
CHAPTER II

FRAMEWORK FOR THE ASSESSMENT

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INTRODUCTION

In 1974 the United States Congress established a process for assessing the state of the forest and range resources in this country through passage of the Forest and Rangeland Renewable Resources Planning Act (RPA). The RPA directed the secretary of agriculture to assess the demand, supply and condition of all forest and range resources in the United States and to submit the first of these assessments by December 31, 1975. A five-year update to this first assessment was mandated for 1979. The act then directed the secretary to establish an ongoing process for updating the national RPA assessment every 10 years after reporting the findings from the 1979 assessment.

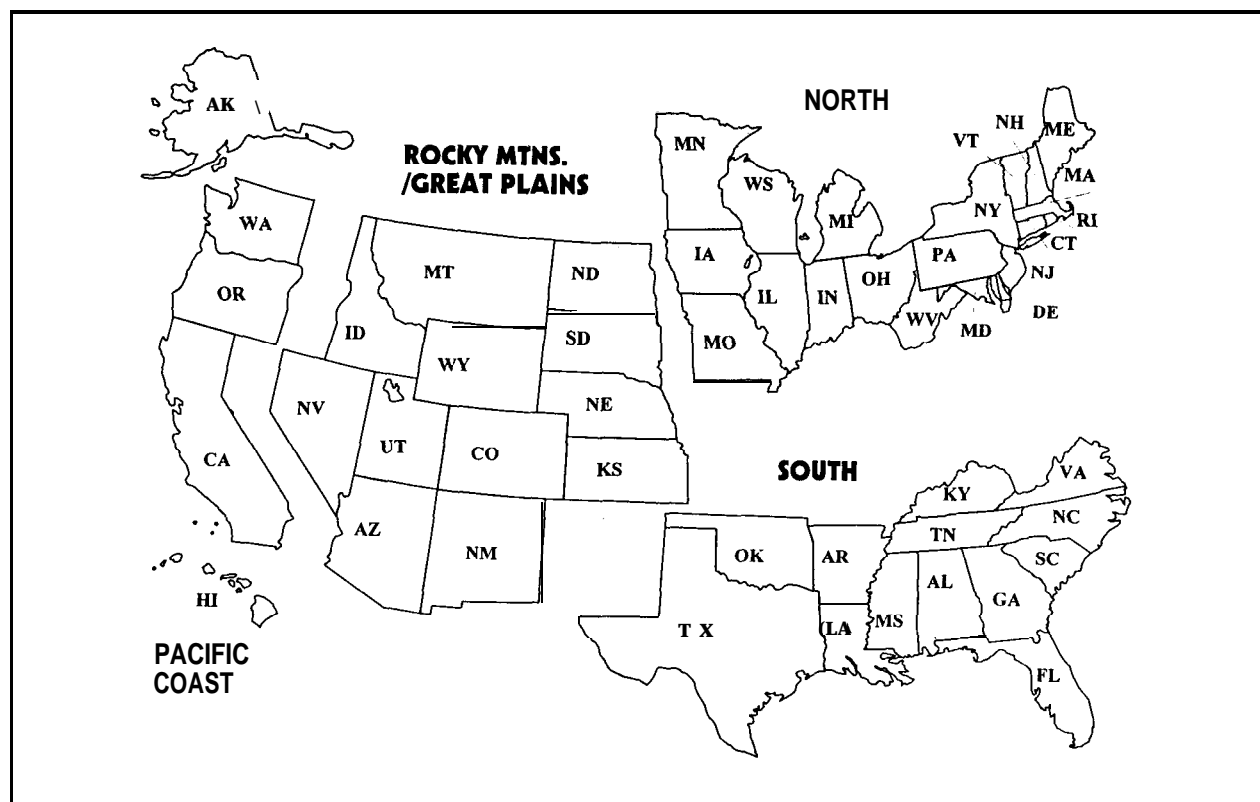
The intention of the RPA assessment was and is to describe recent trends, current condition and likely futures for timber, water, wildlife and fish, range, minerals, and outdoor recreation and wilderness in the United States. This book represents the fourth of the outdoor recreation and wilderness studies done to meet the mandates of the 1974 RPA. The other studies covering the other resource areas mentioned above are published elsewhere by the specialists covering each of those areas.

The scale of outdoor recreation and wilderness assessments prior to this one was primarily national. Secondly, as was possible given data limitations, regional differences were described and interpreted. As the assessment process has evolved and capabilities have progressed from the first one in 1975, demands for regional information have grown. While the overall national picture is still very much of interest and is the major focus of this assessment, more emphasis has been placed on identifying regional differences and on examining geographic patterns of the primary study variables at the scale of individual counties. The makeup of the four assessment regions is shown in Figure 11.1. More easily accessible data at county level and advances in GIS tools for microcomputers have now made county-scale examinations of geographic patterns of outdoor recreation and wilderness resources and uses feasible. This assessment of outdoor recreation and wilderness provides national, regional and county-scale results.

Past assessments also focused on comparing demand and supply trends through a constructed “gap” analysis. The gap of reference was the difference between demand for outdoor recreation and wilderness opportunities and the supply of these opportunities. Chapter IV of the 1989 assessment was devoted to such a gap analysis (Cordell, et al., 1990). This had been the traditional econometric approach to identifying imbalances between supply and demand where such differences could be viewed as problems, or opportunities, for setting policies and programs to better match demand and supply. While the RPA assessment has always been carefully designed to deal only with fact finding and non-prescriptive interpretation, findings indicating gaps between demand and supply were found useful in identifying areas where policy changes could be considered. Indeed, this is the reason for conducting such an assessment in the first place.

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Figure 11.1: The four RPA Assessment Regions, 1997



While comparisons between demand and supply in the form of a gap analysis were highly informative, the complexity and assumptions underlying such an analysis made communication of its findings difficult. For this assessment, a formal gap analysis is not attempted. Less of a statistical approach has been adopted. Primarily the approach in this assessment is to use the expert judgement of the assessment specialists to examine supply trends across the spectrum of opportunities the public and private sectors provide in light of demand trends and projections. From this less formal “gap analysis” and based on knowledge of issues in outdoor recreation and wilderness, we attempt to identify policy, management and research implications for the country. It is the authors’ opinion that this form of qualitative comparison can provide valid insights just as the more quantitative econometric gap analysis does.

Thus, the *framework* for this national assessment of outdoor recreation and wilderness includes the following activities:

- Inventory and describe trends in the availability of the land and water resources of this country for outdoor recreation uses, both publicly and privately owned.
- Examine in depth the availability of *private rural lands* for outdoor recreation and the conditions under which access is permitted.
- Describe recent trends and current **participation** in outdoor recreation by region of the country and across social groups.
- Forecast **future participation** trends under widely accepted assumptions about future population growth, changes in population makeup and shifts in the availability of recreation opportunities.
- Describe recent trends, the current situation, and likely future **wilderness system** designations, uses, and values.
- Describe the public’s **perceptions** and evaluations of recreation opportunities in the United States.
- Interpret the implications of resource availability, demand, and other trends for future resource management, policy, and research.

In the preceding chapter, introductory text was provided about the benefits and the histories of outdoor recreation and wilderness. Dr. Beverly Driver is internationally known for his work on the meaning of and

management for benefits of outdoor recreation. He offered the first section of Chapter I on benefits as he was retiring from the U.S. Forest Service.

Following Dr. Driver's treatise on benefits, Dr. Robert Douglas provided a review of the history of outdoor recreation in the United States. Dr. Douglas has written his own books on the subject, has completed numerous studies of participants and management issues, and has taught for a number of years in one of the country's larger universities. This history helps set the context for the analysis and examination of issues that follow in later chapters. Following Dr. Douglas' history is Dr. John Loomis' history of wilderness in this country as it moved toward and ended up as the National Wilderness Preservation System in 1964. Dr. Loomis' history helps set the context within which we later examine in detail wilderness demand and supply trends in the U. S.

In the following sections, brief descriptions are provided of the thought, data, analyses, and approaches used to address each of the core elements of the earlier described assessment framework. Details of the data and analysis for any one of these elements are provided as technical appendices to each chapter as needed. The chapters themselves are devoted to describing the findings of the analyses.

RESOURCES AND OPPORTUNITIES-CHAPTER III

As with the other resource areas about which the overall RPA assessment is concerned (wildlife, etc.), this assessment covers all sources of outdoor recreation opportunities. These sources include federal agencies, states, local government, and-private lands and businesses. While our primary emphasis is natural-resource-based recreational opportunities, some attention also is given to facilities for outdoor sports and other activities that are usually found in urban settings. Private sources of opportunities are viewed as being as important as public-sector opportunities. For the most part, in fact, public and private opportunities complement one another.

To add depth to the assessment analyses, numerous agency, professional, and industry representatives were-invited to contribute short papers for this chapter. These contributed pieces have added enormously to our understanding of the trends uncovered in the data. Outdoor recreation touches almost all the individuals and institutions in this country, and having the short papers from some of these individuals and institutions adds insight into the ways recreation opportunities are made available to Americans.

A key concept in our assessment of outdoor recreation resources is "availability." Not all land, water and snow/ice resources are available, and the nature of availability varies widely among individual outdoor recreational sites. For example, portions of most military bases are closed to the public for security reasons. Some private holdings are closed to the public to protect crops or because of potentially conflicting other uses. Our intention is to identify the land, water, snow/ice and developed resources which are available for outdoor recreation use and which thus represent opportunities for the public. We attempt to describe these opportunities as they currently exist and to identify and describe trends in the area, number, and location of these opportunities.

The content of our examination of outdoor recreational opportunities includes:

- Federal properties across the seven major land management agencies, plus coverage of military, Indian, and marine sanctuary properties.
- Specially designated federal systems including wilderness, national recreation areas, national trails, and national rivers.
- Campgrounds and other camping facilities, both public and private.
- Public/private partnership resources, specifically two umbrella programs that have grown substantially in the 1990s: Scenic Byways and Watchable Wildlife.
- State recreation lands including state parks, forests, wilderness, fish and game lands, state trails, and scenic rivers.
- Local government park and recreation agencies, local facilities and sites, park districts, outdoor recreation in urban areas, and greenways.
- Recreational access to private lands, industrial and nonindustrial; nature conservancy preserves; and private recreation businesses, both the providers of facilities and the providers of services.

The above categories of recreation resources and opportunities are covered in a data base referenced as NORSIS. NORSIS is the acronym for the 1997 National Outdoor Recreation Supply Information System. NORSIS contains over 400 separate measures of recreation opportunities from boat ramps, campgrounds,

and downhill ski lift capacity, to area in national parks and national forests. Where extant at county scale, the supply measures were entered at that scale directly from the secondary sources. Where available at site scale, data were aggregated across sites and summed to totals for each county. For some measures of recreation resources and opportunities, data were available only at state, regional, or national scale. In presenting the findings from our analysis of the data in NORSIS, county-scale maps were produced for key measures to indicate the geographic pattern of availability. To see the overall pattern of availability across the many measures in NORSIS, indexes were estimated across related measures of opportunities, enabling display of a more limited number of measures to provide a more comprehensive look at the patterning of outdoor opportunities. Trends in these indices were also examined.

PRIVATE RURAL LANDS-CHAPTER IV

Private rural lands make up over 60 percent of the land base of the 48 contiguous states-approximately 1.28 billion acres. Especially in the East, private land is an extremely important potential resource for outdoor recreational use. Unlike public lands, there is very little information available from existing sources covering recreational opportunities on private lands. Because of the magnitude of the recreational opportunities these lands represent and because lack of data meant it was necessary to conduct a national survey of private land holders for this assessment, Chapter IV is devoted specifically to recreational access and ownership issues on rural private lands.

Continuing with application of the concept of availability, the approach for examining recreational opportunities on private lands was to survey land owners to obtain the data needed to estimate four types of availability:

- (1) Portions of private holdings on which recreational use was restricted to family, friends, neighbors or employees only.
- (2) Portions of holdings leased to individuals or groups for their exclusive use.
- (3) Portions of holdings available to anyone for recreational use, including both those holdings requiring permission or a fee and those not requiring permission.
- (4) Portions of holdings completely closed to anyone except the immediate household of the owner.

The survey was entitled the National Private Land Owners Survey (NPLOS). To enable tracing of trends in availability, this most recent NPLOS was designed so that the essential measures were consistent with those in previous surveys. The 1995 NPLOS is the third in a continuing series of NPLOS studies conducted at 10-year intervals. The first was in 1975.

The primary interest driving NPLOS is in estimating the area of private land, nationally and by region, that is available for public recreational use. The estimate of this area of available land derived from NPLOS data is the sum of above accessibility categories two and three.

A continuing concern within the overall RPA assessment process is avoiding inconsistencies in reporting area of land and water across assessments of the different resource areas. For example, area of forested land estimated one way for the outdoor recreation assessment could easily disagree with area of forest estimated another way for the timber assessment, unless common definitions and sources of data were used. To avoid such inconsistencies, statistical estimates of area from the NPLOS study focused only on proportions of private land among the above-listed access categories. The end step in estimating area was to use the NPLOS-derived estimates of proportions with widely accepted sources of areal data, including the National Resources Inventory, which is conducted every five years by the Natural Resources Conservation Service. Also used was total land area at county scale as maintained by the Bureau of the Census. Areal estimates for this assessment were generated at regional scale and disaggregated to county scale.

In addition to the primary emphasis on estimating area by type of accessibility, descriptions of private land and of the owners were developed from the NPLOS survey data. Land ownership objectives, land uses and vegetative cover types, problems encountered from others' use of private lands, and characteristics of owners were attributes analyzed to identify associations with different levels of availability for recreation.

PARTICIPATION-CHAPTER V

A central element of this assessment is the description of recent trends, current levels and likely future trends in participation in outdoor recreation activities by the American public. To enable fully covering par-

ticipation trends and patterns across the country, an update of the ongoing series of National Recreation Surveys was planned and executed (Cordell, et al., 1996). This most recent of the National Recreation Surveys was entitled the *National Survey on Recreation and the Environment* (NSRE). The data from the NSRE provided the primary basis for estimating percentages of the population, numbers of participants, number of days during which people participated, and number of trips taken primarily for outdoor recreation. Where possible, current participation estimates were compared with estimates from previous National Recreation Surveys (1960, 1965, & 1982-83) to describe trends, both recent and long term. In keeping with the structure of the resources and opportunities analysis, participation was categorized as primarily land, water, or snow/ice based. In addition, estimates of participation for individual activities were generated.

Other sources of data were employed as needed to describe types of participation outside the scope of the NSRE. These sources included studies of mountain biking, information on bird watching participation, federal and state visitation data, industry and Department of Commerce data on sales and consumer spending, and data on international visitation to the U.S. for tourism.

The principal elements of the data and analysis for describing participation and trends from the NSRE and the other sources described above included:

- Current participation levels for land, water, and snow/ice recreational activities and types of participation (summaries across related activities, e.g., all types of hunting). Included also are participation in outdoor sports (not nature based), estimates of number of days and trips participants took during the year of the survey, and participation patterns by the most active of participants, the enthusiasts.
- Long-term (from 1960) and recent (from 1982-83) participation trends in comparable activities across the various National Recreation Surveys, including land, water, and snow/ice activities.
- Comparisons of participation across activities by various groups within American society, including racial, age, sex, and income groupings.
- Comparisons of participation across regions of the country, including the four assessment regions (North, South, Rocky Mountains and Great Plains, and Pacific Coast) and nine more disaggregated forest regions (Alaska, Pacific Northwest, Pacific Southwest, Intermountain, Northern Rockies, Rocky Mountain, Southwestern, North, and South).
- Estimates of visitation at developed sites and in dispersed areas managed by the federal land and water managing agencies and visitation at state park systems.
- Recent trends (since 1986) in consumers' spending on outdoor recreation equipment and services and industry sales and revenues associated with outdoor recreation purchases.
- Trends and current levels of international visitation to the United States with emphasis on visitation associated with nature-based tourism.

These elements of Chapter V covering outdoor recreation participation were examined closely to surface new trends, as well as to determine if trends of the past were continuing.

FUTURE PARTICIPATION—CHAPTER VI

This portion of the assessment provides a method for examining the effects that demographic, population, and resource availability factors may have on outdoor recreation participation in future years. The factors examined include age, income, sex, region of the country, nearby recreation opportunities, and population growth. From this analysis, projections of likely participation changes in the future for winter, water, wildlife, dispersed land, and developed land recreation activities have been developed.

As in the previous assessments of outdoor recreation, the approach is to estimate cross-sectional models by measuring the association between variation in observed recreation participation and variation in demographic makeup and recreation opportunities available to participants. With these associations estimated, future participation can be estimated using projections of change in the factors identified in the models as having significant cross-sectional associations with participation. The factor representing availability of recreational opportunities was measured using the resource measure in the NORSIS data set that best reflected the nature of the resources (sites, facilities, and services) important to each activity.

Two forms of models were estimated to support projections of future participation patterns. The first was a logistical regression model, which is the appropriate form for estimating association between incidence of participation/nonparticipation and the demographic and opportunities factors. The second was a count data model, which is appropriate for estimating the association between counts of numbers of days of participation and trips away from home for recreation. Both forms of models were estimated for 23 separate recre-

ational activities for each of the four assessment regions. Projections of the factors in the models were obtained from the Bureau of Census and the USDA Economic Research Service.

Following is the structure used for reporting the results of the projections:

- Of the 23 separate activities, similar ones were grouped into winter, water, wildlife-related, dispersed-land and developed-land groups.
- Projected future participation was reported by activity and for activity groups at national and regional levels.
- All projections were developed for the year 2000 and then for each decade after that up to 2050.

In using and discussing these projections, the uncertainty of how recreation may trend in this country in the future and of the ability of statistically estimated cross-sectional models to predict this future was kept in mind. Our interpretation of the projections, therefore, is that they provide useful information about potential changes in outdoor recreation demand if the population and its characteristics trend as predicted.

NATIONAL WILDERNESS PRESERVATION SYSTEM-CHAPTERS VII AND VIII

Two chapters were devoted to the wilderness portion of this assessment. For the most part, this assessment includes federal lands identified by congressional designation in the National Wilderness Preservation System (NWPS) as the wilderness resource. A widely accepted convention, and one used here, is to identify designated Federal Wilderness by capitalizing the first letter of the term. This helps distinguish designated Wilderness from the many other conceptualizations of wilderness, many of which see it simply as remote areas seldom entered by humans.

The base analysis underlying the Wilderness assessment is presented in Chapter VII. This chapter begins with an examination of the long-term trends in the Federal Wilderness System since its beginnings in 1964. The emphasis is on Wilderness Areas within the National Forest and the National Park Systems. Examined also are qualified federal roadless areas and the representativeness within the current system of the different types of ecosystems across the United States.

In addition to the Federal Wilderness System, composition of the eight state wilderness systems is described, including their recreational uses. Impacts of use and threats to resource health of these state systems are covered.

Acknowledging the importance of Wilderness as a recreational opportunity, use trends on areas managed by the four administering agencies are traced. Lack of good data on recreational uses of Wilderness is a limitation of this section of the assessment. In addition to the "on-site" recreational benefits of Wilderness, "off-site" benefits are explained and research exploring these benefits is described. These benefits include option, existence, and bequest benefits. Another benefit of Wilderness is protection of remnant portions of natural ecosystems. GIS maps illustrate which ecosystems are protected under the National Wilderness Preservation System.

Parallel with the modeling completed for projecting future recreation participation, as presented in Chapter VI, models were estimated of trends in Wilderness visitation using a time-series, fixed-effects approach. Since reliable visitation trend data were available only for the Forest Service and the National Park Service Wilderness Areas, models were developed for these two portions of the NWPS only. Demographic, area designation, and regional effects on visitation trends were estimated. Future recreational use of Wilderness was estimated using the resulting models and forecasts of the values of the variables found important in the models for future years of interest. One effect of interest was changes in visitor use resulting from increased Wilderness designation.

In addition to assessment of the status and use of the National Wilderness Preservation System, coverage is included in Chapter VIII of Wilderness uses, users and values and of current challenges to managers of the Federal Wilderness System. The material covered in this chapter deepens the understanding of trends in Wilderness recreational uses and users and provides an update of Wilderness management policies and issues from the perspectives of the managing agencies.

Drs. Watson and Cole of the Leopold Wilderness Research Institute describe changes in demographics of users and in use patterns of Wilderness from their and others' research in recent years. Also examined are changes in attitudes toward wilderness management. Drs. Friese, Kinziger, and Hendee of the University of Idaho follow with an examination of a particular use of Wilderness, visiting areas for personal growth reasons. Mostly, this section of the chapter covers wilderness experience programs and the trends in popularity of

these programs in recent years. Next, Drs. Watson and Landres of the Leopold Wilderness Research Institute trace values and the evolution of values toward Wilderness from the time of establishment of the Wilderness System. The effect on Wilderness values of the many and dramatic societal changes that have occurred since the 1960s is examined, as is the importance of understanding value shifts in Wilderness management.

Following the above described papers on use, users and values, three of the four federal agencies which manage portions of the National Wilderness Preservation System discuss management issues. Wilderness specialists in each of the four federal agencies were invited to develop papers describing recent trends, current conditions, and likely future challenges. Perspectives from the U.S. Forest Service (Geary and Stokes), the Bureau of Land Management (Jarvis), and the National Park Service (Henry) are included. The philosophies underlying Wilderness management and the issues and challenges facing federal agencies are obviously different from those of the 1960s and 1970s and are trending from where they were at the time of the last assessment in 1989. A major change has been the establishment of the Interagency Wilderness Management Strategy, which is described.

MOTIVATIONS, PREFERENCES, AND **SATISFACTIONS**—CHAPTER IX

To improve understanding of trends and likely futures of outdoor recreation and Wilderness supply and demand, a review of recreationists' preferences, perceptions, and expectations is provided in Chapter IX. The first section of this part of the assessment is an analysis of the CUSTOMER data covering the preferences and satisfactions of visitors to a sample of recreation sites across the country. CUSTOMER is an acronym for Customer and Use Survey Techniques for Operations, Management, Evaluation and Research. CUSTOMER was conceptualized and designed by Cordell and others at the Forest Service Outdoor Recreation and Wilderness Assessment Research Unit in Athens, Georgia. Interviews of over 11,000 visitors at 31 recreation areas across the country were conducted from 1991 to 1994, and participants were asked their preferences for and satisfactions with both general and setting-specific attributes of recreation sites. Preferences and satisfactions were analyzed using the importance-performance framework to identify the importance of various attributes (facilities, scenery, and services) and their satisfactions with these attributes during the visit on which they were interviewed. The importance-performance analysis was then used to identify attributes that may warrant greater management attention in the future.

The second section of this chapter examines findings from a review of published literature on preferences and expectations for outdoor recreation experiences. First examined are the motivations for participating in outdoor recreation among segments of the American public. Next, the review covers experience preferences among recreation participants and attitudes toward encountering other recreation participants while at an outdoor recreation site. This latter portion includes the perceptions and effects of user crowding at recreation areas and visitors' preferences for the optimum number of others they encounter while recreating. This literature review is intended to provide a better understanding of the implications of continued growth in the popularity of outdoor recreation in the United States as the limited number of recreation sites and opportunities seem likely to become more heavily used.

IMPLICATIONS-CHAPTER X

Chapters III through IX contain the key findings for this assessment of supply and demand. These key findings are the basis for describing the implications of trends in outdoor recreation and wilderness as we near the end of the 20th century and look beyond. It is acknowledged by the assessment team that the implications identified are those of the team. It is likely that a somewhat different set of implications could result from the interpretations of others. The reader of this book is encouraged to think of the implications of this assessment's findings as reading and studying proceed.

COMMENTS ABOUT THE CURRENT ASSESSMENT CAPABILITIES AND DATA

As with any undertaking that relies in part on secondary data, has a limited budget, and is staffed with a particular team of scientists and analysts, this assessment has strengths and weaknesses which need to be acknowledged. For this fourth national assessment of outdoor recreation and wilderness, strengths to be built upon and areas where improvements would be desirable are noted below.

Strengths

The assessment of trends in the availability of outdoor recreation opportunities is the most comprehensive compilation to date of supply indicators across both public and private sectors in this or any other country. The data were developed at county scale wherever possible; this relatively fine level of aggregation enabled much greater capabilities for modeling, indexing, and mapping.

Lacking up-to-date data on recreational access to private rural lands, examination of recreational opportunities across the vastness of the private lands of this country was undertaken by conducting an original survey of the owners of these lands.

Participation trends and current demand for outdoor recreation were, for the most part, supported by an original population survey designed specifically to meet the assessment requirements for descriptive and model-based results. The National Survey on Recreation and the Environment also tied back to the National Recreation Survey series originating in 1960.

Recent past and current trends provide only limited information about the future beyond the year 2000. Original research was conducted to estimate forecasting models of future demand as it might occur given changes in population, demographics, and availability of opportunities.

Coverage of the National Wilderness Preservation System and complementary state systems and candidate roadless areas has been improved over the work done for the 1989 assessment. Added were future demand models and reviews of changes in preferences, attitudes, and values people hold about Wilderness in this country.

Much more coverage was given in this assessment to recreation visitors' preferences, satisfactions, motivations, and expectations. This additional coverage provides much deeper understanding of the possible implications of growth in outdoor recreation participation in the United States, a growth that seems assured to continue into the future.

Numerous user and provider groups and special topic experts have added specific short papers to Chapters III, V₂ and VIII. These papers provide depth and diversity of information about specific interests and industries that would not otherwise be possible.

Weaknesses

While public participation in outdoor recreation has grown to unprecedented levels, public budgets and professional interest in maintaining up-to-date data about the status of outdoor recreation and Wilderness in the United States has waned. In some cases, data that existed in the past exist no more. In other cases, the indicators of supply changes used were indirect measures because directly applicable data were not available.

Reliable measures of the amount and kind of recreational activity at outdoor areas in general, and of Wilderness specifically, are practically nonexistent for the 1990s. Reported visitation statistics are usually not based on actual counts or statistical sampling designs.

In addition to the National Survey on Recreation and the Environment, other population surveys are conducted using different designs and sample sizes. It is difficult to use the results of other surveys, given their differences in design and in some cases differences in estimates of recreation participation.

Time series data on recreation participation are not adequate to support time series model estimation, which is viewed by many as superior to cross-sectional models to predict changes in demand across future times.

The analysis of demand and supply in this assessment stops at the U.S./Mexican and U.S./Canadian borders. Yet it is obvious that recreation trends and recreational travel do not stop at these borders. This situation has likely led to some bias in the estimates of trends reported in the chapters that follow.

REFERENCES

- Cordell, H. K., Bergstrom, J. C., Hartmann, L. A., & English, D. B. K. (1990). *An analysis of the outdoor recreation and wilderness situation in the United States: 1989-2040*. Ft. Collins, CO: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, GTR RM-189.
- Cordell, H. K., et al. (1996). United States of America. In G. Cushman, A. J. Veal, & J. Zazanek (Eds.), *World leisure participation: Free time in the global village*. Wallingford, England: CAB International.