise on which this paper is based is that the topic of recreational barriers, as currently pursued in the professional literature, is unmanageably broad. It is argued that significant progress cannot be made in developing an understanding of that topic until paradigms are established to facilitate theory development and guide research. Examples are provided of how the barriers topic might be addressed within four emerging paradigms: Neulinger's 'Paradigm of Leisure,' the arousal seeking theory of play, "Leisure Diagnostic Battery paradigm, and the flow mode. Common themes across these models are also explored and some future directions for inquiry on the topic of recreational barriers are suggested.

INTRODUCTION

Perhaps one of the most intuitively obvious directions for research in recreation and leisure is that of barriers to recreation participation. The barriers issue is as relevant to park managers as it is to therapeutic recreation personnel who work in treatment facilities. In park settings, managers are challenged not only to identify obstacles which preclude participation by their 'latent demand' markets (Howard and Crompton 1980) but also to facilitate the alleviation of barriers which limit the frequency, duration, and style of participation of current users. In treatment centers, recreation therapists must identify and alleviate personal and environmental factors which constrain both recreation participation and the rehabilitation process of individuals who have suffered injuries and disabilities.

Despite the ubiquity of the problem, only a limited number of studies have been conducted in which

the authors specifically identified barriers as the central topic under investigation (Boothby and others 1981; Ellis and Witt 1986; Francken and Van Raaij 1981; Henderson and others 1988; Jackson 1988; McGuire 1984; Searle and Jackson 1985a; Searle and Jackson 1985b; Wii and Goodale 1981; Witt and Goodale 1985). Typically in these studies a list of potential barriers is linked to some external predictor or criterion. Witt and Goodale (1981), for example, examined variation in such barriers as time, money, knowledge of use of available resources, and family obligations across family life stage. Jackson (1988) studied a similar list of barriers as they relate to nine different categories of leisure activities.

In their review of literature related to barriers to recreation participation for the Presidents' Commission on Americans Outdoors (PCAO), Ellis and Rademacher (1986) noted that, although research involving lists of barriers is very limited, "... the topic of barriers to recreation and leisure is virtually as broad as the field itself.' In fact, if a barrier is defined as 'any factor which precludes or limits an individual's frequency, duration, or quality of participation in recreation activities,' (Ellis and Rademacher 1986) any study in which recreation participation serves as a dependent variable can be thought of as a study of a potential barrier. User density, for example, becomes a barrier when density levels become so great that the individual perceives the setting as being crowded. The absence of density levels, which create perceived crowding, on the other hand, may be thought of as a **facilitator** of recreation participation (Barefoot and others 1981; Manning and Ciali 1980; Shelby 1981; Shelby and others 1988).

The potential scope of the barriers topic, therefore, is enormous. Wade (1985) has edited an entire book on the topic and, in the PCAO review, Ellis and Rademacher (1986) identified major categories of potential personal and environmental barriers. Table 1 includes a summary of these categories, along with representative barriers within each.

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Table 1.--Some major categories of barriers of leisure

Category	Examples
<u>Personal</u>	
Optimal barriers to arousal	Illness: disability; lack of homeostasis
Physical adaptation	Fitness: stress
Biological rhythms	Ciradian and diurnal rhythms
Perception of competence and control	Depicted failures; self degenerative attributions; lack of perceived contingency between behaviors and outcomes
Intrinsic motivation	Overjustification via extrinsic rewards; lack of curiosity
Awareness of opportunities and resources	Knowledge of leisure; inappropriate information provided
Roles and norms	Inappropriate role models; lack of resources to use leisure to affirm identity
Social skills	Poor interpersonal skills
<u>Environmental</u>	
Quality of available resources	Lack of Opportunity for novelty, complexity, dissonance Poor aesthetic quality e.g., crowding, noise, litter, absence of opportunity for tranquility
Quality of interpersonal environment	Overdirectiveness of significant others: user density and perceived crowding; inappropriate social groups; lack of friends with similar interests
Availability of resources	Lack of time; lack of sufficient money; distance; fear

Given the scope of the barriers issues, leisure researchers are faced with an incredibly challenging task. How does one gain insight into the nature of barriers and their relationship to recreation participation when the topic is unmanageably broad? As a first step in addressing this question, it is useful to note that the problem of narrowing one's focus is not at all unique to researchers who are interested in the barriers issue. In fact, the problem of establishing focus is common to science itself (Kuhn 1970). Faced with the challenge of understanding the nature and motion of subatomic particles, biological processes, and the infinite and perplexing array of human behavior, scientists adopt 'paradigms' to develop understandings and insights. Paradigms consist of theoretical and conceptual propositions about the nature of the phenomenon under investigation. These propositions enable scientists to focus on the most relevant variables within the paradigm, and to ignore the myriad additional variables which are not targeted by the paradigm as being relevant to understanding the phenomenon.

It seems reasonable to assume that the problem of narrowing the scope of the barriers issues can be effectively addressed through the use of paradigms. Rather than continuing to study arbitrary lists of potential barriers which intuitively make sense, the use of paradigms can provide direction and focus for barriers research. Mannell (1986) and Wii and Ellis (1985) showed how the use of paradigms has partially resolved problems of definition and meanings of such key terms as play, recreation, and leisure, thereby permitting operationalization of key variables and, ultimately, scientific growth in recreation and leisure. This paper will consider some major recreation and leisure paradigms, and propose some major barriers which may be prominent within those paradigms. Four major paradigms will be considered: Neulinger's (1981) paradigm of leisure, the arousal seeking theory of play (Ellis 1973), the Leisure Diagnostic Battery paradigm (Ellis and Witt 1986), and the flow model (Csikszentmihalyi 1975).

BARRIERS WITHIN NEULINGER'S PARADIGM OF LEISURE

Neulinger's (1981) paradigm of leisure is an attempt to categorize the conditions which produce leisure and nonleisure states of mind. According to the paradigm, two variables determine an individual's experiential state at a given point in time: perceived freedom and motivation. Neulinger points out that perceived freedom is the 'one and only' essential criterion for leisure experiences to occur (Neulinger 1981). Individuals experience leisure when they perceive their involvement in an activity to be freely chosen. Individuals who are involved in an activity due to necessity or 'perceived constraint,' on the other hand, are not experiencing leisure.

Neulinger's (1981) paradigm, however, also proposes the existence of different types of leisure and nonleisure experiences. These experiences include all possible combinations of experiences of 'leisure,' 'work,' and 'job.' The specific type of leisure or nonleisure experience in which an individual is involved is determined by the particular combination of perceived freedom and the type of motivation the individual has for being involved in the activity. Three types of motivation are of concern: intrinsic motivation, extrinsic motivation, and a combination of intrinsic and extrinsic motivation.

Different leisure and nonleisure states are associated with each combination of the levels of the perceived freedom and motivation variables. If, for

example, an individual is under the condition of intrinsic motivation and perceived freedom, his or her experiential state will be best described by a condition of 'pure leisure.' If motivation is extrinsic but perceived freedom is present an experiential condition of 'leisure-job' will be present. Nonleisure conditions are also explained by the model. 'Pure work' exists when motivation is intrinsic and a "perceived constraint" exists. Neulinger's (1981) diagram which succinctly summarizes the paradigm is presented in figure 1.

With this brief introduction to Neulinger's (1981) paradigm, we may now turn to the issue of barriers. The paradigm clearly targets the "perceived freedom/perceived constraint" variable as the key determinant of whether or not a condition of leisure is being experienced. Barriers are any factors which are causally linked to that variable.

Identification of these barriers must begin with an explicit definition of the perceived freedom/perceived constraint continuum. Neulinger (1981) is particularly explicit about the meaning of perceived freedom. He points out that perceived freedom to be "... a state in which the person feels that what he/she is doing is done by choice and because one wants to do it' (p. 15). The meaning of this term is also held to be intuitively obvious: 'no philosophical definition of freedom is required (since) everyone knows the difference between doing something because one has to and doing something because one wants to' (p. 15).

Freedom					
Perceived Freedom			Perceived Constraint		
Motivation			Motivation		
Intrinsic	Intrinsic and Extrinsic	Extrinsic	Intrinsic	Intrinsic and Extrinsic	Extrinsic
(1)	(2)	(3)	(4)	(5)	(6)
Pure Leisure	Leisure-Work	Leisure-Job	Pure Work	Work-Job	Pure Job
Leisure			Non-Leisure		

..... State of Mind

Figure 1.—A paradigm of leisure.

Perceived constraint, therefore, can be thought of as a perception that one is doing an activity "because one **has to**' rather than *because one **wants to.**' Barriers, within Neulinger's (1981) paradigm of leisure, are factors which promote this sense of obligation.

Identification of major barriers, therefore, requires the identification of the major sources of individuals' perceptions of obligations. To a great extent, it seems that such perceptions would stem from the presence of overbearing conditions and overdirective'significant others" (Bishop and Jeanrenaud 1985). For children, major sources of overdirectiveness might include parents, teachers, older siblings, domineering peers, and recreation leaders who do not appreciate the need of the individual for independence. Potential sources of overdirectiveness for adults would include perceived obligations from work (Sprietzer and Snyder 1987) church and civic organizations, and demands and expectations from spouses, children, and members of friendship groups. In a park setting, overdirectiveness might be experienced by visitors who encounter interpreters and rangers who seek more to obtain conformity with rules than to help people learn to understand and respect rules. The emerging practice of rangers wearing firearms may even create a stronger sense of obligation among visitors. For ill and disabled individuals in institutions a major source of overdirectiveness would be the medical and rehabilitative staff of the institution (Langer 1988).

Other factors may also create a sense of obligation. The fitness fad in popular culture, for example, makes us feel obligated to maintain an active lifestyle and to pursue fitness and appropriate nutrition. We may feel obligated to get in our 20 minutes of exercise each day rather than read a favorite book or watch a favorite television show. Cultural pressures for upward mobility occupationally and "keeping up with the Jones family' may lead us to feel obligated to spend nights working rather than in freely chosen activities which produce leisure experiences.

Within Neulinger's (1981) paradigm, therefore, both cultural and interpersonal forces may be the most important direction for barriers research. Additionally, it is possible within Neulinger's paradigm to identify barriers which discriminate among the type of leisure experiences, i.e., pure leisure, **leisure-work**, and **leisure-job**. The identification of these barriers would begin with an analysis of the intrinsic motivation and extrinsic motivation concepts (which Neulinger considers to be separate and orthogonal). With knowledge of the conditions under which intrinsic motivation and extrinsic motivation apply, along with

knowledge of sources of perceived obligation, one could effectively specify the nature of the experience of individuals in particular sets of circumstances. The Neulinger (1981) paradigm clearly offers the **potential** to provide focus on the enormously broad topic of barriers.

BARRIERS WITHIN THE LEISURE DIAGNOSTIC BATTERY PARADIGM

Another conceptual model which proposes that a condition of freedom is at the heart of leisure is the Leisure Diagnostic Battery (LDB) paradigm (Ellis and Wiii 1984, 1986). Although both the LDB and Neulinger's paradigm focus on freedom, fundamental differences exist between the two. Rather than focusing on the nature of individuals' experiences in particular sets of circumstances, the LDB addresses relatively stable beliefs people hold about themselves, with regard to their perceived degree of ability to determine the initiation, process, and outcome of leisure experiences. An individual who believes that he or she is able to freely choose and participate in activities in such a manner that positive feelings of self determination and competence are produced is assumed to have a high degree of perceived freedom in leisure. Individuals who do not feel capable of making such choices and who expect to have unsuccessful and unrewarding experiences, on the other hand, are assumed to have low degrees of perceived freedom in leisure.

Attribution theory has been used to explain how this sense of perceived freedom is established, changed, or maintained (Weiner and others 1971). Of concern are the attributions people make to their own competence or incompetence following successful and unsuccessful recreation engagements. An individual's perceived freedom is enhanced when he or she attributes successes to his or her personal competence (skill, ability, wisdom, creativity, etc.) and failures to such unstable or uncontrollable factors as fate, bad luck, fatigue, or lack of effort. The opposite attributional pattern is considered to be a **'self-degenerative'** attribution pattern and is assumed to undermine individuals' perceived freedom in leisure (Ellis and Witt 1986). This self-degenerative pattern has been linked to depression and associated dysfunctional behaviors (Ellis and Niles 1985; Ellis and Witt 1986; **Iso-Ahola** 1980).

The question of barriers within the LDB paradigm has been approached conceptually as well as empirically. From a conceptual standpoint, the attributional explanation targets as major barriers those factors which lead individuals to the utilization

of a self-degenerative attribution pattern. An example would be an inability to find indicators of success within engagements which overtly seem to be failures. The fly fisherman who hiked 10 miles to a remote lake only to find the fish uncooperative could find indicators of competence in his or her casting technique or ability to match the aquatic insects with artificial flies. Attributions of such successes to personal competence and the overall failure to catch fish to, say, the changing weather or water temperature, would serve to protect the fisherman's sense of perceived freedom. An attribution in the order of 'I'm not a good fisherman,' on the other hand, would be dysfunctional. If such an attribution were the fisherman's typical response to an unsuccessful engagement, a barrier to perceived freedom would exist.

Similar to Neulinger's (1981) paradigm, **overdirective** significant others may be a prominent force in establishing these self-degenerative attributional patterns. Of particular concern would be the significant other who provided feedback which either supported the self-degenerative attribution pattern or was not contingent upon the individual's performance. The lack of contingency between the individual's behavior and the outcome does not permit a sense of self determination and, if noncontingent responses become the norm, a sense of helpless depression can result (Miller and others 1985). People need a chance to succeed as well as to fail. Within the LDB paradigm, barriers exist when an individual is unable to recognize successes as being a result of his or her competencies.

Barriers within the LDB paradigm have also been addressed empirically. The presence of personal and environmental behaviors such as lack of time, money, transportation, and appropriate social group would seem to limit an individual's repertoire of potential recreation activity choices. As discussed in the introduction to this paper, however, the number of barriers which could be problematic is endless. Ellis (1983) conducted a study which was designed to work toward a parsimonious grouping of barriers which would distinguish between people who were high and low in perceived freedom. In that study, groups of individuals at various levels of perceived freedom responded to a series of questions representing 24 barriers to their recreation participation. Two discriminant functions explained the significant variation between the groups. The first of these was comprised of such items as "there are enough places nearby where I can go play; 'it is easy for me to find fun things to do,' and there is a park near me where I can play if I want to.' That function was named "Availability of Resources.' Items such as "I have a lot of friends to do things with," 'I can easily talk in a

group," and 'other children usually let me play with them' produced high correlations with the second discriminant function. Each of these items included an interpersonal theme, leading to a name of 'gregariousness/sociability barriers" for the second function. This study provides an example of an empirical approach to the problem of identifying manageable groups of barriers within a particular paradigm.

BARRIERS WITHIN THE AROUSAL SEEKING PARADIGM

The arousal seeking theory of play paradigm is based on the theoretical position that humans, as animals, seek information loads which foster an "ideal physiological and affective condition of activities' (Ellis 1973). This optimal condition is in effect a reflection of the ebb and flow of personal and environmental elements of arousal. Arousal has been described as an enhancement of a primal investigatory reflex known as the orienting reflex (Pavlov 1927). In man, the orienting reflex serves much the same role as in other animals; readying the organism for some appropriate action (Berlyne 1960). Arousal then, manifests itself as a complex and integrative process of selective attention and information processing which has a specific tie to the immediate environment. Environmental attributes such as novelty, complexity, and dissonance (Berlyne 1960) impact the relative degree of activation which is experienced by a person at a given time. Although the environment plays a significant role in arousal seeking behavior it is important to understand arousal as phenomena with strikingly individual characteristics.

The arousal process originates in two areas of the brain-the cerebral cortex and the reticular activating system (RAS) (Ellis 1973). The RAS is a gatekeeper of stimuli, letting input flow to the cortex where it is then processed resulting in a regulation of the PAS. The cyclical form of arousal is referred to as cortical arousal-focusing on attention, alertness, vigilance, and information processing (Zillman 1982). The ability of an organism to maintain arousal at an optimal level allows that organism to function more efficiently within an environment. Sensoristaxis (Schultz 1965) is the term used to describe the level of arousal which is considered to be optimal for an organism. The complexity and individuality of **sensoristaxis** in humans is compounded by the recognition that arousal can be produced through levels of thinking-cognitive activity (Stephenson 1967; Berlyne 1960). Zuckerman (1983) explains the complex biological makeup of sensation seeking as involving neural chemicals, gonadal hormones, genetic relation-

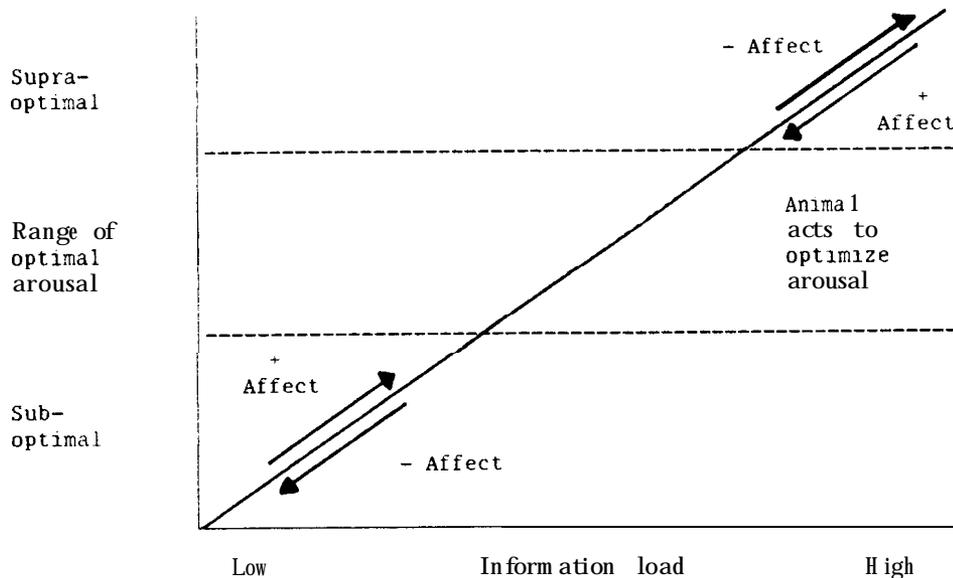


Figure 2. -Model of arousal theory and play.

ships and the involvement of the limbic system. (arousal) is described as a complex, possibly inherited, certainly individualized phenomenon (Ellis and Rademacher 1986). Ellis' (1973) theory of play as arousal regulating behavior presents a conceptual backdrop which posits that there exists in man a need for arousal, and that the drive toward optimal arousal may be utilized to explain behavior and leisure experiences. The conceptual model of arousal-seeking behavior is presented in figure 2.

The position that arousal seeking behavior may account for play behavior and other leisure experiences holds several assumptions:

1. Individuals have a need for optimal arousal.
2. The movement of an individual toward optimal arousal is pleasant.
3. Individuals learn to associate feelings of arousal with behavior.
4. Stimuli vary in their capacity to arouse.
5. The drive toward optimal arousal forces the changing of behavior, and the continued engagement with stimuli, which is arousing.
6. Arousing stimuli are forms of information which provide some involvement with novelty, complexity, and/or dissonance.

These assumptions present a picture of the arousal phenomenon as being innately driven yet

strongly dependent on environmental conditions/ situations. In addition, there is a suggestion that arousal seeking behavior may be learned and manipulated by higher organisms- particularly man.

The proposition that individuals pursue behavior that either avoids or integrates arousing stimuli, with the primary purpose being movement toward optimal arousal, suggests that some aspects of the arousal phenomenon may be manipulated while others cannot. Barriers to recreation participation, as viewed from the 'optimal arousal as play' paradigm, are a function of the complex arousal potentiality of the human organism and the relationship of that organism with stimuli of a given environment.

Physiological Attributes as Barriers to Recreation Participation

Within the confines of the arousal paradigm, recreation participation, "is behavior which is motivated by the need to elevate the level of arousal toward the optimal' (Ellis 1973). Any factor which significantly affects the arousal potentiality of an individual may be interpreted as being a barrier to recreation participation.

It is important to underscore the idea that arousal, and the barriers to arousal, are integrative and dynamic in nature. As such, the physical potentiality of an individual plays a significant role in the functioning of an organism as it pertains to arousal seeking behavior and so recreation participation. The dynamic quality of arousal seeking is illustrated in the interplay between sensoristasis and homeostasis (Wade 1985).

Homeostasis (Cannon 1932) is the regulation of biological processes directly tied to physical activity. Regulation of activity is linked to individual biological limitations (e.g., heart rate, temperature, oxygen consumption, etc.), which form a physiological 'window' within which optimal arousal seeking behavior must function. In essence, the relationship between homeostasis and sensoristasis may be viewed as counterbalancing and mutually inclusive in determining the range of behavior which may fall into the category of recreation participation. In this sense, an individual's physiological health, level of conditioning, biological predispositions, and neurological functioning affect one's homeostatic balance, and so may be considered barriers to participation.

Although resource managers may have little influence as to the range of arousal seeking behavior that an individual brings into a recreation setting, it is important to understand three important concepts which originate in the discussion of physiological attributes. First, there is likely to be a broad spectrum of physiological potential inherent in any individual or group of resource users. Second, the concept of resource use is integrally tied to a complex sensing and interpretation of the resource environment as forms of information which are for all intents and purposes arousal stimuli (Kaplan and Kaplan 1982). Finally, individual recreation/leisure behavior is part of a dynamic, and in some respects a self generating process with roots in the learned movement toward the satiation of optimal arousal needs. The importance of these concepts to modern land management theory and practice is in the recognition that the manipulation of recreation resources, or lack of manipulation, is a key component in availability/limitation of information, and so arousal potential.

Environment Attributes as Barriers to Recreation Participation

Attributes of the environment provide and enhance stimuli for an organism. The arousal paradigm views information when novel, complex, or dissonant as the primary source of stimuli for an organism. The ability to manipulate information, in all its forms, is how Ellis (1973) described the role of play in moving an organism toward optimal arousal.

Paramount in understanding the role environmental attributes play in clarifying the barrier issue is the awareness that the "environment", which the arousal paradigm speaks to, is understood as diverse and not limited to the typical land area classification. Environment also refers to one's psychological/cognitive frame of reference in a given situation or setting. Working from this perspective, the environment may become a barrier to recreation participation if the information present provides a level of novelty, complexity, or dissonance which is unsuitable for physical or cognitive stimulation of the organism. In this sense, some environmental conditions, although managed with good intentions, fail in moving an individual or groups of individuals toward the preferred level of optimal arousal. In some cases environmental conditions may actually deter optimal arousal.

Land managers who are involved in decision making based on the concept of optimal arousal become manipulators of information which may or may not act as stimuli to recreation land users. The importance in viewing land management as information manipulation has been addressed from slightly different perspectives. The Recreation Opportunity Spectrum (ROS) (Clark and Stankey 1979) was developed as a means of varying available experience across a particular setting or groups of settings. Essentially the ROS may also have preserved a high degree of novelty, complexity, and dissonance in those same settings. Similarly, environmental interpretation strives to enhance user arousal/attention by building psychological/cognitive novelty, complexity, and/or dissonance into public relations, resource management, education, or law enforcement based materials (Sharpe 1982).

Understanding that managing the environment is integral in building and tearing down barriers to recreation participation means managers must weigh the inherent and produced stimuli of the environment within their charge and make decisions accordingly. The optimal arousal paradigm, although seeming to add direction to land management decisions, certainly expands management responsibility. By projecting the impact of barriers beyond the scope of the physical environment there is an added incentive for managers to understand the impact of psychological/cognitive environmental factors.

BARRIERS TO PEAK EXPERIENCES: THE FLOW MODEL

The flow paradigm sprang out of a study of enjoyable experiences which took place in both work and leisure settings (Csikszentmihalyi 1975). Flow is based on the experiential state described by Mihalyi Csikszentmihalyi (1975) as a singular construct with the following experiential characteristics:

1. A merging of action and awareness;
2. A centering/intense focusing of attention;
3. Loss of self consciousness/ego awareness;
4. Perception of great power and control;
5. Clear demands for action and unambiguous feedback;
6. The absence of a need for external rewards – autotelic activity.

The flow state is often described as a peak experience which represents a matching of participant skills with the challenge at hand. The flow model (fig. 3) illustrates the relationship between skills and challenges. Within the confines of the paradigm, mismatched-skills challenges produce the experiential states of boredom and anxiety.

Perhaps the most important aspect of the "flow" paradigm is the concept of peak experiences within recreation activities. The presence of peak experiences in recreation and leisure activities/setting certainly speaks to the issue of recreation participation possibly being tied to a developmental process. Peak experiences in other life situations are often viewed as developmental in their benefit (Damon 1963; Horney 1950; Maslow 1962). So, the "flow" paradigm is an assumption that peak experiences, composed of the six flow characteristics previously mentioned, are encountered during participation in recreation activities. As this occurs, the flow experience becomes one of positive affect and so the experience is viewed as enjoyable. Barriers to recreation participation within the "flow" paradigm would limit the ability or opportunity of an individual to experience "flow" in a particular setting or situation.

Several undiscussed elements of this paradigm may prove to be barriers to recreation participation within the "flow" paradigm. These issues may be addressed as barriers tied to skill development and barriers linked to challenges within a particular situation/setting.

The barrier issues that relate directly to skills of a recreation participant are issues of depth in a particular skill and the development of a large recreation skill repertoire. Both the depth and breadth

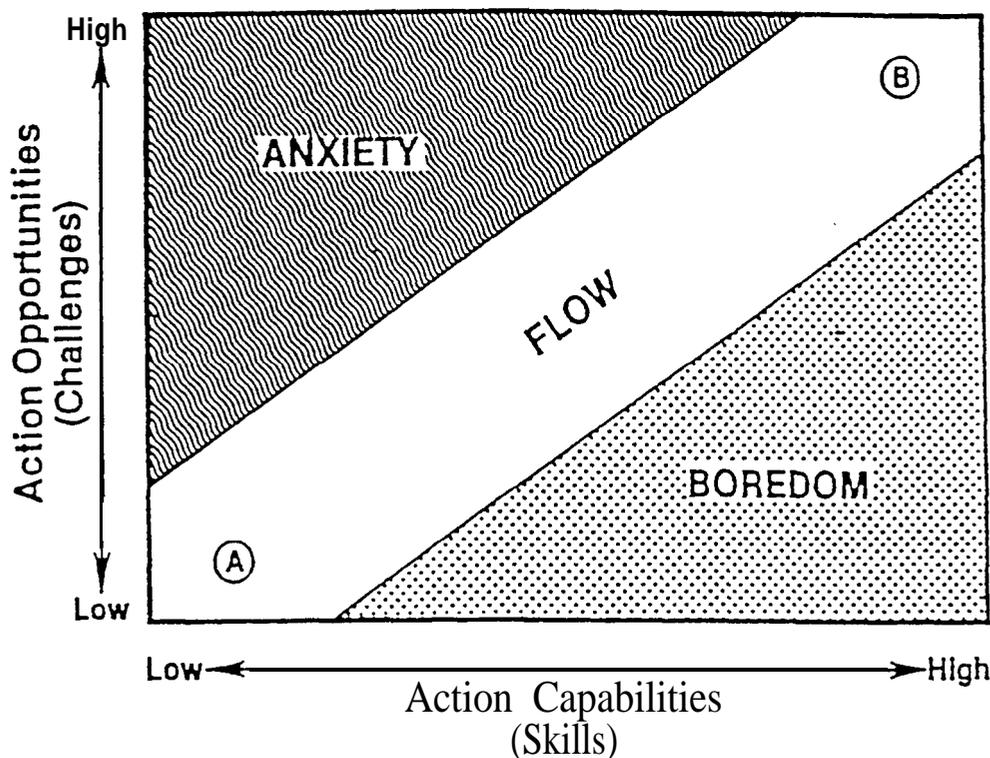


Figure 3. -Model of the flow experience.

of skill development become barriers to recreation participation within the flow paradigm due to the fact that differing skill components require a matching of differing challenge components in the flow model. This raises questions of how the experience of flow varies within and across enjoyable experiences. Is the flow experience transferable across similar activities?

The specific nature of the flow experience is not clearly understood in regard to these questions. Barriers to recreation participation based on the "skill" side of the flow paradigm may include both actual skill limitations as well as perceived limitations. Perceived skill is an important limiting factor to take into account as potential recreators are inundated with information and queries as to how to conduct leisure experiences. The plurality of leisure opportunities in modern times certainly may be viewed as a psychological constraint in activity selection, and so skill development. A prime example of this phenomenon is the white water rafter who can only have a leisure experience while consuming alcohol because that is how he has come to understand rafting from prior experiences with media, other rafters, etc.

Barriers to recreation participation based on the challenge of specific settings become issues of access/opportunity and conflict between competing skills in a particular setting. Setting management, as a function of flow management, is a very salient feature of **wildland** management. It is important in that the resulting peak experiences of wilderness recreationists seems to depend upon a psychological and physical relationship with risk/challenge inherent in **wildland** settings. Being cognizant of the myriad recreation activities that take place in public lands makes addressing barrier issues in an equitable way nearly impossible. Within the flow paradigm, a need exists to assure varied recreation opportunity while limiting activity conflict within any particular setting. In doing so, land managers guarantee a level of experiential opportunity which may otherwise be lost.

It is important to mention that exploring potential barriers to recreation participation within the flow paradigm of leisure requires an understanding of flow as a simplified model of experience. However, although the model has heuristic value it cannot substitute for a thorough understanding of the complexity of the actual flow experience. In addition, if we are to understand leisure from an experiential/subjective frame of reference we must realize that no experience takes place as an unrelated isolated event.

SUMMARY AND DISCUSSION

The paradigms discussed within this paper may prove to be valuable tools in separating questions concerning barriers to recreation participation. However, the value of each paradigm in specifically identifying barriers is limited by the validity of each paradigm in clarifying the nature of the recreation activity/experience. It should also be noted that questions concerning the nature of recreation participation, leisure, and barriers to participation are expanding well beyond the current knowledge base in this field. The burgeoning "need to know" about barriers to recreation participation is in essence a call for further efforts in understanding the relationship between people, their recreation and leisure, and environmental conditions which influence participation. It is a call for tools of understanding which may better guide leisure services and recreation/resource management in the future.

Common Themes

A common theme evident in the barriers to recreation participation question involves the personal nature of the recreation/leisure experience. The nature of participation may, therefore, be viewed as a function of individual potentiality and identity. Each paradigm examined in this paper has consistently presented a basis of understanding recreation and leisure phenomena which reflects the intensely individual nature of participation/experience and the psycho-social confines within which recreation occurs. Although the paradigms overtly address the individuality of the recreation participation question there is also an underlying theme which addresses the psycho-social nature of modern recreation and leisure participation. As suggested earlier, recreation participation does not occur in a vacuum. The psycho-social setting within which the recreation participation question is seated in is known as modernity. Modernity is the psycho-social condition which individuals face in post-modern/post-industrial society. Modernity is typically described as a sense of personal fragmentation-loss of identity. John Marx (1980, p. 162) describes the societal aspect of the dilemma of modernity as follows:

"The most distinctive characteristics of **post-industrial/post-modern** society will be the bewilderingly rapid rates of change in the symbolic meanings, models, and interpretations that constitute the domain of expressive culture; the other defining attribute of this type of society is the stability, rigidity, and resilience to change of its basic institutional designs, structural patterns, and role-status relations."

Marx explains "... that identity as well as the rest of expressive culture is so thoroughly detached and segregated from institutional structures that it becomes self-consciously constructed model of/for subjectively experiencing private meaning, meanings which have no (public) significance for (changing) the world out there' (p. 164-165).

The impact of Marx's comments are quite strong if we adopt any leisure paradigm which is based on subjective experience- which all four paradigms discussed here are. Modernity becomes a barrier to recreation participation because it establishes identity formation as an experiential process. As such, the interplay between modernity and self-definition, (and so self-perception, self-regulation, feelings of power and control, and sources of motivation) becomes muddled. From this perspective the recreation experience is **part** and product of modernity. In this sense, modernity may be a significant barrier to recreation participation and vice versa.

Recognizing the personal and psycho-social themes within the barriers discussion gives us some insight into the complexity of the barriers issue in spite of using paradigms as defining elements. The job of the recreation/resource manager of modern times becomes more complicated, and so management more sophisticated. The discussion of barriers to recreation participation may impact management of resources the most by bringing out the need for more individualized management schemes. Perhaps we're seeing the final days of the "shot gun" approach to recreation management on public lands. The management agenda for the future must be supported by a better understanding of the recreation participation issues – particularly barriers to participation.

Future Directions

Several needs for conceptualization and research on barriers are implied by this paper. One of these is to determine the outcomes with which to associate barriers. The outcomes associated with the paradigms discussed in this paper were leisure experiences (Neulinger's paradigm), perceived freedom (LDB), arousal, and flow. What barriers are associated with recreation **activity** choice decisions and styles of participation preferred? What barriers affect preferences and how do these relate to expectations, satisfaction, and user experiences? The development of such paradigms to describe such phenomena must precede barriers research in these areas.

In addition to the need for development of additional paradigms to explain a broader array of leisure phenomena is the need for validation of existing models. Neulinger's (1981) paradigm is frequently cited and seems easily testable through experience sampling methodology (Larson and Csikszentmihalyi 1983), but only limited validation research on that model has been reported (Hultsman and Russell 1988). The LDB measure of perceived freedom has been subjected to tests of convergent and discriminant validity (Ellis and Witt 1986) but only one limited test of the attributional underpinnings of the concept which is measured by the instrument has been attempted (Ellis and others 1986). Although arousal is a thoroughly researched topic, only a few studies have utilized the concept in play behavior studies and none of these were directed at validation. Serious questions also remain with regard to the flow model. Critics of the model have raised the question of whether a flow experience associated with low skills and low challenge is equivalent to the flow experience associated with high skills and high challenge. Validation efforts of these and other major paradigms (e.g., Driver 1977; Tinsley and Tinsley 1985) is essential for scientific growth in recreation and leisure to continue. Finally, the modernity issue raised in the previous section is a very important, yet neglected, direction for leisure research.

Barriers research becomes manageable and relevant following this process of validation of paradigms. Experimental and correlational methods may be used to determine the extent to which barriers such as those proposed in this paper actually interfere with the targeted outcome. Within Neulinger's paradigm, for example, the extent to which perceived obligation actually precludes leisure experiences should be addressed. Studies are also needed to examine barriers within the other paradigms.

At the heart of this paper is a call for increased reliance on paradigms. The use of these conceptual devices narrows our focus and provides the opportunity for parsimonious solution to a very large and complex problem. Further attempts to generate knowledge about barriers without such focus can only lead to additional confusion and frustration.

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EQUITY ISSUES IN OUTDOOR RECREATION

Daniel L. Dustin and Richard C. Knopf¹

Abstract- Outdoor recreation service delivery has moved from a stage of rapid growth and development to a stage characterized by limits. During this transformation, traditional conceptions of the public "right" to outdoor recreation are being shaken by the reality of inadequate supply. Four categories of equity issues that have loomed in face of this reality are described. While these issues carry no easy solutions, the onus is on the research community to render insight.

INTRODUCTION

In the closing chapter of *Wildland Recreation Policy*, J. Douglas Wellman (1987) suggests that management is today's policy frontier. By that he means we can no longer expect problems associated with recreational use of public lands to be resolved by a simple expansion of resources. Increasingly the challenge is to manage wisely what we have. As Wellman characterizes it, 'wildland recreation managers are in the hot seat, and the future prognosis is for more conflict as expansion of the **wildland** recreation estate slows, recreation participation rises, and the variety of recreation tastes increases.'

The wise management of existing resources is our professional challenge. But wise management in terms of what? To what goals or purposes do we owe our allegiance? As public servants, is our obligation only to serve the citizenry's expanding tastes for recreation? Or is it our duty, as Joseph Sax (1980) argues, to elevate those tastes, to encourage certain kinds of recreation and discourage others? As public servants, are we to accommodate only those people who express a demand for outdoor recreation opportunities, or are we to seek out those others who are disenfranchised, who are not participat-

ing, and find out why? And what of our obligations to the environment? Is wise management a **human-centered** notion only?

The purpose of this paper is to explore these questions in the context of equity or fairness. Given the public nature of outdoor recreation resources, and given the fact that in a democracy all citizens have an equal stake in the public trust, wise management necessarily means doing what is fair or equitable for everyone.

However admirable this injunction, working towards it is complicated and often times frustrating. That it should be so is no excuse to forgo it. On the contrary, that we should be willing to engage in the debate indicates the progress we have made as a human service profession. It is in this spirit that we now take stock of our successes and failures in outdoor recreation planning and policy so that we might better serve the American public in the future.

THE CURRENT STATE OF AFFAIRS

Perhaps the watershed incident in outdoor recreation management occurred in the summer of 1970 in Yosemite National Park. Until that time the history of outdoor recreation had been largely one of expansion and growth. Lands had been set aside for recreational purposes, agencies had been created to administer those lands, and facilities had been developed to serve greater and greater numbers of Americans who were expressing their newly acquired taste for outdoor recreation.

But now, in the heat of that Yosemite summer, conflict occurred between recreationists with differing needs and interests who were competing for the same recreational space. The **"freaks** versus straights' incident, as it was popularized in a National Park Service film, symbolized the end of recreation management as a process of accommodation and the beginning of recreation management as a process

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of conflict resolution. The idea of limited resources was ushered in along with a sense of recreation as a problem.

This problem of recreation precipitated an ambitious research agenda over the last two decades ranging from inquiries into the nature of recreation needs and motivations, to the benefits derived from recreation pursuits, to the various impacts associated with recreation engagements, to alternative resource management strategies. A recent review of the resulting literature (Manning 1986) gives the distinct impression that a concern for limits colors contemporary thought along with a concern for doing a better job with what we have.

This concern is intensified by what seems to be insufficient public funding for the proper management of outdoor recreation lands. No matter how sincere the professional commitment, in the absence of adequate fiscal support it is difficult to accommodate the public's interest in outdoor recreation in a way that maintains the quality of what they are enjoying. What is currently being resorted to in the way of alternative funding strategies, as we shall soon see, is fraught with equity implications.

The research literature is also beginning to sensitize us to the complex workings of things, to the untold rippling effects that occur as a result of our managerial and policy actions. We are beginning to see connections previously unseen, to feel impacts previously unfelt, to understand relationships heretofore not understood.

Emerging equity issues are thus beginning to take form. They can be categorized broadly as issues of access, use, environment, and management.

The Access Issue

In an era of increasing use of limited resources, the question of carrying capacity has dominated the literature. How many people can be accommodated in a particular recreation area or facility without doing irreparable damage to either the resource or the quality of visitor experiences? It was hoped that an answer to this question would provide justification for any subsequent decisions to limit access to overburdened recreation areas and facilities. While the concept of recreation carrying capacity has proven to be problematic as a management tool (Graefe and others 1984; **Stankey and McCool 1984**), and while there is movement away from it to the idea of limits of acceptable change, resource managers are still left with the thorny question of an equitable basis upon which to limit access should it be deemed necessary, Who gets in and who doesn't?

The establishment of user fees for public recreation may be appropriate both from a social equity perspective and from a more pragmatic economic perspective (Fedkiw 1986). The sense is that for too long taxpayers who have not benefited directly from the provision of outdoor recreation opportunities have subsidized others who have. Proponents of user fees argue that it is only fair and equitable that those who benefit directly should assume a larger share of the cost of maintaining those recreation areas and facilities (Howard 1988). User fees are the mechanism for shifting that burden.

Not only do user fees appear to be socially equitable, they offer welcome relief from the economic pinch felt by most recreation land managers. If the revenue generated by user fees can be earmarked for maintenance of those same outdoor recreation environments, then they seem even more reasonable.

Counterarguments to user fees generally include a concern for possible discrimination against the poor, a concern for the privatization of public recreation, a concern for social stratification, and a concern for the effect of fees and charges on the meanings derived from outdoor recreation experiences (Cockrell and **Wellman 1985**). User fee opponents admonish the profession to consider carefully the potential inequities of fees and charges before moving forward with them (**Dustin and others 1986**; Schultz and others 1988).

Besides user fees, there are many other rationing mechanisms that have been touted for limiting access to heavily used outdoor recreation environments. They range from first come-first served arrangements, to reservation systems, lotteries, geographical quotas, length-of-stay limitations, and eligibility requirements.

All of these mechanisms, however, have been shown to favor one segment of the population over others (Cole and others 1987; Knopf and Schreyer 1985). So the search continues for the most equitable rationing mechanism or combination thereof.

This search is made all the more difficult by a lack of consensus regarding the fundamental purpose of parks in American life. Should parks be considered a basic need (i.e., a 'public good'), then certain means for limiting access seem more equitable than others. Should parks be considered a discretionary item (i.e., a 'private good'), then other rationing mechanisms seem more appropriate. Until such a consensus is reached, however, the debate over the access issue is likely to intensify.

The Use Issue

Even if the access issue were resolved, there would still be the question of what one is allowed to do in outdoor recreation settings. This, too, is an equity issue in light of the public nature of outdoor recreation resources. Who determines appropriate use? Should it be left to the individual who is exercising his or her public property rights? Or should it be left to professionals who are entrusted with the stewardship of outdoor recreation environments? This issue is especially troublesome because most recreation land managers come from forestry backgrounds and are primarily concerned with resource protection (Knopf 1988). Their **mindset** nourishes a view of recreationists that is largely negative. According to managers, recreationists do things to the environment, things that should be stopped. Is this orientation to service likely to result in equitable policy and management decisions or is it likely to lead to highly discriminatory practices in the guise of eco-centric concern?

And what of those who are left out of the use issue altogether because the current menu of outdoor recreation opportunities offers them nothing of interest to begin with? What of ethnic minorities, disabled populations, the elderly, etc.? If the flow of benefits from public outdoor recreation resources is to wash over the entire population, should we not be working harder to serve the needs and wants of those groups currently underrepresented in outdoor recreation pursuits? (Knopf and others 1987).

Once again the issue boils down to the purpose for which public recreation lands have been set aside. If the professional obligation is to provide outdoor recreation opportunities to meet expressed demand, then we appear to be doing a good job. If the professional obligation extends farther to the identification – indeed the stimulation-of latent demand and the creation of opportunities yet **unimagined**, then there is much to be desired. All of this presupposes, of course, that serving human beings is our primary professional mission.

The Environment Issue

More and more, however, a concern for the environment itself has entered into resource management discussions. If being fair to everyone includes nonhuman living things, then our traditional thought must be expanded to include what we perceive to be the interests of things natural (Stone 1974). To extend such 'rights' to the environment represents a dramatic step in ethical consideration that we as yet

have not taken. Such consideration would undoubtedly result in calls for increased restraint and temperance in human recreational conduct for the benefit of other members of the biotic community (Leopold 1949). What can be anticipated in this respect are heated discussions about human 'rights' conflicting with nonhuman 'rights'. Whether or not we have the capacity to step out of our **human-centeredness** for the sake of such discussions remains to be seen.

The Management Issue

Intertwined with the aforementioned equity issues is the possibility that management practices themselves unwittingly discriminate against certain segments of the population. The best example of management-induced discrimination is the visitor 'invasion-succession' phenomenon, whereby veteran recreationists who prefer little or no man-made developments are displaced by others as resource managers who build new facilities in response to increasing use pressures (**Dustin and McAvoy** 1982; Schreyer and Knopf 1984). Similarly, the delineation of the Recreation Opportunity Spectrum along an urban-primitive continuum has been challenged as only one possible dimension along which outdoor recreation opportunities might be categorized (Williams and Knopf 1985). There may be others as well. To what extent, then, does our commitment to that system limit the possibility of our envisioning others?

Increasingly, recreation planners and **policymakers** must be aware of the equity implications associated with management induced change. As much as possible, they must assess the possible rippling effects of their decisions and anticipate the full costs and benefits of their intended actions. Such assessment may well require a fundamentally different orientation to planning, one that is sensitive to the systemic properties of decision making processes. (Knopf and Schreyer 1985).

FUTURE PROSPECTS

In addition to greater competition for limited public recreation resources, economic pressures, and a professional community that is increasingly aware of, and sensitive to, the complexities of outdoor recreation planning and policy, a more enlightened citizenry can be expected to demand more professional accountability in the future. Such demands will likely be manifested in political platforms, interest group activities, lobbying, and the like, but they

undoubtedly will be characterized by a heightened level of individual participation. Rationales for service delivery will have to be thought through thoroughly for they will be scrutinized more closely than ever.

In all likelihood, the following questions typify **equity** concerns of the future:

What is the purpose for the existence of public outdoor recreation resources?

What rights are associated with the word 'public' in terms of access and use?

What criteria are the above-mentioned 'rights' based on? Can they be made explicit? Can we agree on them? If not, what is the most equitable way to proceed?

Who has a 'right' to participate in the 'rights' discussion? Those who use outdoor recreation resources? Those who would like to but feel disenfranchised? Those who are indifferent? The environment itself?

The onus is on the research community to address these questions. This means an agenda for inquiry ranging from basic philosophical debate about what we ought to be doing and why, to practical matters such as the appropriateness of fees and charges and various methods of limiting access to overused outdoor recreation environments.

CONCLUSION

The surfacing of equity issues in outdoor recreation should not be interpreted as a sign of failure. On the contrary, we are evolving from one stage of service delivery, characterized by rapid growth and development, to another stage characterized by limits. These days it makes sense to evaluate what we have accomplished, to make sure we continue to do a good job with what we have. A concern for equity is a reflection of our professional maturation. It is a time for fine tuning, for making necessary adjustments so that we might do even better work in the future.

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THE BENEFITS OF OUTDOOR RECREATION PARTICIPATION

Richard Schreyer and B.L. Driver'

Abstract- One of the most crucial elements in assessing the value of recreational uses of natural resources is an understanding of the benefits derived by participants. As a nonmarket commodity, recreational values have been hard to assess. The psychological benefits derived have been particularly difficult to represent in ways which could guide resource allocation decisions. This paper examines what benefits are, problems in gathering data about them, previous research on the topic, and major issues in the use of benefit information in resource management. Recommendations are made for future directions.

THE CONCEPT OF BENEFIT

To observe that outdoor recreation participation is beneficial is almost tautological. We define recreation in terms of freely chosen activities that are engaged in because they do good things for us. In this sense, recreation is beneficial to us almost by definition. It would be as awkward to assert that art is beneficial or that music is beneficial. Without having to identify what the exact nature of those benefits are, we can see through the substantial expenditures people make over art and music that they must derive some tangible outcomes from them. Similarly, we can see this in the willing participation in outdoor recreation pursuits — 89 percent of all Americans according to the 1983 survey of recreation (U.S. Department of the Interior, National Park Service 1986) — and in the billions laid out for purchase of recreational goods and services.

The problem comes when we start talking about recreation resource management and planning. Recreation then becomes a public service rather

than a market commodity. While art and music are in the public sector as well, they are more strongly tied to well defined pricing systems, such as charging fees for admission to art galleries and concert halls. Recreation pursued on public lands is charged for on a much more limited basis.

Further, recreational uses of resources must compete with other resource uses that do have more clearly defined market values, such as the use of a tree for timber. We may therefore be concerned about the relative worth of outdoor recreation in the resource allocation picture. Our rational/empirical heritage in resource management suggests that decisions about use be based on “objective” indicators of relative merit. Hard commodities such as timber are not only more tangible than psychological experiences such as recreation, their utility is more immediately apparent. There is also the *mindset* that providing timber for housing is more “important” than providing recreation for our pleasure.

Thus, recreation often appears at a disadvantage because it is not tied to market indicators of worth, and appears at best superfluous. If the true worth of this resource use is to be characterized, we must find some more tangible ways to identify and express the benefits derived from recreation participation. That has proven to be a substantial challenge, for what may be taken on faith as being beneficial may be quite difficult to document.

What is a recreation benefit? Most simply, a benefit may be defined as an improved condition or desired change in state, or the prevention of a worse condition (Driver and Peterson 1987). In this sense, the improved condition would be an outcome of the recreation participation, as opposed to the *participation* itself. Further, recreational opportunities would not be considered as benefits, so much as they are seen to be facilitators of benefits. It is also important to distinguish a benefit from the value of the benefit. The benefit is the improved condition. The value is the extent to which that condition is desired. It may

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be expressed as the relative importance of that condition, in terms of tradeoffs we might make with other resources or conditions (Brown 1984).

The range of benefit could be extremely wide, from physiological benefits to improved states of mind (Driver and others 1987). It could encompass societal benefits (Driver and Brown 1987) as well as other spinoff benefits (Driver and Rosenthal 1982). It could also include nonhuman benefits, such as the benefits derived from preserving natural ecosystems (Rolston 1985).

We know that the recreational and noncommodity values of our public lands are becoming increasingly important. Our urban public sees wildlands as desirable places to maintain in a wild state, whether they actually visit them or not. This interest has been manifested in the wilderness preservation movement, in the adoption of the Recreation Opportunity Spectrum as a means of classifying the range of recreational opportunities available on public lands, and in the passage of legislation such as the Renewable Resources Planning Act and the National Forest Management Act, which are pointed toward providing for more systematic input from the public on resource values. The challenge has thus become how to translate this shift in cultural values into systematic resource planning and management.

The documentation of recreation benefits could stand to serve a significant function in this regard. It would give decision makers information which would allow them to make more rational allocation decisions, as it would provide them with a clearer picture of the worth of such resource uses. It might then lead to more realistic policies on establishing fees for recreation. This in itself could help recreation resource uses pay their way and provide even more information on their relative worth. It could also establish a firmer base for the professional status of recreation resource management. Professional positions could be defined with greater status and opportunities in resource agencies (Driver and others 1987).

Resource managers would be in a position to provide more and higher quality opportunities if they knew what aspects of recreation resources were most beneficial and why. Traditionally recreation has been perceived somewhat as trivial or superfluous (Driver and others 1986). However, identification of benefits would lead to a clearer understanding of the outputs of the resource management process. Thus, managers may be better able to identify specific objectives for recreation resource management, and

gain a better sense of the relative substitutability of different types of opportunities (Driver and others 1987).

Such information could help citizens as well. It would help them make more informed decisions about their choices of recreational opportunities, as they would have a clearer picture of the nature of the benefits to be derived. It would also allow them to make more useful input into the resource allocation process, in expressing their preferences. People would have a clearer sense of the tradeoffs involved in different types of resource allocation. They could also formally express these preferences in the political arena as more informed voters (Driver and others 1986).

Thus, it would appear that any future systematic planning for outdoor recreation should encompass a serious effort to identify and measure the benefits of recreation participation. In guiding this direction, it is useful to examine what is already known. The following section discusses the existing state of the knowledge on recreation benefits.

RESEARCH ON RECREATION BENEFITS

Research Issues

While there has been a considerable body of research addressed to the social psychology of recreation, there has been relatively little systematic inquiry into the nature of recreation benefits. Much of that work has focused on the **reasons for participation**, as opposed to what the outcomes have been. There are currently few comprehensive attempts to explain the actual dynamics of benefit attainment through participation. Perhaps the most significant efforts to date have been those by Driver and Tocher (1974) and Tinsley and Tinsley (1985).

There are also a number of difficulties which affect the implementation of research on benefits. At the most fundamental level is the concern for what constitutes a benefit itself. Time may play a role; for instance, smoking may be a short term benefit and a long term cost. Persons with different values may interpret an outcome differently, particularly where moral issues are concerned. And of course, what may serve to **benefit** one person may be a cost to another (e.g., damming a free flowing river). Thus, there need to be more formally defined **criteria** concerning what constitutes a benefit (Driver and Peterson 1987).

There are questions concerning how **comprehensive** it is possible to be in identifying **benefits**. How do we know when we have tapped the relevant domain of recreation benefits (Driver 1986)? There is a question as to how **dependent a benefit** is on a particular recreational opportunity. Of course, while such an opportunity may not be unique in its provision of a particular benefit, it may in fact be strongly preferred as a means of attaining that **benefit**. There are also concerns about how to capture **off-site benefits**, such as existence values or contributions to quality of life. Given that much of what we study as benefits may be measures of things happening out in the population in general, it may be difficult to establish effective research controls in order to get a clearer picture of the **cause-effect relationships between** recreation participation and a given benefit such as mental health (West 1987).

There are also issues in measurement. First, it is necessary to separate the different components of benefit identification. Initially, we must specify what the benefits are. Then, we have to measure the **magnitude** of these benefits to different segments of the public (Schreyer 1987). Research to identify these various types of benefits may use different sources of information. For instance, one may use experts familiar with the field of recreation to draw on their experience in identifying possible benefits. Such 'Delphi' techniques are helpful in guiding research, but must ultimately be validated through more systematic means.

It is also possible to ask people for their own perceptions of benefits. There is a question as to the subjective nature of such self-reports, in that people may perceive something as a benefit which may in fact be a cost. However, to the extent that people perceive reality in a certain way, then that may become functional reality in shaping their choices and ultimate behaviors. Such information may be obtained directly through asking people about the benefits of their participation. It may also be indirectly gleaned from other studies which have examined reasons for participation or motivations for recreation.

Information about benefits may also be obtained through measures of changes in behavior. These would be more objective indicators of improved conditions. Physiological measures of a person's health following recreation participation could be an example. Also, general population indicators of well being, such as health statistics, mortality rates, absenteeism, divorce rates, incidence of crime, etc., could all be used as measures of benefit (Driver and Brown 1987). The following sections briefly review some of the research in these areas.

Delphi Techniques

Expert judgments of the **benefits** of recreation participation most commonly exist in popular writings about the uses of natural environments. Such writings are extremely diverse, and generally oriented toward personal interpretations of benefits, as opposed to making broad generalizations about the domain of benefits. Driver and others (1987) describe a cross section of 'classical' writings on the benefits of wilderness to humans. Similarly, Stankey and Schreyer (1987) also draw inferences concerning the **benefits** of wilderness based on historical writings.

Few such discourses have been pointed at a systematic attempt to identify the range of the benefits of **wildland** recreation participation. One such effort is described by Schreyer (1984) in reporting the results of a workshop in which a collection of scientists from a range of disciplines engaged in an exercise attempting to identify the potential benefits of recreation participation. Three groups generated lists of such **benefits**. Tables 1 through 3 show the lists of **benefits** identified by these different groups. It will be noted that while there are many similarities, there is considerable variation in the nature of identified **benefits**, as well as in the number of different benefit categories delineated.

Self Reports

One of the more common approaches to this line of research has been the assessment of people's reasons for participation. As recognized above, this does not represent benefits per se, so much as an indication of what people expect the **benefits** to be. There have been many such studies in outdoor recreation in the last 20 years. Many of these have been standardized measures, such as the Recreation Experience Preference scales developed by Driver (1977). The list of these scales is shown in table 4, representing the range of types of reasons why people seek to participate.

Driver and Brown (1987) summarize the results of over 100 such studies, involving over 100,000 recreationists. In an attempt to summarize the common themes in this large body of research, they proposed a **typology** of personal benefits, shown in table 5. Obviously, a breakdown by type of **activity** would be impossible within the context of this study. However, Brown (1981) provided a breakdown across a selected set of **wildland** recreation activities of the relative importance of certain types of benefits. This comparison is shown in table 6.

A number of reviews of various elements of the benefits of outdoor recreation currently exist. A

Table 1. --Delphi listing from the benefits specification workshop (Schreyer 1984)

<p>I. Social/personal</p> <p>Health-activity Group cohesiveness-making friends Meeting people Status Skills Learning Increased productivity Conflict resolution Courtship</p>	<p>Community stability and harmony Cultural pride and nationalism Historical understanding</p>
<p>II. Material</p> <p>Income Trophies Play (Poaching)</p>	<p>Meat Hides Community development</p>
<p>III. Environmental</p> <p>Preservation Conservation Husbandry Stewardship</p>	<p>Joint products (management) Baseline indicators Ecosystem appreciation Understanding human dependency</p>
<p>IV. Psychological</p> <p>Independence/self-sufficiency Mastery "Split rail" Atavism Historical recall Group solidarity Kinship Family Exploration Sharing Achievement Leadership Risk Taking Creativity Aggression Escape Danger Contrast value/compensation Nature kinship and empathy Aesthetics</p>	<p>Prowess Privacy Isolation Bonding Competence Virility Personal attractiveness Nurturance Abasement Ethics Value clarification Simplicity Savagery Diversity Humility Spiritual/religious</p>

compendium on the social benefits of outdoor recreation was compiled by Kelly (1981). Driver and others (1987) characterized the benefits of wilderness. Driver (1986) addressed the **benefits** of river and trail recreation. Probably the most comprehensive collection of information on benefits research to date is in the literature for the President's Commission on Americans Outdoors, as coordinated by Driver and Peterson (1987). While a number of the papers were oriented toward economic **benefits**, there were also literature reviews on personal benefits (Driver and Brown 1987), the benefits of adventure recreation (Ewert 1987), and the social benefits of recreation (Burch 1987; West 1987).

Behavioral Measures

Given the many barriers to carrying out research on behavior change as an indicator of **benefit**, few such studies have been done. What studies do exist are reviewed in Driver (1986). These include studies on the physical health benefits of **exercise (Buccola and Stone 1985)**, and on **beneficial physiological responses to natural settings (Ulrich 1981, 1984)**. **There is also a considerable body of research on the benefits of adventure education programs, though there is considerable disagreement over the validity of such results (Ewert 1987)**.

FUTURE DIRECTIONS

The Importance of Recreation

As there is no means for the quantification of **benefits** at present, it is difficult to make specific projections. However, there is little doubt that the value of natural settings for providing recreational benefits will increase in the future. These increases are likely to be substantial.

Reasons for this increase involve an **ever**-increasing urbanization of society. This trend is not just in the United States; it is worldwide. Urban populations place greater value upon **wildland** settings as sources of refuge from the stresses of daily life. Such lands also constitute a component of quality of life in providing aesthetic resources for public enjoyment. As the rigors, stresses, and constraints of modern urban life increase, the potential benefits of natural settings stand to increase.

Other values related to such recreational uses of the resource will also increase, such as wildlife and water. The more traditional commodity uses of such natural settings, such as timber, grazing, and minerals, will change in their relationship to the noncommodity uses. Our needs for these commodities will not diminish, but the ways in which they are obtained will change. There will likely be much more interest in intensive production on the most productive sites, as well as greater private sector responsibility, leaving much of the Federal estate for maintenance as natural settings. Mineral access will continue, but in an atmosphere of greater regulation to comply with noncommodity values.

An increasing linkage of the benefits of recreation participation to the economic system, through the establishment of fees and better means of documentation of the worth of such **benefits**, may lead to a growing awareness of the importance of the provision of such opportunities to society. Further, the economic viability of many communities located in close proximity to natural settings could increasingly be supported by revenues derived from recreational uses, such as the provision of tourist services.

Future Needs

Such a growth in the relative importance of recreational uses of public lands will inevitably require some substantial structural changes in the processes of resource management and policy. Contemporary resource management tends to be commodity-driven

Table 2.--Delphi listing from the benefits specification workshop (Schreyer 1984)

Individual
Psychological
Stress reduction
Stimulation
Happiness
Self
Creativity
Self actualization, esteem, etc.
Physical
Fitness
(neg: Injury)
Nature
Learning about wildlife (knowledge gained)
Learning about physical environment
Social/cultural/historic - Knowledge and understanding of cultures
Social
Social harmony
Better relations with family, friends
Economic
Increased productivity
Jobs
Income
Physical
Environmental protection (many costs too)
Animal population control = ecological stability

or output-driven. This leads to a disproportionate amount of attention being focused on resources which have traditionally been easy to measure or quantify, such as timber production. New systems for integrated decision making will have to evolve which will better capture social outputs. While such outputs are already accounted for in organic legislation for agencies such as the Forest Service, there is little to define the specific methods of that incorporation. This will change internally when external pressures become sufficiently intense as to require such response.

A more active policy dialog needs to occur at the higher levels of administration concerning the appropriate directions for resource management efforts. "Business as usual" rhetoric is becoming increasingly difficult to accommodate. This suggests the need for more original thinking at higher levels of

Table 3. --Delphi listing from the benefits specification workshop (Schreyer 1984)

Family solidarity	Enhanced problem-solving
Cultural continuity/adoption	Spiritual communication
Mental health--capacity to cope	Humility
Self-identity/frame of reference	Skill development
Physical health	Recreational
Well-being	General
Cure/Prevention	Organizational skills
Relaxation and enhanced concentration	Decision-making
Stress mediation	Sensation of experience/arousal/
Social bonding/intimacy/dyad formation	Entertainment/Play
Sexual potency	Thrill/vertigo
Group identification	Peak experience
Enhanced world view--cognitive maturity	Sense of aesthetics
Catharsis/self-disclosure	Quality of life feeling
Self-confidence	Pride/patriotism
Cognitive efficiency/integrative complexity	Political action
Capacity for fantasy/imagery/creativity/ reminiscence/anticipation	Environmental awareness
Social validation/communication skills	Products of creativity-- "works of art"
Socialization/learning social rules	Establish leadership function
Financial return/utility function	Status/trophies
Productivity in workplace/everyday environment	Validating understanding
Vehicle for competition	Locus of control/autonomy
Stability	Storage function (children)
Point of transition (moving from one life situation to another)	Survival capacity
Jobs	Privacy/withdrawal
Regional well-being	Eating/commensalism

administration. It is reasonable to expect that resource agencies will tend to espouse traditional "party lines." Therefore, it is necessary to find other sources of articulation for these newer values. There is currently no institutionalized voice for the benefits of outdoor recreation since the demise of Bureau of Outdoor Recreation/Heritage Conservation Recreation Service (BOR/HCRS). The need for such an institutional voice is becoming increasingly apparent,

Bureaucracies in general tend to be resistant to change. This is no different with the bureaucracies that manage our natural resources. It is unrealistic to expect response to these changing societal needs overnight. However, it becomes increasingly important to look at the forces which will bring about change in such organizations. First, there should be an active consideration of bringing about change from the bottom up. The lower level resource managers of today will be the high level administrators of tomorrow. Such persons in general will have a greater flexibility in world view. An active and aggressive program of training mid-career bureaucrats in the significance and meaning of social benefits from the uses of natural resources should be considered. Such programs are in fact beginning to be seen in resource management agencies; more needs to be done.

Second, there needs to be a more systematic consideration of career entry level positions for persons trained professionally in recreation resource management for resource agencies. This is a particular void as far as the Forest Service is concerned. Such positions would lend greater credence to "the professional significance of recreation resource management. It would provide a greater visibility to the discipline within the organization. It would also create a cadre of people who could move up through career ladders who have training in the social aspects of recreation resource management.

This would also help to dispel some of the mindsets which surround the practice of recreation management. Such mindsets have to do with the tendency to believe that "anyone can do recreation management.* Currently, agency personnel assigned to recreation staff positions tend to be persons trained in other disciplines who have been reassigned for a variety of reasons. This helps support perceptions that the pursuit of recreation resource management is of little importance. This is also supported by the tendency to use volunteers for recreational tasks. While such volunteers provide a valuable workforce in a time of limited budgets, there is little doubt about the priorities for such positions. They are often assigned to innocuous tasks. Recreation, by implication, suffers from this identification.

Table 4.--Recreation experience preference scales making up the recreation experience preference domains (shown in capital letters), from Driver and Brown (1987)

<p>1. Enjoy nature</p> <p>A. Scenery B. General nature experience C. Undeveloped natural area</p> <p>2. Physical fitness¹</p> <p>3. Reduce tension</p> <p>A. Tension release B. Slow down mentally C. Escape role overloads D. Escape daily routine</p> <p>4. Escape noise and crowds</p> <p>A. Tranquility/solitude B. Privacy C. Escape crowds D. Escape noise E. Isolation</p> <p>5. Outdoor learning</p> <p>A. General learning B. Exploration C. Learn geography of area D. Learn about nature</p> <p>6. Share similar values</p> <p>A. Be with friends B. Be with people having similar values</p> <p>7. Independence</p> <p>A. Independence B. Autonomy C. Being in control</p>	<p>8. Family kinship²</p> <p>9. Introspection</p> <p>A. Spiritual B. Personal values</p> <p>10. Be with considerate people²</p> <p>11. Achievement/stimulation</p> <p>A. Reinforcing self-confidence self/image B. Social recognition C. Skill development D. Competence testing E. Seek excitement/stimulation F. Self-reliance</p> <p>12. Physical rest²</p> <p>13. Teach/lead others</p> <p>A. Teaching-sharing skills B. Leading others</p> <p>14. Risk taking²</p> <p>15. Risk reduction</p> <p>A. Risk moderation B. Risk prevention</p> <p>16. Meet new people</p> <p>A. Meet new people B. Observe new people</p> <p>17. Nostalgia</p>
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¹The items that make up these scales have been tested for many types of validity and reliability, with reasonably good results.

²These domains have only one scale, with the same title as the domain.

A foundation to the above observations involves an increasing need to carry out an active and diverse research program on the nature of recreation benefits. We can generate many statistics on who participates in what, where. But as long as there is little understanding of the functional nature of recreation participation, many of the mindsets described above will be maintained. We need to better document the outcomes of participation, and the consequent value of resource uses in providing opportunities for those outcomes.

Barriers

The barriers to movement in this direction are substantial; most have been outlined above. In brief recapitulation, they consist of mindsets in which recreation is considered superfluous and of little relevance. This is abetted by our inability to document the benefits of recreation participation and the worth of those benefits to the public. The lack of charging fees for access to public recreation opportunities adds to this concern.

Table 5.--A taxonomy of some probable personal benefits gained from use of outdoor recreation opportunities, developed by Driver and Brown (1987)

A. Personal development	C. Therapeutic/healing
1. Self-concept	1. Clinical problems (drug abuse, etc.)
2. Self-actualization	2. Stress/tension mediation
Self-reliance	3. Physical rest
2: Value clarification/introspection	
5. Humility	D. Physical fitness/health
6. Leadership	E. Stimulation
7. Spiritual growth	F. Independence/freedom
8. Aesthetic enhancement	G. Nostalgic
9. Learning	H. Commodity-related
B. Social bonding	
1. Family kinship	
2. Kinship with significant others	
3. Meeting new people	

Table 6.--Highly valued specific experiences for selected recreation activities, from Brown (1981)

Specific Experiences	Wilderness backpacking-Western	Wilderness backpacking-Eastern	Hiking-Western	Hiking-Eastern	Camping auto	Fishing-Western	Fishing-Eastern	Hunting	Off-road vehicle recreation	River running	Cross-country skiing
Relationships with nature	X	N	X	N	X	X	X	X	X	X	X
Escape from physical pressures	X	X	X	X	X	X	X	X	X	X	X
Escape from social pressures	X	X	X	X	X	X	N	X	X	X	X
Achievement/challenge		X						X	X		
Autonomy/independence/freedom	X										
Reflection on personal values		X		X							
Recollection/nostalgia					X	X	X				
Risk taking/action/excitement									X	X	
Meeting/observing other people									X		
Use and care of equipment						X	N		X		
Exercise/physical fitness	X	X	X	X		X	X			X	X
Being with one's recreation grp.	X	X	X	X	X	X	X	X	X	X	X
Learning/exploration	X	X	X	X	X	X	X		X	X	X
Family togetherness	X		X	X	X	X	X		X	X	
Privacy	N	X			X	N	X				
Security					X				X		
Physical rest					X	X	X				

X = Highly valued specific experiences.

N = Not measured so regional comparisons are not possible.

Organizationally, resource management agencies are much more oriented toward commodity outputs and quantifiable indicators of performance. Social service functions, while recognized, tend to be given lower priorities. The presence of traditional political/economic clientele and the lack of a unified political clientele for recreation keep it from becoming a major consideration in resource allocation decisions. Resistance to change leads to an adversary relationship with many of the social forces seeking to change our views of wildlands. This leads to slow change driven by animosity and conflict, rather than active planning and anticipation. And, of course, our current fiscal problems constrain the allocation of funding in directions which would help resolve some of these issues.

RECOMMENDATIONS AND IMPLICATIONS

Research Needs

We are faced with a seemingly insurmountable opportunity. We are aware that the value of recreation resources to the public is important and growing. However, the formal body of knowledge concerning the actual benefits of participation is limited. This information is increasingly vital in a time of changing demands and needs for public lands. It is easy to suggest the need for more research when one is a researcher. Unfortunately, there is little latitude to debate the point in this case. While the amount of research and its scale may still be at issue, the following are the most critical research priorities we believe are necessary for helping to deal with recreation resource allocation planning and management:

1. An active program of research to identify systematically the benefits of outdoor recreation participation.
2. Research that would cast recreation benefits in more objective terms, such as behavioral changes.
3. Research that would identify more clearly the role of the physical setting in providing specific types of **benefits**.
4. The development of better means of control in establishing cause-effect relationships between participation and indicators of benefit.
5. The development of better means to measure the magnitude of given recreation benefits.

6. The development of a body of knowledge that can help lead to more refined theories about the benefits of recreation participation.

7. The development of more sophisticated decision-making strategies capable of incorporating social indicators into the resource management process, without requiring them to be reduced to quantifiable units of output.

Issues for Discussion

The discussion in this paper obviously involves interpretation of information, as well as a number of assumptions about the state of society and the nature of resource management. This may lead to the opportunity to debate many of these issues, particularly in light of the need to forecast trends. We suggest the following as questions to be considered:

To what extent are current administrative structures in resource managing agencies capable of responding to the changing needs of the American public?

Should there be significant changes in the structure of administrative decision making, including the abandonment of more historical means of quantitative decision making, such as FORPLAN?

Can the responsiveness to the needs of the public be increased by making higher agency administrative positions subject to political appointment, rather than internal selection of agency personnel?

How can organizational barriers to the recognition of the significance of social values of natural resources be overcome?

How can traditional notions of natural resource discipline education be overcome?

Will it ultimately be necessary to cast recreation benefits in a dollars and cents mode in order for them to attain any relevance in the policy arena?

Can the social value of recreation participation be adequately recognized if there is not a professionally trained cadre of recreation resource managers in place?

How can we best predict and validate the relative importance of natural settings for the provision of recreation benefits?

Are the social forces in this nation actually moving in the direction of increased valuing of wildlands for such uses? How would we document such trends?

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Section 8.

Social, Economic, and Environmental Implications of Outdoor Recreation Demand and Supply Interactions

FOREST VISUAL QUALITY MANAGEMENT AND RESEARCH

R. Bruce Hull IV¹

Abstract- Management and research of forest visual quality are critically examined. The major conclusion is that shortcomings in visual quality research and management are in large measure due to misconceptions concerning what visual quality is. Thus, a considerable portion of the paper is devoted to better defining visual quality. In addition, the visual impact of several forest management actions is summarized, and the major visual management/ research paradigms are compared. A recommendation is made to sponsor basic research so that visual quality may be better defined and better understood so that visual management may be more successful. Initiating a long term, broad based inventory of forest visual quality through cooperation with the Forest Service's existing Renewable Resource Evaluation program is also recommended. The paper concludes that visual quality will continue to increase in value to society and that concern with forest visual management should consequently increase in priority.

INTRODUCTION

This paper differs from others in this proceedings in that the resource being discussed is not well defined. As a result, information about past, current, and future amounts of visual quality simply are not available. Suggestions will be made as to how this information may be collected. The bulk of the manuscript, however, critically reviews the current state of the art of visual quality research in hopes that new directions and new efforts will be spurred.

Publicly funded forest visual quality research began in earnest in the late 1960's. It resulted from the legislative mandate of multiple use management, the increasing demand for forest recreation, the increasing exposure to forest and rural environments

due to ease of transportation, and the growing public awareness of environmental quality concerns. Unfortunately, as of 1988, visual quality research and management have not advanced much beyond the ideas proposed in the 1960's. After more than two decades of work there is little acceptable theory; management is left to "experts" who have trouble defending their decisions; visual quality is still regarded as an intangible forest product, and thus odd man out in multiple use decisionmaking; and the existing visual management system is not compatible with management of other forest products. This does not reflect negatively on the many who worked in this area but, instead, demonstrates the enormity and complexity of the problems faced by visual quality research and management.

Many of the difficulties arise from the ambiguous and multifaceted nature of the definition of visual quality. The products (i.e., the benefits) of visual quality need to be identified. These products must be the focus of management and research. We must look long and hard at the role of visual quality in forestry and ask: What exactly does the forest visual environment produce? And then we can ask: What is the objective of forest visual management? Until these questions are answered little progress will result in visual quality management. We will continue to spin our wheels.

This paper is divided into six sections:

1. Definitions of visual quality;
2. The impact of forest management on visual quality;
3. Efforts to manage visual quality;
4. Policy suggestions;
5. A summary of the major unresolved issues identified in the paper; and,
6. The future significance of visual quality.

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DEFINING VISUAL QUALITY

In order to identify, assess, predict, and consequently manage a forest resource one must first have a precise, defensible, and meaningful definition of the resource. There must be agreement on what is being managed. Unfortunately, this is not the case with 'visual quality.' The purpose of this section is to direct attention to this shortcoming and to offer some suggestions. However, since the scope of this paper is so broad, this section can only highlight important issues. A more rigorous and exhaustive treatment of each issue is dearly needed.

The word 'quality' can be defined in several ways. The most appropriate interpretation for forestry applications is as the 'degree of excellence' of some forest resource. This implies that there exists an amount, a quantifiable measure, which reflects how much of the attribute is present relative to excellence. This interpretation begs the question: What does an excellent visual environment do that a less excellent one does not? Or, more specifically, one might ask: What is the product (i.e., benefit) associated with visual quality? With current state-of-the-art information these questions, however fundamental to the validity of visual quality research and management, are difficult to answer. This demonstrates a fundamental weakness. One goal of research must be to identify what it is that forest visual quality produces. Other forest products are not so ill defined, for example: products of high quality timber are houses, paper, and jobs; high quality grazing lands produce lots of well-fed animals; high quality watersheds produce ample irrigation and drinking water and little erosion. But we know little of what visual quality produces. Does it directly impact physical or mental health, or dollars spent on recreation? Some suggestions are offered below.

There are numerous 'products' of the visual environment. For each product there must be a standard of excellence; that is, there must be an environment which provides the most benefits to users. This standard can serve as a criterion by which to judge "visual quality." Since there are so many products of the visual environment, there will also be many criteria. If the product is not explicitly identified, confusion may result, the goals of management policy will not be achieved, and management action may be misdirected and/or unproductive.

Potential Products of Visual Quality

Several potential products are discussed below, each will need its own criterion to serve as a guide for management.

1. **Quality of outdoor recreation** is influenced by the forest visual environment. The appearance of the forest affects those engaged in traditional forest uses (hiking, fishing, camping, viewing, etc.). Each activity requires unique environmental characteristics in order that the activity may be engaged, that expectations may be met, and that satisfactions may be maximized. For example, scenic beauty would be appropriate when evaluating forest visual quality for users whose only activity in the landscape is visual exploration from a vantage point. Hikers, campers, and hunters will each have their own criteria which would consider factors such as those affecting locomotion through the forest.

2. **Emotion** constitutes a large portion of possible reactions of persons to places. There are many purposes with which a person may approach a landscape but there are only a few emotions that can be experienced. This limited response set makes the research task easier since it is more focused (Hull and Harvey 1988). There are various theories of emotion. One is that dimensions of pleasure, arousal, and dominance explain most of a person's feelings in an environment (Russell and Pratt 1980). A person may visit a forest to experience an emotion not experienced in his/her normal day-to-day activities (e.g., relaxation, awe, wonder). Scenic beauty is merely a subset of the pleasure dimension of emotion (see Hull and Harvey 1988; Russell and Pratt 1980); ignoring the other components of emotion may produce an incomplete and inaccurate picture of what is happening to visitors.

3. The appearance of a forest **advertises** the quality and policy of forest management, just as the facade of a building advertises the quality and type of business conducted within it. Because the visual environment is readily available to the public and because the public feels qualified to judge visual quality, the appearance of the forest will be used by the public to judge forest management and forest policy. Walters and others (1979) suggested that the visual appearance of clearcutting in the Monogahela and Bitterroot National Forests triggered the political debate on forest management in the 1960's and 1970's and resulted in legislative controls being placed on forest management. This is a case where visual quality was used by the public to evaluate forest management policy. The implications were far reaching.

4. **Mental health** may be one benefit of a high quality visual environment. On the positive side, there is stress reduction (Ulrich 1981), low arousal, and fascination to reduce workload on forced concentration (Kaplan 1977). Also, the organizing effect that emotions can have (Leeper 1948) may lead to healthier life styles. On the negative side, the visual environment can be distracting and cause stress or emotions that hinder the accomplishment of one's objectives.

5. Many mental health issues translate to physical health. The viewing of green things (vegetation), for example, has been shown to speed up post-operative recovery and lessen patients' needs for pain killing drugs (Ulrich 1984). An attractive visual environment is also likely to motivate people to engage in forest activities that may indirectly increase **health** by encouraging physical exercise.

6. A **community's economy** is often dependent upon monies from tourism which, in turn, is dependent upon the visual **quality** of the environment. The ability of an environment to attract people to the area and to keep them there is critical to most tourist industries.

7. Trees in residential areas may serve as symbols of positive factors such as social status and seclusion (Hull 1988; Pitt and others 1976). These factors influence residential satisfaction. Furthermore, property value is greatly influenced by the surrounding visual environment in general, and vegetation in particular (Devitt 1988; Seila and Anderson 1984; Walsh and Olienyk 1981).

8. Visual characteristics influence the **safety** of an environment as perceived by users (Schroeder and Anderson 1984) and the appropriateness for criminal activity as perceived by criminals (Krupat 1987).

9. The visual environment (perhaps along roadsides) may be the only contact some people have with nature, with the change of seasons, and with the forces which shaped the evolutionary past of humans. Shepard (1982) theorizes that contact with nature is critical for proper maturation of the individual.

The major conclusion to be reached from this discussion is that there are numerous criteria by which visual quality may be judged. To "manage visual quality," then, can mean many things. One could argue (as a reviewer did) that it is not practical to specify different visual quality indices for each of the dozens of possible **products/benefits** of the visual environment, that doing so seems to confuse visual quality with nonvisual concerns, that we should focus

on some **intrinsically** valued quality of the visual environment (perhaps aesthetics, whatever that is) and ignore the others. But this puts us right back where we started, without any idea as to what exactly we are producing with visual quality and hence without criteria to guide management and to measure whether we have succeeded. It simply is not enough to say 'It is beautiful' or 'it is high in visual quality' without also specifically identifying why this matters. Knowing why beauty matters will help determine how it should be managed.

These questions must be answered so we can identify the product we are managing the visual environment for, and therefore identify criteria useful in guiding management. Yes, this makes the problem more complex. That is the nature of the beast. Ignoring it will not make it go away.

Considering Viewer Purpose in the Definition of Visual Quality

In addition to the difficulties which became apparent when defining 'quality; there are **difficulties** which arise when defining 'visual: This term is too general to be of much use. It can be used to refer to almost any product from scenic beauty to hunting quality, from naturalness to vegetative screening. To be specific one needs to refer to how the landscape will be used. Thus, it is the viewer's purpose that must be considered. The importance of considering a visitor's purpose when managing visual quality is discussed in some detail, as it is a critical yet oft neglected issue.

A place judged to be high in visual quality for a user with one purpose may not be high in quality for a user with another purpose. A hiker interested in backpacking will look for different environmental characteristics in the environment than a fisher interested in fishing, or a farmer interested in farming, or a Sunday driver interested in viewing, or a home buyer interested in settling. For example, car campers are concerned about having adequate vegetative screening between campsites to increase privacy rather than having a more scenic open and penetrable park-like view.

There is theoretical justification for being concerned with the viewer's purpose. The sensory, perceiving and mental encoding of the environment is influenced by the perceiver's purpose (Brunswick 1956; Canter 1984; Ittelson and others 1974). 'People react to what they experience in terms of **communalities**, in terms of classes and categories' (Kaplan 1979, p. 4). A landscape is perceived as a particular

instance of a class of landscapes. The assignment of a landscape to a class is likely dependent upon the observer's purpose—upon how that landscape will be used. Thus, a landscape will be categorized differently by a forester, a designer, a home buyer, a hiker, a hunter, etc. This, in turn, will make visual quality assessments depend upon the visitor's purpose.

There is empirical evidence suggesting the influences of purpose on a person's visual quality evaluations. Several examples from the literature should suffice. Taylor and Daniel (1984) found that landscape preferences for burnt forest landscapes were dependent upon the viewer's contemplated use (e.g., camping, hiking, viewing). Buhyoff and others (1982) and Buhyoff and Leuschner (1978) showed that knowledge about the cause of forest health (insect damage) influenced scenic evaluations. Perhaps the informed viewers had different uses of the forest in mind; at least they assigned different connotative values to the same landscape features. Zube and others (1983) found that landscape preferences were dependent upon a participant's age. Age influences a participant's purpose: grade school children simply do different things in the environment than do elderly people. And Anderson (1981) found that a description of the 'official' land use (i.e., wilderness versus commercial timber stand) influenced observers' scenic evaluations of landscapes regardless of the forest's actual scenic beauty or actual land use. Land-use titles suggest how the landscape will be used, which in turn influences what the observer would expect to do in the area, which, apparently, influences evaluations of scenic beauty.

Scenic beauty of the environment may be of primary concern when the user's primary purpose is sightseeing. Note, however, that the number of visitors with only this purpose may be fewer than first thought: even people driving along scenic corridors must be concerned with various aspects of the visual environment that influence driving safety, such as viewability, arousal potential (to keep drivers alert), distractability, etc. Thus there are good reasons to be concerned with the whole range of visual quality criteria. Viewer's purpose must be considered when defining visual quality.

IMPACTS OF FOREST MANAGEMENT ON VISUAL QUALITY

Given the multiple definitions of visual quality, it is not surprising that only a few have been examined in detail. Studies, which make up the bulk of the literature, have not been overly concerned with the purpose of the observer, which is unfortunate since, as described above, purpose seems relevant. Nonetheless, the results seem reliable and are probably appropriate for forest users who only intend on viewing the landscape from a fixed vantage point.

Two major paradigms for assessment of aesthetic impacts are the psychophysical and the formal aesthetic (Daniel and Vining 1983; Zube and others 1982). These research paradigms have produced the lion's share of evidence concerning visual impacts of forest management. As most often applied, they are both concerned with assessment and prediction of scenic quality. The psychophysical approach follows the scientific method. It is characterized by quantitative analysis of persons' scenic evaluations and by use of statistical methods to relate changes in forest characteristics to changes in scenic assessments made by the public. It requires considerable effort and expertise to implement because assessments are elicited from many persons and statistical analyses are rigorous. The formal aesthetic approach is characterized by rules-of-thumb developed by design professionals through application of historically based design principals. It also requires considerable effort and expertise to implement. But, it is designed to be implemented efficiently by a few experts — people trained in the method. Thus, it is more practical, but the results may be less defensible. Specific findings from both types of studies are presented, but first some more general, theoretical findings that are relevant to forest concerns.

Theories of Visual Quality

Elements in the environment that impact scenic beauty can be placed in one of two **categories**—process or content (Kaplan 1977). Process elements reflect how humans come to understand their immediate environment. The process reflects how humans come to grips with uncertainty in the environment so that potentials and threats will be taken into account. Three important processes include: 1) making sense of the world by recognizing and predicting situations; 2) acting on environmental information by reaching decisions about environmental affordances; and 3) exploration of the environment to increase the repertory of familiar situations, to increase knowledge base, and to practice skills

necessary for survival (Kaplan 1977). These processes are hypothesized to influence aesthetic quality. In summarizing the impacts of process, Ulrich (1986, p. 32) suggests that preference or liking for unspectacular natural scenes should be comparatively high if:

1) Complexity, or the number of independently perceived elements in the scene is moderate to high (e.g., Kaplan and others 1972; Ulrich 1977);

2) The complexity is structured to establish a focal point, and other order or patterning is also present (e.g., Küller 1972; Ulrich 1977);

3) **There** is a moderate to high level of depth that is clearly defined (e.g., Craik, 1970; Hull and Buhoff 1983; Ulrich 1974, 1977; Wohlwill 1973);

4) The ground surface has even or uniform length textures that are relatively smooth, and the observer judges that the surface is favorable to movement (e.g., Daniel and Boster 1976; **Rabinowitz** and Coughlin 1970; Ulrich 1974, 1977);

5) A deflected or curving sightline is present, conveying a sense that new landscape information lies immediately beyond the observer's visual bounds (e.g., Appleton 1975; **Cullen** 1961; **Herzog** 1984; Kaplan 1973; Kaplan 1975; Ulrich 1977);

6) Judged threat is negligible or absent (Ulrich 1983; Zuckerman and Ulrich 1982).

Content refers to the connotations of specific landscape features that influence an observer's aesthetic evaluation of the landscape. Some researchers (e.g., Ulrich 1983, 1986) hypothesize that certain landscape features have positive connotations that do not require learning (e.g., water is good, snakes are bad). Other researchers (e.g., Hull and **Revell** 1988; Lowenthal 1968; **Rapoport** 1982) suggest connotations of most features are learned. Examples of landscape features with connotations that influence scenic evaluations include:

Building style and material: There tends to be a preference for the vernacular (**Rapoport** 1982);

Cultural artifacts: Temples and other religious artifacts have special meaning to people and thus increase visual quality of landscapes when present (Hull and **Revell** 1988);

Signs of progress: People of developing countries tend to highly value landscapes with roads, transmission towers and other signs of progress as did early American settlers who highly valued cleared land and hated and feared the evil wilderness (Nash 1982);

Nature over urban: Findings from most studies of current landscape preferences demonstrate that scenes with signs of 'Man's' influence are negatively valued. With the guarantee of basic necessities, modern man prefers views of landscapes without evidence of civilization, at least with respect to scenic beauty.

Specific Scenic Impacts of Forest Management

Many of the specific impacts of forest management (listed below) are substantiated by evidence gained empirically through psychophysical landscape preference research studies. The proof of other impacts lies in the validity of the formal aesthetic landscape assessment paradigm. The National Forest Landscape Management publications (U.S. Department of Agriculture, Forest Service, 1974, 1975, **1977a**, **1977b**, 1980, 1985) describe, in detail, the implications of many forest management actions in a variety of ecosystems.

Fire: Prescribed and unplanned forest burns in the foreground view can have tremendous scenic impacts. For example: "Prescribed fire can often be used to create or maintain visually attractive combinations of trees, shrubs, herbaceous plants, and grasses. . . . In the mixed conifer-pinegrass plant community, for example, the colorful and distinctive subclimax ponderosa pine can be maintained only by reducing the competition of the more shade tolerant white fir" (Litton 1984, p. 16). Light burns, which leave a healthy dominant canopy, can actually increase scenic beauty of the stand over time, as understory is cleared out and overstory grows stronger. Heavy burns, in contrast, can drastically reduce scenic beauty as overstory is destroyed and the bulk of the biomass returns in the form of dense, impenetrable understory (Taylor and Daniel 1984). After logging, Anderson and others (1982) found that burns decreased scenic beauty when compared to unburnt logged sites, but that the burnt sites quickly regained and surpassed the unburnt sites in beauty.

Note that evidence of fire decreases persons' evaluations of scenic beauty because Smoky the Bear has done an excellent job in convincing us that fire is bad. Thus, when evidence of fire is visible (e.g., blackened trunks) it decreases the quality people associate with the place. Changing public attitudes about fire may change scenic evaluations of burnt landscapes.

A burnt area in the background of a view also has scenic impact, but less severe. The more linear

the contour of the burn and the greater the contrast in color and height of vegetation in comparison to surrounding stands, the greater the negative scenic impact.

Even-aged versus Uneven-aged Management: Visual impacts of all management actions are less in uneven-aged stands. The uneven-aged stand has more diversity, which increases scenic beauty; it retains vegetation after harvest, which increases scenic beauty; it screens views that might decrease scenic beauty; and it never reaches the very low level of scenic beauty caused by clearcutting. In visually sensitive areas, uneven-aged stand management should be implemented whenever possible (Rutherford and Shafer 1969; U.S. Department of Agriculture, Forest Service 1980)

Harvest: No forest management action has a more negative visual impact than harvesting an even-aged stand (Hull and Buhyoff 1986). In the foreground, trees dominate the view and frequently block out middle and background views. Any change to these trees will have enormous impacts on scenic beauty. Harvesting causes a loss of trees, an increase in dead and downed wood (slash), visibility of eroded soil and tracks, and a general loss of order in the forest environment. All this combines to drastically decrease scenic beauty. Shelterwood cutting is generally less visually destructive than clearcutting. It is important that vegetation at the edges of a **clearcut** gradually increase in height to decrease contrast and negative scenic impact of cut as viewed from a distance. It is also important to vary the harvest boundary so that it appears natural, irregular, and sympathetic to topographical contours. Skidding trails and loading zones need to be screened since these visual scars are the last to heal.

Scenic impacts of timber harvest are difficult to assess in isolation. The whole forest management program should be analyzed over the planning horizon as suggested by Hull and Buhyoff (1986). Harvesting, slash removal method, regeneration method, density, site index, rotation length, etc. all are important determinants of forest scenic beauty and all change from year to year as the stand matures. Harvesting is only one brief phase in the life of the forest.

Regeneration: After clearcuts, planted stands are generally more scenic than naturally regenerated stands. They have more scenic beauty because they grow faster, create rows that allow deeper visual penetration, and appear more neat and uniform. All of these increase scenic beauty (Hull and Buhyoff 1986; Schroeder and Daniel 1981). In general, any effort to keep some vegetation in the area after harvest

increases scenic beauty because it decreases visibility and softens the contrast of soil colors versus surrounding vegetation. For example, there is an 'esthetic shelterwood' management practice (U.S. Department of Agriculture, Forest Service 1980, p. 138) that requires one more entry into a stand than a normal shelterwood harvest but increases scenic quality.

Thinning: People tend to prefer open, park-like stands that result from thinning (Hull and others 1987; **McCool** and others 1986; Patey and Evans 1979; Schroeder and Daniel 1981). Hull and Buhyoff (1986) found that a heavily thinned stand is actually preferred (on average, over the long run) more than a lightly thinned stand, and sometimes more than an unthinned stand. The slash from both light and heavy thinning detracts from scenic beauty in the short term, but not enough to offset the increase in scenic beauty that occurs in the long term from having fewer, larger trees in the well-thinned stand. This increase in scenic beauty even surpasses some unthinned stands that never suffered from the loss in scenic quality due to slash.

Slash: Thinning and harvest operations produce dead and downed wood, which has a highly negative impact on scenic beauty (Arthur 1977; Benson 1982; Daniel and Boster 1976; Schroeder and Daniel 1981; U.S. Department of Agriculture, Forest Service 1980). Brown and Daniel (1984) found the long-term impacts of slash to be moderately negative and the short-term impacts to be extremely negative. This is intuitive, slash will decay with time, decreasing in height, amount and visibility.

Ground Cover: Understory vegetation (grass, shrubs) has a strong scenic impact. Generally, the impact is positive unless the understory becomes so large as to prevent visual penetration of the forest stand (Brown and Daniel 1984; Hull and others 1987; Schroeder and Daniel 1981).

Forest Density: Large trees tend to have a positive influence on scenic beauty and small trees a negative impact (Brush 1979; Herzog 1984; Hull and others 1987; Schroeder and Daniel 1981). A few large trees are preferred over many small trees, thus in two stands with equal basal areas, the one with the fewest trees will be preferred. This is the forest characteristic most easily and frequently controlled through management. It is fortunate that a forest that is well managed from a biological/economic perspective is also scenic (Brush 1979).

Rotation Age: Older trees and more mature ecosystems generally result in higher scenic values (Hull and Buhyoff 1986).

Man's impact: Natural landscape features are generally preferred over urban and built features. Likewise, signs of Man in the forest tend to decrease scenic beauty (Carls 1974). Houses usually decrease the scenic beauty of forested landscapes unless they are heavily screened by vegetation and built in harmony with the surroundings (Vining and others 1984).

Roads: A major impact of forestry is the road network that must be built in the forest. New road cuts are very unscenic because they contrast in color and shape with the forest and because of their visibility due to loss of vegetative cover. A road continues to detract from the visual quality of an area if it does not conform to the curves in topography. Roads well integrated into the forest may actually increase scenic beauty by increasing penetrability, legibility, and mystery (Kaplan 1985; U.S. Department of Agriculture, Forest Service 1977b).

Land-Use Designations: Anderson (1981) found observers' scenic evaluations to be dependent upon a descriptive title arbitrarily assigned to the land. The name itself influenced scenic evaluations regardless of actual forest characteristics. From most to least scenic in impact, the land-use labels are as follows: "wilderness," "National Park," "recreation area," "leased grazing land," "commercial timber stands." Thus, public perception can be influenced merely by the name a place is called.

Urban Forestry: Visual preference for urban forests increases with the following: increasing diameter at breast height, increasing basal area per stem, and increasing crown enclosure (Buhyoff and others 1984). In residential streets, scenic quality increases with increasing stem size (Lien and Buhyoff 1986; Schroeder and Cannon 1988).

Insects: Damage done to trees by pine beetles extends beyond the biological and economic realms. Scenic beauty is also degraded (Buhyoff and Leuschner 1978; Buhyoff and others 1982). This is especially true for viewers who have knowledge that tree damage is due to insects.

Ephemeral Landscape Characteristics: Features that change the landscape only temporarily tend to increase scenic quality (Hull and McCarthy 1988). Leaf color increases scenic quality, as do sunsets, wildlife (Hull and McCarthy 1988), and snow (Buhyoff and Wellman 1980).

General Factors Mediating Scenic Impact of Forest Management

Three general factors that influence the scenic impacts of all forest management actions are the temporal nature of forest management, the distance of the action from the viewer, and the topography in which the impact is located. These are discussed below.

Most forest management actions have long-term impacts on the visual environment, since the forest grows and continues to respond to an intervention. Thus, the visual impact of a forest management action is not static or temporary, it can continue for the life of the stand. For example, a thinning operation initially degrades scenic beauty because of creating slash, but over time the slash disappears and the thinned forest, which has bigger trees with more space between them, becomes much more scenic. Therefore, it is important to consider the scenic impacts of forest management actions as occurring over the whole planning horizon as suggested by Hull and Buhyoff (1986) and Brown and Daniel (1984).

The magnitude and character of most scenic impacts vary with the distance from which the stand is viewed. Most impacts lessen as distance from observer increases, but some impacts change in character as attention shifts from the specifics to the general (e.g., from the slash in the foreground of a **clearcut** to the outline and color contrast of the **clearcut** against uncut stands in the background). The Forest Service's Visual Management System has three basic distance classes: foreground (0 to 0.4 km.), **middle-ground** (0.4 to 4.8 km.), and background (4.8 km. to the horizon). Viewers are assumed to be much less sensitive to impacts occurring in the background and moderately less sensitive to impacts in the middleground. Most of the impacts described below refer to forest changes that occur in the foreground of the observer's view.

The magnitude and character of most scenic impacts also depend upon topography. Topography influences the extent to which the impact is visible. On the top of a hill a management action will be very visible because it disrupts the horizon. On mid-slope a management action will be very visible if the slope is facing the viewer because the entire action will be visible, nothing will be screened by vegetation. On a slope facing away from the viewer the action will be mostly out of view and the impact will be negligible. When the viewer is at the same elevation as the action and the action occurs on flat land, the impact will be minor since vegetation can easily screen much of the action from the viewer.

MANAGING VISUAL QUALITY

The Visual Management System (VMS) was developed by the Forest Service to meet legislative mandates requiring forest management to consider visual resources (for a review of this subject, see Smardon and others 1986; for an introduction to VMS see the USDA Forest Service Handbooks). VMS assumes that aesthetic value is inherent in abstract features of the landscape (line, form, color, harmony, etc.). The system categorizes landscapes based on similarity in land form in order to identify homogeneous land form types. Within each land form type, landscapes are further categorized by variability/diversity of various landscape features (topography, vegetation, water, and land use) to identify landscapes of 'distinctive,' 'common; and "minimal' visual quality. The 'sensitivity' of each tract of land to public viewing is also identified to determine how many people see the area, from what distance, and with what purpose (e.g., touring or commuting). With information on public sensitivity and inherent visual quality, each tract of land is assigned one of the following visual quality objectives, which place limits on the extent of landscape modification forest management can cause:

Preservation: Only ecologically induced changes in the landscape are allowed.

Retention: Management activities may not be visually evident.

Partial retention: Management activities must remain visually subordinate to the naturally appearing landscape.

Modification: The effects of management activities in the foreground and middleground may dominate the view but must appear natural.

Maximum modification: Management activities may appear dominant in the foreground and middle-ground areas, but should appear natural when viewed as background.

The VMS (and systems like it) is widely implemented and has proven very successful in maintaining and enhancing visual quality. However, it is limited in its usefulness by problems with defensibility and incompatibility. Both of these weaknesses can be strengthened through strategic use of quantitative psychophysical methods.

The Forest Service landscape architect, as the in-house expert and defender of visual quality must "go to bat" against experts for other resources armed with much more tangible and better defended resource estimates (e.g., board feet, net profit, animal unit months). It is important that all resource specialists have sound and defensible information to support their arguments. The VMS data, unfortunately, have come under fire for being low in measurement quality. That is, the data are low in sensitivity, reliability, and validity (Daniel and Vining 1988; Feimer and others 1981). Furthermore, in order to justify any management action on public lands, decisionmakers must demonstrate public participation, which is difficult for VMS since its visual quality assessments are those made by "experts" and not the "public," who feel quite able to make their own assessments.

Psychophysics is an attempt to quantitatively and rigorously relate changes in persons' evaluations of an environment to changes in the environment (see, Hull and others 1984, 1987). Numerous viewers are shown environments of interest (or surrogates- i.e. photographs) and asked to rate or compare them to other environments with respect to scenic beauty. Statistical techniques are used to factor out some of the biases due to differences among viewers in their use of the rating technique and to aggregate the evaluations of many viewers into one number. Once a scenic beauty estimate is obtained, regression analysis is used to relate the variations in scenic beauty with variations in the forest environment (e.g., scenic beauty = height, age). The psychophysical method produces estimates of high measurement quality (Daniel and Vining 1988) and may be used to represent the preferences of different concerned interest groups as well as the 'general public.' Thus, armed with psychophysical based estimates and traditional VMS information, the landscape architect will be in a better position to argue his/her case.

It is also important that the method used to manage visual quality be compatible with traditional forest management decisionmaking. Unfortunately, the VMS is rather inflexible. It is not set up to explore trade-offs between visual quality and other resources. VMS does not provide information about changes in visual quality which would result from proposed forest management actions, instead it places restrictions on forest management operations. This makes visual quality a constraint forest management must work around rather than a resource to be managed. Furthermore, modern forest management is often based on complex and quantitative decisionmaking tools (such as linear programming), which assist management in evaluating trade-offs and identifying

the 'best' forest management option. These systems work best with resource assessments of interval or better measurement quality and with assessments that are predicted by common forest variables. VMS assessments are of ordinal quality and the relationships between traditional forest measures and visual quality are not straight forward. Again, the psychophysical method can assist (see Brown and Daniel 1984; Hull and Buhyoff 1986; Hull and others 1987). Psychophysically based visual quality prediction models are quantitative, flexible, and can be driven by the same basic forest measurements used to assess other forest products. These properties allow trade-offs to be made. Furthermore, psychophysical prediction models are prescriptive and can assist the landscape architect and forest manager by suggesting how typical forest variables (dbh, tree height, etc.) influence visual quality. VMS, in contrast, is based on abstract characteristics (line, form, etc.), which are not directly controlled by forest management. The translation from these abstract visual properties to forest characteristics understood and managed by foresters requires someone with design training.

Psychophysical techniques are not without their critics, however (Daniel and Vining 1988; Goldbeck 1986; Sancar 1985; Zube and others 1982). Major objections include disagreement over claims of measurement quality, the validity of theory and findings, and the appropriateness of using public preferences to determine aesthetic quality and to set aesthetic policy.

On balance, the VMS and psychophysical procedures are concerned about somewhat different things. VMS is primarily concerned with the viewability of the landscape and management of the landscape. It places aesthetic value in the landscape rather than in the viewer. And, it places heavy emphasis on the 'naturalness' of a landscape and the ability of a landscape to typify an ecosystem (i.e. it is concerned with the 'character' of the landscape). The psychophysical procedure is primarily concerned with a person's reaction to the landscape. It places the aesthetic value of the landscape in the viewer and thus defines forest scenic beauty as whatever the viewer thinks it is. The psychophysically produced scenic estimates are of high measurement quality and involve public participation. VMS derived scenic estimates are less flexible and less defensible. VMS is in use on thousands of acres. Psychophysics is only beginning to be used.

Efforts to integrate psychophysically based visual quality systems with other forest product assessment and prediction systems have been successful (Daniel

and others 1984). The integrated pest impact assessment system (IPIAS) was developed in an effort to enable better decisions concerning forest insect damage in the Colorado Rockies. It integrates scenic, recreation, timber, insect, property value, and other forest products using prediction models driven by a common data base. For a given stand and a given management prescription, IPIAS will assess the impact of the action on each of the forest products. Work on this type of system is still in its early phases, but thus far the results are promising. They still have a long way to go before they can compare with the applicability of VMS, however.

POLICY IMPLICATIONS

First and foremost, basic research is needed to define the concept of visual quality. The difficulties with forest visual quality management and research seem due to a poorly defined construct. We must identify what it is that a scenic environment does to visitors so that we can then measure and manage it. We must identify the numerous products associated with visual quality and sort out which are relevant to various forest management situations. The purpose of the visitor while in the forest must be considered in the definition.

We should ensure that the current visual assessment/management systems are doing what we want. We should be asking what we need of a visual assessment/management system and how can it best integrate with multiple use forest management. Then, we should implement a system to meet these criteria. Visual quality management must allow tradeoffs to be made with other forest resources so that optimization-based forest planning is possible.

An inventory system for forest visual quality is needed as a basis to help answer the two issues raised above and as a basis to satisfy the resource inventory demands of RPA. Currently, no systematic approach exists to determine the overall amount and quality of the visual environment. There is not even a baseline. Buhyoff and others (1986) experimented with an inventory system that holds promise. The US. Department of Agriculture, Forest Service, has in place a Renewable Resource Evaluation program that continuously monitors forest- and land-use conditions at fixed points located around the United States. Buhyoff and others (1986) developed a visual quality sampling strategy, which was tied into this larger assessment system. Wider implementation of such a system would provide data to monitor forest visual quality.

SUMMARY OF MAJOR ISSUES RAISED HERE

Numerous important issues that deserve discussion and research were raised in this paper and are summarized below.

1. The existing definition of visual quality is inadequate. It must reflect how a viewer's purpose determines visual **quality**. And, it must reflect the numerous **benefits/products** associated with the visual environment. Perhaps there are numerous definitions.

2. More attention should be paid to a person's entire emotional response: scenic beauty/aesthetics is just one component of environmental affect.

3. There are numerous benefits/products derived from the forest visual environment. There needs to be a better understanding of these. Why is so much money and energy devoted to visual quality? What does it do for people?

4. There is a need to integrate formal aesthetic and psychophysical methods to better assist forest management. VMS has problems of defensibility and compatibility with which psychophysical systems can assist. Yet, psychophysical systems by themselves are complex and expensive and not as easily applied. Psychophysical systems can be used to validate design rules-of-thumb, to assess scenic preferences of various interest groups, to quantify visual quality, and to facilitate the making of trade-offs.

5. There is a need to debate whether the aesthetic criteria used to manage public lands should be set by experts trained in aesthetics who will 'lead' the tastes of the public to better things or whether aesthetic **criteria** should be set by the public who use the land and know what they like. Part of the debate revolves around the issue of whether aesthetic tastes are learned or innate. If tastes are learned, then using the public to set aesthetic criteria risks mirroring ourselves in a landscape that represents the mediocrity of aesthetic tastes learned a generation ago. **Gussow** (1979) asked the still **critical**, still unanswered question at the 'Our National Landscape' conference almost one decade ago:

'How do we preserve the best of the past, the quality in the present and permit additions and changes which reflect new energies and new, creative, adaptive capacities?'

6. Visual quality of a forest is not static. A change in the forest that occurred yesterday impacts scenic quality for years to come as the forest matures and responds to the change. Visual quality assessments should account for the temporal characteristics of scenic beauty. The 'impacts' of forest management actions should be assessed over the planning horizon of the forest, not just after the action occurs.

7. No assessments of visual quality have adequately considered the spatial component of a visual experience. We are animals of motion, We do not experience landscape scenes as disconnected entities. The major determinants of scenic beauty are likely due to the accumulations of scenes as one moves through the landscape.

8. A monitoring system for visual quality is needed to set a baseline, to satisfy RPA inventory demands, and to provide basic information about forest visual quality.

FUTURE SIGNIFICANCE OF VISUAL QUALITY

Since at least as early as the 1864 Yosemite Park land grant, our concern with landscape beauty has been recognized as national policy. However, because it is an intangible phenomenon, it has not been treated on equal footing with other resources. But, over the years, more and more attention has been given to the quality of our visual **environment**—this trend is likely to continue.

Opportunities for people to experience forested landscapes will increase with expanding leisure time, expanding transportation networks, and changing demographics. This should create a greater awareness of the benefits of visual **quality** and thus a greater constituency to support visual quality in political battles. Also, as we shift from a consumer, **growth-oriented** society—as we must in order to avoid totally fouling our nest, Earth—our priorities must shift (Dubos 1968, 1980). We must become less concerned with material things and more concerned with nature, less concerned about quantity and more concerned with quality. An increasing appreciation of our visual environment should result. In addition, as we continue to take note of the visual quality we have already

lost and as 'development' continues to take farm land, forest, and other traditional sources of scenic views, the increasing scarcity of scenic beauty will increase its value.

Forest visual quality advertises the quality of forest management and forest policy. The visual environment is readily available to the public, and the public feels qualified to evaluate it. As the public's sophistication and concern with environmental issues increases, the quality of the visual environment will increasingly be called into question. The Forest Service will need to maintain high standards for the visual environment or attract negative **criticisms** from the viewing public regarding all lines of forest management concerns.

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Forty-one papers addressing the outdoor recreation resource and its benefits to the American people are presented in eight categories: General Trends and Issues; The Outdoor Recreation Resource; Trends and Current Status; Trends in Recreation Participation on Public and Private Lands; Outdoor Recreation Demand Forecasting; Outdoor and International Recreation Demand; Wilderness Resources and their Recreational Uses; Social Psychological Dimensions of Recreation Participation; and Social, Economic, and Environmental Implications of Outdoor Recreation Demand and Supply Interactions.

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The Forest Service, U.S. Department of Agriculture, is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives-as directed by Congress-to provide increasingly greater service to a growing Nation.

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