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Experiment Station**

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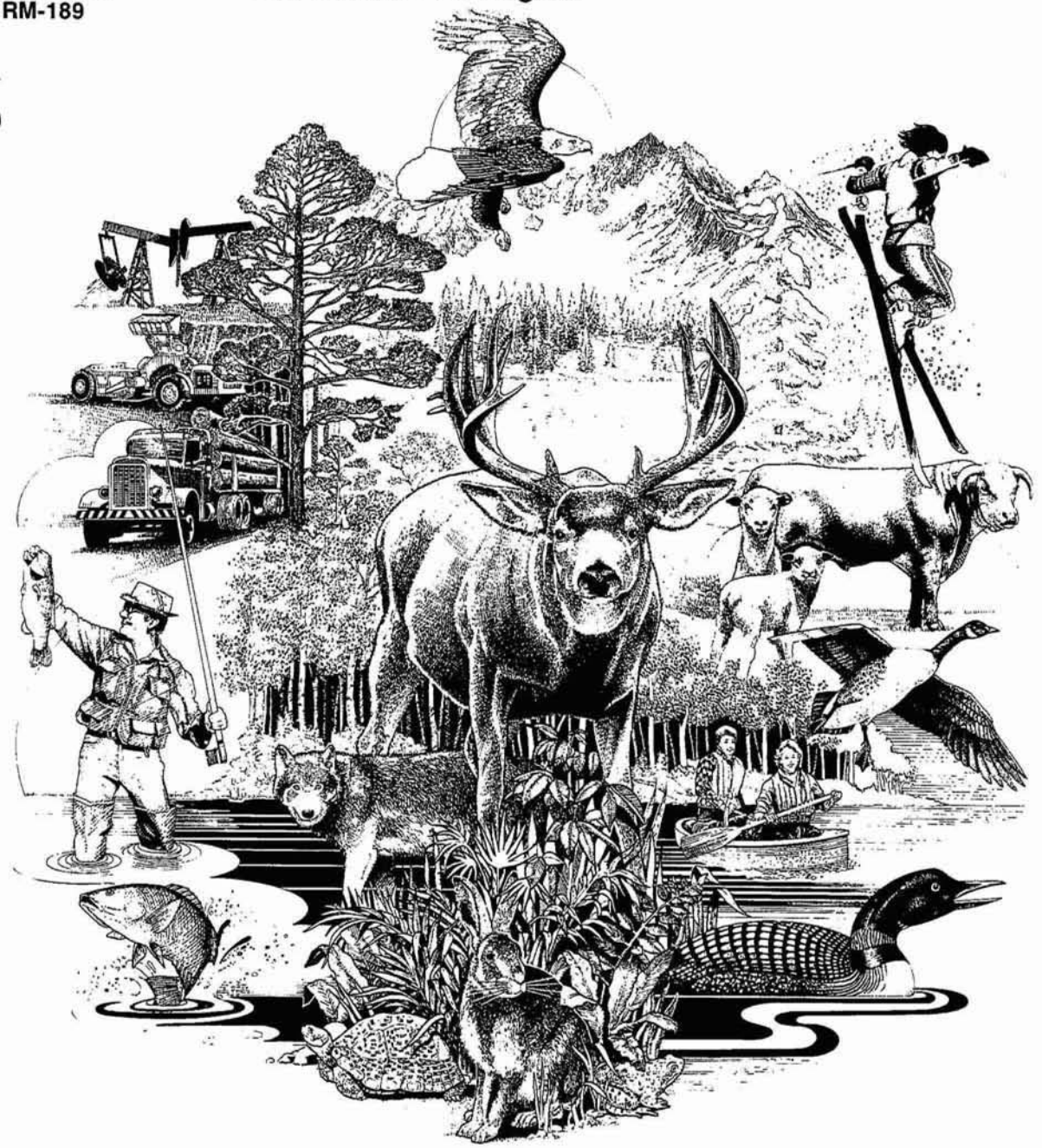
**General Technical
Report RM-189**

An Analysis of the Outdoor Recreation and Wilderness Situation in the United States: 1989–2040

A Technical Document Supporting the 1989 USDA Forest Service RPA Assessment

H. Ken Cordell, John C. Bergstrom, Lawrence A. Hartmann, and Donald B.K. English



Preface

The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), P.L. 93-378, 88 Stat. 475, as amended, directed the Secretary of Agriculture to prepare a Renewable Resources Assessment by December 31, 1975, with an update in 1979 and each 10th year thereafter. This Assessment is to include "an analysis of present and anticipated uses, demand for, and supply of the renewable resources of forest, range, and other associated lands with consideration of the international resource situation, and an emphasis of pertinent supply, demand and price relationship trends" (Sec. 3.(a)).

The 1989 RPA Assessment is the third prepared in response to the RPA legislation. It is composed of 12 documents, including this one. The summary Assessment document presents an overview of analyses of the present situation and the outlook for the land base, outdoor recreation and wilderness, wildlife and fish, forest-range grazing, minerals, timber, and water. Complete analyses for each of these resources are contained in seven supporting technical documents. There are also technical documents presenting information on interactions among the various resources, the basic assumptions for the Assessment, a description of Forest Service programs, and the evolving use and management of the Nation's forests, grasslands, croplands, and related resources.

The Forest Service has been carrying out resource analyses in the United States for over a century. Congressional interest was first expressed in the Appropriations Act of August 15, 1876, which provided $2,000 for the employment of an expert to study and report on forest conditions. Between that time and 1974, Forest Service analysts prepared a number of assessments of the timber resource situation intermittently in response to emerging issues and perceived needs for better resource information. The 1974 RPA legislation established a periodic reporting requirement and broadened the resource coverage from timber to all renewable resources from forest and rangelands.

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Contributors to chapter I, The Outdoor Recreation and Wilderness Resource Base, were Walter Cook (University of Georgia)—nonfederal wilderness areas; Douglas McEwen (Southern Illinois University)—private campgrounds; Linda Profaizer (Woodall's Publishing Company)—commercial facilities; Laura Szwak (National Park Service)—nonprofit organizations; Brett Wright (George Mason University) and Allen Rowell (formerly Forest Service)—nonindustrial private forest lands; Pat Reed—wilderness; Jim Absher (University of Georgia)—wilderness substitutes; Ellen Absher (Consultant)—state recreation lands; Barbara McDonald (National Oceanic and Atmospheric Administration)—local government recreation; and Gail Vander Stoep (University of Massachusetts)—interpretation resources.

Contributors to chapter II, The Demand for Outdoor Recreation and Wilderness, included Joe O'Leary (Purdue University)—demand modeling and social trends; Gina McLellan (Clemson University)—trends in outdoor recreation; Helen Freilich (Forest Service)—trends in population participation; Kathy Andereck, Muzzafer Uysal (Clemson University), and Marsha Iyomasa (formerly U.S. Travel and Tourism Administration)—international tourism; Pam Walker (Forest Service)—recreation and the disabled; Alan Ewert (Forest Service)—high risk recreation; Carter Betz (formerly Forest Service)—federal/state comparisons; Pat Reed—nonrecreational use of wilderness; Barbara McDonald—local area participation; Betsy Sale (Virginia Commonwealth University)—user attitudes, expectations and conflicts; Carter Betz—projections; and Dan Hope (University of Georgia)—demand trends.

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HIGHLIGHTS: OUTDOOR RECREATION AND WILDERNESS IN AMERICAN LIFE

Outdoor recreation and wilderness are part of our American heritage. The President's Commission on Americans Outdoors (1986) observed:

> The majesty of the great outdoors helped make America and Americans what we are today. No mere coincidence matched a national character of independence, of resourcefulness, and of generosity, with a land of splendor, vastness, and inspiration.

Not only is the out-of-doors a central part of our history, it is also an important part of our contemporary lives.

People go outdoors for many reasons—for exercise, challenge, competition, relaxation, a change of pace or scenery, for beauty, to be with family or friends, solitude and contemplation, or to study nature or history. Popular activities include driving, walking, swimming, camping, picnicking, skiing, or playing sports such as baseball or soccer. But Americans also birdwatch, study history, garden, rockclimb, windsurf, and sunbathe. In fact, a single outing typically involves several activities. Driving, picnicking, socializing with family or friends, and observing nature could easily be included in a single trip.

People enjoy the outdoors from their own urban backyards to remote wilderness. Their enjoyment often begins well before they arrive and often lasts long after they return. Other people enjoy and value these areas, especially wilderness, without ever traveling to them.

The outdoors offers only one of the many alternative ways that people can occupy their leisure time. Video movies, computer games, a variety of indoor sports, plays and social events, and restaurant dining attract people indoors. While the ways people spend their leisure is changing, people experience a continuing need to go outdoors as a contrast to the indoor lives they lead. The Domestic Policy Council's Task Force on Outdoor Recreation Resources and Opportunities (1988) eloquently summarized this situation:

> Whatever it may be, outdoor recreation is a leisure moment outdoors, freely enjoyed. It has no boundaries and no bounds beyond those of wondering and wandering in the outdoor environments—not even the spacious skies, the majestic purple mountains, the sunrise or sunset, and the ever-changing seasons which bring a new dimension to each moment and each day. Outdoor recreation is life rejoicing in the outdoors.

The Values of Outdoor Recreation and Wilderness

Americans benefit from outdoor recreation and wilderness in many ways. The President's Commission put it this way: "Outdoor recreation helps us accomplish personal goals—fitness and longer life, family togetherness, friendship, personal reflection, and appreciation of nature and beauty" (PCAO 1986). The Commission identified a number of social, economic, and environmental benefits stemming from outdoor recreation.

Outdoor recreation contributes to personal health. Physical fitness is a primary reason for engaging in outdoor sports, but outdoor activities also contribute to mental health by reducing stress.

Outdoor recreation creates jobs and invigorates local economies. In addition to consumer spending for outdoor recreation ($132 billion in 1986) (Domestic Policy Council 1988), local and regional economies benefit from the jobs, taxes, and tourism generated both directly and indirectly by the demand for outdoor recreation.

Outdoor recreation contributes to family cohesion. In one study, families said they pursued outdoor activities to strengthen family ties. It provides links between generations such as when parents teach their children to hike, camp, identify wildlife, hunt, or fish.

Outdoor recreation can help prevent crime. Young offenders in a program that featured outdoor sports and other outdoor activities had a far lower rate of repeat offenses than did participants in five other nonoutdoor programs.

The outdoor environment enriches America's culture as evidenced by books, plays, poetry, and art featuring nature and outdoor activities.

Outdoor activity has stimulated public interest in the quality of the environment and helped generate public support for control of air and water pollution and the preservation of land, water, and wildlife.

Wilderness also produces most of these recreational benefits. In addition, wilderness often provides other nonrecreational benefits to our culture. It helps preserve life-sustaining diversity in nature and some of the best places to measure change in our environment. Air and water are cleansed, and many commercially important fish and wildlife species begin their lives in wilderness.

A Brief History of Outdoor Recreation and Wilderness in America

The natural environment has always been a central element of American culture, yet it was not until the late 1800's that national attention was focused on this natural heritage as a recreation resource. In recent years, the management of forest and rangeland resources for recreation and wilderness uses has become increasingly important.

Outdoor Recreation in America: The Early Years

Native Americans directly depended on the natural environment for all aspects of their lives (Spears and Swanson 1978). Lewis and Clark observed that the men of the mountain tribes were "fond of shooting their arrows at a target made of bark, riding and exercising themselves on horseback, racing, etc." (DeVoto 1953). Early colonists also engaged in outdoor pursuits, often out of necessity, but also for enjoyment. Although Puritan laws or convention discouraged frivolous pursuits, men engaged in activities derived from their work: hunting, fishing, marksmanship contests, and horse racing. During the middle 1800's, the leaders of the "Muscular Christianity" movement agreed that physical fitness was compatible with religious teachings. As a result, activities such as walking, rowing, and ice skating rose in popularity. Women gradually began to participate with men in a greater range of outdoor social events. As outdoor activity increased, attention turned to providing open space where people could exercise, meet other people, or just relax in pleasant surroundings.

The Emergence of Government's Role in Outdoor Recreation and Wilderness

Today, open space is considered the primary outdoor recreation resource. By contrast, the first European settlers were challenged with establishing islands of civilization in a forested "wilderness" which they saw as their Christian duty to subdue with axe and plow. Many colonial communities established public common lands, but their original purpose was grazing of livestock rather than public recreation. However, the founders of some of the nation's first cities, such as William Penn in Philadelphia and James Oglethorpe in Savannah, provided for city squares or other open areas to create more attractive and impressive urban environments. The Spanish settlements in the Southwest usually had plazas which provided space for casual strolling and public meetings (Chubb and Chubb 1981).

Over time, American attitudes toward nature changed. Romanticism, the view that wild nature and a primitive lifestyle had value in and of themselves, grew with the writings of philosophers, poets, and writers such as Rousseau, Byron, and Cooper. Influenced by the romanticist view of nature and the close-to-the-land lifestyles of Native Americans, George Catlin proposed the idea of a "nation's park" in 1833. Coincidentally, it was in that year that the first national preserve—Hot Springs in Arkansas—was established by Congress to protect the springs widely renowned for their therapeutic properties. Later, transcendentalists, such as Ralph Waldo Emerson and Henry David Thoreau, believing that the divine is evident in nature, argued that the value of "wilderness" is the preservation of civilization.

To provide relief from what they feared would become a stifling urban environment, Frederick Law Olmstead and Calvert Vaux designed New York City's Central Park in the 1850's. Their ambition was to maintain open space and provide a place for exercise and relaxation. Central Park was to become a model for open space protection emulated by many cities across the country. Between 1880 and 1890, more than 80 cities established public park systems while playgrounds were developed in connection with schools. Several state and county park systems were established during this period (Chubb and Chubb 1981).

In the late 1800's, attention turned to the vast federal estate of the West. This land was acquired by the United States through purchase (from France and Russia), conquest (from the Native American nations and Spain), and negotiation (from Great Britain). For years, the federal government gave its land to homesteaders and railroads to stimulate development of the West. Later, interest turned to holding portions of the federal lands for the broader public benefit including recreation. In 1864, California persuaded the federal government to turn over

Yosemite Valley to the state for "public use, resort, and recreation."

But, a sentiment was growing for retaining in federal ownership areas of spectacular scenery. In 1872, Congress established the 1.6 million-acre reserve that later became Yellowstone National Park "as a park or pleasuring ground for the benefit and enjoyment of the people." Along with the establishment of national parks, such as Mount Rainier, the Grand Canyon, and other great western parks, attention turned to the forests. The first forest reserves were established in the 1890's through presidential proclamation.

Unlike the parks, where preservation and recreation were emphasized, the forest reserves (later to become the national forests) were to ensure a supply of timber for the nation and protect water supplies. But, they also were available for recreation. In 1903, President Theodore Roosevelt designated Pelican Island, Florida, a national wildlife refuge, thus inaugurating a new federal system specifically aimed at preserving wildlife and their habitats. Federal lands in the West, which had not been given to private interests, states, or municipalities or incorporated into other federal land systems, remained as public domain, managed by what is now the Bureau of Land Management, and were available for recreation.

By comparison, the East had little federal land on which to establish national parks and forests. With passage of the Weeks Law in 1911, the federal government began buying land for national forests in the Appalachians. Meanwhile, states and philanthropists acquired land for parks, such as the Great Smoky Mountains and Shenandoah, and turned them over to the federal government.

Outdoor Recreation Before World War II

The industrial revolution brought many changes. Steam railroads and steamboats opened areas previously accessible only to the most rugged mountain men. However, the 14- to 18-hour workday and 6-day workweek of the industrial revolution left most people little time for recreation. Gradually, working hours declined. By 1900, the average worker spent 10 hours a day on the job, and outdoor recreation activity increased fairly dramatically.

The mass-produced automobile made the outdoors accessible to millions of Americans following World War I. Visitation to national parks and other recreation areas grew rapidly through the 1920's. Although the Great Depression of the 1930's had a devastating effect on the nation's economy, job-creation programs, especially the Civilian Conservation Corps, benefited thousands of city, state, and federal recreation areas through rehabilitation and development of high-quality facilities.

Outdoor Recreation After World War II

As millions of servicemen and women returned to civilian life after World War II, demand for outdoor recreation and an economy to support it grew. Many new families were started during the "baby boom," and the population grew rapidly. The quality of automobiles and roads increased, fuel became cheaper, and the average workweek declined to 40 hours over 5 days. Outdoor recreation opportunities were increasingly available to middle- and lower-income groups. Use of public recreation lands continued to increase.

Increased use had its effects, however, and by the mid-1950's, it was apparent that use was overwhelming. Forests, parks and other recreation sites, and the facilities built in the 1930's were deteriorating. Park Service Director Newton Drury responded with Mission 66, a program to rehabilitate facilities and build new ones in the national parks by 1966. Conservationists, led by Joseph Penfold of the Izaak Walton League, recommended additional action to meet the nation's outdoor recreation needs. The result was Congressional action in 1958 establishing the Outdoor Recreation Resources Review Commission (ORRRC). The ORRRC was charged with assessing the nation's outdoor recreation needs to the year 2000 and recommending programs to address those needs. Information was gathered by the Commission over a period of three years.

The ORRRC found that outdoor recreation was a major leisure activity growing in importance and that outdoor recreation opportunities were most urgently needed near metropolitan areas. While considerable land was available for outdoor recreation, it was not effectively meeting the need. The ORRRC's recommendations lead to creation of the Bureau of Outdoor Recreation in 1963 to coordinate national recreation policy and programs. Other results of the ORRRC influence include the Land and Water Conservation Fund (1965), the Wilderness Preservation System (1964), the National Wild and Scenic Rivers System (1968), and the National Trails System (1968).

Outdoor Recreation After ORRRC

In the 1960's and early 1970's, demand for outdoor recreation opportunities dramatically increased again (chapter II). Government at all levels responded to these increasing demands with dollars, land, and facilities. Federal expenditures for recreation increased from $75 million in 1960 to a high of $1.4 billion in 1980. In addition to creation of new national wilderness, river, and trail systems, new national parks were established in and near metropolitan areas, along with new national recreation areas within both the National Park and National Forest Systems. The National Wildlife Refuge System also expanded. With money from the Land and Water Conservation Fund, states, cities, and counties expanded their park and open-space systems. Legislation was enacted to reduce air and water pollution and to protect cultural resources. Meanwhile, American society changed significantly. Since 1960, the national population increased by 63 million people and shifted southward and westward; the average American was older; the Nation shifted from dependence on traditional heavy industry to high-technology, communications, and services; and government, business, and residence became less centralized.

The President's Commission on Americans Outdoors

In the 1980's, major changes both in the demand for and the supply of outdoor recreation opportunities became apparent. Participation in many activities had surpassed the projections of the ORRRC. A growing population was putting increased pressure on recreation lands while development was subtracting from available open space in and near growing cities and towns. Technology had spawned a host of new activities, from hang-gliding to driving rugged vehicles off-road, to snowmobiling. The population was changing toward an older citizenry, more women working, and more single parents. The private sector had become a significant supplier of outdoor recreation areas and equipment. Meanwhile, the federal government and many states were in difficult financial straits; they were finding it hard to pay for many programs, including outdoor recreation.

A consortium of interest groups went to Laurance Rockefeller, the chairman of the 1960 ORRRC, and urged that he take the lead in stimulating a new ORRRC-like assessment of outdoor recreation trends and needs. In 1982, Rockefeller convened a small group of conservation and recreation leaders under the chairmanship of Henry L. Diamond, former commissioner of New York State's Department of Environmental Conservation. Revisiting many of the issues the ORRRC had explored 20 years earlier, Rockefeller's Outdoor Recreation Policy Review Group concluded that with governments retrenching, "Even with the tremendous growth in the involvement of the private sector, there is evidence that outdoor recreation opportunities are contracting overall, rather than expanding to meet increasing need." These findings led the Rockefeller group to recommend a comprehensive federal reappraisal of the nation's recreation policy and resources by a new commission patterned after the ORRRC. When efforts to have Congress enact legislation creating the commission stalled, President Reagan established, by executive order, the President's Commission on Americans Outdoors in 1985. President Reagan directed the Commission to look ahead for a generation and determine what Americans wanted to do outdoors and what was needed to ensure that they have the necessary opportunities.

The Commission's report, *Americans Outdoors: The Legacy, the Challenge* (1987), contained more than 60 specific recommendations addressing outdoor education, public services, volunteers, resource protection, information needs, and funding. The Commission said the provision of outdoor recreation opportunities were most needed close to home, and it urged a "prairie fire of local action" to protect, restore, and provide local recreational lands. It recommended the establishment of "greenways" described as "corridors of private and public lands and waters to provide people with access to open spaces close to where they live . . . ." It urged communities to shape growth to keep them attractive places in which to live and work, and it recommended intensified efforts to maintain the quality of natural resources and to increase recreation opportunities on federal lands. Partnerships between government agencies and the private sector were seen as a key to expanding outdoor opportunities. Finally, the Commission recommended that Congress establish a dedicated trust fund to provide a minimum of $1 billion a year for outdoor recreation.

The Protection of Wilderness

The early national parks were intended to provide an outdoor experience in relative comfort—access by train or carriage, plush resorts to which visitors could retreat after a day enjoying spectacular scenery. Within the federal government, the current concept of wilderness—land left essentially wild and free from human impact—originated with the Forest Service. In the 1920's, Aldo Leopold, Arthur Carhart, and others in the Forest Service began advocating the preservation of large areas in an undisturbed state. Leopold provided a working definition: "A continuous stretch of country preserved in its natural state, open to lawful hunting and fishing, big enough to absorb a two-weeks' pack trip, and devoid of roads, artificial trails, cottages, and other works of man" (Wellman 1987).

The nation's first wilderness preserve, the 500,000-acre Gila Roadless Area in New Mexico's Gila National Forest, was designated by the Forest Service in 1924. Four more designations quickly followed. Subsequently, the Forest Service developed the "L-20" regulations, directing national forest staffs to protect "primitive" undeveloped lands. This represented one of the first attempts to establish wilderness as a general classification of land use with specific management guidelines. Under these regulations, some 63 primitive areas encompassing nearly 8.5 million acres were established. But protection was tenuous, boundaries could be changed by administrative order, and many contained state or private lands which were subject to development. Wilderness advocates, especially Robert Marshall, then chief of the Forest Service's Recreation and Lands Division, pressed for stronger measures. The result was the "U-Regulations" of 1939, which established three land categories: wilderness (areas of more than 100,000 acres to be left undeveloped); wild (5,000 to 100,000 acres to be managed as wilderness); and recreation (roadless areas where timber harvest and some other development were permitted).

Following World War II, wilderness proponents, led by Howard Zahnisher of the Wilderness Society, pressed for congressional action to provide greater protection than that afforded by administrative action and establishment of a "national wilderness preservation system." With impetus provided by the ORRRC's wilderness endorsement in its 1962 report, the Wilderness Act became law in 1964. Passage of the Act created the National Wilderness Preservation System (NWPS) and requires affirmative action by Congress on each addition to the wilderness system. It shifted the process of wilderness designation from the Forest Service to Congress and made it intensely political (Roth 1984). While the Wilderness Act applied to national parks and national wildlife refuges as well, its early effects were felt main-

ly by the Forest Service, which already possessed large areas of protected wilderness. Lands managed by the Bureau of Land Management were not subject to the Wilderness Act until passage of the Federal Land Policy and Management Act of 1976. Most early congressional designations were in the West where large, roadless, and relatively pristine areas existed. Wilderness was more problematic in the East where land purchased for national forests had substantial evidence of earlier human settlement. The Wilderness Act of 1975 made it clear that these lands could qualify for wilderness status, too.

In the 1970's, two major inventories of potential wilderness in the national forests were conducted (termed Roadless Area Review and Evaluations, or RARE I and II), and the process for considering wilderness designation in the national forest land management planning process was formalized. Designation remains highly controversial. Nonetheless, almost 89 million acres of wilderness have been established as of 1988, more than 32 million of it in the national forests. Little more than one-third of the NWPS is located in the lower 48 states. Its eventual size may increase, but the relative distribution in Alaska and the 11 western states will change little.

Wilderness Use Today

Accurate assessments of current wilderness use are difficult due to the nature of wilderness. It is very often remote with limited opportunities for user contact. Also, no study of wilderness comparable to the President's Commission on Americans Outdoors has been undertaken. However, several national conferences in the 1980's have focused on different aspects of the recreational and nonrecreational use of wilderness.

Most researchers now conclude that recreational use of wilderness is growing more slowly in the late 1980's, following rapid growth in the prior two decades (chapter II). A number of reasons account for this slower growth including changing age structure and population redistribution, constraints on leisure time, fuel availability and price, and changing interests and preferences. Nevertheless, within the national forest system, 1 of every 20 overnight stays occurs in wilderness.

Yet, on-site recreation activities are not the only valid measure of wilderness use. A number of Americans may value and "enjoy" wilderness without leaving home—through books and films, by just knowing that wilderness exists and could be used in the future, or by knowing the resource will be there for future generations.

Growth of recreational use of wilderness peaked in the late 1970's, after a 20-year period of rapid growth. Interest in nonrecreational values of wilderness has increased in recent years.

Recreation should not be viewed as the only use of wilderness. The value in protecting wildlands for a multitude of reasons has been noted for years by many Americans (chapter II). According to the Wilderness Act, wilderness may also provide the "public purposes of. . . scenic, scientific, educational, conservation, and historical use" (Section 4b). These other values are only now being studied in detail; but, undoubtedly, they will grow in significance, both as they are better measured and valued and as the country becomes more populated and developed.

Because of the nature of some of the nonrecreational values, American wilderness has implications on a global scale. The protection of the environment is no longer simply a national issue. It is international, as the pollution of one nation affects the environmental resources of others. Accordingly, the wilderness in the NWPS benefits more than one nation when it safeguards gene pools, cleans air and water, and helps moderate global climate change.

High-Priority Issues for Outdoor Recreation

High-priority issues have been identified through several means: by special studies conducted for this assessment and the President's Commission; through involvement of key professionals and scientists; through a series of strategic planning sessions involving a broad range of interests; and through a comprehensive review of state outdoor recreation assessments submitted by state recreation agencies. These are discussed below.

Resource protection.—Protection of resources and open space has been identified as the most important issue affecting outdoor recreation. Protection should be viewed in terms of a comprehensive strategy involving the reservation and protection of lands and waters for recreation use and ensuring a high-quality environment in and near recreation areas.

Acquisition of open space.—Most states and recreation interests believe more land and water must be acquired to meet anticipated outdoor recreation needs. Of high priority is the acquisition of land for ocean, lake, and river access. A study of local government professionals shows they identified, almost unanimously, the need to acquire additional space and access (McDonald and Cordell 1988).

Conflicting use.—Conflicts among recreation interests rank highly as an issue of outdoor recreation significance. Most often mentioned are conflicts between hikers and motorized trail vehicles, between motorboats and nonmotorized vessels, between consumptive and nonconsumptive visitors, and between development and preservation interests.

Coordination.—Coordination among public agencies, private nonprofit organizations, and industry must improve. Resources, facilities, and services often can be provided more effectively through partnerships involving public agencies and private organizations.

Access to outdoor recreation.—Access for outdoor recreation by all population groups is a major concern of contemporary America. This includes both physical and social access and it especially pertains to access for disabled and other special populations.

Public information and education.—Public education is essential to spotlight recreation opportunities, the benefits of recreation, and threats to recreation resources. Increasingly, Americans come from an urban background with little understanding or empathy toward our natural environment. Without such understanding, sensitivity to environmental losses or to the many values of outdoor recreation is often lacking.

Liability.—The high cost or unavailability of liability insurance has emerged as a major issue. Liability is either unavailable or very expensive for local agencies and private providers. As a result, some cities have cut back on recreation programs while private suppliers are often forced to increase fees to cover the higher cost of insurance. Moreover, most landowners are reluctant to open their land for public use for fear of costly lawsuits.

Funding.—The need for stable, continuous funding to pay for operating and maintaining recreation facilities ranks among the top current issues. Most state and local agencies strongly favor continuation of the Land and Water Conservation Fund (LWCF) (PCAO 1987). Also needed is expanded and more flexible authority to charge fees for use of public lands, especially federal lands.

Information needs.—More information about the public's recreation preferences is needed to adequately plan recreation programs and identify land acquisition needs. More information is needed on the values of recreation, on the demand for and participation in various activities, on public and private recreation supply, and on the quality of recreation resources and the environment.

High-Priority Issues for Wilderness

High-priority issues have also been identified for wilderness through discussions at recent national conferences (Freilich 1989, Kulhauy and Connor 1986, Lucas 1987). These are discussed below:

Allocation.—The appropriate criteria or agenda that determines the final size and composition of the NWPS is much debated (Reed 1989). Aside from the obvious recreational demand, advocates of increasing the NWPS point to the need to protect representative ecosystems and areas to monitor environmental changes among other reasons. Those who argue against enlarging the NWPS are concerned that wilderness restrictions on water use, grazing, mining, and energy extraction do not contribute to the national economic growth.

Nontraditional wilderness.—A related issue is whether the NWPS should be expanded to include aquatic and underground wilderness units. In addition to amending the Wilderness Act, a number of potential problems would need to be resolved, including surface rights.

Wilderness degradation.—The characteristics important to wilderness are vulnerable. Even the Wilderness Act itself sets up a tension between human use and preservation of wilderness character. Some wilderness areas are heavily used for recreation resulting in soil ero-

sion, plant loss, water pollution, disruption of wildlife, and loss of opportunities for solitude. Wilderness is also threatened from outside sources including aircraft overflights, air pollution, and the introduction of exotic plant species. Furthermore, wilderness may be threatened from global influences such as ozone depletion, acid precipitation, deforestation, and desertification.

Nonrecreational use.—Increasing attention is being paid to the range of wilderness values apart from recreation. These values include consideration of habitat, scenic, scientific, educational, conservation, spiritual, and historic uses. Many of these uses have yet to be accurately measured and commensurately valued. As a consequence, many important uses of wilderness may not be well represented in forest and resource planning.

International cooperation.—The National Wilderness Preservation System is unique in the world in terms of its purpose. Yet, it could serve as a component of a larger global system of wild areas for resource protection.

Management coordination and consistency.—According to the Wilderness Act, wilderness is a supplemental purpose in forests, parks, wildlife refuges, and public lands. Because each agency has a somewhat different mission, the management of wilderness areas is not entirely coordinated or consistent. This situation may be further complicated by subsequent wilderness designation acts which often have special provision for only one or two wilderness areas.

Funding and training.—The designation of wilderness by law does not ensure the preservation of an area in its original condition. Inadequately trained wilderness managers and understaffed and poorly funded wilderness management programs seriously hamper the mandated responsibility to preserve wilderness character. In addition, baseline and applied research is in many cases lacking or the results often are not translated into specific management provisions.

Education.—Wilderness managers alone cannot prevent the degradation of the wilderness resource. The public must also understand wilderness values and how to use wilderness with respect and restraint, so it does not lose its character. The development of effective educational and interpretive techniques and material to teach the public low-impact use skills will be a continuing challenge.

Assessment Goals

As the preceding synopsis of outdoor recreation in the United States shows, changes in demands and resources have occurred, especially since World War II. Each year, millions of people use the nation's public lands for outdoor recreation. The Analysis of the Outdoor Recreation and Wilderness Situation in the United States is intended to build upon past studies and to establish a new and better information base on outdoor recreation and wilderness demand and supply. Also, this assessment answers several key questions which will help identify ways to meet demand through the year 2040. Specifically, it is to serve as the foundation for the Forest Service's development of a 50-year program through which that agency can help satisfy the nation's outdoor recreation and wilderness needs.

This assessment will address several questions:

1. What is the current status of outdoor recreation and wilderness resources?
2. What are the nature and magnitude of long-range trends in demand for and supply of outdoor recreation and wilderness resources to 2040?
3. What are the social, economic, and environmental implications of these trends in demand and supply?
4. What are the opportunities for and constraints to improving the management and use of public land resources in order to meet societal goals?
5. Based on analyses of the answers to these questions, what are the implications for forest and range resource programs in the Forest Service?

Findings of this Assessment

This assessment is based on many sources: literature reviews, surveys of visitors to public recreation lands, surveys of landowners and local recreation area managers, and projection techniques.

Presented below is a condensed version of the Assessment's major findings, arranged according to the chapters that follow. Details explaining how these findings were reached are discussed in depth in those chapters and in the references cited.

The Resource Base for Outdoor Recreation and Wilderness

- State and local governments manage over 54 million acres of recreation lands, over 30 million of which are in the East. Over 95% of the 690 million acres of federal recreation lands are in the West.
- Private rural lands open for recreation, other than industry-owned parcels, are declining due to conversion to other uses and to increased closures or more restrictive access policies. About 23% of private land is open to public recreation.
- Federal agencies manage nearly 89 million acres of designated wilderness in the National Wilderness Preservation System. Most acreage is in Alaska (56 million); all but about 5 million of the 32 million acres in the lower 48 states are on national forests. In addition, defacto (wilderness-like) primitive areas exist on federal, state, and private lands.
- More than 7,000 miles of rivers have been designated for inclusion in the National Wild and Scenic Rivers System, over 85% of which are in the West. State-designated significant rivers (for recreation, historic, scenic, or wildlife reasons) number 60,000 miles, over 70% of which are in the East.
- Most downhill skiing capacity is located in the West and especially on national forest lands. Over two-thirds of the nation's cross-country skiing areas are located in the Northeast.

The Demand for Outdoor Recreation and Wilderness

- The rate of increase in participation in some outdoor recreation activities has slowed in recent years. For these activities, increasing use of public recreation areas largely matches the current rate of increase in population. New activities are appearing, however, and are being substituted for some of the formerly most popular activities.
- Extended long-distance vacations are being replaced by more frequent, close-to-home recreation trips, consequently increasing the importance of recreation opportunities near urban areas.
- Participation patterns differ among activities, with some (such as picnicking) showing infrequent participation by a large segment of society while other activities (such as running or jogging) show a frequent participation by a smaller population group. Physically active recreation activities have become relatively more popular.
- Factors which are strongly related to participation in outdoor recreation include the availability of opportunity, age, ability and disability, race, education, and income. Federal and state recreation areas disproportionately serve young- to middle-aged, able-bodied, white individuals who are most often well-educated and in middle-income groups.
- Following the rapid growth in the 1960's and 1970's, the reported rate of change in wilderness recreation visits slowed in the early 1980's to the point where it leveled off or even declined in some areas. This decline was due, in part, to the same general factors influencing outdoor recreation at that time. Since 1986, reported wilderness recreation use has begun to increase again. Wilderness recreation visits account for about 5% of total Forest Service recreation use.
- Interest in nonrecreational values of wilderness, such as scenic, scientific, educational, conservation, and historical uses, is growing as their significance becomes better understood and measured. The "demand" for these uses should increase as our national population grows.
- Wilderness is an important component in global health, serving to cleanse air and water, protect ecosystems and gene pools, and help to regulate world climate.
- The demand for downhill skiing, cross-country skiing, pool swimming, backpacking, visiting prehistoric sites, running and jogging, and day-hiking will grow faster than for other outdoor activities. If the American public were to have all the opportunities wanted and costs of using these opportunities were to remain the same, each of these activities would increase by at least 30% above current levels by 2000.
- Considering the forecasted number of trips, the most popular recreational activities by 2040 will be sightseeing, walking for pleasure, pleasure driving, pool swimming, picnicking, day-hiking, family gatherings, bicycle riding, photography, stream/ lake/ocean swimming, wildlife observation, visiting historic sites, and developed camping.

The Supply of Recreation

- Land-based recreation opportunities are between 5 and 15 times more available in various portions of the West than they are in the East. Water recreation opportunities are 2 to 8 times more available in the West.
- An increasingly important limitation to the availability of outdoor recreation opportunities is access to private land and water, or to public recreation lands where private properties bar access.
- The public sector is more actively encouraging private investment in recreation sites, facilities, and services on public lands. This has stimulated a healthy expansion of recreation opportunities on public lands.
- Public participation of outdoor recreation is highly dependent upon the availability of opportunities. If opportunities are expanded at the same rates as in the recent past, trail and developed-site land opportunities, stream and lake water opportunities, and developed winter opportunities will grow most rapidly. Motorized land and water opportunities, and undeveloped snow-based opportunities, will grow slowest.
- Management, resource availability, access, and facility needs are likely to be most acute in the East where effective recreation opportunities are least, crowding is the greatest, and private land closures will have the most impact.

How Maximum Preferred Demand Compares to Availability of Recreational Opportunities

- Comparisons of projected supply and demand for outdoor recreation opportunities reveal "gaps" for some activities. These gaps occur when preferred demand, or the number of trips Americans would like to take if there were no shortages of opportunities, is greater than expected supply, or the number of trips Americans could take given the scarcities of recreational opportunities that would occur with available resources.
- Projected gaps for land-based activities are much larger than projected gaps for water-based or snow- and ice-based activities.
- Land-based activities with the largest projected shortages appear to be dispersed activities such as day-hiking, wildlife observation, sightseeing, and backpacking.
- Water-based activities with the largest projected shortages appear to be pool swimming and nonmotorized lake and river activities such as rowing, canoeing, and kayaking.
- Snow- and ice-based activities with the largest projected shortages appear to be dispersed activities such as cross-country skiing.

Social, Economic, and Environmental Implications of Demand-Supply Comparisons

- The social characteristics of selected multicounty communities across the United States can be com-

pared with the available recreation opportunities to yield information on social imbalances. In general, Americans who are elderly, less educated, part of a racial minority, economically disadvantaged, disabled, or living in cities have fewer opportunities to participate in resource-based recreation than do others.

- The uneven distribution of opportunities can have adverse social effects including reduced family stability, more crime and juvenile delinquency, less opportunity for social bonding, more social conflict, and slower ethnic and cultural assimilation.
- Increased economic opportunities for the private sector are projected for several categories of recreation. These include investments in developed recreation areas and the provision of associated goods, services, and information. Increased government revenue generated by user fees is expected to be offset by higher management costs for dispersed recreation.
- Impacts on natural systems from most outdoor recreation and wilderness uses are minimal compared to more consumptive uses such as lumbering or mining. Recreational impacts such as soil compaction and erosion are generally local in nature and the greatest damage occurs during the initial use of an area.
- Outdoor recreation and wilderness use can benefit natural systems through improved esthetic quality, greater environmental awareness, and preservation of natural systems. For example, demand for water opportunities has generated pressure on governments and industry to improve water quality in rivers, especially near urban areas.

Opportunities for Meeting Outdoor Recreation Needs

- Many ways exist to close the gap between demand and supply of recreation and wilderness opportunities. Providers can especially make great contributions by better management and protection of existing environments, resources, and facilities.
- Outdoor recreation opportunity providers can reduce the supply-demand gaps by improving services through increasing responsiveness to the public, and through interagency and public-private sector cooperation and coordination.
- Research identifying recreation and nonrecreation benefits of wilderness and development of better methods of measuring and comparing variables can generate additional alternatives to reduce the supply-demand gap.

Obstacles Hindering Attainment of Opportunities

- Obstacles which could block opportunities to narrow the recreation and wilderness supply-demand gap do exist. A major problem is the imbalance between recreation and wilderness land distribution (mostly in the West) and the population distribution (mostly in the East).
- Private landowners are often hesitant to provide access to their land for public use without economic incentives or protection of the uses for which they own the land.
- Insufficient funding, information, cooperation, and coordination among agencies contributes to problems in reducing the recreation-wilderness supply-demand gap.

Outdoor Recreation and Wilderness Program Implications

- National forests near urban areas represent one of the most important opportunities to meet the increasing demand for outdoor recreation closer to people's homes. Better information about these opportunities, partnerships with local government and private entrepreneurs, education of the visitor, facility upgrades, and intensified management can improve opportunities on these national forests.
- Protection of wilderness and wilderness-like areas and enhancing nonrecreational uses should rise dramatically in importance in the management of the NWPS.
- Overcrowding and user conflicts will intensify in the future, especially on eastern national forests. Educating users and managers, redistribution of use concentrations, and greater use of volunteers are needed to help alleviate these problems.
- National forests typically contain special places and features, some of which are unique and irreplaceable. Every forest is special in some way, and the special features and values making them unique need to be protected. This is especially true for wilderness.
- Increasing public access to both public and private properties will be necessary in the future. More exchanges, easements, acquisitions, and partnerships may be needed in the future to provide this access.
- Quality, safety, and convenience will become increasingly important management targets on national forests. Protection of high-quality scenery, better facilities, control of littering and other human impacts, and upgrading of vistas, trails, and services will be demanded by future recreationists.
- Carrying out an expanded mission in providing recreation opportunities and improving wilderness management for the American public will require an expanded and commensurately accelerated and funded recreation and wilderness research program. Particularly needed are improved techniques for intensified management, monitoring wilderness uses, and values, planning, and marketing.
- The major role for the Forest Service and other federal agencies is to manage the recreation estate to provide access to quality recreation opportunities for all who care to participate while maintaining the quality of the resource and facilitating other multiple-use activities.

An Analysis of the Outdoor Recreation and Wilderness Situation in the United States: 1989–2040

A Technical Document Supporting the 1989 RPA Assessment

H. Ken Cordell, John C. Bergstrom, Lawrence A. Hartmann, and Donald B.K. English

CHAPTER I: THE OUTDOOR RECREATION AND WILDERNESS RESOURCE BASE

Introduction

The resource base for recreation includes all lands, waters, and developments which are available to the public under any of various circumstances and which have not been designated for industrial, commercial, residential, or other such uses to the exclusion of recreation. This available recreational resource base encompasses more than just that part which has been identified only for recreational purposes. Some lands also are managed for more than one use, such as for timber, nature preservation, and grazing, as well as for recreation. Some lands have recreation as a dominant but not sole purpose. On other lands, recreation is only incidentally permitted, but it is not excluded. If available under any of these circumstances, such land and water resources are considered to be a part of the available **recreation resource base**. This available recreation resource base is a focus of this Assessment.

Wilderness resources include both federally and nonfederally designated roadless areas. Of special interest is this country's world-renowned National Wilderness Preservation System (NWPS). Also of interest are state wilderness systems and those lands designated and preserved in a wilderness-like condition by private organizations. In addition to designated wilderness, this chapter also considers nonwilderness lands that offer opportunities for the primitive type of recreation typically associated with wilderness. Thus, this assessment also focuses on **wilderness resources** including recreation opportunities on nondesignated lands with wilderness character.

In our treatment of recreation and wilderness resources, this chapter examines the status of the land and water resource base, the condition of protected wilderness, and public accessibility in terms of proximity to roads and population centers and in terms of resource type, ownership, and regional distribution.

Categories of Recreational and Wilderness Resources

Recreational resources are of three types. **Land Resources** range from the coastal flatlands across prairies to the tallest mountain ranges. **Water Resources** include rivers, streams, lakes, oceans, and their shorelines. **Snow and Ice Resources** may be viewed as a subset of land and water resources. These resources include recreation areas with sufficient snowfall and temperature conditions to provide winter sports opportunities. We discuss snow and ice separately from land and water resources because they create very different resource management needs.

This assessment arrays recreationally available land and water by degree of remoteness as determined by distance from the nearest road or roadhead passable to a two-wheel drive passenger vehicle. Distance from the nearest road also characterizes resources as recreational environments and distinguishes them according to their level of development since developed facilities are necessarily close to roads. Each resource—land, water, snow and ice—is subdivided into four categories which identify their remoteness or level of development. Wilderness, the most remote category, acknowledges the importance of wilderness for recreation but does not ignore other wilderness uses and values. These other uses and values are examined separately as required by the legislation that established this important designation of public land.

The subdivisions of resource types, or recreational environments, presented in this assessment are described below and in figure 1. Although some types of opportunities associated with each subdivision are identified below, specific activities and opportunities will be examined in more detail in following chapters.

Land Resources

Wilderness and Remote Backcountry Areas are the most primitive and least disturbed land environments. These lands are either designated as wilderness or lie more than 3 miles from a road. Opportunities for solitude and nature-oriented recreation, such as backpacking, are available on these lands. Nonrecreational uses such as scientific study, ecosystem preservation, protection of habitat for threatened and endangered species, and spiritual development are provided by the wilderness resources in this category. **Extensive Undeveloped Areas Near Roads** border wilderness and the most remote backcountry and lie 0.5 to 3 miles from a road. Recreational opportunities in these areas are typically nonmotorized and include such activities as backpack-

ing, nature study, wildlife observation, and primitive camping. **Roaded and Partially Developed Areas** lie within 0.5 mile of a road but outside heavily developed areas. This recreational environment may be federal, state, or private lands within 0.5 mile of road access. Most state forest, park, and fish and game lands are in this category, as are nearly all commercial forests and most nonindustrial private lands. Forest roads and most trails where both motorized and nonmotorized recreational activities occur are in this category. **Developed Land Sites** principally encompass land-based facilities such as campgrounds and picnic areas. Other important developments include golf courses, resorts, and many municipal facilities such as playgrounds and sports fields.

Water Resources

Wild and Remote Waters include primitive, free-flowing streams or remote bodies of water located more than 0.5 mile from a road. River segments designated or under study for inclusion in the National Wild and Scenic River System (NWSRS) are also included, as are wilderness lakes, rivers, and streams. Rafting, trout fishing, and canoeing are typical of recreation occurring in these waters. **Lakes and Streams Near Roads** include all or portions of water bodies without direct road access but which are located within 0.5 mile of a road. These waters include ponds, beaches, and major portions of federal and other reservoirs. Motorized boating, swimming, and fishing are among the principal recreational uses. Water resources which have direct and adjacent road access and which have associated light development, such as parking areas, boat launch ramps, and scattered picnicking facilities, are discussed in this chapter under the heading of **Partially Developed Water Resources. Developed Water Sites** include facilities such as swimming pools, water parks, and marinas. Commercial water-based recreational opportunities are typically within this category.

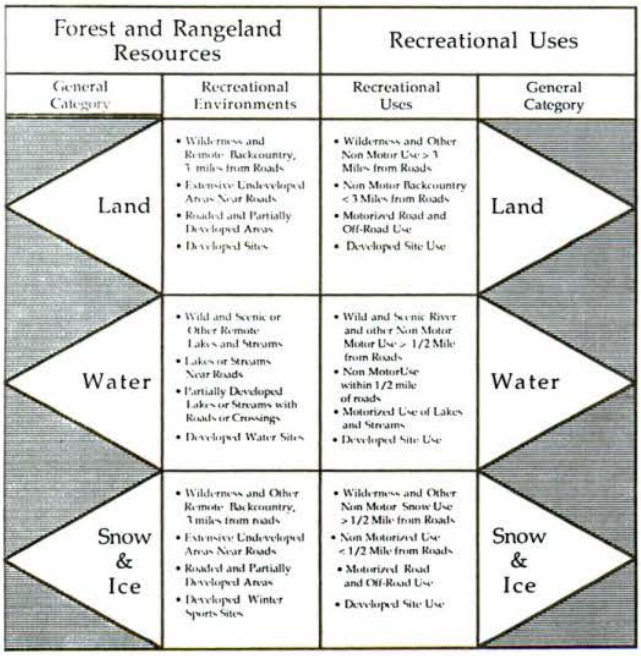


Figure 1.—Categories of recreational and wilderness resources and uses.

Snow and Ice Resources

These resources are classified the same as land environments. The distinguishing feature is sufficient snowfall to support a winter recreational season, assumed to be 16 or more inches annually, and temperatures low enough and long enough 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 cross-country skiing, snowshoeing, and activities in solitude at distances greater than 3 miles from roads. **Extensive Areas Near Roads**, 0.5 to 3 miles, and **Roaded and Partially Developed Areas**, less than 0.5 mile from roads, provide opportunities, among other activities, for cross-country skiing, snowmobiling, ice fishing, and sledding. Trails and roads are highly significant to snow- and ice-based recreation. Ski and winter sports resorts characterize intensively **Developed Winter Sports Sites.**

In addition to categorizing recreation resources by remoteness, this chapter also examines who owns or manages them. Thus, privately-owned lands and water are discussed separately from those managed by public agencies. Publicly-owned resources are further subdivided by the level of government managing them. Federally managed resources are discussed first, followed by state-owned resources and, finally, by locally managed resources.

Land Resources

The United States encompasses about 2.4 billion acres including associated water. In 1987, this amounted to almost 10 acres per person, about 1.5 times the world average. Only a very small portion of the total land area is urban or built up—less than 3% nationwide (Bureau of the Census 1987). The federal government manages almost one-third of the country's land; about two-thirds is private. A small remainder is owned primarily by state and local governments. For the most part, the federal estate is undeveloped and uncultivated. Some private lands are developed and some are unaltered from their natural state. The natural forest and rangelands outside federal jurisdictions account for about 35% of our land base, not including Alaska. These public and private lands and water which are available for outdoor recreation are examined in more detail in the following sections of this chapter.

Overview by Ownership

Public land.—One-third of the United States, about 746 million acres, is public land available for recreation.

One-third of the U.S. is public land available for recreation and covers a broad spectrum from small, highly developed local parks to large federal wilderness areas.

Table 1.—Public land and water area (millions of acres) available for outdoor recreation by ownership and region, 1987.

Level of government	Region						
	North	South	Rocky Mtn.	Pacific Coast	Sub-total	Alaska and Hawaii	Total U.S.
Federal	13.0	17.4	258.7	79.9	369.0	321.7	690.7
State	22.9	6.6	7.8	8.6	45.9	6.7	52.6
Local[1]	1.0	0.5	0.3	0.4	2.2	0.1	2.3
Total	36.9	24.8	266.8	88.9	417.1	328.5	745.6
Percent of area	4.9	3.3	35.8	11.9	56.0	44.0	100.0
Percent of population	47.0	30.9	7.6	13.8	99.3	0.7	100.0

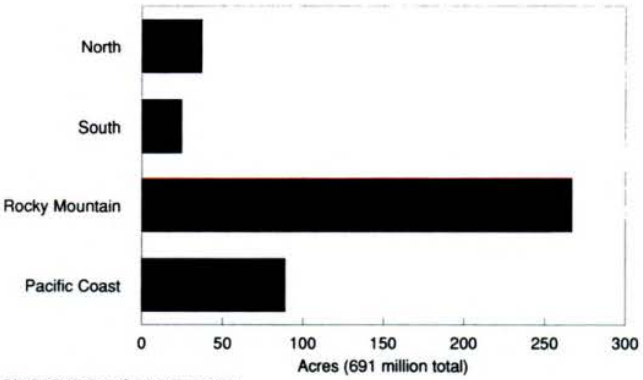
[1]*Includes only local park and recreation departments and other local government properties under the jurisdiction of these departments.*

SOURCE: National Outdoor Recreation Supply Information System, USDA Forest Service, Athens, GA (1987).

This includes about 691 million federal acres, including that under wilderness protection (table 1). All levels of government manage a great diversity of resources, from large undisturbed areas to playgrounds.

Recreation resources are not equally distributed among the levels of government, nor among regions of the country (table 1). Federal agencies manage the majority of primitive areas including wilderness, remote backcountry, and undeveloped forest/land. The western states contain a disproportionate share of these remote public lands mostly because the federal estate is concentrated in the western half of the country (fig. 2). For example, around 70% of Idaho is public land whereas Illinois, with 11 times Idaho's population, is less than 4% public land.

Specially designated federal properties are grouped in four categories (table 2). National Recreation Trails total almost 9,000 miles and are available for a variety of



SOURCE: National Outdoor Recreation Supply Information System (NORSIS) USDA Forest Service, Athens, GA. 1987.

Figure 2.—Area of federal lands in the contiguous 48 states available for public recreation by region, 1987.

Table 2.—Regional distribution of acreages in specially designated federal systems, 1987.

Region	National recreation trails	Wild and scenic rivers	National recreation areas	Wilderness areas
	Miles		*Thousand*	*Acres*
North	2,150	546	285	1,400
South	2,322	366	398	2,500
Rocky Mountains	2,372	1,134	4,093	17,700
Pacific Coast	1,706	5,132	1,147	67,200
Total	8,550	7,178	5,923	88,800

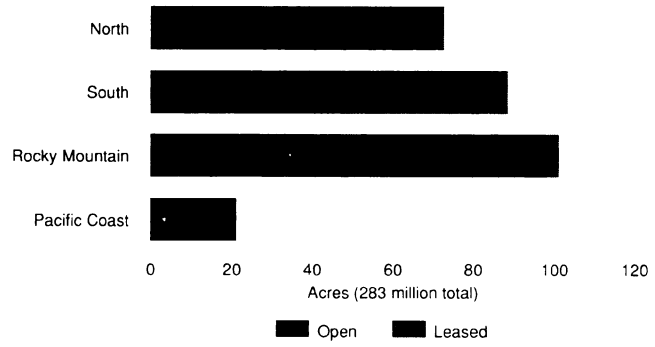
Source: National Outdoor Recreation Supply Information System, USDA Forest Service, Athens, GA (1987).

recreational uses. Wild and Scenic Rivers total over 7,000 miles and are protected from development in order to preserve their outstanding beauty and wildness. National Recreation Areas total almost 6 million acres and are managed mostly for recreation. The National Wilderness Preservation System totals almost 89 million acres and is preserved in a natural condition. Low impact recreation is only one of the NWPS's permitted uses.

States manage about 53 million acres of land available for recreation. State forests generally encompass the more primitive and remote of these lands while state parks offer more developed environments. More than 40% of the 10 million acres of state parks and reserves and over 60% of state forests are in the eastern half of the country. A few eastern states have brought large tracts of wild lands into the public domain, compensating to some extent for the relatively small amount of federal lands there. In general, state lands are much more effectively located for recreation than are federal lands.

County and municipal lands available for recreation, about 2.3 million acres, account for less than 0.5% of the total public recreation domain. Local governments generally have the most intensively developed resources, and they are close to or within populated places and are very accessible. Local resources may be small, but municipal parks account for more than 60% of the number of recreation areas nationwide, illustrating their greater effectiveness in providing some types of public recreational opportunities (President's Commission on Americans Outdoors 1987).

Private land.—Rural private land makes up over 60% of the contiguous United States land base, approximately 1.28 billion acres. Ninety-five percent of this acreage is in nonindustrial ownerships. Currently, more than 350 million acres of nonindustrial private land are closed to all but the exclusive use of owners. Thus, about one-third of nonindustrial private land is not available for public recreation. Access to another 556 million acres was estimated to be restricted to persons who were personally acquainted with owners. These restricted or partially-restricted lands provide an important recreational resource for many, but only about 23% (283 million acres) of nonindustrial, privately-owned rural land is open to the general public for recreation. More than



SOURCE:--National Outdoor Recreation Supply Information System, USDA Forest Service, Athens GA. 1987.

Figure 3.—Acres of nonindustrial private land open or leased for recreation by region, 1987.

80% of this is open free of charge or for a daily fee. The rest is available through exclusive lease agreements involving either a seasonal or annual fee. The average fee per acre in 1986 was $2.97, about $89 per lessee. Much of this open land is located in the South and in the Rocky Mountains (fig. 3). Since 1977, the percentage of private, nonindustrial lands open for public use has decreased from over 29%[1] to 23%. This represents a decrease of nearly 75 million acres of potential recreational land, mostly in the East.

The private sector provides a full spectrum of land resources, from the remote and pristine to the highly developed, including about 60% of all campgrounds in the United States. Privately-owned recreation resources, and especially undeveloped private lands, may become more important in this country for meeting the increasing demand for many types of outdoor recreation. Typically, these private lands are effectively located near population concentrations, are easily accessible by vehicle, and contain many miles of trails and unimproved roads. However, the strong trends toward closing these vast acreages to public access, conversion to urban uses (about 1 million acres per year), and subdivision into smaller tracts may seriously reduce their value as a recreational resource in the future.

Recreational Lands by Remoteness

Remoteness, that is, distance from roads, significantly influences the character of a recreation environment and determines its accessibility. The following discussion of land resources is organized around the remoteness criteria as described above and in figure 1.

Wilderness and remote backcountry.—Designated wilderness must be distinguished from other remote wild areas. Wilderness status typically results from legislative action which, in effect, prohibits many uses. The mandates under which other remote backcountry areas are managed generally are not as restrictive. Moreover, the increased publicity generated by wilderness designation can change and increase the recreational use of

[1]*This figure does not include leased acreage.*

and interest in an area, sometimes resulting in needs for greater management attention (Kelly 1989).

Federal wilderness.—The Wilderness Act of 1964 empowered Congress to set aside wild federal lands as parts of the National Wilderness Preservation System (NWPS). As of January 1, 1988, some 88.8 million acres had, thus, been protected. Wilderness areas are among the most pristine and undeveloped lands in the federal estate. Other large, nonroaded tracts of remote federal lands exist, some of which are under study for inclusion in the NWPS.

The original language of the 1964 Wilderness Act emphasized lands which had been left undisturbed by human actions. Few eastern forests met the Act's wilderness criteria. In 1974, the so-called "Eastern Wilderness Act" changed the eligibility criteria by adding to the NWPS some 207,000 acres of eastern lands which had, at one time, been cut over, roaded, or settled, but which had subsequently returned to an apparent natural state. This new flexibility in defining "wilderness" contributed to expansion of the federal wilderness system in the East (Reed 1989).

Since 1964, public lands designated as wilderness have expanded ten-fold. Wilderness distribution within the United States is tied to the existing pattern of federal land within the national forest, park, and wildlife refuge systems and Bureau of Land Management (BLM) lands. At present, designated wilderness may be found in every state except Connecticut, Delaware, Kansas, Iowa, Maryland, and Rhode Island (and the District of Columbia). Alaska leads all states in total wilderness acreage with 56.4 million acres, almost two-thirds of the NWPS acreage.

Because the majority of federal land is in the 11 western states and Alaska, the five-state Pacific Coast Region has three-fourths of the NWPS acreage (67.1 million acres) (fig. 4, table 3). Another 20% (17.8 million acres) is found in the 11-state Rocky Mountain-Great Plains Region. Of the NWPS acreage, 3% (2.5 million acres) is located in the Southern Region and only 2% (1.3 million acres) is in the Northern Region.

The National Park Service (NPS) manages the most wilderness, more than 36.7 million acres (about 41% of the NWPS), which is mostly in Alaska (fig. 5, table 3). The Forest Service is the second largest manager of wilderness with more than 32.3 million acres (36% of the NWPS acreage). The Fish and Wildlife Service (FWS) manages 22% of the NWPS acreage, and BLM wilderness represents 1%.

Table 3.—National Wilderness Preservation System by region and agency (in thousands of acres).

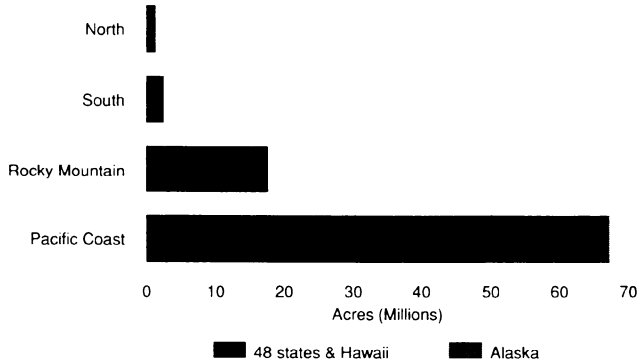
Region	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Mgmt.	Total
North	1,163	133	64	0	1,360
South	619	1,444	470	0	2,533
Rocky Mountain	16,576	690	120	330	17,716
Pacific Coast:					
Alaska	5,453	32,356	18,678	0	56,487
Other	8,541	2,137	1	39	10,718
Total	32,352	36,760	19,333	369	88,814

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

More than 53% of NPS lands are in wilderness status. Almost 24% of the National Wildlife Refuge System is wilderness. Wilderness status has been given to 20% of the National Forest System and less than 1% of the remaining public lands. The Forest Service manages 83% (26.9 million acres) of the wilderness acreage in the conterminous states.

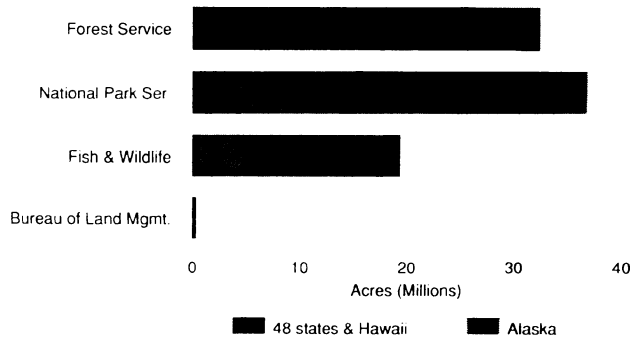
Wilderness areas range in size from the 8.7 million-acre Wrangell-St. Elias Wilderness in Alaska to the 6-acre Pelican Island off the Florida coast. The average size is nearly 195,000 acres. More than half are between 5,000 and 50,000 acres. About 16% are smaller than the minimum 5,000-acre size recommended in the original Wilderness Act. Less than 4% of all wilderness areas are larger than 1 million acres, and most of those are in Alaska (Reed 1989).

Because of the vastness of Alaska's wilderness, the most predominant ecoregion represented in the NWPS is tundra (27%), followed by subtropical (24%), subartic (18%), and steppe (14%) (Bailey 1980, USDI FWS 1982).



SOURCE:--National Outdoor Recreation Supply Information System, USDA Forest Service, Athens GA. 1987.

Figure 4.—Acreage in the National Wilderness Preservation System by region.



SOURCE:--National Outdoor Recreation Supply Information System, USDA Forest Service, Athens GA. 1987.

Figure 5.—Acreage in the National Wilderness Preservation System by federal agency.

Particularly under-represented in the NWPS are the prairie grassland ecoregions of the Great Plains (Reed 1989).

Hill and mountain landforms (Hammond 1970, USDI FWS 1982) account for about three-fourths of all wilderness areas. Plains and tablelands make up less than 5% of the NWPS (Reed 1989).

Potential and substitute wilderness lands.—Under the NWPS, 14 million additional acres of federal lands have been recommended for wilderness designation (Reed 1989). Of these recommended areas, 9 million acres are in national parks, 3.4 million in the FWS lands, and 2.4 million are in the national forests. Over two-thirds of this recommended wilderness acreage is in the Rocky Mountain Region; none of it is in Alaska.

Estimates show that approximately 123 million acres of federal lands have been under study at one time or another but are not yet recommended for inclusion in the NWPS (Reed 1989). Another 30 million acres of other public and private lands may also meet the remoteness criteria of wilderness (Absher et al. 1989). These lands outnumber actual NWPS acres by nearly two-to-one. The Forest Service manages about 47% of these potential wilderness lands. Because most federal lands are located in the 11 western states, existing wilderness patterns would be maintained if more areas were designated in the future. Over half of the potential areas are located in the Rocky Mountain Region; only 3% are in the North.

The anticipated trend is for potential wilderness acres to diminish through two opposing processes (Cook and English 1989). First, a portion of those lands currently under study for wilderness classification will eventually be added to the NWPS system. The potential wilderness areas will be further diminished through future development. Some federal roadless areas released from wilderness study for other uses will undergo development or modification that will disqualify them from future consideration for wilderness designation.

In addition to the NWPS, a number of federal wildland preservation systems preserve an additional 12 million acres (Soper and Humke 1989). Complementary to the system in purpose, these other areas similarly seek to ensure natural diversity and generally are not recreation oriented. They include research natural areas, areas of critical environmental concern, special interest areas, and wild rivers in the National Wild and Scenic River System.

Research natural areas are managed to ensure natural diversity and may be designated and managed by any of the four wilderness managing agencies, plus the Department of Defense. Presently, more than 500 research natural areas totalling 4.2 million acres have been established (Soper and Humke 1989).

The Bureau of Land Management manages more than 280 units as Areas of Critical Environmental Concern (ACEC) totaling some 5.1 million acres (Soper and Humke 1989). ACEC's are mandated to protect important historic, cultural, scenic, and/or natural values.

The Forest Service manages 45 special interest areas to protect them and manage their scenic, geological, botanical, zoological, paleontological, archeological, and other special characteristics (Soper and Humke 1989).

Nonfederal wilderness.—Specifically designated nonfederal wilderness and other wild and natural areas constitute approximately 4.9 million acres across the country (Cook and English 1989). About 40% of this area, in 3,800 separate tracts, is owned by nonprofit organizations, 30% is owned by states, and the rest is private. Only 37 tracts are over 25,000 acres, and 135 are at least 5,000 acres, the minimum size guideline in the original NWPS legislation. About 72% of these acres in large tracts are state lands. In general, the preservation efforts of states and other nonfederal entities seem to have complemented the distribution of NWPS lands because they are concentrated in the East (table 4).

About one-fifth of the states have wilderness preservation systems. State wilderness and wild area criteria are similar to the NWPS criteria in many ways. States have often adopted the language of the federal wilderness act, incorporating varying degrees of flexibility in their definition of wilderness (Stankey 1984). Pennsylvania, for example, allows old roads and utility rights-of-way through state wilderness areas. New York's Adirondack Mountains equal or surpass the wildness scenic quality of any NWPS area in the East, and Michigan's Porcupine Mountains Wilderness State Park contains the second largest virgin forest in the East, after the Adirondacks (Crispin 1980). The distribution of state-owned wilderness varies across the country (table 4). The North and the South contain more than two-thirds of all state-owned wilderness, illustrating how states have an opportunity to compensate, to some extent, for the large area of federal wilderness in the West.

Most states with large, roadless tracts have already reserved some portion of them in a wilderness system. States with large state forest systems have the option of removing further portions to wilderness status, but this seems unlikely (Cook and English 1989). Natural areas, on the other hand, are increasing through stepped-up acquisition by nonprofit organizations, private land trusts, and the like (Nutter 1984). Rapid growth beyond their present acquisitions are unlikely, however, because of a dwindling base of large natural areas.

Several nonprofit organizations and institutions, including local governments, own or protect wild or

Table 4.—Acres of state-owned wilderness and extensive roadless areas (in thousands of acres), by managing agency and region, 1987.

Region	Agency		Total
	State forests	State parks	
North	2,292	31	2,323
South	0	99	99
Rocky Mountains	0	49	49
Pacific Coast	10	2,539	2,549
Total	2,302	2,718	5,020

Source: National Outdoor Recreation Supply Information System, USDA Forest Service, Athens, GA (1987).

natural areas. In most cases, these places are set aside primarily to preserve unique or critical ecosystems and wildlife habitats, and not necessarily to provide recreation. These areas are included as recreation resources because they attract visitors and may accommodate low-impact recreational pursuits such as hiking or nature study. Such areas provide trails and parking but generally few other amenities.

Other federal remote wild lands.—The federal government manages just over 100 million acres of nonwilderness but remote lands, about 70 million of which are in Alaska (English 1989). Much of the remainder are BLM lands in the West. Outside Alaska, the Forest Service manages just 1.5 million of these acres. Only 1.4 million acres of remote and roadless areas exist in the East (table 5).

State remote wild lands.—About 5 million acres of state lands are in wilderness or remote backcountry (English 1989). State park systems include 75% of these lands. The rest are state forest lands, almost all of which are in the North. Over half of the remote acres managed by state park systems are in the Southern Region while most of the rest are in Alaska. The Rocky Mountain Region contains little remote state land because of the vast federally-managed acreage in this part of the country.

Extensive undeveloped areas.—Surrounding wilderness and the most remote backcountry lies a class of lands located between 0.5 and 3 miles from road access. Presumably, 0.5 mile is a sufficient buffer to impart a remote character to the land.

Federal lands.—More than 86% of the 87.3 million acres of lands in this undeveloped category are part of the National Forest System (table 6). Another 12% are in national parks. The majority of these large, undeveloped areas are located in the Rocky Mountain Region. About 2.2 million acres are located in the North, and another 3.3 million acres are in the South. The East has about as much land in this category as it does in the two more remote categories combined.

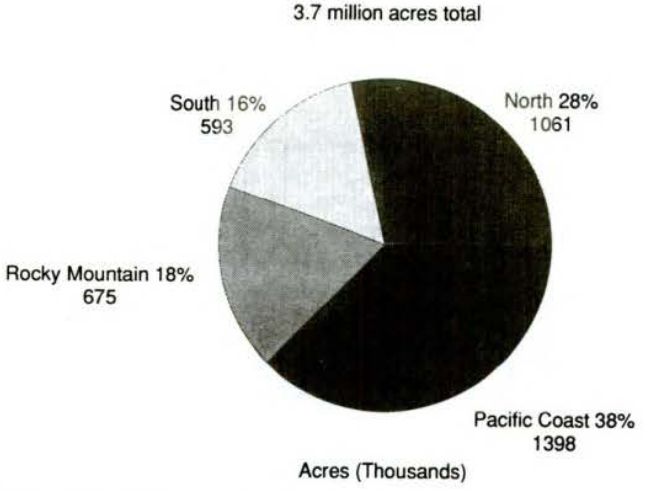
State lands.—State-owned lands provide about 3.7 million acres of backcountry lands between 0.5 and 3 miles from roads—all on park system properties. Over one-third of these acres are in the Pacific Coast Region, and over one-fourth are in the North (fig. 6).

Nonindustrial private lands.—An estimated 31 million of the 283 million acres of open private rural lands are more than 0.5 mile from a road and are extensive enough to be placed in this category. The vast majority of this private backcountry acreage is in the Rocky Mountain Region—almost 26 million acres. About 3.5

Table 5.—Distribution (in thousands of acres) of federal remote backcountry, not in the NWPS, greater than 3 miles from a road, by region.

Region	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Mgmt.	Total
North	0	605	18	0	623
South	0	596	217	0	813
Rocky Mountain	1,539	1,863	117	14,725	18,244
Pacific Coast:					
Alaska	11,910	11,996	46,826	0	70,732
Other	0	1,596	0	9,922	11,518
Subtotal	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, USDA Forest Service, Athens, GA (1987).



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 6.—State recreation lands between 1/2 and 3 miles from a road by region, 1987.

Table 6.—Distribution (in thousands of acres) of federal extensive undeveloped areas, by region and agency.

Region	Forest Service	National Park Service	Fish and Wildlife Service	Bureau of Land Mgmt.	Tennessee Valley Authority	Total
North	2,011	139	38	0	0	2,188
South	1,602	1,512	145	0	6	3,265
Rocky Mountain	53,227	5,907	243	736	0	60,113
Pacific Coast	18,703	2,731	3	318	0	21,755
Total	75,543	10,289	429	1,054	6	87,321

Source: National Outdoor Recreation Supply Information System, USDA Forest Service, Athens, GA (1987).

million of the backcountry acres in the Pacific Coast region are leased for recreational use.

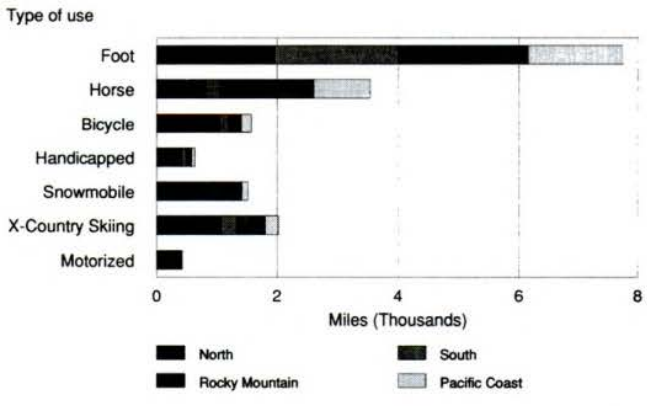
Roaded, partially developed lands.—The land areas most heavily used for outdoor recreation are those within 0.5 mile of or adjacent to roads. Most trails, often former access roads or rail lines, lie within this distance of current roadways and often parallel or cross them. The majority of lands outside the federal estate are in this category. Intensively developed sites located near roads will be discussed below under "developed lands."

Federal lands.—More than half the entire federal estate, nearly 390 million acres, is located within 0.5 mile of a road and is outside intensively developed areas, such as campgrounds. Almost 80% of this acreage is managed by the BLM. The Forest Service manages nearly all the remaining 72 million acres, only 5% of which are located in the eastern half of the country. Nearly 50% of federal lands in all regions, except the Pacific Coast, are in this category. Due to the extensive roadless areas in Alaska, less than 20% of federal lands in the Pacific Coast are within 0.5 mile of a road.

Among the most important of resources within roaded, partially developed areas are trails for walking, biking, horseback riding, and other trail-dependent activities. Federal agencies manage about 160,000 miles of trails. Nearly 100,000 are on Forest Service lands, and about 36,000 are on BLM lands. Although the majority of these trails are located in the western regions, federal agencies still provide 23,000 miles of trails in the eastern half of the country. Through federal agency efforts, coordinated by the NPS, over 760 trails and trail segments covering over 8,400 miles have been designated as part of the National Recreation Trails System (NRTS). Over 500 of these trails are managed by federal agencies, about 140 by local governments, 80 by state agencies, and almost 30 by private individuals or organizations. Figure 7 shows the regional distribution of NRTS trails by use type.

State lands within 0.5 mile of a road.—About 80% of state recreation lands, 43 million acres, are relatively undeveloped and lie within 0.5 mile of roads. Just over one-half are managed by forest agencies; most of the rest are under the jurisdiction of park or fish and game departments. The North contains over one-third of all such state lands, about two-thirds of this area is managed by forest agencies (fig. 8). State agencies manage about 102,000 miles of trails. Over half of these (57,000 miles) are in the North, and about one-third (38,000 miles) are in the South. Fewer than 10,000 miles are located on state lands in the western half of the country.

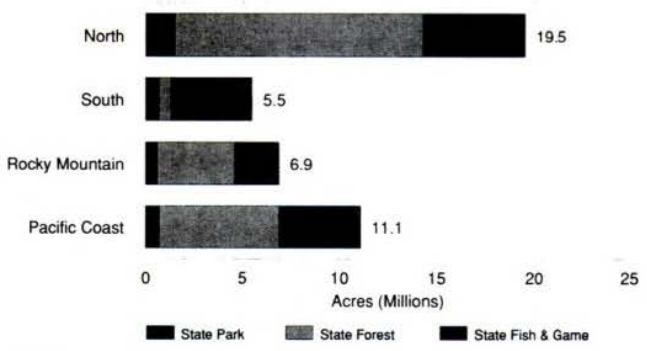
Privately owned roads and trails.—Approximately 2.3 million miles of roads and trails (15% of the 15.5 million total miles) are located on nonindustrial private land open to the public for recreation (fig. 9). This represents about 1 mile of trail or unimproved road per 123 acres of private land designated by owners as open to public access. Lands in the East appear to be more heavily roaded than lands in the West. The North has over 1 million miles of roads and trails on private lands compared to about 300,000 in the Rocky Mountain Region and about 121,000 in the Pacific Coast. Many private roads



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

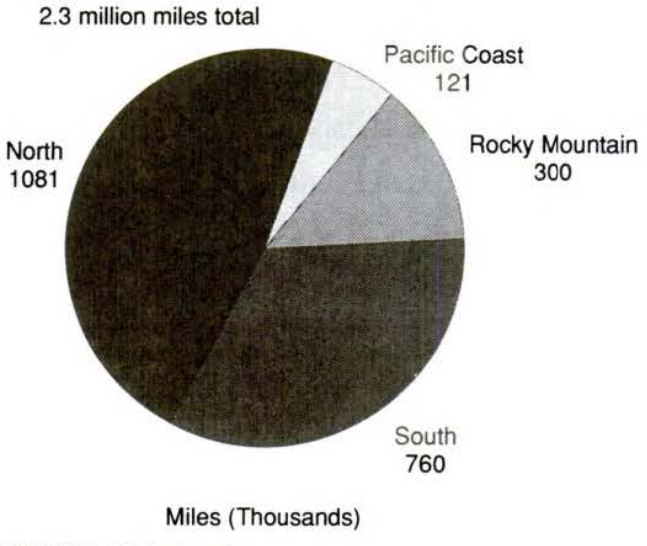
NOTE: Trail miles are not additive across uses due to designations of many for more than one use.

Figure 7.—Miles of National Recreation Trails by region and type of use, 1987.



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 8.—State recreation lands within 1/2 mile of a road by region and jurisdiction, 1987.



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 9.—Miles of roads and trails on nonindustrial private lands open to the public for recreation.

are not maintained and, thus, are not clearly distinguishable from trails.

Developed land sites.—Man-made facilities such as golf courses, campgrounds, and amusement parks as well as developed areas designed for very intensive uses such as playgrounds, ballfields, and picnic areas form the "developed lands" category. These lands are the least remote, generally adjacent to roads, and very often located close to or within populated areas.

Campgrounds.—Campgrounds range from the rustic—a fire pit and a flat place to pitch a tent—to full-amenity sites with hot showers, tables, electrical and sewer hookups, and sometimes cable television and telephone hookups for recreational vehicles. Campgrounds are an ever-present component of the American outdoor opportunity. As a recreational resource, they concentrate on human use, are hardened to withstand environmental impact, and provide launch points for trips into natural areas or to nearby attractions of great variety. Over 17,000 are listed and include over 1.3 million campsites across the country.

About 5,000 of the campgrounds in the United States are operated by eight different federal agencies. The majority, 70%, are in national forests. The Corps of Engineers, the second largest supplier, manages another 17%. In terms of regional distribution, the Pacific Coast and Rocky Mountain Regions split equally 70% of all federal campgrounds. Only 10% of federal campgrounds are located in the North. Generally, federal campgrounds are less developed than their state and commercial counterparts. Nationwide, less than 10% of federal campgrounds have water, electrical, or sewer hookups.

Nationwide, state agencies manage almost 2,100 campgrounds, mostly in state parks, with 134,000 spaces. State campgrounds are concentrated more in the eastern regions, particularly in the North. Often, these campgrounds provide accommodation for visitors who come primarily to use the lakes which are frequently found in state parks.

The private sector accounts for about 55% of all campgrounds in the U.S. and provides more than 70% of the total capacity. In general, private campgrounds cater to the camper who desires more facilities and services than public campgrounds provide. Private campgrounds, more often than public ones, provide amenities such as a store, hookups for water, electrical, cable TV, and phone, and playground facilities. Over 50% of private campgrounds nationwide provide full hookups (McEwen 1989).

Just as states have at least partially compensated for the regional concentration of federal wilderness lands in the West, private enterprise in the East provides camping opportunities where a much greater proportion of the population resides. The North has more than 40% of private campgrounds; the South has another 30%. The greater concentration of public lands in the West accounts for the greater proportion of public campgrounds in those regions (fig. 10).

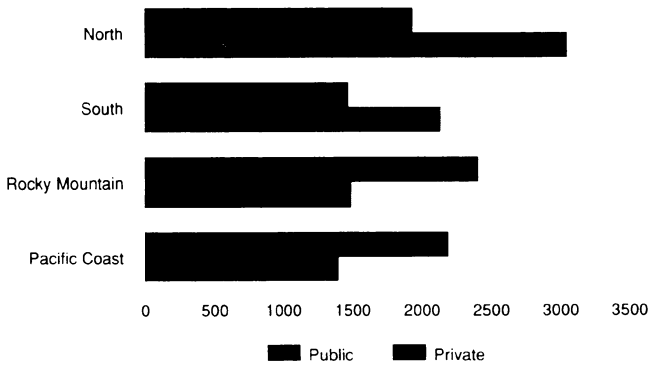
Roads.—As the automobile continues to shape the American lifestyle, driving for pleasure continues to rise as a pastime. Roads are an important part of the national recreation resource base. Federal agencies manage about 144,000 miles of roads on federal lands that are available for recreation as well as for other uses. Their regional distribution parallels the distribution of federal lands. The North and South Regions combined contain fewer roads on federal lands for recreation than the Rocky Mountain Region alone (fig. 11). Few roads on federal lands are designated specifically for recreational uses as is, for example, the Blue Ridge Parkway.

The over 17,000 campgrounds in the U.S. range from the more rustic federal sites to full-amenity campgrounds, mostly privately owned. Seventy percent of federal campgrounds are managed by the Forest Service.

Nonetheless, these roads are vital to access as well as recreational opportunities in themselves. In the mid-1980's, the recreational importance of roadways was recognized in the various scenic byway programs being initiated as a combined effort of state and federal agencies. These programs are expected to bring emphasis to the aesthetic qualities of highways and their surroundings.

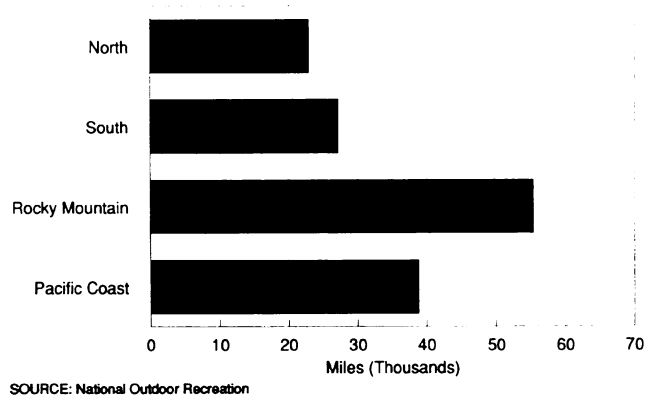
Other developed recreational resources.—A large portion of the facilities developed for recreation were built and managed by the private sector, but several important public sector contributions exist. Federal agencies operate over 63,000 picnic areas, 80% of which are located in the East. State-run picnic areas, which generally are provided at state parks and recreation sites, are similarly distributed due to the concentration of these areas in the North.

Dude ranches and golf courses are among the myriad commercial enterprises operated by independent entrepreneurs and large developers. Generally, such private businesses provide resources and services not otherwise available. Often, they facilitate access to public areas. The majority of land-based commercial enterprises are located where the population is most dense. Almost



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 10.—Number of public and private campgrounds by region, 1987.



SOURCE: National Outdoor Recreation Supply Information System (NORSIS) USDA Forest Service, Athens GA, 1987.

Figure 11.—Miles of road on federal land open for recreation, by region, 1987.

three out of five resident camps are located in the North, a region which also contains nearly half of the country's 11,000 commercial resorts. Another 18% of resorts are located in the South.

Three-fourths of the more than 6,000 golf courses open to the public are located in the East. The 2,400 members-only golf courses are also located primarily in regions with the greatest population. Golf courses also provide an important open space resource where people walk, jog, ski, snowshoe, or participate in other compatible activities.

Local lands.—As noted in the introduction to this section, the numerous local recreation areas are small in area but large in numbers and use. More than 75% of American adults use local parks or other recreation facilities in their communities. Over 7,000 local park and recreation departments serve local communities, and they manage about 2.3 million acres of recreation lands in over 94,000 separate areas. Primarily, local governments provide developed resources for intensive or structured recreational use. About 85% of the departments provide about 64,000 sports fields and 44,000 playgrounds. About two-thirds of these local government agencies provide outdoor tennis (57,000 courts nationwide) and basketball (23,000 courts), and about half provide fitness trails and volleyball courts. Local governments also provide almost 6,500 outdoor swimming pools, 1,500 18-hole golf courses, and over 800 9-hole golf courses (fig. 12).

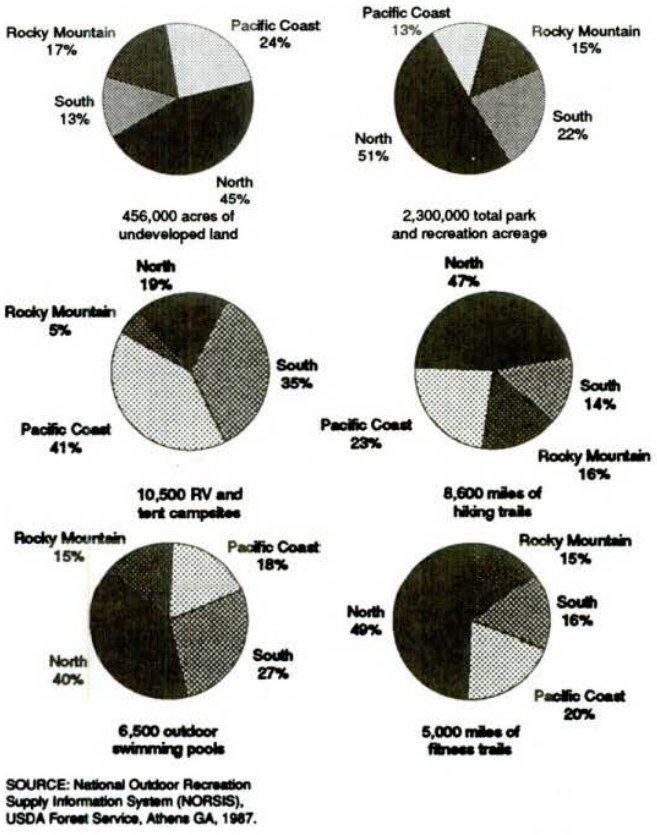
Undeveloped natural resources are also managed by many local park agencies. A nationwide survey of city and county governments showed that, out of all local recreation land holdings, more than 400,000 acres, or about 18% of the total, were in an undeveloped state (McDonald and Cordell 1988). Nationally, about half of all local park agencies manage natural areas of which about half are at least 100 acres. The larger the population served, the more likely that a local department manages some natural area acreage and the larger the department the larger the total area is likely to be.

Of the 7,000 local park and recreation departments nationwide, 63%, about 4,500 departments, manage recreational trails. Local trails total about 27,000 miles nationwide (fig. 12). Most of these trails are managed as fitness trails (46% of departments), hiking trails (29%), or bicycling trails (21%). A small percentage of trails are managed for off-road vehicle use (3%). The total mileage in hiking trails exceeds 8,500, with 6,800 bicycle trail miles, 5,000 fitness trail miles, over 5,000 snow trail miles, and 470 miles of off-road vehicle trails. Other types of trails total about 2,500 miles.

Local governments also operate overnight camping facilities. Nationwide, recreational vehicle and tent campsites number more than 10,000 (fig. 12). There are also approximately 10,500 day and resident camp areas operated by municipal and county governments.

The almost 2.3 million acres of local government park and recreation lands do not tell the whole story. Many more local lands contribute indirectly to recreation through local open space acquisition programs. Local agencies were reported to administer 8.7 million acres

Over 7,300 river miles in over 720 rivers have been designated as wild, scenic, or recreational rivers.



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 12.—Selected local park and recreation land facilities by region.

of open space in more than 87,000 separate units across the country in 1986 (President's Commission on Americans Outdoors 1987).

Water Resources

As with land resources, water resources vary from primitive to highly developed, from remote, alpine lakes to highly developed marinas. Water resources are managed by a variety of public agencies at all levels as well as by the private sector. As with land resources, the private sector contributes at the more developed end of the resources spectrum. Because access to water resources frequently requires facilities of some sort, private enterprise contributes most heavily by providing commercial access sites.

Wild and Remote Waters

Federal waters.—Of the nearly 3.6 million miles of rivers and streams in the United States, 7,365 miles in over 720 rivers or river segments have been designated as wild or scenic rivers under the Wild and Scenic Rivers Act of 1968. These rivers constitute the National Wild and Scenic River System (NWSRS). The NWSRS was established to protect free-flowing rivers with scenic, recreational, or other distinctive values. Rivers are classified as "wild," "scenic," or "recreational" depending on their accessibility, extent of disturbance to the river and surrounding area, and the degree to which they

provide outstanding scenic or recreational opportunities. Most such designated rivers are managed by the federal government, but about 10% are managed by state or local governments, sometimes in partnership with a federal agency.

Rivers and river segments in the NWSRS include some of the most remote waters in the country. As with wilderness, most wild and scenic river miles are located in the West, specifically in the Pacific Coast Region (71%) which includes Alaska. A little over 900 miles (13%) of wild and scenic river miles are located in the East.

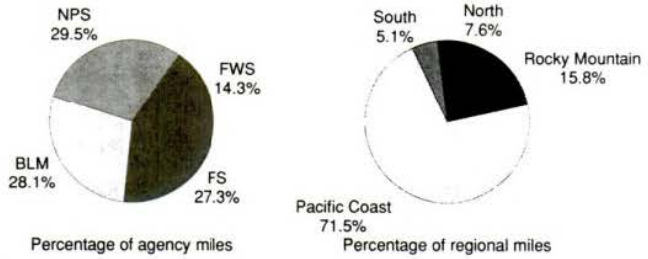
Almost 7,550 additional miles of river are, or have been, under study for possible inclusion in the NWSRS. Most of these segments are administered by the NPS. Unlike the already designated mileage, these segments are distributed fairly evenly across regions. In the East, four times as many miles of rivers are under study as have been designated wild and scenic rivers. Compared to the distribution of wilderness lands, the eastern regions contain a larger share of this fairly primitive resource (fig. 13).

Undeveloped state waters.—Many states protect rivers or sections of rivers which are largely free-flowing and undisturbed. More than 60,000 miles of rivers fall into this category. The eastern half of the country contains more than 70% of these state-managed, undeveloped rivers.

Partially Developed Water Resources

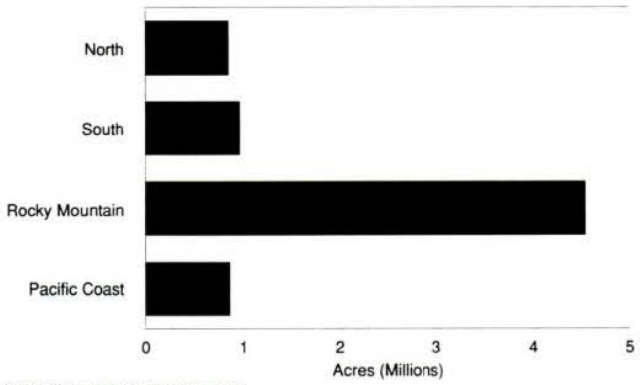
A number of federal agencies manage water resources adjacent to road access. These areas include lake and ocean shorelines and rivers with road and parking access at the water's edge or crossing it. The estimates of resources in this category include portions of national rivers, seashores, lakeshores, and recreation areas, as well as river miles on land managed by the BLM and water areas and lakeshore miles on lands managed by the Corps of Engineers, the Tennessee Valley Authority, and Bureau of Reclamation. The information in this category is mostly for federal resources. Information on surface water acreage that is partially developed and owned by states was not available.

More than two-thirds of this partially developed water resource is located in the Rocky Mountain Region (fig. 14, table 7). While the North has the fewest acres of par-



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens, GA, 1987.

Figure 13.—Distribution of miles of National Wild/Scenic River components by agency and region as of January 1,11987.



SOURCE: National Outdoor Recreation Supply Information System (NORSIS) USDA Forest Service, Athens, GA. 1987.

Figure 14.—Acres of National Rivers, National Recreation Areas, National Seashores, and National Lakeshores, 1987.

tially developed water, most are near major metropolitan areas, facilitating access by large groups of people. The Rocky Mountain Region dominates in this category because most Bureau of Reclamation projects are located there. About 40% of municipal recreation departments manage lake areas for recreation, over 56,000 total acres, and about half of these lakes are at least 15 acres in size.

Developed Water Resources

The private sector is the largest provider of developed water resources. Federal and state developments generally are less developed and more closely linked to the natural resource base than are commercial enterprises and local facilities.

Swimming areas, beaches, and boating.—Counter to the prevailing pattern of other types of federal recreation areas, water resource facilities are concentrated in the eastern half of the country, particularly in the South. This is primarily due to the large number of facilities operated in the East by the Corps of Engineers and the Tennessee Valley Authority. Many developments are so large that extensive partially developed areas co-exist on the same reservoir with scattered developed sites. As mentioned above, these types of facilities also tend to be near population centers because of historic settlement patterns along river corridors in the East.

The percentage of state parks providing swimming and boating gives an indication of the development of water resources at the state level. A greater proportion of state parks in the Rocky Mountain Region provide these types of resources than in any other region (fig. 15). Overall, about 40% of state parks provide some sort of swimming facility, about 25% provide boating access, and about 60% allow fishing.

Marinas.—Almost half of the 5,000 marinas and boat docks in the country are located in the North; another 40% are in the South. Thus, most of these facilities are located in the eastern United States where the majority of coastlines and large population centers are located.

Swimming pools.—Outdoor swimming pools are an important local recreation resource, often developed by

Table 7.—Area (in thousands of acres) of selected water-related federal resources by type and region.

Region	Type of Area			
	Acres of National Rivers, Lakeshores, Seashores & Recreation Areas	Bureau of Reclamation Water acres	Miles of Rivers Managed by BLM	Corps of Engineers Water acres
North	846	0	0	124
South	961	72	0	26
Rocky Mountain	4,539	1,628	3,646	90
Pacific	860	538	1,849	279
Total	7,206	2,238	5,495	519

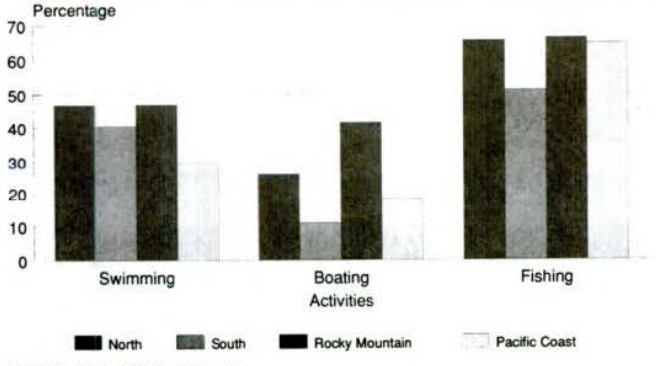
Source: National Outdoor Recreation Supply Information System, USDA Forest Service, Athens, GA (1987).

municipal governments. Nationwide, local governments operate almost 6,500 outdoor pools. Many more are provided as a commercial enterprise. These facilities are heavily concentrated in the East. Over half of the swimming pools open only through memberships are in the North, and about 30% are in the South.

Snow and Ice Resources

Many of the same resources that provide recreational opportunities in summer for activities such as backpacking, hiking, and off-road vehicle driving are also used in winter for activities such as cross-country skiing, snowmobiling, and winter camping. The resource base for these winter activities depends upon the acreage of land and water in climates with suitable snowfall and temperature. All areas available to the public that receive an average snowfall of 16 inches or more a year are considered part of the snow and ice recreation resource base (fig. 16).

More than 625 million acres, about 85% of the entire federal estate, receive adequate snowfall for winter recreation. Well over half of this acreage is located in the West and in Alaska. Only 2% of snow-laden areas within 0.5 mile of a road are located in the North. State agencies manage about 36 million acres of land receiving adequate quantities of snow.



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 15.—Percentage of state parks providing opportunities for selected water recreational activities.

Trails and Roads for Winter Use

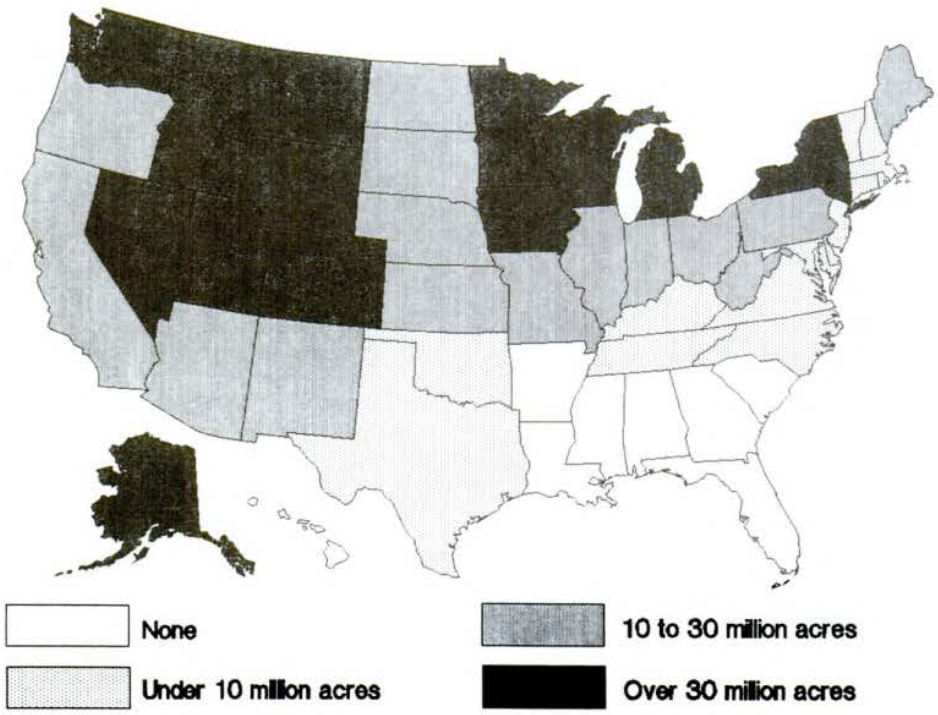
Over 2,000 miles of trails in the National Recreation Trail System (NRTS) may be used for cross-country skiing. Over half of these miles are located in the North. About 1,500 NRTS miles are open to snowmobiles and, again, the majority (60%) are located in the North.

During winter, about 100,000 miles of roads on federal lands receive sufficient snowfall to be used for winter recreational activities. As travel corridors, some of these roads may actually be more important in the winter when trails are impassable or hard to find. Half of these roads are located in the Rocky Mountain Region, and another one-third are in the Pacific Coast states. Almost all (90%) are on lands managed by the Forest Service. Local governments provide winter trails as well. Nationally, over 5,000 miles of local trails are available for winter use.

Cross-Country and Downhill Ski Resorts

Primary commercial opportunities for snow- and ice-based outdoor recreation are downhill and cross-country ski areas. Other forms of outdoor winter activities, such as snowmobiling and sledding, depend only on open areas and enough snow or upon temperatures low enough to freeze pond and lake surfaces for ice skating. The development of ski resorts has been almost exclusively by private investments, although resorts frequently use adjacent public land, most often Forest Service land, for ski runs and lift facilities.

The Nordic ski area directory, published by Ski magazine in 1985, lists over 400 cross-country ski areas. Nearly two-thirds of these areas are in the North. The average number of trail miles maintained per area was highest in the Pacific Coast Region (41) compared to 25 in the North. In recent years, commercially provided cross-country skiing with well groomed trails, lodging, food service, transportation, and other amenities has been



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 16.—Distribution of public and private land acres available for winter recreation by state.

growing rapidly. Ski magazine also listed 382 downhill ski areas. While 58% of the lifts are located in the North, the Rocky Mountain Region boasts greater skier capacity—40% of the national total.

Nationally, about one-third of ski lifts are on national forest lands. In the West, where Forest Service lands are more prevalent, the percentage is higher—83% in the Rocky Mountain Region and 78% in the Pacific Coast Region. Almost 60% of skier lift capacity is at ski areas on national forests, mostly in the West. Only 14% of skier capacity is on national forests in the North.

Conditions and Trends: Changes Occurring to the Outdoor Recreation Resource Base

The above sections have identified the extent of outdoor resources currently available for recreation in terms of acreage, regional distribution, and ownership. But changes are occurring in this country which may substantially affect the size, quality, and availability of the resource base.

Recent Resource Trends

Land.—Recent trends in availability of and access to land recreation environments are somewhat mixed. Despite increased wilderness designations, road developments on public lands have significantly reduced total remote backcountry acreage. Although road developments and purchases have increased the acreage in and access to roaded and partially developed environments on public lands, these increases have been offset by closures of private lands.

The number and capacities of developed land resources such as picnic areas, campgrounds, resorts, nature centers, and golf courses have increased. While some federal sites have been closed or have faced reduced maintenance, local government and private resource investment and management has risen enough to offset federal decreases.

Water.—Remote and wild water resources available for recreation have increased slightly in recent years. Designations of Wild and Scenic Rivers and increases in water quality and guide services (Brown 1985) have all contributed to offset road and other development. The net result has been a small increase in available remote water resources. Some closure of private lands and development on public lands has caused small decreases of opportunities for public recreation on lakes nearer to, but not immediately accessible by, 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 which closely approximate population growth rates.

The number of intensively-developed water sites has grown rapidly in recent years. Pools, marinas, piers, water amusement parks, and other developments have grown in capacity as well as numbers. 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.

Snow and ice.—Growth or decline rates for wilderness, undeveloped and partially developed, and roaded areas in regions where snow and ice are sufficient for winter sports parallel those for undeveloped land resources in general. Private land closure has especially limited resource availabilities for snow and ice recreation. Developed winter sports sites, on the other hand, have risen in recent years due both to the development of new areas and to increases in technology and capacity.

Factors Contributing to Recent Resource Trends of Open Space Losses

Estimates suggest as much as 1.5 million acres of rural land are converted annually to more developed uses (USDA FS 1980). Even though this is a tiny portion of the total land base, the impacts on recreation opportunities at the local and regional level can be significant and additive over time. This is because close-to-home open space, which is the most heavily used and demanded recreation resource, is most severely threatened by development. The esthetic integrity of an area can be affected when fragmented development occurs, particularly along road corridors once considered a visual scenic resource.

The fastest growth and expansion continues to occur in suburban areas, signifying the demise of the bedroom community and the rise of decentralized urban cores. Predicting how this kind of growth has changed and may continue to affect general environmental quality and opportunities for outdoor recreation is difficult and speculative. The increased demand for growth management in rapidly developing areas of the country indicates a new awareness and dissatisfaction with the side-effects of rapid growth. Around the country, voters are strongly supporting measures to channel and control growth in the interests of preserving local natural resources such as wetlands and undisturbed open space, and other distinctive cultural, historic, and esthetic features.

While urbanization erodes the rural private land base, other factors are also hastening the decline in rural land availability (Cordell et al. 1985). First is the increased fragmentation of private nonindustrial lands into smaller ownerships, often into tracts under 50 acres (Cordell et al. 1985). Fragmentation makes access contingent upon more land owners and usually signifies changes in owners and reasons for owning the land. Many reasons for owning land are not conducive to public recreation access. Second, more landowners are posting their lands to control access (Wright et al. 1989). In 1977, over 29%[2] of the nonindustrial private land base was open to public recreation. By 1986, that figure had dropped to about 23%. Third, an increasing proportion of rural acres are under recreational leases for the exclusive use of specific groups. Much leasing is monetarily motivated so additional leasing is likely, given the projected increases in the public's desire for recreational access to these lands.

[2]*This figure does not include leased acreage.*

Land Protection

The total amount of federal land managed under specific guidelines which limit kinds of use, either as a park, refuge, or wilderness area, has increased significantly since 1960. Most of the increase resulted from reclassification of public domain lands in Alaska. In addition, many of these same lands in 1980 were added to the NWPS, tripling its acreage.

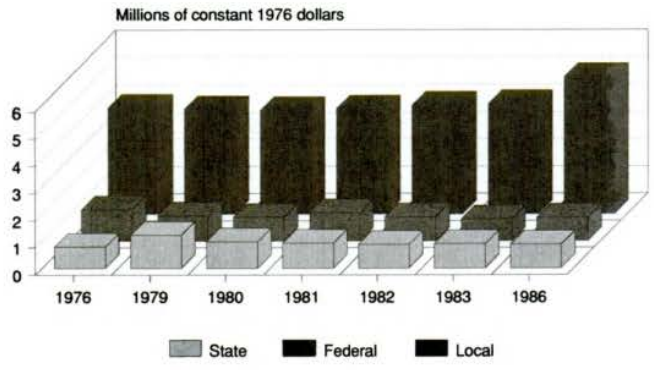
It should be noted that, in total, the federal acreage has decreased since 1980 because many Alaskan public domain lands were turned over to Native American populations or state agencies. Because most multiple-use federal lands may be used for recreational activities, a reduction in the federal acreage generally reduces recreational opportunities. However, it is still true that lands specifically designated for recreation have increased since 1980, despite a total reduction in the size of the federal estate. These special designations do not, however, physically increase the total acreage of resources available for recreation. They merely change the status of existing federal lands.

State protection of lands through outright purchase and special designations has slowed in the 1980's. Additional designations to protected status from existing state parks or state forests are expected to be few (Cook and English 1989). However, much evidence suggests that the natural area preservation movement is young and still growing. The growth of private sector agencies such as The Nature Conservancy are good indicators. For example, in the past few years, The Nature Conservancy has shown growth in total contributions, in contributions over $1,000, in corporate cash and land donations, and in memberships. It seems likely that impetus from the private sector will result in continued growth of this movement.

Facility Degradation and Budgets

Though budget constraints and increased use have emphasized the need for managing recreation, the collective net result has been a general degradation of both facilities and infrastructure. As of the end of fiscal 1986, the Forest Service reported a maintenance backlog in its recreation facilities of $1.7 billion. The NPS reported a $1.9 million shortfall for maintenance and capital improvements in 1988 (General Accounting Office 1988). The General Accounting Office report concluded that "because of advanced, continuing deterioration, some of these assets may be lost permanently." Direct expenditures by the federal government on parks and recreation (fig. 17) has declined 34% (in constant dollars) since 1980 (Bureau of the Census 1987).

State spending for parks and recreation has fluctuated since 1980 (fig. 17). From 1980 to 1984, real-dollar spend-



SOURCE: Bureau of the Census of Government Finances, U.S. Department of Commerce, Government Finances

Figure 17.—Direct government spending for parks and recreation, 1976 to 1986 (constant dollars).

ing declined 13%; from 1984 to 1986, there was a 17.7% gain (both inflation adjusted). The net result is a 2.2% gain since 1982. More significantly, state park budgets declined by 23% from 1980 to 1985, causing increasing concerns about facility deterioration (National Association of State Park Directors 1981, 1986). State forest agencies, however, have roughly doubled their recreation budgets during the same period, resulting in a small net gain when considered across all state agencies. Another important change in states' recreation financing has been the use of fees and charges—up 55% between 1978 and 1984. For example, revenue from entrance and parking fees increased 41% in state park systems from 1980 to 1985, comprising 20% of total revenues in 1985 (National Association of State Parks Directors 1986).

Expenditures for locally managed recreation resources rose 20% (in constant dollars) from 1980 to 1986. However, rising land prices and dwindling open space as the urban fringe expanded have reduced opportunities for reserving more land specifically for recreation.

Local governments have been confronted with three other financial problems. First, the sources traditionally used for capital improvements, the Land and Water Conservation Fund and matching state funds, have been substantially reduced (Mantell et al. 1989). Second, many localities are having more trouble raising money specifically for capital improvements. Third, concern about maintenance and improvement of existing facilities has diverted attention from acquisition of new areas.

Environmental Quality

A polluted environment can reduce the safety and appeal of some recreational pursuits, destroy some outdoor opportunities altogether, reduce the visual quality of landscapes, and threaten the viability of natural habitats upon which many other recreation opportunities depend. Upstream and upwind pollutants, the sources of which are outside park, wilderness, or recreation area boundaries, can compromise much of management's effectiveness and can have detrimental effects on plant and animal health.

Air pollution has affected the quality of outdoor resources in many ways. Thermal inversions in the Southwest have caused particulates from some contaminants to settle over scenic canyon vistas in various protected areas. Views in national parks, forests, and monuments have sometimes been obscured by particulate accumulation in the air. Acid deposition contributes to the dieback and decline of vulnerable coniferous trees at relatively high altitudes in the Southeast and other parts of the country. In the northeast and north-central states, some lakes particularly vulnerable to acid deposition have become virtually sterile. The outdoors as a recreation resource can be seriously affected if smog makes it unsafe to exercise outside as it does frequently in the summer in the Los Angeles basin where much of the Santa Monica Mountains National Recreation Area is located.

In the Everglades in southern Florida, wildlife habitats have been significantly reduced as a result of water pollution and drainage causing declines in the water table (Mangun 1983). The enjoyment of such a habitat is significantly diminished when that which people came to see has disappeared as a result of toxic contamination.

Reduction of phosphate loadings in the Great Lakes has greatly reduced algal blooms (the result of eutrophication) which closed many beaches in previous decades. However, toxic contaminants still plague the Great Lakes and fish populations have suffered (National Research Council, Royal Society of Canada 1985).

Other U.S. waters are still so heavily contaminated that swimming is considered dangerous. Such places as Boston Harbor or the South Branch of the Raritan River in New Jersey, which receive inadequately treated effluent from industry, septic systems, and nonpoint urban and agricultural sources, are so heavily polluted that they should not be considered part of the recreational resource inventory. Toxic contaminants have also caused massive declines in fisheries, although clean-up efforts on some rivers in New England have caused a resurgence in fish populations and the consequent resurgence in recreational fishing as well.

Shorelines

Development along shorelines contributes to water pollution and flooding and directly decreases access to recreational resources, especially when a beachfront is ringed by private homes and resorts. The Minnesota Department of Natural Resources is working to ensure that local zoning authorities enforce floodplain ordinances so that the quality of resources used for recreation (which is heavily biased toward water) will remain high (Minnesota Department of Natural Resources 1984). In California, more than 23% of the ocean-side state park units experienced beach sand loss, a trend which threatens the very existence of a very popular recreational resource (California Department of Parks and Recreation 1984).

CHAPTER II: THE DEMAND FOR OUTDOOR RECREATION AND WILDERNESS

Dramatic social changes have occurred since the Outdoor Recreation Resources Review Commission announced its findings (ORRRC 1962). The U.S. population has grown by 63 million people, although the rate of increase has slowed dramatically from 2.1% to less than 1% per year. The population has shifted south and west with increasing migration to nonmetropolitan cities and communities. Average income continues to increase.

Leisure time increased until the 1970's, but now the amount of time Americans have for leisure appears to be decreasing. Between 1973 and 1984, the average number of leisure hours fell over 31% (Harris 1984). In the 1988 Harris survey, a further decline was observed, resulting in an overall loss of about 37% in 15 years. Harris identified more women in the workforce and longer working hours for factory workers as major reasons. The increased time Americans have devoted to commuting has also depleted leisure. Retired individuals have the greatest amount of leisure while dual income households have the least.

Today, leisure activities are centered closer to home. Outdoor recreation has embraced some new activities and developments which have simplified participation in traditional activities, and changes have occurred in home leisure technology. Contributing to this trend toward "at-home" activity are the aging of the population, rediscovery of the family as the "baby boom generation" bears children, home-video entertainment, and less leisure time.

The post-World War II baby-boom generation is maturing. The average age of Americans is rising and will continue to rise. With this has come a change in activity patterns. For example, even though Americans jogged over 2.5 billion times in 1987, some factors indicate participation in such activities may have peaked (Cordell et al. 1989). We may expect to see many other changes in outdoor recreation activities as a result of an interplay between technology, demographics, socioeconomic conditions, personal preferences, consumer-oriented marketing, and aging. Indicative of such changes in recreational activities, the trade press noted several years ago that some ski areas were working to "gentle" their slopes to accommodate the aging population (Cordell et al. 1989). Similarly, walking for pleasure (and for health) has remained one of the most popular activities (4.3 billion occasions last year) while other forms of exercise seem to be dropping in popularity. Risk and adventure activities have always been popular with young adults. Some managers, however, report that middle-aged individuals are showing increased interest in risk activities (Cordell et al. 1989).

Society is changing from an industrial to a high-technology service and communications society, and government is becoming more decentralized. The change to high technology and service is contributing to significant changes in outdoor recreation apparent over the past 25 years.

Measuring Recreation Demand

Several different expressions are used to represent trends and possible future demand for outdoor recreation and wilderness. Recreation demand is often measured through participation and participation rates, visits, occasions, trips, and activity. **Participation** refers to the act of engaging in recreation and **participation rates** to the number or percentage of people who participate. A **visit** is participation at an identifiable site or area which has distinct entry and exit points such as a state park or national forest. Typically, the number of recreation visits is the statistic maintained in public agency records. A recreation occasion is participation which may or may not involve travel away from home. If the occasion involves travel, then it is a **trip** requiring travel time to and from home to one or more recreation sites or areas, plus the time spent recreating. An **activity**, as used here, is a distinctive kind of recreation participation like camping, bicycling, tennis, or horseback riding.

When trips are discussed in this chapter, they are classified by the activity the participant considered to be the main reason for the trip. **Demand**, then, is the number of activity-specific recreational trips away from home which people would be willing and able to take after they have considered both how much each of those trips will cost in gasoline, fees and other travel expenses, and how much time it will take. Recreation occasions based at home, such as running or bicycling, do not involve travel and typically occur more frequently than trips away from home.

Assessing the demand for wilderness experiences and opportunities is more complex than other outdoor recreation because it involves a number of other uses which may be nonrecreational. Unlike outdoor recreation, the value of scientific, educational, preservational, and other nonrecreational uses transcends the individuals involved as on-site users. The beneficiaries are typically the scientific community, students, future generations, and other more broadly defined groups. For this reason, measures of wilderness uses discussed in this chapter may seem more vague than measures of recreational uses.

Recent Trends in Outdoor Recreation

The rate of increase for some of the more traditional forms of outdoor recreation appears to be leveling off from the rates of the 1950's and 1960's. Some new and some of the more active traditional recreational pursuits have become more popular, and some passive activities less popular. While hours of use in federal recreation areas have remained stable or only increased slightly over the past 10 years, the number of visits has increased. The 2- or 3-week vacations that were the norm just a few years ago are now less common; but, the number of shorter trips, such as day trips or long weekend trips, has increased (Market Opinion Research 1986). Also, more

recreation now takes place close to home, with the median for day trips to federal recreation areas at 25 miles and 130 miles for overnight trips. McLellan and Siehl (1988) summarized the likely future: "In the decade ahead, recreation managers, researchers and policy makers will find need to cope with rapid change; recreation resource concerns increasingly will be people issues and not resource issues alone. People and society change faster and more erratically, than do the natural resources with which we are professionally concerned." In the following sections, some of the major factors of societal change are examined for their effects on outdoor recreation demand.

Factors Influencing Recreation Demand[3]

A number of factors influence trends in demand for outdoor recreation. O'Leary et al. (1988), Hartmann et al. (1988), and O'Leary (1989) examined several major national recreation studies over the past 30 years to identify which factors may shape the future of outdoor recreation participation. The factors identified include: (1) an aging population with earlier retirement; (2) a decline in available leisure; (3) population growth, particularly in the South, the West, and in rural communities (although at slower rates than in the 1950's and 1960's); (4) increasing immigration, probably bringing new patterns of outdoor recreation; (5) a greater percentage of the workforce represented by women, resulting in more dual-income households with increased discretionary income and less family leisure time; (6) a changing family structure including fewer extended families and more single parent families; (7) higher average education levels; (8) greater health-consciousness; (9) baby boomers entering middle age and becoming important consumers; (10) baby boomers delaying marriage and having children; and (11) rapid economic changes. The implications of these factors are substantial. The typical American family may be smaller with more discretionary income, but they have less free time. These families must plan for shorter, but more frequent, vacations and may choose different activities or do activities in a different way than American families of the past. Some of the major factors which will help shape future recreation demand are discussed below.

Population growth rates and geographic distribution.—The U.S. population is growing at a slower rate than in the past. About 100 million people have been added over the past 5 decades, about 2 million people per year. Wharton Econometrics Forecasting Associates estimates that additional growth over the next 5 decades, to the year 2040, will total slightly over 90 million, an annual average increase of only 1.75 million (Cordell et al. 1989). Immigrants will provide a substantial proportion of this expected increase. Geographic redistribution, apart from the well-publicized sunbelt/snowbelt shift, shows important changes in residence patterns with some rapidly growing nonmetropolitan areas. Continued extensive population growth is forecast in coastal states. In the 1970's, the growth rate of nonmetropolitan counties exceeded that of central cities and the suburbs, reversing a long trend. In the 1980's, however, the general trend reversed again with cities and suburbs growing more rapidly. But a number of nonurban counties continued to grow at a rate more than twice that of the nation. These fast growing "exurban" counties are sought by both retirees and the young because of quality-of-life factors such as scenic and recreational amenities and federal lands, particularly parks or wilderness. Also, the estimated 40% of the population living within 50 miles of the ocean in 1984 is projected to double by the twenty-first century.

The post-World War II baby boom continues to have a profound impact on outdoor recreation. Clawson (1982) calculated that, between 1945 and 1970, there were 20 million births above what would have been expected had pre-World War II birth trends continued. Clawson points out that, by 2010, the earliest of the baby boom generation will be 65 years old. Moreover, between 2020 and 2040, the United States will have an unusually large number of older persons. While their activities may change with age, indications are that the baby boom generation will continue their interest in outdoor recreation, with greater participation than their parents. If parental participation affects what children do, the children of that generation also may be expected to participate at high levels.

Participation barriers.—Some Americans simply choose not to participate in outdoor recreation while others face unwanted constraints. Certain periods of the life cycle (such as early child-rearing and old age) reduce recreation opportunities. Other barriers relate to lifestyle, including lack of time, lack of money, disabilities, or poor health. A third set of participation barriers relates to recreation opportunities: lack of appropriate facilities within an accessible distance, undesirable recreation places, lack of information about recreation opportunities, poor transportation, or lack of convenience (Hartmann and Walker 1989).

Although virtually all segments of the U.S. population participate in outdoor recreation to some degree, certain barriers seem to affect some segments of society more than others. The 10% of respondents to the 1986 Market Opinion Research poll who said they did not go outdoors for recreation generally were either poor, unmarried, old, or physically or mentally disabled. Transportation generally is improving nationwide, but the absence of public transportation may deny outdoor recreation opportunities to many people, particularly the elderly or poor in inner cities (President's Commission on Americans Outdoors 1987).

The 1985–87 Public Area Recreation Visitor Study (PARVS) reported that recreation varies by social group, especially participation rates (Hartmann and Cordell 1989). Overall, people with low or very high income, the

[3]*The material presented in this section is a summary of several unpublished papers prepared for this Assessment. The conclusions of these papers are based on extensive literature reviews and analysis of the Public Area Recreation Visitor Study, which involved interviews with 32,000 users of federal and state recreation areas nationwide. Copies of these papers are on file with the Outdoor Recreation and Wilderness Assessment Group in Athens, Georgia.*

Many Americans face barriers to recreation at some time (such as during early child-rearing or old age). Other barriers relate to lifestyle or lack of recreation opportunities.

aged, disabled, blacks, and less-educated recreationists visiting state and federal lands participate significantly less in many outdoor recreation activities than do the rest of the population. The factors underlying differences in participation are complex, interrelated, and not yet fully understood.

Social-psychological influences.—Current social-psychological issues in outdoor recreation include: (1) meeting the **diversity** of demand that exists and that will continue to grow; (2) designing our recreation opportunities to be fair or **equitable** to various segments of society; (3) resolving **conflicts** that ultimately occur among different user groups; (4) dealing with rapid **changes in society**, values, and technology; and (5) contributing to the long-term **benefits** from recreation (such as greater physical and mental health, better productivity, family stability, cultural pride, and identification) while responding to the pressures of short-term events (Schreyer 1988). These social-psychological issues are having greater influence on recreation participation as society becomes more complex. In addition, choosing strategies to achieve balance among the interests these issues represent is increasingly influencing natural resource policy in the United States. As these issues become more acute, demands for outdoor recreation opportunities will take on a different social context, perhaps well beyond the simple one of providing quality outdoor opportunities.

Socioeconomic make-up.—Recent information from the PARVS shows considerable differences in recreation participation depending on demographic make-up. Age, income, race, disability, and sex seem to be among the more influential factors (Hartmann and Cordell 1989).

Aging of the population is a dominant socioeconomic characteristic. Although that segment of the population which is 65 years and older will continue to fall until about 1995, a result of a lower number of births in the 1920's and the Great Depression of the 1930's, more than half of the population will be over 40 by 2000 (Snyder and Edwards 1984). The amount of participation in most forms of outdoor recreation declines with age. This pattern varies depending on the activity as participation rates for some activities, such as walking for pleasure, even increase with age. Generally, the more physical recreation activities show the sharpest decline with age, but many people participate in outdoor recreation into their 70's and 80's (Hartmann and Cordell 1989).

The patterns of recreation participation change with age. Consider camping, for example. Older individuals commonly seek more developed campgrounds, travel further to reach their destinations, and tend to stay longer at the same site than younger individuals (Hartmann 1988). The strong relationship between age and recreation patterns has important implications for the future. Although the influence of cohort effects have been shown for some activities (English and Cordell 1985), the percentages of the total recreating public will likely follow behaviors similar to the current elderly population. These overall percentages will be influenced by the increasing number of older Americans.

If recreation patterns of older Americans change, those changes are most likely to be increased participation in the more physically demanding activities. The current emphasis on health and physical fitness may impact the choices and opportunities of individuals as they remain healthier and more active for a longer period.

Income is often considered an important factor in outdoor recreation participation. Most visitors to federal and state recreation areas are from middle-income groups. Both low- and high-income groups use such areas less. Travel patterns are somewhat different depending on income. People with higher income travel further and stay longer. Some expensive activities, such as sailing, show a strong relationship to income while others, such as walking for pleasure, show no such pattern. These findings indicate that income can be an important barrier to participation in some activities, but other activities are available to all. This pattern is likely to continue, indicating that the economically disadvantaged will continue to lack certain recreation opportunities in the foreseeable future.

While incomes generally are trending upward, the President's Commission on Americans Outdoors discerned a bipolarity in the income statistics: the middle class, those earning between $15,000 and $30,000 per year, is shrinking. Income distribution projections show polarization toward more high- and low-income families. Households with incomes over $50,000 (in 1980 dollars) are projected to triple by the mid-1990's. Older Americans have become more financially stable, and are an actively sought market in recreation, travel, and tourism. This could cause increased demand for private recreation by those who can afford it and a corresponding need for public recreation by those in lower-income groups.

The population is also becoming more ethnically diverse. Immigration and very high birth rates among minority populations are rapidly changing the composition of American society. The American-Asian population increased 146% between 1970 and 1980; the Hispanic population rose by 56% between 1970 and 1982 (Cordell et al. 1989). During this same period, the black population grew by only 22% and the white population by only 11%.

Differences exist in recreation patterns among these different racial groups. Blacks are usually underrepresented in resource-based, nonurban outdoor activities. Additionally, some activities appear to be more popular with one racial group than another. Although very little research has been conducted on racial differences in outdoor recreation participation, analysis of the PARVS data has shown that camping, day hiking, wildlife observation, motorboating, and most winter activities have higher participation rates among whites than nonwhites. Picnicking typically has higher participation rate among nonwhites. Despite these differences, participation rates were close between racial groups for many activities. Also, trip patterns are different between these groups. Nonwhites tend to visit areas closer to home and have considerably shorter lengths of stay at recreation areas than whites (Hartmann and Overdevest 1990).

Although the era of legal discrimination based on race has passed in this country, significant differences in recreation behavior among the races persist. The reasons for these participation differences among the races are currently unresolved. Cultural norms possibly play a large role in determining participation behaviors. However, intervening factors such as income, education, transportation, and information may also produce differential participation barriers for some racial groups (Hartmann and Overdevest 1990).

Continued efforts to promote racially equal opportunity may act to increase resource-based recreation participation by nonwhites in the long term. However, if recreation differences are primarily cultural, rather than opportunity differences, the changing racial composition of the population and the resultant mixing of cultures may eventually produce a mix of activities desired by the population as a whole.

Participation differences also exist between men and women. In general, men participate more frequently in strenuous activities than women (O'Leary et al. 1982). Also, the decline in outdoor recreation participation occurs earlier in life for women than for men. For some activities, such as all forms of hunting, men have a higher rate of participation. Participation rates in other activities, such as developed camping, are nearly equal. Some activities, such as walking for pleasure, show a higher participation rate by women. Differences in recreation trip characteristics are minor between men and women, however. The reasons for these differences is a matter of speculation, and how the long-term influence of the "women's movement" will affect participation patterns remains unknown.

Social groups are another important influence on recreation behavior. They include the immediate household, the individuals with whom people recreate, and possibly the social groups with which people associate during nonleisure (Hartmann 1988). The American household is changing. Single-parent families doubled between 1970 and 1984, reaching 6.6 million. Although the divorce rate is expected to stabilize, estimates are that half of all children today will eventually live in a home without a father.

The 1982–83 National Recreation Survey (NRS) examined those individuals over age 60 who were teaching recreation skills to others and found that most were teaching their skills to family or friends (USDI NPS 1986). With an increasingly mobile society and a trend away from extended families living together, the opportunities for passing recreation skills from one generation to another may be reduced, especially the more complex skills such as hunting and fishing. This influence may contribute to a reduction in the number of individuals who know how to do these activities and ultimately lead to a reduction in participation. Also, the composition of the group with whom one participates influences both the choice of activity and the duration of those activities. The presence of the elderly or children in the group was especially important in determining camping style and duration on Forest Service lands (Hartmann 1988). With an aging society, coparticipant group influences may deserve increased attention in the future, especially as

the presence of older individuals seems to have a strong influence on the activities of the entire group.

Disabilities.—The recreation patterns of disabled people are quite different from other individuals. Disabled people participate less per capita in all forms of recreation than other individuals, but many of the disabled have more leisure. Also, a smaller percentage of the disabled participate in outdoor recreation than the nondisabled population. Some activities which are more commonly participated in by disabled individuals include sightseeing, picnicking, walking, driving for pleasure, developed camping, and fishing. Intervening factors, such as advanced age and low income, add to the recreation constraints of many disabled individuals. Some studies have shown that attitudes of recreation area personnel, lack of information about recreation opportunities, and fear of the unknown may actually be more formidable barriers than physical impairments for many disabled individuals (Hartmann and Walker 1989). As disabled individuals become more accepted in society and as technology permits them greater mobility, more disabled individuals will likely use public recreation areas in the future. Recreation area managers, planners, and policy makers should expect increased use of these areas by disabled individuals.

Technology.—Technology directly creates new recreation equipment and uses, but a large part of technological advancement has come from military and other nonrecreation sources. From military technology has come four-wheel drive vehicles, rubber rafts, and the parachute. Much of the available outdoor clothing and camping equipment has also come from military research. More recently, space technology has provided the lightweight "space blanket" and many other materials which have been adapted to outdoor recreation uses. Other recent technological advancements have been made in television, transportation, medicine, natural sciences, structures, and computers. Rapid technological advancements add an element of uncertainty to long-range recreation planning (Shafer et al. 1988).

Attendance at Public Recreation Areas

Recent estimates developed for this Assessment indicate the relative proportions of outdoor recreation use which occur on sites managed by each of the four major resource owners. These estimates focus on visitation and draw upon several sources, such as the PARVS, the 1982–83 NRS, agency visitation records, and research studies reporting lengths of stay at various recreation sites. They show that federal lands receive an estimated 12% of all outdoor recreation participation, state lands receive about 14%, local recreation opportunities account for 60%, and private lands and enterprises provide for about 14%.

Visitation to federal outdoor recreation areas.—The annual Federal Recreation Fee Report (USDI 1974–1987) describes visitation to federal recreation areas managed by seven federal agencies (Forest Service, Park Service, Bureau of Land Management, Fish and Wildlife Service, Bureau of Reclamation, Tennessee Valley Authority, and Corps of Engineers). The majority of areas managed by these agencies are in forest and rangeland settings; some are predominantly water. Overall, the number of visitor days on these areas increased 4% from 1977 to 1987 (table 8). Although some agencies had slight declines in recreation use (fig. 18), visitor days of use at national forest sites increased by over 16%. Also, while total visitor days during this period were changing erratically, and their total rose only slightly past their previous 1977 level, **number of visits** to some federal land systems increased more rapidly. This difference between total visitor time on sites and number of visits reflects visits of shorter duration.

Table 8.—Thousands of visitor days to federal sites (and index to 1977).

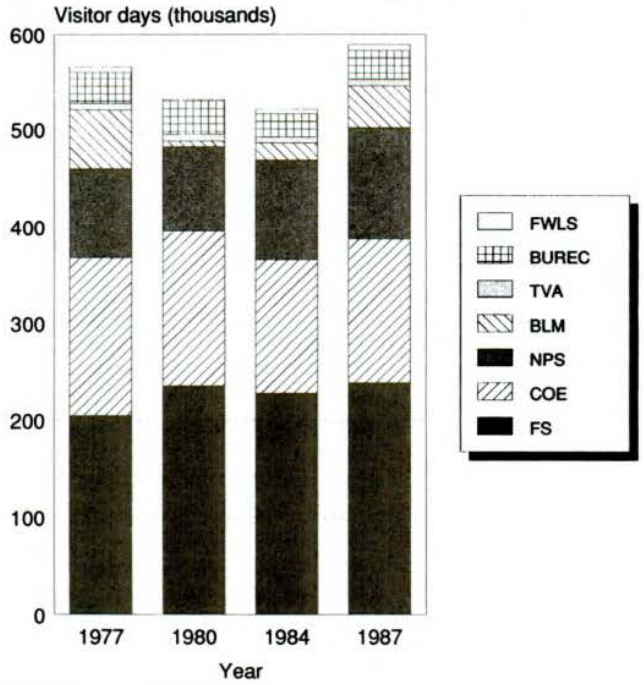
Agency	Year			
	1977	1980	1984	1987
Forest Service	204,797 (100.0)	234,899 (114.7)	227,554 (111.1)	238,458 (116.4)
Corps of Engineers	162,750 (100.0)	160,529 (99.6)	137,657 (84.6)	148,683 (91.4)
National Park Service	92,029 (100.0)	86,807 (94.3)	103,296 (112.2)	114,753 (124.7)
Bureau of Land Management	60,226 (100.0)	5,692 (9.5)	17,349 (28.8)	43,099 (71.4)
Tennessee Valley Authority	7,038 (100.0)	7,268 (103.3)	6,620 (94.1)	6,508 (92.5)
Bureau of Reclamation	33,607 (100.0)	33,932 (101.0)	23,515 (70.0)	31,783 (94.6)
Fish and Wildlife Service	6,010 (100.0)	1,451 (24.1)	4,791 (79.7)	5,973 (99.4)
Total	566,457 (100.0)	530,578 (93.7)	520,782 (91.9)	589,257 (104.0)

Source: U.S. Department of Interior (1974–1987) Federal Recreation Fee Report.

For visits to national forests, the percentage of all trips that were 2 hours or less in travel time increased from 43% in 1977 to 72% in 1986. Meanwhile, the number of trips of greater than 8 hours travel time dropped sharply from 23% in 1977 to 6% of all trips in 1986 for national forests, and from 41% in 1977 to 9% in 1986 for national parks (table 9). The percentage of repeat visits is increasing for both national forests and national parks (table 9). Length of stay has changed as well, with proportion of visits of 1 day or less increasing, and visits of more than 1 day (24 hours) declining (table 9).

Visitation to state outdoor recreation areas.—In 1979, about 92% of state park users were day visitors while about 8% stayed overnight. In 1980, day users constituted about 87% of visitors; and by 1986, total use was about 90% day use and 10% overnight use. State recreation area visitation has held fairly constant over the past 10 years with about 9 of every 10 visitors making a day visit to state parks. State parks are continuing to serve public needs for primarily day-use recreation (USDI 1974–1987).

Newly available data from the PARVS provides additional information on the trip characteristics and recreation activities of visitors to state recreation areas. These data confirm that most visitors to state recreation areas are day users. Most day visits to state parks are about 3 to 4 hours. The median one-way travel distance for day visitors ranged between 25 and 35 miles, depending on the region of the country. Longer trips in the Rocky Mountain Region produced a higher mean travel distance than in the eastern regions. For overnight visitors, median length of stay is a little over 2 days for state areas while



SOURCE: National Park Service, Annual Fee Reports

Figure 18.—Recreational visitor days for federal land management agencies, 1977 to 1987.

Table 9.—Comparison of reported length of stay, repeat visits, and one-way travel time for two federal agencies, 1977 and 1986.

	Forest Service		Park Service	
	1977	1986	1977	1986
	percent			
Length of stay				
0–2 hours	6	26	28	30
2–4 hours	8	22	13	29
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)				
< 2	43	72	31	55
3–4	19	14	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.

the mean length of stay is about 3.5 days. Median reported travel time for overnight visitors to state recreation areas is about 2 hours; median miles traveled to reach these areas is 85 miles. Popular recreation activities in state parks are similar to those in federal areas. Active sports such as swimming and fishing appear to be more popular at state areas, and sightseeing was more popular at federal areas. Some regional differences were evident (Betz and Cordell 1989).

Visitation to local outdoor recreation areas.—The Municipal and County Park and Recreation Study (MACPARS), completed in 1985, estimated that between 125 and 175 million individuals are served annually by over 7,000 local park and recreation departments (McDonald and Cordell 1988). This represents between 51% and 72% of the U.S. population.[4] The 1986 Market Opinion Research report found that three out of four American adults visited a local park at least once in 1985, representing 140 million adults over 18 years of age. A recent trend toward shorter, closer-to-home vacations may mean that local park demand will increase even more. Organized sports, such as baseball, softball, and football, represent one form of developed outdoor recreation that involves most American children, either as participants or as spectators. However, surveys typically do not include children and, thus, fail to count the very large number of youths being served through local recreation programs, including nature centers, local parks, and developed sports programs.[5]

Demand for local park and recreation opportunities is difficult to quantify, particularly at the national level.

[4]*These figures are calculated as follows: park and recreation departments nationwide are estimated between 5,000 and 7,000 in number. these departments serve an average of 25,000 people each.*

[5]*Municipal and County Park and Recreation Study (McDonald and Cordell 1988), and weighted to U.S. Census of Governments data by community size and recreation budget size. For communities of under 25,000 population, unweighted data are used.*

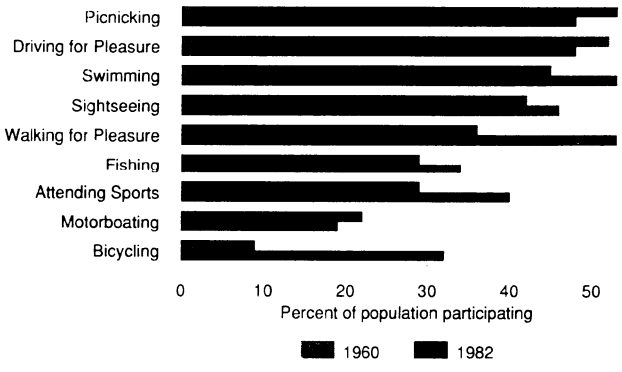
The variety and scarcity of use reporting schemes, the autonomy of local government operations, and lack of a unified system of service delivery all complicate evaluation. At the local level, the growth and continued public support of local park and recreation operations are indications of strong public demand. According to the MACPARS (McDonald and Cordell 1988), operating budgets in local departments rose a median of 25% between 1983 and 1985. While not a direct measure of demand, this level of local support for park and recreation departments indicates a desire for their services and a demand for close-to-home recreation opportunities, which may increase even more in the future.

Participation in Outdoor Recreation Activities

General trends in recreation participation.—Surveys of public participation, both by public agencies and private organizations, generally point to continued growth in demand for outdoor recreation. While the outdoor recreation surveys of the past 3 decades are not strictly comparable, they do point to some general trends for specific activities and to how participation has grown or declined. For example, a comparison of the 1960 and 1982–83 NRS shows an increase in percentage of the population that participated in six of nine popular outdoor activities (fig. 19). Many of these are vigorous activities, such as bicycling, walking for pleasure, and swimming.

The A.C. Nielsen Co. surveyed participants in some typical outdoor recreation pursuits at 3-year intervals from 1973 to 1982. The survey showed the participation rate for bicycling, fishing, boating, and snow-skiing increasing between 1973 and 1982 while the swimming participation rate declined and camping rose and then fell between 1973 and 1979 (Nielsen 1982).

More recently, a survey conducted by Market Opinion Research (1986) showed the relative popularity of many outdoor activities. This survey found that walking or driving for pleasure, sightseeing, picnicking, swimming, visiting zoos and fairs, attending outdoor sports events, visiting historic sites, fishing, bicycling,



SOURCE: U.S. Department of the Interior 1986

Figure 19.—National trends in participation in selected activities (people age 12 and older) 1960 and 1982.

Table 10.—Percentages of population participating in outdoor recreation activities in two time periods, 1977 and 1987.

Activity group and activity	Percentage of participants participating at least once annually	
	1977 (households)	1987 (individuals)
	percent	
Land-based		
Camping (developed)	30	20
Camping (dispersed '77) (primitive '87)	21	11
Driving off-road vehicle	26	12
Hiking	28	16
Horseback riding	15	10
Nature study/photography	50	13
Picnicking	72	54
Pleasure driving	69	54
Sightseeing	62	51
Water-based		
Canoeing	16	9
Sailing	11	7
Other boating	34	7
Swimming outdoors	61	*
Outdoor pool swimming	*	48
Non-pool swimming	*	35
Water skiing	16	10
Snow/ice-based		
Cross-country skiing	2	4
Downhill skiing	7	7
Ice skating	16	7
Sledding	21	5
Snowmobiling	8	4

NOTE: Sampling and methods were different between the above two cited studies. The 1977 study reported percent of households participating in outdoor recreation by type of activity. The 1985–87 study reported percent participation by individuals. Differerences between percentages reflect survey methods and measurement of household versus individual participation. Higher household percentages reflect high probabilities that at least one person in a household is a participant.

Source: USDA Forest Service's 1979 Resources Planning Act Assessment; 1985–87 Public Area Recreation Visitor Study.

**No data available for these categories.*

and camping topped the list of participation rates among Americans.

Even more recent data on outdoor recreation participation has been developed from PARVS for this Assessment (Cordell et al. 1987). PARVS is the successor to the Federal Estate Visitor Survey which served as a data base for the 1979 RPA Assessment's recreation analysis. Analysis of these two surveys shows the changes in participation rates of selected activities (table 10).

Another measure of participation is **rank order** of the percentage of population participating in activities. This allows comparison between surveys using somewhat different methods. Using this ranking system, Hartmann et al. (1989) found that picnicking was the most popular outdoor recreation activity in all surveys except the most recent. The most dramatic change is seen in bicycling which gained in relative 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 of a more active lifestyle for Americans.

Participation data from the 1960 and 1982 NRS can be accurately compared across only nine activities (fig. 19). Differences in questions and definitions between the two surveys (for example, for camping and boating) complicate or preclude trend analysis. Table 11 provides two measures of current outdoor recreation participation. Additionally, trend information from the 1960 and 1982–83 NRS and a synopsis of the most current information available from PARVS is provided for selected activities discussed below. (Hunting and fishing participation is discussed in the Wildlife and Fish Assessment.)

Driving and walking for pleasure.—Pleasure driving and picnicking have the highest participation rates among outdoor recreational activities. Participation spans all demographic segments and is surpassed only by walking for pleasure among the over-60 age group.

Table 11.—Annual participation in selected outdoor recreation activities.

Activities	Percent of population 12 years old and older participating	Median number of days of participation annually
Land-based activities		
Walking for pleasure	60	35
Driving for pleasure	54	21
Picnicking	54	7
Sightseeing	51	15
Bicycling	36	18
Running/jogging	29	42
Family gatherings	23	6
Visiting nature museums	23	3
Camping in developed campgrounds	20	9
Visiting historic sites	20	4
Attending special events	19	3
Day hiking	16	10
Wildlife observation	14	18
Nature study/photography	13	18
Photography	12	14
Driving vehicles or motorcycles off-road	12	12
Camping in primitive campgrounds	11	8
Horseback riding	10	9
Big game hunting	7	11
Small game hunting	6	13
Backpacking	5	7
Water-based activities		
Swimming in outdoor pools	48	16
Swimming in lakes, streams, ocean	35	13
Warmwater fishing	22	21
Motorboating	21	10
Water skiing	10	8
Canoeing/kayaking	9	6
Saltwater fishing	8	12
Coldwater fishing	7	15
Sailing	7	6
Snow and ice-based activities		
Other winter snow activities	12	7
Downhill skiing	7	9
Ice skating	7	5
Sledding	5	5
Snowmobiling	4	9
Cross-country skiing	4	6

Source: 1985–87 Public Area Recreation Visitor Study.

The PARVS found high participation rates in walking for pleasure among all ages, both genders, and nearly all income groups. The median participation per person is 35 days annually.

Day hiking.—Hiking grew significantly in popularity between 1960 and 1982, with 14% of the NRS respondents participating in 1982. The NRS indicated that both men and women enjoyed the activity and that participation remains high up to about age 60, then it drops sharply. Participation in hiking increases with education and income. Current data from PARVS indicates that 10 days annually is the median participation per person in the United States and that 16% of the U.S. population over 11 years old participated at least once annually. About 20% of participants go hiking more than 15 days annually. Persons over age 40 have a lower participation rate, but no gender differences were apparent.

Camping.—Camping, including backpacking, almost doubled in rate of participation between 1960 and 1982. Camping has traditionally been among the most popular outdoor activities among both sexes and among people of varying ages, education levels, and incomes. Data from PARVS showed clear differences among participants depending on camping style. Backpackers are generally fairly small family or friendship groups who are young, highly educated professionals, with a high percentage of males and very few accompanying young children or elderly. Groups camping in primitive or developed campgrounds represent a broader spectrum, having nearly equal gender ratios, being middle income, and often containing both elderly and young children. These groups are most often families (Hartmann 1988). Some 20% of the recreating public camped at developed sites, with a median of 9 days annually. Over 11% of the recreating public camped in primitive campgrounds, with a median of 8 days annually. Backpacking involves about 5% of the recreating public, with a median of 7 days annually.

Off-road vehicle driving.—Off-road vehicle driving, including motorcycles, four-wheel drive all-terrain vehicles, and beach buggies, was not a prominent activity in 1960. The 11% participation reported in 1982 represents significant growth since 1960. PARVS shows 12% of recreationists currently participate, which represents over 20 million people. These participants are generally young (60% under age 30) and are 64% male. Median days of participation is 12. (Note: In this assessment, snowmobiling is not included in the more general category of off-road vehicles but is discussed separately.)

Horseback riding.—About 9% of NRS respondents said they engaged in horseback riding, a rate that has been fairly stable since the 1960's. PARVS shows an interesting distribution of the frequency of participation indicating two main groups: a majority who probably rent horses for a few days a year, and an avid minority who likely own their own horses and ride as often as possible. Horseback riding is somewhat more popular among women than men, and the largest group of participants is aged 15–19.

Different types of recreation activities attract different people. People using developed campgrounds represent a broad spectrum of users.

Bicycling.—Bicycling has gained dramatically in popularity since 1960, more than tripling its population participation rate. Based on the 1982 NRS, 37% of young adults (aged 25–39) said they bicycled, and 22% of the middle aged (40–59 years) said they did. An estimated 78 million Americans bicycle, more than half of whom are over 18 years of age and more than half of whom are women (Moran et al. 1986). Physical fitness and enjoyment of nature were given as major reasons for pursuing the sport.

Technology has broadened participation in bicycling. In addition to the traditional child's bicycle, touring, racing, mountain, and adult three-wheeled bicycles are now available. Each offers a different recreational experience to a different clientele. In 1985, more than 100,000 young people participated in dirt bike motocross racing; 8,000 persons participated in 110 sanctioned mountain bike events; and 600,000 Americans took a bicycle vacation or extended tour (Moran et al. 1986). PARVS indicated participation by 76 million Americans over age 11 each year, confirming the NRS figure and revealing that 36.4% of the population participated at least once annually. The data also showed that the median frequency for bicycling is 18 days, but 20% of participants over age 12 participate 60 days or more per year. About 115 million biking trips away from home are made each year by the American public.

Swimming outdoors.—Outdoor swimming was already extremely popular in 1960, but participation increased from 45% to 51% between the 1960 and 1982 NRS surveys. In the 1982 survey, a somewhat larger proportion of respondents said they swam in outdoor pools rather than in natural environments. Currently, swimming is still very popular with 48% of the PARVS respondents participating in pool swimming at least once annually. Median number of annual participation days is 16, with 20% of participants swimming on 50 different days each year. Women make up about 55% of participants in outdoor swimming, which is popular nationwide and with all age, education, and income groups.

Boating.—The 1982–83 NRS reported the participation rate for the general category of "boating" as 28%. That study found participation tends to be greater among higher income and education groups. Little difference in participation rates exist between men and women, and participation continues through middle age. Of all boating activities, canoeing or kayaking had the largest participation growth, from 2% in the 1960 survey to 8% in 1982. More information on specific types of boating is presented below from the PARVS data set.

Canoeing/kayaking.—The current participation rate from the PARVS study for this activity shows that about 9% of the recreating public participates. These individuals participate a median of 6 days per year. They are generally young, 60% are under age 35. Men make up 54% of participants, and income of participants roughly follows that of the U.S. population.

Sailing.—About 7% of the recreating public participates in sailing, for a median of 6 days each year. These participants are generally young (under 35) and slightly more women than men participate. Sailing can be an expensive sport; thus, it is not surprising that the proportion of the public that sails rises dramatically with income. Over 25% of participants have family incomes over $50,000.

Motorboating.—Twenty-one percent of the recreating public uses motor boats at least once a year, with a median participation of 10 days. Motorboating is less age-related than most other outdoor recreation activities, and men make up about 55% of participants. Graefe (1986) reported that expenditures for boating have grown

from $7.5 billion in 1979 to $12 billion in 1984. Also, small boats account for the majority of recreational motorboats; 62% are 16 feet or less.

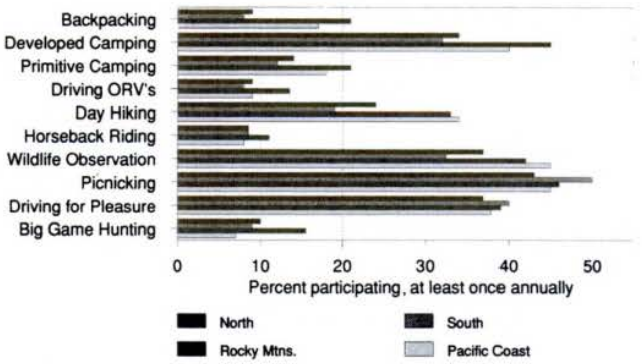
Cross-country skiing.—Immigrants from northern Europe brought cross-country skiing to America. As a recreation, cross-country skiing declined to insignificance by the 1960's and was not even considered in the 1960 ORRRC survey. Also known as Nordic skiing or ski touring, cross-country skiing's rise to a 3% participation rate in 1982–83 (4% to 5% outside the South) grew from a base of almost zero. The NRS found the demographic pattern of skiers to be similar to that of downhill skiers, except that it is markedly less popular among urban people and its popularity continues into middle age. PARVS reported that the median number of participation days was 6, and that individuals aged 25–35 dominated the activity although individuals of all ages participated. About 4% of the U.S. population over age 11 participates.

Downhill skiing.—Participation in downhill skiing is typically an activity for young, affluent adults. At least once annually, 7% of recreating Americans participate, with a median of 9 days. Of these participants, 60% are aged 15–30, and men comprise about 55% of participants. About 50% of participants have family incomes of at least $35,000, and over 25% have incomes of $50,000 and above.

Snowmobiling.—Motorized, over-snow vehicles have been used for several decades where heavy snow cover persists for long periods. Snowmobiling as a recreational activity was just beginning to become popular in the United States in the 1960's. The 3% participation rate recorded in the 1982 NRS survey represents much growth since 1960. The 1982–83 NRS found that the demographic traits of snowmobilers are similar to cross-country skiers, except that snowmobiling attracts a smaller percentage of those individuals in the higher education and income categories. Currently, an estimated 4% of people over age 12 participate about 9 days per year.

Regional Variation in Outdoor Recreation Participation

Data from the 1985–87 PARVS show some striking regional differences in the kinds of outdoor activities people pursue (fig. 20). As one might expect, the data largely reflect differences in opportunities among the regions. For example, backpacking is more prevalent in the Pacific and Rocky Mountain Regions than in the South and North, probably because the former have more public land. The South and North surpass the Pacific and Rocky Mountains in warm freshwater fishing while the situation is reversed for cold freshwater fishing. Where opportunities are similar, no extreme differences in participation are apparent among regions. Differences in travel characteristics do exist among regions. Individuals from the Pacific Coast travel further on recreation trips than recreationists from other regions—nearly twice as far as recreationists from the South. Individuals from the Rocky Mountain Region stay longer on site than those from other regions, particularly longer than in the South.



Source: 1985-1987 Public Area Recreation Visitor Study

Figure 20.—Regional differences in annual recreation participation by origin of respondent.

Recreation Trends Which May Carry into the Future

More than 100 recreation researchers attended the 1985 National Outdoor Recreation Trends symposium. They examined persistent trends for their possible implications for future outdoor recreation in the United States. Below is a synthesis of major points relating to participation and demand (McLellan 1986).

The role of outdoor recreation in American life continues to expand. While the mix of activities has been changing, participation in traditional activities has not increased as sharply as it did in the 1960's and 1970's, though it should continue to grow. Increases in participation have been particularly noticeable in physically demanding activities, such as bicycling, canoeing/kayaking, developed camping, downhill skiing, cross-country skiing, water skiing, and snowmobiling. These activities have had broad appeal for the baby boom generation because many are available to a broad economic segment of the population and could be found relatively close to home.

Participation has leveled off in boating, horseback riding, fishing, swimming, golf, tennis, picnicking, driving for pleasure, and driving motorcycles and other motor vehicles off-road. Many of these activities peaked in the 1970's and early 1980's and were not expected to grow in the next 15 to 20 years. Decreased participation in hunting was predicted. Many of these predictions have, thus far, held true, but others were short-term anomalies.

Outdoor risk and adventure recreation, encompassing such activities as white water sports, rock climbing, ice climbing, and hang gliding, were expected to continue growing in popularity. This demand growth was expected to come from a more urbanized, mobile, and affluent population. The demand could be dampened by increased transportation costs and competition for available resources (Ewert 1989).

As it had in the past, technology was influencing recreation as equipment development made new activities

possible. Researchers conjectured the possibility of snow surfing, jet-pack backcountry camping, jet snow skis, and personal all-terrain hovercraft. Technology was also expected to improve safety and communications, making more people feel more secure in outdoor activity (Shafer 1989).

Use of Public Recreation Areas by Foreign Visitors

The growth in tourism from foreign visitors has been dramatic. Between 1960 and 1981, foreign visitors to the United States increased from 602,000 to more than 8 million (Stronge 1983). Although Americans traveling overseas still outnumber foreign visitors to this country, the gap has narrowed significantly. International travel is a major export industry. International tourism services is the third largest export industry in the United States (Little 1980). Wynegar (1986) estimated that more than 23 million international visitors would travel to the United States in 1987, and total domestic earnings would amount to nearly $17 billion. Overall, international tourism accounts for about 5% of total U.S. tourism industry earnings (Little 1980). It is estimated that more than 5% of direct tourism jobs are attributable to international visitors. Overall, tourism ranks among the top three employers in 40 states.

Outdoor recreation sites and opportunities are an important attractant to foreign tourists, although information on total numbers of foreign visitors who participate in outdoor recreation on forest and range lands is sparse. It is believed, however, to be substantial (Manning 1980). Internationally known areas such as Yellowstone, Yosemite, and Grand Canyon National Parks attract thousands of foreign visitors each year.

Data collected through the PARVS and the In-Flight Survey, conducted by the U.S. Travel and Tourism Administration, provide a rough picture of the characteristics and outdoor recreation patterns of foreign visitors to the United States (Andereck et al. 1989). Although foreign visitors were a small portion of the total sample, more than 40% of the foreign respondents contacted in the PARVS were from Canada. Foreign visitors differed in some respects from domestic visitors, according to the PARVS data (table 12). Foreign visitors tended to be older, from professional or technical occupations, and to have more years of education than domestic visitors to U.S. public recreation lands. About one-third of foreign visitors were on a repeat visit to the recreation area where they were contacted, and scenic beauty was a

Table 12.—Comparison of foreign and domestic visitors to public lands in the United States, 1986.

	Foreign	Domestic		Foreign	Domestic
	----- *percent* -----			----- *percent* -----	
Social group			**Employment status**		
Family	70.9	61.3	Employed full time	52.3	43.4
Group of friends	18.1	18.0	Student	11.9	13.8
Single individual	8.0	10.7	Self-employed	9.6	6.7
Family/friends	—	8.0	Retired	9.3	10.6
Organized group	2.2	1.9	Homemaker	7.6	9.0
			Other[1]	9.3	12.6
			Income		
			Less than $5,000	5.1	4.4
			$5,000-$10,000	5.1	5.4
			10,000-15,000	6.5	9.2
Education			15,000-20,000	11.6	10.1
17 years or more	31.3	11.5	20,000-25,000	10.1	12.4
16 years (college)	30.2	17.4	25,000-30,000	10.1	11.5
13 to 15 years	16.3	23.2	30,000-35,000	9.8	11.5
12th grade	14.2	29.7	35,000-50,000	24.2	21.1
9th to 11th grade	4.7	13.9	50,000 or more	17.4	14.4
8th grade or less	3.4	4.4			
Age			**Usual occupation**		
Less/25 years	20.3	28.1	Professional, tech.		
25–39 years	37.3	44.2	or kindred work.	46.2	30.3
40–59 years	31.2	19.3	Student	10.8	13.5
60+ years	9.2	8.5	Manager or administrator	8.7	9.4
			Craft and kindred	7.3	5.8
Race			Homemaker	7.3	9.8
White	90.4	87.9	Armed forces	3.5	1.4
Hispanic origin	3.3	3.9	Service workers	3.1	4.7
Other[2]	6.3	8.2	Other[3]	12.6	21.4

[1]*Includes "not employed" and "employed part-time" categories.*
[2]*Includes Asian or Pacific Islanders, American Indian or Alaskan Native, and Black- not Hispanic origin.*
[3]*Includes clerical, sales, unemployed, laborer, except farm, operative and kindred workers, and transport equipment workers.*
Source: 1985–1987 Public Area Recreation Visitor Study.

principal reason for their visit. Generally, foreign visitors participated more as sightseers, walkers, pleasure drivers, and developed campers than did domestic visitors (Andereck et al. 1989).

It is likely that the demand for outdoor recreation by international visitors will increase in the future. The U.S. Travel and Tourism Administration projected a 12% growth of international travel to the United States in 1987 and a 2% increase in 1988 (Wynegar 1986).

Wilderness

The 88.8 million acres in the National Wilderness Preservation System in 1988 represents a valuable and irreplaceable resource to be carefully preserved for the future. The original Wilderness Act of 1964 specifically authorized the uses of wilderness: "Wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use" (78 Stat. 894). A number of these uses are further endorsed in subsequent acts, including the 1974 Forest and Range Land Renewable Resources Planning Act, the National Forest Management Act of 1976, and the Federal Land Policy Management Act of 1976. The manuals of the Forest Service, Park Service, Fish and Wildlife Service, and Bureau of Land Management accordingly acknowledge and support a variety of recreational and nonrecreational wilderness uses.

While the Wilderness Act emphasizes the protection of pristine areas, it also recognizes recreational values of benefit to contemporary Americans. Wilderness areas provide "outstanding opportunities for solitude for primitive and unconfined type of recreation." Over the 25 years since the Wilderness Act became law, millions of Americans have visited designated wilderness areas for recreation, solitude, and nature appreciation. But, recreational use is only one use of wilderness. Other, nonrecreational uses, such as education, science, habitat preservation, and ecosystem preservation, are growing in importance and recognition. Recreational and nonrecreational uses can, in fact, conflict. Wilderness implies an absence of man's permanent influence and, in some cases, it seems, of recreation itself. Wilderness resources frequently are so fragile that even normally low impact kinds of recreational use may detract from and, in sufficient quantities, seriously damage wilderness sites (Kelly 1989). The same may also be said for many nonrecreational uses if these uses involve disturbances by man, his machinery, or his chemicals.

Trends in Recreational Use of Wilderness

Following World War II, recreational use of wilderness flourished. However, visitation reports indicate that the rate of increase in wilderness recreation visits slowed in the late 1970's and early 1980's (table 13) to the point that it had leveled off and even showed decline in some areas (Lucas and Stankey 1989). Total recreational use in wilderness was estimated at 14 to 15 million visitor days in 1986 (Roggenbuck and Watson 1989). Recreational use of national forest wilderness areas grew sevenfold between 1946 and 1964 at an annual rate of 11.5% (Lucas and Stankey 1989). Since passage of the 1964 Wilderness Act and the substantial increase in wilderness acreage in the National Forest System (now 32 million acres), use has increased by 150%, averaging 4.4%

The 1964 Wilderness Act preserved these areas for "recreation, scenic, scientific, educational, conservation, and historical use." The 88.8 million acres currently in the National Wilderness Preservation System are a valuable and irreplaceable resource.

Table 13.—Trends in recreational use of National Park and National Forest wilderness and backcountry, 1971–1986.

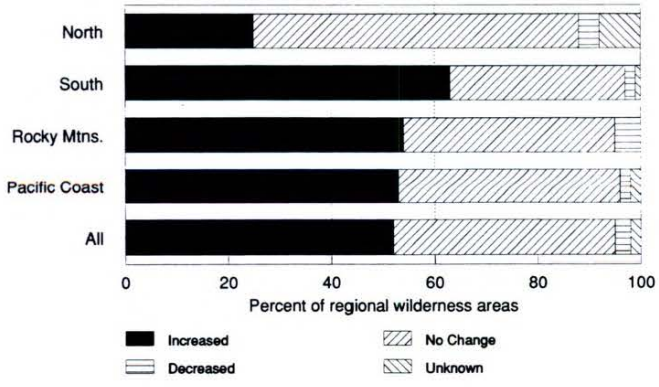
Year	National parks		National forests	
	17 major wilderness areas (designated in 1964)	All parks primitive areas	All wilderness & primitive areas	Original wilderness & parks
	--- thousand overnight stays ---		----- thousand person-days -----	
1971	712	1,096	6,703	6,703
1972	857	1,495	6,459	6,459
1973	910	1,954	6,682	6,665
1974	1,027	2,172	6,743	6,723
1975	1,115	2,346	7,802	7,297
1976	1,231	2,609	7,106	6,790
1977	1,098	2,570	8,008	7,755
1978	904	2,590	8,620	8,291
1979	902	2,397	9,605	8,652
1980	996	2,395	9,268	8,177
1981	968	2,330	11,417	7,984
1982	881	2,424	11,158	7,888
1983	865	2,580	9,909	7,204
1984	833	1,979	10,209	7,534
1985	770	1,680	12,734	7,412
1986	758	1,645	12,015	7,093

Source: Lucas, Robert C., and Stankey, George H. (1989).

per year. Between 1981 and 1986, however, recreational use of wilderness increased 5%, or less than 1% per year. During the early 1980's, year-to-year changes were recorded as downward more often than upward. Still, a recent nationwide telephone survey indicated that managers in more than 50% of wilderness areas believed that recreational use increased somewhat between the years 1986 and 1988 (Reed et al. 1989). This same survey also indicated that less than 5% of wilderness areas had perceived any decreases in recreational use (fig. 21). These more recent data indicate that wilderness recreational use may have turned upward again, a trend consistent with overall public land recreational use.

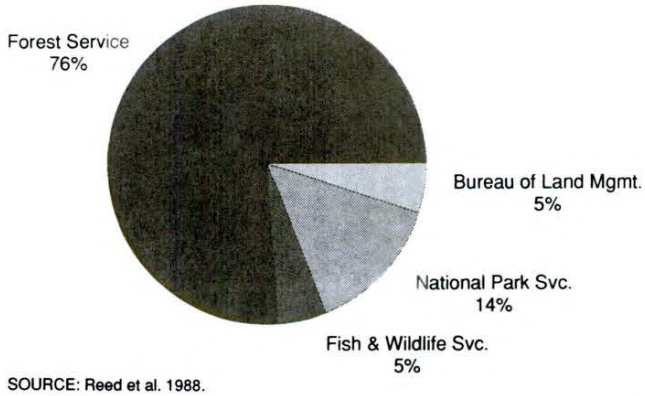
In absolute terms, the growth in national forest wilderness use has exceeded that of many other kinds of recreation taking place in the National Forest System. As a percentage of national forest recreation use and of national forest developed campground use, wilderness use has grown steadily, except in 1986, and now accounts for 5% of total National Forest System recreational use. From data collected through the nationwide telephone survey of managers, it may be estimated (fig. 22) that recreational use in national forest wilderness accounts for more than three-fourths of the National Wilderness Preservation System total (Reed et al. 1989, Roggenbuck and Watson 1989).

Backcountry use in national parks more than doubled between 1971 and 1976, from 1.1 million overnight stays to a peak of 2.6 million in 1976. Since 1976, reported backcountry use has been declining. From 1976 to 1986, national park backcountry use declined 37%, although the number of units which began to report backcountry use increased 20%. Fewer visits were recorded in national park backcountry in 1986 than in 1973. However,



SOURCE: Reed et al. 1988.

Figure 21.—Wilderness managers' perceptions of recreational use trends from 1986 to 1988 by region, all.



SOURCE: Reed et al. 1988.

Figure 22.—Estimated distribution of total recreational use in National Wilderness Preservation System.

the survey of wilderness managers indicated either stable or growing wilderness use between 1986 and 1988, indicating a possible recurring upturn.

The reasons for reported declines in wilderness and backcountry use in the early 1980's are unclear. Changes in population distribution around the United States during this period bear little resemblance to changes in wilderness use patterns. In addition, increasing regulations and a possible image change may have discouraged wilderness use. Regulations to limit use have been imposed in some wilderness areas, although no evidence directly links regulation to declining use. Other possible reasons for this shift in use include an aging population, changing leisure interests (Lucas and Stankey 1989), and a shift in attitudes of the American public from the environmentalism of the 1960's and 1970's to the consumerism of the 1980's (Roggenbuck and Watson 1989). As both of these sources state, perhaps the "yuppie" lifestyle supports the **concept** of wilderness but not its actual on-site use. On the other hand, the image of wilderness camping may be changing. The possibility of being ticketed by a backcountry ranger for illegal camping or for having a campfire, or the fear of contracting giardiasis from contaminated water, may be contributing factors discouraging recreational use of wilderness in the early 1980's. It should be noted that these possible reasons have been suggested by wilderness experts but, as yet, have not been tested or substantiated by research.

Serious shortcomings in how agencies count and estimate wilderness visits complicate analysis. For example, the National Park Service does not count day use in national park backcountry areas. And, because it is difficult to measure day use in national forest wilderness, such counts may be under- or overreported for these areas.

While surveys of wilderness use have been sporadic during the 1970's and 1980's, some trends are apparent. Usage distribution has been very uneven through time, among areas, and even within individual areas. Weekend peaking of wilderness use can be severe, especially in a few of the more popular western wilderness areas which are close to population centers.

Summer is the season of greatest use for most wilderness areas, but the ratio of summer to off-season use varies substantially by area. Some areas have usage peaks of short duration centering on the fall hunting season. In some areas of the East, October is a high-use month because of autumn color. Spring is a high-use time in a few low-elevation areas in the Southwest and in southern California. While winter typically is a very low use period, participation during the winter months seems to be increasing.

A few of the most popular areas typically account for one-third or more of wilderness visitation. Evidence suggests that most wilderness recreation users come from the state or region of the state closest to a wilderness area (Roggenbuck and Watson 1989). Those wilderness areas near major population centers in the southern Appalachians, New England, Minnesota, and California typically are the most intensively used, but location does not explain all the variation. Some swampy wilderness areas in the Southeast are very lightly used, and several of the recently established eastern areas have few visitors despite proximity to population centers. Lack of special attractions, sparsity of trails or travel routes, heavy biting-insect populations in warm weather, and lack of public awareness that these areas exist probably account for the low use. Although wilderness use appears to be spread unevenly across seasons, among areas, and within individual areas, limited evidence indicates an overall trend toward a more even distribution of use within areas and, perhaps, less weekend peaking.

Though recreation is growing more slowly in some national forest wilderness areas and despite the reported decline in national park backcountry use, wilderness recreation will continue as an important pastime, particularly in national forests. National park backcountry areas still account for about 7% of all national park overnight visits. Wilderness use accounts for 5% of national forest recreation use. Moreover, use trends do not reflect the only importance of wilderness.

Nonrecreational Use of Wilderness Areas

Wilderness recreation is only one way that wilderness resources are used and valued. Other values, such as maintenance of species diversity, protection of threatened and endangered species, protection of watersheds, scientific research, and social values, are attributable to wilderness. Sometimes such nonconforming uses as mining and grazing occur in wilderness. Some of the nonrecreational uses are not necessarily exclusive to wilderness settings. Also, some benefits may overlap with those previously attributed to recreational use. Congress does not designate wilderness only for recreation, but as a total resource which includes several nonrecreational uses (Reed 1988). Some recent wilderness legislation suggests the beginning of a trend toward more specific acknowledgment of nonrecreational values. Wilderness user research supports the conclusion that greater consideration should be given to off-site and nonrecreational uses (Roggenbuck and Watson 1989).

Nonrecreational uses of wilderness are widespread throughout the National Wilderness Preservation System. Recent trends, 1986 through 1988, show increases in nonrecreation uses in some wilderness areas (Reed et al. 1989). For example, in 1988, 75% of wilderness areas had identified prehistoric or historic cultural sites. One-half were home to one or more federally- or state-listed threatened or endangered plant or animal species. One-third were used for scientific research, environmental education, or livestock grazing. One-sixth had known spiritual sites, human development programs, subsistence resources, or water storage reservoirs. Because little detailed research has been conducted on the extent of these nonrecreational uses of wilderness, the general public has not always been aware of their value. Most of the benefits of wilderness are not as easily measured or valued as those of timber, water, forage, mining, or even recreation. As a result, many important and valu-

able aspects of wilderness typically have not been included in the forest planning process. Interest in nonrecreational uses and values of wilderness is increasing, and improved methods to measure and describe these uses will have to be developed (Reed 1988, Reed et al. 1989).

Preservation.—Wilderness preserves life-sustaining systems at several different scales. The preservation of natural diversity is essential to our quality of life and vital to our future national and global survival. The passive physical preservation of functional ecosystems in wilderness is an important supplement to active manipulative management of the environment. Ecosystems include not only plant and animal species, but also elements of their habitats including air, soil, water, and microclimate plus physical processes such as fire.

During the Fourth World Wilderness Congress in 1987, 62 nations voted unanimously for preservation of representative samples of all major ecosystems of the world to ensure the preservation of the full range of wilderness and biological diversity. In this country, we are over half way toward that goal. Of the 261 basic ecosystems in the United States, 157 are now represented in the NWPS (Davis 1989). Eighty major ecosystems are not yet represented in any preservation-oriented system (e.g., NWPS, national forest, state wilderness). It is anticipated that most, but not all, of the forest and desert ecosystems in the United States will be represented in the NWPS by 2000. However, additional emphasis is needed on protection of the fertile native grassland ecosystems since most of these lands are in private ownership and lack the scenic splendor that spurs the citizenry to seek wilderness designations (Davis 1989).

Closely related to the preservation of ecosystem diversity is the use of wilderness for preserving genetic diversity, or variation of life forms at or below the species level (Schonewald-Cox and Stohlgren 1989). While some plant and animal species will naturally become extinct, wilderness is important in reducing the extinctions which may result from human actions. Known threatened and endangered species have been reported in 57% of NWPS areas (Reed et al. 1989). About 20% of all wilderness areas contain both plant and animal species that are threatened. Well known threatened and endangered vertebrate wildlife species found in wilderness include the bald eagle, grizzly bear, and the nearly extinct California condor.

While wilderness does not necessarily offer unique opportunities to preserve important historic and prehistoric cultural sites, it may possess sites of unique cultural and environmental interest (Neumann and Reinburg 1989). Prehistoric sites in wilderness, in particular, are valuable preserved records of our natural and cultural histories. Understanding how cultures have dealt with past environmental conditions may teach us much about how we can manage land and water resources, particularly wilderness, with minimal impact. These sites may also yield valuable data on natural changes in species diversity and distribution, plus extent and frequency of natural events such as fire, flooding, and climate change. The number of historic and prehistoric sites within the NWPS is not well known. The exact number and locations of sites are often legally or culturally protected information, but they may number in the tens of thousands nationwide (Neumann and Reinburg 1989). A recent survey of wilderness managers reported that 42% of all wilderness areas had sites of both historic or prehistoric interest (Reed et al. 1989).

External benefits.—Wilderness also protects or enhances resources beyond wilderness boundaries, especially watersheds, air, scenery, and wildlife. Wilderness watersheds may produce valuable water and may also reduce water pollution and flooding outside of wilderness. Because wilderness watersheds remain intact and mostly undisturbed, erosion is minimized and normal runoff does not contribute to accelerated siltation of streams and rivers (Satterlund 1972). As a result, water remains clean, valuable downstream fish spawning areas may be preserved, the lifespan of downstream water storage and distribution facilities may be extended, and the severity of floods downstream is typically reduced.

The quality of wilderness air is not only a benefit to wilderness users but also to users of surrounding areas. As visual mediums and backgrounds, wilderness air may protect the scenic integrity of significant adjacent public lands such as national parks (Yuhnke 1983).

Wilderness areas may also provide temporary or seasonal cover and habitats for migratory wildlife species which only occupy the wilderness for a relatively short but critical time (Schoenfeld and Hendee 1978).

Therapy.—Organized programs for the therapeutic rehabilitation of individuals with various psychological, social, and physiological disorders can be facilitated in wilderness. Such therapeutic programs benefit both individuals and society in general in several ways.

Therapeutic programs for exceptional children and adults (the chronic mentally ill and disturbed children and adolescents) include fostering normal behavior patterns, emotions, social interaction, initiative, perceptual and motor skills, stamina, and group and individual decision making (Levitt 1988).

Although conclusive research is insufficient, the quality of life for all citizens may be enhanced to some degree by such wilderness programs. In addition to the stated benefits, wilderness therapeutic programs may also provide social benefits such as shorter institutionalization time and reduced public expenditures for treatment. Once rehabilitated, many participants may actually add to the economy through their employment, purchasing power, and ability to pay taxes. In 1987, 12% of all wilderness areas nationwide were used as a setting for some type of "therapeutic program" (Reed et al. 1989). However, in some wilderness areas such use is discouraged because it is not considered to be wilderness-dependent.

Human development.—By nature, wilderness provides few, if any, guarantees for the physical comfort, ease, or safety of users. The wilderness setting, therefore, inherently challenges its users. The resulting experiences may serve to enhance a user's self-concept. Williams et al. (1989) described three separate components of the benefits to individual self-concept enhancement associated with wilderness use: personal identity,

national identity, and identification with nature. A number of private human development programs are conducted in wilderness. They include Outward Bound, Vision Quest, and the National Outdoor Leadership School (NOLS). Some type of sponsored human development program occurred in 17% of all wilderness areas nationwide in 1987 (Reed et al. 1989). Again, some wilderness managers do not consider such human development programs to be appropriate uses of wilderness since they are not wilderness-dependent.

Subsistence.—Wilderness often serves as a source of physical subsistence for rural and native Americans (Muth and Glass 1989). Subsistence is the customary use of renewable natural resources by rural subpopulations dependent upon fish, wildlife, and plant species for physical survival, economic and social well-being, or the maintenance of traditional culture. Subsistence use patterns in wilderness are complex and changing and, in some cases, are becoming an income-supplementing activity as opposed to a sole source of income. Nationwide, about 13% of all wilderness areas accommodated some subsistence use by rural or native populations in 1987 (Reed et al. 1989).

Spiritual development.—Wilderness is also a place where the human spirit may be enhanced, individually and collectively, through the use and exposure to nature or sacred places and things. The use of wilderness for spiritual growth has not been well researched or documented and is one of the most difficult uses to measure or value. Nevertheless, spiritual purposes are specifically acknowledged in national wilderness statutes, code, and agency policy as a significant value (McDonald et al. 1989).

Sacred places include areas that serve religious or spiritual functions and areas with capacities to inspire us, such as Yosemite or the Grand Canyon. Almost 20% of all wilderness areas across the managing agencies, and 18% of Forest Service wilderness, were reported to contain a site spiritually important to Native Americans (Reed et al. 1989). A number of organized groups use wilderness to promote spiritual growth as a stated purpose in outdoor recreation activities, including Boy Scouts, Girl Scouts, Sierra Club, National Audubon Society, and Outward Bound. Individuals likewise experience comparable spiritual growth outside organized groups, often without either planning for it or even seeking it.

Contributions to social welfare.—Recent economic research has begun to explore nontraditional ways of measuring the total benefits of the natural environment to society. Studies using contingent valuation (or "willingness-to-pay") methods now suggest that Americans also attach certain noncommodity values to the simple preservation of wilderness (Walsh and Loomis 1989).

It is a myth that only those who visit a wilderness for recreational or other purposes derive value or benefit from it. In addition to visitation, people may also indirectly derive benefits from knowledge about wilderness and its preservation. In general, a majority of Americans have reported that they consume some form of preservation values of natural areas (Walsh and Loomis 1989). Several noncommodity values have been identified for the preservation of wilderness including "option," "bequest," and "existence" values.

Research and monitoring.—Wilderness is a laboratory for the study of natural processes and the interaction of human culture and nature. As this country continues to grow and the influences of humans on the environment become more pervasive, the need to study natural processes becomes more critical. Wilderness areas provide excellent opportunities for studying natural processes and understanding how ecosystems function in the absence of human interference (Greene and Franklin 1989). Some form of environmental research was being conducted in 37% of all wilderness areas in 1987 (Reed et al. 1989). The environmental research being conducted on elements of the NWPS has been strongly influenced by the missions of the four agencies and their respective management policies and practices (Allin 1985, Franklin 1987). Ecological research is still lacking in baseline inventories of all types of wilderness areas.

Because wilderness often represents the natural environment in its most pure and unmodified form, it offers excellent opportunities to study individual and collective human relationships with nature (Manning 1989). Social research may include investigations into recreational, cultural, spiritual, physical, and psychological interactions, to name but a few. Products of social research in wilderness are useful for a number of reasons. Foremost, social research is useful in improving the management and preservation of wilderness because only human-induced impacts have the potential to destroy wilderness character.

Monitoring in wilderness serves to measure and document background information and changes for all types of land as well as to preserve the legally mandated integrity of the wilderness area itself or others comparable to it. However, because of expense and perceived impact, and because their usefulness is often not immediate, environmental monitoring activities are often ignored. The general pattern of environmental research among the four federal agencies also holds true for environmental monitoring.

Education.—Wilderness is, in one respect or another, a classroom for everyone. Wilderness education helps to achieve two goals of the Wilderness Act: (1) provide for the enjoyment of users, and (2) protect the resource. Formal and informal educational or interpretive programs may help visitors to gain deeper understanding of the special qualities of wilderness and its natural processes. Such programs not only help visitors to recognize the unique opportunities in wilderness use but also to appreciate its fragility. As a result, educated visitors often have less impact on the environment and help to keep wilderness untrammeled. More than 37% of all wilderness areas hosted some type of environmental education program in 1987 (Reed et al. 1989). About 11% of all wilderness areas showed some increase in such activity in the past 3 years.

The wilderness setting also offers unique opportunities for training wilderness resource managers, which was one of the five major action items identified in the 1983 National Wilderness Management Workshop in Idaho. Field-based wilderness "classrooms" provide skills training and resource sensitivity in addition to resource training (Spray and Weingart 1989). A survey showed that 12% of all wilderness areas hosted some type of resource manager training in 1987 (Reed et al. 1989)

Nonconforming uses.—Several nonconforming commercial commodity resources may be consumed or extracted within wilderness boundaries where they were legitimate uses prior to wilderness designation. The most common commercial uses permitted in wilderness are grazing, mining, and outfitting and guiding services.

A survey indicated that 44% of all wilderness areas had active commercial outfitting or guiding services in 1987 (Reed et al. 1989). In 1987, 35% of all wilderness areas reported active cattle or sheep grazing allotments. Another 9% of wilderness areas reported active surface or subsurface mining claims in 1987. And, about 1% of all wilderness areas reported active producing oil or natural gas wells that year.

Over the past 3 years, the level of commercial uses in most wilderness areas has generally been stable. Most wilderness areas experienced slight decreases in grazing and mining and most saw commercial outfitting and guiding services increase somewhat.

In addition to commodity resources that are consumed within wilderness boundaries, wilderness often cleanly and cheaply produces a wide range of valuable commodity and noncommodity output which is eventually consumed outside wilderness boundaries. Many wilderness areas, particularly those located in mountains, are important watersheds. Water may be used in a number of recreational, agricultural, domestic, and commercial or industrial purposes. A number of fish (and wildlife) species reared in wilderness migrate out of the wilderness where their harvest contributes to local economies. Wilderness areas also provide important vegetation which produces oxygen as well as purifies polluted air.

Projections of Future Demand for Outdoor Recreation

Projections of demand for outdoor recreation were developed for this Assessment. They reflect how much Americans would prefer to recreate at a future time if opportunities and the cost of taking recreational trips away from home were to remain as they are today. Under these unconstrained conditions, projections of the public's maximum preferred future demand for land, water, and snow and ice activities were estimated for each decade to the year 2040. Within each of these three resource categories, a range of activities is covered from those which predominantly occur as dispersed use in remote wildlands to those which are predominantly development oriented.

Although subject to error caused by an uncertain future, projections reported here are well-grounded in economic theory and statistical methods. Recreation customers are the same people who buy bread at the grocery store, and they decide to recreate or not in a manner very similar to how they choose which brand and what amount of bread to purchase. These research results are offered as advancement of the understanding of recreation demand and supply. The results should be interpreted and applied using professional judgment and with due consideration of social, political, and other qualitative factors that impact outdoor recreation demand and supply (Bergstrom and Cordell 1988).

For the projected activities, there were a total of 2.7 billion recreational trips away from home and primarily destined for rural forest, range, and water areas for 1987. From this benchmark measure of current recreation demand, projections of the public's maximum preferred demand for recreational trips were developed. These projections were based on the best available assumptions about future growth of disposable personal income, its affect on percentage of the population earning real income in excess of $30,000, percentage of the population who are young adults (18 to 32), population growth, and the degree to which a variety of recreational opportunities will likely exist. These are the major factors appearing to shape future recreation demand.

Among individual activities, those projected to exhibit the most rapid rates of demand growth by the American public include downhill skiing, cross-country skiing, pool swimming, backpacking, visiting prehistoric sites, running and jogging, and day hiking (table 14, figs. 23 and 24). All of these activities are expected to rise 30% or more by 2000. They are also physically demanding and require space, trails, and access. They do not, for the most part, require extremely large capital investments on the part of resource managers. Provision of the space, trails, and access will, however, generally be a challenge for future management of public lands. While these lands, managed in cooperation with private interests, are large enough to accommodate the projected demand increases, their lack of proximity to populated areas will be a problem.

The activities expected to grow next most rapidly include bicycle riding, horseback riding, nature and wildlife study, photography, visiting historic sites, and developed camping. All of these activities primarily involve land-based recreational trips and tend to be highly dependent upon scenic or otherwise interesting environments. For these activities, capital investment needs would be relatively small and public lands can greatly contribute to meeting demand growth.

While maximum preferred demand for trips for all activities are projected to grow, growth in demand will be slower for some activities than for others. Activities with slower projected growth of trip demand by the year 2000 include nature study, driving vehicles or motorcycles off-road, picnicking, stream/lake/ocean swimming, and motorboating. For the most part, these activities are less physically active and to a greater degree involve motor-driven equipment. These activities typically require the designation of special places and "use zones" to facilitate participation.

Table 14.—Maximum preferred demand for recreational trips away from home and indices of future demand growth to 2040.

Resource category and activity	Trips in 1987 (millions)	Future number of trips as percentage of 1987 demand				
		2000	2010	2020	2030	2040
Land						
Wildlife observation and photography	69.5	116	131	146	162	174
Camping in primitive campgrounds	38.1	114	127	140	154	164
Backpacking	26.0	134	164	196	230	255
Nature study	70.8	105	113	120	131	138
Horseback riding	63.2	123	141	160	177	190
Day hiking	91.2	131	161	198	244	293
Photography	42.0	123	143	165	188	205
Visiting prehistoric sites	16.7	133	160	192	233	278
Collecting berries	19.0	113	126	143	166	192
Collecting firewood	30.3	112	124	138	157	178
Walking for Pleasure	266.5	116	131	146	164	177
Running/jogging	83.7	133	163	197	234	262
Bicycle riding	114.6	125	148	173	202	222
Driving vehicles or motorcycles off-road	80.2	105	111	118	125	130
Visiting museums or info. centers	9.7	118	136	153	174	188
Attending special events	73.7	114	127	141	157	168
Visiting historic sites	73.1	122	143	169	203	241
Driving for pleasure	421.6	115	128	142	157	167
Family gatherings	74.4	119	135	152	170	182
Sightseeing	292.7	118	136	156	183	212
Picnicking	262.0	108	117	126	136	144
Camping in developed campgrounds	60.6	120	137	155	173	186
Water						
Canoeing/kayaking	39.8	113	126	140	157	169
Stream/lake/ocean swimming	238.8	105	110	117	124	129
Rafting/tubing	8.9	111	136	164	215	255
Rowing/paddling/other boating	61.8	112	124	136	150	159
Motor boating	219.5	106	111	117	123	127
Water skiing	107.5	111	121	131	141	148
Pool swimming	221.0	137	169	205	242	269
Snow and ice						
Cross-country skiing	9.7	147	177	199	212	195
Downhill skiing	64.3	153	197	247	298	333

Source: 1985–87 Public Area Recreation Visitor Survey.

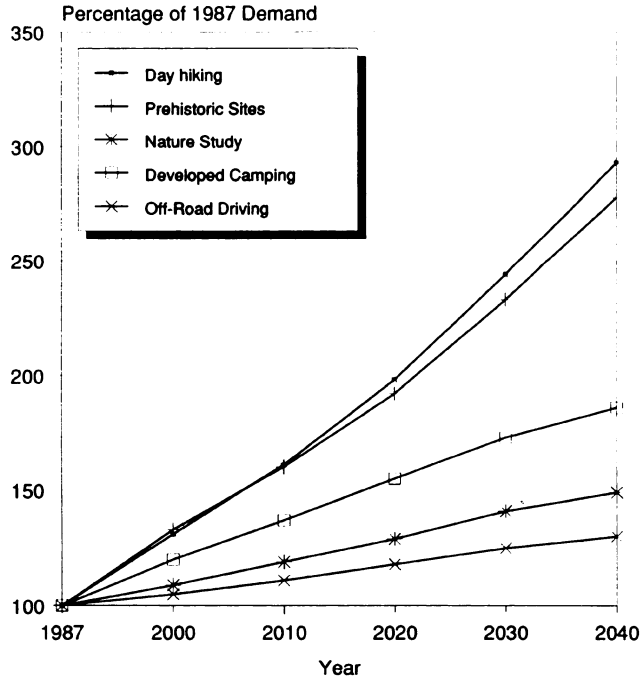


Figure 23.—Projected demand growth for selected LAND-BASED outdoor recreational activities, 1987 = 100%.

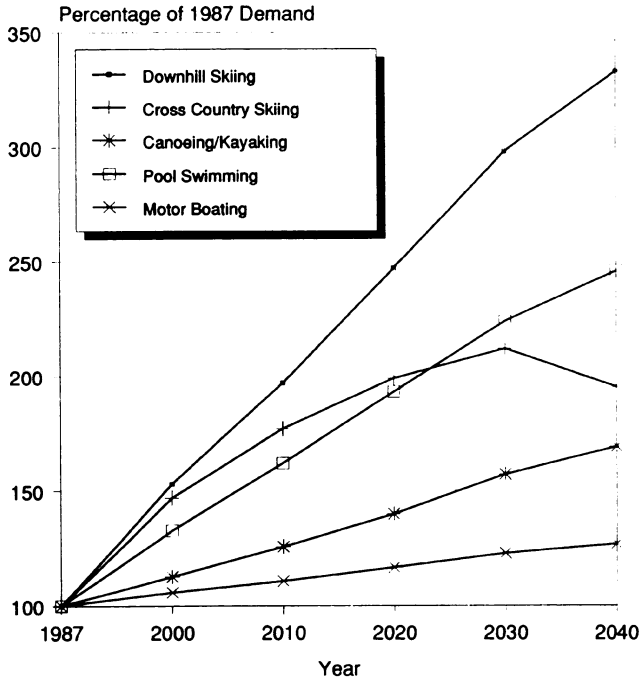


Figure 24.—Projected demand growth for selected WATER- and SNOW-BASED outdoor recreational activities, 1987 = 100%.

Currently, the 11 activities that are expected to exhibit the **greatest growth in number** of recreational trips away from home in the future, in order from greatest to least, include: walking for pleasure, driving for pleasure, picnicking, stream/lake/ocean swimming, family gatherings, pool swimming, wildlife observation and photography, other outdoor photography, motorboating, bicycle riding, and day hiking. The top eight of these activities, which involve over 35% of all outdoor recreational trips away from home, are predominantly passive, low-impact, and require little capital investment by site managers. The last three activities require some facilities including trails.

By 2040, if average cost per trip does not change and opportunities are expanded, participation would change as shown below. Activities are arranged from highest to lowest number of trips.

	Million trips	Percentage change
Driving for pleasure	704	+67
Sightseeing	620	+112
Outdoor pool swimming	594	+169
Walking for pleasure	472	+77
Picnicking	377	+44
Stream/lake/ocean swimming	308	+29
Day hiking	267	+193
Bicycle riding	254	+122
Visiting historic sites	176	+141
Family gatherings	135	+82
Wildlife observation and photography	121	+74
Camping in developed campgrounds	113	+86
Photography	86	+105

If the predicted percentage growth occurs, these 13 activities will account for a total of more than 2 billion additional trips away from home by 2040. Significant shifts in types of recreational trips are apparent from the above lists. Sightseeing and driving for pleasure are projected to be the most popular activities by 2040. These shifts assume that the public's demands for space and facilities can be met in future years. Pool swimming, day hiking, bicycle riding, family gatherings, picnicking, and stream and lake swimming will become dominant day-use activities. More developed facilities will be needed to serve these demands. More camping sites will also be needed. At the same time, there will be a high demand for sightseeing, walking, pleasure driving, and photography. Many of these activities depend upon high quality scenery and access. Some depend upon specialized facilities.

The growth rates of maximum preferred demand vary among activities. Land-based activities have highly variable projected rates of growth, ranging from a low of 30% to 2040 for off-road driving to a high of 193% for day hiking (fig. 23). Growth in demand to 2040 for water and snow activities is also quite variable, ranging from 27% for motorboating to 233% for downhill skiing (fig. 24). These very different growth rates indicate the magnitude of predicted demand shifts in the future and point to a likely shift of pressures on recreational resources and management. While these projections may not be precise, they do, nonetheless, provide insights and offer the opportunity to anticipate rather than react to demand shifts.

Although much less quantitative, growth of wilderness use seems highly likely. Recreational uses have shown reduced growth rates, even decreases for some

Sightseeing and driving for pleasure are projected to be the most popular outdoor recreation activity in 2040. Pool swimming, day hiking, bicycle riding, family gatherings, picnicking, and stream and lake swimming will become dominant day-use activities.

areas, in recent years. However, since 1986, an upturn of recreational wilderness use once more seems to be occurring. And, based on projected futures for activities which commonly occur in wilderness, demand increases seem evident. For example, backpacking is projected to grow 155% by 2040, wildlife observation and photography 74%, day hiking 193%, and general outdoor photography 105%.

Future demands for nonrecreational uses of wilderness are less clear, although indications are for an upward trend. Participants at the 1988 Wilderness Colloquium, all experts on wilderness resources, indicated that future nonrecreational uses and values may soon dominate over recreational uses. Increasing environmental concern, needs for biological monitoring, decreasingly available undisturbed spaces, and other trends strongly support a prediction for demand growth of nonrecreational uses.

CHAPTER III: THE SUPPLY OF OUTDOOR RECREATION AND WILDERNESS

The Supply Concept

The concept of **recreation demand** was discussed in the introduction to chapter II and was defined as the number of recreational **trips** people will take after they have considered the costs those trips will entail. To be consistent in our analysis in this chapter and to meet this Assessment's objective of examining population-level wants for recreation opportunities and experiences, rather than demand for access to a specific facility or category of sites, supply must be similarly defined. We must, therefore, examine the **supply of trips**, rather than supply of sites or facilities, as the appropriate measure of recreation supply.

The supply of recreational trips is more complex as a concept than is the supply of recreational facilities or most other commodities or services. This complexity arises because a recreational trip is not purchased as a tangible good or discrete service directly from a retail or wholesale establishment. A further complication arises because a significant portion of the recreation opportunities in this country are provided by the public sector. Here, classical production processes, as described in the economics literature, typically do not apply.

A recreational trip involves the total experience as first defined by Clawson and Knetsch (1971). Using this definition, a trip involves not only an on-site visit at a facility, but also anticipation, travel, and recollection. Thus, the consuming household and the recreation site manager are involved in the "production" or supply of a recreational trip or experience. Application of traditional economic analysis aimed at detecting probable shortages of recreational trip opportunities for the American public can fail unless the involvement of the recreationist as a part of the production process is taken into account.

The mismatch in definitions between the opportunities that the forest or park manager provides and the trips or experiences that recreationists demand has long been a source of confusion. This has especially been the case when the target for demand and supply comparisons has been at the national or regional level rather than at the site level. At the national or regional level, the concern is whether sufficient opportunities for outdoor recreation trips are being provided to meet population demands. At the site level, the concerns are typically with construction of new facilities, how much capacity to provide, or sometimes whether to operate a site at all. These two different levels of concern involve quite different questions and quite different demand and supply comparisons.

In recent years, a workable framework for national- and regional-level demand and supply comparisons has come to light. This framework, the household market model, as originally described by Bockstael and McConnell (1981), was adopted for this Assessment to explicitly recognize the role that households play as part of the recreation trip production process (Cordell and Bergstrom 1989). Since a trip is also the unit that the recreationist demands and, subsequently, consumes, the necessary conditions for an economic comparison of demand and supply is met.

The household market model defines two steps or stages in production of recreation supply on a national or regional level. In the first step, public and private managers and proprietors develop and manage land, water, and other resources to make different kinds of environments and opportunities available for public recreational use. In the second step of recreation production, the household combines the environments and opportunities provided by managers and proprietors in the first step with their own knowledges, skills, abilities, equipment, travel, and technology to produce recreational experiences or trips. New technology and equipment, such as hang gliders, help make new kinds of recreation experiences—they help create new supply. In the case of hang gliders, this new technology has brought increased management attention to cliffs with updrafts, many of which are now treated as recreational environments. Recreation skills courses and new information about the locations of public sites may also lead to production of more recreation trip supply.

In this chapter, the supply of recreation is presented from the perspective of this two-step production process. First, the resource and facility inventory of chapter I is reexamined here to measure how effective their amounts and locations are relative to the numbers and locations of the populations who may want to use them. Taking account not only of the amount of facility and resource opportunities but also of their location, as well as the location and number of potential users, more accurately reflects available opportunities. Availability of opportunities is an important factor determining trip production (i.e., supply).

Second, recent trends of the amount of recreational environments and facilities, as provided by both the public and private sectors, are described. Factors affecting trends in the availability of recreational opportunities are also discussed as a prelude to speculating about possible supply futures. Third, a brief discussion of likely future trends in recreational opportunities, assuming recent trends continue, is provided as a step toward anticipating future supply. The supply of opportunities for recreational trips and experiences is projected for each decade to the year 2040. The conditions and implications of these projected futures are briefly discussed. Finally, current availability, recent trends, and likely future supply of wilderness use opportunities are presented.

Understanding the supply of wilderness is even more complex than that of recreation. Recreational use of wilderness is subject to the same considerations as recreation outside of wilderness. However, the nonrecreational uses of wilderness are many, and hard data on consumption and demand are lacking. As a consequence, the national demand for wilderness in most

cases is politically expressed. Accordingly, classical economic supply considerations, beyond per capita figures, are mostly qualitative.

Effectiveness of the Amount and Location of Available Recreational Opportunities

Recreational opportunities are widely available to Americans, but their type and quantity are unevenly dispersed among and within regions across the country. Remote backcountry areas are heavily concentrated in the West. Developed sites are generally more evenly distributed between West and East, yet more people live in the East to compete for use of these relatively scarce opportunities. An unevenness of available opportunities also occurs within regions. Some local areas have many more opportunities than others, and often the opportunities in some local areas are more conveniently located near population centers. These two factors, amount of opportunities available relative to numbers of people and location of these available resources relative to location of people, define the effectiveness of opportunities.

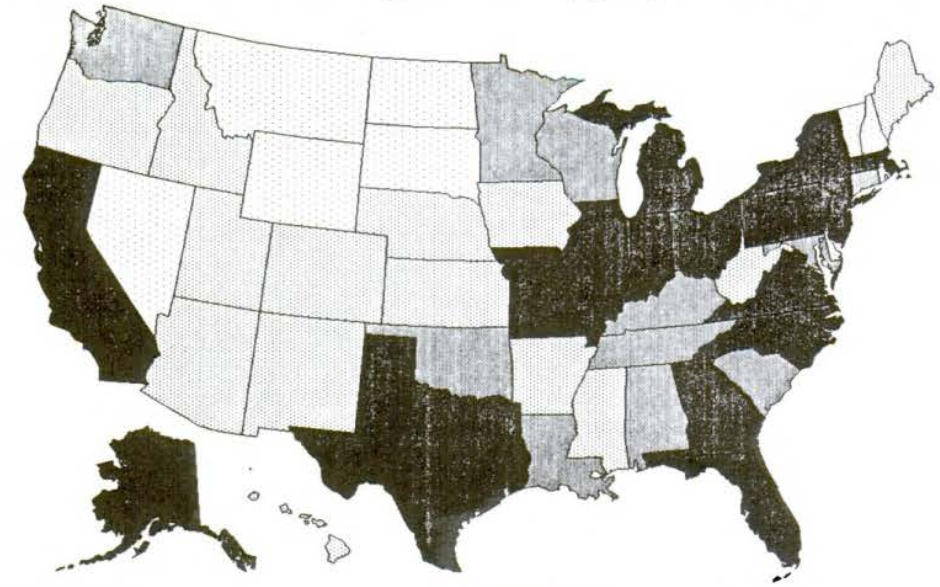
The effective amount and location of available recreational opportunities, from remote wildlands to developed environments, is highly variable nationwide. This variability is important when considering the supply of outdoor recreation. Improvements in supply may be affected by changes in the sheer quantity of land and water available for recreation in a region as much as they may be affected by overall shifts in the location of opportunities relative to where people live. The more effectively that recreational opportunities are made available relative to numbers of people and their location within a region, the more trips residents of a region can take without expending more time and money to "produce" the average trip.

Another important factor affecting a person's or household's level of trip production for a specific type of recreation is the availability of other types of opportunities which may compete for scarce personal time and money. Here, amount and location of alternative opportunities is a most relevant consideration. As alternative or substitute opportunities become more abundant and/or conveniently located and, thus, as substitute trips become relatively less expensive to produce, there may be less of some particular types of recreational trips taken by households.

In the supply analysis which concludes this chapter, effectiveness of the mix of recreational opportunities available is a vital consideration in the household production process. In that analysis, it is shown that the effective quantity and location of recreational opportunities have important effects on the supply of particular types of recreation. The following brief sections point out some of the more striking interregional and intraregional differences in effective recreational opportunities.

Land-Based Opportunities

The more densely populated states are located in the East (fig. 25). Less than 5% of federal recreation lands



SOURCE: National Outdoor Recreation Supply Information System (NORSIS), USDA Forest Service, Athens GA, 1987.

Figure 25.—Distribution of population by state.

(excluding Alaska) are located in this region. State and local lands help some to make up for the lower quantity of federal properties in the East, but they typically offer a different kind of recreational opportunity. Two-thirds of nonfederal public and private lands are east of the Rockies. Also, state and local lands generally are located closer to cities.

Even with the much greater prevalence of state, local, and private lands in the East, the disparity in per-capita availability of recreational opportunities between the West and East is extreme. Measured as an effectiveness index, which takes into account the amount of resources, number of people, and location of resources relative to location of people, opportunities linked to land resources are typically 5 to 15 times greater in the Pacific Coast and Rocky Mountain Regions than they are in the Northern and Southern regions (figs. 26–29).

The effective availability of wilderness and the most remote of recreational opportunities (fig. 26) is about 15 times greater in the West than the East. Forest Service and BLM lands largely account for this regional mismatch between locations of opportunities and of people. In the East, limited remote and wilderness opportunities are most effectively available in Florida, Minnesota, Wisconsin, and in upper New York State. Effective availability of less remote backcountry (0.5 to 3 miles from roads) is much greater in the East than is remote wilderness (fig. 27). Few areas in the East lack backcountry opportunities. But, as with wilderness opportunities, much greater availabilities exist in the western states.

Roaded and partially developed land opportunities (those within 0.5 mile) are the areas where most of the resource-based outdoor recreation in the United States occurs. Because some private land is still accessible, the effective availability of these more convenient land opportunities in the East is substantially greater than the more remote types of opportunities. Typically, absence of availability coincides with large population concentrations such as the area from Richmond to Boston (fig. 28). Combinations of roaded public and accessible private lands in the West, except for the southern two-thirds of California, provide highly effective road-accessible opportunities. Developed recreation, in contrast to other land opportunities, is the most evenly distributed of opportunities (fig. 29). In the West, the least effective availability relative to numbers and location of population is southern California, most of Texas, and parts of Kansas. Less effective availabilities of developed land opportunities in the East exist in the lower Mississippi subregion, in the Piedmont Crescent subregion from Richmond through Atlanta to Birmingham, and in the Cincinnati area.

Water-Based Opportunities

Though common apprehensions foster images that industrial pollution creates unsafe water in urban areas, there are, in fact, many fishable and swimmable water areas in or near major population centers. In 1986, the Environmental Protection Agency estimated that about three-quarters of this surface water was clean enough for fishing and swimming (Domestic Policy Council 1988). Further clean-up efforts may greatly expand water-based recreation opportunities. These efforts will have the greatest impact in areas of high population density where waters tend to be privately or municipally owned and historically have been the most heavily polluted (Domestic Policy Council 1988).

Though more resources for water recreation than for land recreation are located near population centers, a large East-West disparity still exists. The most remote of water recreation opportunities, such as Wild and Scenic Rivers, are five to eight times more abundant in the West (fig. 30).

Areas in the West that have the greatest amount of road accessible and developed water opportunities generally have two to six times the opportunities that areas with less abundant opportunities have (figs. 31, 32 and 33).

Snow and Ice-Based Opportunities

The distribution of winter recreation opportunities across the United States follows temperature gradients, elevational differences, and snowfall areas. Snowfall in the northern states and at higher elevations convert recreationally available land areas into snow opportunities for skiing, snowmobiling, snowshoeing, and other winter activities. Effectively, the western regions have about 12 times more remote, wilderness, and backcountry snow opportunity than does the North (figs. 34 and 35). The South, of course, has virtually none, except for the southern Appalachian area. Road-accessible snow opportunities and developed winter recreation sites differ less between West and North by about 7 to 1, respectively (figs. 36 and 37).

Recent Trends of Resource Availability

The single most critical factor determining the degree to which recreation opportunities are being offered to the public is available access, both to land and water resources and to facilities and development specific to certain types of outdoor recreation. This Assessment focuses on those resources and developments which are available. Since 1970, the amounts of resources available have changed, some dramatically so. Following is a brief overview of recent trends (1970–1987) of resource availability.

Land Resources

Though land designated as wilderness has increased, road building and other land conversions have decreased recreation opportunities in remote backcountry environments, of which wilderness is a part. In 1987, 326 million acres of land were farther than 0.5 mile from a road. In the years, from 1970 to 1987, the amount of this remote land resource decreased about 2.9 million acres annually, or 0.9% per year.

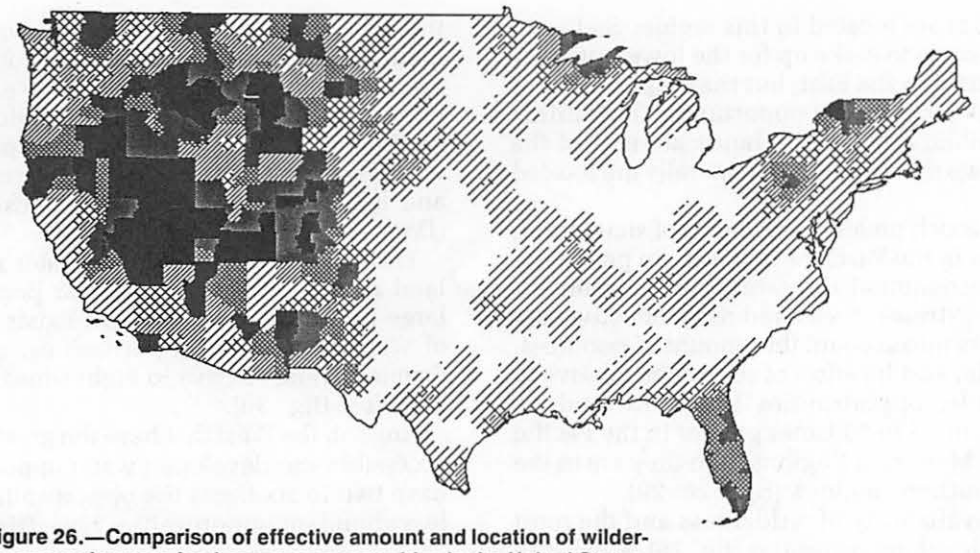


Figure 26.—Comparison of effective amount and location of wilderness and remote backcountry opportunities in the United States, 1987.

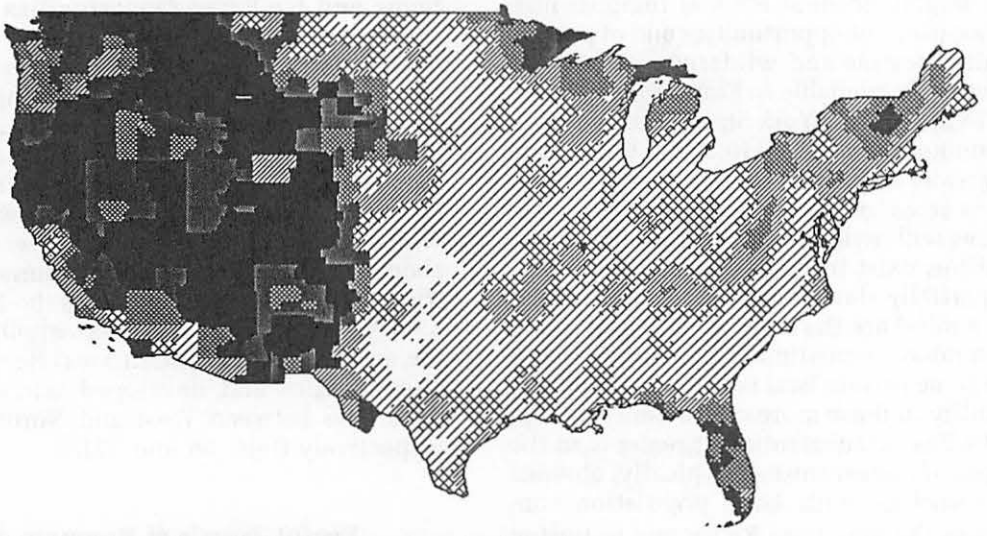


Figure 27.—Comparison of effective amount and location of extensive undeveloped land opportunities in the United States, 1987.

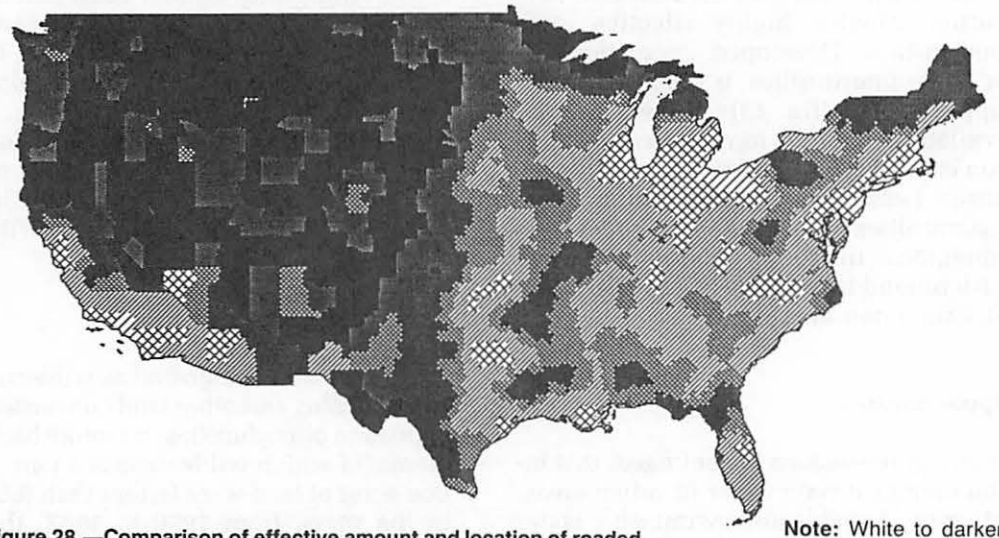


Figure 28.—Comparison of effective amount and location of roaded, partially developed land opportunities in the United States, 1987.

Note: White to darker shadings indicate zero to opportunity. Effectiveness of opportunities available location relative to the number and location of

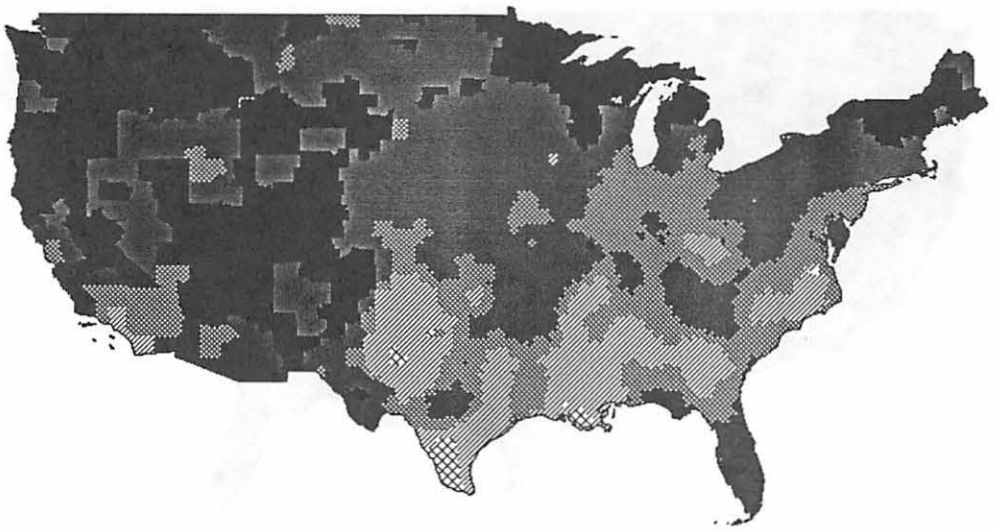


Figure 29.—Comparison of effective amount and location of developed land opportunities in the United States, 1987.

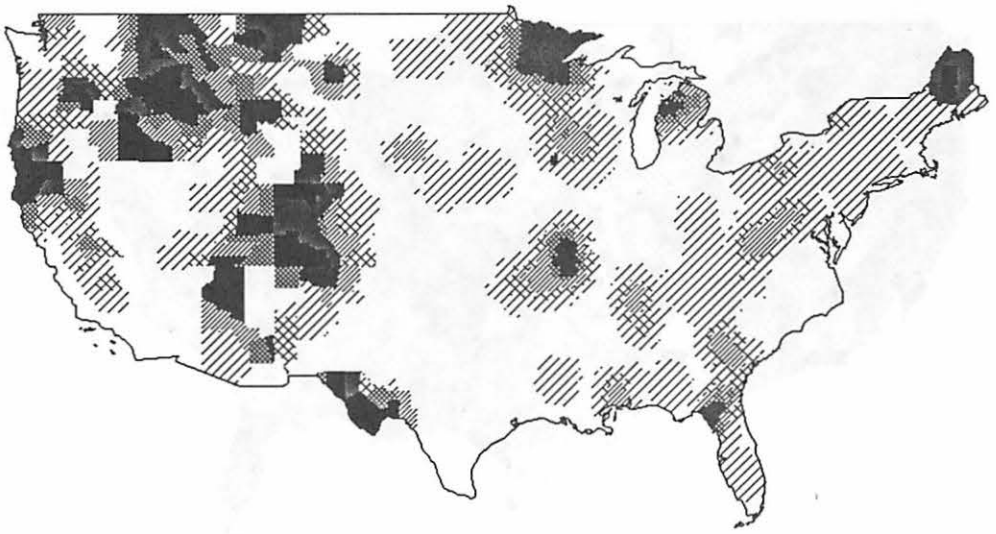


Figure 30.—Comparison of effective amount and location of wild, scenic, or remote water opportunities in the United States, 1987.

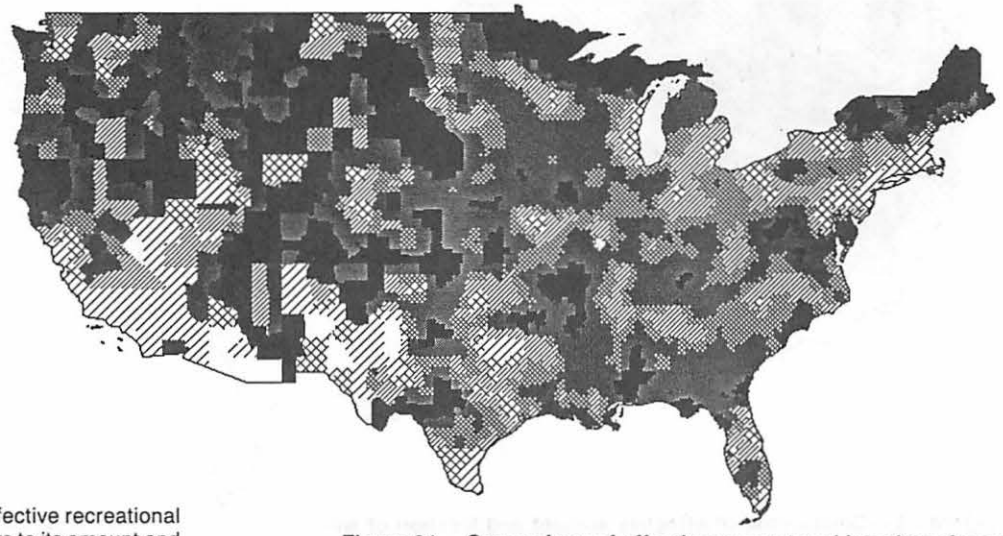


Figure 31.—Comparison of effective amount and location of near-road lake or stream opportunities in the United States, 1987.

successively higher levels of effective recreational to a county, state, or region refers to its amount and population as potential users of the opportunities.

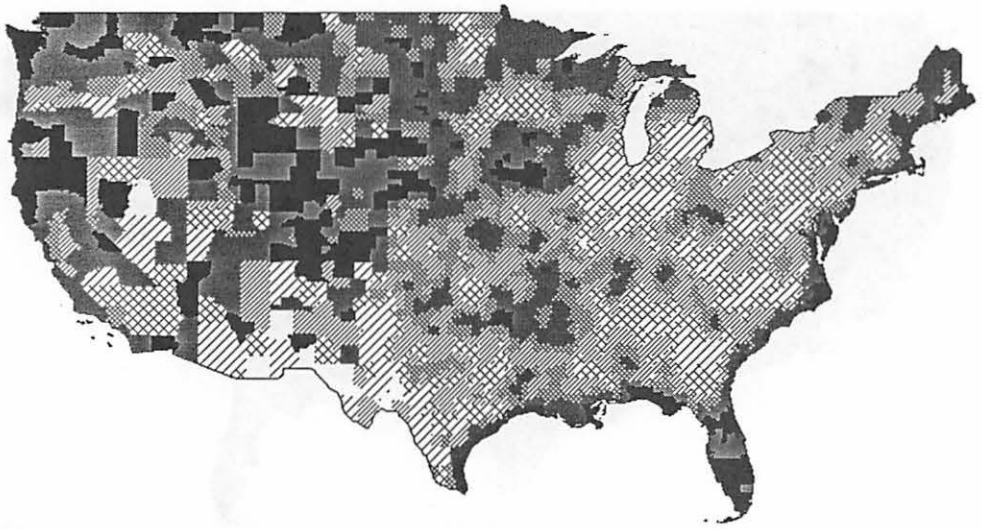


Figure 32.—Comparison of effective amount and location of partially developed lake or stream opportunities in the United States, 1987.

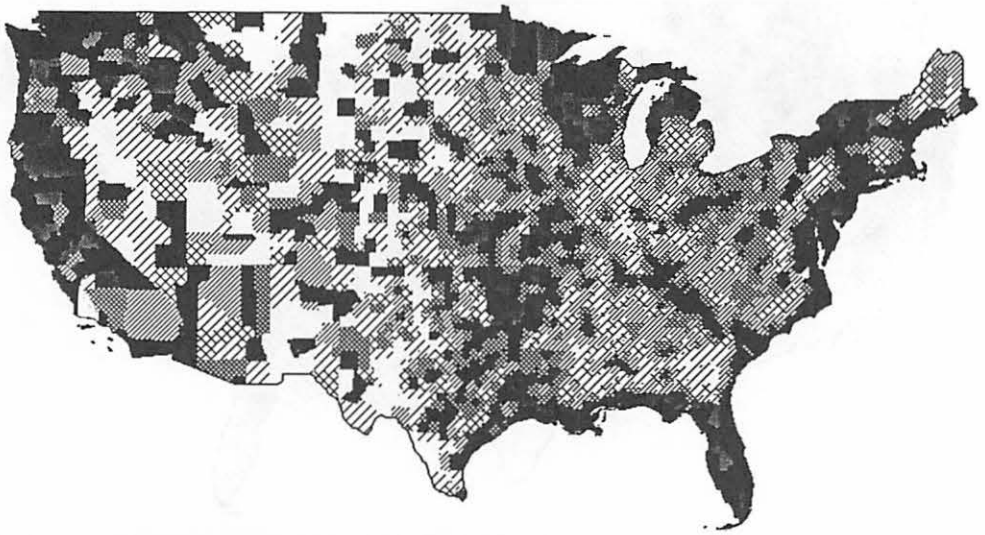


Figure 33.—Comparison of effective amount and location of developed water opportunities in the United States, 1987.

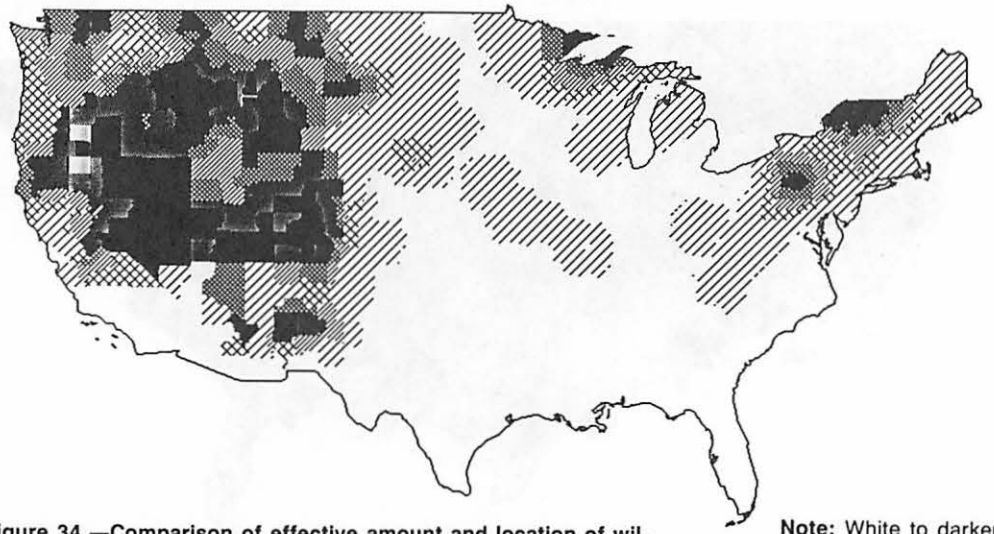


Figure 34.—Comparison of effective amount and location of wilderness and remote winter opportunities in the United States, 1987.

Note: White to darker shadings indicate zero to opportunity. Effectiveness of opportunities available location relative to the number and location of

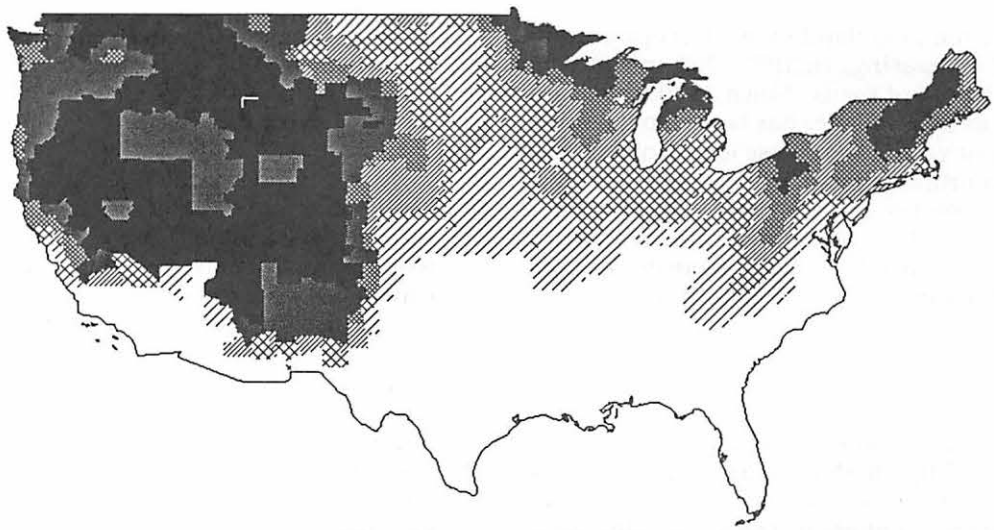


Figure 35.—Comparison of effective amount and location of near-road, undeveloped winter opportunities in the United States, 1987.

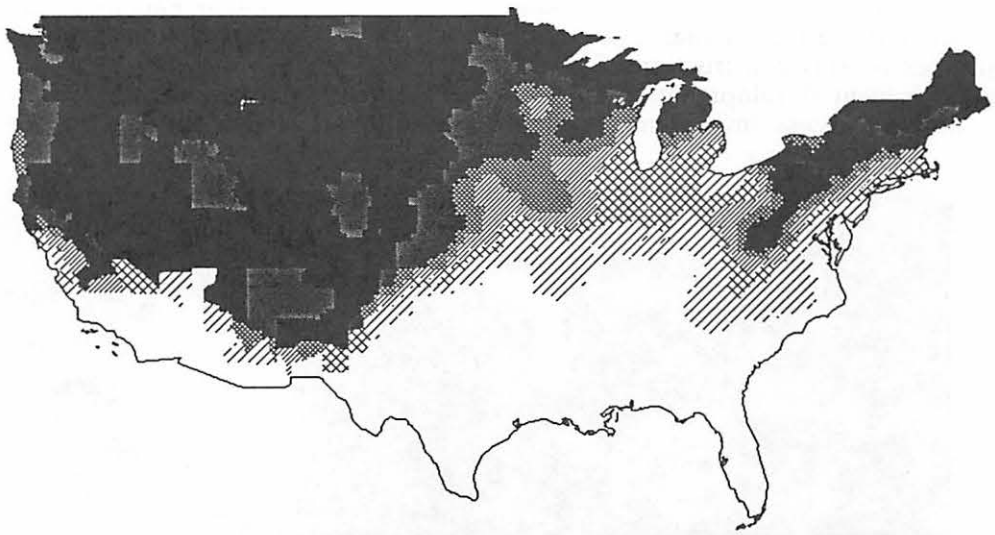


Figure 36.—Comparison of effective amount and location of roaded, partially developed winter opportunities in the United States, 1987.

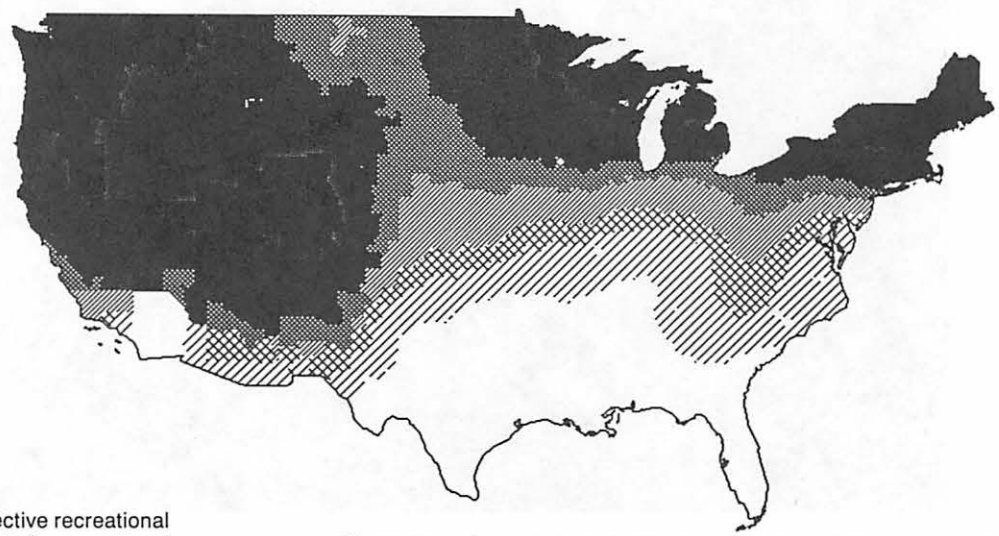


Figure 37.—Comparison of effective amount and location of developed winter sports site opportunities in the United States, 1987.

uccessively higher levels of effective recreational
o a county, state, or region refers to its amount and
opulation as potential users of the opportunities.

Roaded forest and rangeland recreation opportunities also have been decreasing. In 1987, 720 million acres were within 0.5 mile of roads. Since 1970, the average annual decline in this category has been about 5 million acres, or 0.7% 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% per year.

Water Resources

Since 1970, remote wild water available for recreation has increased slightly, at about 0.3% 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. The greatest increase occurred in highly accessible water recreation opportunities and developed water sites which grew between 0.5% to 1% 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 trends indicate gradual reductions in the per capita amounts of roadless, remote land in areas where snowfall is sufficient for winter sports. Additionally, roaded and partially developed areas where sufficient snowfall for recreation occurs have also been decreasing, primarily because of 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% per year.

Other Factors Influencing Recreation Opportunities

Access, information, budgets, and private services are additional factors influencing the availability of re-

Access, information, budgets, and private services all influence the availability of recreation resources.

sources and, thus, the amount and nature of opportunities the American public has or will have for outdoor recreation.

Access

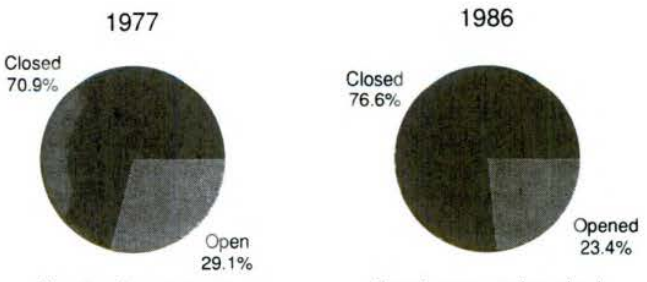
Several factors have broadened the availability of this country's public lands: the expansion of the interstate highway system, more frequent and lower cost air travel, better travel information and services, and more fuel-efficient automobiles, as well as growth in the tourist industry. But, practical constraints limit the availability of much public wildlands so recreation participation is often light, especially on federal lands (Domestic Policy Council 1988). Along with state and local governments, private landowners make an important contribution in providing recreational opportunities near urban areas where federal opportunities usually are quite limited. This does not mean, however, that all federal lands are difficult to access. Some national forests and national parks are located near or even within urban areas. But these federal and state areas usually are not adequate to meet all recreation demands, which highlights the importance of private lands.

Private nonindustrial land.—The portion of total nonindustrial private acres reported open for public recreation decreased from about 29%[6] in 1977 to about 23% in 1986 (fig. 38). Currently, 283 million private acres are open to public access either for free, a fee, or lease. One can attribute this trend toward ownership for exclusive uses to the decline of acreage, perceived threats of liability suits, needs for privacy, and competing land uses (Wright et al. 1989). Absentee ownership and previous bad experiences with public use have encouraged posting. Also, fragmentation of the land base into smaller tracts has made land availability contingent upon an increasing number of owners (Cordell et al. 1985).

To encourage private owners to provide access, 46 states have implemented legislation protecting against liability suits except in cases of gross negligence. Many of these statutes have not been tested in court, and owners who charge fees for access usually are not protected. So far, owners have been reluctant to take advantage of the statutes (Domestic Policy Council 1988). In addition, among owners who would be willing to open more land, revenues from fees or leases or tax incentives rank higher than protection from liability as incentives for providing more public access. Nationwide, about 4% of private nonindustrial land (53 million acres) is leased, although lease or fee arrangements are a rapidly rising trend, almost doubling every 5 years. Hunting seems to be the overwhelming recreational activity in lease arrangements; but, horseback riding, camping, and fishing, among others, are increasingly involved.

Private industrial forest lands.—Generally, little information exists on the availability of 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. This

[6]*This figure does not include leased acreage.*



Forest and range acres open for recreation

Forest, range, and cropland acres open for recreation

SOURCE: USDA Forest Service, 1980; and NPLOS, USDA Forest Service, Athens, GA, 1986.

Figure 38.—Percentage of nonindustrial private land open for recreation, 1977 and 1986.

figure had changed little since 1960 when 97% of industrial forest land was open to the public for recreation. However, by 1977, that figure had fallen to 58% (Cordell et al. 1985). During the mid-1960's, industrial forest lands began to shift from being open free of charge to charging an entry fee to help cover costs associated with public recreation. Currently, most of the access is available through leasing.

Water and shorelines.—Private ownership limits access to shorelines. This is particularly true in the East where public access to freshwater lakes and ocean beaches is usually inhibited by private owners who have posted properties adjacent to shorelines. Complaints about excessive fees for privately-owned beach use is common up and down the eastern seaboard. Land use and liability issues, as well as a willingness to compromise the longstanding "home-rule" principle, will have to be resolved in order to expand access to extremely popular water-based recreation opportunities. The trend since the early 1900's has been a rapid decrease of publicly accessible shorelines as private and commercial development have boomed.

Public institutional access issues.—Chapter I indicated the variety of federal, state, and local agencies managing recreation lands. Each entity manages its lands in accordance with a particular mandate. National recreation areas (31 areas), national wild and scenic rivers (about 8,000 miles), the National Trail System (58,000 miles), and the National Wilderness Preservation System (89 million acres) constitute specifically designated subsets of the lands managed by these federal agencies. Otherwise, recreation opportunities are only part, and often a small part, of the outputs for which agencies manage their land and water.

In general, federal lands offer opportunities of a primitive nature. The U.S. Fish and Wildlife Service and the National Park Service are the most extreme in this regard, prohibiting (in most instances) snowmobiling and other activities which require motorization or development. The Forest Service and the Bureau of Land Management (BLM), on the other hand, manage their lands for a broad spectrum of opportunities and purposes.

The BLM administers its lands, most of which are western rangelands, to accommodate a variety of recreation activities, from backcountry hiking and rock hounding to off-road vehicle use. The Corps of Engineers

provides many inland swimming and boating opportunities at its projects, which are designed mostly for navigation, hydropower, and flood control. The 6 million acres of waters and lands around Bureau of Reclamation projects provide recreation opportunities in Rocky Mountain and Pacific Coast states. The Bureau manages several designated recreation areas, such as Lake Powell, which was created by the Glen Canyon Dam on the Colorado River. The Tennessee Valley Authority (TVA) manages many reservoirs originally built primarily for hydropower and flood control in the Tennessee River basin. However, boat ramps, swimming areas, docks, piers, and similar recreation-related facilities are common on TVA projects.

The mission statements of state agencies managing recreation lands embrace the same spectrum of restriction and opportunity that federal agencies uphold. The same tension found at the federal level between the opposing goals of preservation and use exists among the states. In a survey of state park mission statements, Myers and Green (1989) found that the words "development" or "improvement" were mentioned as often as recreation. Historically, the emphasis at the state level has been to provide broad use at the expense of preserving undisturbed natural areas. In some states, this emphasis has shifted in recent years. Some states have established natural resource conservation areas accessible only for passive recreation (Myers and Green 1989). Counter to this movement is the thrust by several state park systems to develop more of their parks as tourist attractions in order to enhance state economies.

Institutional constraints on recreational activity vary with the administering agency. Such policies may limit access—and, therefore, opportunity—to varying degrees and function in much the same way that posting by a private landowner prohibits certain uses.

Private Sector Activities on Public Lands

The public sector has encouraged private investment in recreation facilities and services on public lands. Private enterprise has almost completely taken over some kinds of recreational opportunities, usually those that require the most development. Special use permits, leases, and concessionaire contracts are some of the alternative vehicles being used to set up private operations on public land. Downhill skiing is a good example. Private resorts operate on public lands (primarily national forests) in the majority of cases.

Providing recreation opportunities on public land has made the private sector a management partner with public agencies. In this fiscally conservative era, such joint ventures are growing. In wilderness and backcountry settings on public lands, private outfitters provide most of the services. For example, the major concessionaire in Yosemite National Park has operated a series of backcountry "High Sierra Camps" for years during the summer season. These camps offer lodging in tent cabins (which are removed in the fall), showers, and food for hikers who pay for the rustic comfort. Growing numbers of public campgrounds have been placed under management of private concessionaires, and guide and outfitter services leading tours into remote scenic areas have become popular. In another example, the Appalachian Mountain Club operates a series of hostels along the Appalachian Trail in the White Mountain National Forest, New Hampshire.

Information

Disseminating information about recreation opportunities expands resource awareness and use. Information gives potential users ideas and increases their enthusiasm about activities or sites which they may learn about. Growth in the tourism industry and the myriad computer information services indicate that information about recreation opportunities is available and growing.

Respondents to a survey for the President's Commission on Americans Outdoors (1986), however, cited word of mouth and newspapers as their major sources of information about recreational opportunities. Information from recreation areas and providers was cited only as a minor source. As the Domestic Policy Council (1988) pointed out, "response may indicate that the largest demand for better information is for outdoor recreation opportunities closer to home which generally are not addressed by the tourism industry and travel services except in the weekender section of local newspapers."

Public Agency Budgets for Recreation

In 1986, the federal budget for "recreational resources" was about $1.5 billion (1986 constant dollars). The federal budget for recreation peaked in 1978 at $2.15 billion dollars (1986 constant dollars) but has steadily decreased since. The same trend has been true of state park and recreation budgets. They decreased in real dollars at an increasing rate between 1978 and 1984.

Local government expenditures, however, have actually increased by $229 million (1977 dollars) between 1977 and 1982. Between 1982 and 1985, local government park and recreation operating budgets rose about 26% and capital budgets rose 39% (McDonald et al. 1989). Growth rates varied by region. Operating budgets in the South, Rocky Mountain, and Pacific Coast Regions rose rapidly, with capital budgets in the South and Rocky Mountain Regions rising most rapidly. Growth of operating budgets has been evident across all sizes of agencies or departments. However, capital budgets grew most rapidly among local departments of the more heavily populated cities and counties.

Private Services

Many outdoor recreation opportunities come available through private enterprises rather than public agencies or private organizations. Guides and outfitters, equip-

ment rental firms, bed and breakfast operations, and interpretive services all make certain activities more accessible and attractive.

Guides, outfitters.—Through outfitters and guides, recreationists can avoid both investing in specialized or expensive equipment and planning logistical details of a trip. Guide services are especially important for access to wilderness and other extensive roadless areas. These services make larger trips possible by organizing groups. A sizeable niche exists for guides and outfitters to make backcountry recreation available to the public.

More than 1,000 guide services are listed nationwide. Most of these enterprises are located in regions suited to their services and are, therefore, concentrated in the western regions. Another avenue of access to remote recreation areas comes through the services of dude and guest ranches. In 1987, most of these (more than 250 listed) were located in the Rocky Mountain Region.

Rental firms.—Suppliers of recreation services include those who rent equipment. Recreational vehicles, canoes, and camping equipment are examples. More than one-half of the 1,750 equipment rental firms advertising in the Yellow Pages in 1986 were located in the North, and another 27% were in the South. Within the equipment rental industry, about 65% of those who specifically rent recreational vehicles were located in the eastern half of the country. Canoe rentals were concentrated in the North.

New equipment.—Off-road vehicles, including mountain bikes and snowmobiles, hang gliders, stunt kites, jet skis, ocean kayaks, and rock-climbing equipment all create new kinds of recreational opportunities, providing users with expanded access to outdoor settings and new points of view. Continuing innovation in equipment and the kind of activities people undertake will create challenges for users and resource managers alike.

Private organizations.—Some of the organizations which directly provide many general and programmed recreational opportunities include YMCA's, YWCA's, Boy and Girl Scouts, student and youth groups, conservation work skill volunteers (such as the Student Conservation Association and the Appalachian Mountain Club), and community service groups. These organizations provide recreation for its own sake and as a means to achieve other goals. While many programs target youth, others target special populations such as the handicapped or inner city residents. These organizations also provide the important functions of teaching outdoor skills and nature appreciation and developing public interest in outdoor recreation. They also supplement the supply of recreation facilities and provide access, primarily at the local level. Many of them organize activities and trips, thus, facilitating participation by their members.

A wide variety of resource protection interests are concerned with wildlife, wilderness, historic and cultural resources, urban open space, federal lands, rivers, wetlands, shorelines, and other natural resource features. In addition to education, some of these organizations monitor the management and quality of specific resources. Others, such as local land trusts, use special tools and innovative fund raising to acquire and otherwise protect natural resources. These groups also offer recreation related services such as tours and school programs which help them carry out their conservation work.

Associations of recreation enthusiasts typically promote a specific activity or group of activities. Examples include United Four Wheel Drive Association, League of American Wheelman, National Campers and Hikers Association, American Horse Council, and American Canoe Association. Often, these are partially supported by equipment manufacturers. Members learn new skills, find out about places to engage in the activity, jointly protect their interests, and are provided socializing opportunities through the organizations' programs.

Nonprofit organizations are somewhat different in that they tend to develop when a part of the population perceives a public service need. The past 30 years have shown unprecedented growth in the number of groups and members. Outdoor recreation associations have grown more than 63% since 1970.

Interpretive Services on Federal Lands

Interpretive services, including guided walks and tours, campfire programs, self-guided nature trails, slide shows, and so on, have long been associated with federal recreation areas. By the late 1970's, changing social values, strained government budgets, and the shift of public attention to other concerns all contributed to reductions in interpretive programming, especially in federal and state agencies. In the last few years, interest and attention to interpretation has resurged. Though interpretation's mission and its core definition have remained stable, its face and character have changed. Funding has decreased, providers of interpretation have expanded, and techniques and roles have shifted. Visitors have indicated a willingness-to-pay for interpretive services. Increasingly, user fees are being assessed for many types of interpretive programs. In exchange, users expect higher quality.

Reduced funding and subsequent interpretive staff reductions have increased the need for alternative means for providing these services. One major change is the increasing role of the private sector in providing such services, including interpretation on public lands. Many outfitters, guides, resort owners, and other recreational entrepreneurs are incorporating interpretive programming into their offerings. Several public agencies are strongly encouraging this role. Information about an area and an enhanced awareness of the relationship between the user and the resource increases the attractiveness of a facility or service, gives them a competitive edge, and enhances the experience of their clients.

Cooperating associations and "friend" organizations are involved more frequently in various ways to support interpretation. Volunteers and interns have increasingly replaced or supplemented full-time seasonal interpretive staff. Interpretive associations affiliated with the Forest Service, for example, have enhanced the quality of the outdoor recreation experience for many visitors

to the national forests. These associations grossed more than $1.56 million during 1986, for which the Forest Service received a direct benefit estimated at $637,469. In 1987, 39 interpretive associations were linked to the national forests all over the country. An example of how such partnerships benefit both government agencies and the public is the Laguna Mountain Volunteer Association. Members have donated 20,000 hours to improve trails, campgrounds, and visitor services in a national forest.

Projections of Recreation Supply

This chapter opened with a brief explanation of the process by which households or individuals are involved in supplying recreational trips or experiences. First, through investment and management, agencies, private landowners, private service entrepreneurs, and other resource managers or service vendors provide various forms of outdoor recreational opportunities. Second, households combine these opportunities with their knowledges, skills, abilities, equipment, and technology to "produce" recreational trips or experiences. A camping trip, for example, requires a campground, tent, lantern, camping skills, transportation, and other inputs. A white water float trip requires a raft, the white water river, knowledge of river running, life preservers, travel, and other equipment and services.

The land, water, and snow and ice resources described in chapter I and the trends indicating changes in their availability for outdoor recreation are integral factors determining recreation supply. Changes in access, budgets, organizational involvements, services, and many additional factors influence recreation supply trends. If those trends continue, they will have important effects on future outdoor recreation opportunities.

For supply analysis of this Assessment, the assumption is made that a continuation of recent trends is the most likely future for recreational resources, barring any unforeseen or planned change that would influence these trends. Using the best available estimates of these trends, the rates of change reported earlier were developed for land, water, and snow and ice resources. These estimated rates of change were based on such known trends as wilderness designation, forest road construction, ski lift capacities, private land access, and recreation site development. As the availabilities of land, water, and snow and ice resources change, so do the number and types of recreational trips taken by households and individuals. An increased availability of resources represents increases in opportunities, in which case, more trips can be taken at the same or lower consumer costs per trip. On the reverse side, decreases of availability mean more travel, time, and, in general, greater effort to produce recreational trips.

Projections of growth in recreational trip supply are presented in this chapter to reflect what may happen in future years if recent trends in recreational opportunities continue to the year 2040. Supply projections for selected activities are compared. Recent trends in the amount and availabilities of land, water, and snow and ice resources were reviewed in chapter I and briefly reiterated in an earlier section of this chapter.

Estimates of future trends are shown in table 15 and represent an extension into the future of the recent resource trends described in chapter I. Thus, if no market or policy changes occur, the extended trends in table 15 reflect the most likely future for availabilities of land, water, and snow and ice resources for recreation. On this

Projections of future recreation supply were made with the assumption that recent trends would continue.

Table 15.—Estimated future trends in land, water, and snow and ice resources and environments if recent trends (1970–1987) in amounts of resources available for outdoor recreation were to continue.

Resources and environments	Projected percentage change from 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, roaded 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 and 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, roaded areas	- 9	-15	-21	-26	-31
Intensively developed winter sports sites	17	28	36	43	49

Table 16.—Current supply of recreational trips away from home and indices of future growth to 2040 if recent resource availability trends continue.

Resource category and activity	Trips in 1987 (millions)	Percentage of 1987 supply				
		2000	2010	2020	2030	2040
Land						
Wildlife observation and photography	69.5	107	113	120	126	130
Camping in primitive campgrounds	38.1	108	115	122	130	134
Backpacking	26.0	124	144	165	185	198
Nature study	70.8	99	101	103	107	108
Horseback riding	63.2	114	125	135	144	149
Day hiking	91.2	123	144	168	198	229
Photography	42.0	115	128	141	154	163
Visiting prehistoric sites	16.7	127	148	173	203	236
Collecting berries, etc.	19.0	110	120	132	149	169
Collecting firewood	30.3	109	118	130	144	161
Walking for pleasure	266.5	116	132	148	168	183
Running/jogging	83.7	131	160	192	229	260
Bicycle riding	114.6	124	146	170	197	218
Off-road driving	80.2	104	108	112	118	121
Visiting museums and information centers	9.7	118	134	152	172	187
Attending special events	73.7	115	129	144	161	175
Visiting historic sites	73.1	117	133	152	178	204
Driving for pleasure	421.6	110	120	129	139	145
Family gatherings	74.4	121	139	160	182	202
Sightseeing	292.7	114	128	144	164	185
Picnicking	262.0	110	120	131	145	156
Camping in developed campgrounds	60.6	120	138	158	178	195
Water						
Canoeing/kayaking	39.8	113	126	138	153	163
Stream/lake/ocean swimming	238.8	108	118	128	140	152
Rafting/tubing	8.9	123	151	182	229	267
Rowing/paddling/other boating	61.8	110	120	130	142	150
Motor boating	219.5	107	114	122	131	138
Water skiing	107.5	112	122	132	144	152
Pool swimming	221.0	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

basis, the projections in table 16 predict the most likely future supplies of recreational trip opportunities.

Expected Future Land-Based Recreation Supply

In general, across the land activities listed in table 16, continuation of recent trends in making resources available for public recreation will lead to expansion of recreational trip supply as households find ways to more effectively utilize increasingly scarce opportunities. This growth is projected at about 15% overall to the year 2000. The supply of land activities projected to grow most rapidly includes running/jogging (31%), visiting prehistoric sites (27%), bicycle riding and backpacking (24%), day hiking (23%), and family gatherings and developed camping (21% and 20%, respectively). In total, projected growth in trip supply among these seven activities is expected to reach just over 140 million per year by the year 2000.

Among the land recreation environments in fig. 39, supply of developed-site trip opportunities is expected to grow most rapidly, 8% by 2000. This represents continuation of recent trends and, if continued, is expected to result in 11% growth of recreational trip supply. Supply of both motorized and nonmotorized recreational trips in roaded, partially developed lands and in extensive roadless lands is projected to grow 9% to 10% by 2000. This growth is projected even though the land area in these environments is expected to decrease 9% to 12% by 2000. This growth of trip supply in the face of decreasing resource availabilities reflects a large, unused capacity, especially on public lands. Households and individuals will have the capabilities, apparently, to produce more trips even though the costs of doing so are likely to be greater.

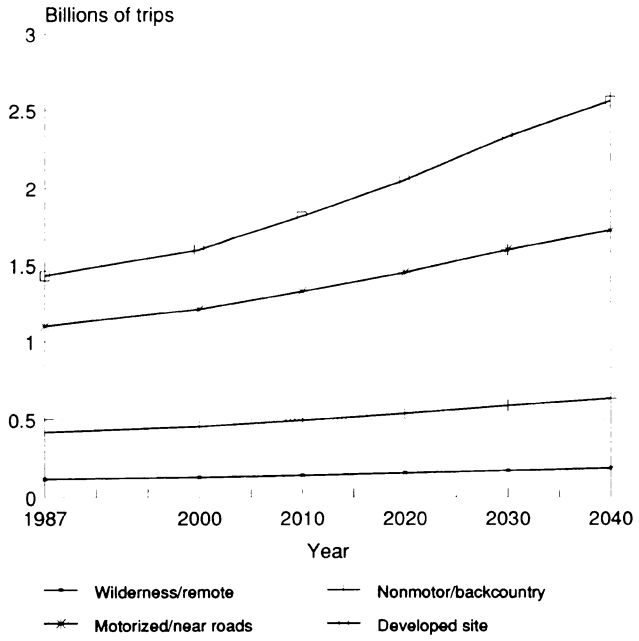


Figure 39.—Projections of future supply trends for LAND-BASED recreation trips if past trends continue.

For the most part, the relative growth rates among land activities should remain about the same in future years. The one dominant theme among the fastest growing activities is their dependence upon access, trails, and developed site resources. Substantial growth of these resources could lead to substantial increases in recreational trip supply in future years.

The slowest growing activities mostly depend upon roaded and partially developed rural lands. Continuation of the recent downward trends in access to these resources will result in very slow rises in recreation supply as households must overcome the shrinkage in space and access by using different means and technology to produce their recreational trips and experiences.

Expected Future Water and Snow/Ice-Based Recreation Supply

For the most part, water recreational trip supply will grow moderately with continuation of recent resource availability trends. The exceptions are rafting/tubing (24% by 2000) and pool swimming (35%), which are projected to grow rapidly. Motorized water recreation supply will grow slowly if recent trends continue. Access, technology, and services associated with rafting and tubing types of activities (especially outfitter and guide services) have risen rapidly in recent years. So, too, has the number of swimming pools. Continuation of these trends is projected to result in rapid growth of the supplies of these opportunities. In fact, pool swimming supply is projected to increase to levels beyond that of stream, lake, and ocean swimming supply by 2020. Continuation of the moderate expansion of resources suitable for motorized water recreation, a rate that is somewhat below that of population growth, is projected to lead to proportionate rises in supply of motorized water trip opportunities as reservoirs and lakes continue to be crowded at peak times (fig. 40).

The decrease of undeveloped and roaded rural lands in areas with good winter snowfall is projected to cause slow growth for supply of cross-county skiing and similar dispersed activities. Actually, the supply of dispersed winter recreational trip opportunities should rise moderately through 2010, and then a continued loss of access and expected conversions to incompatible other uses of private and public lands may cause decreases through 2040. If recent trends continue, downhill skiing supply could continue to rise rapidly as both new sites and new capacities are added. Such development pressures from downhill skiing could actually contribute to some losses of cross-country opportunity. While continuation of recent past trends is an assumption of this Assessment across all types of recreational environments, ski industry projections forecast a slowing of the rapid growth which dominated in the 1960's and 1970's.

Different forms of recreation supply will grow in the future at very different rates if recent resource availability trends are continued (table 16, figs. 39 and 40). Following these trends into the future sometimes matches well with what the public will likely prefer. Where this

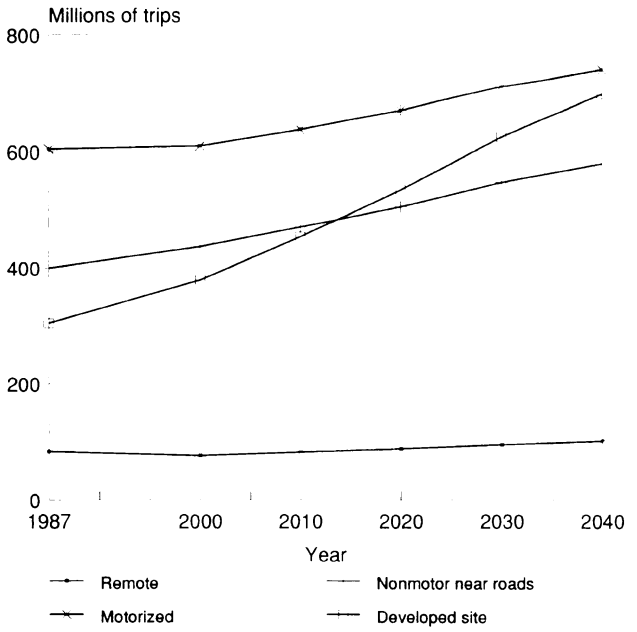


Figure 40.—Projections of future supply trends for WATER-BASED recreation trips if past trends continue.

occurs, few if any shortages should occur. But for some activities, recent supply trends may not match public demand for recreation opportunities, and a different course into the future may need to be considered. These are among the topics covered in the next chapter.

Wilderness

The extent of the National Wilderness Preservation System, NWPS, is described in chapter I. The size of the System and the availability of wilderness is likely to expand considerably within the next decade. However, the characteristics of potential wilderness are greatly influenced by the language of the Wilderness Act. The way in which current wilderness areas are managed also significantly affects availability.

Current Availability

The opportunity for public use was one of the overriding concerns of the Wilderness Act. With few exceptions, the entirety of the System is accessible for appropriate public uses. Geographic location among the nation's population is not a criterion in the designation of wilderness areas. Because wilderness is an administrative "overlay" on federal lands, its location is not random. It will always be tied to existing federal land ownership patterns. In an ideal sense, wilderness is equally available to all Americans. But, in a practical sense, its geographic distribution makes wilderness more accessible to certain populations.

On a regional or state level, the location of wilderness will probably always be unevenly distributed across the nation in terms of population. The majority of federal lands are located in the 11 western states and Alaska. While these states account for only about 20% of the nation's population, they hold more than 95% of the wilderness areas. Alaska alone has nearly two-thirds of the total national wilderness acreage, but less than 1% of the national population. Residents of states east of the Rocky Mountains, therefore, must often either travel greater distances and spend more money to get to a wilderness area or share it with a greater number of people (on a per capita acreage basis).

Representativeness of ecosystem type is also not a formal criterion for the designation of wilderness. The ecosystems which are available for use in the NWPS are again limited to those in federal ownership. Due to the contribution of Alaska, nearly one-half of the available wilderness areas have tundra or subarctic ecosystems. The majority of wilderness areas in the contiguous states are located in forested, mountainous areas. Particularly underrepresented in the System is wilderness prairie.

Properly managing wilderness is as important as including more acreage in the NWPS. Designation alone cannot guarantee wilderness opportunities because wilderness, to a large degree, depends upon human perception of its qualities. Impacts from excessive or improper recreational use can degrade wilderness character. Similarly, the influences of acid precipitation, global warming, and aircraft overflights, among other possibilities, may also adversely impact wilderness. Therefore, although wilderness in name, lands so designated could no longer effectively offer wilderness opportunities or experiences. In effect, extraneous factors could reduce the supply of wilderness.

Wilderness by law serves multiple purposes which may conflict with each other. As more becomes known about the nonrecreational values of wilderness, these conflicts may become more apparent. The available opportunity for any given use may need to be adjusted through management. As new wilderness areas are designated, criteria regarding acceptable levels of change should be adopted.

Recent Trends in Supply

Growth of the NWPS has not followed easily identifiable patterns and, thus, does not lend itself to mathematical trend analysis. Rather, it has been the field of politics which better explains and predicts trends.

Since its inception in 1964, the System has grown tenfold to nearly 89 million acres. But this growth has not occurred uniformly every year, and several significant events have shaped the current System and its growth. Following the Wilderness Act in 1964, the Eastern Wilderness Act (1974) and Endangered American Wilderness Act (1978) both served to change operational definitions of what could be considered potential wilderness. The Federal Land Management Policy Act (1976) added a fourth agency (the Bureau of Land Management) charged with wilderness preservation and management. The Alaska National Interest Lands Act (1980) more than doubled the size of the NWPS with wholesale realloca-

tion of federal lands among agencies. In these acts, the supply of wilderness was increased as a result of a long political effort reflecting the will (or demand) of the nation.

New additions to the System have often been delayed until key resource issues were resolved, especially water rights. The future size of the System, therefore, also depends upon the courts to interpret existing legislation. Perhaps reflecting this trend, legislation creating new wilderness areas over the past 10 years has begun to be more specific regarding the designation purposes and to state exceptions or additions to Wilderness Act provisions. Again, the consequence is that differing amounts of the System may be available for different uses, complicating the description of supply.

Projected Supply

Despite pending resource issues, the NWPS will most likely continue to grow over the coming decade. Observers note that competing commercial interests such as timber, mining, and grazing have begun to find potential wilderness areas less attractive in the present economy. Noted, too, is the fact that Congress has generally exceeded the recommended acreage when designating new areas (McCloskey 1989). Estimates of the ultimate size of the System have been put as high as 350 million acres (Flamm 1989).

Regardless of designation purpose, legal interpretation, and conflicting resource issues, most large additions to the NWPS are likely to occur in Alaska and the West. Considerable acreage in Alaska managed by the National Park Service and the Fish and Wildlife Service may eventually enter the System. The BLM estimates that up to 15 million acres throughout the western states could enter the System over the next several years. Many of these areas would be designated more for their nonrecreational values than for their recreation potential.

CHAPTER IV: HOW MAXIMUM PREFERRED DEMAND COMPARES TO AVAILABILITY OF RECREATION AND WILDERNESS OPPORTUNITIES

Introduction

In the first part of this chapter, maximum preferred future demand for outdoor recreational trips away from home, as presented in chapter II, is summarized. Next, future supply of recreational trip opportunities, given a continuation of recent trends in the provision of recreational and wilderness facilities and resources, as presented in chapter III, is reviewed. How maximum preferred demand compares to likely future supplies of recreational trip opportunities is then discussed. Following this discussion, implications of alternative future rates of change in the availability of recreational facilities and resources are considered. General observations concerning the supply and demand of outdoor recreation and wilderness in the United States are then provided in the final sections.

The Demand Outlook: Outdoor Recreation Opportunities Preferred by Americans

Trends and Influences in Demand

People still enjoy traditional outdoor recreation activities, but the growth rate of demand for these activities has slowed since the 1950's and 1960's. "Baby boomers," those Americans born between 1946 and 1964, are growing older. As this large segment of the American population ages, recreation preferences change. Age often limits the ability of some people to participate in some activities.

Other important dimensions to demographic changes, in addition to aging, influence demand growth. The American population is growing at a much slower rate than in the past. Dual-income households are expected to become increasingly common so discretionary income should increase dramatically for much of the population. With more members working, however, families may realize less leisure time and encounter more difficulty in taking advantage of recreational opportunities. Americans are living longer and enjoying generally higher levels of health and physical fitness. All of these, and perhaps other factors, contribute to shifting preferences in outdoor recreation demand.

Maximum Preferred Demand

Method.—For this Assessment, projections of future demand for outdoor recreation are expressed as maximum preferred demand, which is defined as the number of outdoor recreational trips away from home that Americans would take if just enough opportunities exist to satisfy those preferred number of trips. This definition assumes no shortages of opportunities would occur and that the cost of a trip would remain at today's level. In 1987, Americans took an estimated 4.5 billion recreational trips away from home, mostly to rural forest, range, and water areas, according to the research provided by this Assessment using the Public Area Recreation Visitors Study. From this base of current recreation demand, projections of the public's maximum preferred demand for recreational trips were developed for each

Because baby boomers are entering middle age, recreational preferences are expected to shift.

decade through 2040. (Selected recreational activities which typically occur across the forest and range recreational environments are shown in figure 1.) Projections were based on assumptions about five factors which significantly influence recreation demand. These assumptions were: (1) the cost of taking trips in the future will remain the same as it is now; (2) the percentage of the population earning more than $30,000 a year will rise; (3) the proportion of young adults (persons 18 to 32 years old) in the population will fall; (4) overall, the population will grow but at a decreasing rate; and (5) the availability of recreational opportunities will be adequate in the future. Projections are measured from this Assessment's benchmark year, 1987, as a percentage change in number of trips. Projections of maximum preferred demand are discussed in more detail in chapter II.

Result.—For the growing number of older Americans and those baby boomers who now have families at home, simple recreational activities such as picnicking, pleasure driving, sightseeing, and day hiking should continue to be popular even though rates of increase should be modest. These activities are easily accessible, require only moderate amounts of time, are inexpensive, and are easy to organize. Maximum preferred demand for them will increase steadily. Seemingly contradictory to this trend, maximum preferred demand for more expensive, time consuming, and adventuresome recreational activities such as rafting/tubing, canoeing, kayaking, downhill skiing, cross-country skiing, and backpacking should increase considerably. This predicted trend may diminish as baby boomers age, but it may rise again toward the end of the 50-year period considered here as boomers' children begin to pursue the recreation interests they learned from their parents. The simultaneous growth of both passive and adventurous activities may not be a contradiction but a demonstration of preference for variety to match the increasing varied lifestyles, cultural backgrounds, and personal abilities.

Continued interest in health and physical fitness may contribute to increased demand for exercise-oriented activities that are broadly available and easily engaged in close to home. Maximum preferred demand for bicycling, swimming, walking, running, and jogging shows a steady increase in the future. Slight increases in maximum preferred demand will occur for primitive camping, driving vehicles or motorcycles off-road, nature study, collecting forest products (such as firewood, berries, seashells, and mushrooms), wildlife observation and photography, motor boating, and water skiing.

The increasing number of low-income families, particularly urban-bound minorities, has the potential to change the complexion of outdoor recreation demand. Because of limited incomes and lack of exposure to outdoor environments, minorities often participate in outdoor recreation substantially differently than do affluent Americans. For example, a popular recreational activity among some low-income ethnic groups is family gatherings, and maximum preferred demand for family gatherings is projected to increase at a relatively high rate in the future. By and large, however, low-income urban people represent an outdoor recreation constituency which, in many ways, has yet to be effectively recognized by most resource management agencies. This group can potentially become more active in many forms of outdoor recreation if the availability of appropriate opportunities increases or incomes, knowledge of, and access to the out-of-doors increase.

The Supply Outlook: Continuing Past Resource Availability Trends

As explained in more detail in chapters I and III, the effectiveness of the types, qualities, and quantities of outdoor recreational facilities and resources vary considerably across the United States. Because the West has extensive public land and a relatively small population, effective land-based recreational opportunities are generally 5 to 15 times greater than in the East. To even out the regional availability of land-based recreational opportunities per person, a large population shift from East to West would have to occur, or availability of land-based recreational opportunities in the East would have to increase dramatically. Some recreational opportunities, such as remote wilderness backpacking, however, will likely remain relatively scarce in the East.

The uneven distribution of opportunities is not as extreme for water recreation. Effective opportunities for some types of water-based recreation are comparable between East and West. A major difference is less effective coldwater and white water opportunity in the East.

Another important difference between East and West is the impact of crowding. Congestion generally reduces the satisfaction people obtain from an outdoor recreational experience (Cicchetti and Smith 1976, McConnell 1977, Walsh et al. 1983). Potential impacts of crowding are reflected in the measures of effective recreational opportunity presented in chapter III. In the West, many large population centers are close to vast tracts of largely undeveloped public lands, usually managed by the Forest Service or the Bureau of Land Management. Denver residents, for example, are within 1 hour's drive of the Roosevelt, Arapaho, and Pike National Forests. Residents of Los Angeles, Seattle, Portland, Salt Lake City, and Phoenix all have similar opportunities just outside their city limits.

Thus, in the West, effective recreational opportunities are relatively large for many activities. The implication is that each person can access many recreational facilities or resources within a reasonable driving distance if he or she so desires. The extent of crowding or congestion is less in the West. In the East, very few relatively undeveloped land and water areas are located within 1 hour's drive of a population center. Effective recreational opportunities dependent on these undisturbed settings are, therefore, relatively small. This means that the likelihood of crowding or congestion is greater than in the West since each person has access to fewer recreational spaces, facilities, or resources within a reasonable driving distance. The lack of recreational opportunities close to large population centers in the East is most severe for remote backcountry, wilderness, and other extensive, roadless environments.

Continued interest in health and physical fitness activities which are available close to home shows a steady increase into the future.

Inner city residents could become more active in outdoor recreation if appropriate opportunities are made available, or their income, knowledge of, and access to the out-of-doors increase.

The use of private lands for outdoor recreation potentially could ease the uneven geographic distribution of recreational opportunities. In addition to the 283 million acres of private lands open to the public or leased for recreation in 1987, 556 million acres of private lands are available to acquaintances of individual owners. Much of these 839 million acres are located in the East. Recent trends, however, indicate that the number of acres open to the public without a lease is steadily decreasing. Compared to 10 years ago, almost 10% more private, nonindustrial land is now closed to the public, according to research conducted for this Assessment with the National Private Landowner Survey data. Additionally, more than one-third of the private industrial lands open to the public in 1960 are now closed. Unless trends are reversed, private lands may not have a substantial impact on the future availability of effective recreational opportunities in the East.

Often, people cannot take all of the trips they would prefer. The type and number of recreational trips which people can take may be limited, in part, by available recreational facilities or resources. In chapter III, the supply of opportunities for recreational trips was projected under the assumption that recent resource availability trends would continue into the future.

Continued trends in the availability of different land, water, and snow and ice facilities and resources are described in table 15. Gains and losses largely reflect the recategorizing of facilities and resources as a result of building roads and the development that typically follows improved access. For land resources, only the intensively developed site category shows an increase in available facilities and resources. Wilderness and roadless areas, undeveloped areas near roads, and partially developed, roaded areas all show sharp declines.

With respect to water resources, wild and remote lakes and streams, lake and stream sites adjoining roads, and intensively developed water sites all show increases in available facilities and resources. Lakes and streams near roads show a decline. As development progresses, some waters will have to be reclassified. This and additional closures of private land will alter the accessibility picture. For snow and ice, only intensively developed winter sports sites show increases in available facilities and resources while wilderness and roadless areas, undeveloped areas near roads, and partially developed roaded areas show decreases.

Projected Future Supply of Recreational Trips

The supply of recreational opportunities can be measured in terms of recreational trips. This measuring unit reflects the availability of facilities and resources plus the actions of recreationists who use them. Recreational trips cannot be purchased at the local convenience store like a loaf of bread. As described in chapter III, if a person desires to enjoy a recreational trip, he or she must use their own time, travel, experience, knowledge, and equipment, along with available recreational facilities and resources, to "produce" or take a recreational trip.

The supply of opportunities for recreational trips is, therefore, determined by a two-step process. First, public or private agencies, groups, or individuals make recreational facilities and resources available to the public. Second, households make given resources and facilities destinations for intended use. Projections of the future supply of opportunities for recreational trips consider both of these supply steps.

Future expected supply of trip opportunities was determined by calculating the total number of trips that the public will take if recent trends in the availability of recreational facilities and resources continue. The calculations also consider those factors which influence the public's recreation decisions. The factors affect household production and, thus, are used to predict the expected supply of trip opportunities. Thus, the expected future supply of trip opportunities represents the expected number of trips that the people will most likely produce given constraints of time, income, location, access, technology, personal skill, and amount of facilities.

If recent trends continue, the availability of resources should stimulate an increase of trip opportunities for activities such as biking, day hiking, walking, running and jogging. More passive recreational activities that show a relatively high increase in expected supply of trip opportunities include developed camping, sightseeing, visiting museums, and visiting historic and prehistoric sites. Expected trip opportunity supply will also increase at a relatively high rate for some of the more active and adventuresome activities including rafting and downhill skiing.

Expected trip opportunity supply should increase at a moderate rafe for picnicking, horseback riding, river and lake swimming, canoeing and kayaking, and cross-country skiing. Expected trip opportunity supply for specialized land-based activities, including primitive camping, nature study, wildlife observation, and off-road driving will increase at a relatively low growth rate. General activities that show a relatively low increase of expected trip opportunity supply include motorboating and driving for pleasure.

Comparison of Preferred Demand and Expected Supply

Projections of maximum preferred demand indicate the number of recreational trips Americans would prefer to take in the future if the availability of recreational facilities and resources or increased trip costs did not limit their opportunities. Projections of expected supply indicate opportunities for recreational trips assuming that recent trends in the availability of recreational facilities and resources continue. That is, expected supply represents recreational trip opportunities if either planned or market-driven deviations from past trends do not occur.

Both supply and demand are measured by recreational trips. Thus, by comparing projections of maximum preferred demand to projections of expected supply of trip opportunities, differences affecting discrete activities can be identified and measured using the same units.

The 1987 base year for this Assessment represents an equilibrium between demand and supply[7] measured in number of trips away from home. Projections of maximum preferred demand and expected supply for activities that occur on forest and range are indexed to this 1987 base as shown in table 17. The percentage by which preferred demand exceeds expected supply is also shown. The methodology upon which this demand-supply comparison is based is presented in detail in Cordell and Bergstrom (1989).

The severity of a demand-supply gap may not be totally revealed by the percentage difference. Even a small percentage difference can have major social, economic, and environmental consequences if it represents a relatively large number of trips. Thus, demand-supply

[7] *In the base year, demand is assumed to equal supply.*

Table 17.—Projected gap between maximum preferred demand and expected supply of outdoor recreational trips away from home, measured as percentage difference by decade to 2040.

Resource category and activity	Trips in 1987 (millions)	Percentage of 1987 trips				
		2000 D/S/G[1]	2010 D/S/G	2020 D/S/G	2030 D/S/G	2040 D/S/G
Land						
Wildlife observation and photography	69.5	116/107/ 9	131/113/18	146/120/26	162/120/26	174/130/44
Camping in primitive campgrounds	38.1	114/108/ 6	127/115/ 8	140/122/18	154/130/24	164/134/30
Backpacking	26.0	134/124/10	164/144/20	196/165/31	230/185/45	255/198/57
Nature study	70.8	105/ 99/ 6	113/101/12	120/103/17	131/107/24	138/108/30
Horseback riding	63.2	123/114/ 9	141/125/10	160/135/25	177/144/33	190/149/41
Day hiking	91.2	131/123/ 8	161/144/17	198/168/30	244/198/46	293/229/64
Photography	42.0	123/115/ 8	143/128/15	165/141/24	188/154/34	205/163/44
Visiting prehistoric sites	16.7	133/127/ 6	160/148/12	192/173/19	233/203/30	278/236/42
Collecting berries, seashells, mushrooms, etc.	19.0	113/110/ 3	126/120/ 6	143/132/11	166/149/17	192/169/23
Collecting firewood	30.3	112/109/ 3	124/118/ 6	138/130/ 8	157/144/13	178/161/17
Walking for pleasure	266.5	116/116/ 0	131/132/ 0	146/148/ 0	164/168/ 0	177/183/ 0
Running/jogging	83.7	133/131/ 2	163/160/ 3	197/192/ 5	234/229/ 5	262/260/ 2
Bicycle riding	114.6	125/124/ 1	148/146/ 2	173/170/ 3	202/197/ 5	222/218/ 4
Driving off road	80.2	105/104/ 1	111/108/ 3	118/112/ 6	125/118/ 7	130/121/ 9
Visiting museums or infornmation centers	9.7	118/118/ 0	136/134/ 2	153/152/ 1	174/172/ 2	188/187/ 1
Attending special events	73.7	114/115/ 0	127/129/ 0	141/144/ 0	157/161/ 0	168/175/ 0
Visiting historic sites	73.1	122/117/ 5	143/133/10	169/152/17	203/178/25	241/204/37
Driving for pleasure	421.6	115/110/ 5	128/120/ 8	142/129/13	157/139/18	167/145/22
Family gatherings	74.4	119/121/ 0	135/139/ 0	152/160/ 0	170/182/ 0	182/202/ 0
Sightseeing	292.7	118/114/ 4	136/128/ 8	156/144/12	183/164/19	212/185/27
Picnicking	262.0	108/110/ 0	117/120/ 0	126/131/ 0	136/145/ 0	144/156/ 0
Camping in developed campgrounds	60.6	120/120/ 0	137/138/ 0	155/158/ 0	173/178/ 0	186/195/ 0
Water						
Canoeing/kayaking	39.9	113/113/ 0	126/126/ 0	140/138/ 2	157/153/ 4	169/163/ 6
Stream/lake/ocean swimming	238.8	105/108/ 0	110/118/ 0	117/128/ 0	124/140/ 0	129/152/ 0
Rafting/tubing	8.9	111/123/ 0	136/151/ 0	164/182/ 0	215/229/ 0	255/267/ 0
Rowing/paddling/other boating	61.8	112/110/ 2	124/120/ 4	136/130/ 6	150/142/ 8	159/142/ 9
Motorboating	219.5	106/107/ 0	111/114/ 0	117/122/ 0	123/131/ 0	127/138/ 0
Water skiing	107.5	111/112/ 0	121/122/ 0	131/132/ 0	141/144/ 0	148/152/ 0
Outdoor pool swimming	221.0	137/135/ 2	169/166/ 3	205/200/ 5	242/237/ 5	269/267/ 2
Snow and ice						
Cross-country skiing	9.7	147/125/22	177/136/41	199/142/57	212/141/71	195/126/69
Downhill skiing	64.3	153/159/ 0	197/208/ 0	247/261/ 0	298/317/ 0	333/359/ 0

[1]*D is the maximum preferred demand; S is the expected supply; and G is the percentage difference (gap) between demand and supply. D, S, and G are all expressed as percentages of the 1987 base number of trips. In the projection base year of 1987, demand is assumed to equal supply with zero gap, that is, demand and supply are in equilibrium.*

gaps are presented also in terms of absolute numbers of trips in table 18.[8]

Zeroes in tables 17 and 18 indicate that no gaps are predicted. The implication of a "no gap" situation is that past trends extended into the future will increase recreational facilities and resources at rates sufficient to permit Americans to take as many recreational trips as they prefer at the 1987 level of trip costs. Projected gaps are graphically illustrated for selected activities in figures 41 through 46.

Implications of Alternative Rates of Recreational Opportunity Growth

Continuation of Recent Trends

Even without study, a person could accurately surmise that the future promises a mixture of increasing and decreasing recreational opportunities. But, generalizations cannot so accurately predict which activities will gain and which will lose opportunities. By considering the extension of recent trends, we can identify specific opportunity shifts. For example, continuing the trends indicates losses of remote, roadless and roaded forest and of farm and range areas available for recreation. Developed recreation sites will continue to increase. These increases or decreases will affect the expected future supply of outdoor recreation opportunities differently. Where the predicted effects are significant, the shortages between demand and supply have implications for future resource management and research.

Shortages are predicted for the three most basic categories of resources. As a possible implication for policy, the most serious is the expected shortfall in opportunities for warm-season trips to both roadless and roaded undeveloped areas (fig. 47). Shortages of land-based recreational opportunities are predicted to occur most dramatically for roaded, partially developed opportunities. These places provide opportunities for activi-

[8]*While data in tables 17 and 18 should be read with caution (it is perhaps unrealistic, for example, to assume that the pace of development of down-hill ski facilities will continue long into the future), this analysis does help identify potential supply shortfalls warranting attention.*

Table 18.—Projected gaps between preferred demand and expected supply of outdoor recreational trips away from home.

Resource category and activity	Difference between demand and supply in millions of trips (and percentage)				
	2000	2010	2020	2030	2040
Land					
Wildlife observation and photography	6.3 (9)	12.5(18)	18.1(26)	25.0(36)	30.6(44)
Camping in primitive campgrounds	2.3 (6)	3.0 (8)	6.9(18)	9.1(24)	11.4(30)
Backpacking	2.6(10)	5.2(20)	8.1(31)	11.7(45)	14.8(57)
Nature study	4.2 (6)	8.5(12)	12.0(17)	17.0(24)	21.2(30)
Horseback riding	5.7 (9)	14.6(16)	22.8(25)	30.1(33)	37.4(41)
Day hiking	7.3 (8)	15.5(17)	27.4(30)	42.0(46)	58.4(64)
Photography	3.4 (8)	6.3(15)	10.1(24)	14.3(34)	18.5(44)
Visiting prehistoric sites	1.0 (6)	2.0(12)	3.2(19)	5.0(30)	7.0(42)
Collecting berries, seashells, mushrooms, etc.	0.6 (3)	1.1 (6)	2.1(11)	3.2(17)	4.4(23)
Collecting firewood	0.9 (3)	1.8 (6)	2.4 (8)	3.9(13)	5.2(17)
Walking for pleasure	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Running/jogging	1.7 (2)	2.5 (3)	4.2 (5)	4.2 (5)	1.7 (2)
Bicycle riding	1.1 (1)	2.3 (2)	3.4 (3)	5.7 (5)	4.6 (4)
Driving off-road	0.8 (1)	2.4 (3)	4.8 (6)	5.6 (7)	7.2 (9)
Visiting museums and information centers	0 (0)	0.2 (2)	0.1 (1)	0.2 (2)	0.1 (1)
Attending special events	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Visiting historic sites	3.6 (5)	7.3(10)	12.4(17)	18.3(25)	27.0(37)
Driving for pleasure	21.1 (5)	33.7 (8)	54.8(13)	75.9(18)	92.8(22)
Family gatherings	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Sightseeing	11.7 (4)	23.4 (8)	35.1(12)	55.6(19)	79.0(27)
Picnicking	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Camping in developed campgrounds	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Water					
Canoeing/kayaking	0 (0)	0 (0)	0.8 (2)	1.6 (4)	2.4 (6)
Stream/lake/ocean swimming	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Rafting/tubing	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Rowing/paddling/other boating	1.2 (2)	2.5 (4)	3.7 (6)	4.9 (8)	5.6 (9)
Motorboating	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Water skiing	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Outdoor pool swimming	4.4 (2)	6.6 (3)	11.1 (5)	11.1 (5)	4.4 (2)
Snow And Ice					
Cross-country skiing	2.1(22)	4.0(41)	5.5(57)	6.9(71)	6.7(69)
Downhill skiing	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

ties such as day hiking, nature study, horseback riding, and sightseeing. These are also the places where most types of hunting and most other general forms of land-based dispersed recreation occur. In particular, private forest and range lands near populated areas, as well as "close-in" public lands, represent both a reason for possible future shortages and an opportunity to meet demand growth. Providing adequate future opportunities for wildlife observation, day hiking, photography, driving for pleasure, sightseeing, and similar activities would most directly address predicted national supply shortages for about 75% of outdoor recreation.

The availability of developed recreation sites responds more readily to market signals than other types of long-term opportunities. Thus, planned long-run rate increases may be unnecessary; the market may attract sufficient investments to increase the number of sites.

Demand for water and snow and ice recreation typically has grown at faster rates than land-based recreation and has tended to receive much more policy and planning attention. But the magnitude of projected trip opportunity gaps for land-based recreation is much larger than water or snow and ice opportunity gaps. For example, even though the gap for developed land-based recreation is small relative to that for dispersed land recreation, the projected shortage of developed land trip opportunities still is approximately four times that projected for water and snow and ice opportunities combined.

If recent trends in availability of facilities and resources continue, a relatively small shortage should influence water recreational opportunities. Mostly, such shortages will affect opportunities for nonmotorized lake and river activities and for outdoor pool swimming. Snow- and ice-based recreational opportunity shortages should be greatest among dispersed activities such as cross-country skiing.

One major implication of these findings seems to be that prompt attention is needed to research and develop incentives regarding public access to private lands. Continuation of closure and leasing trends could have serious negative consequences. The effects of these trends are certainly being felt now. Another implication is that more access and information about available public land near urban centers are needed. The most visible need does not seem to be for development of public lands but for access, trails, and information.

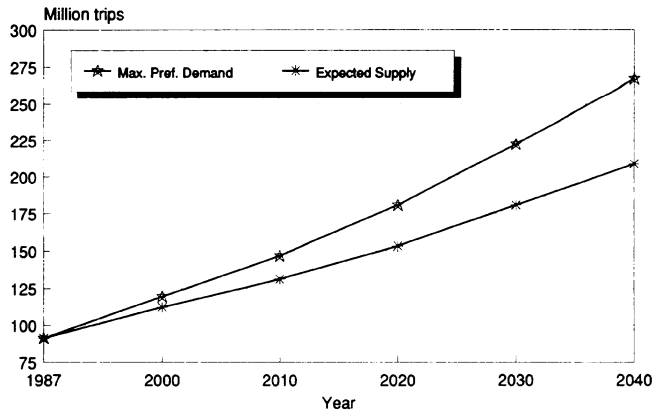


Figure 41.—Projected gap between maximum preferred demand and expected supply for day hiking.

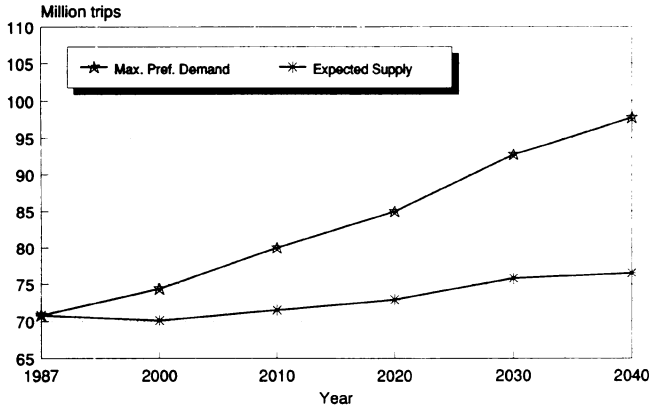


Figure 42.—Projected gap between maximum preferred demand and expected supply for nature study.

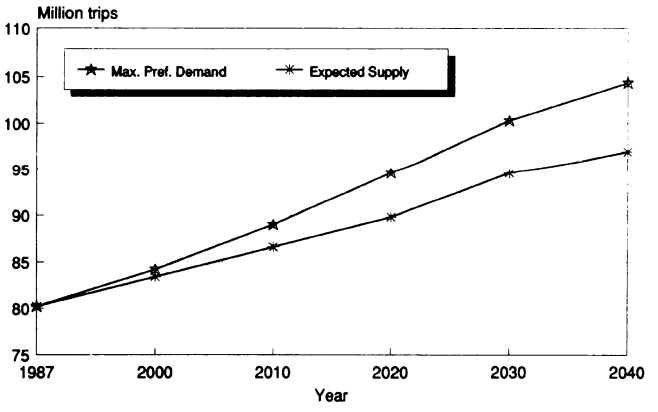


Figure 43.—Projected gap between maximum preferred demand and expected supply for off-road driving.

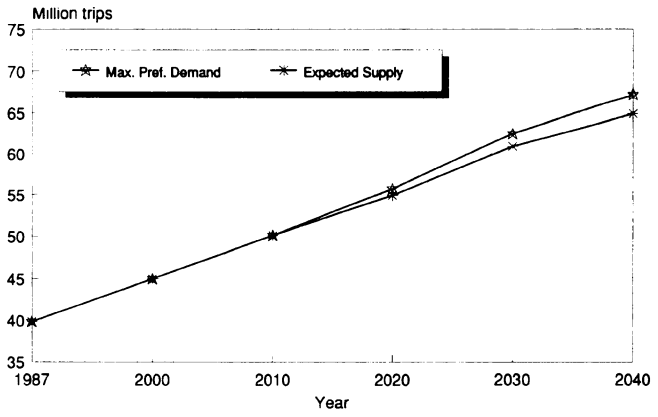


Figure 44.—Projected gap between maximum preferred demand and expected supply for canoeing and kayaking.

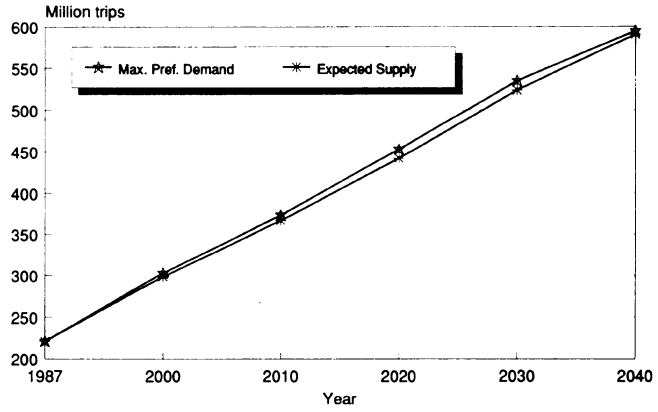


Figure 45.—Projected gap between maximum preferred demand and expected supply for outdoor pool swimming.

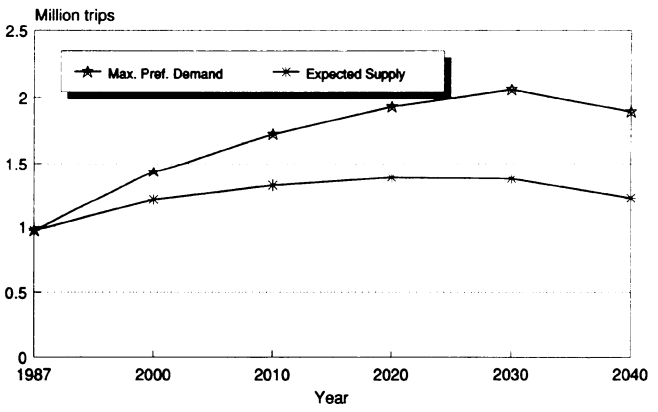


Figure 46.—Projected gap between maximum preferred demand and expected supply for cross-country skiing.

Assumption of No Growth in Available Federal Facilities and Resources

The gaps between preferred demand and expected supply of trip opportunities discussed in the preceding section are conditional upon federal recreational facilities and resources increasing or decreasing in the future at the same rates as recent trends. A different gap situation would occur if the availability of all facilities and resources, except federal, were to change in the future at the same rates as recent trends. With availability of federal facilities and resources held at current levels, the gap between preferred demand and expected supply would widen considerably for primitive camping. Gaps would widen slightly for collecting berries, seashells, and mushrooms, collecting firewood, driving off-road, driving for pleasure, sightseeing, and visiting historic and prehistoric sites. Gaps would also widen slightly for canoeing or kayaking, and rafting after the year 2020. Downhill skiing would have a relatively large gap because such a large percentage of the opportunity has been developed on national forests.

For many other activities, however, gaps would be reduced if federal facilities and resources were to be held constant, since some recent trends actually show declines in resources and facilities. Holding facilities and resources at current levels implies a gain compared to continuation of recent trends. Holding resources and facilities at current levels also implies increased investments beyond those currently planned. For example, the gap between preferred demand and expected supply for cross-country skiing would be eliminated by maintaining existing levels of opportunities because there would be no competing uses, road closures, or development to decrease the cross-country skiing opportunity base. Gaps would also move toward elimination by a moderate amount for the land-based activities of backpacking, and wildlife observation and photography. Gaps would begin to close slightly for day hiking, horseback riding, and nature study.

Resource Availability Growth Rates Needed to Satisfy Preferred Demand

Of potential interest in planning future resource management and policy are the growth rates for recreational facilities and resources that would be needed to satisfy projected future preferred demand. A high rate[9] of recreational facility and resource growth, about 1% per year, would be needed to satisfy maximum preferred demand for day hiking, bicycling, running and jogging, driving off-road, driving for pleasure, sightseeing, visiting museums, and visiting historic and prehistoric sites, as well as downhill skiing.

A medium rate[10] of recreational facility and resource growth, about 0.5% per year, would be needed to satisfy

[9] *A high rate of recreational facility and resource growth is defined as growth approximately equal to the expected growth rate of population 12 years and older to 2040: slightly less than 1% annually, or a total growth of about 43% by 2040.*

[10] *A medium rate of public recreational facility and resource growth is approximately one-half of the expected population growth rate: about 0.5% annually, or a total growth of about 22%.*

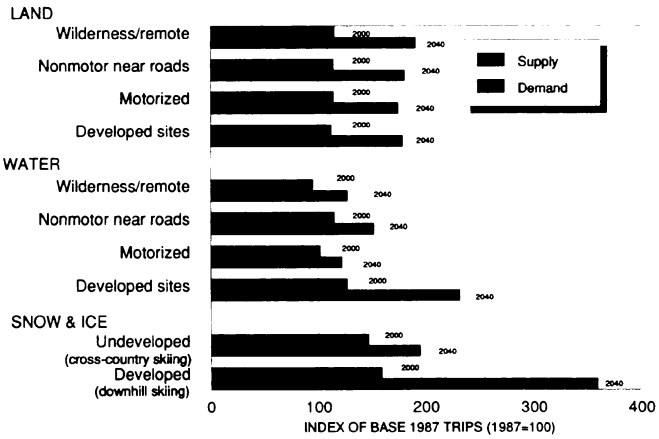


Figure 47.—Projected indexes of outdoor recreation demand, supply, and shortages by category, 2000 and 2040.

preferred demand for developed and primitive camping, backpacking, picnicking, family gatherings, walking for pleasure, collecting firewood, collecting berries, seashells, and mushrooms, horseback riding, and photography plus canoeing or kayaking, water skiing, rowing/paddling/other boating, sailing, and lake, river, or ocean swimming, as well as cross-country skiing.

Maximum preferred demand for nature study and wildlife observation and photography can be satisfied with a 0.25% growth of recreational facilities and resources per year. A low growth rate[11] of recreational facility and resource will also satisfy maximum preferred demand for motorboating and rafting.

Wilderness

Demand and Supply Outlook

Assessment of "demand" for wilderness is a difficult task since it involves many possible uses, some of which do not easily lend themselves to traditional measures. Public use of and benefits from wilderness occur both on- and off-site. That is, visitors may travel to a wilderness area for on-site recreation activities such as backpacking or fishing. They may also travel to wilderness for on-site uses such as research, human development, or for spiritual purposes. All these uses involve a physical presence of the user at the wilderness area.

Alternatively, some forms of wilderness use do not require an on-site visit yet benefits are derived as surely as the recreational backpacker or those seeking a spiritual experience derive benefits. These benefits include simply knowing that wilderness exists and that it will be available for future generations. Off-site benefits may also be derived by assigning an intrinsic value to wilderness—wilderness for wilderness' sake. All Americans, knowingly or unknowingly, derive value from wilderness because it helps to preserve our environment, whether it is protecting the diversity of plant and

[11] *A low rate of public recreational facility and resource growth is defined as approximately equal to one-fourth of the population growth rate: slightly less than 0.25% annually, or a total growth of about 11%.*

animal life or maintaining clean air and water. Research and monitoring conducted in wilderness improve land management and quality of life.

The growth rate in on-site recreational use of wilderness has apparently leveled off over recent years following several decades of very rapid growth. Whether this recent trend will continue is unclear, but it is probably tied to a changing national demographic profile. Though less measurable at this time, the on-site use of wilderness for certain nonrecreational purposes may not follow strict demographic trends. And, other off-site uses of wilderness, particularly those that support the quality of the environment in which we live, will likely never diminish.

Assessment of the "supply" of wilderness is also challenging since the act of designating wilderness acreage does not necessarily translate into the production of wilderness experiences. Wilderness character is often quite fragile and may be threatened from overuse, especially recreational use within an area but also from sources outside an area. Further, because of the many purposes of wilderness, not all areas within the National Wilderness Preservation System (NWPS), nor every acre of any single wilderness area, are available for all uses. Recent legislation has begun to more specifically stipulate some of the more important uses for new wilderness areas.

Because the NWPS is composed of federal lands only, wilderness areas are not uniformly distributed throughout the nation. Unlike local and state parks, wilderness areas exist where available undisturbed lands are, and they cannot be flexibly located to meet the recreational or environmental needs of any certain local population. Most designated wilderness is located west of the Rocky Mountains, predominantly in Alaska. As a result, for much of the nation's population, using a wilderness area for recreation takes much more travel time and money than would be required to use state or local recreational areas. Also, the ability to preserve ecosystems, clear air, and clean water favors the western half of the nation.

Additional acreage has been identified with the potential to become designated wilderness, most of it located in western states and Alaska. Some of these potential wilderness areas would add to or strengthen the diversity of the ecosystems represented in the NWPS, particularly warm and cold desert ecotypes. However, because they are not federal lands, other ecotypes, such as prairie grasslands, are not well represented now and may never be.

General Observations Concerning Projected Demand and Supply Imbalances

What are the policy implications if recent trends of resource and facility availability continue into future years? And, what are the management implications of the imbalances that may result between what people would **prefer** to do and what they are **able** to do? Lastly, what are similar policy implications for wilderness management? A continuation of recent trends implies commitments to current policies and current levels of public spending for outdoor recreation. The gaps between future demand and supply may widen considerably for some activities without a change of budgets and spending. In some cases, federal and state spending levels have been decreasing. For other activities, future demand/supply gaps are more likely to be negligible to modest. Whatever the impact, however, continued substantial public sector spending will be necessary if recreation and wilderness opportunity trends are to continue.

Deviating from past trends can involve even more changes in public budgets and private investments. Without deviating from past public sector trends, it is highly likely that some undesirable consequences will occur and benefits may be foregone. But, even a small change to address projected gaps may mean many millions of additional dollars. The alternative future facility and resource growth scenarios presented above indicate various federal supply alternatives from minor decreases to an over 40% increase through 2040. Even a decision to maintain all facilities and resources at their current quantity and quality would result in a major shift away from some of the decreases in facilities and resources experienced since the 1970's.

If projections for natural resource-based outdoor recreation are indicative of the future, national forests, especially in the East, along with other public and private lands, must be managed more intensively for dispersed recreation. Primitive camping and backpacking, hiking and horseback riding, nature study, and wildlife observation are all projected to experience large shortages, particularly in the East. An increase in public awareness of recreational opportunities, improvement in roads and trails, an increase in interpretive and educational programs, management to reduce hazards and improve safety, and protection of natural, historical, and prehistoric sites and features will all be needed. These management objectives are manpower intensive and will require extensive education and training. If demand grows as projected, identification of heretofore unused sites and areas and perhaps purchasing additional acreage will also become necessary. Partnerships with other public and private entities will be essential. These objectives will require careful budget examination, and large increases may be needed to eliminate gaps. A much larger effort would be needed in land resource management and protection relative to water or snow and ice resources.

Along with resource allocation and management objectives, associated social, economic, and environmental implications will remain important. For example, providing opportunities near urban areas meets the majority of the American population's demand. If urbanization and migration patterns continue, more than three out of every four Americans will continue to reside in urban areas in the future. Most will be born and reared in a city and will have little knowledge of or sensitivity to natural environments. Without a public effort to increase outdoor recreation and wilderness awareness and supply in urban areas, the level of urban population interest in a number of outdoor activities may decline.

In contrast, however, demand for other forms of outdoor recreation may increase substantially as urban residents seek an "escape" or diversion from the pressures of urban life. Models and projections typically do not adequately account for such "preference" changes. Blacks participate far less than whites in a number of outdoor activities and tend to use state and federal lands for day use more often than other ethnic groups (Hartmann and Overdevest in press). Because blacks are more concentrated in central cities, they have a much lower effective supply of opportunities available to them.

Also, though opportunities will be available on private land to help satisfy projected gaps, landowners are likely to charge a fee for use and to post their land against certain (or all) activities. Thus, opportunities will be particularly limited for low-income people who may not be able to pay for private lands use.

The elderly may face even more severe shortages of preferred activities, including nature study, photography, walking, and other low-cost, less strenuous activities. This situation may challenge resource managers to provide recreation opportunities for the elderly. Disabled populations also often experience difficulties in using many sites.

The projections presented in this chapter are based on assumptions about the future and build from emerging trends. A trend discussed in chapter II showed that people are now taking more frequent but shorter trips for almost all activities. Thus, growth of trip demand is up and continuing to grow; but, this growth has a crucial relationship to availability of opportunities. Research has clearly demonstrated this dependence as has the modeling done for this Assessment. When viewed from this context, future consumption will not only depend on the value of time, preferences, income, and other factors but also on availability of opportunities, which mainly determines household trip costs. A recreation trip is widely considered the appropriate consumer unit in outdoor recreation. Therefore, future trip consumption is dependent on both demand-side and supply-side changes, including both provider and consumer technology. Several previous studies of outdoor recreation have based their conclusions mainly on demand-side changes. This approach leaves out the important effects that altering quantities of opportunities can have. As a nation, we have choices. One choice is to have either more or less outdoor recreational and wilderness opportunities. This Assessment provides some tools and results to indicate that choices made about future availabilities of opportunities can have important consequences.

One of the more important recreation demand-side trends concerns the value of time, which may not be adequately accounted for here. Leisure (nonwork, unobligated time) has declined 37% in the last 15 years while the marginal value of time has risen. Meanwhile, recreation, as a proportion of leisure, has increased since the early 1970's. The interpretation of this, in a period of rapidly increasing value of time, is that individual recreation demand, in general, is strongly inelastic. Also, in the future, older people will recreate more than older Americans in past decades because recreation will have been a more prominent part of their younger lives. The aggregate demand picture is somewhat different than a per capita or individual demand picture; and, certainly, demand growth is highly variable among activities. All of these emerging trends will need to be monitored carefully. As we learn more, adjustments in predictions and policies should follow.

Traditional quantitative trend analysis of the wilderness supply provides little insight into the future availability of wilderness or the degree to which it will meet national demands for wilderness outputs. Such changes are politically determined and depend upon Congress for allocation and federal agencies for management after designation.

Assuming that Congress continues to periodically add wilderness acreage on a state-by-state basis throughout the next decade, the recreational supply of wilderness, in general, may be adequate in terms of a national per capita acreage. However, the resulting distribution of the wilderness will require more time and energy by Americans to gain access to it, particularly among those living in the East. Even if lands now owned or controlled by agencies such as the Bureau of Indian Affairs or the Department of Defense were to become eligible for wilderness status, they, too, are nearly all within the western United States.

Without more specific legislative direction to (and policies from) federal agencies, many nonrecreational opportunities may continue to be underutilized or even compromised due to inherent conflicts among wilderness uses.

Without a plan to build the NWPS with specific objectives for ecosystem representation, some of the few remaining examples of unrepresented ecotypes may be lost. Both the supply and demand for recreation and wilderness are shifting as a result of changing demographic patterns. There are, however, no overall trends regarding anticipated gaps. What can be stressed is the need for accurate monitoring of changes, all the while trying to improve measurement to address discrepancies between demand and supply. In the case of wilderness, it is especially important to develop better measurement concepts to account for values, such as biodiversity, which are difficult to quantify.

CHAPTER V: SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPLICATIONS OF DEMAND-SUPPLY COMPARISONS

Introduction

The human ecology paradigm (Hawley 1950, Micklin and Choldin 1984, Park 1915, Theodorson 1961) provides the framework for this chapter's examination of the social, economic, and environmental implications of the findings and predictions presented thus far. The human ecology paradigm relates populations to their changing environments. As used here, it points to the consequences of continuing or changing trends in recreation and wilderness opportunities and resources. Interdependence among the paradigm's three major components, the human population (social), production and distribution (economic), and the natural (environmental), is examined. Demand and supply trends are also considered in order to identify implications for forest and range resources planning, management, policy, and research.

This chapter builds upon and adds dimension to the previous four chapters which describe current and projected demand for and supply of outdoor recreation and wilderness opportunities in the United States. Demand and supply is influenced by social, market, and governmental actions. In chapter III, "expected supply" was projected as the most likely outcome of the recent trends in availabilities of recreation and wilderness opportunities. In light of this possible future, this chapter addresses three specific objectives:

1. Identify social, economic, and environmental implications to today's society of the current availabilities and distributions of recreation and wilderness opportunities;
2. Assess the implications of trip and visitation growth that would likely result if recent trends in availabilities of opportunities are allowed to continue; and
3. Describe social, economic, and environmental changes that would likely occur if sufficient outdoor recreational opportunities were provided to eliminate gaps between the amount the American population would like to consume and the amount they could consume if recent trends continue.

One section each is focused on primary social, economic, and environmental factors or concerns which are likely to be affected by future recreation demand and supply changes. Possible gains or losses to society represented by these changes are discussed. Implications of the supply and demand for wilderness are also presented.

Situation Summary

Americans will continue to pursue their individual outdoor recreation interests into the next century. Some activities will gain popularity and others will lose; trend analysis helps identify which direction given activities will go. If the present trends in declining public land acquisition and private land closures continue, they will exacerbate an already disparate situation of accessibility. Not all segments of the American population have equal access to outdoor recreation opportunities. Geographic distribution of people and resources, income levels, usable leisure time, and other factors all prevent equal access, both individually and collectively. Crowding, already common in the East, can be expected to worsen unless more opportunities for outdoor recreation are provided at a pace that matches the growth in demand. If current trends continue, enough outdoor recreation opportunities will be developed to prevent shortages in supply for some activities but not all.

Social Implications: Changes, Imbalances, and Benefits

Outdoor recreation typically involves people interacting with each other and with a natural setting. Some segments of the population use natural resources for recreation at higher rates and in different ways than others do. This section examines emerging social trends in recreation contexts, the imbalances of opportunities that exist among various societal groups, and social benefits accrued through participation in recreation.

Major Social Trends and the Role of Recreation

Demographic trends point to intensifying stress on U.S. society. These trends include greater numbers of immigrants to be assimilated into society, more single-parent families and female-headed households, more families below the poverty level, and an aging population. Participation in outdoor recreation and wilderness activities may help ease social tensions resulting from these demographic trends. Failure to provide outdoor recreation opportunities could allow more stress to affect individuals, families, and society. These trends also add support to the assertion that outdoor recreation opportunities at the urban and local level are likely to be even more important in the future. Immigrants usually settle in cities, and those who are single-parent families and poor are likely to have more difficulty traveling long distances to seek recreation opportunities.

Godbey (1986) summarized eight major societal trends that are expected to affect recreation and leisure behavior. They are: (1) greater generational heterogeneity; (2) aging baby boom generation; (3) changing household composition; (4) increasing elderly population; (5) decreasing leisure time; (6) increasing economic restraint; (7) changing female work roles; and (8) increasing institutionalization of leisure. O'Leary (1985) summarized six major social trends of the 1980's that are expected

to significantly impact the American population and recreation situations in the future: (1) increased political conflict; (2) increased technological advances and innovations; (3) increased "experience erosion"; (4) increased depreciative behavior; (5) changing leisure activity patterns; and (6) increased social displacement. Cordell et al. (1989) identified other major trends including (1) shifting political power; (2) increasing self determination; (3) increasing value of time; (4) rapidly changing racial and ethnic mix; (5) new population shifts; (6) reduced attachment to the "land"; and (7) increasing regionalization.

These societal trends are sure to influence public recreational patterns and will likely shift the relative importance of recreation in American lifestyles. Trends away from the traditional family structure to more dual-income as well as single-parent households, and the overall decline in leisure, indicate that short, close-to-home trips will increasingly displace the extended vacation as a leisure norm. The combination of an aging population, advances in technology, and an emphasis on health and fitness indicate the potentially increasing importance of recreation activities to the elderly and the disabled. The apparent declining importance of the traditional family structure may indicate increasing importance of other aspects of life. Decisions concerning when, or whether, to have children and the increasing importance of careers also influence recreation patterns. Technological innovations indicate that a greater variety of recreation opportunities will be available generating new market segments, more diverse management challenges, and potentially increased conflicts among resource users. As litigation becomes more common throughout society, so too will the increase in the recreation setting. A proliferation of lawsuits has already begun and has caused some recreation areas to close or withdraw services for fear of litigation.

Such social trends, linked to recreation trends, indicate that the mix of popular recreational activities will likely become more diverse, with increasing importance attached to those activities which are popular with the elderly and those which can be consumed with small investments of increasingly scarce time. Those recreation areas close to large population centers also will be proportionately more heavily impacted.

Uneven Availability of Recreational Opportunities

American society is not homogeneous. It is made up of many different groups, reflecting various mixes of social factors and values. One individual can belong to many groups. Recreational opportunities and participation vary across these groups. The most important factors defining social groups, as related to recreational opportunities and participation, are age, sex, education, race/ethnicity, income, and rural/urban residence. Each of these factors and their relationship to recreational opportunities and participation will be discussed below. For analysis purposes in these discussions, representative "communities" across the United States with different social characteristics were defined to allow comparisons of the available local recreational opportunities. The intent of this analysis is to identify existing unevenness of availability across social groups.

Age.—Age is an important stratifying variable in American society (Neugarten and Hagestad 1976). Findings from the Public Area Recreation Visitor Study (PARVS) presented in chapter II illustrate how participation in outdoor recreation varies by age. Young people who commonly participate in more strenuous activities shift to less strenuous activities with advancing age. In later years, participation rates drop to very low levels and sometimes cease altogether. Water skiing, sledding, and other winter outdoor recreation can be considered primarily a young person's activity, while nature study, photography, walking, and other less strenuous activities are more common, but not unique to, the elderly. Approximately 11% of all Americans were over 65 in 1982; however, a projected 19% of the total population will be elderly by the year 2025 (Bureau of the Census 1983).

Comparing the age characteristics of U.S. communities with the effective amount and location of recreation opportunities (see chapter III) available to those communities produced some interesting and important results. Those communities with higher percentages of people under age 5 had significantly higher effective supply indices for most types of recreation opportunities. Other differences in effective opportunities also existed depending on the general age distribution among communities. This finding may indicate that families with young children have a propensity to live in areas with more nearby outdoor recreation opportunities.

In general, population age differences among the identified communities had little relation to differences in participation in outdoor recreation. This suggests a higher importance of age-related physical barriers as opposed to age-related differences in availability of opportunities. The incidence of barriers as a deterrent to recreation participation is becoming better recognized as more research results become known.

Gender.—Males and females differed in total rates of participation and in types of activities. The participation rates of males in activities such as driving off-road vehicles, backpacking, primitive camping, canoeing or kayaking, water skiing, and especially all forms of hunting were much higher than those of females. Females, on the other hand, more often engaged in horseback riding, walking for pleasure, sightseeing, and picnicking. A comparison of male and female differences in participation between the 1982–83 National Recreation Survey and the 1985–87 PARVS suggests that these gender differences have remained relatively stable during the 1980's.

Comparing communities with different gender ratios showed women had fewer recreation opportunities than did men for most land classifications and even more so across snow- and ice-based categories. Using a similar comparison for recreation participation, participation differences were found depending on the type of activity. Gender differentiation appears to manifest itself in

both outdoor recreation participation and available opportunities. Some of these differences in opportunities between male and female may be important.

Education.—Education is one of the primary determinants of "life changes" in society (Weber 1956). Educational differences in recreation participation have been illustrated earlier in the findings of this Assessment. Backpacking, nature study and photography, camping in primitive campgrounds, walking for pleasure, sightseeing, picnicking, and canoeing and kayaking were among the activities associated with higher educational levels. Also, changes in participation by various educational levels seemed to have occurred over time.

The analysis also compared available effective recreation opportunity among communities with different overall educational attainment. Results varied depending on the characteristics of the recreation resource considered. For all land recreation opportunities, and most water opportunities, communities with more than 55% of their adults being high school graduates had much higher effective opportunity index values than did communities where less than 55% of the adults were high school graduates. Opportunities for snow- and ice-based recreation was much higher in those communities with high percentages of high school graduates and college-educated individuals.

For 10 out of 12 types of recreational opportunities, the supply per capita was greatest among communities with higher education levels. The exceptions were for developed water recreation opportunities for which supply availability was not significantly different across education levels, and nonmotorized water opportunities for which communities with the lowest levels of education, had the greatest effective supply per capita.

Race and ethnicity.—Race and ethnic groups differed in outdoor recreation opportunity and participation. Analysis of the effective availability of recreation opportunities compared to racial distribution showed significant differences. For example, communities with higher Hispanic populations showed high effective supply for almost all types of recreation opportunities. Communities with greater than 90% white population also showed high opportunity index values but for only half the recreation land types considered. In contrast, communities with a proportionately high black population showed low opportunity indices. This finding has greatest implications for considering equity in the distribution of opportunities for black populations, currently the largest racial/ethnic minority group in the United States.

In almost every outdoor recreation activity, the total percentage of whites participating one or more times annually exceeded that of all considered minorities. Blacks have continued to be very underrepresented in backpacking, horseback riding, driving off-road, primitive camping, developed camping, canoeing, water skiing, sailing, and all snow- and ice-based activities. Black underrepresentation in these activities appears to have been relatively stable in recent history. Communities with high percentages of whites had significantly higher participation indices for remote water activities and for all snow- and ice-based activities. But, these same communities had low participation indices for developed land and developed water activities. This finding was reversed for communities with high percentages of blacks.

The above information suggests a need to address the issue of low minority participation. Underrepresentation by minorities may have negative implications for race and ethnic assimilation into the larger American society. Clearly, inadequate availability of opportunities may cause low participation; but, other factors such as income, education, culture, or social differences may contribute. This complex question is becoming increasingly important as the social and ethnic mix within and among communities changes and as efforts continue for improving equal opportunities for all of society.

Income level.—One of the most important determinants of lifestyle choice is income. Income also influences recreation (Noe 1974, Reissman 1954). The analyses for this Assessment indicated, for example, that the highest participation in backpacking existed among both the highest and lowest income groups. Participation rates in nature study, photography, walking for pleasure, sightseeing, canoeing, water skiing, sailing, cross-country skiing, and downhill skiing were higher among high-income levels.

Communities with more families below the poverty level had significantly lower participation in all snow- and ice-based activities. These same communities had significantly higher participation in motorized land-based recreation activities.

In this analysis, both the percent of families and the percent of individuals under the poverty level were examined. Overall, communities with more low-income residents had greater effective per capita supply of developed and partially developed land opportunities and more opportunities associated with remote rivers and lakes. Roaded land and nonmotorized water recreation opportunities were more available to low income communities, but snow and ice opportunities were less available. No significant differences were found for other opportunity classifications.

Urban or rural residence.—Previous research and this Assessment have shown that outdoor recreation participation varies between rural and urban communities. Rural communities have tended to participate more in hunting and off-road driving. Urban populations tend to participate more in sailing and cross-country and downhill skiing. These rural and urban differences have remained relatively stable over time. However, if increased population movement to rural communities and exurbs continues, these differences may become less pronounced. At present, the participation differences seem mostly due to differences in opportunities available between rural and urban populations.

Comparison of the effective recreational opportunity between these communities showed that urban dwellers had less recreation opportunity than did rural residents, particularly regarding roaded and partially developed lands, intensively developed sites, wild and remote rivers and lakes, and river segments near roads. The opportunities available to urban populations were, of

course, related to how much land and water resources suitable for outdoor recreation were still available.

If urbanization and immigration patterns persist, then at least three-fourths of the American population will reside in urban areas in the future. This may mean that this growing population of urban residents could put tremendous pressures on rural areas in their attempt to recreate away from home. It is unclear whether this pressure will extend to areas providing the most remote types of opportunities. But, for the most part, the strongly urban communities contain much greater proportions of elderly, Blacks, Hispanics, and other racial and ethnic minorities. These groups typically fall disproportionately into lower income brackets. In addition to lower incomes, urban communities have more youngsters, juveniles, single-parent families, female-headed households, dual-income families, and unemployed. Opportunities for these urban populations must be highly accessible in the form of urban parks and areas close to the city.

Effects on American Society

Researchers have found that individuals, groups, communities, regions, and the nation are affected to varying degrees by participation or nonparticipation in outdoor recreation (Burch 1965, 1969, 1986; Cheek and Burch 1976; Kaplan 1960). Though difficult to quantify, such effects are important. Among the potential benefits to individuals are improved physical and mental health, increased self-esteem, a sense of well-being, and spiritual growth. Participation in outdoor activities can increase family interaction and foster cohesion. Potential benefits to society include increased social solidarity, increased ethnic and cultural assimilation, decreased social deviance, and increased national pride. Most of these benefits can also be achieved in ways other than through outdoor recreation. While it is difficult to quantify a direct cause and effect relationship between outdoor activity and many of the identified social benefits, substantial evidence suggests that outdoor recreation is one of the better ways to improve the welfare of individuals and society (Ewert 1986, Kelly 1985). The reverse is also true, lack of opportunities may exacerbate needed improvements of welfare.

For some activities, considerable shortages of opportunities will occur. Based on the analyses done for this Assessment, these shortages are likely to affect some segments of society more than others. Those activities with the largest predicted shortages are, in order: sightseeing, day hiking, wildlife observation, photography, and pleasure driving. These activities are widely popular among all social groups and are particularly important to the elderly, the disabled, and less affluent members of society. If these shortages come to pass, as predicted, these and perhaps other segments of society will not experience the benefits that recreation participation offers.

The social effects of not having adequate opportunities may be most intensively and immediately felt at the local level. Ultimately, however, these effects will aggregate upward to regional and national levels. Generally, shortfalls in outdoor recreation opportunities will most severely affect residents of metropolitan areas where many socially and economically disadvantaged people live. The possible and sometimes likely effects of insufficient recreation opportunities on several important aspects of American society are discussed below.

Family stability.—Because outdoor recreation can provide opportunities for family interaction and bonding

Family gatherings and other social engagements are important benefits from outdoor recreation.

Society may benefit from improved racial and ethnic relations through recreation participation.

(Carlson 1979, Holman and Epperson 1984, Orthner 1978, Rapaport and Rapaport 1975, Scheuch 1960, Snyder and Spreitzer 1973), it carries the potential to improve family stability. Historically, the primary users of public parks have been families (Szwak 1988). To the extent that outdoor recreation opportunities are not as available to families in the future, family stress may increase.

Crime and juvenile delinquency.—Research has shown that outdoor recreation reduces social deviance such as juvenile delinquency and prison recidivism (Ewert 1986). Thus, inadequate outdoor recreational opportunities could result in greater crime and juvenile delinquency. On the other hand, outdoor recreation sometimes provides opportunities for crime and deviant social behavior such as vandalism, littering, arson, and theft.

Social bonding and conflict.—Outdoor recreation and wilderness experiences influence the level of social participation and social group bonding (Burch 1986). The importance of social participation for personal well-being is widely accepted among social science professionals. Suicide rates are higher without cohesive social units and when people do not participate or interact within various social settings (Durkheim 1897). However, conflict can occur in any social situation, and outdoor recreation and wilderness uses are not exceptions. Conflicts between motorized and nonmotorized wildland recreationists are a well-known example. Various other competing and conflicting uses of natural resources do and will create on-site conflicts. Overcrowding will continue to cause conflict at some sites, such as whitewater rivers, if greater opportunities are not provided.

Ethnic and cultural assimilation.—Results of this Assessment show clearly that differences in recreation patterns depend, in part, on race and ethnicity. A more equal distribution of recreation opportunities and encouragement of equal participation among all races may be one way to better promote better interracial understanding and to reduce social friction. Insufficient outdoor recreation opportunities for immigrants may inhibit cultural interaction and deter assimilation into society.

Economic Implications

Recreation is tied in several important ways to local, state, regional, and national economies. It also has very significant economic efficiency and welfare dimensions (Alward 1986, Driver et al. 1987, Peterson and Brown 1986, Stoll 1986, Walsh and Loomis 1986). Secondary economic benefits are realized through increased employment and personal incomes; investment in recreation facilities and services; tourist and provider spending; regional and local economic growth and redistribution; and increased revenue and costs to local, state, and federal government (Kelly 1985, Walsh 1986). From economic efficiency and resource allocation perspectives, outdoor recreation and wilderness are major competitors for the use of forest and range resources. They can also contribute substantially to national welfare.

In this section, the economic implications of consumption growth and of projected opportunities shortages are discussed. This discussion focuses on seven economic factors or potential effects: (1) private sector profits including income to landowners; (2) property values; (3) recreation-related revenues to the public sector; (4) general revenues and costs to local governments; (5) recreation management costs; (6) management for other forest and range resource uses; and (7) redistribution of economic activity. The following discussion assesses

potential effects for each economic factor by comparing trend continuation with generating more recreation opportunity. The magnitude of these effects depends on the market share held by various recreation types and on the projected most likely future change of these market shares from the 1987 base to the year 2040.

Profits to the Private Sector

Land-based recreation.—Major opportunities for private sector business expansion will occur, especially in providing developed recreation opportunities and associated services. The market share for developed recreation is large; moderate to rapid growth in demand is projected. Accelerating private investments beyond recent trends will generate little additional profit since shortfalls below the public's maximum preferred demand are not expected. Roaded and partially developed recreation opportunities also will offer some significant opportunities for private entrepreneurs, particularly in sales of bicycles, day hiking equipment, sports clothing and shoes, purchases associated with sightseeing, and hunting gear. Near-road backcountry recreation is about 10% of the outdoor recreation market. With greater investment than in the recent past, more rapid growth in equipment demand should occur for hiking, horseback riding, wildlife observation, nature study, photography, and related activities.

Because wilderness use represents only about 2% to 3% of the outdoor recreation market, the overall economic effect of an increase in designated wilderness should be relatively small. A moderate expansion of designated wilderness will increase economic opportunities for outfitters and guides. Opportunities for sales of backpacking equipment and clothing will continue, but a significant market could develop for information to facilitate wilderness use. The greatest opportunity seems to be for information about trails, natural areas, historic and prehistoric sites, and significant scenery.

Water-based recreation.—Water recreation opportunities will offer substantial private sector growth potential. Strong demand for access to and accommodations near water, including marinas, pool complexes, nonpool swimming areas, and other facilities, will continue. Club memberships, food and rental concessions, recreation residences, and equipment sales and rentals can generate substantial revenues. Sale or rental of motorboats, water skis, and a host of new motorized water equipment can create moderate potential for increased private opportunities on lakes and rivers with road access. Much of the revenue from remote site, nonmotorized water recreation is likely to come through guide and outfitting services and through raft and other equipment rentals. However, the percentage of outdoor recreation which occurs on remote river sites is only 6%, limiting its overall potential for economic growth. Investment growth at rates greater than recent trends would net only modest additional profits.

Snow and ice.—Though their current overall market share is less than 1%, winter sports present an excellent private sector economic opportunity. This is particularly true for downhill skiing because per person expenditures are typically quite large. A substantial increase, 259% by 2040, is projected for downhill skiing and should fuel this market. Lodges, resorts, rentals, food, ski lifts, and instructional services are highly marketable. Transportation from airports and metropolitan areas to winter sports locations will also create business opportunities. Because motorized winter recreation is

Increasing demands for some forms of outdoor recreation will create opportunities for private enterprise.

only 0.1% of the total recreation market, its overall economic effects will be minor. The market share of backcountry snow and ice recreation is less than 1%, and the small market and widespread availability of land and trails where climate is favorable limit private sector opportunities. The principal opportunities will occur in equipment sales and rentals and in sales of winter sports clothing, with some additional opportunities in outfitting. Acceleration of opportunities for cross-country skiing will increase private sector profits.

Income to landowners.—Income to landowners from fees and leases offers another opportunity for private sector profit. Increasing pressure on public lands for nonconsumptive uses and closure of some private lands will create financial opportunities for landowners who want to open their land to the public for daily, seasonal, or annual fees. Additional income will be gained by charging for some road and off-road uses. Landowners also will have opportunities to capitalize on the increased demand for campsites and semideveloped recreation. Owners of land near wilderness and backcountry areas may realize some economic benefits through use of their land as staging sites for guided and outfitted trips, for grazing pack animals, and as trailhead camps. Landowners along lakes and streams will also benefit by charging for camping and boat access. For snow and ice recreation, opportunities are more limited, although some landowners may be able to lease their land to snowmobile clubs and cross-country skiing enthusiasts.

Property Values

Values of developed properties and those lands with development potential near attractive public or private recreation areas should increase relative to other land values. Rising demands for recreation using partially developed and roaded public and private areas are likely to significantly offset decreases in the value of land for agriculture in selected areas. This could have a stabilizing influence on rural land prices. Properties which provide road or trail access to public or private recreation lands are likely to appreciate in value because recreation opportunities associated with these lands are attractive to second-home buyers. Historically, new housing units have sold at higher prices in areas where there are opportunities for backcountry recreation. Also, commercial and industrial lands located near outdoor recreation opportunities may increase in value because access to recreation is an important factor affecting some business location decisions. Increased demand for wilderness is likely to have a significant effect on nearby property values.

Revenues to the Public Sector

Land.—Developed land-based recreation sites offer the greatest immediate potential for increased revenue for public agencies. Demand for the use of developed sites is projected to rise steadily and users generally are willing to pay fees. Revenues from direct management of sites or through leasing of sites to private concessionaires could be significant and substantially defray some management costs. Next to developed sites, motorized and nonmotorized recreation in roaded and partially developed forest and park areas represent the greatest public sector revenue opportunities. Well designed fee structures (assuming authority to charge fees) will increase revenues for agencies at all levels, but especially federal and state. Charging fees for use of wilderness or nonwilderness remote areas would require a change in policy, and collection would be costly unless paid through an annual pass or use permit. However, revenues for wilderness or nonwilderness backcountry are not likely to cover management costs. If opportunities for both developed and dispersed land-based recreation were increased to the levels the public would prefer, over 70 million additional recreational trips would result by 2000, more than 400 million by 2040. If substantial fees were charged, these increases would not occur because imposing fees would result in decreased consumption. The amount of this decrease would depend upon the fee level and other factors.

Water.—Since many lakes and rivers used in association with privately developed recreation sites are publicly owned, substantial revenue potential exists. Motorized and developed-site water recreation is about 12% of the total recreation market and projected market growth is moderate to high. The greatest opportunities will come from permits to private facility operators and fees paid by individual boaters. Recreational facilities, including swimming pools, will be especially attractive; but, expansion at rates about equal to recent trends will be adequate.

Snow and ice.—Potential exists for major increases in revenue from permits for privately-operated, developed winter recreation sites on public land. Making more public land available at rates equal to recent trends for downhill ski areas, if operators could be charged fair market value for use of the public land, could produce significant revenues. Fees could be charged for use of public snowmobile and cross-country ski trails, but an expected low volume of participation and relatively small number of accessible sites limit these revenue possibilities. For wilderness or backcountry winter recreation, opportunities for charging fees are limited. Even with the high projected growth for backcountry winter recreation (more than 200% in 50 years), little added public revenues are likely. New, innovative, and publicly acceptable means for charging and collecting user fees may increase revenue possibilities for dispersed recreational activities.

Revenues and Costs to Local Government

Land.—Growth in land-based recreation will stimulate more spending by local government, but revenues from fees and taxes will also increase. Expected strong participation growth in day hiking, visiting historic and prehistoric sites, running, jogging, bicycling, picnick-

ing, and family gatherings will heavily pressure local government sites and facilities. But, for these activities, net revenue potentials will be limited by high development and maintenance costs. The development of permanent or second-home residences will broaden local property tax bases. However, for both developed-site recreation and home development, the costs to localities for roads, utilities, law enforcement, and health services will be substantial and may more than offset revenue increases in the short run. While wilderness and backcountry users spend about the same amount in local areas as do other kinds of users, they are far fewer in number and generate limited total revenues. However, they typically do not put extra service or road use demands on local governments so a modest net local tax gain may be realized. Expansion of opportunities at rates greater than recent trends for wildlife observation and nature study, horseback riding and day hiking, visiting historic sites, and family gatherings will encourage more rapid participation growth, but at relatively low costs.

Water.—Property taxes on water-related development will increase sharply while sales taxes generated from vacationers and second-home residents will be significant and should increase over time. On the other hand, local governments will be called upon to provide costly facilities and services. In the case of nonmotor water recreation, sales taxes by outfitters, guides, and equipment sales and rental firms will provide some small revenues. Installation of pools and other water facilities in local parks and recreation sites will be important for urban residents, but these facilities will be costly to maintain.

Snow and ice.—Even though snow and ice recreation is projected to increase significantly, local sales tax revenues will increase very little because overall local spending by participants is relatively low, except for downhill skiing. In those relatively few locations where developed winter sports sites exist or might be built, substantial sales and property tax revenues may develop. However, road maintenance, law enforcement, and service costs will likewise be significant. Nonmotorized, backcountry winter recreation typically has limited private business impact and will not be a source of local government revenues nor impose additional costs.

Recreation Management Costs

Land.—On public lands, overall costs of management will increase significantly. More services, law enforcement, and interpretive personnel will be needed to accommodate greater numbers of visitors and a variety of activities including trail use, river running, nature study, skiing, camping, visiting museums, and visiting historic and prehistoric sites. More intensive visitor management will be required to prevent conflicts among users, such as commercial and private boaters, hikers and horseback riders, motor and nonmotor users, and consumptive and nonconsumptive users. More management to minimize damage to fragile natural sites and to facilities will also be necessary as user numbers grow. Additional investment in facilities will be required, along with associated long-term maintenance, especially trails, historic site access, roads, and overnight and day-use developed sites.

Private landowners who make their land available to the public, whether for a price or free of charge, also will incur substantial costs for liability insurance, road and fence repairs, and posting signs.

Expanding opportunities for roaded, partially developed environments for hiking, bicycling, sightseeing, and most general forms of dispersed recreation will pose the most serious budgeting challenge. Expanding these opportunities at a high rate of about 1% per year would be necessary to prevent future shortages. Accounting for possible inflation, a budget growth of 5% to 7% per year may be needed.

Water.—A direct conflict often arises between motor and nonmotor recreationists on rivers and lakes. Meeting the need for visitor management in such cases, especially at the more accessible and popular areas, could be quite costly. The costs of operating developed water sites will increase some, but these should not be excessive. However, the cost of liability insurance will be significant.

Snow and ice.—The relatively small number of users and a trend toward placing responsibility for safety on the individual should help stabilize the costs of managing winter recreation. The need for avalanche control and other routine backcountry snow management will continue, of course. Some increased costs may occur because of demand for information on winter opportunities, less than optimum snow conditions, and safety measures. Public and private expansion of dispersed winter opportunities will be needed to prevent a projected shortage. The role of the private sector in providing dispersed winter opportunities may become relatively more important.

Management for Other Forest and Range Resource Uses

Just as timber harvesting or mining sometimes preclude or diminish the value of land for some forms of recreation, increased recreational use can affect commodity production. Expansion of the NWPS precludes timber harvesting and mining. Intensive recreational use also could preempt noncommodity uses of the land such as reservations for scientific study. In rural areas where second-home development is popular, the acquisition and dedication of land for recreational use will foreclose commercial and residential development. Recreational uses of private lands adjacent to public forests or grasslands sometimes preclude altering the landscapes of those lands by mining, timber harvesting, or controlled burning.

However, the extent to which recreation actually conflicts with commodity and noncommodity uses and values is directly related to the intensity of management to avoid conflicts. For example, reductions in timber production in one area of high recreation value might be offset by intensifying timber management on areas

of higher timber productivity and lower recreation potential.

Developed-site recreation typically does not involve extensive use of forest and range so conflicts with other uses are usually less obvious. Increased recreational use of reservoirs for which the main purposes are power generation, navigation, or flood control often results in pressure to maintain lake levels. This results in some decrease in power and flood control benefits.

Recreationists should encounter few conflicts between backcountry winter recreation and other uses. However, motorized winter recreation occurring off-road may adversely impact some resources; careless off-road vehicle use can damage tree plantations and interfere with wildlife. Concerns about maintaining a forested view at winter resorts may result in some loss of timber production.

Overall, the highest predicted growth of forest recreation participation by 2040 is indicated for backpacking (+98%), day hiking (+129%), visiting museums (+87%), visiting historic sites (+104%), family gathering (+102%), sightseeing (+85%), developed camping (+95%), rafting/tubing (+167%), and downhill skiing (+259%). These activities depend upon scenic and clean environments, linear access, and site protection (particularly critical for archaeological sites). Increasingly over time, the public area recreation visitor is going to be sensitive to commodity and extractive resource uses and will likely cause impacts on the degree of and methods by which these nonrecreational uses will be exercised. If predicted shortages are eliminated in the future, more area and resources will, thus, be impacted, particularly as they are affected by scenery protection and provision of linear access.

Redistribution of Economic Activity

Investments in outdoor recreation areas, facilities, and services can result in redistribution of economic opportunity from one sector of the economy to another, or from one region to another. Thus, in assessing economic costs and benefits, it is important to look at the distributive effects of satisfying recreation demands.

Land.—In terms of land resources, the greatest opportunity for expanding local economic activity lies in recreational pursuits involving extended stays such as those at ski resorts or campgrounds. Because opportunities are typically widely scattered, redistribution of economic activity is usually modest. Past economic growth patterns among retail, service, and manufacturing sectors have not been heavily impacted by outdoor recreation visitation and spending. More recent trends have shown greater development of private accommodations, food and other services, and transportation associated with recreation. Increasingly, states and local areas are looking to recreation and tourism as a means of stabilizing their economies.

An expansion of recreation opportunities to meet projected demand would result in an increase of more than 400 million recreational trips per year—most of them to rural areas. Local spending associated with these trips would likely exceed $8 billion per year, with an expected impact on total industrial production of between $10 billion and $12 billion. With farm and other rural incomes expected to continue to decline, recreation may offer a viable economic complement to agriculture, particularly if farmers can take advantage of increased opportunities to charge fees for recreational use of their land. Similarly, many of the areas suitable for potential expansion of nonmotorized recreation outside of wilderness are in areas where farming is a large component of local economies. A substantial increase in demand for this kind of recreation is projected, potentially resulting in greater long-term economic activity as service and retail sectors respond to demand. For wilderness and backcountry recreation, redistributional effects will be less because of their small market share, and most of the effects will occur in the West.

Water.—Retail sales, amusement, and recreation businesses tend to be more prevalent in areas with the greatest potential for expanding developed, water-based recreation opportunities. Thus, increasing demand will cause a moderate growth in business opportunities in these areas and lead to some business and income redistribution. Since retail service and recreation-related businesses are weak in areas where most of the potential for nonmotor, water recreation supply expansion exists, substantial redistribution of income and employment are not anticipated.

Snow and ice.—Numerous service, retail, and recreation enterprises already operate in those areas with the greatest potential for expansion of downhill ski areas and other developed winter recreation facilities. Thus, growth in developed winter sports should result in little, if any, redistribution of economic activity. Because of its low market share, backcountry winter recreation can produce little additional business activity in areas where these winter opportunities exist. Most winter recreation equipment, clothing, and other needs are purchased where people live, not where the activity takes place.

Environmental Implications of Increased Recreation Demand

Compared to more consumptive uses, such as timber harvesting, mining, and grazing, most outdoor recreation and wilderness uses have relatively low impact on natural systems. These uses also provide opportunities for people to reinforce their ties to the natural environment, and they provide opportunities to monitor the health of natural systems. Driver et al. (1987) have identified several benefits of outdoor recreation and wilderness uses, including an improved esthetic quality, greater environmental awareness, and stimulus to preserve natural systems. Outdoor recreation programs, for example, may help preserve areas of high scenic and ecological quality, historic areas, and sites especially valuable for scientific study and outdoor education. The addition of parks and open space in urban areas can significantly improve the quality of the environment in

populated areas. Moreover, participation in outdoor recreation creates support for efforts to preserve species diversity and to maintain water and air quality. It also fosters land stewardship (Driver et al. 1987, Rolston 1986).

On the other hand, some forms of outdoor recreation can adversely affect the natural environment (Clark 1986, Cole 1986, Rolston 1986, Stankey and Manning 1986, Williams and Jacob 1986). Sustained or repeated heavy use for certain activities can degrade land, water, air, scenic values, and fauna. Environmental impacts can occur across a variety of natural conditions, components of the natural environment (soil, water, vegetation), ecosystem types, spatial scales (site-specific, area-wide, system-wide, and national), and the ecological hierarchy of population, community, ecosystem, and landscape. Environmental interactions are complex. Typically, direct impacts are local, occur along trails and in and around campgrounds, and are limited in extent. However, when thousands of visitors congregate in an area, the effect can be quite large and significant. Indirect effects can sometimes extend throughout an entire watershed.

The designation of additional wilderness areas can provide general benefits to the environment by protecting areas from road development, timber harvest, and development that could lead to an array of adverse impacts. Additional wilderness areas are needed if one goal of the NWPS is to preserve as diverse an array of ecosystems as possible—particularly prairie grassland ecosystems. On the other hand, wilderness designation can attract increased visitation resulting in some degradation of the natural environment.

Some specific impacts of recreation likely to occur through increased participation are discussed below.

Esthetics and Alteration of the Natural Landscape

Increased recreational use may reduce esthetic quality because of construction, facilities, and site "hardening" to accommodate intensive recreational uses. Additionally, increased use pressures existing areas to exceed their carrying capacities. Although some efforts are being made to reduce the scale of development and to remove visually intrusive structures at some sites, some development will inevitably occur in order to provide the conveniences and health and safety protection that recreation visitors increasingly seek. The degree to which these effects reduce the quality of the recreational experience is a matter of individual preference and perception.

On the other hand, additional recreational use in high quality settings can raise the environmental consciousness among those involved. This heightened awareness can, in turn, result in demands for higher visual standards in and around recreation sites and facilities. This can ultimately lead to political action to influence or reverse esthetic degradation not only at the recreation site, but also in the communities where people live. Examples include ridgeline development laws enacted in mountain resort areas, billboard regulation along scenic byways, and litter control in suburbs.

Additions of recreational facilities and more efforts to preserve the resources necessary to prevent opportunity shortages can help protect the quality of rural landscapes and add to the inventory of forested landscapes. Increased management to help reduce opportunity shortages for activities such as backpacking, photography, nature study, wildlife observation, sightseeing, and day hiking can help improve overall landscape quality. Greater preservation of scenic, historic, and prehistoric areas will stimulate better protection of the visual resource. Designation of scenic byways, as recently enacted federal legislation would permit, may have very widespread positive benefits much beyond the immediate environs of the affected roadway.

Soil and Vegetation

Recreation has been linked to soil compaction and erosion (Ketchledge and Leonard 1970, Manning 1979, Weaver and Dale 1978). Generally, such impacts are localized and limited to strips along trails and around campgrounds. Compaction and erosion impacts are greatest in the early stages of use (Cole 1982, 1986). Thereafter, the negative impacts of additional use slow considerably (Stankey and Manning 1986).

Recreation's impact on vegetation follows the same pattern as for soil. That is, initial use can cause substantial vegetative decline after which additional use causes comparatively little added change. Trampling of sensitive plants may allow more resistant or undesirable species to become more abundant (Crowder 1983). Trampling can reduce the vigor and diversity of plant species. For both soils and vegetation, foot traffic has less impact per visit than either horses, bicycles, or motorized vehicles.

Activities with moderate to high levels of expected growth that can impact soils and vegetation include horseback riding, bicycle riding on trails, backpacking and hiking, and developed-site use. Though hiking and backpacking trips may increase in existing wilderness areas, the most severe impacts may already have occurred. However, horseback riding and increased use by outfitters who use saddle horses or pack animals can have some adverse consequences. Similarly, some portion of the expected increase in bicycle riding can be attributed to mountain bikes. The growing use of these machines can contribute to additional soil and vegetative damage. Continued trends of reduced budgets for trail maintenance, developed-site management and refurbishing, and enforcement personnel may allow negative recreational impacts to go uncorrected.

Whether localized ecosystems will be negatively affected by the projected moderate increases in activities, such as firewood and berry collecting, will likely depend on management philosophies. The foot and vehicular traffic inherent in these activities could possibly contribute to trampling and erosion.

Even though off-road vehicle (ORV) use is not projected to grow rapidly, the severe adverse impacts to both

Many forms of outdoor recreation have a substantial influence on the economic development of local areas.

vegetation and soils caused by ORV's make it an important activity to monitor. The degree to which increased ORV use will occur in ecologically fragile areas, such as sand dunes, will determine, in large part, the extent to which this recreational use may become problematic. Recent trends have been to close more areas to ORV uses. ORV user groups have responded with political pressures and educational programs for users.

If expanding trail systems to improve backpacking and day hiking means new construction in existing NWPS lands, additional vegetation and soil damage may occur. However, if this expansion is associated with protection of additional lands, or if it occurs through alteration of existing rights of way, such as railroad and utility corridors, the gains from protection may equal or outweigh losses from increased use.

Expanding road systems necessary to reduce shortages of opportunities for pleasure driving and sightseeing can have severe negative soil and vegetation impacts. Blacktopped corridors especially may have severe negative impacts on vegetation (Willard and Marr 1971). Also, unpaved roads are notorious as a source of sediment in streams, thus influencing stream vegetation (Irland 1985, White and West 1980).

Wildlife

In general, remote environments contain choice wildlife habitats characterized by the absence of man, noise, pollution, and other anthropogenic alterations. Other factors also determine the presence or absence of wildlife. For example, various species require minimum habitat sizes. The grizzly bear requires as much as 2,500 km^2 on which it roams for food (Seruheen 1986). The vegetational composition of an area and its geographical location also determine a wildlife species' presence, numbers, and health.

Maintaining the full spectrum of wildlife species is advocated by most ecologists. The loss of unaltered areas to development has caused some species to decline, becoming rare, endangered, or extinct. For example, the Colorado squawfish (*Ptychocheilus lucius*), once found throughout the Colorado River system, is now largely limited to portions of the upper basin in the states of Colorado and Utah. The species habitat has been fragmented by dams and altered by regulated streams (Haynes and Bennett 1986). Additional species face similar fates in threatened environments.

High density forms of recreation can create air, water, and noise pollution, and often garbage dumps (Boyle and Samson 1986). Wildlife often habituate to human presence so disturbances may be minor. Feeding of animals by recreationists usually creates unnaturally high densities of animals. This may amuse the person doing the feeding because he or she enjoys viewing and interacting with the animals. However, negative consequences can arise if animal populations become dependent on human instead of natural food sources. Animals which become too tolerant of people may damage private possessions or property and public facilities. Close contact between people and wildlife can also increase the incidence of animal-borne diseases such as plague and rabies. These problems often force health and wildlife authorities to destroy offending animals.

Outdoor recreation can affect wildlife populations through habitat alteration, disturbance, or direct mortality. Many reports of impact have been made, but the literature lacks quantitative assessments of long-term effects (Boyle and Samson 1986). Research on recreation's effect on wildlife sometimes presents contrasting conclusions based on the same observations.

The expected growth in backpacking and day hiking could negatively affect wildlife directly through losses of soil and vegetation, increased animal feeding and litter, especially plastics, and increased human presence.

Some positive effects may accrue indirectly. For example, a greater awareness of natural systems may stimulate greater public concern for wildlife.

Increases in developed camping and picnicking, and the garbage often generated as a by-product of human presence, can affect animals by increasing their dependence on that garbage for food and by eliminating their fear of humans. This latter consequence can be dangerous to humans where raccoons, bears, and alligators are involved. Long-term effects on animal populations are not well-known.

Increases in vehicular recreation can affect animals directly by increasing the likelihood of death by collision and indirectly by damaging food or breeding areas. Several motorized activities are predicted to grow moderately—pleasure driving, sightseeing, and motorboating. Off-road use is predicted to grow slowly although its effects on wildlife may be profound (Boyle and Samson 1986). More trips to forest sites for almost any activity can impact wildlife populations.

Water and Air Quality

Recreational development and activity can alter the amount of sediment in streams (Gosz 1982). One consequence of severe soil compaction is erosion into aquatic systems (Manning 1989). Transported sediment can carry heavy metals, nutrients, and organic compounds which can collectively or individually cause problems or worsen existing problems in aquatic systems (Burby et al. 1983). Nutrients can increase plant growth, thereby reducing dissolved oxygen. This produces an environment that favors plant over animal life. Increased sedimentation stemming from soil compaction, disturbance of vegetation, and bacterial contamination from human waste all degrade remote waters.

Including areas in the National Wilderness Preservation and Wild and Scenic Rivers Systems helps protect the quality of some rivers. In addition, greater demand for water opportunities has pressured governments and industry to improve water quality in rivers, especially those near urban areas.

In some localities, especially in very popular developed sites and along well-traveled scenic corridors, air quality can be reduced by automobile exhaust and smoke from campfires. Because most recreation-related travel is by automobile, increases in recreational trips will create more air pollution problems. Developing more recreation areas will affect air quality. More areas may disperse usage and, thereby, minimize pollutant accumulation. Opening new recreation areas may also create air pollution problems where they did not exist before. Locating new areas near urban centers may limit travel miles which could minimize pollution, or the eventual congestion could worsen local air quality problems.

All water activities are expected to grow at least moderately, and rafting and pool swimming are expected to more than double in the next 50 years. Crowding in some areas, especially remote water areas, and some increases in plastic and other litter can reasonably be expected. Overuse of some fragile areas could result from growth in canoeing, kayaking, and rafting. In addition, growth in motorboating and water skiing will add to pollution in some lakes and rivers.

Recent trends in water quality improvement should continue for the projected growth in water-based recreation. Greater demands for further improvements, especially in and around urban centers, can also be expected and will likely impact water quality legislation, monitoring, and related programs.

Wilderness

The current wilderness situation has several distinct social, economic, and environmental implications resulting from both allocation and management issues.

Social Implications

Wilderness may be considered our social heritage. It provides a multitude of social benefits, from recreation to human development and rehabilitation to spiritual enrichment. It provides opportunities to examine and learn about past cultures and natural history. If insufficient wilderness is allocated, or if it is managed so that these opportunities are diminished, the nation may lose an important part of its heritage and the benefits it can provide to future generations.

Increasingly, the focus on wilderness concerns its quality, whether for recreational or nonrecreational uses. An inadequate supply of wilderness, particularly if it is not well managed, may result in Americans being unable to enjoy a wilderness environment as intended by the Wilderness Act. Distinctions between wilderness and nonwilderness lands, resources, and experiences can become blurred.

Economic Implications

Government agencies will not experience any direct revenue losses as the growth of wilderness recreation slows because no fees are charged for using wilderness. Less growth, however, may affect suppliers of equipment used in wilderness recreation as manifested in slower sales growth. Slower growth of wilderness recreation is not expected to significantly affect commercial outfitters whose business should increase with national demographic changes.

Because wilderness areas help protect air, water, wildlife, and other environmental attributes, it provides value to the economy in several ways. Wilderness watersheds help store and release water with minimal treatment requirements for later agricultural, residential, and even industrial purposes. Clean wilderness rivers are often critical spawning grounds for fish such as salmon which have commercial importance. Such spawning grounds would be very costly if not impossible to recreate. If the NWPS protects the widest possible sample of ecosystems, it then becomes a very cost-effective method

for natural preservation of germ plasm compared to man-made gene banks.

Environmental Implications

The quality of existing wilderness can be adversely affected by both internal and external factors. The federal government must actively enforce environmental legislation to protect ambient air and water quality, or else wilderness ecosystems may suffer. If legislation creating new wilderness does not specifically identify the values which are to be protected by designation, then other values may be given equal or greater attention. Federal agencies must develop comprehensive management plans unique to each individual wilderness area so that environmental attributes, social experiences, and scientific research opportunities may be preserved. If recreational use begins to expand again, as it seems to be doing, users must be educated in low-impact use techniques. Otherwise, increased crowding will damage soil, water, vegetation, and wildlife in these sensitive environments.

Conclusions

Comparing the demand for and supply of outdoor recreation opportunities and wilderness resources reveals several important social, economic, and environmental implications for forest and range resources. These implications represent both potential opportunities and looming problems.

As a result of the way resources and population are distributed, recreation areas in the East generally sustain much more concentrated use than those in the West. This situation seems likely to continue. If the trend toward greater closure of private lands can be reversed, the added recreation opportunities may help alleviate some projected increases in crowding of eastern recreation lands. Most pressure will be on supply of areas and facilities for physically active pursuits, particularly warm-weather activities on roaded, partially developed lands near population centers.

Other pressures will be for nonconsumptive uses such as sightseeing, day hiking, wildlife observation, and nature study. The largest specific opportunity shortages are predicted for sightseeing and driving for pleasure. Nonrecreational uses of wilderness also are expected to increase and, in some instances, may be incompatible with recreational uses.

The importance of outdoor recreation to Americans is growing. However, some segments of society have less opportunity for outdoor recreation and wilderness use. Americans who are elderly, less educated, a racial minority, economically disadvantaged, or disabled and who live in cities have fewer opportunities to participate in resource-based recreation than do others. These groups' needs for recreation and constructive leisure may be higher than those of other groups. This shortage of recreational opportunities for some population segments is likely to have adverse social impacts. Less recreation opportunity may result in less family stability, more crime and juvenile delinquency, less opportunity for social bonding, more social conflict, and slower ethnic and cultural assimilation among people with the above characteristics. These social impacts will continue into the foreseeable future unless changes are instituted to bring about a more even distribution of opportunities.

Outdoor recreation and wilderness resource trends also have highly significant economic implications. Major opportunities are projected for private sector investments in developed recreation opportunities and provision of associated goods, services, and information. These opportunities are projected for several categories of land, water, and snow and ice recreation. Landowners will have increased opportunity to realize profits by charging fees for recreational uses of their lands, and property values of areas near attractive recreation areas should increase. Because users of public recreation lands are generally willing to pay fees, some potential exists for generating additional revenue. These would come from fees for developed, land-based recreation and permits for private facility operators on developed water areas and developed winter recreation sites.

Additional revenue generation through increased fees is expected at all government levels. But higher management costs for dispersed recreation may offset many revenue gains. In some cases, increased management emphasis on recreation may decrease the use of agency lands for commodity production which can shift economic activity among sectors of our economy.

Most outdoor recreation and wilderness uses have relatively low direct impacts on natural systems compared with other consumptive resource uses. These uses also provide opportunities for people to reinforce their ties to the natural environment and can result in long-term gains in environmental awareness. Still, some forms of outdoor recreation can damage the land, degrade water, air, and scenic quality, and disturb wildlife. Soil compaction and erosion problems are typically localized as are vegetation impacts. The greatest damage may come from early use in new areas while further use of existing sites may cause little additional damage. Many wildlife species can habituate to human presence, but animal damage to possessions and facilities and transmission of animal-borne diseases are a possible result of increased recreation use. Some animal species require large tracts of undisturbed lands for survival; their populations could be reduced by significant recreation developments.

Overall, as society changes, so does recreation. Consequential changes are predicted to occur in the economy and the environment. The direction of these impacts can be influenced by management and policy decisions. The overall trend of increased use of outdoor recreation and wilderness areas indicates that policy actions must be taken to address the issues discussed above. In the remaining three chapters of this Assessment, our vision of opportunities to improve management, policy and practice, anticipated barriers to pursuing these opportunities, and specific recreation program needs for the Forest Service are presented.

CHAPTER VI: OPPORTUNITIES FOR IMPROVING THE AVAILABILITY AND MANAGEMENT OF RECREATION AND WILDERNESS RESOURCES

Earlier chapters identified a number of trends in outdoor recreation and wilderness demand and supply. The nation's population is increasing, and the demand for outdoor recreation and wilderness is growing with it. Moreover, the public is becoming more diverse as are the activities it pursues outdoors. However, many people do not participate in outdoor recreation or use wilderness for a variety of reasons.

Extensive land and water are available to help meet increased outdoor recreation demand, but many of these resources are located some distance from where the bulk of the population lives. Interest in outdoor recreation opportunities closer to home is a dominant current trend. Unfortunately, this is also where recreation and wilderness opportunities and open space are most limited and in jeopardy from urban and other development.

Projections of likely future situations for outdoor recreation show the likelihood of many gaps of varying magnitudes between what people would like to do (preferred demand) and what they may be able to do (expected supply). In the future, supply will be constrained even more than it is today. While these constraints and the gaps they may cause are problematic, they can also represent exceptional opportunities to improve the availability and management of outdoor recreation and wilderness resources. Opportunities sort into eight categories as follows:

1. Increase the availability of outdoor recreation opportunities;
2. Improve or protect the quality of outdoor environments, resources, and facilities;
3. Improve services to the public;
4. Expand coordination, cooperation, and partnerships;
5. Increase the supply of wilderness;
6. Maintain the existing quality of wilderness;
7. Increase management for nonrecreation values of wilderness;
8. Improve the technical and information base for recreation and wilderness management.

This chapter explores these opportunities.

Increase the Availability of Outdoor Recreation Opportunities

Making Better Use of What We Have

The first logical step to improving availability is to recognize and make better use of what is already available. Many recreational demands could be satisfied through increased or redistributed use of existing public lands. Private lands also can provide more public outdoor recreation. The demand and supply analysis in the preceding chapters has indicated that many activities for which shortages are expected require little action other than providing information about the opportunity, means of access, and relatively simple facilities.

Public lands.—Existing public lands can accommodate substantially higher visitation without undue impact on resources or other uses. While past attention has focused on over-crowding in a few areas, such as Yosemite Valley, the Grand Canyon's South Rim, and Cape Cod, large areas of existing public forest and range lands receive relatively little or no use. In many cases, new or improved access roads, facilities, trailhead parking, and trails would greatly facilitate more use of currently sparsely used areas. Even some places experiencing relatively high visitation could accommodate greater use with few effects. Opportunities include more intensive management to separate conflicting uses, to educate visitors on low-impact backcountry techniques, and to encourage off-season use. For example, by installing hot showers in campgrounds, more people would visit some localities during cooler seasons.

Increased recreational use of some public lands could put different users into conflict which diminishes the outdoor experience. Where needed, incompatible user groups can be separated in space and time. Snowmobilers and cross-country skiers, for example, can be directed to separate trails. Mountain bikers and hikers can use the same trails at different times of day or on different days. Improving the knowledge among users of how their activities' impact other users as well as the resource may also help.

Rural private lands.—Rural private lands comprise nearly two-thirds of the nation's land base and provide numerous outdoor recreation opportunities. The President's Commission on Americans Outdoors said, "Many landowners have concerns, ranging from liability to vandalism, which prevent them from opening their lands to the public for recreation use" (PCAO 1987). According to findings from the National Private Landowner Survey (NPLOS), however, 77% of private land potentially available for outdoor recreation is closed to public access. Many owners are purchasing land for their own personal recreation or residences in a rural setting.

The greatest incentive to open land to the public, as reported by landowners, is the opportunity to realize some economic gain. This especially seems true in areas suffering from a depressed farm economy. By charging a fee for public use, landowners could increase their incomes and help offset property taxes and other costs of ownership, usually without affecting other uses of the land much. Public agencies, especially those in the Department of Agriculture, might provide landowners with information on the potential economic returns from opening their lands to the public for a fee or through leasing.

More Opportunities Close to Home

The nature of outdoor recreation trips is changing. Rather than a single long vacation to a distant place each year, more people now make shorter trips close to home. Thus, outdoor recreation opportunities close to urban areas are of growing importance and are likely to remain so for the foreseeable future. The challenge is to provide sufficient high-quality and diverse outdoor recreation opportunities for urban residents. Opportunities can be realized through land acquisition in and near urban areas for public recreation and through improved planning and provision of economic incentives to encourage the inclusion of recreation areas and open space in community development. Some public lands lie close to urban areas, particularly in the West. Examples are the three national forests adjacent to the Los Angeles-San Diego metropolitan areas: the Mount Hood National Forest near Portland, Oregon; the Mount Baker-Snoqualmie National Forest near Seattle, Washington; the Wasatch National Forest adjacent to Salt Lake City, Utah; and national forests and BLM lands near Boise, Idaho. These and other public lands provide those urban residents with excellent opportunities for outdoor recreation in natural settings.

Retaining open space in urban development.—As urbanization spreads outward from metropolitan areas and small cities, the retention of natural environments in and near urban and suburban areas becomes a particular challenge. The PCAO observed that recreation lands and waters and open space made communities and neighborhoods more desirable places in which to live, work, and play (PCAO 1987). Recreation areas and open spaces can be incorporated into communities and neighborhoods through more careful planning, which encourages the creation and expansion of greenways. Special attention is needed for resources such as rivers, floodplains, forests, and abandoned railroad rights-of-way in and near urban areas.

Acquisition and other methods of preserving open space.—In some growing metropolitan areas where sufficient recreation opportunities are not likely to be provided through private action, public acquisition may be the only certain way of providing the public with parks and open space. Public acquisition also may be needed to preserve areas of exceptional recreational, scenic, or ecological value in both urban and rural areas.

In many cases, however, land can be maintained as open space without acquisition. State and local agencies can preserve open space by exercising controls over development density, tax incentives to private landowners, and environmental and safety regulations. Prohibiting development in critical floodplains for example, can benefit wildlife habitat. Numerous federal, state, and local agencies and private land trusts have maintained open space through the acquisition of development rights or the purchase of access and scenic easements. These easements enable private landowners to retain some uses of their land while providing them compensation for the public benefits the land provides (U.S. Senate, Committee on Energy and Natural Resources 1981, 1982).

Improve and Protect the Quality of Outdoor Environments, Resources, and Facilities

A quality environment is essential for quality experiences out-of-doors. Many of the activities predicted to grow rapidly require high-quality environments and focus on study, photography, or other means to appreciate natural, historical, or prehistorical features. Many of the most popular and high-growth activities of the future rely on scenic beauty.

Protect Esthetic Quality

Esthetics is a comprehensive term for the effect that the interaction of all senses have with the natural environment. It incorporates smells, sounds, tastes, touches, movements, and views. Esthetics depend upon environmental integrity so that harmony is evident within and between natural systems, human developments, and uses (New York State Forest Resources Planning Program 1982). Esthetic quality attracts people to an area and increases their enjoyment of the outdoors.

Pleasant scenery is often the key to the quality of an outdoor activity. Opportunities to protect and enhance scenic resources on both public and private lands do exist. Through careful management of other uses, scenic qualities can be maintained and activities such as timber harvesting made more acceptable to the public (McGuire 1979). Necessary facilities, from roads to restrooms, can be designed and placed to maintain esthetic quality while enhancing enjoyment of the outdoors. Trails, too, can be located in such a way as to improve hikers' enjoyment. In a study of three recreation areas in Tennessee, Hammitt et al. (1984) found that trail users preferred an element of mystery as they walked—bends in the trail which hid the scene they were approaching. Hikers preferred trails which zigzagged across the forest edge rather than a trail that simply followed the edge of the woods.

Litter and signage are pervasive problems affecting the esthetic quality of the nation's recreation lands and waters. Land management agencies are hard pressed to keep up with the tide of billboards, nonbiodegradable containers, medical waste, and other trash that often blight many popular recreation sites and waters. Volunteers and civic organizations can assist in the collection of litter and the restoration of esthetic quality of federal, state, and local recreation areas. Moreover, litter vandalism and prevention can be stressed in public education programs, such as Take Pride in America, and in on-site interpretive programs.

Reduce Impacts on Heavily-Used Forest and Range Areas

On some sites, increased recreation use and steady or declining funds for management have resulted in significant resource damage. When damage occurs, the area's carrying capacity has been exceeded. However, while some areas suffer heavy use, often other nearby

Protecting natural beauty may be one of the most important opportunities for resource management in coming decades.

areas offering the same kinds of outdoor opportunities are relatively lightly used. A major opportunity exists to redistribute use to less intensively used and possibly less ecologically sensitive areas, thus avoiding or lessening damage from overuse.

Improve Maintenance of Facilities

Because of previous funding shortfalls, a backlog of needed maintenance and restoration of facilities has been growing at federal, state, and local recreation areas. Failure to perform routine or cyclical maintenance can allow facilities to deteriorate beyond restoration or repair, representing a loss of the public's investment. Moreover, poorly maintained or unsafe facilities reduce visitors' enjoyment and can actually deter use, thus effectively reducing recreation supply. Protecting past investments in expensive facilities, increasing visitor enjoyment and safety, and expanding supply can be accomplished, in part, by eliminating maintenance backlogs.

Protect Historic and Prehistoric Areas

Visiting historic and prehistoric sites is a popular outdoor activity, and it is projected to grow even larger. In 1987, some 32% of the recreating public visited a historic or prehistoric site at least once. Many of these sites are managed by recreation-related public agencies. Federally protected resources range from Dinosaur National Monument, to Indian cave dwellings, to numerous Revolutionary and Civil War battlefields. States also protect important prehistoric and historic resources such as the Gold Museum in Dahlonega, Georgia. Private organizations also maintain significant historic sites such as George Washington's Mount Vernon and Thomas Jefferson's Monticello. Whatever the managing agency or organization, these areas should be guarded from deterioration and erosion, vandalism, theft, overuse, and neglect. In addition to already identified significant prehistoric and historic sites, many currently unprotected sites need to be identified, evaluated, preserved, and made accessible.

Improve Air and Water Quality and Maintain Ecosystem Diversity

While considerable progress has been made in cleaning up the environment, most clean-up efforts have solved only the traditional and more simple problems. Difficult and pervasive problems such as the disposal of toxins and the loss of biological diversity still plague the integrity and health of natural resources. Clean and esthetic environs are the basis of enjoyment of many outdoor recreation activities and of maintaining the integrity of wilderness.

Water quality.—Major improvements in the quality of the nation's waters have made numerous streams and lakes once again suitable for outdoor recreation. The Potomac River near Washington, D.C., is a prime example. Closed to fishing and water-contact activities in the 1970's, the Potomac is now enjoyed by windsurfers, water skiers, and fishers. While significant advances have been made in reducing levels of fecal coliform bacteria and increasing dissolved oxygen, surface water and groundwater are becoming increasingly polluted by contaminants such as chlorides, nitrates, and some toxic metals (Conservation Foundation 1987). Numerous opportunities exist to increase the attractiveness of streams and lakes for outdoor recreation and to reduce the possible hazards to the health of those who use them. Growth projections of water activities have assumed continued increases in water quality. Much greater shortages of trip opportunities will occur if water quality declines.

Air quality.—While considerable progress has been made in reducing ambient concentrations of all five major air pollutants (suspended particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, and organic compounds), many areas still experience periods of poor air quality. As of 1984, some 368 air quality control regions with a total population of about 80 million people failed to meet health-based ozone standards (Conservation Foundation 1987). Acid deposition—chemicals emitted into the air which then fall to earth—are believed to be affecting forest ecosystems in some parts of the country. Many experts also express concern that increasing levels of carbon dioxide and trace gases in the atmosphere are changing the earth's climate, which could ultimately affect the distribution and vitality of forest in the United States (Shands and Hoffman 1987). Projected increases in sightseeing and other activities dependent on views and vistas are heavily dependent on air quality improvements.

Ecosystem diversity.—The loss of ecosystem and genetic diversity is a growing concern (Norse 1986). Opportunities exist to preserve a cross section of different ecosystems and to enhance genetic diversity through greater attention to protecting diversity on public lands. Private lands with important ecosystems and gene pools could be exchanged for less significant federal lands or purchased outright. Ecologically significant areas also could be incorporated into state wilderness or natural area systems or be protected by local or private action, although this is likely to involve relatively small areas. Particularly important is the preservation of prairie and grassland ecosystems. Protection of ecosystem diversity could be made an explicit purpose of federal wilderness.

Manage Whole Ecosystems

Historically, nearly all recreation lands were designated according to political boundaries rather than boundaries related to ecosystems. Often two or more public agencies or a private concern may manage portions of a single watershed, each having different management objectives. Two or more agencies might manage different habitats used by a single big game species. People are increasingly recognizing the importance of managing entire ecosystems, although political divisions make this difficult. Management by ecosystem could provide more consistent management across naturally occurring wildlife habitats and ranges, habitats of rare or endangered species, and entire watersheds. Since many recreation areas border either Canada or Mexico, some international cooperation for ecosystem management may eventually be desirable. Perhaps the best current example is U.S.-Canadian cooperation in managing Waterton-Glacier International Peace Park.

Improve Services to the Public

More and Better Information

To take advantage of opportunities for outdoor recreation, the public must know what is available. This requires broad-based information on both public and private opportunities. Often, potential users are simply not aware of the opportunities that exist. Better information availability will require imaginative efforts to develop easily understood informational brochures and other media and to get the information to potential users. Public awareness of existing outdoor recreation sites and opportunities can be increased through information and marketing campaigns that use national, regional, and local news media and recreation and tourism publications issued by public agencies and private industry. Some public agencies have enjoyed success with "user-friendly" computer terminals in public places and centralized information centers that provide information on opportunities offered by local, state, and federal agencies, local chambers of commerce, and private businesses. Expanded programs of visitor information, including on-site interpretive and educational services, could help match current and potential users with recreational opportunities in a particular area. At the same time, these types of programs can inform visitors of resource management policies and suggest appropriate outdoor behavior.

In many cases, neither the public nor many recreation site managers are aware of technical innovations in recreation activities, equipment, site development, and management techniques. To meet this need, showcase recreation areas might be established in or near populous

areas to demonstrate and publicize new and emerging outdoor opportunities and innovative management practices.

Provide Opportunities for Those Who Do Not Participate

Some people do not engage in outdoor activities at all or do so far less than other segments of society. In some cases, it is a matter of choice; but, for the elderly, disabled, poor, and some ethnic minorities, significant obstacles prevent their participation. While the reasons for nonparticipation have not been well identified or documented, it should be possible to increase participation across the social spectrum by reducing known barriers and making outdoor recreation more appealing. For example, if low incomes mean that some people cannot afford to pay for transportation to distant recreation sites, then parks and playgrounds can be developed closer to where they live and shuttle services can be provided. If this is not feasible, then subsidized transportation to distant recreation areas could be considered. For the mentally or physically disabled, opportunities exist to build special facilities to permit their enjoyment of the outdoors and provide information on opportunities available. Disabled persons generally have the same needs as all others; usually, the problem lies with inaccessibility or hazards.

Anticipate Changes in Public Needs

The public's recreational activities are undergoing constant and rapid change. Managers of public lands are challenged to accommodate the resulting new demands—from campground hookups for large, self-contained recreation vehicles to cliff access for hang gliders. The bicycle is a good example of equipment evolution and public tastes in outdoor recreation. In 1960, a bicycle was a heavy, balloon-tired machine built for use

Access to ocean shorelines and natural areas will represent some of the greatest opportunities to improve recreation supply in the future.

on smooth, flat surfaces. Today, there are many different kinds of bicycles—touring, racing, BMX, and the mountain bike made for trail riding. Bicycling is no longer an activity limited to smooth paved surfaces. To take maximum advantage of new technologies, the public requires access, information, services, and facilities. The public land manager is called upon to provide opportunities for traditional and popular activities such as camping and hiking while accommodating new activities such as mountain and BMX biking. The recreation manager must also be sensitive to demographic changes that affect recreational use patterns such as population growth or decline, increased numbers of immigrants, the rising number of single-parent and female-headed households, and increased numbers of foreign visitors. Establishing model recreation sites in different parts of the country, systematically monitored to identify changes in patterns of recreational use, could provide information that would help managers anticipate and accommodate changing public recreation demands. Strong, on-going programs of research to monitor public tastes and attitude changes would provide baseline information and enable anticipation of change.

Educate the Public About Natural Resources

Outdoor recreation offers an opportunity for the public to better learn about the role and importance of natural systems and their conservation and wise use. This benefit may be realized in addition to the benefits of outdoor recreation as an activity simply to be enjoyed. A growing public interest in wildlife observation, visiting historic and prehistoric sites, and nature study points to the potential of public education programs. Such programs, including interpretation integrated into recreation activities, might well help reduce vandalism and destruction of trees and wildlife in public recreation areas and make restrictions on use for resource protection more acceptable to the public or even less necessary. Interagency cooperation and partnerships with nonprofit organizations can expand and enhance educational and interpretive programs. On the Chippewa National Forest in Minnesota, for example, the National Audubon Society offers a training program for naturalists working at area resorts. In future years, as the American people may become yet more detached from natural resources, outdoor recreation may become the primary vehicle to achieve environmental awareness and sensitivity.

Expand Coordination, Cooperation, and Partnerships

Many organizations and private businesses provide or are associated with forest- and range-based outdoor recreation. They include federal, state, and local agencies and quasi-public or private organizations such as the Appalachian Mountain Club, the Boy and Girl Scouts of America, YMCA's, and the Izaak Walton League of America. Many opportunities also are offered by churches, civic clubs, and neighborhood associations. Numerous commercial organizations, from Kampgrounds of America to wilderness outfitters, provide or facilitate outdoor recreation. These agencies and organizations may provide competing or complementary outdoor recreation opportunities. In an era of tight government budgets and growing private investment, improved coordination among public agencies and private sector organizations can increase recreational opportunities cost-effectively

Providing learning experiences may become one of the most important management activities.

by avoiding duplication of efforts, by more comprehensively identifying needs, by pooling resources, and by exchanging information on effective and ineffective programs. Through working together, the needs of many organizations and users can be met simultaneously and more cost-effectively than if each worked separately. Outdoor recreation research and technology transfer is a particularly fertile area for cooperation. For example, the production of the analysis for this Outdoor Recreation and Wilderness Assessment involved more than a score of public agencies, universities, private organizations, and individuals.

Considerable opportunities exist to improve recreation resources and services by cooperation among government agencies. Various federal and state land-management agencies often have adjacent lands. By coordinated efforts, these agencies can supply a more diverse range of complementary recreation opportunities while maintaining each of their separate management philosophies.

Government and private organizations and businesses have a long history of cooperation in providing public outdoor recreation. Private entrepreneurs manage ski areas on many national forests, and concessionaires provide food and lodging in many national parks. Nonprofit organizations work with federal and state agencies to provide interpretive publications and programs at recreation sites. The Appalachian Mountain Club and numerous other volunteer groups help maintain trails. While public-private partnerships are growing in number, the potential has barely been tapped. Opportunities to bring public agencies and the private sector closer together in short-term, goal-specific associations, or long-term, more comprehensive relationships, are nearly infinite. Cooperation and partnerships can also serve to build coalitions for the support of federal, state, local, and private outdoor recreation programs and open space preservation.

Opportunities to Increase Supply of Wilderness

The NWPS currently contains about 89 million acres of federal land, about 4% of the nation's total area. About two-thirds of the wilderness acreage is located in Alaska; only 5% is east of the Great Plains. Potential growth of the Wilderness System depends upon additions from federal lands already under study, federal lands which, to date, have not been considered, and other state, local, and private lands with wilderness character. Such opportunities exist.

Complete Existing Wilderness Studies

In excess of 50 million acres of Forest Service, National Park Service, Fish and Wildlife Service, and Bureau of Land Management lands are being studied for their wilderness suitability. Where lands possess wilderness potential, they present an opportunity for inclusion into the System. Large, intact, or nearly intact ecosystems, such as the Greater Yellowstone, California Desert, Appalachian Mountains, and Arctic Slope, are major opportunities. Nonrecreational values should be considered equally in determining suitability.

Study Alternative Wilderness Types and Locations

Other lands now managed by the Department of Defense and Bureau of Indian Affairs could also be examined for wilderness potential. Territories and other possessions of the United States could be examined for areas having high value for designation, particularly in protecting ecosystem diversity.

In addition to traditional federal surface lands, other types of significant resources and ecosystems provide opportunities for wilderness or wilderness-like values, including caves, freshwater lakes, coral reefs, kelp forests, and ocean coastlines.

Not all lands and waters with high wilderness values are owned by the federal government. Where such lands are owned by states, local governments, or private organizations, efforts should be made to find means for protection.

Opportunities to Maintain Existing Quality of Wilderness

Designation of wilderness does not necessarily ensure that these lands will forever maintain a wilderness character. Public use may transfer some human influences such as air pollution to wilderness areas. Even so, some opportunities are available to help maintain the quality of wilderness.

Improve Wilderness Education

By definition, only humans have the capacity to adversely impact wilderness character. Wilderness visitors, particularly recreational users, can be educated in low-impact procedures as one means to help reduce unnecessary or undesirable impacts. Such efforts may utilize interpretive programs and techniques at the point of entrance into a wilderness, as well as through outreach programs to educate communities through schools or other institutions.

Improve Wilderness Management

Resource managers have the prime responsibility in the protection of wilderness values and resources. Management effectiveness can be increased through additional staffing, training, and career opportunities. Wilderness managers are needed at each forest, park, wildlife refuge, or public land district having wilderness management responsibilities. Additional training and academic course work would be useful for these positions.

Complete Management Plans for Wilderness

Separate management plans should be completed for each wilderness. Each plan may consider the general and

specific values for which the wilderness was designated and develop strategies to ensure that those values are preserved. Plans should include some type of process for establishing measurable standards for desirable conditions, such as the "limits of acceptable change" process.

Conduct Wilderness Threats Assessment

Because of real possibilities that wilderness character may be compromised, a separate assessment of current and potential threats to areas in the NWPS should be undertaken. This assessment should look at both internal and external threats. Inside of wilderness, issues that should be examined include recreational impacts such as water pollution, erosion, wildlife disturbance, introduction of nonnative species of plants and animals, and visitor experience preferences. Outside of wilderness, threats such as residential, commercial, and industrial development along wilderness borders should be investigated. In addition, some threats which may originate some distance from a wilderness area, such as acid rain, air pollution, and global climatic change, also need to be examined. These threats need to be monitored continuously.

Continue Wilderness Research

A wilderness research program should continue to focus on recreational user impacts and experiences and the extent, value, and compatibility of various nonrecreational uses. Information on research and baseline environmental conditions within each wilderness should also be available in a centralized computer database. Increased research and educational efforts could help both the public and wilderness managers to understand the extent, value, and management of nonrecreational uses.

Opportunities to Improve Management for Nonrecreational Values of Wilderness

Nonrecreational values of wilderness, including ecosystem preservation, plus scientific, cultural, historic, educational, esthetic, and spiritual benefits, are as important as recreational uses. These wilderness values and uses may be enhanced through management and policy direction as well as through research.

Future wilderness management plans should clearly specify all special nonrecreational values which wilderness areas provide. This direction should be translated into guides, handbooks, and specific management practices to ensure that the intent of the legislation is realized.

Improve the Technical and Information Base for Recreation and Wilderness Management

Research provides opportunities to improve management for the outdoor recreation and wilderness uses and values discussed thus far. While substantial research has been done on the social importance of recreation, recreation demand, and topics related to near-term planning and management, gaps remain in our knowledge. For example, recreation supply and the cost of providing outdoor recreation have been inadequately researched. Moreover, research findings do not fully describe interactions among users, resources, and management. Existing wildernesses are little utilized for research aimed at monitoring changes in the environment or for understanding relatively undisturbed natural ecosystems over time. Some specific opportunities to improve our knowledge base are discussed below.

Standardized data.—If managers are to respond in a timely fashion to changes in public recreation needs or changing resource conditions, better information will be required on environmental and participation trends, likely future demand, preferences and satisfactions, and available supplies of outdoor recreation. The provision of relevant and timely information can be greatly enhanced through improved standards and definitions for recreational data. Different public and private agencies often have different and sometimes incompatible definitions for measures of recreation demand or supply. Different federal agencies may also have different monitoring and measurement standards for wilderness. Development and use of widely accepted concepts and definitions can lead to better communications and more optimal decisions and cooperation among the wide range of recreation and wilderness management interests.

Improvement of assessment methods.—Research can improve the methods for conducting future assessments of natural resources in both urban and wild environments and on both public and private lands. Managers need to better understand recreation trends so they can stay in step with change. Important areas of inquiry include how public opportunities and those provided by the private sector complement one another, better measures of recreation suitability and quality, improved knowledge of motivations, barriers to and norms of recreation participation, and a better understanding of social and economic benefits derived from outdoor recreation and wilderness.

Estimating recreation benefits.—Because social and environmental benefits of outdoor recreation are often difficult to assess, recreation and resource protection programs may be valued incorrectly, if at all. Without hard dollar values of the benefits accruing from outdoor recreation, land managers find it difficult to justify investments in recreation programs and facilities. Researchers have made substantial progress in estimating commensurate values for outdoor recreation. By improving valuation technology and models, the benefits of outdoor recreation programs can be documented and brought to bear on resource allocation decisions. In the same way, nonrecreational uses and values of wilderness are often undervalued, and sometimes not even recognized, in the forest planning process. Basic and applied research should document these nonrecreational uses so they can be weighed with values such as timber, water, forage, and mining.

CHAPTER VII: OBSTACLES TO IMPROVING OUTDOOR RECREATION AND WILDERNESS RESOURCES

Numerous and significant obstacles may impede achieving improvements of potential recreation opportunities and wilderness resource management identified in the previous chapter. These identified constraints typically cut across several opportunity categories. For example, liability for personal injury inhibits opening of private land for public use and also deters some uses of public lands. Imperfect information on recreation and wilderness demand and supply, participation, preferences, barriers to participation, and the effectiveness of opportunities constrain the responsiveness of planning to a variety of new demands and changes. Constraints fall into five broad categories:

1. Distribution of recreation lands relative to urban areas and public access;
2. Funding;
3. Liability;
4. Information and education for both users and managers;
5. Coordination and communications among providers.

Distribution of Recreation and Wilderness Lands and Obstacles to Public Access

Inadequate access to recreation lands, open space, and wilderness constrains the expansion of recreation opportunities, especially for people living in populous metropolitan areas and in the East and South. Most federal land available for outdoor recreation and wilderness is located in the West. Though federal land exists close to some metropolitan areas, the most attractive federal lands, waters, scenery, and facilities often are located some distance from urban areas. The same is generally true for state lands within the four Assessment regions. Accessibility will remain a constant issue so long as most Americans live in the East and most federal lands remain in the West. Improved access to private lands in the East could enhance some recreation opportunities.

Conversion of Private Land to Development

The conversion of available private farm, forest, and range lands to development limits opportunities for public use or public acquisition. From 1969 to 1978, some 90 million acres of farmland were converted to nonagricultural uses including residential, commercial, and industrial development plus roads, highways, and airports (Cordell et al. 1985). Agricultural and forest lands likely will continue to be developed at a rate of about 1 million acres annually for the next 5 decades (USDA FS 1987). This will significantly reduce the total private land base available for public recreation. The situation is more acute in the East and South where private lands constitute the majority of the land base. The loss of potential recreation lands has long-term implications for management of public recreation areas. More users forced onto a smaller land base will increase the potential for conflict among users and for overuse of available recreation areas.

Closure of Private Lands to Public Access

The increasing trend toward closure of private land to general public use also limits the expansion of outdoor recreation opportunities (Wright et al. 1989). People often purchase rural land as a personal recreation site and post it against public use. More landowners are leasing land to private groups, particularly for hunting, and excluding the general public.

In addition, there is a trend toward increased numbers of farms less than 50 acres, forest tracts less than 100 acres, and tracts of more than 500 acres. Large tracts are often better suited for exclusive lease arrangements while owners of small tracts generally want to reserve their land for their personal use and are less inclined to permit public recreation. This situation especially affects recreation in the East. Even private industrial lands once open to the public are being closed or restricted.

Closure of private land can block access to public lands, lakes, streams, rivers, and beaches. Such closures are a major problem for western national forests and BLM lands. In the East, private land closure stimulated public acquisition of the Appalachian trail corridor.

Closing private lands seriously restricts options to direct different user groups to the most appropriate land ownerships. It also diminishes close-to-home recreation opportunities, and it provides no relief from negative impacts incurred at heavily used public areas. Opportunities to forge partnerships among private landowners, users, and public agencies also may be diminished.

Poor Access to Recreation Lands by Special Populations

Disadvantaged people often do not, or cannot, visit distant national parks and wilderness areas. The cost of travel may be prohibitive (Hultsman et al. 1986). Physically disabled people often need special transportation or facilities which cannot be found in many outdoor recreation settings. Research indicates that resource managers seldom encourage disabled people to participate in outdoor activities and seldom respond to special needs (Hartmann and Walker 1989).

Conversion of Wilderness and Potential Wilderness Lands

Development and activities around some wilderness areas, especially adjacent road construction, timber harvesting, mining, oil and gas extraction, and commercial

Inadequate access to recreation lands will be an important constraint to improving outdoor recreation supply in the future.

and residential development, have effectively reduced the acreage of areas having the true wilderness character of vastness and wildness. Such activities may affect opportunities for primitive recreational experiences and solitude. Additionally, wilderness wildlife habitats and populations may be affected and fisheries and water quality, cultural resources, visual quality, and scientific uses may be compromised (Chestnut and Rowe 1983, Schonewald-Cox and Stohlgren 1989, Wilderness Society 1989). Policies discouraging buffer zones surrounding critical wilderness areas permit many of these effects to occur virtually up to the boundaries. These lands will have little, if any, chance of regaining wilderness character in the foreseeable future.

Wilderness solitude and biotic diversity also may be lost through the effects of sources not restricted by boundaries. Sights and noise of aircraft, particularly military overflights, adversely affect wilderness characteristics of solitude (Peine et al. 1989). Other areas have been degraded by the effects of air pollution on vegetation (Peine et al. 1989) and visual quality (Chestnut and Rowe 1983). Perhaps the greatest threat to loss of effective wilderness areas may come from atmospheric changes, including global warming, desertification, and ozone depletion (Peine et al. 1989).

Funding

Funding obviously affects resource management. Small budgets delay program expansion, land acquisition, development of informational and educational materials, and research.

In recent years, federal and state funding for outdoor recreation and wilderness has been declining. It is significant that in their reports to the President's Commission on Americans Outdoors, 48 states expressed a need for stable funding, the most frequently mentioned concern. The Domestic Policy Council (1988) concluded that public budgets have difficulty sustaining on a regular annual basis the outdoor recreation services, maintenance, and facility replacement needs on public lands. As a result, it is difficult for public agencies to supply the quantity and quality of opportunities demanded by consumers on an even or expanding annual basis. This is the experience at both federal and state recreation sites.

Funding declines and instability reduce ability to maintain, much less expand, recreation and wilderness resources, programs, and research. Opportunities to preserve and protect exceptional natural features or significant historic or cultural sites can be lost because of insufficient funding. Likewise, opportunities to educate

visitors through on-site interpretive and educational programs can be limited. If the downward budget trend of recent years were to continue, managers will not be able to respond to changing demands on resources. Only recently have some agencies been given authority to charge or increase user fees or to develop other methods to raise funds for operations and maintenance (Driver et al. 1985).

Generally, federal and state authority to charge fees is limited. All seven federal land management agencies may charge fees for use of specialized sites, facilities, equipment, or services furnished at federal expense (Domestic Policy Council 1988). However, fees are limited and may be collected only for areas that meet established standards of development. The National Park Service is the only agency authorized to charge entrance fees, although Congress has barred charges at some units and has limited the amount that can be charged. In the case of state recreation areas, state legislatures often specify the areas where fees can be charged. Moreover, legislatures generally establish uniform, system-wide charges that preclude differential fees to better distribute use or recoup high management costs. Only recently have federal fees been returned to the collecting agency rather than put in the general treasury (Driver et al. 1985). Surveys of recreationists have indicated that they are willing to pay fees or accept higher fees for use of public outdoor recreation areas if the revenues are earmarked to support or improve the services and facilities where they were collected (Domestic Policy Council 1988).

Some recreation agencies have been successful at attracting contributions of equipment, funds, and labor for facilities and habitat improvement projects. However, adequate base funding is essential to assure that there are facilities and resources to satisfy the broad range of public demands.

Tort Liability and Increased Costs of Insurance

Substantial increases in the cost of liability insurance have significantly reduced outdoor recreation opportunities. The PCAO (1987) cited specific examples: play equipment was removed from city playgrounds; a recreation department stopped renting and converting old houses into recreation centers; and sledding was barred in city parks. Increased willingness to sue, higher awards for injuries, as well as sovereign immunity have all stimulated a dramatic increase in the number of recreation-related lawsuits (Hronek 1985). Meanwhile, juries appear to give less weight to traditional defenses of voluntary assumption of risk and contributory negligence.

Some public agencies have curtailed programs to reduce their vulnerability to tort liability actions, but the liability issue has most acutely affected private providers. Ski resorts, outfitters, and river guides have had to increase their fees substantially. Private landowners frequently cite a fear of being sued as a major factor in deciding to close their land to public use. Liability can also affect decisions about charging fees for use of both private and public lands. Where fees are charged, the public agencies and private landowners may be held to a higher standard of public protection than if no fee is levied (Koslowski 1989). Increased insurance premiums and greater risk of lawsuits may more than offset revenues from fees.

In response, 48 states have enacted recreational use statutes intended to provide some protection for private landowners who permit public use of their land (Koslowski 1989). Even so, the threat of liability continues to inhibit opportunities to expand recreational opportunities offered by both public agencies and the private sector.

Providing sufficient opportunities for camping, family gatherings, and other developed site uses may be a challenge if agency budget trends continue.

When faced with a potential liability, agencies most often restrict use or close recreation areas.

Information and Education for Users and Managers

Incomplete information about users also often constrains the provision of outdoor recreation and wilderness opportunities. Without complete information on who the customer is, what his or her preferences are, and barriers to his or her participation, policy makers and managers are less able to develop effective programs. Likewise, the absence of complete information on outdoor recreation opportunities hampers efforts to increase supplies and can result in wasteful overlaps. Absence of information about opportunities also reduces supply because sites and facilities unknown to the public, in effect, do not represent an opportunity. Failure to develop new management techniques and to transfer management technologies may inhibit management performance. For example, managers could benefit from information on new techniques to avoid user conflicts and ways to prevent or mitigate adverse impacts to forest, range, and wilderness resources.

Coordination and Communications Among Providers

Seven federal agencies manage recreation lands, four manage wilderness, and each has its own land management philosophy, mission, and objectives. Another 60 federal agencies provide directly or indirectly some recreational programs or services (Shivers 1987). Moreover, each of the 50 states has agencies that manage state lands and programs to provide recreation or some form of wilderness-like area (Soper and Humke 1989). More than 3 million acres of wilderness-like areas are also maintained in land trusts by nongovernmental organizations such as The Nature Conservancy. Poor coordination and communications among public outdoor recreation providers and between public agencies and private interests can constrain outdoor opportunities. The Domestic Policy Council (1988) found that assessing the adequacy of outdoor recreation supplied on federal lands is complicated by geographic, organizational, and functional fragmentation of the involved agencies. Further, the absence of any clear, integrated national policy guidance hinders recreational development.

While some federal lands managed by different agencies may be contiguous or in close proximity, regional or area coordination is often lacking. Potential interagency relationships include situations such as a national forest which attracts visitors who hike backcountry trails in the forest, but who then camp in a nearby state park. The Domestic Policy Council (1988) asserted that, "An integrated federal policy relating to area and regional coordination and development of recreation on federal lands could improve effectiveness and efficiency for both national and local purposes [and] assure similar coordination at the higher levels of agency coordination."

Inadequate coordination among government levels and between government and private organizations can ultimately cause management duplication and deficiency. The degree of cooperation, in part, determines how well

public lands meet the outdoor recreation and wilderness demands of the American public.

Management of the recreational and nonrecreational values and benefits of wilderness also is hampered by a lack of interagency cooperation. For example, where animal and plant communities do not follow political boundaries or where esthetic and spiritual values may be attached to very large areas, close coordination in management is essential. Inadequate or imprecise direction, starting from the language of designation acts through the diverse policies of the managing agencies, also presents an obstacle to consistent management of wilderness.

CHAPTER VIII: OUTDOOR RECREATION AND WILDERNESS PROGRAM IMPLICATIONS

The findings of this Assessment of the Outdoor Recreation and Wilderness Situation in the United States show that demands for outdoor recreation and wilderness opportunities will continue to grow and diversify. But, unless opportunities for some activities are expanded more rapidly than in the recent past, significant shortages will affect many popular recreation activities and wilderness uses, especially for the people living in the East and near urban areas. The two major management options are maintaining the current pace of providing recreation opportunities or expanding opportunities rapidly enough to prevent the projected shortages. Either will be expensive since both require large operating, acquisition, and capital budgets.

Regardless of annual budgets and expenditures, the American public will increase its outdoor recreation. People will be taking fewer long trips, but more short trips; and, many urban residents will continue to be limited in how far they can travel for recreation. As a consequence, land and water facilities near urban centers will be even more heavily used. Unless new resources and facilities which can disperse use are built and existing resources and facilities are carefully maintained, resource agencies may be unable to accommodate the growing demand for outdoor recreation. The more significant questions become not only which major option costs more and which less, but also which option confers the greater total benefits on individuals and society.

This chapter is devoted primarily to identifying the implications of the findings of this Assessment for shaping the Forest Service's management, research, and assistance programs for the 1990's. These implications will be used as one of the considerations for development of alternative program strategies for the agency.

Implications for Management of the National Forests

Many national forests could accommodate higher levels of recreational use than they now support. A few forests could accommodate increased use with little more than continuing current management and development strategies and making the public more aware of the opportunities that exist. For most forests, accelerated investments in management, access, and facilities would be required. This would include eliminating present maintenance backlogs, increasing efforts to stimulate public awareness and assure safety, and providing high-quality outdoor opportunities for both foreign and domestic visitors. While accommodating more use, managers will be challenged to protect national forest resources from overuse. Management, resource, access, and facility needs are likely to be most intense in the East where effective recreation opportunity is least, where crowding is greatest, and where predicted closures of additional private lands will have the greatest impacts. Because many national forest lands are quite remote, increased visitation may not occur in those areas even with better information and management. On the other hand, forests near urban areas should experience large increases in visitation, whether or not more information or management is provided.

Existing land management plans for individual national forests should serve to identify outdoor recreation

Increasingly, public lands are looked to as a place for recreation.

opportunities, partnerships for delivering those opportunities, and the markets for recreation. Collectively, national forests possess a broad diversity of recreation opportunity. This diversity hinges on the unique and distinctive character of individual forests. A key management strategy will be to inform the public about national forest opportunities while directing specific user groups to those national forest resources with the most potential to meet their particular recreation demands with the least conflict among users. National forests, national grasslands, and their components, such as wilderness areas, must be planned and managed as both individually unique units and as parts of a larger system.

Serving Urban and Special Populations

The steadily increasing use of national forests by urban population groups will challenge managers several ways. They will be expected to provide for the physically active as well as the physically or mentally disabled while protecting resources from potential damage caused by overuse. This is especially critical in wilderness. Where appropriate, important managerial actions include: (1) upgrading of arterial roads for sightseeing and pleasure driving; (2) construction of additional roadside rest areas, vistas, and access to historic and prehistoric sites; (3) improved facilities for family gatherings, educational exhibits and programs, and picnicking and camping sites; (4) improved loop trails suitable for viewing wildlife, nature and wildlife photography, collecting berries and for strolling; and (5) improved information and signing. All of these must be accomplished with special disadvantaged populations in mind. Existing trails, buildings, and parking areas may require structural modifications and new facilities with updated and appropriate design considerations must be built.

Even though many urban residents increasingly seek adventure and risk-oriented recreation and are going outdoors to find it, the continuing urbanization of the American population means people are becoming more detached from natural environments. In contrast to generations past, a land ethic is, very likely, not a part of most people's heritage. An aggressive community outreach program to offer environmental education and outdoor skills training could become an essential management tool. Better prepared recreationists create fewer safety problems, and better educated recreationists cause less damage to the resources they enjoy. On-site interpretive programs can reinforce the outreach programs. To be effective, these actions must be strengthened with adequate staffing. Ultimately, nothing can substitute for knowledgeable, host-oriented uniformed personnel in the field.

Forest Environments Requiring Attention

Increased management and access will be required to improve opportunities on undeveloped areas near roads and on partially-developed roaded areas. These are the outdoor environments where the greatest declines in opportunities are projected, as much as 40% within the next 50 years. Should these projections prove true, such lands near urban areas would become especially important. The increasing incidence of private land leasing and closures could also contribute to blocking essential access to public lands. Providing guaranteed access to undeveloped and semideveloped national forest lands will be a major challenge. And, as more people use these lands, managers will be further challenged to protect them from overuse. Hunters, backpackers, wildlife observers, and sightseers all pressure the resources on which their recreation depends. If present trends continue, eventual shortages can result in overcrowding,

Providing convenient opportunities to photograph and study natural settings will be an important strategy for managing National Forests in coming years.

user conflicts, and resource degradation. Improving access is essential to prevention of these consequences of projected opportunity shortages.

The demand for cross-country skiing and similar dispersed winter activities is expected to far exceed supply over the next 5 decades. To meet projected shortages, more attention should be devoted to increasing cross-country ski opportunities in climatically suitable forests that receive enough snow for this type of activity. Access to private land will be one of the keys. Also, downhill skiing facilities must continue to expand and new facilities must be built. The prediction of no shortage in downhill ski opportunities is based on the assumption that recent trends in ski area development can and will continue. The Forest Service is the largest supplier of downhill ski opportunities, and its actions regarding this resource will determine whether or not a shortage will occur.

If the recent emphasis on providing water opportunities is continued, no major shortages are projected for most water-oriented activities. But, the expected growth in such activities as white-water rafting, canoeing, kayaking, and swimming will require maintenance of access and control of erosion and pollution that could impair the quality of water resources within the national forests.

Acquisition of Land and Easements

While no massive land acquisition program seems likely in the near future, it may be necessary and feasible to purchase land or easements to permit public access to some areas of the national forests. In some cases, especially in the East, it may be desirable to acquire lands which provide exceptional scenery or outdoor opportunities, link existing recreation areas, or preserve the quality of the recreation resources on existing public lands. Developing partnerships with nonprofit organizations to acquire desired lands could be a cost-effective way to accomplish management goals. The exchange of disjunct parcels of national forest lands for private lands could be a cost-effective way of increasing opportunities. While opportunity is still available, unique and significant areas important to outdoor recreation and wilderness should be identified and protected. These areas may include wilderness-like areas, unique natural features, travel corridors, and significant scenic, historic, and archaeological sites.

Quality of Resources and Facilities

Meeting projected increased demands for outdoor recreation will require attention to the quality of resources and facilities on the national forests, especially in the East. The scenic quality of national forests is highly valued by the public and has led to creation of a scenic byways program. Relatively large gaps between demand and supply are projected for scenery-oriented activities such as pleasure driving, sightseeing, and nature photography. To avoid degrading the view from well-traveled roads, hiking trails, or rivers, and to minimize erosion and stream sedimentation, facilities, forest roads, and timber sales should be carefully planned and executed. Addressing maintenance and rehabilitation backlogs must be continued and accelerated to avoid excessive and costly deterioration of facilities. Such acceleration could require a substantial, though short-term, funding base. Some new visitor centers, picnic areas, campgrounds, road access, trailhead parking, and trails will be needed to meet anticipated visitation growth and to avoid damage from overuse.

User Information and Education

National forests receive the greatest visitation of all federal lands; but, many people, particularly urban dwellers, are unaware of the opportunities they offer. More rigorous and diversified exposure could help the public realize the outdoor recreation potentials of national forests. Off-site information targeted to urban publics, with attention to various ethnic groups, the economically disadvantaged, and persons with physical and mental disabilities, could greatly improve their opportunities for participation in outdoor recreation. On-site information and interpretive services could help visitors better appreciate their outdoor experience and treat resources with greater sensitivity. Improved information for visitors can help prevent overcrowding and overuse by directing visitors to less crowded wilderness and nonwilderness areas and by informing them of the impacts they have on soil, water, flora, and fauna. Such information would need to be sensitive to the different backgrounds of each group.

Dissemination of information to potential visitors could be made more effective through expanded cooperation within divisions of the Forest Service, through increased research on information dissemination techniques and effects, and through greater partnerships with other federal, state, and local agencies and with private cooperators. Consolidated information centers, cooperative publications, and innovative dissemination methods could make it more convenient and enjoyable for the public to learn about outdoor opportunities on national forests in their area and across the nation.

Establishing Partnerships

Much of the needed work—from facilities construction and management to interpretation—could be accomplished through partnerships involving both profit and nonprofit organizations within the private sector. Currently, the Forest Service utilizes the private sector to provide services and to build and maintain facilities and trails. Efforts could be intensified to include guide and outfitting services for backcountry and wilderness use, backpacking, trail riding, and cross-country winter sports. Specific means for establishing partnerships include: (1) communicating with private landowners

about the existing incentives, income potential, and social values of opening or keeping open their lands; (2) providing incentives for private investment to stimulate a greater variety of recreation opportunities, especially in economically depressed rural areas; (3) using land management plans to determine forest-specific recreation opportunities and to emphasize local opportunities for partnerships; and (4) providing incentives for national forest permittees, outfitters, guides and other concessionaires to provide recreation opportunities for the disabled and disadvantaged. As was shown in chapter I, membership and purchasing ability of both conservation-oriented and nonprofit organizations, such as The Nature Conservancy, and special interest groups, such as the American Hiking Society, are expected to grow. These organizations could be approached with specific plans for facility development, land purchases, or other projects to the benefit of both the organization and to other users of the National Forest System. Developing partnerships with elementary and secondary schools and local nature centers could increase the environmental and recreational awareness of students and the community and is an especially inviting opportunity. The increasing number and diversity of local government parks and recreation departments also offers great potential for making available environmental and recreational information.

Charging or Increasing Fees for Use of the National Forests

Implementing new fees where none have been previously charged or increasing existing fees could help cover some management costs of especially costly developed facilities. Moreover, a graduated system of fees related to use pressures for campgrounds could help limit overcrowding and overuse of the more popular sites. Additional study is needed to identify acceptable and cost-effective means for charging for dispersed recreation. Typically, the constituents of this kind of recreation are both willing and able to pay fees. The major condition for their willingness is that the revenues thus generated be used to improve and maintain those sites where the fees are collected. Recent legislation has begun a move in this direction. Sometimes, however, regular appropriations are reduced proportionate to the increased fee revenues, resulting in zero net gain.

Implications for Forest Service Research

This analysis of the recreation and wilderness situation has implied a need for research for dealing with supply and demand changes, for better understanding users and their outdoor recreation preferences, for improving management techniques, for improving measurements of recreation phenomena, and for managing new and rising noncommodity forest uses. Although important advances have been made since the last Assessment, many critically important research questions remain unresolved. Without research, decisions may be poorly based and inappropriate.

Trends in outdoor recreation demand and supply must be monitored on a continuing basis if managers are to have sufficient advance information to respond in a timely manner to changing conditions and changing public preferences. Monitoring demographic and economic trends and recreation-related technological advances is essential to improving projections of future change. Better information would also help guide outreach programs addressed to previously uninvolved publics.

Research is necessary to monitor changing public demand for national forest recreation and wilderness opportunities.

Improved data on the supply of recreation resources at all levels, public and private, would help eliminate overlaps, better identify gaps in opportunities, and ensure more efficient investment of funds. As prediction capabilities improve, so too will planning and management.

In doing this Assessment, it became clear that standards for data collection, analysis, and presentation and broadly-accepted definitions of supply and demand are needed. Continuing the effective partnerships formed to develop the data and analyses for this Assessment is desirable. An example of such a partnership is that with state recreation agencies for coordinating federal data collection efforts with the states' comprehensive outdoor recreation plans.

Research also will be needed to help managers deal with intensified, and sometimes conflicting, public uses. Specific topics warranting research priority include:

- Managing of high-use recreation areas to help managers resolve user conflicts, to communicate effectively with users, to control vandalism, to limit environmental degradation, and to deal with other site abuses.
- Managing wilderness and other roadless sites to help managers evaluate carrying capacities and to set use standards, especially for popular areas, to better communicate with users, and to unobtrusively manage for visitor use.
- Planning, monitoring, and managing national forest wilderness for nonrecreational uses and values.
- Managing special areas, to help managers preserve cultural, historic, and prehistoric components and artifacts, control vandalism, and to interpret such areas for the public.
- The interaction of outdoor recreation with other forest and range resources and uses and the complementary roles of public and private sectors in addressing needs for public use opportunities.
- Developing low-cost techniques for constructing, restoring, and maintaining facilities and for minimizing the adverse impacts of use.
- Understanding the social disparities of the existing distribution of recreational opportunities, differences in barriers to participation among different populations, and the sources and possible solutions to achieve more balance.
- The social, economic, and environmental benefits or consequences of outdoor recreation and wilderness management and use.
- Effective information dissemination to users and potential users of Forest Service lands through marketing and interpretation.

This information would permit managers to more accurately evaluate the costs and benefits of recreation and wilderness programs and to weigh tradeoffs with other uses and values.

Technical Assistance to Private Land Owners

Private lands could provide more recreation opportunities for the public than they now do. They have the potential to help ease the uneven geographic distribution of recreation opportunity. To do so, owners need more information on management techniques and costs, earnings potential, and liability assessment. Assistance to private owners can be offered by state and local governments. Most states have agencies which provide forestry, wildlife, and conservation assistance. Many cities and towns have created parks and recreation and forestry departments with a variety of professional staff. These entities could become vital links to improving the availability of private land to the recreating public. The USDA Soil Conservation Service is responsible for providing technical assistance concerning income producing recreation on rural nonfederal lands; the Cooperative Extension Service is responsible for providing educational programs. As appropriate, the Forest Service's State and Private Forestry division could cooperate through these local, state, and federal organizations to provide information relevant to improving private lands management.

Implications for Wilderness Management

The evidence is mounting that nonrecreational uses and values of wilderness are rising relatively faster than recreational uses and values. Scientific uses, human development and spiritual growth, education, and preservation of critical wildlife, fish, and plant habitats, watersheds, and gene pools are all uses that could benefit from increased management emphasis. Guidelines are needed for coordinating management of both recreation and nonrecreation uses of wilderness areas. Forest Service research could work with the National Forest System to develop effective methods for monitoring nonrecreational uses, to quantify and describe nonrecreation demands and values, and to estimate baseline levels of nonrecreational uses of wilderness resources.

Adequate personnel must be available to monitor recreational use of wilderness, assess use impacts, and prevent abuse of fragile archaeological and ecological sites. National forest management plans should be required to include a review of all roadless areas and to recommend wilderness designation for those that would fill an ecosystem gap in the National Wilderness Preservation System (Davis 1989). Concurrent with direct management, indirect management should be implemented. Administrators and managers cannot assume the public understands the spectrum of values inherent in wilderness. Through various partnerships and outreach programs, the Forest Service can keep the public informed of wilderness values.

Recreation and Wilderness Programs Within the Context of Assessment, Program, and Policy Implications

Several general issues surround the future of the Forest Service's outdoor recreation and wilderness programs. These issues also pertain to timber, forage, and the other

forest and range land uses. The discussion that follows centers on outdoor recreation and wilderness program implications in the context of four broad questions. These four questions capture the essence of selected major forest and range resource policy issues currently being debated in general and in the Forest Service in particular.

1. What should the federal government do to ease potential shortages of outdoor recreation and wilderness opportunities?
2. What should the role of national forests be in the production of outdoor recreation opportunities and protection of wilderness?
3. Should recreation and wilderness policies for management of national forests vary among regions?
4. What role should Forest Service research programs play in the production of new information and technology needed for increased recreation opportunities?

Easing Potential Shortages of Opportunities

In this Assessment, shortages are predicted for future years if costs of opportunities do not rise and recent supply trends continue. The largest such shortages are predicted for undeveloped backcountry as well as near-road opportunities. Access to private forest and range lands, as well as public lands near populated places, are highly critical to providing sufficient opportunities. The most severe predicted shortages are for wildlife observation, day hiking, nature photography, pleasure driving, sightseeing, and similar activities. These activities depend on accessible, reasonably close, visually attractive, and relatively undisturbed natural environments. The federal government is the major holder of properties with such environments, for example, in national forests, parks, and wildlife refuges. Some of these federal properties are relatively remote and may not effectively meet future shortages. For the majority of these properties, however, the federal role is to ease future opportunity shortages by improving access to and the quality of the surrounding federal estate.

Easing potential shortages could also be accomplished, in part, by moving more toward priced admission for recreational use of federal lands. Most forms of recreation on federal lands currently require no fee. A growing acceptance of pay-as-you-go as one means for administering recreation programs may open new ways to produce modest revenues which could be used for further helping to improve access, management, and facilities.

The greatest shortages anticipated for wilderness opportunities are for nonrecreational uses. About 89 million federal acres are in the National Wilderness Preservation System as of 1988. These acres offer great potential for increasing nonrecreational uses. One way to encourage nonrecreational uses without generating user conflict is to redirect some recreational uses to the 100 million federal acres of wild, remote, but undesignated land.

Role of National Forests in Producing Outdoor Recreation Opportunities and Protecting Wilderness

National forests currently accommodate a wide range and large quantity of outdoor recreation activities and visitors. The emphasis is mostly on traditional uses, such as sightseeing, camping, and hiking. National forest campgrounds and other developed sites have tended toward the less-developed end of the facility spectrum. The Forest Service generally has sought to control new uses so as to limit possible adverse effects on the resource and on the traditional uses. This has generally been consistent with the desires of traditional forest users. However, the demands for less traditional national forest activities, such as trail biking, river rafting, and skiing, are growing fast. Moreover, many people, particularly in urban areas, do not use national forests and for many different reasons. A new recreation initiative, the National Recreation Strategy, has been instituted by the Forest Service in an attempt to be more responsive to the public's outdoor recreation demands and to accommodate both nontraditional, as well as traditional, uses.

To meet the public's preferred demand for outdoor recreational opportunities, high rates of opportunity expansion (about 1% per year) will be needed for some activities. Downhill skiing capacity must expand 40% in the next 50 years to meet the predicted demand. National forests cannot offer unlimited recreational expansion because the Forest Service is a multiple use agency and must accommodate many uses. But, increased publicity about opportunities, more conveniences such as modern toilets, better signing, stores, vistas, fitness trails, educational offerings, and improved access would better meet modern recreation demands.

As has been emphasized, national forests can conserve American wilderness best by adding unique or representative ecosystems to the NWPS, by protecting designated wilderness areas from over-use, and by educating the public on the nonrecreational values of wilderness.

Variation of Policies Among Regions

National forests and other public and private lands are quite different in character, availability, and concentration between west and east. Major distinctions also exist among Forest Service regions. Wet coastal forests, for example, differ dramatically from drier interior forests, and the two environments cannot equally accommodate the same uses. Other forest uses, such as timber, grazing and wildlife habitat, also vary substantially between and within regions. The potential of these other uses to expand affects recreational opportunities.

Some national forests, particularly those mountainous forests in New England, the Appalachians, the Rockies, and the Pacific Coast, are nearer urban populations. They provide highly attractive natural settings and are very popular. Consequently, they have significantly different constituent groups than more remote forests. Such constituent groups have active interests in the future of these

forests. Resource and optimal use differences, urban proximity, and different constituency interests strongly imply that some differences in recreation and wilderness policies among and within Forest Service regions may be desirable. Different policies imply emphasizing different uses in different places. For the future and on a few forests, a need will exist to emphasize recreation, education, and public service more than commodity production. This may be especially true in the southern Appalachians and along Colorado's Front Range and in California. In economically depressed areas and for the urban poor, a waiver of fees may be advisable. In Alaska, where subsistence uses of wilderness may be essential to remote residents' way of life, some hunting and gathering may need to be continued. Overall, however, the need is for a consistent set of policies which permit flexible consideration of fees, use, and management according to regionally different demands, user preferences, and opportunity conditions.

Role of Forest Service Research

Over the years, the Forest Service has been a leader in outdoor recreation and wilderness research. For example, the President's Commission on Americans Outdoors relied heavily on information from Forest Service research. Likewise, Forest Service researchers have made highly significant contributions to theory, methodology, and management applications to recreation and wilderness resources. Many experts from state and local agencies and from many universities have worked cooperatively with Forest Service researchers in a very productive relationship.

The future roles for Forest Service research in outdoor recreation and wilderness will be even more challenging. To meet anticipated needs, research should encompass the task of defining and maintaining outdoor recreation databases cooperatively with other providers. It should also encompass theory advancement to enable better understanding of human values and behaviors and of human and natural environmental relationships. It would further need to focus on improving methods for carrying out applied works in economics, sociology, and other social and related sciences. A broad front of research activity will be needed if future growth and shortages of recreation and wilderness are to be effectively addressed. In addition to contributing research directly, one of the essential and historically significant roles that Forest Service research has played is to stimulate other agency and university research in areas of highest need. A more detailed examination of past, present, and future research was developed by Cordell (1988).

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