



The State of the Great Outdoors

America's Parks, Public Lands, and
Recreation Resources

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 **RESOURCES**
FOR THE FUTURE

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Preface

This report is an independent assessment of trends in the demand and supply of outdoor recreation resources, open space, and conservation lands in the United States over the past quarter century and an assessment of public and private sector funding and financing of conservation and recreation. Much of the work is retrospective, looking at historical trends in how outdoor resources are managed and used and evaluating success stories. Perhaps more important, the study looks ahead, examining how emerging trends will shape the use of outdoor resources in years to come. In addition, several areas are identified where additional research is needed.

Resources for the Future (RFF) undertook this work in conjunction with the Outdoor Resources Review Group (ORRG), a private, bipartisan assemblage of public officials and recreation professionals that has conducted a review of priorities, challenges, and opportunities in managing the nation's land and water resources. Senators Jeff Bingaman (D-NM) and Lamar Alexander (R-TN) served as honorary co-chairs of the group, which released its policy report in July 2009.

The ORRG commissioned RFF to conduct independent research to inform the group's deliberations and to serve as a source of information and analysis for the broader policy community. This study is the result of that effort. It is based on RFF's collection and analysis of a wide variety of data, some primary analytical research, and literature reviews. It was also bolstered by meetings, discussions, and conversations with an extensive group of experts from the fields of conservation, land use, public health, and recreation. RFF also undertook original surveys of state and local parks officials to ascertain their needs and priorities. In the series of formal ORRG meetings held in 2008 and 2009, RFF presented preliminary research findings. Subsequent discussions helped to inform and improve the final product. (A full list of meeting participants

and contacts associated with the ORRG effort, along with background and commissioned papers, can be found at www.rff.org/ORRG.)

We would like to thank all of the ORRG members for their valuable feedback (please see the list of members that follows). In particular, we are grateful to Henry Diamond, Patrick Noonan, Douglas Wheeler, Gil Grosvenor, and Gordon Binder for guidance in focusing our research and for reviewing and commenting on our background papers, presentations, and preliminary findings. Any remaining errors are our own.

We are also grateful to the following individuals for providing information and data: Peter Harnik, Ben Welle, and Colleen Gentles, Center for City Park Excellence, Trust for Public Land; Andrew du Moulin, Conservation Finance Program, Trust for Public Land; Ken Cordell, Carter Betz, Don English, and Todd Harbin, U.S. Forest Service; Ben Simon, U.S. Department of the Interior; Ross Gorte, Congressional Research Service; Wen-Huei Chang, U.S. Army Corps of Engineers; Ron Fowler and Kevin Kilkullen, U.S. Fish and Wildlife Service; Mary Katherine Ishee, private consultant; and James Strittholt and Kai Henifin, Conservation Biology Institute.

The following individuals provided helpful comments and expertise as we drafted background materials: Thomas Gotschi, Rails-to-Trails Conservancy; Christopher Douwes, U.S. Department of Transportation; Michael Wilson and Wayne Strum, National Park Service; Mark Shaffer, Doris Duke Charitable Foundation; Phyllis Myers, State Resource Strategies; Christy Plumer, The Conservation Fund; Luther Propst, Sonoran Institute; and Peter Harnik, Center for City Park Excellence, Trust for Public Land.

We thank the following individuals for their valuable assistance with our survey efforts: Phil McKnelly, National



Association of State Park Directors; Catherine Nagel, City Parks Alliance; Rich Dolesh, National Recreation and Park Association; Yvonne Ferrell, formerly with the National Association of State Outdoor Recreation Liaison Officers; and Joseph Wynns, National Recreation and Park Association and formerly Indianapolis Department of Parks and Recreation.

This study benefited from the expertise provided by the following consultants who provided background research: Geoffrey Godbey, Pennsylvania State University; Rick Frank, Center for Law, Energy, and the Environment, University of California, Berkeley; Jan Stevens, California Attorney General's Office (retired); Daniel Morris, Resources for the Future; and George Siehl, Pennsylvania State University, Mont Alto.

We are grateful for the excellent research assistance provided by Jeffrey Ferris and Joseph Maher of RFF who worked diligently to compile data, facts, and background information on a number of important issues. This report would not have been completed without their valuable assistance. The following RFF staff members were also instrumental in supporting our research efforts and producing this report: Peter Nelson, Stan Wellborn, Felicia Day, and Adrienne Foerster.

Funding for the overall efforts of the ORRG was generously provided by the Laurance S. Rockefeller Fund, American Conservation Association, Richard King Mellon Foundation, and David and Lucile Packard Foundation. Grant funding to conduct this research was provided to RFF, in turn, by The Conservation Fund. We would also like to acknowledge the financial support provided by the Environmental Systems Research Institute, Inc. for our geospatial analysis.

Resources for the Future is an independent, nonpartisan think tank that, through its social science research, enables policymakers and stakeholders to make better, more informed decisions about energy, environmental, natural resource, and public health issues. The work undertaken in this study builds on RFF's legacy of work on land use, conservation, and recreation pioneered in the 1950s and 1960s by Marion Clawson, John Krutilla, and others.

Throughout its 55-year history, RFF has earned a reputation for conducting timely, high quality policy-oriented research that has a real impact. RFF actively shares the results of its work with policymakers in government at all levels, environmental and business organizations, academicians, the media, and the interested public. RFF neither lobbies nor takes positions on specific legislative or regulatory proposals.

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Executive Summary

Natural landscapes, parks, and open space provide a range of benefits to society that have been documented and quantified in a variety of studies. These public goods are provided, for the most part, by government, and policymakers need information and analyses to determine how much to provide, what types of lands should be protected, and how to go about protecting them. In this report, we provide some of this information by summarizing trends in outdoor recreation resources supply over the past quarter century, assessing and reviewing a variety of measures of the demand for outdoor recreation, and describing the complex landscape of funding and financing for outdoor resources.

Our review follows in the footsteps of the Outdoor Recreation Resources Review Commission (ORRRC), which published its highly influential report on the status of America's outdoor resources in 1965; the 1983 Outdoor Resources Review Group; and the follow-on effort of the President's Commission on Americans Outdoors (PCAO) in 1987. It also serves as a companion to the policy recommendations report of the 2009 Outdoor Resources Review Group.¹

Supply of Open Space, Conservation Lands, and Recreation Resources

The United States has substantial open space and protected public lands. However, additions to the federal estate have leveled off in the past 20 to 30 years. Approximately 655 million acres are managed by the National Park Service, Bureau of Land Management, Forest Service, Fish and Wildlife Service, Army Corps of Engineers, and Bureau of Reclamation. These federal public lands are not uniformly distributed across the

United States. Eighty-nine percent of the acreage managed by the National Park Service is located in the 13 western states and 67 percent in Alaska alone. Bureau of Land Management (BLM) and Forest Service lands are also concentrated in the West. State park acreage has grown since the late 1970s but not substantially. Moreover, state parks vary widely across states.

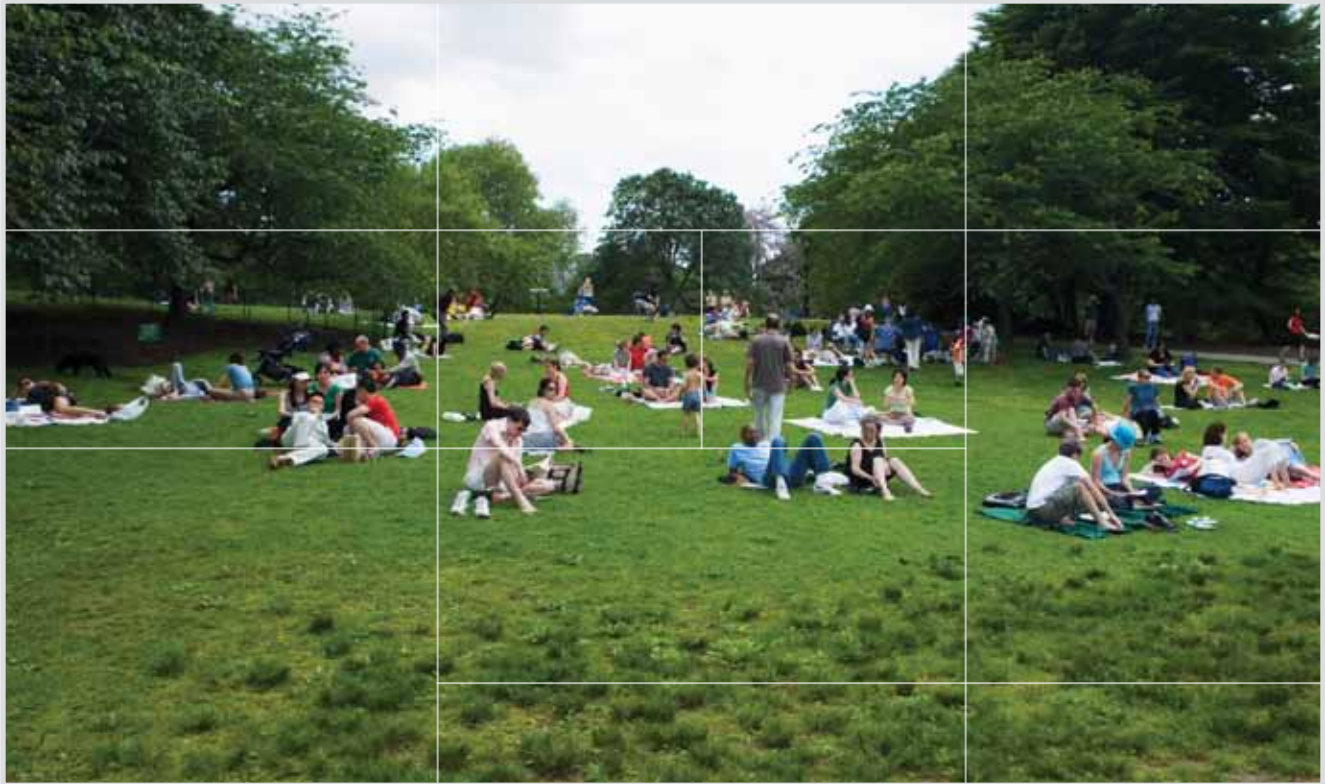
Unfortunately, because there is no systematic collection of data on parks owned and maintained by city and county governments, we are unsure about the trends in local park acreage. One theme of our findings throughout this study is the paucity of data on local parks and open space and the need to remedy this problem.

Although acreage in conservation, open space, and parks has held constant, if not risen slightly, we identified several problems that have come up in recent years related to a deteriorating capital stock and deferred maintenance in national parks, wildlife refuges, national forests, Corps of Engineers and Bureau of Reclamation sites, and state and local parks. Almost across the board, these recreation providers have listed a litany of issues related to inadequate funds and staffing to address aging infrastructure and unanticipated new problems.

Climate change is the most serious problem facing public land managers in the near future, and one of the most urgent issues for policymakers is development of climate adaptation policies. Warmer temperatures, less precipitation in some parts of the country, more precipitation in others, stronger storms, and rising sea levels have led experts to predict serious impacts on many outdoor resources in the upcoming years, and some problems have already manifested themselves.

Growth in private conservation lands has proved to be one of the biggest changes since the 1980s. There

¹ For a history of these review commissions and summary of their findings and recommendations, see Siehl (2008). Information about the ORRG efforts and a link to the group's final report can be found at www.rff.org/orrg.



were approximately 400 local land trusts in the United States in 1980; by 2005, that number had more than quadrupled to 1,667. These local land trusts and four major national land trusts—The Nature Conservancy, The Conservation Fund, Trust for Public Land, and Ducks Unlimited—have protected an estimated 37 million acres. This is more than the total lower-48 acreage of the National Park Service (NPS).

Demand for Outdoor Recreation

Some observers have pronounced a decline in participation in nature-based activities in recent years, particularly among children. Other authors have countered that although there have been shifts in the kinds of activities people engage in outdoors, there is no evidence of a general decline. To sort out these conflicting claims, we looked at a variety of data on participation in outdoor activities and visits to public recreation sites. Our findings present a mixed message and suggest a need for further research.

Visits to public lands have generally stayed constant or declined slightly since the late 1970s and early 1980s. This appears to be true for sites managed by

the National Park Service, BLM lands, Army Corps of Engineer projects, and state parks. Unfortunately, a consistent time series on visits to national forests is unavailable except for the 2000s. Thus we are unable to draw a conclusion about visits to those lands. And again, a data vacuum exists at the local level. Our survey of local park directors and data collected in recent years on a limited set of large cities seem to suggest that local parks are heavily used, but without more systematic data on a broader set of localities, it is difficult to draw strong conclusions.

An additional measure of outdoor recreation demand is available from three national surveys. These surveys rely on phone or Internet questionnaires of a random sample of U.S. residents and generally ask whether respondents participated in particular recreational activities in the past 12 months. They also ask about the number of days or times a person participated.

These surveys do not provide a consistent picture of participation in outdoor recreation nor of the trends over time. In general, participation rates from the National Survey on Recreation and the Environment (NSRE), a Forest Service survey carried out in conjunction with two universities, are higher than



those of the Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) survey conducted by the Fish and Wildlife Service and Census Bureau and also higher than the most recent results from a survey by the Outdoor Foundation, a private nonprofit organization. In addition, the FHWAR survey shows declining participation in fishing and hunting since the early 1980s, a trend not confirmed in the NSRE.

The FHWAR survey focuses only on fishing, hunting, and wildlife watching. The Outdoor Foundation includes many different activities but has not used a consistent survey methodology over time. Only the NSRE is capable of describing trends over a long period of time for a wide range of activities. We examined seven specific activities and found that, according to this survey, participation rates either increased or held steady for all of them between 1982 and 2008.

These three surveys require respondents to recall their activities over the past several months and do not ask about the amount of time spent in various activities. An alternative data source that overcomes these problems and that is underused in the study of trends in outdoor recreation is the American Time Use Survey

(ATUS). The ATUS has been conducted annually by the Bureau of Labor Statistics since 2003 and periodically before that by various university centers as far back as 1965. Our analysis of the data shows that time spent in outdoor recreation rose considerably between 1965 and 2007. However, most of the increase took place before 1993; a decline occurred between 1993 and 2003, followed by an uptick between 2003 and 2007. Our statistical analysis of the ATUS data shows that demographics such as number of children, education, and age play a big role in time spent in outdoor recreation but that so too does the amount of leisure time a person has. In fact, leisure availability seems central in explaining the increase in participation over the 1965 to 1982 period and also in explaining a recent drop-off.

Understanding children's engagement in outdoor pursuits is of keen interest. Researchers have documented health problems related to obesity, and others are concerned about a lack of connection to nature. Although trend data is lacking, we examined recent data from three new national surveys: the teenager (age 15 to 19) sample of the ATUS; the National Kids Survey carried out in 2008 and 2009 by the NSRE researchers, which covers 6- to 19-year-olds; and the

2008 Outdoor Foundation survey, which included 6- to 17-year-olds. Again, some differences show up among the surveys, though in this case differences in the survey questions make comparisons more difficult. The ATUS teen sample shows much lower average weekly time spent in outdoor activities than the National Kids Survey, and although comparisons with the Outdoor Foundation survey are more tenuous, participation rates in that survey appear lower than in the National Kids Survey. Some of these samples are small and only limited information is available thus far; going forward, we need better information on children and the outdoors and more sophisticated analysis of the data as they become available.

Characterizing trends in outdoor recreation demand over the past 25 years is thus difficult. We conclude that visits to federal lands and state parks are holding steady at best; on a per-capita basis, the trends seem to be slightly downward. We also conclude that fishing and hunting have dropped off in recent years; a number of studies and surveys support this conclusion. The factors put forward by many experts to explain this decline—lack of access due to development of private land on the urban fringe, restrictions on public lands, fees, increasing urbanization, and reductions in

leisure time—may affect participation in other outdoor recreation, particularly time intensive activities such as backpacking, rock climbing, kayaking, camping, and the like. Our statistical analysis of time-use data highlighted the importance of leisure time availability in explaining time spent in outdoor recreation. Further investigations into the importance of free time, along with the other factors that have been mentioned, would be useful. In particular, we feel that more use should be made of the extensive GIS data available on protected lands to see how access and proximity to particular outdoor resources affect recreation participation and time spent in outdoor pursuits.

For activities that are closer to home and not time-intensive, such as walking and bird watching, some evidence from one of the national surveys indicates that trends may be upward. Unfortunately, a serious gap in data and knowledge exists about use of local parks and participation in outdoor recreation in urban areas. From the very limited information available, urban parks and recreation areas appear to be widely used. However, the extent to which available resources are meeting the needs of urban populations is unclear. Finally, understanding how demographic changes in the future will affect demand is critical.



Funding and Financing Conservation, Parks, and Recreation Lands

We found significant changes over the past quarter century to the landscape of funding for conservation and recreation. Some federal programs have diminished in importance and new ones have been created.

States are more engaged than in the past and several have sophisticated funding efforts under way. At the local level, governments have turned to the voters with conservation and recreation financing referenda. Additionally, private conservation financing, only in its infancy at the time of the 1987 President's Commission on Americans Outdoors, has grown rapidly, spurred on by federal regulations.

The principal federal funding source for federal land acquisition and grants to state and local governments since 1965 has been the Land and Water Conservation Fund (LWCF). By most accounts, the LWCF has been a major factor in the growth in public protected lands across the country—over 7 million acres of land has been permanently protected through direct acquisition and substantially more has been statutorily protected through development projects. Nonetheless, the LWCF has declined in importance. State grants are so low that many states do not bother applying for them. Funding has also been diverted to other uses besides land acquisition in recent years.

Our research indicated, however, that a multitude of other programs now exist at the federal level for funding land conservation activities. We identified more than 30, many initiated in the 1990s and 2000s. In FY2008, total funding for these programs was more than \$6 billion. The programs deal with habitat conservation and restoration, development of trails, urban parks, wetlands, forests, and farmland and are managed by nine different agencies. They are funded in a variety of ways and the money is spent in different ways. These programs are not, however, a substitute for the LWCF. The bulk of the money—two-thirds in FY2008—is spent on the programs specified in the Farm Bill. The Conservation Reserve Program, at \$1.9 billion, is the largest single federal conservation program. It is important to point out that the CRP keeps land in private landowners' hands, does not permanently protect land from development, and does not require landowners to allow public access.

An overarching evaluation of these federal programs was beyond our scope in this study but seems in order. As more than 30 separate programs exist, an

examination that looks across programs to see what conservation and recreation benefits are achieved at what cost, analyzes the extent to which programs are redundant or complementary, and identifies remaining gaps would be extremely beneficial. With climate change and other problems on the horizon, as we have explained, this overall assessment is even more crucial. Are these programs prepared to deal with the problems of the 21st century?

In addition to federal funding programs, many states have created their own conservation funding programs and tax incentives in the past twenty years. Some states spend significant sums of money and have sophisticated programs that reach across a variety of activities and levels of government. We highlighted five such programs—in California, Florida, New York, Colorado, and Maryland—and summarized the range of activities across all states. Our research identified 79 programs in 43 states totaling \$3.3 billion in FY2008.

Fifteen states provide income tax credits for conservation land or easement donations. These are also relatively new phenomena—with one exception, all of the programs have been adopted since 1999. In states that have a sizable credit or make that credit transferrable, research has found that the programs have had a significant impact on acreage conserved. In programs with smaller credit values, however, the impact appears to have been small.

We identified three other new funding and financing trends: private conservation financing spurred by wetlands and endangered species regulatory requirements; the use of local voter referenda to raise funds for conservation, open space, and parks; and growth in park foundations, conservancies, and other nonprofit groups that work on behalf of state and local parks.

The wetlands and endangered species regulations have spurred the use of mitigation banks, preserved parcels of land that meet particular requirements and from which regulated entities can buy credits. Although the acreage affected is not yet large, these programs hold potential as a cost-effective way to meet regulatory requirements and to do so in a way that creates better land conservation outcomes.

State and local ballot initiatives have become an increasingly popular way to raise money for land conservation activities. Since 1988, \$122 billion has

been approved through referenda and 76 percent of the initiatives placed on ballots have passed. Research shows a disparity across states and regions, however. Some states have passed no ballot initiatives, yet others have passed several. Massachusetts and New Jersey, which provide state matching funds for any funds raised locally, have had a disproportionate share of referenda; California has accounted for the lion's share of dollars raised.

Beyond referenda, disparity across states is quite evident with the new funding landscape. Some states do a lot and others do very little. Furthermore, the rise of state and local park conservancies, “friends” groups, and foundations has benefited communities unevenly. These private groups provide funding and volunteer time for individual parks and park systems, but although they are important contributors in some communities, in others they are nonexistent.

A full analysis of the geographic disparity in conservation funding and outcomes was beyond the scope of this report. Sizable differences exist and our work makes that clear. But a more careful and systematic accounting seems called for. Moreover, if there is significant geographic variation, what it means is less clear. Is it an instance of

the “voting with one’s feet” phenomenon, in which people gravitate to communities that provide the combinations of taxes and public goods that match their preferences and needs? If so, the implication is that the diversity in conservation and recreation outcomes is not necessarily a bad thing. On the other hand, it might also be the case that citizens in communities with very little open space and conservation and few recreation opportunities—and limited funding to provide such resources—are being denied equality of access. As we explain, many observers have emphasized that developing good environmental stewards of tomorrow depends critically upon exposure to and enjoyment of nature today. Further analysis of these issues would be beneficial.

Finally, with several important changes on the horizon—not the least of which is global climate change—it is important to ensure that our conservation funding programs are set up to handle those changes. Land managers at public agencies need to have the resources to undertake appropriate adaptation measures to combat the effects of climate change, and many programs may need to redirect their funding and activities to adapt to a new world. Policymakers need to design adaptation policies that lead to the best outcomes with the resources that are available.





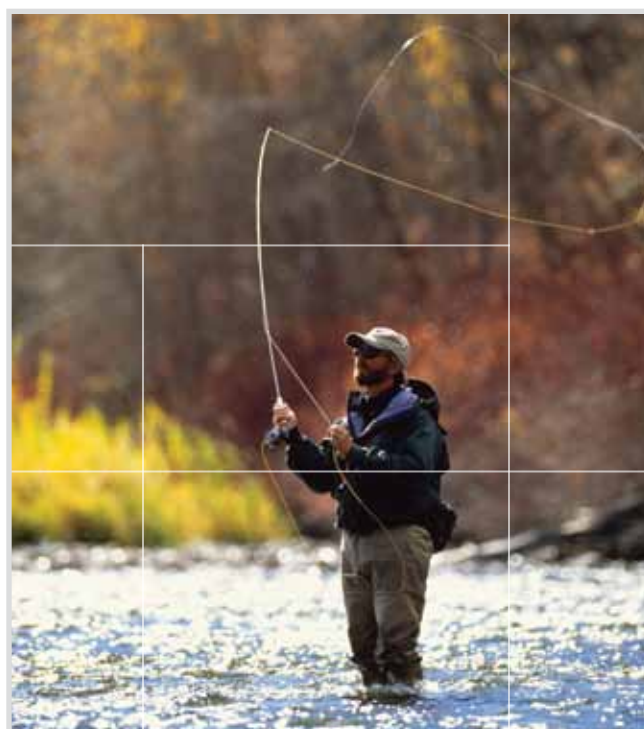
Introduction

In the latter half of the twentieth century, two significant national reviews of American outdoor recreation resources were undertaken. The first, by the Outdoor Recreation Resources Review Commission (ORRRC), operated from 1958 to 1962 and culminated in a five-volume report with wide-ranging impacts. The second, the President's Commission on Americans Outdoors (PCAO), was established in late 1985—on the recommendations of a smaller and more ad hoc 1983 group, the Outdoor Recreation Policy Review Group—and published its report in 1987. Both studies assessed available land and water resources in the United States, the demand for outdoor recreation activities, and the policies to finance and manage the use of public recreation assets and programs. The ORRRC report is widely credited with several major federal programs, most notably the Land and Water Conservation Fund. The PCAO had less direct impact at the federal level but is said to have spurred state and local governments to embark on many new programs, including a focus on greenways (for an in-depth review, see Siehl 2008).

In this report, we follow in the footsteps of these earlier efforts and assess the supply of outdoor resources in America, the demand for outdoor recreation, and the complex layout of public and private sector funding and financing of outdoor resources. Our review is primarily retrospective and focuses on the past quarter century of trends, though in some cases we look at trends farther back in time.¹ We also identify several emerging areas of concern that deserve policymakers' attention. In addition, we note gaps in knowledge and topics that deserve further research and analysis.

¹ Other authors, most notably Ken Cordell of the U.S. Forest Service and his colleagues, have conducted reviews of outdoor recreation and produced reports on various outdoor recreation topics (see Cordell 2004; Cordell et al. 1999; see also <http://warnell.forestry.uga.edu/nrrt/nsre/IrisReports.html>). These reviews have followed the trends in outdoor resources supply, usually with a Forest Service focus, and recreation demand. Funding and financing issues, however, have not been a key element.

Our nation's open spaces, natural areas, and parks are an integral part of the American identity. From iconic national parks such as Yellowstone and the Grand Canyon to local parks, forests, and wetlands, the United States has a large and varied outdoor resource base. These public goods provide a range of social benefits—scenic views, wildlife habitat, stormwater management, and recreation opportunities, to name just a few. Several studies by economists have attempted to estimate these nonmarket benefits. McConnell and Walls reviewed more than 60 studies of the value of open space—studies that cover different kinds of parks, wetlands, forest reserves, urban greenbelts, farmland, and other kinds of open space (2005). They found that values, estimated by hedonic property techniques and contingent valuation



survey methods, are considerable for most kinds of open space and particularly for natural areas. John Loomis and his colleagues reviewed the extensive literature on recreational values of public lands (see Rosenberger and Loomis 2001; Kaval and Loomis 2003; Loomis 2005; Kaval 2007). These authors calculated an average annual national recreation value for federal lands as high as \$55 billion and pointed out that adding state and local parks would greatly increase this number (Kaval 2007).²

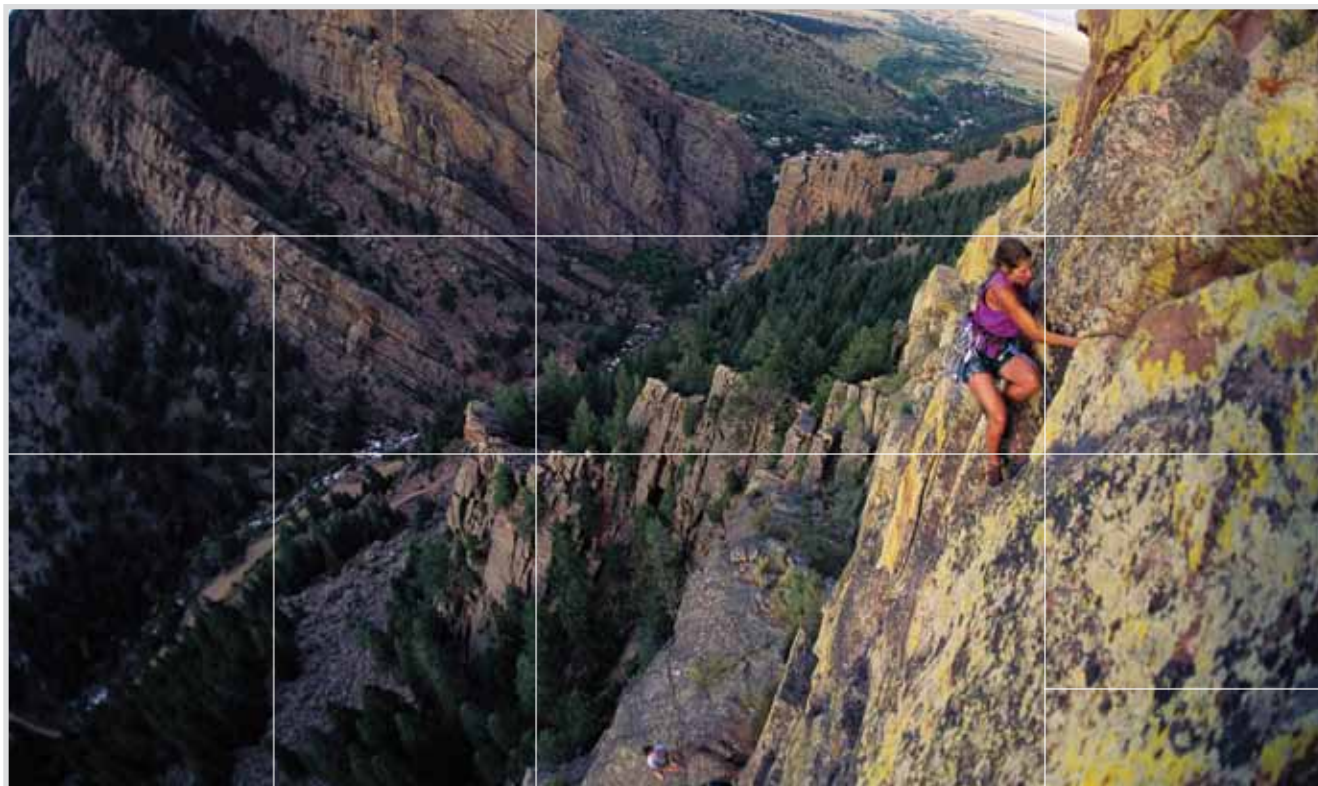
These estimates indicate the value of our nation's public lands and the importance of getting policy right with respect to them. Another key finding in the reviews is how widely the estimates can vary depending on the types of lands, the location, and other characteristics. Policymakers thus need good information on the status of recreation and conservation assets—how the quality and availability of resources have changed over time and the geographic variation in resources. They also need to know the trends in use of such resources by the American public. What do surveys tell us about participation in specific outdoor activities and what are park visitation trends? What changes have occurred,

and are expected in the future, in demographic and socioeconomic factors that will affect recreation demand? How is the country paying for what it provides? Policymakers need to assess whether enough money is available and whether that money is targeted in the right way. This study seeks to provide such information.

Chapter 2 begins by examining trends in supply. We describe acreage managed by the four main federal land-management agencies—the National Park Service, Bureau of Land Management, Forest Service, and Fish and Wildlife Service—as well as that managed by the Army Corps of Engineers and Bureau of Reclamation. We detail the geographic dispersion of these lands and look at how acreage has changed over time. We also talk about state parks and, as best we can, city parks. As we note throughout this report, consistent national data on city parks are unavailable. We discuss issues of concern related to declining quality and deteriorating infrastructure in many parks and recreation areas, and we end the chapter with an outlook on the most significant problem on the horizon, climate change.

Chapter 3 assesses outdoor recreation demand. We display a range of annual visitation data for federal sites and state parks and again, as best we can, we provide

² Recreation values are usually estimated by either contingent valuation methods or the travel cost technique pioneered by Marion Clawson (1959; 1966). For a discussion of recreation demand models based on travel costs and the estimation of benefits, see Phaneuf and Smith (2005).



information on city park use. We then describe findings in three national recreation participation surveys. One puzzle is the discrepancy in findings across these surveys, an issue that we argue deserves further study and attention. We then assess trends since the 1960s in time spent in outdoor recreation activities as reported in the American Time Use Survey, a national survey conducted by the U.S. Bureau of Labor Statistics, and show the results of some statistical analysis of these data. We discuss the concern over children and the outdoors and what recent survey data shows about time spent by youth in outdoor recreation, emphasizing issues that deserve further study.

Chapter 4 untangles the complicated web of federal, state, local, and private financing of conservation and outdoor recreation. It is in this area that the biggest changes have occurred since the 1987 PCAO review. We identify more than 30 federal programs, 20 of which were begun in the 1990s or 2000s, and 84 state programs. Although a full analysis of these programs is well beyond the scope of this report, we describe the wide range of resources these programs are targeting—trail construction, park development, wildlife habitat restoration, wetlands renewal, farmland preservation, protection of urban forests, and more. We also chronicle

other financing arrangements developed since the 1987 review: conservation tax credits, mitigation banks, state and local referenda, and private nonprofit park conservancies and foundations.

The report attempts to provide a foundation of information on demand and supply of outdoor resources and to prompt policymakers to undertake further study of key issues. Chapter 5 summarizes our findings and assesses the key emerging trends policymakers should be aware of, highlighting areas where new data and research are important. These needs revolve around climate change, a better understanding of recreation demand (particularly among American youth), better data and understanding of needs versus resources at the urban level, and a more complete analysis of the federal funding landscape, including an assessment of how programs can be better integrated to achieve coordinated outcomes.





2

Supply of Recreational Resources, Public Lands, and Open Space

In terms of geographical area, the United States is the third-largest country in the world. With 3.8 million square miles of land and water and an average population density of only 80 people per square mile, the country is rich in open space. Moreover, the topography and climate of the nation are varied. With rolling hills, deciduous forests, plains, and western mountain peaks above 14,000 feet, the continental United States has a varied terrain. Its climate also varies, from arid and semiarid west of the 100th meridian and desert in the Southwest, to humid continental and subtropical east of the 100th meridian, and even tropical in southern Florida. Hawaii and Alaska provide their own unique climates and resources. These attributes indicate the potential for America to provide extensive and varied recreational opportunities.

In this chapter, we show exactly what is provided—from federal protected lands to state and local parks. We point out the trends in land uses across the United States over time; in acreage provided through national, state, and local parks; and in acreage provided by other federal land-management agencies. We also discuss issues that affect the quality of these lands and their potential to provide recreation services and highlight changes that are on the horizon.

Major Uses of Land

Ninety-one percent of the continental United States is cropland, pasture, or forest, and this percentage has declined only slightly over the past half century, from 97 percent in 1954. When Alaska and Hawaii are included, the percentage is higher. The amount of land in parks and wilderness areas—which include all state and national parks and state forest preserves, wilderness areas administered by the U.S. Forest Service and Bureau of Land Management, and wildlife areas administered

by the U.S. Fish and Wildlife Service and state wildlife agencies—makes up only a small percentage of the total but has risen sharply.¹ In 1954, that category of land use made up only 1.6 percent of the continental total. By 2002, the figure had risen to 5.8 percent.

Figure 2-1 shows the percentages of total land in the lower 48 states attributable to each of five major uses—pasture, cropland, forest, parks and wilderness areas, and urban. Urban areas are defined by the U.S. Census Bureau as densely populated areas with at least 50,000 people (urbanized areas) and densely populated areas with 2,500 to 50,000 people (urban clusters).² Urban areas were 1 percent of total land area in 1954 but more than triple that, 3.4 percent, in 2002.

In some regions, the changes are more dramatic, particularly in the parks and urban categories. Figure 2-2 shows the percentages of total land area in urban and either park or wilderness use in the Northeast, which includes 11 states, from Maine in the north to Maryland in the south (as well as the District of Columbia), and the Pacific region, which includes California, Washington, and Oregon.

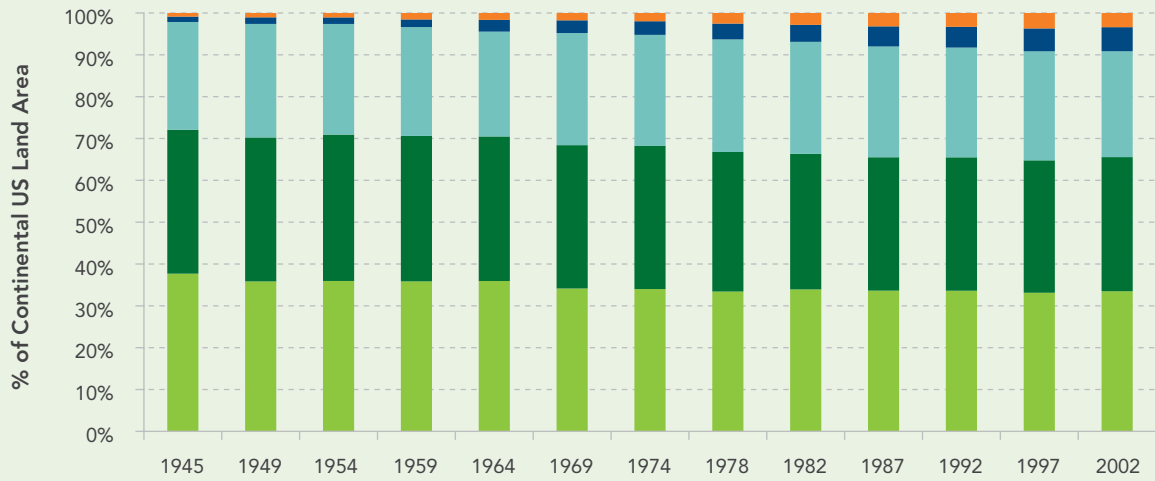
The increases in urban uses and parks and wilderness areas we saw in Figure 2-1 are highlighted in Figure 2-2 as well. However, the changes are more pronounced and vary across the two regions. The Northeast has seen a sharper rise in urban land uses—increasing to above 12 percent in 2002, far above the national average. The three states in the Pacific region, on the other hand, have seen parks and wilderness areas increase dramatically. In 1964, the Pacific region had 6 percent of its land in parks and wilderness; by 2002, that figure had risen to 14 percent. All regions of the country show increases

¹ Parks are estimated to account for 13 percent of forested lands, so the Forest Service estimate of forest acreage is reduced by this amount and the parks and wilderness category increased.

² Urban parks are included in the urban land-use category.

FIGURE 2-1

Major Uses of Land in the Continental United States

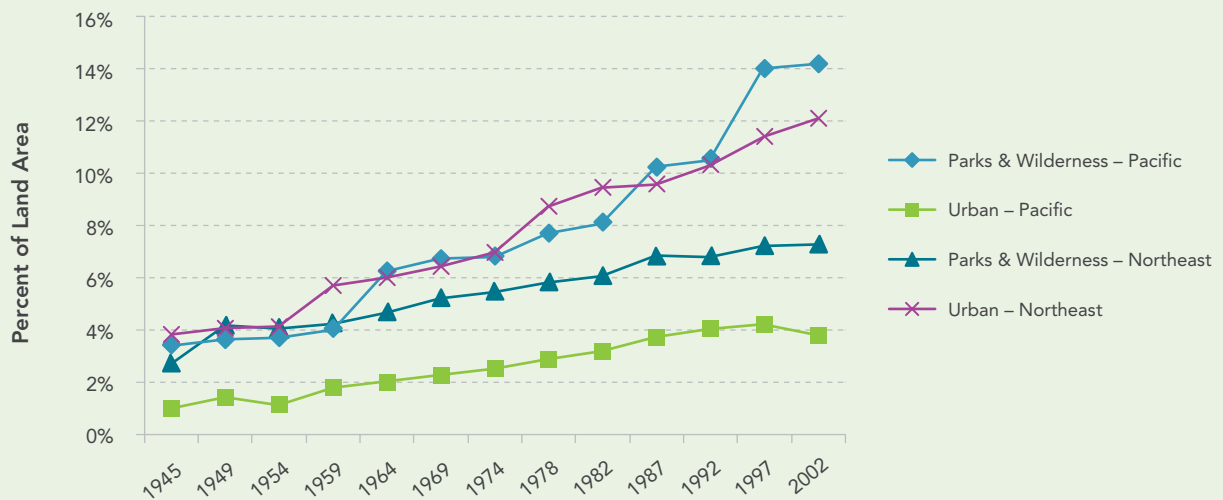


Source: USDA 2007a.

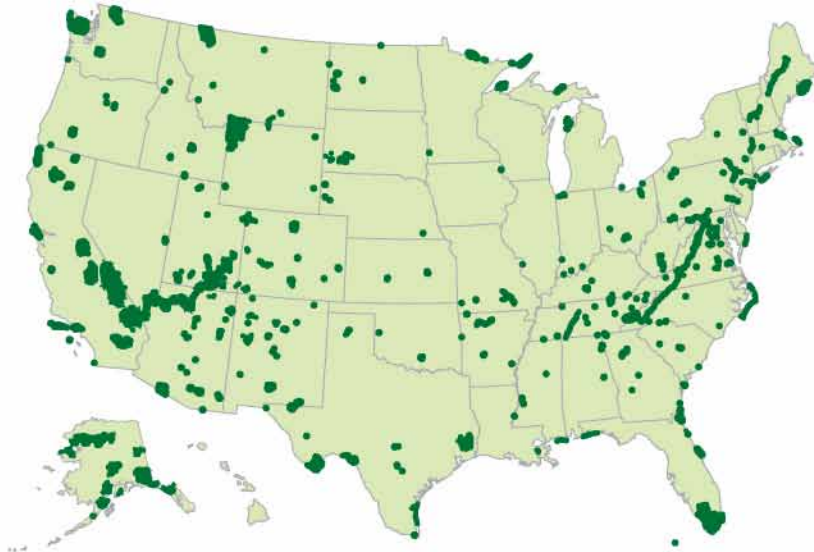
Urban Parks/Wilderness Cropland Forest Pasture

FIGURE 2-2

Parks & Wilderness & Urban Land Uses in Pacific & Northeast Regions



Source: USDA 2007a.

FIGURE 2-3**Lands Managed by the National Park Service**

Source: Conservation Biology Institute, World Wildlife Fund 2008.

Note: Map created by RFF using GIS data from the Protected Areas Database (PAD), version 4. For a description, see <http://www.consbio.org/what-we-do/protected-areas-database-pad-version-4/?searchterm=pad>.

in both of these land-use categories, but the levels and rates of change vary. Also, as we will see, the geographic distribution of public parks and conservation lands is uneven, with the western states having much more public land.

Federal, State, and Local Parkland

Lands owned and managed by the government and designated as parks or recreation areas are clearly managed for public recreational use. These include lands managed by the National Park Service, state parks, and local parks and recreation areas. We address each of these in turn.

National Park System

The National Park Service (NPS), a bureau within the U.S. Department of Interior (DOI), is responsible for managing 391 sites—including national monuments, national recreation areas, national rivers, various types of historic sites, and national parks. These areas cover 84 million acres. Some of the sites, such as Yellowstone National Park and the Grand Canyon, are iconic symbols of America. But the National Park Service also manages a number of small historical sites, military parks, scenic

parkways, the National Mall in Washington, DC, and a variety of other protected locations. The appendix at the end of this chapter lists the various designations of protected lands managed by the National Park Service and includes a brief description of each.

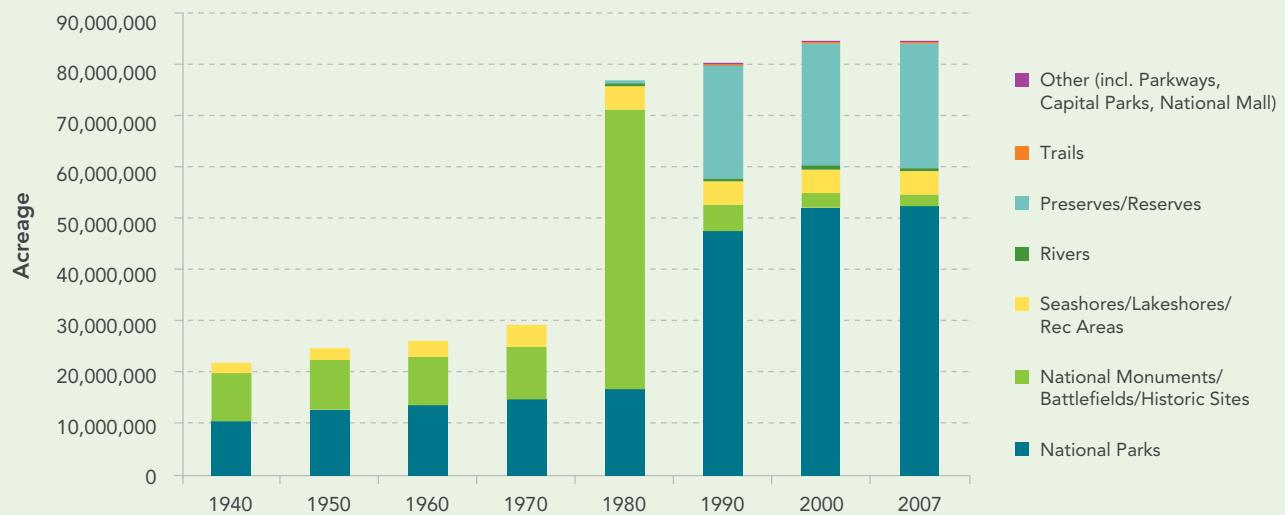
The largest national park is Wrangell-St. Elias National Park and Preserve in Alaska, which encompasses more than 13 million acres. The smallest is the Old Stone House, covering less than 1 acre in Rock Creek Park in Washington, DC. Death Valley is the largest in the continental United States and stretches over 3.3 million acres. Figure 2-3 is a map of all U.S. Park Service lands. Every state except Delaware has a site, but 89 percent of the Park Service acreage lies in the 13 western states, with nearly 67 percent in Alaska alone.

Figure 2-4 provides a snapshot of the growth in acreage managed by the Park Service since 1940 by type of unit. The bulk of the acreage falls into the national park category, with national preserves and reserves and national monuments making up most of the remaining acreage.³ The figure highlights the enormous growth

³ We have included national military parks and various historic sites and parks in this category but most of the acreage is comprised of national monuments.

FIGURE 2-4

Trends in Acreage Managed by the National Park Service



Source: NPS n.d., a.

Note: Because their acreage is small by comparison, some categories fail to adequately show up on the graph.

in acreage in the 1970s—total acreage managed by the NPS in 1980 was 2.6 times the level in 1970. The increase in national monument acreage came mostly in 1978 when President Carter declared large areas of land in Alaska to be national monuments. Much of this land was converted in the early 1980s to national preserves and national parks. Many new lands added to the Park Service inventory since the 1980s have come in the national preserve category, with much of the acreage designated in Alaska. Total acreage has remained relatively constant since 2000.

State Parks

The more than 6,600 state park sites in the United States cover 14 million acres of land and provide a wide range of recreation opportunities in accessible, relatively close-to-home settings. In fact, with only 16 percent of the acreage, state parks serve 2.5 times as many visitors as the national park system. The systems vary widely across states, however, and have changed over time.

Figure 2-5 shows the growth in total acreage managed by state park systems over the period 1978 to 2007. Total acreage rose from 10.2 million in 1978 to just under 14 million in 2007, an increase of 37 percent. The

distribution of this acreage varies geographically. Table 2-1 shows the distribution of acreage and number of sites or areas across states in 2007. New York has 1,416 state park sites, by far the most of any state, and Alabama has the fewest at 22. Perhaps not surprisingly, Alaska has the most park acreage, with 3.4 million acres. California and New York follow with 1.6 million and 1.4 million acres,

TABLE 2-1

Distribution of State Park Acreage and Number of Sites

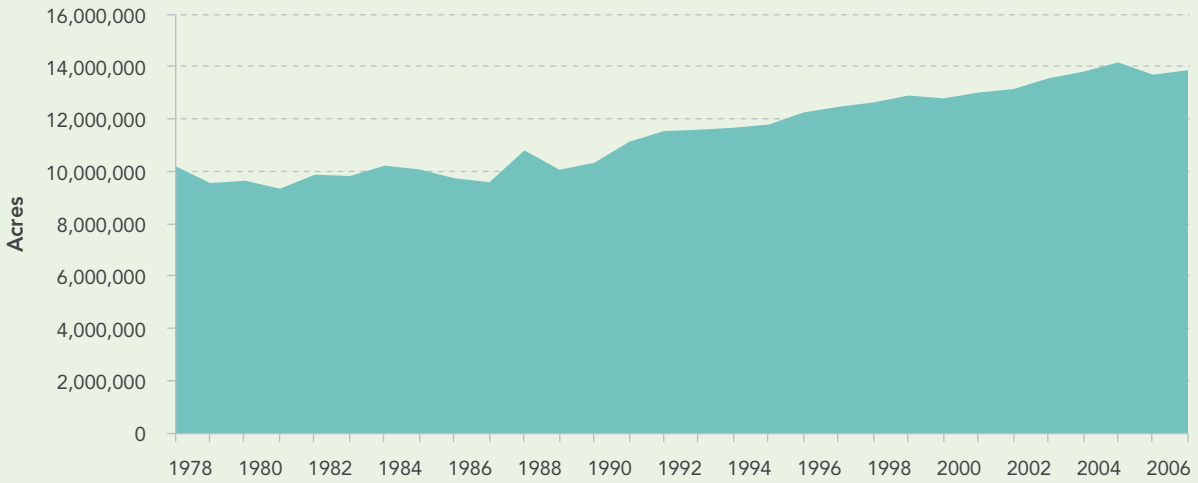
Acreage ¹	States	Sites	States
> 3 million	1	1,416	1
1–2 million	2	300–400	3
500,000–700,000	3	200–300	4
200,000–500,000	9	100–200	11
100,000–200,000	14	50–100	17
50,000–100,000	12	25–50	12
< 50,000	9	< 25	2

1 No states have between 2 and 3 million acres or between 700,000 and 1 million acres, thus we leave these two categories out of the table.

Source: National Association of State Park Directors 2008.

FIGURE 2-5

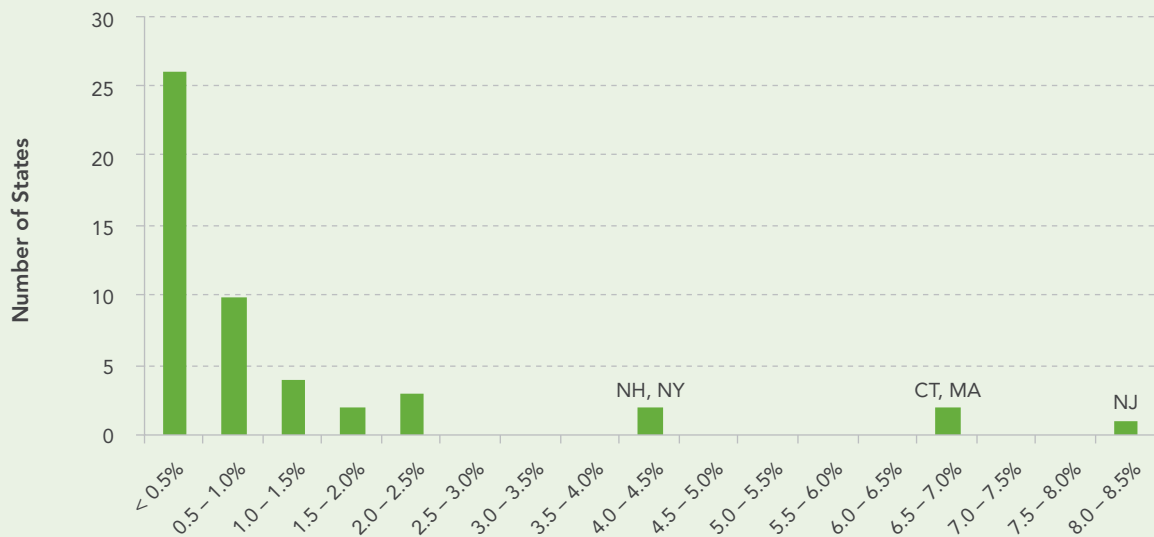
Acreage in U.S. State Park Systems



Source: National Association of State Park Directors various years.

FIGURE 2-6

State Park Acreage as Percent of State Land Area



Source: National Association of State Park Directors 2008.

respectively.⁴ These three states account for 45 percent of all U.S. state park acreage.

Figure 2-6 shows the distribution of state park acreage as a percentage of state land area. On average, across all states, park acreage is only about 1 percent of total land area. Half the states have roughly 0.5 percent of land area in parks. As Figure 2-6 makes clear, the average is brought up by the five states with more than 4 percent: New Hampshire, New York, Connecticut, Massachusetts, and New Jersey. That these northeastern states have very little federal land acreage, including national parks, is worth emphasizing. State parks may be providing the recreational resources that are provided by federal lands in other states, particularly those states in the West.

Facilities vary widely as well. Some states have parks with cabins or cottages, lodges, pools, and in some cases golf courses; others have more rustic provisions with only trails and campgrounds. Kentucky, for example, has 18 lodges in 53 state parks, but 23 states have no lodges at all. The average state has 3,214

⁴ The New York figures do not include the approximately 3 million state-owned acres in the Adirondack and Catskills Forest Preserves. These areas provide significant recreational resources but are not included in state park statistics.

improved campsites in its state parks but Alaska has none—only primitive campsites—and Wyoming has only 15, whereas New York has more than 15,000 and Michigan nearly 13,000 (National Association of State Park Directors 2008).

Local Parks

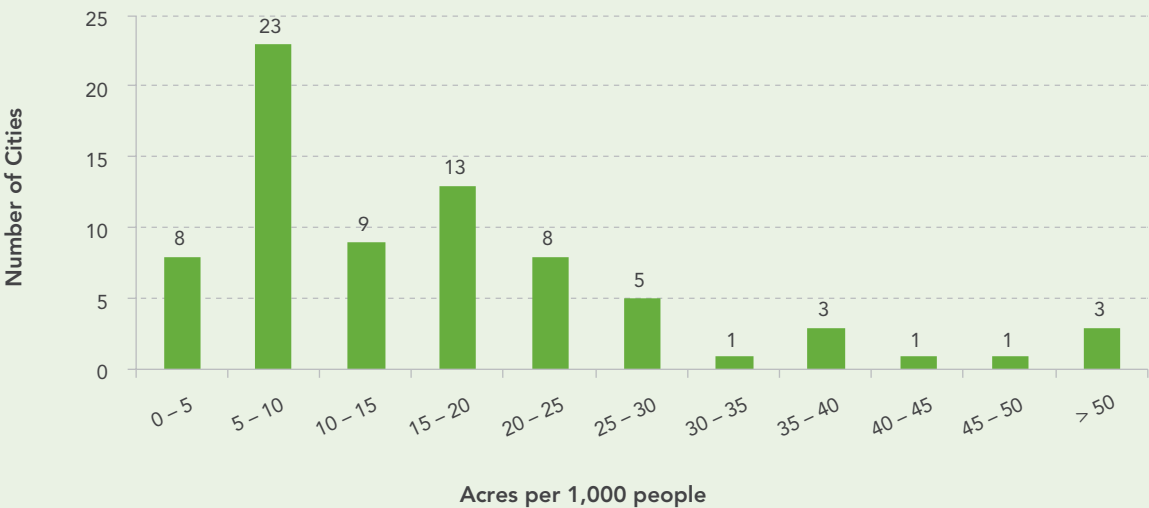
Characterizing and describing local parks is difficult given the wide variety of parks provided in individual communities and the lack of any central organization or government agency responsible for collecting and managing data on local parks. The Trust for Public Land's Center for City Park Excellence (CCPE) collects information each year on parks in 75 cities.⁵ Although these data provide only a piece of the full picture, we use them to give a sense of the landscape.

The cities in the CCPE sample average approximately 18,000 acres of parkland within their borders. Acreage varies widely, however, from only 330 acres in Santa Ana, California to nearly 104,000 in Jacksonville, Florida and well over 500,000 in Anchorage, Alaska. Figure 2-7 shows the distribution of park acres per 1,000 city residents and Figure 2-8 the distribution as

⁵ For more information, see <http://www.tpl.org/ccpe>.

FIGURE 2-7

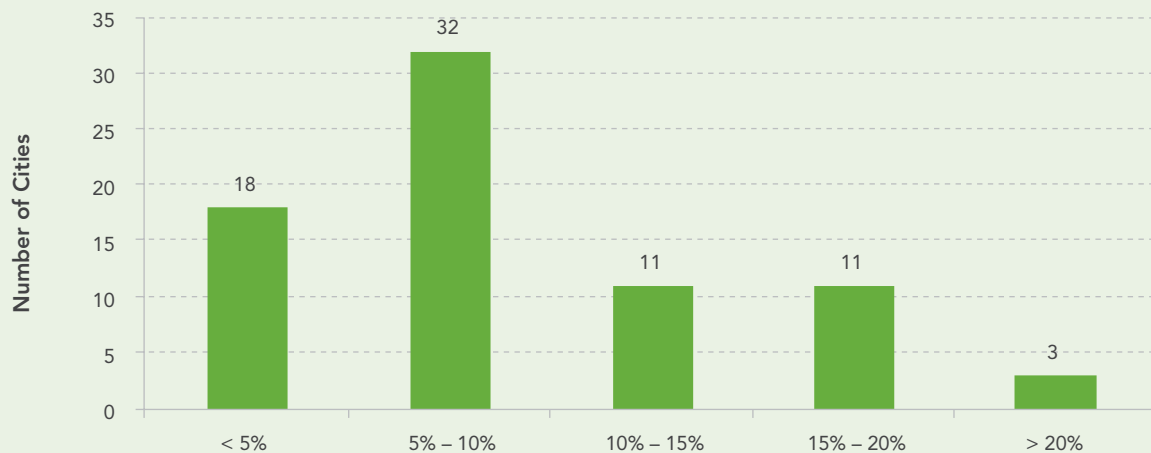
Park Acres per 1,000 Residents in 75 U.S. Cities



Source: Trust for Public Land 2008.

FIGURE 2-8

Park Acreage as a Percentage of Land Area in 75 U.S. Cities



Source: Trust for Public Land 2008.

a percentage of city land area. Most cities in the sample have between 5 and 10 acres per 1,000 people, but some provide much more than that, as Figure 2-7 makes clear. The three cities with more than 50 acres per 1,000 people are Anchorage, Jacksonville, and Albuquerque. The average across all 75 cities in the sample is 41 acres per 1,000 people. Parks make up just less than 10 percent of the total land area of an average city. Again, there is some variation across cities, as shown in Figure 2-8. Most cities—32 of the 75 in the sample—lie in the 5 to 10 percent range. Only three have more than 20 percent: Anchorage (40 percent), Albuquerque (30 percent), and San Diego (22 percent). The lowest percentage is Honolulu at 1.6 percent.

For illustrative purposes, we show two cities in Table 2-2 that have approximately equal populations. Philadelphia has only about half the park acreage of San Antonio, on both a total and per-resident basis. Its percentage of the land area of the city, however, is much higher than San Antonio's. Philadelphia also has more park units (301) than San Antonio (213). What does this mean for city residents? A Philadelphia resident is likely to live closer to a park than a San Antonio resident, but shares that park with more people. In addition, the average park size is much smaller in Philadelphia than San Antonio.

Of course, this is a simplistic characterization; spatially detailed and disaggregated data on parks and population would allow a more careful look at these kinds of questions. With advances in geographic information system (GIS) technology, many local governments now collect such information, but neither the CCPE nor any other organization or government agency keeps a consistent dataset of this type across cities for the entire United States.

TABLE 2-2

Park Acres, Number of Units, and Population for Selected Cities in 2007

	Philadelphia	San Antonio
Population	1.45 million	1.30 million
Park acres	10,937	20,753
Number of park units	301	213
Acres per 1,000 residents	7.6	16.0
Acres per park unit	36.3	97.4
Acres as percentage of land area	12.7	8.0

Source: Trust for Public Land 2008.

More progress has been made in California than anywhere else. The California Protected Areas Database (CPAD), a GIS inventory of all protected open space in the state developed by GreenInfo Network, includes urban parks.⁶ Figure 2-9 shows the location of protected lands in California as represented in the CPAD, including federal lands, state-owned protected lands such as state parks, and local parks and other local protected open space. The circles show centers of population and were generated by drawing a concentric circle with a 20-mile radius around each city with a population of 100,000 or more. The map makes it clear that the amount of protected land in each of these circles varies, thus not all cities are equally endowed with parks and recreation areas. Moreover, in some urban areas there appear to be many smaller local parks—the urban areas around Los Angeles, for example, which are highlighted in the enlarged circle pulled out from the main map. Other areas appear to have more large blocks of contiguous protected acreage, such as those around the northern California cities of San Francisco and San Jose.

The map illustrates how geographic data can be used to more carefully characterize the availability of conservation and recreation resources for particular populations. Although it is beyond our scope here, further analysis could combine the land-use information and other geographic details about the landscape with census and other data on populations, including various socioeconomic and demographic variables.⁷ This would allow for more careful descriptions of exactly what resources are available to particular communities and where there may be gaps.

Emerging Issues with National, State, and Local Parks

Park acreage has grown over time, but the number of acres tells only a small part of the story. What matters is the quality of those acres, the traits and characteristics of the parks, and the proximity of parks and open space to centers of population.

A problem that seems to be reverberating through park systems at all levels of government in recent years is the deterioration of facilities and natural areas because of too little funding. National park advocates

and others have decried the problems associated with deteriorating infrastructure and deferred maintenance in national parks. By some accounts, the NPS has had a maintenance backlog of \$8 billion, along with a \$750 million operating deficit (NPCA 2008a).⁸

State parks face the same problems. In the fall of 2008, Resources for the Future conducted a survey of state park directors that asked about the challenges they faced (Walls et al. 2009b). In particular, it asked whether each of a set of nine specific problems was “not a challenge,” a “minor challenge,” “significant challenge,” “major challenge,” or “huge issue.” Among these problems was funding—specifically, funding for operations and maintenance, capital and new construction, and land acquisition. The survey also asked directors to identify the most significant challenge they faced. Thirty-nine respondents of the 47 who returned the survey reported either funding for operations and maintenance or funding for capital projects and new construction (14). Sixty-four percent reported operations and maintenance as a major challenge or huge issue and 74 percent reported similarly for capital projects. Many respondents included additional comments about the severity of their deferred maintenance problems.

A similar survey of urban park directors, also conducted in the fall of 2008, uncovered some of the same problems (Walls et al. 2009a). Responses from 46 cities indicated that funding for operations and maintenance and capital projects were both serious challenges. Sixty-five percent of respondents listed insufficient funds for operations and maintenance as a major problem. Fifty percent listed it as their single biggest challenge. Fifty-two percent reported that funding for capital expenditures and construction of new facilities was a significant hurdle.

A number of news stories in 2008 and 2009 have described the severity of the problem at the state and local levels, drawing a clear link with the economic downturn. For example, a December 2008 story in *USA Today* reported problems in several state park systems: Illinois closed 12 historic sites as of December 1, 2008; New York cut services at 75 parks and historic sites; Georgia planned to close 13 sites in 2009; and other states, including Florida and New Jersey, were contemplating closures at the time the story was

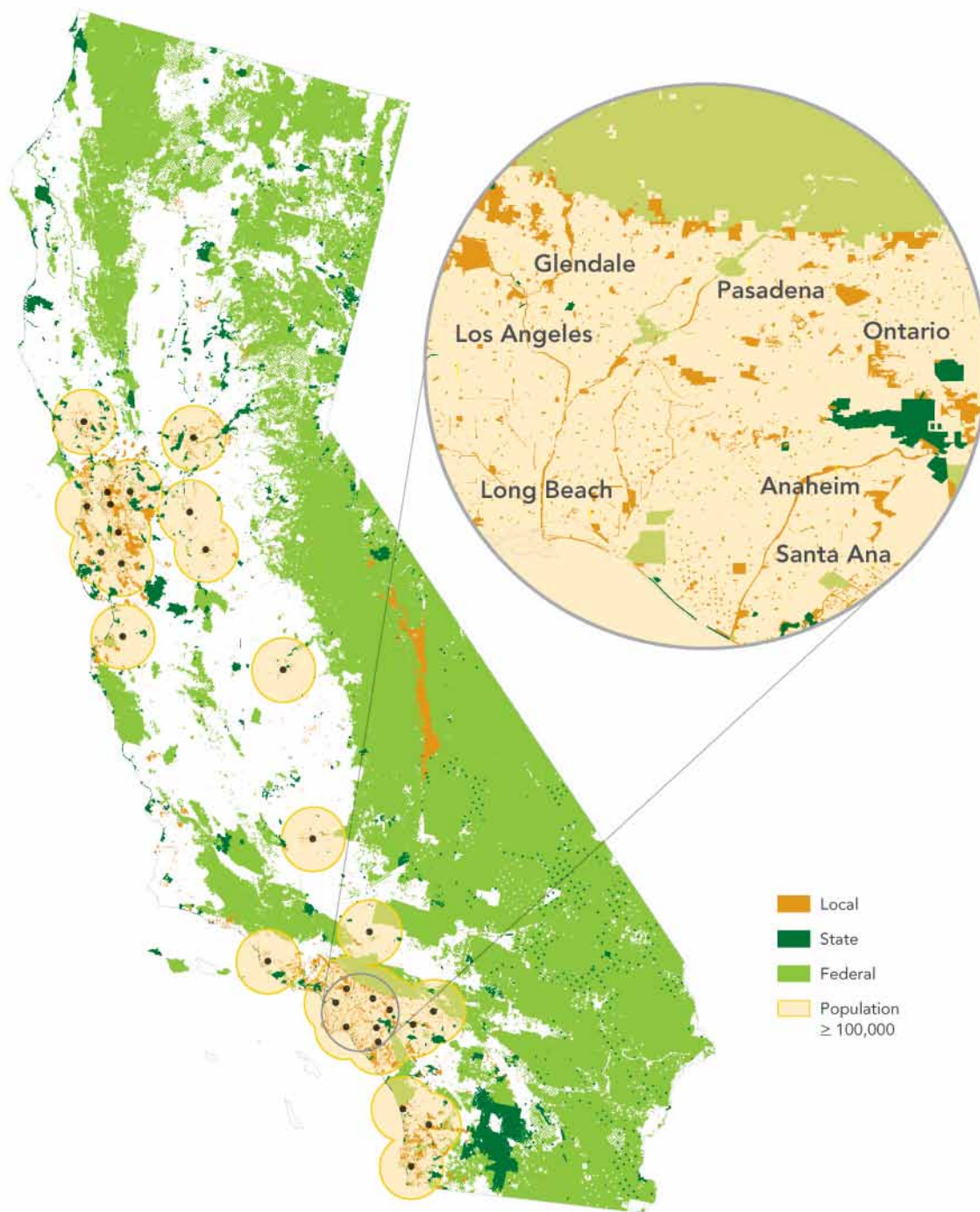
⁶ For more information, see <http://www.calands.org/home.php>.

⁷ GreenInfo Network has worked with collaborators such as the Trust for Public Land and the City Project, an advocacy organization in California, to identify neighborhoods in Los Angeles that are underserved with parks and recreation areas (for more maps and discussion, see http://www.greeninfo.org/html/success_b.html).

⁸ Through the American Recovery and Reinvestment Act of 2009, the NPS will receive \$750 million to apply toward 800 projects. Stimulus funds can be used toward construction, deferred maintenance, road maintenance, trails, energy efficiency, and abandoned mine projects (U.S. DOI 2009b).

FIGURE 2-9

Federal, State, and Local Protected Lands in California

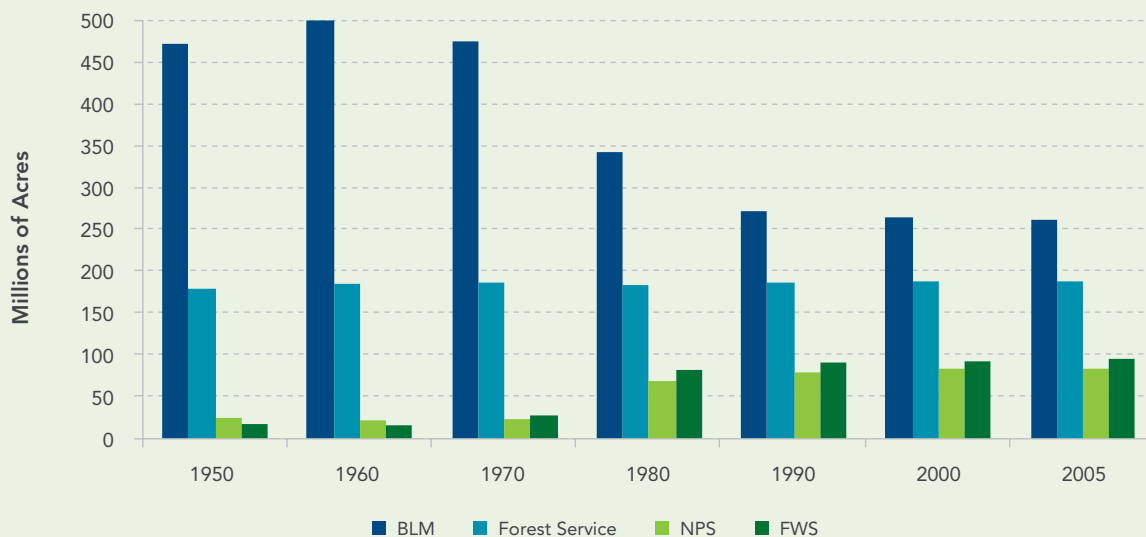


Source: Conservation Biology Institute, GreenInfo Network 2009.

Note: Map created by RFF using GIS data from the California Protected Areas Database (CPAD), created by the GreenInfo Network and updated by the Conservation Biology Institute.

FIGURE 2-10

Acreage of Federal Lands



Sources: Bently 2008; USDA 2008a; NPS various years, 1950–2005; U.S. DOI various years, 1950–2005 and various years, 1950–2007.

written (Bruno 2008). Other news indicated that Ohio was proposing to temporarily close, or mothball, some parks and Oregon was proposing sharp fee increases to cover budget shortfalls (Niquette 2008; Esteve 2008). Perhaps the largest impact was threatened in California, where the governor proposed closure of 43 state parks in 2008, partial closures of others, and delayed opening of three new parks (Anonymous 2008; Save Our State Parks 2008). At the local level, ample evidence suggests that parks and recreation budgets are among the first to be slashed in tight economic conditions. Walls cites several examples (2009). The Indianapolis Parks Department faced a larger cut in its FY2009 budget than any other department in the city. In Florida, proposed cuts in state funding halted new park plans in Sarasota. Similarly, in New York, plans to convert a vacant lot in the Bronx to a neighborhood park were dropped.

Beyond their budget issues, national and state parks have faced a number of other problems in recent years. Air pollution in national parks, for example, is a well-documented and ongoing problem directly related to activities on lands surrounding the parks. Some parks—the Great Smoky Mountains and Shenandoah National Parks, to name two—have perennial issues with visibility and ambient air quality that is below federal standards

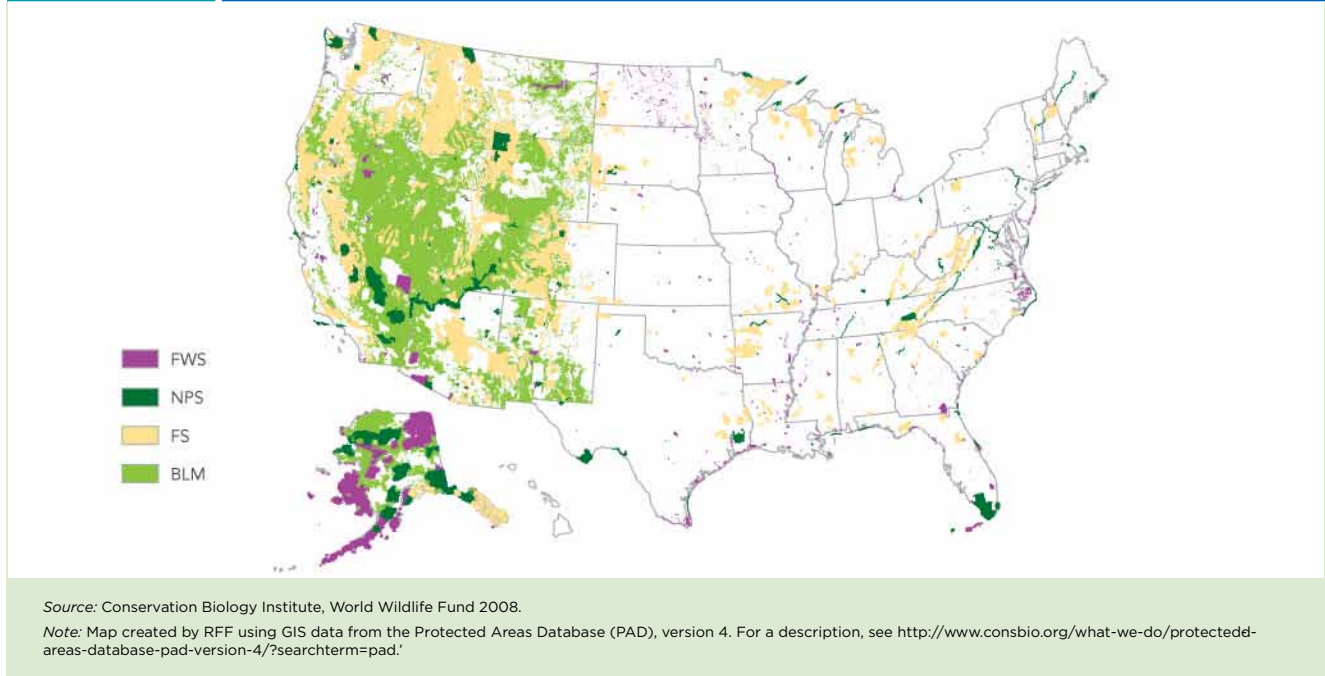
for some pollutants. The National Parks Conservation Association, which advocates on behalf of the parks, has sounded the alarm in recent years over siting of new coal-fired power plants near national parks (2008b). Other issues on nearby lands have revolved around siting of different types of energy infrastructure, roads, and other development. Even residential development of land around parks and other kinds of protected public lands can lead to problems when access to public lands becomes restricted.

One of the biggest problems urban parks face is the loss of available land for new parks combined with increasing demands on existing sites. With increasing urbanization, more and more land in and around cities is being taken up for residential and commercial development. The Economic Research Service of the U.S. Department of Agriculture (USDA), using data from USDA's National Resources Inventory, estimates that the urban and built-up land area in the United States grew an average of 2.9 percent per year between 1980 and 2000, but population grew by only 1.2 percent (USDA 2005).⁹

⁹ Urban and built-up areas defined by the USDA's National Resources Inventory (NRI) include Census Bureau-defined urban areas, plus developed tracts of 10 acres or more, and tracts of 0.25 to 10 acres that do not meet the definition of urban area but are completely surrounded by urban and built-up land (USDA, n.d.).

FIGURE 2-11

Federal Lands in the United States



Studies of land development have shown that in the 1990s, the largest proportion of farmland converted to development went to build houses on lots of 10 acres or more. This large-lot development phenomenon, typically referred to as sprawl, has depleted the availability of land for parks, habitat, and other kinds of open space.

The RFF survey of urban park directors listed “lack of acreage or suitable sites for new parks and recreation facilities” as one of the challenges that directors face. Aside from funding problems, this was the most significant challenge listed by the respondents. In congested urban areas, the issue seemed to particularly resonate, given the written survey comments. Land prices in urban areas combined with limited local funding for land acquisition are also contributing factors.

Other Federal Lands

Several other agencies manage lands for conservation and recreation purposes, but in most cases, the agencies are also governed by other objectives. U.S. Bureau of Land Management (BLM) lands are leased for mineral and energy development as well as livestock grazing. The U.S. Fish and Wildlife Service (FWS) manages lands primarily for habitat purposes, which sometimes

leads to restrictions on visitation by the public. The Forest Service, likewise, manages its lands for timber production and other uses as well as recreation.

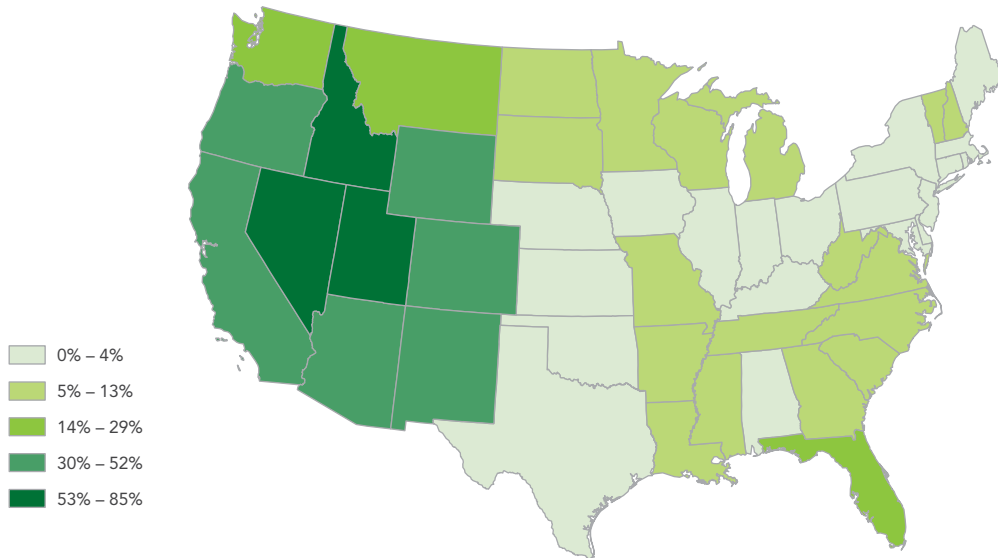
Figure 2-10 shows acreage of BLM, Forest Service, FWS, and NPS lands from 1950 to 2005. Lands managed by the Park Service have increased, as explained earlier. FWS lands have as well. The FWS was officially established as a DOI bureau in 1940 and the National Wildlife Refuge system as part of FWS in 1966.¹⁰ Lands have been added to the FWS system through fee acquisition, donations, and easements. Forest Service acreage has stayed relatively constant but BLM lands have decreased. Between 1950 and 2005, BLM acreage declined by nearly 45 percent as the bureau gradually sold many of its properties. Nonetheless, BLM still manages more acreage than any of the other agencies—262 million acres in 2007. The next largest, the Forest Service, oversees 193 million acres as of 2008.

Figure 2-11 shows a map of these four types of federally owned lands. The large amounts of BLM and Forest Service lands are clear. It is also clear that most federal

¹⁰ Government programs addressing issues associated with fish and wildlife existed before the FWS was formed, specifically, the Bureau of Biological Survey and Bureau of Fisheries in the Department of Agriculture.

FIGURE 2-12

Percentage of Federally Owned Lands by State



Source: Natural Resource Council of Maine and the National Wilderness Institute 1999.

Note: Map created by RFF using federal acreage data from the above sources.

lands are in the western states. Figure 2-12 shows the percentage of each state's lands in federal ownership; Idaho, Nevada, and Utah have the highest percentage—all three are above 53 percent. More than 78 percent of the land in Nevada is owned by these four federal land management agencies (U.S. DOI n.d.).¹¹

Unlike the lands managed by the National Park Service, not all of these other federal lands are available for recreation. Many FWS properties are off-limits to visitors. And the multiple uses allowed on BLM and Forest Service lands often create conflicts between recreationists and other users of the land. We now discuss the history of how these lands came to be and some of the current and emerging issues that affect their status as recreation destinations.

BLM

The BLM manages lands that were not claimed from the public domain under the Homestead acts and other land transfer programs. These leftover properties were originally considered of low value and had mostly been

leased or sold over the years. According to Douglass, their recreation potential was slow to develop (1999). However, the Federal Land Policy and Management Act of 1976 explicitly recognized the recreation value of BLM lands and gave the bureau a new mandate to manage for multiple uses, including recreation. In 1976, there were 326 recreation sites on BLM lands; by 2000, there were 3,191—nearly 10 times as many as before the act was passed (U.S. DOI 2001).

Even with this legislation, though, conflicts between recreationists and other users of BLM lands are sometimes serious. These conflicts can arise over livestock grazing, water rights, energy and mineral development, and development for transportation and other infrastructure projects. Even prior uses of the land can create problems for recreationists. For example, there are currently at least 161,000 abandoned hard rock mine sites in 13 western states (Stevens and Frank 2009). These sites have cavities that pose safety hazards, often contain potentially explosive gases, and can leak toxic chemicals such as arsenic, lead, and mercury into groundwater.¹² One of the most longstanding conflicts over appropriate

¹¹ An additional 4.8 percent is managed by the U.S. Department of Defense (U.S. DOI n.d.), approximately 25 million acres. These include military bases, proving grounds, and other installations managed for military purposes that often also provide open space and conservation benefits. In some cases, land is open for hunting and other recreational pursuits.

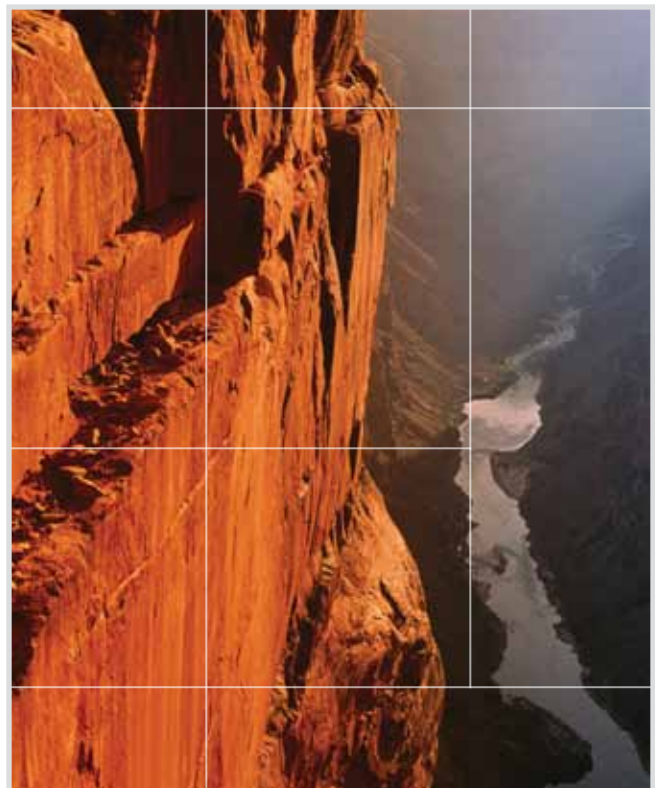
¹² Between 2004 and 2007, at least 12 adults and children died in accidents at abandoned mines (Devaney 2008).

uses of BLM lands is particularly salient today: recreational uses versus energy development. Oil, gas, coal, and other mineral development have been a major source of revenues for federal, state, and local governments, but energy projects can directly conflict with conservation and recreation. These conflicts are typically addressed through environmental analyses that assess the costs of development projects in terms of damage to habitat, water quality, and recreational resources and are required of all projects on public lands. These analyses themselves generate conflicts, however, and many battles are waged over the details of the assessments rather than over the manner in which the government exercises its trusteeship over the lands (Stevens and Frank 2009). With large renewable energy projects on the horizon, as well as plans for new transmission lines, these conflicts are likely to increase rather than decrease in importance. The Mojave Desert, for example, is the site of several large solar energy facilities and has been proposed for more—as of March 2009, 19 companies had submitted applications for facilities to be built on 500,000 acres of desert land.

Livestock grazing is another perennial conflict on BLM lands. BLM allows grazing on approximately 160 million of its 256 million acres.¹³ The bureau administers more than 18,000 permits and leases that allow ranchers to use the lands, with the (renewable) permits and leases typically covering a 10-year period (U.S. DOI 2009c). Ranchers are charged only a nominal fee, which is set by Congress—\$1.35 per animal-unit month in 2009, for example.¹⁴ Fee revenues are shared with state governments, the U.S. Treasury, and a fund for use to improve the rangeland.

Many observers argue that public lands have been overgrazed, resulting in a loss of native grasses and destruction of soils and riparian areas (Sierra Club 2008). Water quality is thought to have suffered in many areas. In desert regions such as Arizona and New Mexico, the riparian areas are highly valuable for many uses, including recreation, thus damage to those zones may result in a substantial loss of value. Moreover, many observers have argued that these arid lands are not well suited to livestock grazing.

On the other hand, Mathews and colleagues (2002) point out that the importance of public land grazing has declined significantly in recent years. Only 6 percent of



livestock producers in the 17 western states have grazing allotments, and revenues from livestock production have declined in importance to western economies. A study by the Sonoran Institute (Basker et al. 2004) also makes this point and goes further, looking at the factors that contribute to personal income in the 11 continental western states. It finds that income from employment in mining, oil and gas development, logging, and lumber and wood products accounted for only 5 percent of total personal income in 2000. Including farming and ranching brought the figure to 8 percent; in 1970, by contrast, 20 percent of income was from these sectors. The Sonoran study also finds that income growth has been greatest in western counties with more public lands, that unprotected private lands located near protected public lands were highly valuable, and that recreation-based tourism is a big draw to these communities.

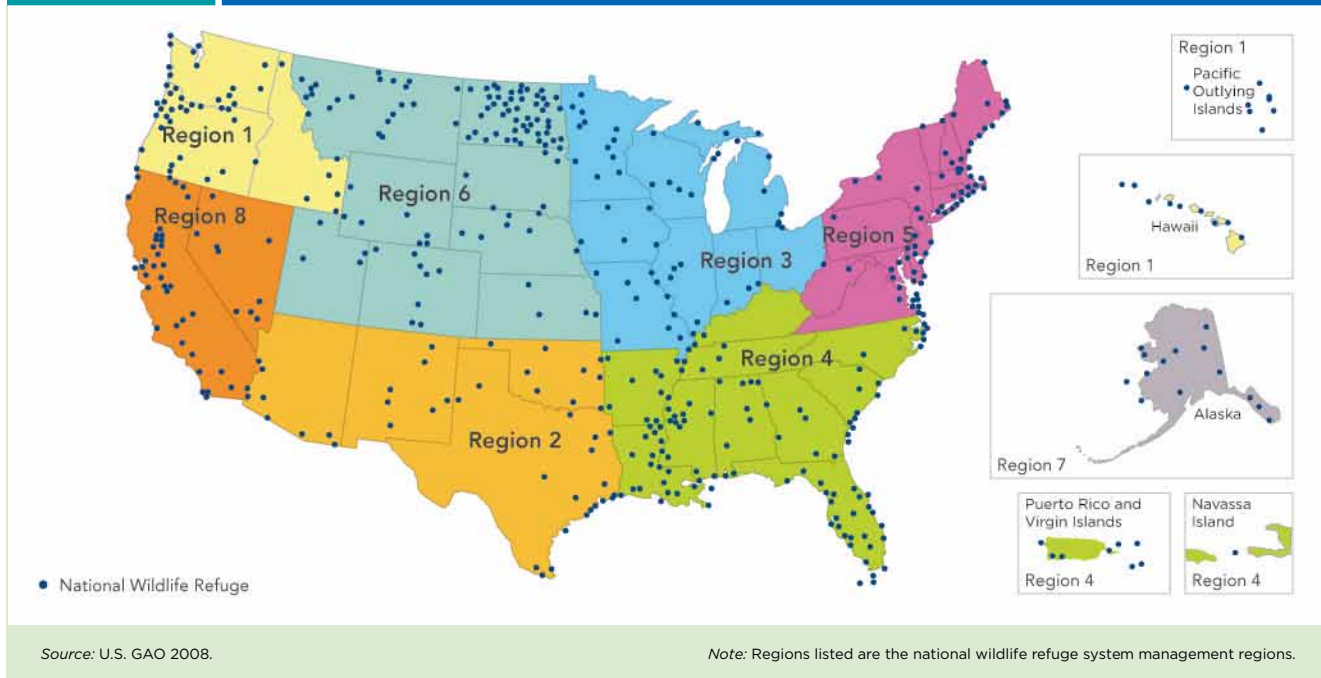
The importance of conservation and recreation on BLM lands was recognized in 2000 with the establishment of the National Landscape Conservation System (NLCS). The NLCS is land protected in perpetuity for conservation and recreation and comprises six separate designations: national monuments, national conservation areas, wilderness areas, wilderness study areas, wild and scenic rivers, and national scenic and historic

¹³ The Forest Service also allows grazing on some of its lands.

¹⁴ The BLM sets a limit on the number of animal-unit months.

FIGURE 2-13

Location of National Wildlife Refuges



trails.¹⁵ As of 2009, BLM managed 860 separate NLCS units covering approximately 27 million acres of land (U.S. DOI 2009a). NLCS lands are very popular with recreationists and wildlife enthusiasts—although they represent only about 10 percent of BLM lands, the NLCS areas account for more than one-third of all visits to BLM’s approximately 262 million acres (Gardner 2009a).

Despite the popularity of the NLCS, yearly funding for it has been a source of frustration. The program has grown significantly in size over its operational history, but yearly appropriations have not increased commensurately. In its first year, NLCS funding was \$63.4 million (in 2007 inflation-adjusted dollars) but in 2009, funding was actually lower, \$59.4 million, even though acreage had risen (Gardner 2009a, 2009b). Questions persist as to whether funding for management and law enforcement is adequate to address the threat of vandalism and other damages to NLCS resources (Gorte et al. 2009).

National Wildlife Refuges

The first wildlife refuge, the tiny Penguin Island Refuge in Florida, was created in 1903 by President

Teddy Roosevelt. A handful of other refuges were created after that with land carved out of existing federal landholdings. To expand the system beyond existing holdings, Congress passed the Migratory Bird Conservation Act in 1929, which authorized land acquisitions, and the Migratory Bird Hunting Stamp Act in 1934, which raised money for those acquisitions by requiring hunters of migratory waterfowl to purchase duck stamps. Duck stamp proceeds are still used today to acquire land for refuges and to manage those refuges.

Today, 548 refuges cover approximately 97 million acres of land.¹⁶ Figure 2-13 shows the location of the refuges along with the refuge management regions. There is at least one refuge in every state, and FWS reports that every major city has at least one refuge within a one-hour drive.

Some recent studies have found numerous problems in the refuge system. A 2008 study by the U.S. Government Accountability Office (GAO) found the system to be stretched thin financially with not enough staff and

¹⁵ These designations of protected lands are managed by different federal agencies, including the NPS (see the appendix at the end of this chapter). However, the NLCS includes only those areas managed by BLM.

¹⁶ Waterfowl Production Areas are also part of the refuge system; there are approximately 36,000 of these small areas located in the Prairie Pothole region in the upper Plains states, covering 677,000 acres of wetland habitat on private lands. The third category of land in the national wildlife refuge system is Coordination Areas; these are wildlife management areas managed by states (for more information, see U.S. DOI 2008a, 2007).

funding in many locations to maintain facilities and natural areas (U.S. GAO 2008). The Cooperative Alliance for Refuge Enhancement (CARE), a national coalition of 22 wildlife, sporting, conservation, and scientific organizations, found similar problems in a 2009 study (CARE 2009). CARE estimates that the deferred maintenance backlog totals \$2.6 billion; GAO estimates a similar figure. Both reports also describe problems created by activities on land contiguous to refuges—pollution and habitat connectivity problems related to expansion of urban areas and land conversion to agriculture and industrial uses. Invasive species problems are also quite serious in a number of regions, putting further pressure on strapped refuge budgets. The CARE study reported that 2.3 million acres of refuge land are infested with invasive plants and the refuge system was able to treat only 14.6 percent of such land in 2008.

In addition to these problems, there are ongoing conflicts among uses of national wildlife refuges. The primary purpose of the refuge system is to provide habitat. Legislation in 1966 defined a “compatible use” standard and 1997 legislation specifically listed wildlife-dependent recreation as a “legitimate and appropriate general public use,” but it is left to the discretion of individual refuge managers to determine if public use is compatible (U.S. DOI 2000; National Wildlife Refuge System Improvement Act 1997, Section 5[a][3][b]).¹⁷ As a result, approximately one-third of refuges are closed to the public. Even when public use is allowed, a tension sometimes exists between different kinds of public use—for example, between nonconsumptive recreational uses, such as hiking and wildlife-watching, and consumptive uses such as hunting. Hunting is permitted on 300 of the 548 refuges and fishing in 260 of them.

Forest Service

Forest reserves were created by presidential proclamation in 1891 and managed until 1905 by the General Land Office. In that year, they were transferred to the newly created Forest Service, housed in the Department of Agriculture, and, in 1907, renamed national forests. The national forests were created primarily to ensure a steady supply of timber, which was considered essential for housing availability and overall economic growth. Between 1906 and 1907, President Teddy Roosevelt doubled the acreage of the system and it has seen very slow expansion since—increasing from

154 million acres in 1919 to 193 million acres in 2008. Today, there are 155 national forests and 20 national grasslands. Although lands are concentrated in the West—87 percent of Forest Service acreage is in 17 western states—over half of all federal lands in the East are Forest Service lands, thus the agency has impacts across the country (Vincent et al. 2001).

The national forests were popular family vacation destinations as early as the 1920s, but recreation received formal recognition only when Congress passed the Multiple Use–Sustained Yields Act in 1960. This act gave equal statutory authority to each of five uses: outdoor recreation, livestock grazing, timber harvesting, watershed protection, and fish and wildlife habitats. Over the years, conflicts have arisen over these uses, similar to the conflicts over BLM lands. For example, harvesting of old-growth forests in the Pacific Northwest generated concerns in the 1980s and 1990s over endangered species such as the spotted owl. The controversy over livestock grazing on BLM lands, which we have described, carries over to Forest Service lands.

The role of recreation and the value of open space provided by Forest Service lands, however, have grown in importance relative to timber production, livestock grazing, and other market activities. In the 1980s, national forests sold an average of 10.7 billion board feet of timber per year (Fedkiw 1998). By 2006, that number had dropped to 1.5 billion board feet, with a value of approximately \$84 million (USDA 2007a). At the same time, recreation in the national forests has increased, by most accounts (Cordell and Tarrant 2002).¹⁸ The Forest Service estimated that in 2002, recreation in national forests contributed \$111 billion to the economy (Eilperin 2005).

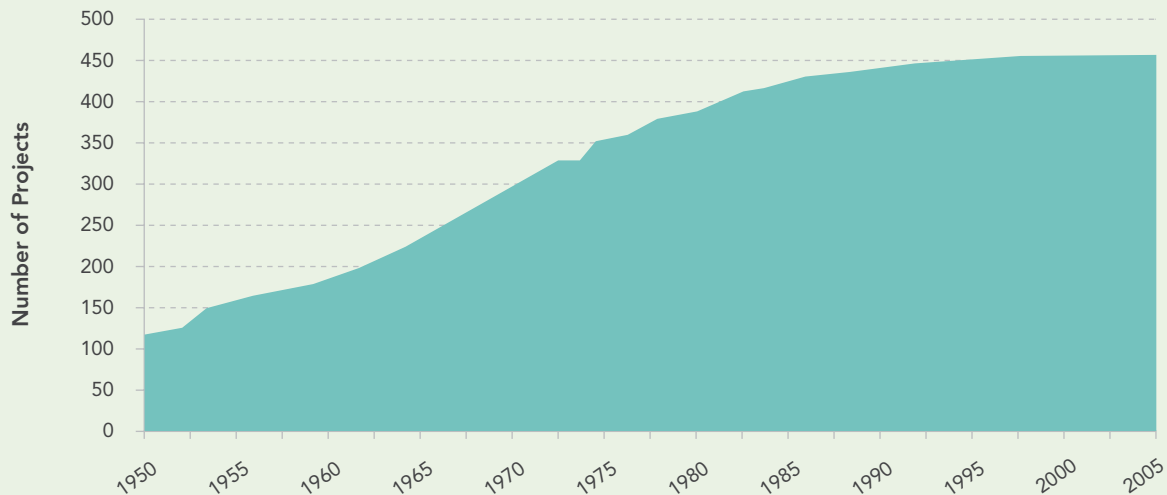
Accompanying the growth in recreation, however, are some conflicts among different types of recreation. In recent years, managing forestlands for off-road vehicle use has become a particular challenge, as motorized trail use sometimes conflicts with use by hikers, mountain bikers, and horseback riders. Some observers argue that off-road vehicles remove vegetative cover and erode soils, damaging trails used by hikers and leading to problems in streams and rivers. In addition, lack of a clear delineation of where such vehicles are allowed has created potential safety problems. Off-road vehicle proponents often protest what they view as

¹⁷ The 1966 legislation was the National Wildlife Refuge System Administration Act, which gathered the individual refuges into the formally defined national wildlife refuge system. The National Wildlife Refuge System Improvement Act (Public Law 105-57) was the 1997 legislation that defined priority public uses, including wildlife-dependent recreation. Many provisions of this law were also in the 1996 Executive Order 12996.

¹⁸ As we will explain in Chapter 3, however, a consistent time series on visitation to the national forests is unavailable.

FIGURE 2-14

Army Corps of Engineers Projects



Source: Chang 2009.

unfair discrimination against their activities and demand reasonable access to national forest lands. The Forest Service has partially addressed the issue by writing off-road vehicle travel management plans covering 27 percent of national forest system lands (U.S. OMB 2009). The plans designate 280,000 miles of roads and 47,000 miles of trails for off-road recreationists (Wildlife Management Institute 2008). With the rise in popularity of this form of recreation, however, and the difficulty in monitoring and enforcement of rules, these conflicts may continue.

Another rising problem with the popularity of recreation in the national forests is the lack of access to many parts of the forests. As development has increased on private lands surrounding the forests, access has become more limited. A difficult problem facing the Forest Service involves securing public rights-of-way on these lands.

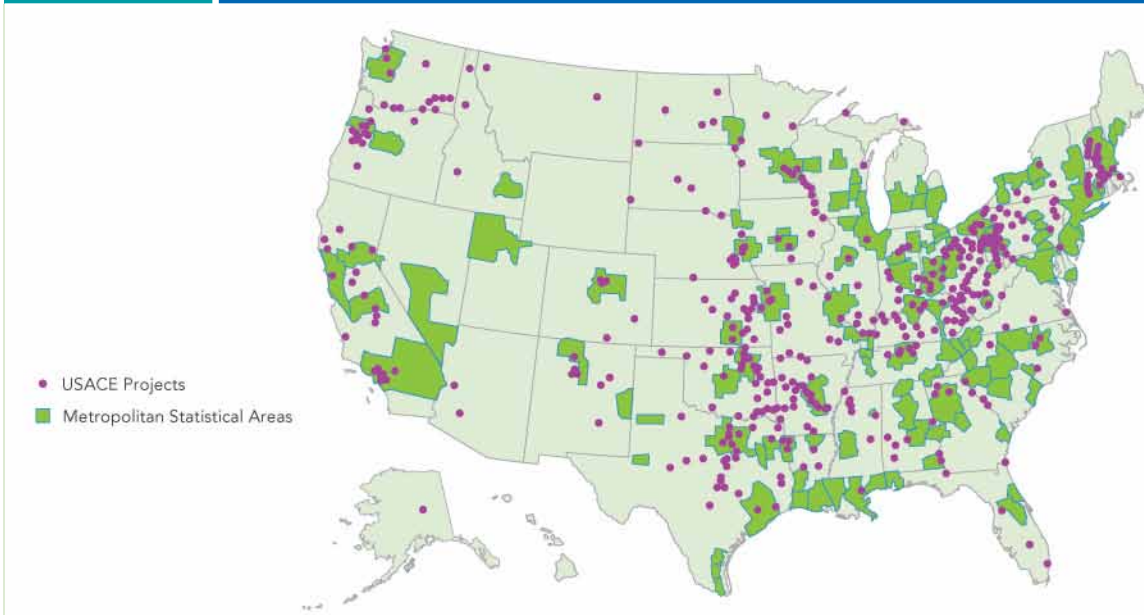
The Forest Service has been forced to meet the increasing demands for recreation with budgets that have not been up to the challenge in recent years. One reason is related to forest fire policy. For many years, the Forest Service suppressed essentially all fires, a policy that has been criticized for creating unnaturally

dense forests and a buildup of underbrush that fuels more severe and fast-moving forest fires. These more severe fires put a strain on the agency budget, as a 1908 law—the Forest Fires Emergency Act—mandates that all available funds in any given year must go toward fire suppression activities. Firefighting has become a serious financial burden for the Forest Service, accounting for 39 percent of the budget in 2008 and even larger percentages in some other recent years (USDA 2007b; O'Toole 2007). In many years, money is diverted from other programs to firefighting.

Another debate that has arisen in recent years surrounds the issue of roadless areas. The national forest system has 60 million such acres (USDA 2001). These areas have not received official wilderness area designation—the Forest Service has more than 400 official wilderness areas covering 35 million acres (USDA 2009)—but many wilderness advocates would like them to have such designation. In 2000, President Clinton halted development in roadless areas of national forests in an effort to protect de facto wilderness sites, but the Bush administration reopened some of them to energy and mineral exploration, activities that could make lands ineligible for wilderness designation in the future (Vincent et al. 2001). The debate over these lands

FIGURE 2-15

U.S. Army Corps of Engineers (USACE) Recreation Sites and Metropolitan Statistical Areas



Source: Chang 2008a.

continues. The Obama administration is studying the issue and attempting to clarify rules. Beyond the issue of roadless areas, however, the Forest Service also struggles as a steward of wilderness: only 20 percent of wilderness areas are managed to minimum agency standards (USDA 2009).¹⁹

Army Corps of Engineers and Bureau of Reclamation Recreation Sites

The U.S. Army Corps of Engineers manages 4,300 individual recreation areas at 420 lakes in 43 states (U.S. Army Corps of Engineers 2008). The Corps lakes are the result of dams built over the years for flood control, navigation, and electric power, but many have high recreational value. In the western United States, the Bureau of Reclamation also built dams, mainly for irrigation and power, and the lakes created at these sites are also popular recreation destinations.²⁰

¹⁹ Forest Service minimum stewardship levels for wilderness areas indicates successfully achieving 6 of 10 elements, including restoration of natural fires, treatment of invasive species, measurement of air quality, implementation of a wilderness management plan, provision of primitive recreation resources, provision of guides to teach wilderness practices and values, protection of wilderness character, satisfaction of information needs, and establishment of baseline workforce.

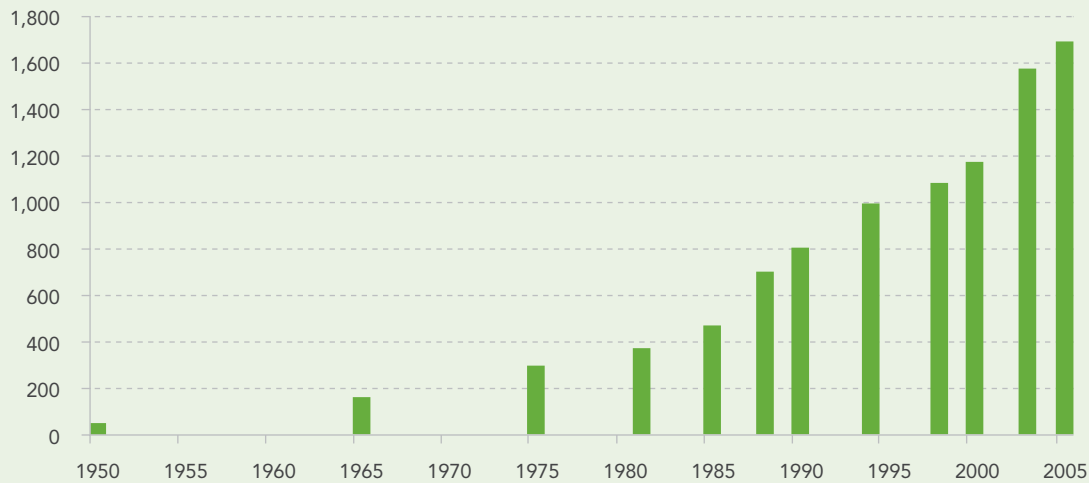
²⁰ The Tennessee Valley Authority (TVA) is another federal agency that has built and run dams. It operates in the southeastern United States and currently has control over about 1 million acres of land and water. We do not discuss the TVA here. Dams alter river systems and reduce or eliminate river-based recreation, not to mention the alteration of wildlife habitat and ecosystems in general. The criticisms directed at federal water policy and the relative benefits and costs of these projects are beyond the scope of this report.

Figure 2-14 shows the number of projects—the term the Corps uses for the sites it operates—in existence from 1950 through 2007. In contrast to most of our other trend graphs, where we focus on the past 30 years, we include earlier data for the Corps to show how dam construction was at relatively high levels in the middle part of the twentieth century but began to subside in the 1980s and halted almost completely in the mid-1990s. According to Chang (2009), many Corps projects were consolidated beginning in the early 2000s. Thus the official total number of projects that the Corps reports for 2007 is 421, though the data in the graph shows a leveling off at 456 in 2000 and remaining at that number through 2007.

Managed acreage, both land and water, totals 12 million. The sites support marinas, campgrounds, picnic areas, hiking trails, and a host of other recreational areas and facilities. In 2008, the Corps operated 90,000 campsites and 3,500 boat ramps and maintained 4,300 miles of trails (U.S. Army Corps of Engineers 2008). Figure 2-15 shows a map of Corps projects, along with delineation of metropolitan statistical areas to show where the sites are relative to centers of population. Although Corps lakes are dispersed throughout the United States, the majority are east of the Rocky Mountains. Pennsylvania

FIGURE 2-16

Number of Land Trusts



Source: LTA 2006.

has the greatest number of projects at 39 and Oklahoma is second with 37. Many Corps projects are close to urban areas—the Corps estimates that 80 percent of its sites are within 50 miles of a large U.S. city (U.S. Army Corps of Engineers 2008).

The Bureau of Reclamation provides 289 recreation sites in 17 western states. Those sites cover 6.5 million acres of land and water. Like the Army Corps of Engineers, the Bureau of Reclamation's sites are the result of reservoirs created by dams that the bureau built. However, there are some differences between the two agencies. The Pick-Sloan Flood Control Act of 1944 (Public Law 78-534) states that the Corps should construct dams for navigation, flood control, power, and other purposes, and that Reclamation should build dams to supply water for irrigation, power, and other purposes. For the Corps, other purposes included recreation—the legislation expressly stated that the Corps could construct, maintain, and operate public parks and recreational facilities. The Bureau of Reclamation has never been allowed to do this. Legislation passed in 1965 stated that Reclamation should “encourage non-Federal public bodies to administer project land and water areas for recreation ... and operate, maintain, and replace facilities.” In the event that no “non-Federal public body” can be

found, Reclamation is restricted to providing “minimal facilities ... required for public safety.”²¹ It is commonly agreed that these minimal facilities are limited to guard-rails, turnarounds for cars, and pit toilets.

This limitation has created issues as reservoirs have been turned back over to Reclamation because of funding problems, leaving the agency with neither the statutory authority nor the funding or staffing to operate the recreation site. The agency is reluctant to abandon sites because physically closing them is usually infeasible and trespassing, vandalism, and other problems can result. A total of 29 sites were turned back between 1976 and 1995 (Lovejoy and Brown 2004).

The Army Corps lakes also face problems related to budget issues. The funding shortfalls and deferred maintenance problems that we described for several of the agencies above—the National Park Service, state and local parks, and national wildlife refuges—also exist for Army Corps lake projects. More than 90 percent of Corps projects were constructed before 1980 and over 30 percent are at least 50 years old. Government rules

²¹ The 1965 legislation is the Federal Water Project Recreation Act, Public Law 89-72 (for a brief history of legislation, see <http://www.usbr.gov/recreation/legislation.html>).

require that projects with a navigation purpose receive funding first, leaving recreation projects usually at the end of the list. In recent years, 74 recreation areas in five states have been either partially or fully closed because of budget problems (ASCE 2009). A 1999 commission on the status of federal lakes, set up by Congress with members appointed by President Clinton, reported on many of these funding problems and also highlighted several management issues (National Recreation Lakes Study Commission 1999). Even at that time, 10 years ago, deferred maintenance at federal lakes was reported to be a problem.

Private Conservation Lands: The Role of Land Trusts

Conservation land trusts are nonprofit and nongovernmental organizations that acquire and protect land from development. Although the earliest land trusts were established in the 1800s,²² they have emerged in recent years as central actors in land conservation. They obtain land to maintain working farms and forests, to protect wilderness areas, to preserve historically important areas, and to protect wildlife habitat and natural areas.

Land trusts obtain real estate from landowners who sell or donate conservation easements (deed restrictions on land uses), or by outright purchases of property. Land trusts can include large organizations such as The Nature Conservancy and the Audubon Society, but many are formed by relatively small organizations operating at community, state, or regional levels (hereafter, local). According to the Land Trust Alliance (LTA; 2006), 1,667

local land trusts operated in the United States in 2005.²³ The number has increased gradually, nearly doubling during the last 10 years (Figure 2-16). The land area protected has increased even more rapidly—from about 6 million acres in 2000 to 12 million acres in 2005 (Table 2-3), nearly the size of the state of Maryland.

About one-third (581) of local land trusts operate in the Northeast, where they protect over 3.5 million acres, the most of any region (see Figure 2-17). Local land trusts conserve about 2 million acres in the Southwest, and about 1.7 million acres in the mid-Atlantic and Pacific regions each.

Much of the recent increase in the area protected comes from the growing use of easements and other contractual arrangements rather than through direct land purchases. As of 2005, only about 14 percent of the total area conserved by local land trusts is in their ownership; other areas are under conservation easements (53 percent) or have been protected by other means (33 percent), such as acquisition by other organizations or agencies (see Table 2-3). Between 2000 and 2005, the land acquired by nonpurchase increased by 1.6 million acres, whereas land purchases added only about 0.5 million.²⁴

In addition to community, state, and regional land trusts included in these estimates, several national private land trusts also operate in the United States. The Nature Conservancy (TNC), the largest land trust, has protected more than 15 million acres in the United States. The second largest private trust, The Conservation Fund, has conserved more than 5 million acres. Ducks Unlimited, which manages and restores wetlands for waterfowl

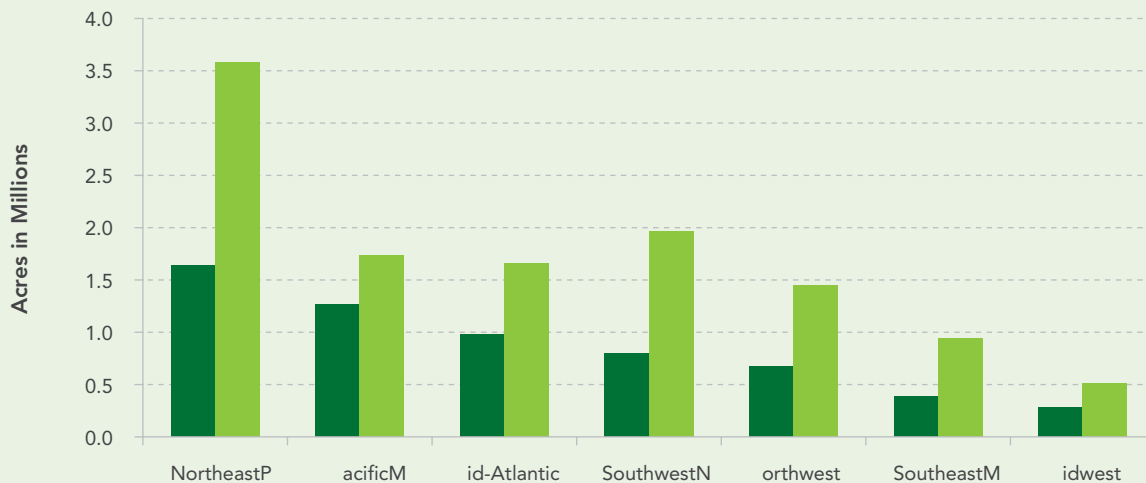
22 The earliest trust is said to be the Trustees of Reservations in Massachusetts, founded in 1891 (see www.thetrustees.org).

23 The Land Trust Alliance (LTA) represents local, state, and regional land trusts, providing technical assistance and tracking the amount of land preserved.
24 During this period, purchased land increased by 40 percent and the area under easements increased by nearly four times that rate, 148 percent.

TABLE 2-3		Total Acres in Local, State, and Regional Land Trusts in 2000 and 2005				
Conservation Method	2000		2005		Increase 2000–2005	
	Acres	Percent	Acres	Percent	Acres	Percent
Ownership	1,219,632	20	1,703,212	14	483,580	40
Easements	2,514,545	42	6,245,969	53	3,731,424	148
Other means	2,322,447	38	3,940,928	33	1,618,481	70
Grand total	6,056,624	100	11,890,109	100	5,833,485	96
Source: LTA 2006.						

FIGURE 2-17

Acres in Local, State, and Regional Land Trusts in 2000 and 2005



Source: LTA 2006.

■ 2000 ■ 2005

conservation, has preserved around 3.5 million acres. The Trust for Public Land, another major national land trust, has conserved more than 2 million acres. To put these numbers into perspective, these four private land trusts together have conserved more than 25 million acres, which is more than the total area of national parks outside Alaska, or roughly 2.5 times the size of Massachusetts.²⁵

In total, the four large land trusts and the 1,667 local land trusts included in the LTA survey have protected about 37 million acres of land. This is significant acreage; if it had been purchased by the government at market prices and added to the federal estate, the government would have incurred a substantial cost. Leveraging private conservation dollars has proved a cost-effective way of adding to the inventory of protected lands in the United States. Moreover, it is now standard practice for land trusts and the government to work hand in hand on many conservation deals. Land trusts work with FWS to protect habitat, often combining federal dollars raised through duck stamp revenues or other means with private dollars. They also work with state fish and game agencies. In addition, large conservation efforts often

include multiple federal agencies, local and national land trusts, and state governments. The state of Georgia, for example, conserved 20,000 acres of forestland in 2007 by spending \$35 million of its own money, leveraged with \$58 million of federal, local, and private land trust money (State of Georgia 2007). The federal money came from the Department of Defense's Readiness and Environmental Protection Initiative, the Forest Legacy program, grants from the Wildlife Restoration Program, and Endangered Species grants; local grants were made by the three counties where the land is located; and The Nature Conservancy, Conservation Fund, and a local land trust also contributed. The protected land is managed by the Georgia Department of Natural Resources. There are many projects around the country with multiple partners of this type.

Summary and Outlook: The Role of Climate Change

The U.S. system of public and private conservation lands is extensive and has grown in the past 30 years. However, most of the growth in public lands took place before 1990. Additions to the national park system have leveled off as have additions to national wildlife refuges,

²⁵ As we explained, the national park system as a whole, at over 84 million acres, comprises more than just national parks. National park acreage is approximately 51.9 million, of which about 32.5 million acres are in Alaska (www.nps.gov).

both popular recreation destinations. Forest Service land has held steady, and BLM lands have declined somewhat. State park acreage has climbed gradually with a leveling off in the past four years; state parks make up only a small percentage of land area in most states. Lack of data makes it difficult to estimate local park acreage, but it seems unlikely that acreage in urban parks has kept up with the rapid growth in population in urban areas over the past 30 years.

Probably the biggest change in recent years is the increase in private land under conservation easement. The land trust movement and the adoption of conservation tax credits and other favorable tax treatment in many states (discussed later) have increased the number of private acres permanently protected. However, much of this acreage is not publicly accessible. Lands under easement provide critical habitat protection, riparian buffers, retention of viewsheds, and many ecosystem services, but do not usually directly provide recreation benefits.

Some of these key resources inventoried in this section are likely to be under stress in the coming years due to a variety of factors. As we explained above, population growth is leading to development of lands on the edge of parks, wildlife refuges, and other protected public

lands. This creates a number of problems—pollution, lack of habitat connectivity for wildlife, and sometimes reduced access to these public lands. Invasive species present another problem that can cause deterioration in the quality of outdoor resources. Moreover, diversion of financial resources to deal with invasive species may end up creating problems at visitor centers, campgrounds, picnic areas, and a host of other public facilities.

Probably the most serious concern on the horizon, however, is climate change. It is now widely recognized that climate change is taking place and in the absence of serious policy to reduce greenhouse gas emissions—and in fact, even with it—the planet will continue to grow warmer over the next century. In North America, mean temperatures are expected to increase between 1° and 3°C by 2039, according to the Intergovernmental Panel on Climate Change's *Fourth Assessment Report* (2007). Beyond 2039, 2° to 3°C of warming will likely occur on the continental edges, with more than 5°C of warming possible in higher latitudes. Precipitation is predicted to increase across the continent with the exception of the southwestern United States, where mean annual rainfall will decrease. These changes are expected to have serious impacts on lands and natural resources, some of which are already occurring.





Morris and Walls (2009) review the literature and assess the likely impacts of climate change on a variety of resources. One of the biggest changes will be reduced snowpack in the western mountain ranges. This is expected to lead to peak streamflows earlier in the spring and reduced summer streamflows (U.S. GCRP 2000). Reduced flows combined with warmer air temperatures will lead to warmer water temperatures, creating changes in the distribution of aquatic species. For example, the current habitat of rainbow trout and other coldwater fisheries valued by anglers are expected to be reduced. Some rivers will be particularly hard hit. The Colorado River, for example, gets 70 percent of its water from snowmelt (Christensen et al. 2004). Climate model runs with a 2.4°C warming show a 17 percent reduction in runoff in the Colorado River Basin, which leads to a 40 percent reduction in basin storage (Christensen et al. 2004). Reservoirs in the basin include such popular recreation areas as Lake Powell, Lake Mead, and Lake Havasu.

Both coastal and noncoastal wetlands, including many national wildlife refuges, may be severely affected by climate change. In most scenarios, many of the wetlands in the Prairie Pothole region are expected to dry up, and the portion of the region with optimal conditions for breeding is predicted to shift south and

east (Johnson et al. 2005). Some research has shown that 309 national wildlife refuges will lose waterfowl species as a result of range contraction due to climate change (Scott et al. 2008). These authors conclude that the most vulnerable refuges are, along with those in Alaska, the 162 coastal refuges.

Sea level rise will create many problems for coastal areas. In the United States, sea levels could rise anywhere between 0.13 and 0.95 meters (U.S. GCRP 2000). Those coastal areas with shallow slopes, high tidal ranges, and high wave height are the most vulnerable to widespread inundation (USGS 2002). In Louisiana, the mid-Atlantic, and the South Atlantic, land subsidence contributes to the net rise; fairly significant increases have already occurred in these areas. Current sea level rise in the mid-Atlantic region is estimated to be 3 to 4 millimeters per year.

Finally, several types of damage are expected to be inflicted on forests and some national parks as a result of climate change. Climate models suggest that the combination of higher overall temperatures and less frequent, more intense rainstorms over long periods will aggravate droughts in the forests of the interior West and also generate more frequent droughts in the forests of the Northwest and East. This will lead to higher

mortality rates in young trees, which in turn leads to more fuel generation for wildfires. In addition, all trees are likely to be weakened against insect invasion and disease infection. One problem already manifesting itself is infestation of the bark beetle. Beetles killed 2.5 million acres of trees in Colorado and Wyoming in 2006 and 2007, and were expected to finish off another 2 million acres by the end of 2008 (Robbins 2008). Warmer temperatures may also cause some unique national parks to lose the very resources on which they are based. The disappearance of the glaciers at Glacier National Park is well documented. Hall and Fagre (2003) estimate that under likely future climate scenarios, remaining glaciers in the park will vanish by 2030. Joshua Tree National Park is another that may lose its signature resource. Studies have posited that the southern half of the Joshua trees' range, which includes the national park, will grow too warm to sustain them and that Joshua trees will vanish from Joshua Tree National Park within the next 100 years (Shogren 2008).

Morris and Walls (2009) point out the irony that just as climate change will have devastating impacts on many outdoor resources, the warmer climate is likely to increase the very demand for recreation that those resources provide. They cite several studies that estimate a net increase in recreation demand. Earlier springs, longer summers, and generally warmer temperatures are predicted to increase the demand for many water-based recreation activities, as well as hiking, camping, and many other outdoor pursuits. The authors argue that natural resource managers should be looking ahead to anticipate some of the negative consequences of climate change and adjusting management schemes in a way that gives resources a better opportunity to weather those consequences. Adequate adaptation dollars are needed, which Congress seems to be recognizing by incorporating such money in recent proposed climate legislation. Exactly how that money is directed and used will be of critical importance.

APPENDIX		National Park Service Units ¹	
Type	Number	Description	
National Battlefield	24	Area associated with U.S. military history ²	
National Heritage Area	27	Place that has special natural, cultural, historic, and recreational elements	
National Historic Site	79	Place that contains a single historical feature directly associated with a person or family of historical significance	
National Historical Park	42	Similar to a national historic site but extends beyond a single building or property	
National Lakeshore	4	Park devoted to preserving natural resources and providing water-based recreation	
National Memorial	28	Memorial commemorating a historic person or episode	
National Monument	74	A wide range of areas (1906 Antiquities Act allows the president to declare landmarks, structures, and other objects of historic or scientific interest as national monuments)	
National Park	58	Large natural place with a wide variety of features, where hunting, mining, and other activities that consume park resources are prohibited	
National Parkway	4	Scenic roadway and the protected lands next to the roadway	
National Preserve	16	Area similar to a national park but that allows hunting, trapping, mining, or oil and gas exploration and extraction	
National Recreation Area	18	Area usually centered on a large reservoir created by a federally built dam	
National Reserve	2	Similar to national preserve but can be managed by a state or local authority	
National River	15	Free-flowing stream or river and the preserved land along it; includes the wild and scenic river designation	
National Seashore	10	Protected area along the Atlantic, Pacific, or Gulf coast	
National Trail	25	Long-distance footpath authorized under the National Trails System Act of 1968; can be a national historic trail or a national scenic trail	
¹ Other designations not included in the table are international historic sites, affiliated areas, and some other sites that include unique names, including the White House and the National Mall in Washington.		² The names of units in this designation include national battlefields, national battlefield parks, national battlefield sites, and national military parks. Source: NPS (n.d., b) and NPCA (n.d.).	



3

Demand for Outdoor Recreation

The diversity in outdoor resources available in the United States provides a range of opportunities for outdoor pursuits. Many changes have taken place in the past quarter century, however, that are likely to have altered participation in those pursuits. The country has experienced sizable population growth, increasing urbanization of the population, and significant demographic changes, such as increases in some ethnic groups and declines in others, along with changes in the age distribution of the population. In addition, changes in the availability of leisure time, transportation costs, and technology are likely to have had an impact on outdoor recreation.

Recent studies have sounded alarms over declining participation in outdoor recreation, particularly nature-based activities. Pergams and Zaradic (2006) show downward trends in visits to national parks over time and negative correlations between national park visits and time spent using a variety of electronic media (television, movies, video games, and the Internet). They argue that these types of indoor activities have substituted for outdoor pursuits in recent years. In a follow-up study, they extend their analysis to other measures of outdoor activities including visits to state parks, national forests and Bureau of Land Management (BLM) lands, numbers of hunting and fishing licenses and duck stamps issued, and numbers of people who go camping, hiking, or backpacking each year (Pergams and Zaradic 2008). The authors argue that the downward trends they find in the data portend problems for the environment, citing studies that find that environmentally responsible behavior is a function of direct contact with the outdoors (see, for example, Hungerford and Volk 1990; Duda et al. 1998; Wells and Lekies 2006). They and others worry especially about children's lack of time outdoors, arguing that adults who are conservation advocates and environmentalists tend to have spent more time in nature as a child. Louv (2005) has coined the term nature-

deficit disorder to describe children's lack of connection with the outdoors.¹

Some researchers have taken issue with these findings. Jacobs and Manfredo (2008) argue that Pergams and Zaradic focus on too narrow a set of metrics. They find that wildlife-watching has risen in popularity and that visitation to National Wildlife Refuge (NWR) sites has grown over time. Cordell, both on his own (2008a) and with colleagues (2008), makes some of the same arguments. Their analysis of results from the National Survey on Recreation and the Environment, a Forest Service recreation participation survey conducted since the mid-1960s, suggests that outdoor activities have shifted over time, from hunting and fishing to off-road vehicle riding, kayaking, and wildlife-watching, among others.

We contribute to this literature by looking at a wide set of general park and public lands visitation statistics as well as data on outdoor recreation participation—both general and for specific activities—and time use. Using the time-use data, we econometrically analyze the factors that explain time spent in outdoor recreation, and discuss available data on children's participation in outdoor recreation. We conclude with some guidance for the future.

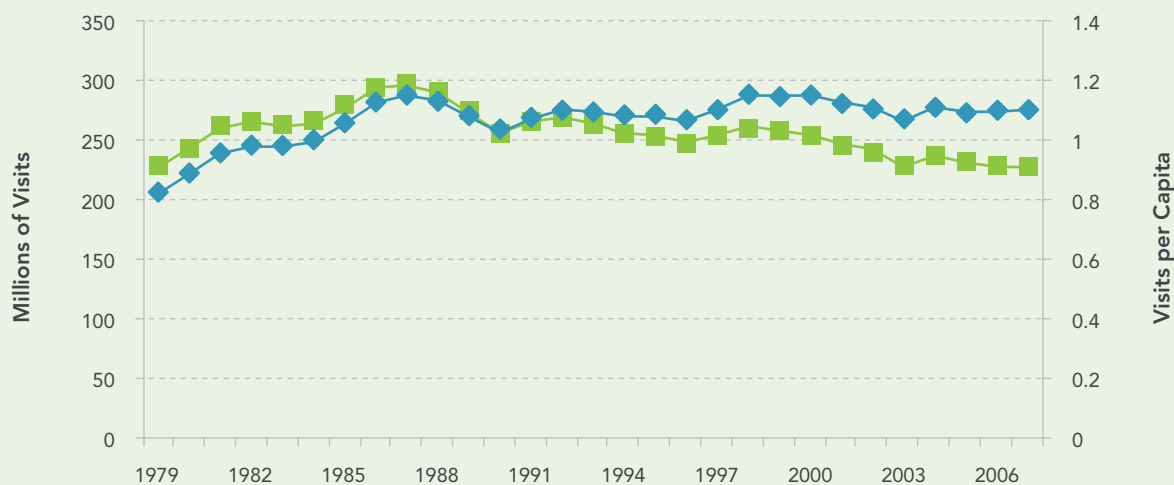
Visits to National Parks and Other Federal Lands

National parks are considered the preeminent outdoor recreation destinations in the United States. Although set aside for a high level of protection, national parks are designed to be visited and enjoyed by the public. Figure 3-1 shows annual visits to lands managed by the National

¹ Godbey (2009) cites studies showing that time spent outdoors has beneficial impacts in terms of reducing youth violence, lessening behavior problems in children, combating problems associated with attention deficit hyperactivity disorder, or ADHD, and fighting obesity.

FIGURE 3-1

Visits to National Park Lands



Source: NPS n.d., a.

— Visits — Visits per Capita

Park Service (NPS) both in total and on a per-capita basis from 1979 through 2007. Included are visits to national parks, national seashores, national historic areas, national monuments, and all of the other categories of lands managed by the NPS and described in the Chapter 2 appendix. The figure shows that the total annual number of visits has remained roughly constant overall since the mid-1980s but declined slightly on a per-capita basis.² On average, in 2007, Americans made less than one visit per year to a national park, about the same as in 1979 but down from the peak in 1987. Figure 3-2 shows camping visits to national parks. These data give a sense of more nature-based recreational use and also park visits involving more time (as an overnight visit is implied). They also show a decline on a per-capita basis, even somewhat more pronounced than the trends in Figure 3-1, and a slight downward trend in total visits as well. Camping visits peaked in 1981 at 5.2 visits per 100 people, and fell by 2007 to 2.7.

Annual time series data on visitation to other federally owned lands is not as comprehensive and consistent across time as the national parks data. Nonetheless, in the following figures we present visitation trends for available

years for U.S. Army Corps of Engineers sites, BLM lands, and NWRs. Figures 3-3 through 3-5 show both total visits and visits per capita for each of these areas.

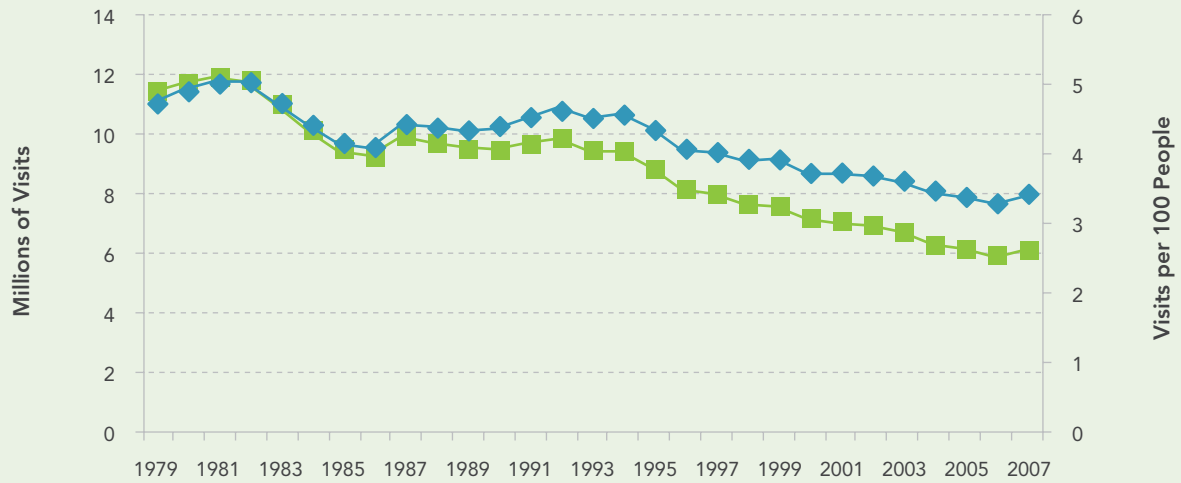
Interestingly, two of the graphs show trends similar to those for national parks: total visits per year to Corps sites and BLM lands stay roughly constant but visits per capita show a slight decline. The data years for Corps recreation sites are identical to those for the NPS—1979 through 2007—and the BLM years are quite close, 1982 through 2007. Both per capita and total visits are greatest for Corps sites; in 2007, an average person made one-third more visits to Corps lakes than to NPS sites (1.21 versus 0.91 visits per year) and total visitation was 35 percent higher (372 million versus 276 million).

The trend in NWR visitation looks somewhat different than the other figures, increasing from 1994 through about 2004, declining only in 2005 and 2006, and rising again in 2007 and 2008. However, we hasten to point out that we were unable to obtain as long a time series for the refuges as for the other sites, so a direct comparison is not possible. Moreover, fewer visits are made to NWRs than to the other sites. The increase over the 1994 to 2007 period may suggest a bit of catch-up on the part of NWRs. Indeed, other authors have suggested that wildlife-watching is on the rise and NWR visits have been growing (Cordell 2008a, 2008b).

² All per capita numbers in this section are obtained by dividing total visits by the U.S. population.

FIGURE 3-2

Number of Camping Visits to National Parks

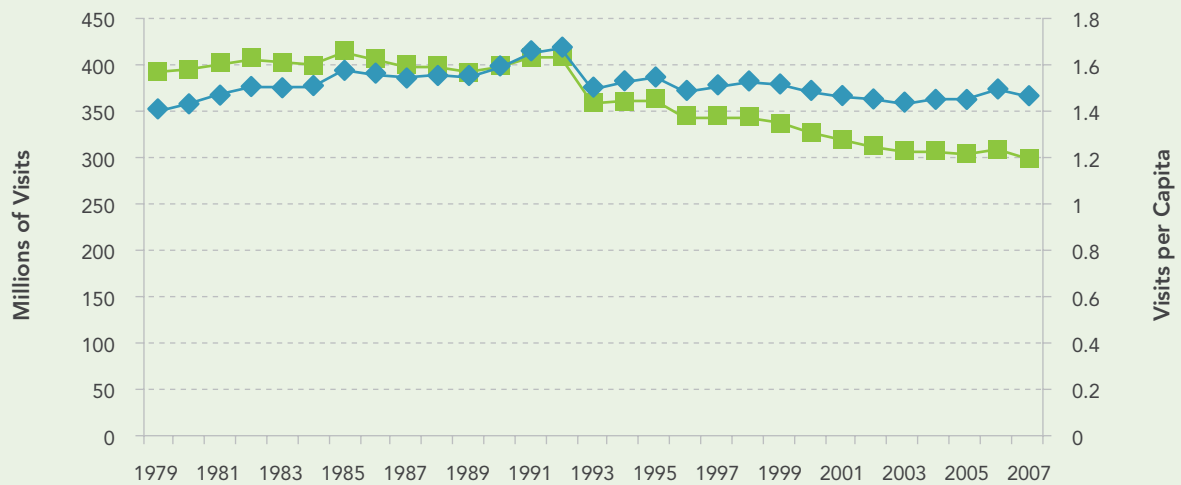


Source: NPS n.d., a.

—◆— Camping Visits —■— Camping Visits per 100 People

FIGURE 3-3

Visits to Army Corps of Engineers Recreation Sites

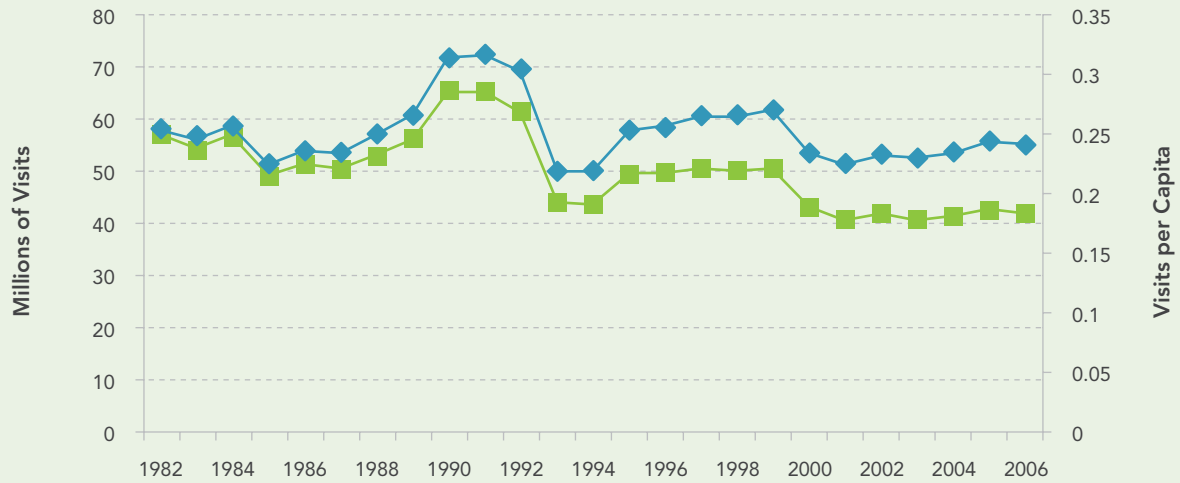


Source: Chang 2008a, 2008b.

—◆— Visits —■— Visits per Capita

FIGURE 3-4

Visits to Bureau of Land Management Lands

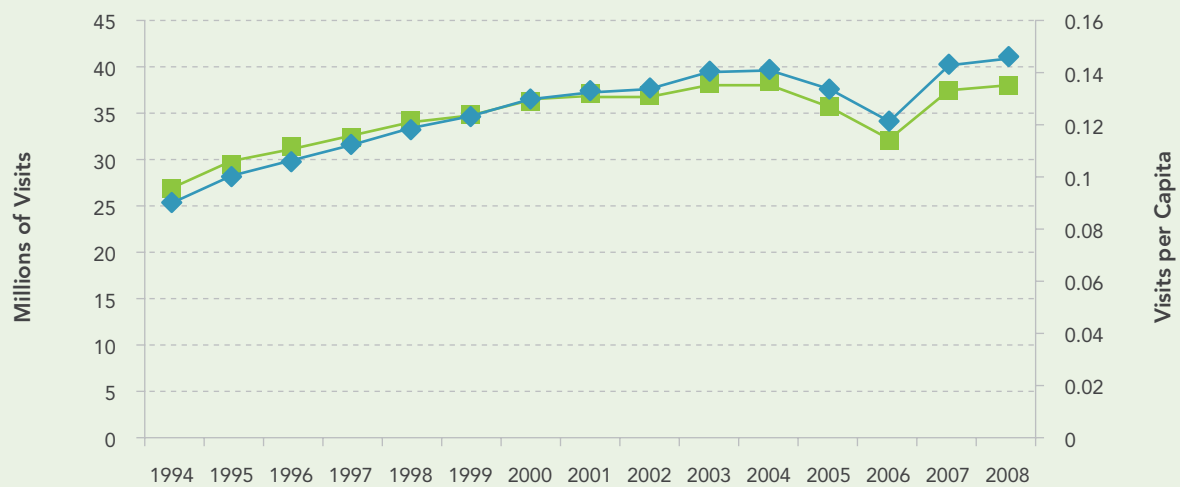


Source: U.S. DOI various years, 1950–2007.

Visits Visits per Capita

FIGURE 3-5

Visits to National Wildlife Refuges



Sources: Kilcullen 2009; Callihan 2009; U.S. DOI 1994, 1995.

Visits Visits per Capita

TABLE 3-1		Annual Visitation to National Forests, 2004–2007		
Year	2004	2005	2006	2007
Visits (in millions)	204.4	195.9	180.4	178.6

Source: English 2008, 2009.

National forests also provide significant recreation opportunities. We cannot show a long time trend of visits to these sites, however, because the Forest Service's methodology for estimating visitation changed significantly in the late 1990s. According to Forest Service experts, a consistent time series is unavailable and comparisons cannot be made between numbers reported before the change and those available after. The current methodology, National Visitor Use Monitoring (NVUM), collects a sample of visitor information consistently across all recreational sites in all national forests.³ Total annual visitation estimates based on this technique are presented in Table 3-1,

³ See the Forest Service website, <http://www.fs.fed.us/recreation/programs/nvum>; see also English et al. 2002.

beginning with 2004 because this is the first year for which information from all national forests is available. English (2009) warns that visitation trends should not be inferred from the data because the lower reported visitation in more recent years is confounded by improvements in the method. Approximately 179 million visits were made to national forests in 2007. Thus the annual number of visits to national forests is less than the number to NPS and Corps sites but far more than visits to NWRs or BLM lands.

Visits to State and Local Parks

State parks provide recreation opportunities that are closer to home for many Americans, particularly those living east of the Rocky Mountains, where fewer federally owned lands are located. As pointed out earlier, state parks serve two and a half times as many visitors as the NPS but have only 16 percent of the acreage. Nonetheless, trends over time in state park visits look very much like those for the federal lands. Figure 3-6 shows total and per capita state park visitation between 1979 and 2007. Total visits have stayed relatively constant or risen slightly over time, and visits per capita have declined slightly. Americans made an average of 2.4 visits per person to state parks in 2007, and 730 million visits overall.

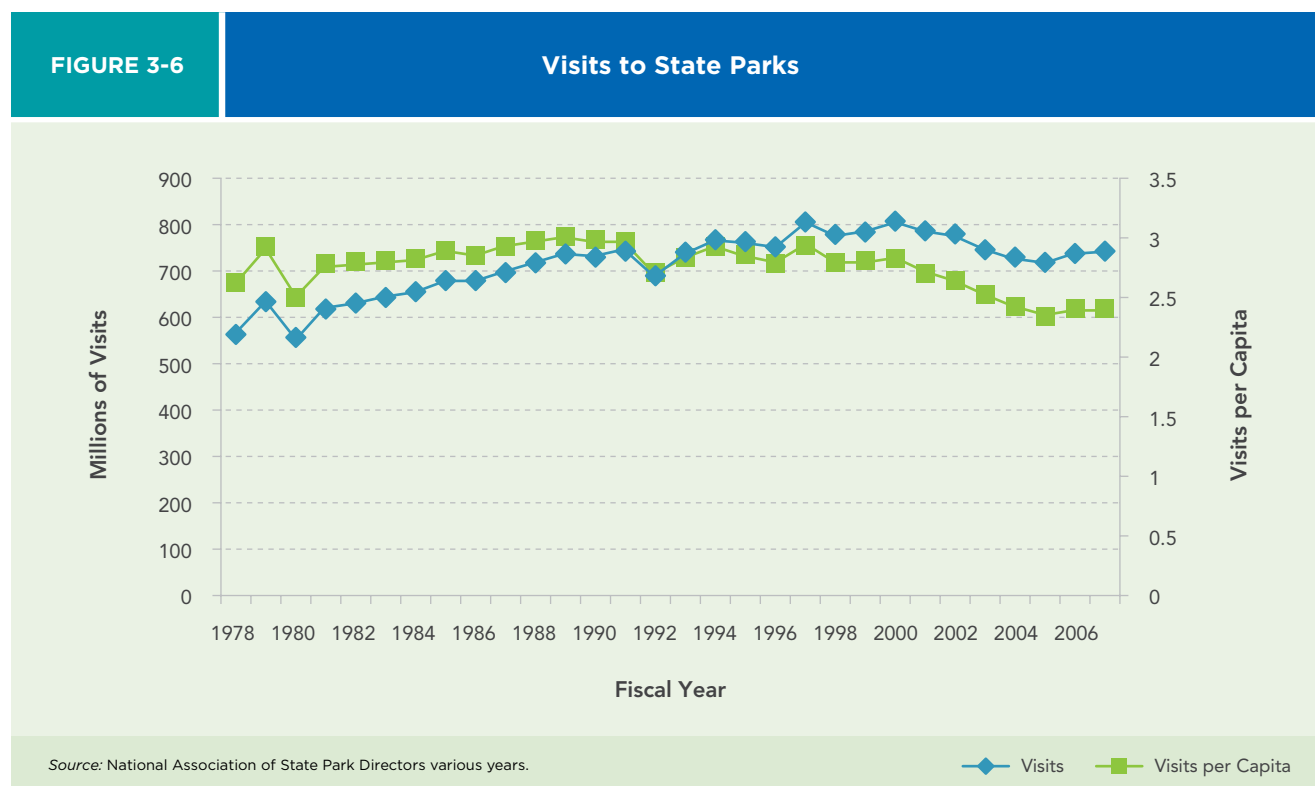
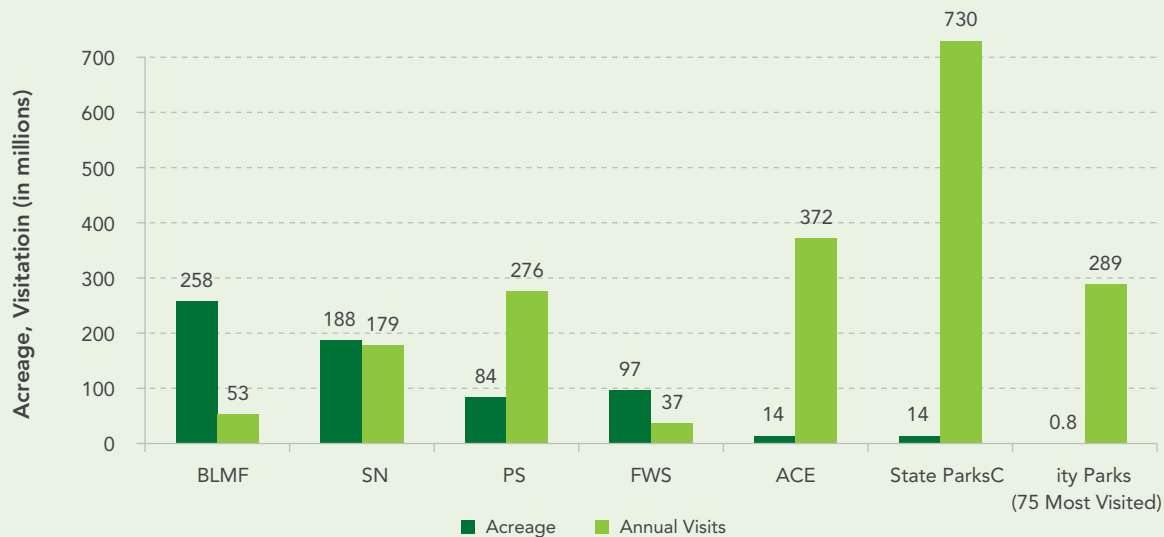


FIGURE 3-7

Acreage and Annual Visitation for Recreation Lands



Sources: Callihan 2009; English 2009; Harnik 2008; Kilcullen 2009; National Association of State Park Directors 2008; NPS n.d., a; U.S. Army Corps of Engineers 2008; USDA 2008b; U.S. DOI various years, 1950–2007.

Note: A national forest visit can be composed of multiple site visits.

Measuring use of local parks is, at best, difficult. Although many cities measure use at facilities that charge fees or participation in park programs that require registration, measuring comprehensive visitor information for all city parks is usually not feasible. Some cities carry out surveys, but the practice is far from universal and, furthermore, comparing across cities with disparate survey techniques and information collected is impractical. Unfortunately, no government agency or private organization puts together a national dataset on local parks. Thus, not only are there no comprehensive data on park use, but information on acreage and facilities is also limited.

The Trust for Public Land's Center for City Park Excellence (CCPE) provides use data for 75 of the most visited city parks. The CCPE reports that these parks had 289 million visitors in 2006. Annual visitation ranged from 25 million in New York City's Central Park to 13 million in San Francisco's Golden Gate Park and down to 400,000 in Anchorage's Town Square (Trust for Public Land 2008). Given the large percentage of the U.S. population living in urban areas, getting a better estimate of urban park use on an annual basis seems critical. Figure 3-7 combines information on visitation for the five federal agencies summarized, along with state parks and the 75 most visited city parks. Acreage figures are also

presented. The numbers shown in the figure are for either 2006 or 2007. The graph highlights that the most heavily used sites tend to be those with the least amount of land area. The two agencies that manage the most acreage—the BLM and Forest Service—have a multiple-use mandate, with recreation as only one component. Thus, though those agencies have more than twice the acreage of other agencies, they support far fewer visitors.

The Resources for the Future surveys of state and city park directors discussed earlier included questions about popularity trends in parks. Specifically, park directors were asked whether various activities were “declining significantly,” “declining moderately,” “about constant,” “increasing moderately,” or “increasing significantly” (for the survey and a summary of findings, see Walls et al. 2009a, 2009b). The activities listed for city parks ranged from picnics to hiking to organized team sports, but for state parks were slightly different and included hunting and fishing. Both surveys included categories for outdoor recreation overall and for outdoor recreation among youth. Figure 3-8 shows the percentage of respondents who reported increasing moderately or increasing significantly to each of the 13 activities on the city park directors survey. Figure 3-9 presents the state park results.

Several interesting findings become clear. First, for urban parks (Figure 3-8), most of the listed activities are reported to be increasing in most locations. For example, about 85 percent of the directors reported that hiking and walking are becoming increasingly popular, either moderately or significantly, in their cities. More than 80 percent reported a similar trend for skate parks. In nearly 90 percent of the cities, dog parks are also on the rise. Outdoor recreation overall and outdoor recreation among youth are also reportedly increasing in urban parks. These findings are interesting for two reasons. First, as explained earlier, concern over declining participation in nature-based recreation, and particular concern over youth participation, has been expressed in many recent studies and is a focus of both media attention and new private and public sector programs (Pergams and Zaradic 2008; Kareiva 2008; Louv 2005). Second, as can be seen in Figure 3-9, the state park results are different. Only about 20 percent of state park directors report outdoor recreation among youth as increasing; 46 percent reported it as declining, either moderately or significantly.

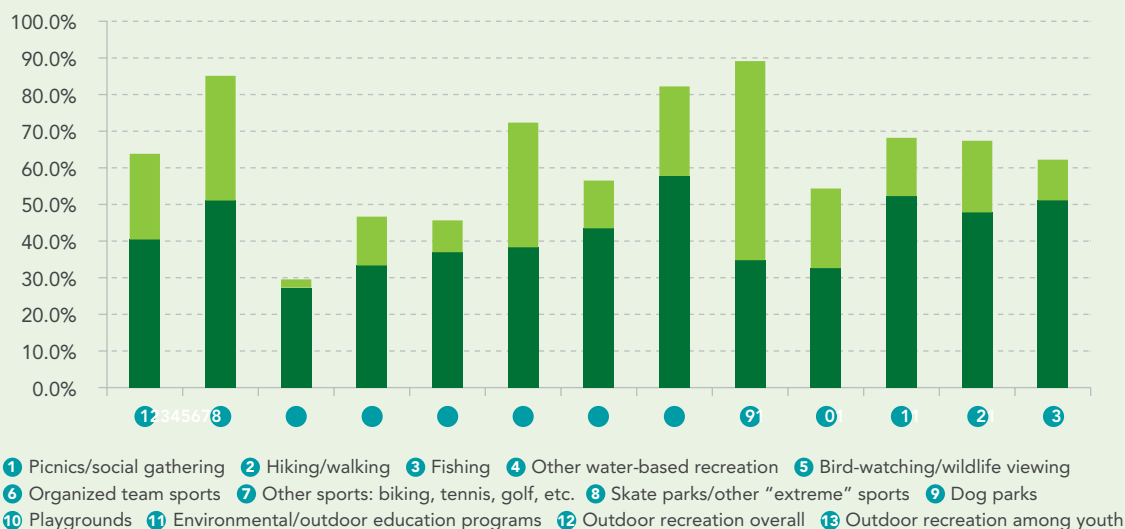
State park directors also reported declines in some specific activities. Fully 51 percent reported hunting as declining, either moderately or significantly, and 20

percent reported fishing. Almost 60 percent reported fishing as about constant. Many of the other categories we presented to state park directors were reported to be increasing, as Figure 3-9 shows, though in general, the percentages are lower than in the urban park survey.

Park directors were also asked about the challenges they faced and whether each was “not a challenge,” a “minor challenge,” “significant challenge,” “major challenge,” or “huge issue.” Urban park directors were presented with 11 specific challenges and state park directors with nine. Both surveys asked whether vacancy, inadequate use, and congestion or crowding were problems. Responses were fairly consistent across surveys. In terms of congestion, about half reported it as no challenge or a minor challenge and the other half as either a significant, major, or huge problem. As to inadequate use or vacancy, only one urban and three state park directors reported a major challenge or huge issue. These responses suggest that park directors are seeing substantial park use at both the state and the local levels. Anecdotal evidence and discussion with directors suggest that urban park use is particularly high. Without a good data series on visitation for local parks, however, drawing a strong conclusion is difficult.

FIGURE 3-8

Popularity Trends in Urban Parks

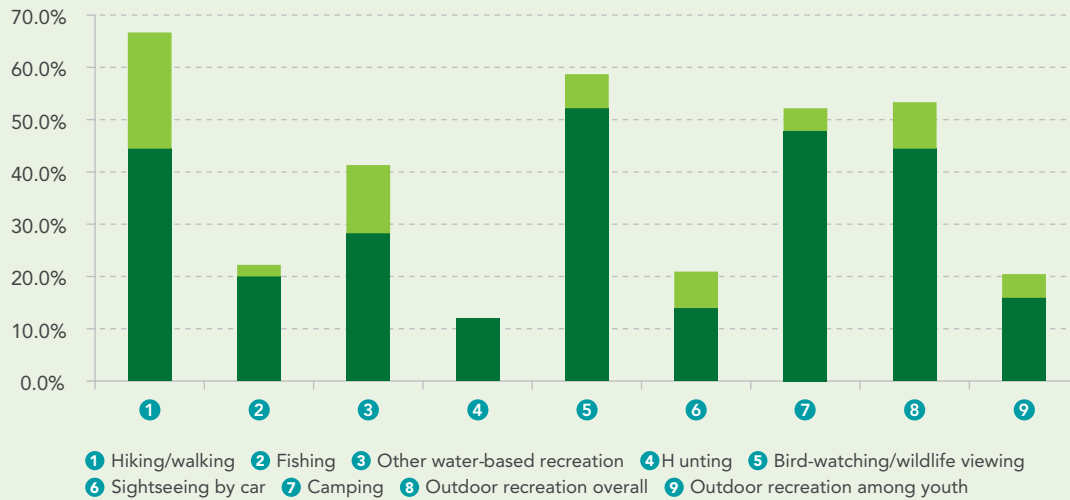


Source: Walls et al. 2009a.

■ Percentage of cities reporting "increasing moderately" ■ Percentage of cities reporting "increasing significantly"

FIGURE 3-9

Popularity Trends in State Parks



Source: Walls et al. 2009b.

■ Percentage of states reporting "increasing moderately" ■ Percentage of states reporting "increasing significantly"

Recreation Surveys

We summarize findings from three national surveys: the National Survey on Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) conducted by the U.S. Fish and Wildlife Service in conjunction with the Census Bureau; the Forest Service's National Survey on Recreation and the Environment (NSRE); and the Outdoor Recreation Participation Study of the Outdoor Foundation. All rely on questionnaires administered by telephone, mail, or Internet of a representative sample of U.S. citizens. They generally ask whether the respondent participated in a particular activity in the past year and, if so, how many days or times he or she did so. The FHWAR survey and the NSRE also collect socioeconomic and demographic information on respondents. The FHWAR survey addresses only fishing, hunting, and wildlife-watching and photography, though it disaggregates these activities into various types. The Outdoor Foundation survey focuses on adventure-and nature-based activities including camping, mountain biking, rafting, kayaking, scuba diving, skiing, and more, as well as fishing and hunting. The NSRE is quite broad, asking about more than 50 activities ranging from camping, hiking, hunting, and fishing to skateboarding, skiing, and off-road vehicle riding to organized team

sports. The NSRE has been taken since the mid-1960s and has, from time to time, included add-on surveys and analyses of special topics. The most recent of these was a survey of youth participation in outdoor recreation in 2008 and 2009.

We find that these surveys are not always in agreement about the level of participation in particular activities or on the trends over time. In general, the NSRE finds higher levels of participation than either the FHWAR survey or the most recent Outdoor Foundation surveys. Earlier years of the Outdoor Foundation survey, which used a different methodology and had smaller sample sizes, shows results more in line with those of the NSRE. The trends over time also diverge between the NSRE and the FHWAR survey. Unfortunately, because of the change in methodology, we are unable to look at trends in the Outdoor Foundation survey over a long period. In the following sections, we provide more details of the findings from the individual surveys.

National Survey on Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR)

The FHWAR survey collects information every five years on participation in various activities associated

with wildlife.⁴ It has been conducted since 1955 but the methodology changed in 1991, thus earlier years are not fully comparable to those after 1991. Beginning in 1991, the Census Bureau, which conducts the survey, began shortening the recall period for survey respondents and reinterviewing throughout the year. Instead of asking respondents to recall whether they had participated in an activity over the previous 12 months, surveyors asked about the previous 4 months. To get a full year of activities, they interviewed respondents three times in the year.⁵ Approximately 80,000 individuals age 16 and older are surveyed in each of the survey years; most of the questionnaires are administered by telephone but some in-person interviews are conducted.

Figure 3-10 presents estimates of the participation rates for fishing, hunting, and wildlife-watching in the United States from the FHWAR surveys. Fishing includes both saltwater and freshwater. Hunting includes small and large game and migratory birds. Wildlife-watching includes both residential activities, such as backyard bird

feeding, and nonresidential, such as visiting a park or wildlife refuge primarily to view or photograph wildlife. The percentages in the figure show the number of people who participated in these activities at least once in the previous year, scaled to be representative of the U.S. population, divided by the total U.S. population.

The trends in all three activities have been either constant or on a slightly downward trend since 1991. The fishing participation rates declined from 19 percent in 1991 to 13 percent in 2006, and hunting from 7.4 percent to 5 percent. Wildlife-watching dropped from 39 percent in 1991 to 30 percent in 1996 but stayed near that level in the 2001 and the 2006 surveys.

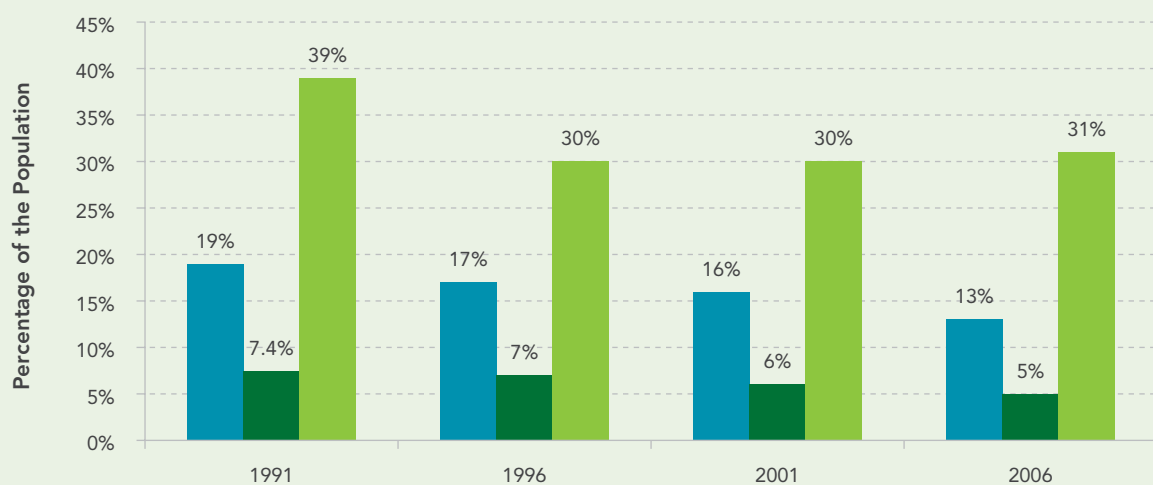
Figure 3-11 shows some information on the level of participation—the days per capita spent fishing, hunting, and watching wildlife—for each of the survey years. Note that this figure is the total days of participation across all survey respondents, which includes those who do not participate—that is, the figure does not represent days per active participant. Some small differences between Figures 3-10 and 3-11 are evident. Most notable is the fact that although the participation rate is highest for viewing wildlife, the days of participation are highest for fishing. Trends over time in the two figures are closely related, however.

4 For a description of the survey and to download the annual summary of data and reports, see http://wsfrprograms.fws.gov/Subpages/NationalSurvey/National_Survey.htm.

5 The FWS reports that the methodology was changed based on research that revealed that respondents had difficulty recalling activities over a longer time period and results tended to be biased upward—that is, people overstated their participation.

FIGURE 3-10

Fishing, Hunting, and Wildlife-Watching Participation Rates (FHWAR Survey)

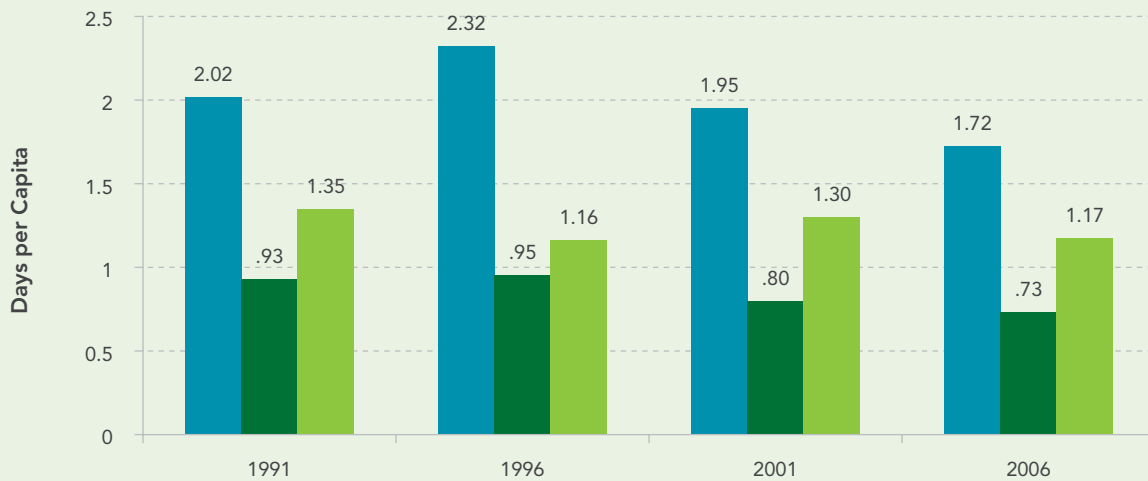


Source: U.S. DOI Fish and Wildlife Service and U.S. Census Bureau 1992, 1997, 2002, 2007.

Fishing Hunting Wildlife Watching

FIGURE 3-11

Days Per Capita Spent Fishing, Hunting, and Wildlife-Watching (FHWAR Survey)



Source: U.S. DOI Fish and Wildlife Service and U.S. Census Bureau 1992, 1997, 2002, 2007.

■ Fishing ■ Hunting ■ Wildlife Watching

The decline in fishing and hunting—particularly hunting—has been well documented and much discussed. In addition to the results from the FHWAR survey, studies have shown declines in hunting and fishing licenses. Other surveys of participation have also documented declines (see the discussion of the Outdoor Foundation survey below). Industry reports drops in sales of equipment, and anecdotal evidence abounds that participation in hunting is much lower than it used to be. The declines have been so sharp that even popular media and mainstream publications have covered the topic in recent years.⁶

To some observers, this trend is a matter of serious concern. Hunters and fishers are considered to be the earliest conservationists and important stewards of the environment. Their volunteer time and donations on behalf of conservation are well known.⁷ Moreover, excise taxes on hunting and fishing equipment, as well as duck stamps, support a number of important conservation programs, which we discuss later.

The declines are thought to be attributable, in varying degrees, to four factors: the urbanization of the population; the loss of open space on the urban fringe to residential and commercial development—open space that once provided important wildlife habitat and hunting areas; decreasing amounts of leisure time, especially leisure time that comes in large enough blocks of time to allow for hunting and fishing (Godbey 2009); and competing opportunities for leisure. In addition, the problem has accumulated over time as adults who once hunted no longer have time and do not pass the knowledge and interest on to their children. The hunting community refers to this as the recruitment and retention problem. Nelson (2008) cites analysis of the FHWAR data showing that though both the recruitment rate and the retention rate have fallen in recent years, those declines have been far larger among urban hunters than rural ones, and that urban areas account for only 45 percent of all hunters but 77 percent of the total adult population.

The reasons urban residents are less likely to hunt are probably attributable to several factors, but lack of access is key. Private lands are critical for hunting—studies show that more than half of all hunting takes place on private lands. The loss of these lands to

⁶ See, for example, Clayton 2005 and Poole 2007.

⁷ One of the largest national land trusts, Ducks Unlimited, was started by waterfowl hunters. The organization claims that 90 percent of its members today are hunters (see www.ducks.org/hunting).

development on the urban fringe means that hunters have to go farther to hunt. Many sites are also now fee based, which further restricts access, especially to moderate- and lower-income households.⁸ Access to BLM and Forest Service lands can also be a problem. Hunters report issues with some lands being off-limits to hunting—for example, closures at national wildlife refuges, access blocked by private properties, and inadequate roads (D.J. Case and Associates 2009).

These trends for hunting could foreshadow some problems with other nature-based activities that require both significant amounts of time and access to particular resources—kayaking, backpacking, camping, and rock climbing, to name just a few.

National Survey on Recreation and the Environment (NSRE)

The National Survey on Recreation and the Environment, or NSRE, represents the continuation of the National Recreation Survey (NRS) series. Begun in 1960 by the Outdoor Recreation Resources Review Commission, the first NRS was a home-based survey of outdoor recreation participation in the United States. Since that time, eight additional surveys have been conducted (1965, 1970, 1972, 1977, 1982 to 1983, 1994 to 1995, 1999 to 2002, and 2005 to 2008). Since 1994, the NSRE has been conducted as a telephone survey.⁹ The NSRE is a partnership between the Research and Development Branch of the U.S. Forest Service; the Coastal and Ocean Resource Economics Program of the National Oceanic and Atmospheric Administration; the University of Tennessee Department of Forestry, Wildlife, and Fisheries; and the University of Georgia Warnell School of Forest and Natural Resources.¹⁰

Data collection methodology has varied slightly over the years, as have portions of survey content. Current versions require respondents to recall whether or not they participated in particular recreation activities over the previous 12 months. The NSRE also collects information on the number of days spent participating in an activity and the number of trips taken where the primary purpose was a certain activity. Any part of a day spent participating counts as a full day.

Over the years, sample size has varied; the most recent survey, conducted in 2005 to 2008, has 19,186 respondents. The responses are weighted to represent the general population.

In Figure 3-12, we show trends in the participation rate for several wildlife-associated activities from the NSRE surveys. The data indicate that the proportion of the population participating in fishing and hunting activities has essentially held steady over the past 25 years. However, participation in bird-watching has notably increased. In the early 1980s, according to the NSRE, 12 percent of Americans participated in bird-watching, and by 2008 some 35 percent did so.

The NSRE participation rates for hunting and fishing are far above those obtained by the FHWAR, as shown in Figure 3-10. Fully 33 percent of respondents to the NSRE reported that they had been fishing in the past year in the 2005 to 2008 survey, but only 13 percent of respondents to the 2006 FHWAR survey did so. The participation rates for hunting are 12 percent for the NSRE and 5 percent for the FHWAR survey. Only bird- and wildlife-watching show similar rates across the surveys, but because watching wildlife generally is a broader category, we would expect participation rates to be greater than for bird-watching.¹¹ The trends exhibited in the two graphs also diverge. Fishing and hunting participation rates stay relatively constant between 1982 and 2008 in the NSRE and even increase between 1994 and 2008. By contrast, the FHWAR survey shows a downward trend between 1991 and 2006.

Figure 3-13 shows participation rate trends for seven other outdoor activities from the NSRE. Between 1982 and 2008, most activities held relatively constant or increased. Walking, bicycling, and day hiking all increased significantly: walking by 31 percentage points, to 84 percent; day hiking by 18, to 32 percent; and bicycling by 7, to 39 percent. All seven activities had reported participation rates in the latest survey (2005 to 2008) equal to or greater than those in the 1982 to 1983 survey.

Some authors have used the NSRE data to explore how participation has changed among various subgroups based on demographics and other factors. Cordell

8 To address this issue, Congress included the Open Fields program in the 2008 Farm Bill, which provides \$50 million over four years for states to implement programs that will pay private landowners for public hunting rights.

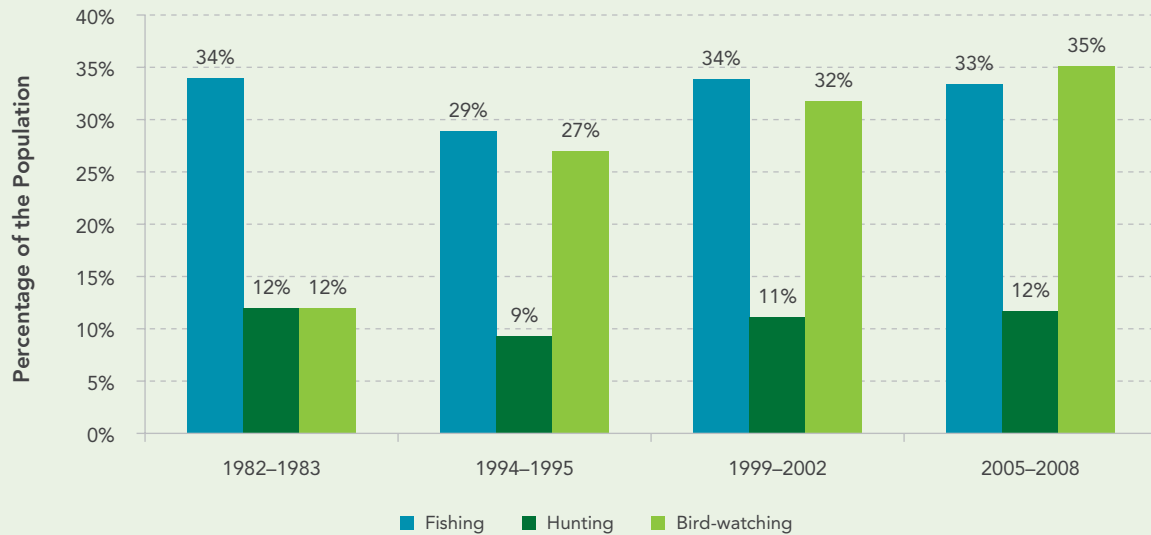
9 The 1960, 1965, and 1982 interviews were conducted in person. The 1970 survey was mailed, and the 1977 survey was conducted by telephone.

10 Other agencies and interests help sponsor and conduct the NSRE at various times, including the BLM, the Environmental Protection Agency, the Coast Guard, states, and nongovernmental organizations. For a description of the NSRE, list of survey questions, and reports of findings, see <http://www.srs.fs.usda.gov/trends/NSre/nsre2.html>.

11 The FHWAR survey asks for information on residential and nonresidential—more than a quarter mile from home—wildlife-viewing activities so it is fairly inclusive; for example, feeding birds or other wildlife in the backyard is included. The bird-watching question on the NSRE has varied slightly among the surveys—in the 1994 to 1995 survey, it explicitly asked about trips more than 15 minutes from home, but the most recent survey simply asked if the respondent viewed, identified, or photographed birds without specifying a location.

FIGURE 3-12

Fishing, Hunting, and Bird-Watching Participation Rates (NSRE)

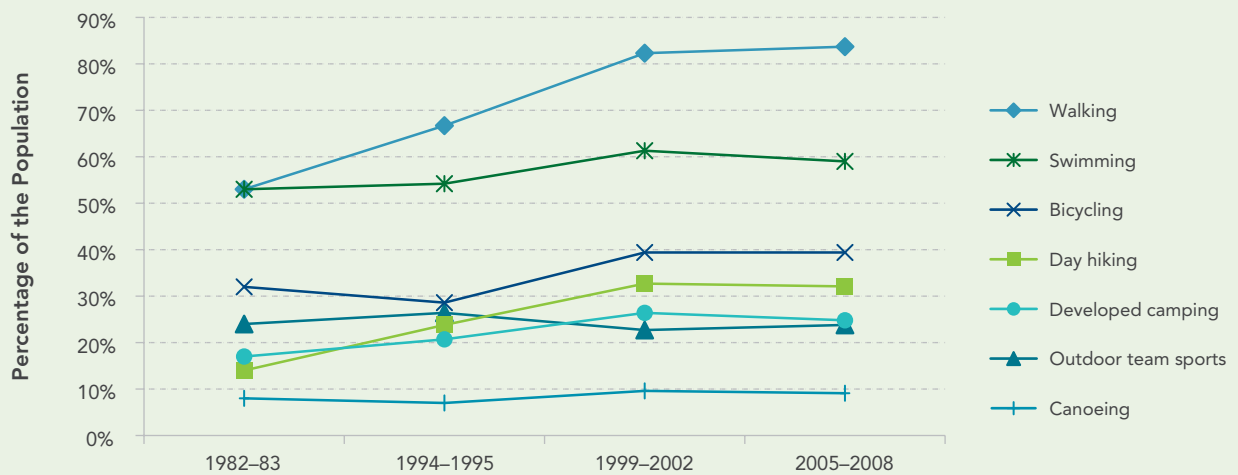


Source: National Survey on Recreation and the Environment various years.

Note: Participation rate is percentage of U.S. population participating in given activity; 1982-1983 rates are percentages of survey respondents and not scaled to national.

FIGURE 3-13

Participation Rates for Various Recreational Activities (NSRE)

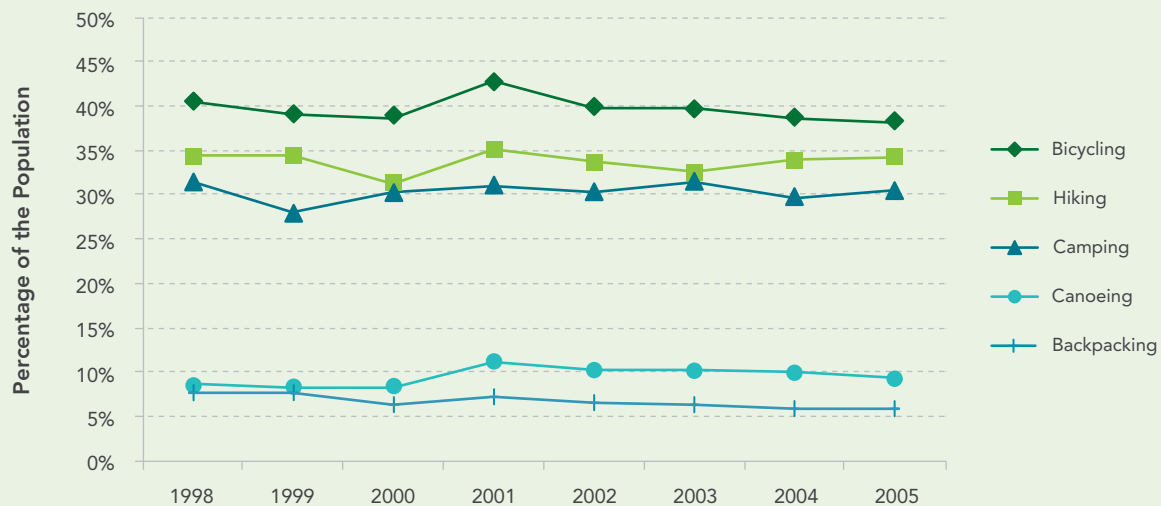


Source: National Survey on Recreation and the Environment various years.

Note: Participation rate is percentage of U.S. population participating in given activity; 1982-1983 rates are percentages of survey respondents and not scaled to national.

FIGURE 3-14

Participation Rates for Various Recreational Activities, 1998–2005 (Outdoor Foundation Survey)



Sources: Outdoor Industry Foundation 2006; Outdoor Foundation 2008, 2009.

(2008a) reports that nature-based recreation activities in particular have become less dominated by men. Cordell also categorizes a group of participants who are enthusiasts and tracks their participation rates and number of days of activity over time. He finds that their participation accounts for the majority of total activity days in the population—for instance, although fewer than 5 percent of the population are kayaking enthusiasts, they account for more than 80 percent of days spent kayaking.

Outdoor Foundation Survey

The Outdoor Foundation is a nonprofit organization that conducts research and promotes the outdoors through various programs and activities.¹² It has carried out a national survey of outdoor recreation participation since 1998. The survey was conducted by telephone between 1998 and 2005 and included approximately 4,000 to 5,000 respondents per year. Beginning in 2006, the survey became web-based and is now much larger—the 2008 survey had more than 40,000 respondents. All of the surveys have been scaled to be nationally representative, but the divergence in sample sizes and

the difference in methodologies means that the later years cannot be compared to the earlier ones. We discuss the findings from both time periods, but treat them as separate samples.

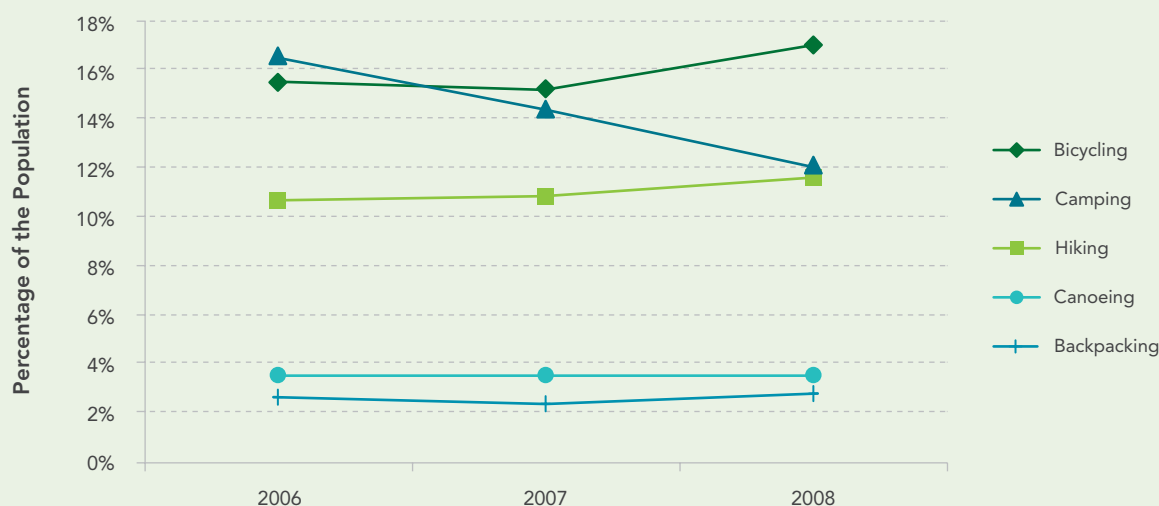
Figure 3-14 shows participation rates for five activities between 1998 and 2005, and Figure 3-15 follows with the same activities for 2006 through 2008. Participation in all five activities stayed relatively constant between 1998 and 2005, with some small increases in all five activities in the early 2000s, followed by a leveling off again at rates similar to the late 1990s. Activities involving more extensive planning, equipment, and time—canoeing and backpacking—have lower participation rates, as expected. Bicycling, at about 38 percent in 2005, has the highest rate.

As Figure 3-15 shows, all rates are much lower with the larger samples and new survey methodology. The participation rate for bicycling in 2008 was 17 percent, half the rate reported for 2005. Camping and hiking in 2008 are lower by an even greater amount—the reported rate for camping was 30.4 percent in 2005 and 12 percent in 2008, and for hiking 34.2 percent in 2005 and 11.6 percent in 2008. Clearly, such a dramatic decline did not take place in such a short time. However, without

¹² The foundation was established by the Outdoor Industry Association, whose members include outdoor equipment and services providers that are mostly focused on adventure and nature-based activities such as kayaking, skiing, rock climbing, and the like. For more information on the foundation and reports based on the survey, see <http://www.outdoorfoundation.org/>.

FIGURE 3-15

Participation Rates for Various Recreational Activities, 2006–2008 (Outdoor Foundation Survey)



Source: Outdoor Foundation 2008, 2009.

more detailed information about survey methodology, it is difficult to know whether the rates from the later surveys are more or less accurate than the earlier ones. The Outdoor Foundation feels that the newer survey yields more accurate results, both because of the larger sample and because the telephone questionnaire in the earlier surveys tended to lead people to overstate participation (Fanning 2009).

Interestingly, the participation rates for 2005, using the old methodology, are almost identical to those in the 2005 to 2008 NSRE survey. Rates for camping, bicycling, canoeing, hiking, fishing, and hunting are all very similar. Rates for the 2008 Outdoor Foundation survey for these same activities, however, are all well below NSRE rates—from one-third to one-half the NSRE levels.

Clearly, the three national recreation surveys are yielding some different findings. Are we to conclude that 40 percent of the population goes hiking (NSRE), or 11.6 percent (new Outdoor Foundation survey), or 34.2 percent (old Outdoor Foundation survey)? Does 13 percent of the population go fishing (FHWR) or 33 percent (NSRE)? It appears that differences in the specific wording of the questions and in the survey methodology may be playing a big role in the discrepancies among

the surveys, but further explorations are needed. (See Schuett and coauthors [2009] for another review.)

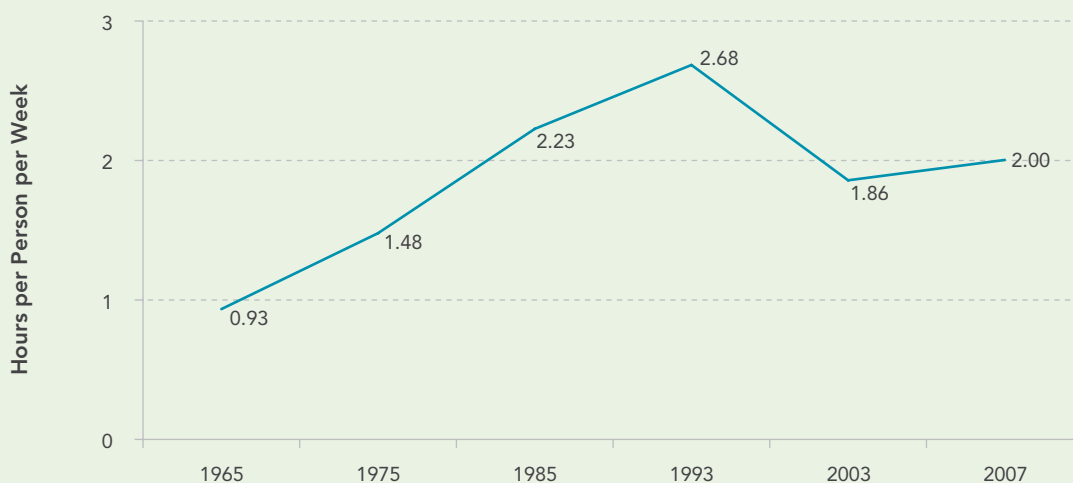
In the next section, we make use of some data that has been underutilized for purposes of studying outdoor recreation activities, the American Time Use Survey. This survey has some features that we consider to be strengths. First, it relies on a daily diary of time use, thus respondents are not asked to recall activities over a previous 4- or 12-month period but rather keep track of the exact amount of time spent in various activities, including recreation, on a single day. Second, the survey has been conducted since the mid-1960s, allowing for a look at trends over a long time period. Third, the socioeconomic and demographic data permit some analysis of the factors affecting time spent in outdoor recreation.

Time-Use Survey Findings

The first three time-use surveys were conducted in 1965, 1975, and 1985 by Survey Research at the University of Michigan. The fourth was conducted in 1993 and 1994 by the Survey Research Center at the University of Maryland. The last two we highlight here were conducted as year-long surveys in 2003 and 2007 as part of the

FIGURE 3-16

Time Spent on Outdoor Recreation and Active Sports



Source: Siikamäki 2009.

American Time Use Survey (ATUS) by the Bureau of Labor Statistics. Sample sizes vary considerably by survey but in total we have 47,271 observations between 1965 and 2007.¹³

These time-use surveys have collected individual, detailed minute-by-minute observations of the daily use of time over a 24-hour recall period. Survey respondents are provided with diaries that allow the timing and verbatim descriptions of daily activities to be easily listed and then converted to measures of the time used in meaningfully specified activity categories. Although the general principles of eliciting and categorizing time-use data have remained fairly unchanged over time, surveys from different years are not identical. By examining original coding manuals and other material describing each survey, we determined that making consistent comparisons across different surveys requires using relatively aggregate categories to classify the use of time for outdoor recreation. We thus use outdoor recreation and active sports as the category for our analysis of the data.¹⁴

It is important to emphasize that participation rates and days of activity from these time-use diaries are not directly comparable to the information collected in the three cited surveys. Those ask about activities over 12 months, or in the case of the FHWAR survey, over 4. The time-use surveys ask individuals to record their activities over 24 hours.

Historical Trends

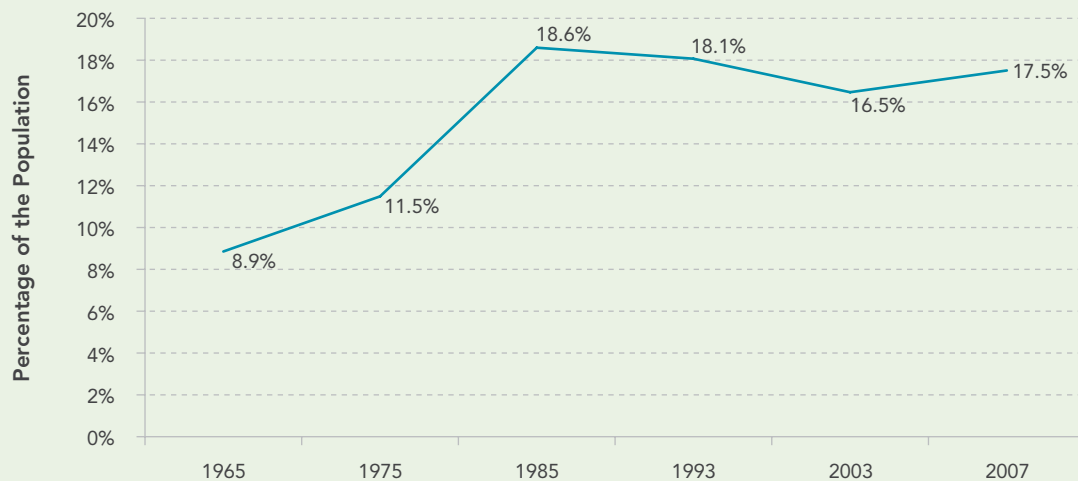
The time spent in outdoor recreation has more than doubled since the 1960s. Whereas in 1965 the U.S. adult population spent on average 0.93 hours per week per capita on outdoor recreation and other physically active sports, in 1975 they spent 1.48 hours, 2.23 hours in 1985, and 2.68 hours in 1993 (Figure 3-16). In more recent years, however, they have spent somewhat less time—1.86 hours in 2003 and 2.00 hours in 2007. Given these trends, the time spent on outdoor recreation seems to have peaked in the 1980s and 1990s, and then shifted slightly downward during the first decade of the millennium. From a historical perspective, however, the current level of time use on outdoor recreation is still high. Moreover, though time for outdoor recreation decreased between 1993 and 2003, it appears to have recovered somewhat by 2007.

¹³ The ATUS is now an annual survey. For more information, see Fisher et al. (2006) and U.S. Bureau of Labor Statistics (2008).

¹⁴ Although we can look at more disaggregated categories such as fishing, hunting, or hiking for some surveys, we cannot do so for all the years and thus limit ourselves here to the outdoor recreation and active sports grouping.

FIGURE 3-17

Trends in Daily Outdoor Recreation Participation Rates



Source: Siikamäki 2009.

Total time use can be disaggregated into two components: the participation rate—that is, the number of participants as a fraction of the total population—and the time spent per active participant. We find that the long-term increase in time spent in outdoor recreation has been largely driven by an increased participation rate. Whereas in 1965 only 8.9 percent of the U.S. population actively participated in outdoor recreation on a given day, approximately 17 to 19 percent did so from 1985 through 2007. Figure 3-17 shows the trends in the participation rate over time.

What Explains Time-Use Trends?

Using econometric analyses and the data from the 1965 to 2003 samples, Siikamäki (2009) examines how gender, age, education, family status (children or no children), and available leisure time jointly determine the likelihood that a person participates and the time spent per active participant.

The estimation results highlight several important demographic findings. For example, considerable gender differences exist in the use of time for outdoor recreation. Siikamäki (2009) finds that, holding all else constant, men spend about 70 percent more time in outdoor pursuits than women. He also finds that households with children are less likely to participate than those with no children,

but when individuals with children decide to participate, they spend the same time in outdoor recreation as others do. Individuals working full-time are less likely to participate, but when they do, they spend more time doing so than others. Finally, education is a strong determinant. The higher the level of education, the higher an individual's participation in outdoor recreation, all else being equal.

One of the most important findings from the econometric analysis is that the leisure time available is positively associated with both participation and time use per active participant.¹⁵ The more leisure an individual has, the greater the likelihood he or she participates in outdoor recreation and the greater the time spent in recreation. Overall, the elasticity of time use for outdoor recreation by an active participant with respect to the amount of leisure is about 0.65—that is, a 10 percent increase in leisure time leads to a 6.5 percent increase in time spent in outdoor recreation. Siikamäki's results also suggest that more than one-third of the reduction in the use of time for outdoor recreation between 1993 and 2003 was due to reductions in the amount of leisure. This is an interesting finding and one that others have speculated about. As Americans have less time

¹⁵ Because leisure time may be endogenous in the model, Siikamäki (2009) instruments for this variable to avoid problems of bias in the results.

for nonwork activities, less time is spent in outdoor pursuits. Godbey (2009) argues that not only has available leisure time shrunk in recent years, but also leisure time is available in smaller increments rather than large blocks.

Table 3-2 breaks down the change in outdoor recreation between 1965 and 2003 and the 1993 to 2003 subperiod into factors associated with changing demographics, the changing amount of leisure, and other factors. The results show that between 1965 and 2003, predicted participation in outdoor recreation increased by 92 percent, from 8.5 percent of the population to 16.3 percent (note that these are model predictions and not the historical averages shown in Figure 3-17). Changing demographics accounted for 20 percentage points of this change, the changing amount of leisure contributed 10.4 percentage points, and other (unobserved) factors supplied 61.5 percentage points. During the same period, time use per active participant increased by 15.8 percent. Demographic change between 1965 and 2003 had a negative effect on time use per active participant, contributing to a 7.9 percentage point reduction. However, the amount of leisure increased considerably between 1965 and 2003, which lifted time use per active participant by 19.5 percentage points. The role of other factors is moderate, increasing time use per active participant by 4.2 percent. As a combined effect of the changes in participation and time use by active participant, time use per capita increased by about 122 percent, as shown in the last column of the table.

The bottom half of the table shows the changes over the 1993 to 2003 subperiod. The drivers here are markedly different. Demographic factors increased participation by 4.7 percentage points, but leisure and other factors reduced it by 0.5 and 13.6 percentage points, respectively. As a consequence, participation declined overall by 9.4 percent. Time use per active participant declined even more, by 14.2 percent. Demographic changes reduced it by 2.3 percentage points, a declining amount of leisure contributed an 8.6 percentage point reduction, and other factors caused a 3.2 percentage point reduction. Overall, average time spent in outdoor recreation declined 22.2 percent, and both reductions in participation rates and time spent per participant contributed.

Siikamäki (2009) speculates that the increase in time spent in outdoor recreation since 1965—especially the rise through the 1970s and 1980s—is partially attributable to the sharp increase in park acreage and number of recreation sites and facilities. As we saw in Chapter 1, acreage managed by the NPS more than doubled in the 1970s. NWR acreage, though far below NPS acreage, also greatly increased—threefold in the 1970s. Without more information and analysis, it is difficult to say for sure if this is the case. Policymakers deciding on efficient and effective provision of open space, parks, and recreation lands need further study of this critical question: How does the supply of recreation resources—acreage, types, and location—affect demand?

TABLE 3-2

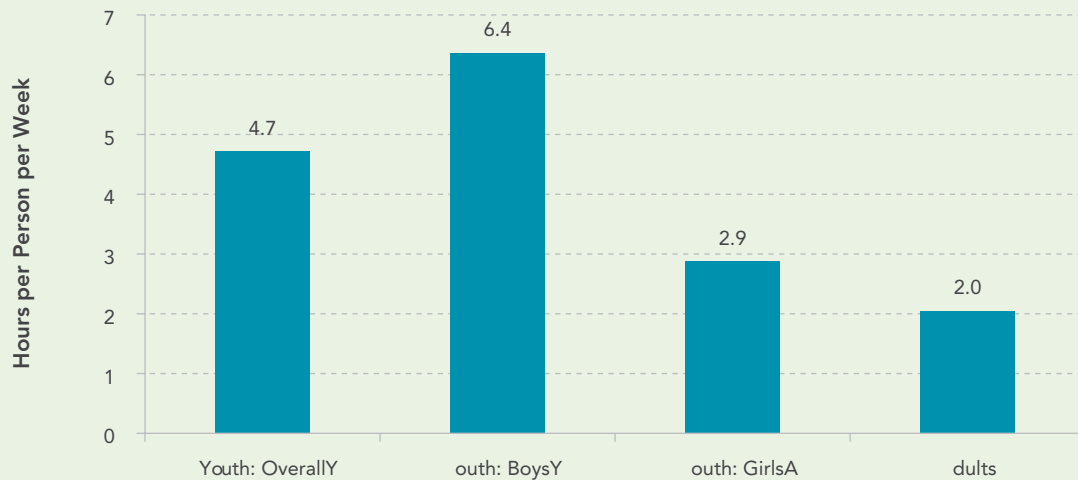
Change in Per-capita Time Use for Outdoor Recreation

	Participation (% respondents with nonzero time use)	Time Use (hrs/week)	
		Active participant	Per capita
Relative change 1965–2003	+92.0%	+15.8%	+122.3%
% points due to demographics	+20.0	–7.9	+13.8
% points due to amount of leisure	+10.4	+19.5	+33.9
% points due to other factors	+61.5	+4.2	+74.6
Contribution to overall change 1965–2003	+85.3%	+14.7%	
Relative change 1993–2003	–9.4%	–14.2%	–22.2%
% points due to demographics	+4.7	–2.3	+2.3
% points due to amount of leisure	–0.5	–8.6	–8.6
% points due to other factors	–13.6	–3.2	–15.9
Contribution to overall change 1993–2003	39.9%	60.1%	

Source: Siikamäki 2009.

FIGURE 3-18

Time Use for Physical Activity, 2003–2007



Source: U.S. Bureau of Labor Statistics 2003–2007.

Note: The youth sample is 15- to 18-year-olds.

Youth Participation in Outdoor Recreation

As we described earlier, concern has grown in recent years about children's lack of time spent on outdoor and nature-based activities. The concern centers around two issues. One is health: obesity rates among children have risen sharply in recent years and physical activity outdoors is an effective way to combat weight problems. The second is a concern that a lack of connection with nature leads to poor environmental stewardship as adults.

Data and information on children's time use and outdoor participation rates are more difficult to come by than information on adults. However, recent studies have tried to gather national data. Here we summarize the adolescent component of the recent American Time Use Surveys; these are data on 15- to 18-year-olds. We also discuss very recent data from a special survey conducted by the organizations that run the NSRE and data from the 2006 to 2008 Outdoor Foundation surveys, as well as reports by the Outdoor Foundation on youth lifestyles.

Time Use by Teenagers: ATUS Results

The ATUS data for 15- to 18-year-olds come from relatively small samples per each survey year, so we

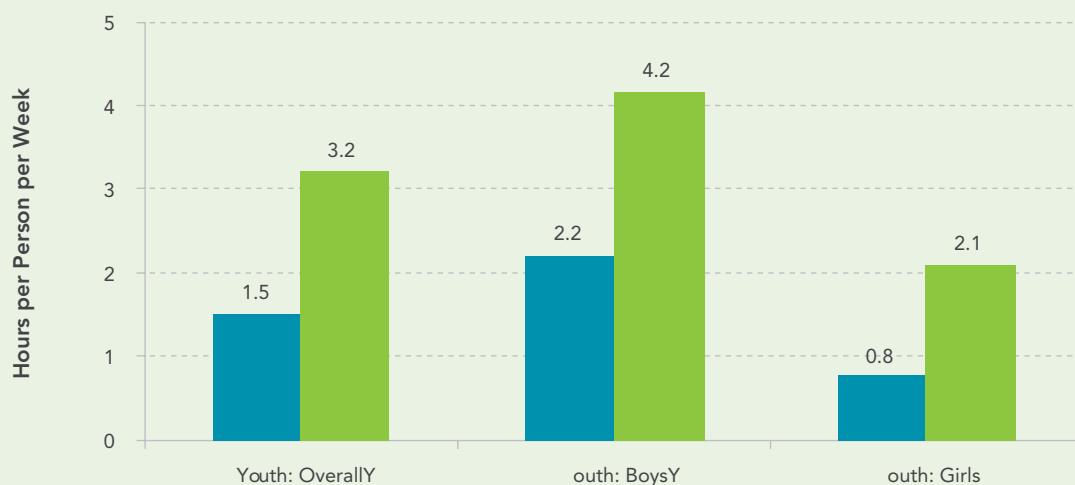
present all our results using five-year averages for the 2003 to 2007 period. Sampling of respondents across different days of the week is not completely random in ATUS, and in some years, certain months have been overrepresented for the 15- to 18-year-old population. We therefore use day and monthly weights to compile statistics that accurately represent annual averages. In addition, the ATUS data include population weights, which we use to generate averages across the population. In total, we have observations on 7,546 teenagers.

We begin by looking at physically active recreation in total, both indoors and outdoors. Teenagers spend on average 4.7 hours per week per person in physically active recreation, as shown in Figure 3-18. Differences between boys and girls are conspicuous: the average for boys, 6.4 hours per week, is about 2.2 times that for girls, 2.9 hours. In comparison to adults, teenagers spend more than twice the time in physically active recreation, 4.7 versus 2.0 hours. Breaking the time use into participation rates and time use per active participant again reveals differences between boys and girls. The participation rate for boys is 37.6 percent and 20.2 percent for girls.

The ATUS also reveals where activities took place. We separate physically active recreation during leisure time

FIGURE 3-19

Time Use for Physical Activity Outdoors & Indoors, 2003–2007



Source: U.S. Bureau of Labor Statistics 2003–2007.

Note: The youth sample is 15- to 18-year-olds.

■ Outdoors ■ Indoors

versus at school. Most recreation for this teenage sample took place during leisure time, not during school hours. For youth overall, 3.4 hours were during leisure and 1.4 were at school. This suggests that physical education classes or other pursuits during school hours amount to, on average, only about 1.5 hours per week. Far more physically active recreation takes place outside school.

In Figure 3-19, we separate physically active recreation into indoor and outdoor recreation. Boys spend about 4.2 hours per person per week in indoor recreation and 2.2 hours at outdoor recreation. The corresponding statistics for girls are 2.1 and 0.8 hours per week per person, on average. In other words, for both boys and girls, only about one-third of their physically active recreation takes place outdoors.

It is often suggested that outdoor recreation has declined because more time is spent on computer use and other digital entertainment, such as television. Although we cannot analyze trends with the ATUS data, we can look at how much time is spent in recent years—that is, for the 2003 to 2007 sample—with electronic media. Figure 3-20 shows time spent watching television or using a computer, for both boys and girls ages 15 to 18 as well as adults. On average, teenagers spend 5.7 hours per week

using a computer and 15.5 hours watching television. Interestingly, boys spend more time both on computers and watching television than girls, about 5.4 hours more per week. In comparison to adults, teenagers' computer use is greater, 5.7 versus 1.8 hours.¹⁶ However, adults watch more television than teenagers do, 18.2 versus 15.5 hours.

These findings suggest that an average American teenager spends about four times as much time in front of screens (computer and television) as in physically active pursuits, either indoors or outdoors—21.2 hours per week versus 4.7 hours.

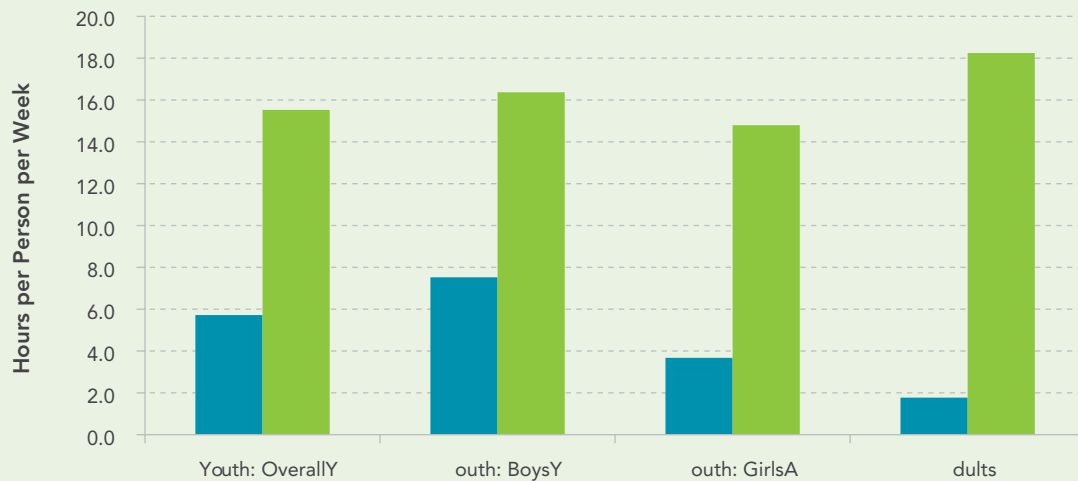
Time Spent Outdoors by 6- to 19-Year-Olds: Results from the National Kids Survey

During 2007, 2008, and early 2009, the researchers who conducted the NSRE did a companion survey of youth, ages 6 to 19, the National Kids Survey. The survey asked how much time was spent outdoors on a typical weekday in the previous week and on a typical weekend day in the previous week. Categories of time blocks were provided: none, less than 30 minutes, about 30 minutes, about 1 hour, 2 to 3 hours, or 4 or more hours. A total of

¹⁶ Note that this is adult computer use during leisure time, not computer use at work, which is a separate category in the ATUS.

FIGURE 3-20

Time Use for Computer and TV, 2003–2007



Source: U.S. Bureau of Labor Statistics 2003–2007.

Note: The youth sample is 15- to 18-year-olds.

■ Computer Use ■ TV Use

1,209 respondents form the basis of the findings, which we summarize in Table 3-3.

These numbers are high in comparison with the numbers from the ATUS. The ATUS numbers for the 2003 to 2007 period showed that teenagers spent approximately 1.5 hours per week in outdoor physically active pursuits (see Figure 3-19). Creating an approximate weighted average of time spent outdoors from the National Kids Survey data in Table 3-3 yields a figure of about 20

hours per week for all youth ages 6 to 19. Cordell and his colleagues (2009b) report findings from the National Kids Survey by age group. Looking at the 16- to 19-year-old age group, for a more direct comparison with the ATUS, the National Kids Survey shows an average of slightly fewer than 18 hours per week. Even assuming that only one-quarter of that time is in physically active pursuits still yields an average three times greater than the ATUS. Further explorations into both of these datasets would be instructive.¹⁷

TABLE 3-3

NSRE National Kids Survey, 2007–2009: Percent of Respondents Reporting Time Spent Outdoors

	Weekday	Weekend Day
None	2.6	4.5
Less than 30 minutes	4.9	2.2
About 30 minutes	8.6	4.2
About 1 hour	22.9	12.3
2 to 3 hours	31.4	27.1
4 or more hours	29.6	49.7

Source: Cordell et al. 2009a.

Note: Respondents are 6- to 19-year-olds.

Cordell and his colleagues (2009b) show some of the demographic breakdowns from the National Kids Survey—showing results by gender, age group, race, and family income. Consistent with the ATUS, boys spend more time outdoors than girls. The 10- to 12-year-old age group seems to spend the greatest amount of time outdoors, and time spent declines slightly with age. Hispanic children spend more time outdoors than either African American or non-Hispanic white children. Last, children from higher-income families appear to spend slightly less time outdoors than those from middle- and lower-income families.

¹⁷ Cordell and his colleagues (2009b) do not report sample sizes for the different age groups and other demographic groupings. Because the entire youth sample is 1,209 and there are four age groups, we estimate about 300 16- to 19-year-olds, which is a fairly small sample.

In a third report using the National Kids Survey data, Cordell and his colleagues (2009c) report on what children do outdoors. Fifteen activities were included in the survey, and respondents were asked which of these they had engaged in over the previous week, which they spent the most time doing, and which was their favorite. In Table 3-4, we reprint the results from Cordell and coauthors that show the percentage of respondents who say that they participated in particular activities. A high percentage report “just playing” or “hanging out” outdoors—87.5 percent of boys and 78.4 percent of girls. The percentage for biking, jogging, walking, skateboarding, and similar activities is almost as high. Even nature-based activities have high participation rates. For example, fully one-third of girls reported that they engaged in bird- or wildlife-watching in the previous week, a rate nearly as high as that for adults in the NSRE. Between 27 and 29 percent of children reported camping, hiking, or fishing (grouped together); 24 percent of boys reported riding four-wheel-drive vehicles or motorcycles.

Data continue to be collected in the National Kids Survey. As sample sizes grow, it should be possible to better understand youth participation in the outdoors and how

it varies by location, demographics, and other factors. Statistical analysis of the factors that explain participation rates and time spent in particular activities would be extremely valuable. In addition, if the survey continues, it will be possible to study trends in youth activities outdoors.

Outdoor Recreation Participation by 6- to 17-Year-Olds: Results from the Outdoor Foundation

In the 2007 survey we summarized earlier, the Outdoor Foundation collected information on youth ages 6 to 17. Although the overall recreation participation rate for the entire population was 50 percent for that year, children ages 6 to 12 had, at 68 percent, the highest rate of any age group. Table 3-5 compares the youth participation rates and overall rates for five selected activities. Youth rates are higher than the general population.¹⁸

The survey found substantial differences between boys and girls: 72 percent of boys ages 6 to 12 reported participating in outdoor activities, but only 61 percent of girls did so. When asked about reasons for not participating in outdoor activities, respondents reported

18 Sample sizes for the youth subgroup are not provided, but the overall sample size is approximately 40,000. Thus if the youth sample (respondents age 6 to 17) is between 5 and 10 percent of the total, the sample size would be approximately 2,000 to 4,000.

TABLE 3-4

**Percent of Youth Participating in Various Activities,
National Kids Survey 2007–2009**

Outdoor Activity	Male	Female	Total
Just play outdoors or hang out	87.5	78.4	83.0
Biking, jogging, walking, skateboarding, and so on.	77.7	80.1	78.8
Listening to music, watching movies, or using electronic device	51.3	59.5	55.4
Playing or practicing team sports	60.5	40.3	50.8
Reading, studying while sitting outdoors	38.5	51.1	44.5
Other sports, e.g., tennis, golf	37.5	35.5	36.6
Attending camps, field trips, outdoor classes	30.8	39.1	34.8
Bird watching, wildlife viewing, and so on	28.2	33.1	30.5
Swimming, diving, snorkeling, and so on	29.3	28.8	28.9
Hiking, camping, fishing, and so on.	29.0	26.7	27.8
Riding motorcycles, ATVs, other off-road vehicles	24.4	15.8	20.2
Snow skiing, snowboarding, cross-country skiing	9.4	8.4	8.9
Boating, jet skiing, water skiing, and so on	7.9	7.2	7.5
Rowing, kayaking, canoeing, surfing, and so on	8.5	6.3	7.4
Other outdoor activities	10.3	11.6	10.9

Source: Cordell et al. 2009, Table 1.

Note: Respondents are 6- to 19-year-olds.

TABLE 3-5

**Participation Rates for Selected
Outdoor Recreation Activities in
2007, Outdoor Foundation Survey**

	Population (%)	Youth Ages 6 to 17 (%)
Bicycling	15.2	30.9
Camping	14.4	23.3
Fishing	18.7	24.7
Hiking	10.7	11.5
Canoeing	3.5	5.7

Source: Outdoor Foundation 2008.

a lack of interest as a primary reason (25 to 45 percent, depending on age group) followed by a lack of time (20 to 35 percent), too much schoolwork (20 to 30 percent), and a preference for screen media such as television, video games, and so on (approximately 20 percent).

The Outdoor Foundation has only recently begun to focus on youth in its surveys, thus trend data is not really available. Although the foundation emphasized a drop of 11.6 percent in youth participation in the 2007 survey over the 2006 survey, it is difficult to ascribe trends based on only two years of data.

Directly comparing the Outdoor Foundation results with those of the National Kids Survey is not possible because of the different categories of activities in the two surveys. The Outdoor Foundation categories are single activities (such as bicycling, hiking, and fishing), whereas those in the National Kids Survey combined activities into groupings (such as biking, jogging, walking, and skateboarding; and hiking, camping, and fishing). Moreover, the Outdoor Foundation asked about activities over the previous year, whereas the National Kids Survey asked about the previous week. However, it appears that the National Kids Survey is getting generally higher participation rates overall than the Outdoor Foundation.

Conclusions: What the Numbers Tell Us and the Future

The statistics on visitation to public lands, recreation participation, and time spent in outdoor recreation present a complicated and incomplete picture of Americans' use of the outdoors. Total annual visits to federal and state parks and other federal recreation sites appear to have held steady over the past 20 to 30 years, but on a per-

capita basis, most of the numbers show a very slight downward trend. This suggests that the average American is making fewer trips to these sites than he or she did in the past. Why this may be the case is unclear, but some of the factors that have been suggested as explanations for declines in fishing and hunting—increasing urbanization of the population and less leisure time, particularly in large blocks, combined with time and other costs associated with visiting sites that are relatively distant from home—may be at play. Our analysis of the time-use data highlights the important role played by available leisure time. We showed that increasing amounts of leisure from the 1960s to 1980s was an important explanation for the increasing amount of time spent in outdoor recreation. Americans have had less time for leisure in recent years, however, which has led to reductions in time spent on outdoor recreation. The time-use data are a unique and valuable resource for studying time spent on outdoor recreation and more work with these data seems in order.

National surveys on recreation participation, all of which ask individual respondents whether they participated in particular outdoor activities over the past several months to a year, provide somewhat mixed messages. The Forest Service's National Survey on Recreation and the Environment seems to show steady to increasing participation rates across a wide range of activities; some activities, such as bird-watching and walking, have increased sharply since the mid-1980s. This is the only survey that covers multiple activities and has been conducted over a long period. However, it is at odds with the FWS and Census Bureau survey of Fishing, Hunting, and Wildlife-Associated Recreation for the activities on which the two surveys overlap. The FHWR survey shows steady declines in fishing and hunting, but the NSRE shows relatively constant rates. NSRE's sharp increase in bird-watching is at odds with FHWR's relatively constant rate for wildlife-watching. In addition, participation rates for recent years in the NSRE appear to be above those from the FHWR survey and the Outdoor Foundation survey.

These differences among the surveys seem to carry over to recent findings about youth. Although trends over time are not available, both the NSRE and the Outdoor Foundation have in recent years included a youth component to their surveys. In addition, the American Time Use Survey, conducted by the U.S. Bureau of Labor Statistics, has a teenager component. The time spent outdoors reported by the NSRE youth respondents is high in comparison with the ATUS respondents, and the participation rates for the NSRE sample appear somewhat higher than those

for the Outdoor Foundation sample. But comparisons may not be appropriate, given the different methodologies and slightly different categories of activities across surveys.

All of these findings suggest that a better understanding of the survey methodologies, the specific questions asked, and the sample of respondents is needed to fully comprehend these differences. For now, although it may be valid to use the individual surveys to understand trends over time, comparing across surveys should be avoided. Participation rates for particular activities should be cited with caution.

A better understanding of Americans' use of the outdoors is needed going forward. In particular, there are at least four important issues that should be addressed through further research and study.

First, as we have said, a knowledge gap exists with respect to local park use. With decreasing amounts of leisure time and busy schedules, the park or trail or recreation area closest to home may be the most important outlet for many Americans. Moreover, because 80 percent of Americans live in urban areas, a better understanding of how natural areas, open space, and parks are used by the urban population is needed.

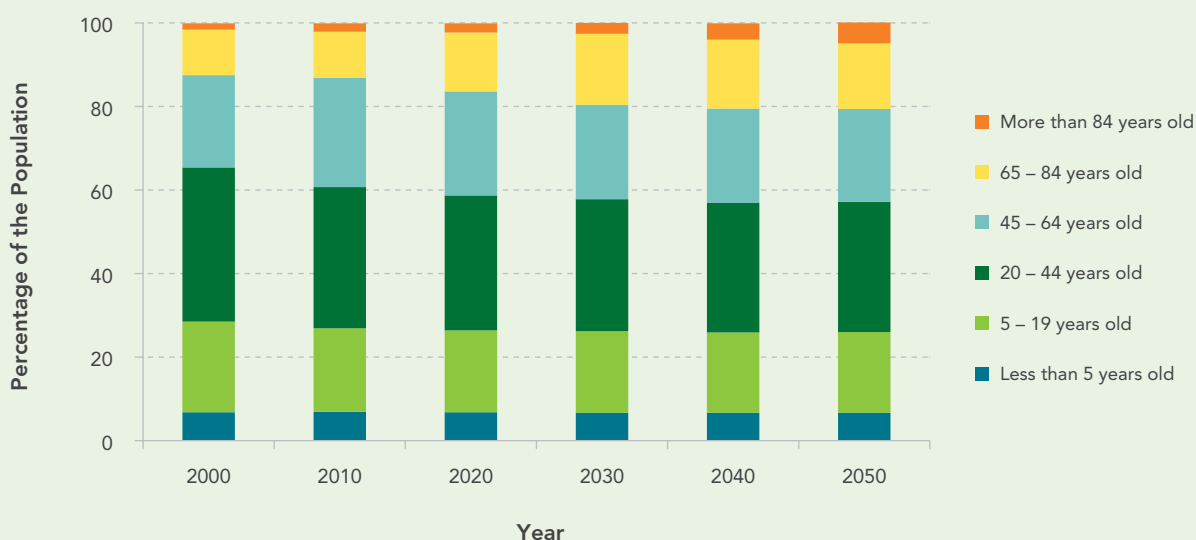
Second, we are only beginning to gather information on youth and the outdoors. Much more is needed to sort out the concerns of many that children are disconnected from nature and that a lack of physical activity outdoors is contributing to health problems. More comprehensive and detailed information on youth outdoor activities is important.

Third, as mentioned, geographic information system (GIS) resources can be put to use to better understand how the location of different kinds of parks and open space relative to centers of population affects the use of those resources. Such analysis would be useful for policymakers and planners deciding how to allocate limited funds and how to manage resources.

Fourth, the demographics of the U.S. population are changing and will continue to change. Figure 3-21 shows Census Bureau forecasts of the age distribution of the population through 2050. By 2030, 19.6 percent of the population will be 65 and over; in 2000, 12.4 percent was in that age category. The Census Bureau also predicts that 20.1 percent of the population in 2030 will be Hispanic, versus the 12.6 in 2000. What these trends mean for use of outdoor resources is unclear, but policymakers need a better understanding to meet the needs of the population.

FIGURE 3-21

U.S. Census Population Projections



Source: U.S. Census Bureau 2009



4

Funding and Financing of Conservation Lands, Parks, and Open Space

The supply of conservation and recreation resources in the United States depends critically on the level of funding and financing available to purchase lands and maintain resources and facilities. Over the past 25 years, the funding landscape has changed significantly. Federal funding through the Land and Water Conservation Fund (LWCF) has declined as new federal programs have been introduced; state programs have increased in some states but not all; funding at the state level has, because of state budget constraints, shown more variability year to year; and, finally, private conservation financing, often driven by government regulations and policies, has increased.

The Land and Water Conservation Fund

The LWCF has been the principal funding source for federal land acquisitions for conservation and recreation purposes since 1965. The Bureau of Land Management (BLM), the Fish and Wildlife Service (FWS), the National Park Service (NPS), and the Forest Service all receive funds from the LWCF. The LWCF also serves as a major source of state and local funding for land acquisition and development of public recreation resources through a state matching grant program.

The LWCF was created in the Land and Water Conservation Fund Act of 1964 (Public Law 88-578). Although funding levels were initially around \$100 million, rising to \$300 million in the early 1970s, these levels were considered inadequate and Congress increased annual funding to \$900 million in 1978, where it has remained. Royalties from oil and gas leasing on the outer continental shelf make up the main source of revenues.

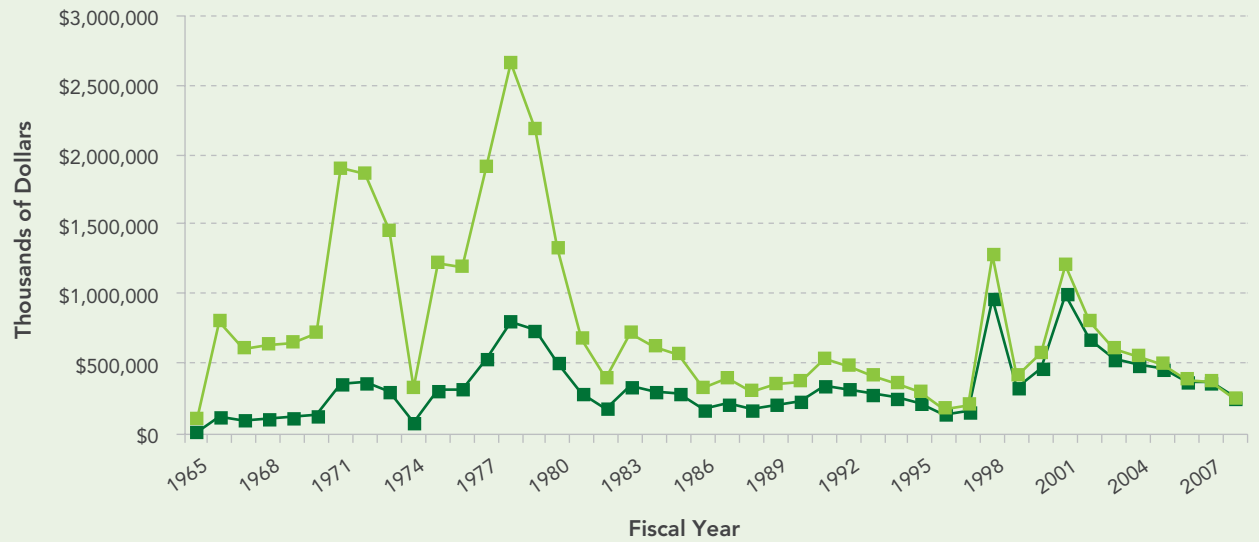
Although \$900 million is accumulated annually, this money is not necessarily spent on federal land acquisition and stateside programs. The LWCF is not a true trust fund in the sense that money collected must be allocated

to specific targeted uses. In fact, in most years, LWCF programs have received far less than the accumulated \$900 million. The unappropriated balance, or the difference between the cumulative amount deposited into the fund over the years and what actually has been appropriated for LWCF state and federal programs, is more than \$16 billion (Strum 2009). Figure 4-1 shows total annual LWCF appropriations in both nominal and inflation-adjusted 2008 dollars. Figure 4-2 shows, in inflation-adjusted dollars, the breakdown of funding among federal land acquisition, the state grant program, and other programs.

Several items are worth highlighting. First, in both nominal and real terms, annual appropriations have fallen since the 1970s. The drop is particularly pronounced in real terms. Annual appropriations over the first 15 years of the program—1965 to 1980—averaged \$1.23 billion in inflation-adjusted 2008 dollars. In the 28 years since, they have averaged \$789 million (in 2008 dollars). Second, the state grant program has fallen even more precipitously. At its inflation-adjusted peak in 1972, \$1.33 billion was spent (in 2008 dollars) on the stateside portion of the LWCF—71 percent of total appropriations. But in the 1980s, Congress greatly cut back the stateside program, and in several years in the 1990s, no state grants were given. From 1990 to the present, the stateside program has averaged \$52 million annually (in 2008 dollars)—9 percent of total appropriations. Third, even as funding has generally declined, year-to-year variability has been significant. In the heyday of the 1970s, the graphs show clearly that appropriations had substantial swings; in the 1980s, the low levels of funding were followed by some increases in the early 2000s. Fourth, in recent years, the LWCF has been used for purposes other than its original intent (see Figure 4-2). This diversion of funds began in 1998, and since 2000, the use of the LWCF for these peripheral programs has increased. Other uses have included the maintenance needs of the four land

FIGURE 4-1

Land and Water Conservation Fund Annual Appropriations, \$, in Nominal and Inflation-Adjusted 2008 Dollars

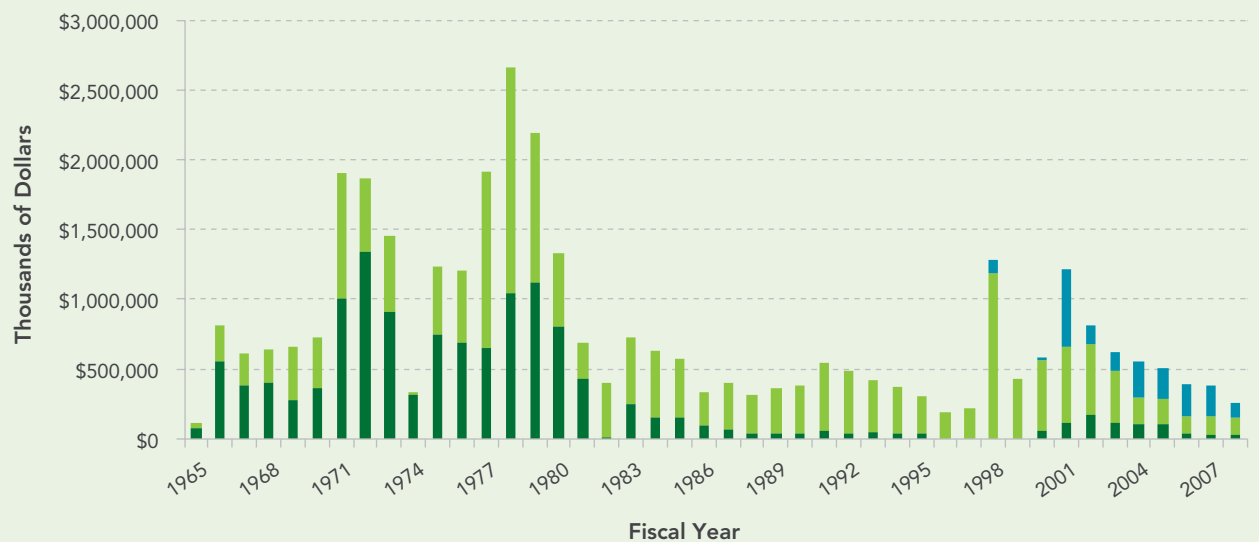


Sources: Vincent 2008; U.S. DOI (2008c).

■ Nominal Dollars ■ Inflation-Adjusted 2008 Dollars

FIGURE 4-2

Land and Water Conservation Fund Annual Appropriations by Program, \$, in Inflation-Adjusted 2008 Dollars



Sources: Vincent 2008; U.S. DOI (2008c).

■ State Grants ■ Federal Land Acquisition ■ Other

management agencies, Forest Service highway work, the Historic Preservation Fund, Forest Service state and private forestry programs, and FWS endangered species grants (Vincent 2006). In 2007, the “other” category of spending accounted for 58 percent of total LWCF spending.

By most accounts, even despite the general funding declines and variability, the LWCF has been highly successful in terms of outcomes achieved. In total, more than 41,000 grants have been made since 1965 to the 50 states, the District of Columbia, and five U.S. territories. The grants can be used for state planning, land acquisition, development, redevelopment, or a combination. Because the states share money with localities, the impacts of the LWCF have been far-reaching. The National Recreation and Park Association claims that 98 percent of the counties in the United States have at least one park or recreation project that has received LWCF funding (NRPA, n.d.). According to NPS statistics, the stateside program has protected 2.6 million acres of state and local parkland through direct acquisition, and many times that number of acres is statutorily protected through development projects that protect lands acquired and developed from nonoutdoor recreation uses in perpetuity. The four federal agencies that receive LWCF money through the federal side of the program—the NPS, FWS, BLM, and Forest Service—have protected more than 4.5 million acres of land (Zinn 2005). Thus, in total, more than 7 million acres of new parks and recreational lands have been added to the American recreation estate and thousands more protected with LWCF dollars through the state and local development projects.

In recent years, several observers have questioned whether the LWCF has become obsolete. The level of state grants has dropped so low and is so unpredictable from year to year that most states consider the funding not worth the costs incurred to apply for grants. A prerequisite of obtaining an LWCF grant is approval of a Statewide Comprehensive Outdoor Recreation Plan (SCORP). Developing a SCORP takes time, effort, and money. With uncertainty in funding availability and generally low levels of total funding, many states have abandoned the program altogether. On the federal side, as money is diverted to a variety of uses, the LWCF is increasingly less focused on its original intent, land acquisition.

We now describe the variety of federal programs created in recent years that provide funding for conservation and, to some extent, recreation. Although most of

these programs do not have the same objective as the LWCF—permanent protection of publicly accessible recreation lands—they do fund activities that have a conservation objective. Some of the programs provide funding for land acquisition, others for purchase of permanent conservation easements. Other activities supported by various programs include construction of trails or park infrastructure and habitat restoration or technical assistance to private landowners for conservation activities. Some programs provide rental payments to farmers to set aside agricultural land for conservation under temporary leases. We err on the side of being inclusive to give a broad sense of the federal government’s activities and levels of funding, but not all of the programs achieve the same objectives and not all provide permanent protection of lands. It is noteworthy, for example, that the single largest program, the Conservation Reserve Program, commits landowners to keep land out of agricultural production for only a 10- or 15-year lease period.

Other Federal Programs

More than 30 federal programs now focus on various conservation and recreation objectives. Table 4-1 lists the programs, current funding levels, date each program began, and cumulative acres protected (or another measure of program outcome).¹ These programs were established through federal legislation and are sustained through management and oversight by federal government agencies. The FWS is the lead agency for 11 of the programs shown, and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service manages 9. Figure 4-3 shows a breakdown of programs by lead agency.

Figure 4-4 shows a breakdown of the number of programs by the period in which they began. About two-thirds of those in existence today were established in the last 20 years. The largest of the USDA conservation efforts, the Conservation and Wetlands Reserve programs, were initiated in the mid-1980s; others came about in the mid-1990s and early 2000s. All of the Forest Service programs originated in the 1990s and 2000s, with the exception of Urban and Community Forestry, which began in 1978. Of the FWS programs, seven have been initiated since 1989. It is also important to note the staying power of some key programs, however,

¹ Note that Table 4-1 also identifies three defunct programs. These are included to demonstrate the diversity and the potential of federal activity.

TABLE 4-1

Federal Conservation Programs

Program	Agency	Inception	Funding (in thousands, FY2008)	Acres Protected*	Notes
Louisiana Coastal Wetlands Program	Corps & others	1990	\$90,000	70,616	1
Readiness and Environmental Protection Initiative	DOD	2005	\$46,000	59,129	2
LWCF Stateside Program	DOI-NPS	1964	\$24,600	2,600,000	3
LWCF Federal Land Acquisition	DOI-NPS	1964	\$129,800	4,500,000	3
Urban Park and Recreation Recovery	DOI-NPS	1979	\$28,900 in 2002 (now defunct)	1,461 projects	4
Highlands Conservation Act	DOI & FS	2005	\$1,723	NA	
Transportation Enhancements	DOT	1991	\$800,000	15,878 projects	5
Recreational Trails Program	DOT	1991	\$79,170		5
Forest Legacy Program	FS	1990	\$52,317	1,579,348	
Forest Stewardship	FS	1991	\$20,000	31,000,000	6
Forestland Enhancement Program	FS	2002	Not renewed	1,700,000	7
Urban and Community Forestry	FS	1978	\$27,700	6,564 communities	8
Community Forest and Open Space Conservation Program	FS	2008	NA	NA	9
Cooperative Endangered Species Conservation Fund	FWS	1973	\$66,200	607 species impacted	
Migratory Bird Conservation Fund	FWS	1929	\$45,144	4,000,000	
National Coastal Wetlands Conservation Grants	FWS	1990	\$20,500	244,000	10
North American Wetland Conservation Act Grants	FWS	1989	\$83,484	6,331,999	11
Sport Fish Restoration Program	FWS	1950	\$398,338	368,909	12
Wildlife Restoration Program	FWS	1937	\$309,687	100,471,010	13
State Wildlife Grants Program	FWS	2002	\$61,523	76,865	
Landowner Incentive Program	FWS	2003	\$20,600 in 2007 (not renewed)	1,333,619	14
Platte River Recovery Implementation Program	FWS & BOR	2007	\$9,600	NA	15
Missouri River Fish and Wildlife Recovery Program	FWS & Corps	2005	\$50,200	est. 2,400	
National Fish Habitat Action Plan	FWS & others	2006	\$2,410	NA	16
Community Development Block Grant Program	HUD	1974	\$93,071	NA	
National Estuarine Research Reserves System	NOAA	1972	\$21,100	1,333,612	17
Coastal and Estuarine Land Conservation Program	NOAA	2002	\$7,900	35,000	
Conservation Reserve Program	USDA-NRCS	1985	\$1,860,929	33,879,482	18
Grassland Reserve Program	USDA-NRCS	2002	\$2,330	1,002,588	19
Environmental Quality Incentives Program	USDA-NRCS	1996	\$1,004,926	41,700 contracts	20
Farmland Protection Program	USDA-NRCS	1996	\$70,159	533,067	21
Wetlands Reserve Program	USDA-NRCS	1985	\$227,631	2,000,169	22
Wildlife Habitat Incentives Program	USDA-NRCS	1996	\$57,811	646,491	23
Conservation Technical Assistance	USDA-NRCS	1935	\$627,000	NA	24
Healthy Forests Reserve Program	USDA-NRCS	2003	\$2,055	197,826	25
Conservation Security Program	USDA-NRCS	2002	\$237,345	2,107,730	26

Sources: Numerous sources; available from authors upon request. See detailed information regarding this table on next page.

TABLE 4.1 INFORMATION

*NA = not available; see the individual program notes for clarification on what is included as "acres protected." If no additional information is provided in the program notes, the acres protected represent acres acquired over the life of the program.

Notes:

1 Acres protected represents net acres of wetlands re-established or protected by projects that have been completed, are under construction, or approved for construction. This data was reported to Congress in 2006 (the most recent year of a congressional report on the program).

2 Acres protected represents acres preserved FY2005 to FY2007.

3 Acres protected in federal program as of 2005. Acres protected in state program includes only acquisitions and not land statutorily protected through park development projects. Total LWCF appropriations in 2008 also included \$101 million for other programs.

4 Projects carried out in 380 local jurisdictions.

5 Number of projects funded are bike-ped and rail-trail projects in TE and Recreational Trails Program. TE funding of \$800 million is total TE budget.

6 Acres protected represents acres under management plans.

7 Acres protected represents acres improved through cost-sharing and technical assistance.

8 These 6,564 communities are actively developing or sustaining an urban forestry strategy, including a forestry management plan, staffing, convening an advisory group, and enacting policy.

9 New program established by Congress as part of the 2008 Farm Bill. The U.S. Forest Service in process of developing program guidelines.

10 Acres protected represents acres of habitat protected, restored, or enhanced.

11 Acres protected represents acres restored, enhanced, protected, or managed in the United States.

12 Funding allocated to the Sport Fish Restoration Program represents 57% of the receipts of the Sport Fish Restoration and Boating Trust Fund (after annual deductions).

13 Acres protected includes lands acquired as well as the development and improvement of habitat and waterfowl impoundments.

14 Acres protected includes lands protected and habitat improved.

15 Agreement signed in 1997 but program did not begin until 2007. During the first increment of the program, the goal is to maintain, restore, and protect 10,000 acres of habitat.

16 Funding for this program must be directed toward restoration activities; land acquisition authority has not yet been granted.

17 Funding is for FY2006.

18 Funding is for FY2007; acres protected represents acres enrolled as of December 2008.

19 Funding is for FY2007; acres protected represents acres enrolled through FY2006.

20 The "accomplishment measure" (acres protected) represents 41,700 EQIP contracts signed in FY2007.

21 Funding represents the federal funding obligated for cooperative agreements signed in FY2007; acres protected represents the cumulative acres enrolled FY1996 through FY2007.

22 Funding represents funds distributed for program operation in FY2007; acres protected represents cumulative acres enrolled as of 2008.

23 Funding is the federal dollars allocated to states in FY2008; acres protected represents acres enrolled in FY2008.

24 Funding is for FY2007; a measure of acres protected is not applicable (NA).

25 Funding represents the federal funding obligated for FY2007; acres protected represents acres enrolled in FY2007.

26 Funding is the amount distributed to states to operate CSP in FY2007; acres protected represents total acres under approved contracts in FY2008.

which have been in existence for more than 40 years: the LWCF, operated by the NPS, and the Sport Fish Restoration and Wildlife Restoration Programs, both managed by the FWS.

Most of the programs included in Table 4-1 have a land acquisition component, either outright land purchases

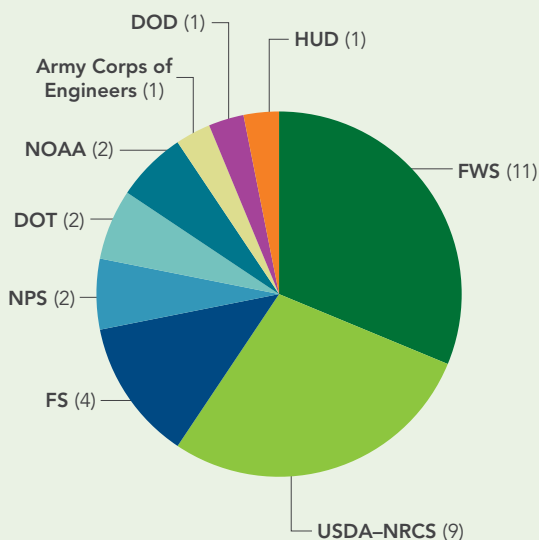
or, more commonly, purchases of easements. As we explained above, however, some have a broader focus on other things, including technical assistance, habitat restoration activities, and development of management plans for private landowners. Among these are

- preservation of critical habitat, including agricultural land, forests, wetlands, and coastal areas;
- habitat restoration, including wetlands;
- aquatic recreation, including boating access and fish restoration and management;
- wildlife conservation and management, including endangered species and migratory birds;
- support of regional conservation efforts; and
- technical assistance for the management of habitat and other outdoor resources, including forests.

Not many of the programs have an explicit recreation component or even an emphasis on public access. The LWCF obviously has recreation as its main objective. The Recreational Trails Program (RTP) and portions of the Transportation Enhancements program, both managed by the Department of Transportation, achieve recreation outcomes (though only the RTP specifically targets recreation). The Community Development Block Grant program, managed by the U.S. Department of Housing and Urban Development (HUD), supplies money for parks and recreation facilities as part of its overall community development emphasis but the extent to which parks are emphasized depends on whether communities apply for grants of this type; parks are not a primary focus of the program. The Sport Fish Restoration Program, which targets fish restoration and management, also provides funds for boating access and thus has a recreation

FIGURE 4-3

Federal Conservation and Recreation Programs by Lead Agency

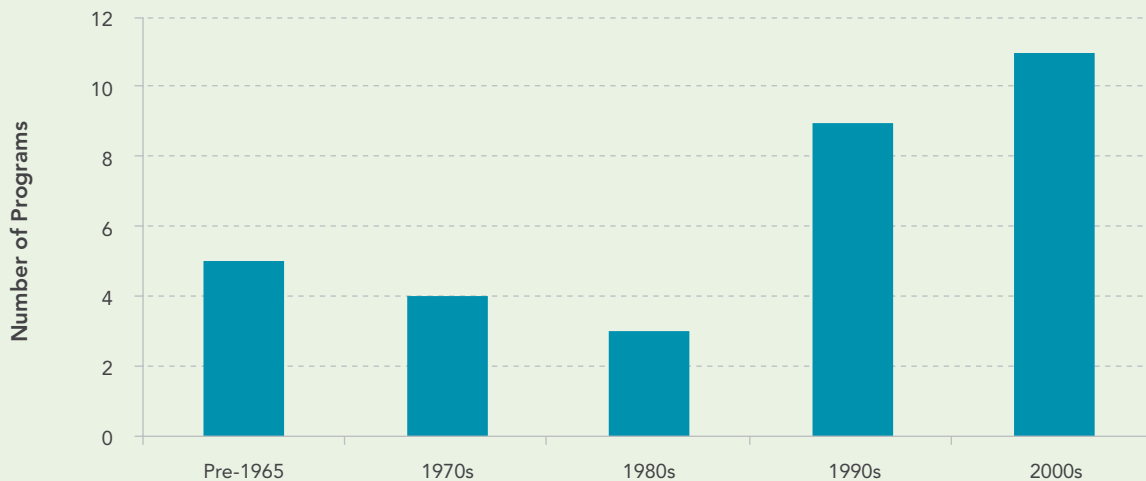


Source: Based on authors' calculations from information in Table 4-1.

Note: Three of the FWS programs are co-managed with other agencies (see Table 4-1).

FIGURE 4-4

Federal Conservation and Recreation Programs by Decade of Initiation



Source: Based on authors' calculations from information in Table 4-1.

component. Beyond these programs, several programs that provide funding for preservation of wildlife habitat have benefits for hunting and wildlife viewing. Ferris and Siikamäki (2009) summarize several studies that estimate the recreation benefits of the Conservation Reserve Program (CRP). One recent study finds that for every acre enrolled in the CRP, about \$15 (in 2007 dollars) of recreation value is accrued.

In aggregate, the programs shown in Table 4-1 represent more than \$6 billion in annual funding for land conservation and recreation.² The lion's share of this funding—approximately two-thirds, or \$4 billion per year—is associated with USDA programs. Nearly \$2 billion is for the Conservation Reserve Program and another \$1 billion is for the Environmental Quality Incentives Program. Figure 4-5 shows the breakdown of funding by agency.

Aside from the sheer amount of money available, sustainability and consistency of funding over time vary across programs. Programs subject to annual appropriations—most of those shown in Table 4-1—may experience wider swings in funding from year to year

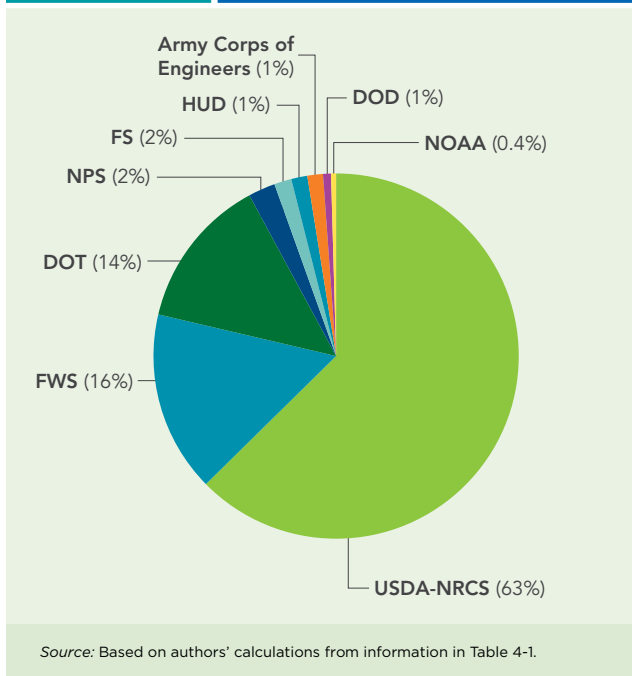
due to changes in the political and economic climates. Others, however, are supported by dedicated funding streams that feed into trust funds or protected accounts. In addition to the benefit of security, the dedicated programs noted here are often lauded for their user-pay, user-benefit principle, meaning that the direct beneficiaries of a program (anglers, hunters, and so on) provide a significant portion of the funding through excise taxes, license fees, duck stamps, and the like. Interestingly, these programs are also some of the oldest conservation programs in existence—the Sport Fish Restoration Program, Wildlife Restoration Program, and Migratory Bird Conservation Fund, for example, are all more than 50 years old. On the other hand, with declines in fishing and hunting, there is concern about declining revenues for these programs. The U.S. Department of Agriculture (USDA) programs are funded as part of the conservation provisions of the Farm Bill and the transportation-related programs as part of the Surface Transportation Program in the transportation bill, the most recent version of which is the Safe, Accountable, Flexible, and Efficient Transportation Equity Act, a Legacy for Users (SAFETEA-LU).

Several of the programs that provide money to state and local governments use a formula apportionments

² Funding levels represent annual program funding for FY2008 unless otherwise indicated.

FIGURE 4-5

Funding for Federal Conservation and Recreation Programs by Agency



method to allocate funds. These include the LWCF, the Wildlife and Sport Fish Restoration Programs, the two transportation programs, the state wildlife grants, and the Community Development Block Grant program. By contrast, others are purely voluntary, though they set rules about what lands are eligible for enrollment. USDA programs are the best example. Individual landowners decide whether to enroll their land in the CRP, the Wetlands Reserve Program (WRP, which provides permanent easements for previously farmed wetlands), or the Farmland Protection Program (FPP, another easement program), subject to the restrictions on eligible lands set by the government. These differences in funding and enrollment procedures lead to some differences in the geographic distribution of conservation outcomes. The formula apportionment programs generally have their greatest impacts in states that generate the largest financial contributions—for example, those states collecting large amounts of excise taxes on hunting equipment—or states with the greatest populations, while the voluntary programs depend on individual landowners' incentives to enroll.

Several of the programs in Table 4-1 are competitive grant programs, in which state or local government agencies, nonprofit organizations, or, in some cases,

private landowners apply for funding to acquire easements, undertake habitat restoration, or engage in other kinds of conservation activities. The Forest Service's Forest Legacy and Urban and Community Forestry programs, the National Coastal Wetlands Conservation and North American Wetland Conservation Act grants (both run by FWS), and NOAA's Coastal and Estuarine Land Conservation Program are all competitive grants programs.

Several programs have requirements for matching grants or nonfederal contributions. These include the two transportation-related programs, the National Coastal Wetlands Conservation grants, the State Wildlife Grants program, the stateside program of LWCF, the Farmland Protection Program, and several others.

A full evaluation and assessment of each of the programs in Table 4-1 is beyond our scope here. What Table 4-1 and our discussion make clear, however, is that the federal government is spending significant amounts of money on a wide variety of land conservation programs. As the LWCF has become less important, other programs have become more so. Whether these programs are complementary or to some extent redundant is an open question. Whether they achieve their goals in a cost-effective manner and whether the overall benefits of the federal government's efforts are worth the costs are as well. Moreover, it remains to be seen whether better coordination across the programs and across agencies would lead to more valuable outcomes. An in-depth and holistic analysis of the programs would be a worthwhile undertaking.

State Conservation Funding Programs

In addition to federal land conservation programs, many states have their own efforts. Our research identified 79 programs in 43 states providing \$3.3 billion annually for conservation efforts.³ Table 4-2 lists the programs. Like the federal programs, most of the state programs—well

³ We used information from the Trust for Public Land's *Conservation Almanac*, as well as a study completed for the Teaming with Wildlife Coalition (see International Association of Fish and Wildlife Agencies and Ecosystem Management Initiative at University of Michigan School of Natural Resources and the Environment 2005) for initial information about programs. However, *Conservation Almanac* is current only through 2005 and the Teaming with Wildlife study only looks at programs focused on wildlife. We then searched individual state websites and published documents and personally contacted government agencies in some states to obtain funding levels and other information. Our focus was on programs with dedicated state funding for conservation activities. We are not including state operating budgets for parks, natural resources, and environment agencies in the state. We also are not including federal funding that filters to the states such as through state wildlife grants, land and water conservation fund grants, the Farmland Protection Program, and others. Although we attempted to be comprehensive in our coverage, we may not have been exhaustive of all state programs that include a land conservation component, especially if such components represent a relatively minor part of a program's objective. Also, judgment calls may have led to some errors of omission or commission. Nonetheless, we are confident that the larger programs in all states are included in our figures.

TABLE 4-2

State Conservation Funding Programs

State	Programs	State	Programs
AK	Exxon Valdez Habitat Protection Program	MD	Maryland Heritage Conservation Fund
AL	Forever Wild Land Trust	MD	Rural Legacy Program
AR	Conservation Sales Tax	MD	Maryland Environmental Trust
AR	Arkansas Natural and Cultural Resources Council Grant Program	ME	Outdoor Heritage Fund
AZ	Arizona Heritage Fund	MI	Natural Resource Trust Fund
AZ	Arizona Preserve Initiative/Growing Smarter Grants	MN	Clean Water, Land and Legacy Amendment
CA	Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act of 2000	MN	Environment and Natural Resources Trust Fund & Other Lottery Programs
CA	Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act	MN	Reinvest in Minnesota Reserve Program
CA	California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002	MN	Legislative-Citizen Commission on Minnesota Resources
CA	Water Quality, Supply and Safe Drinking Water Projects. Coastal Wetlands Purchase and Protection. Bonds. Initiative Statute. Proposition 50	MO	Conservation Sales Tax
CA	Water Quality, Safety and Supply. Flood Control. Natural Resource Protection. Park Improvements. Bonds. Initiative Statute. Proposition 84	MS	Tidelands Trust Fund
CO	Great Outdoors Colorado	MT	Wildlife Mitigation Trust Fund
CO	Conservation Trust Fund	MT	Habitat Montana
CT	Open Space and Watershed Land Acquisition Grant Program	MT	Access Montana
CT	Recreation and Natural Heritage Trust Program	NC	Park and Recreation Trust Fund
DE	Delaware Land & Water Conservation Trust Fund	NC	Clean Water Management Trust Fund
DE	Open Space Program	NC	Ecosystem Enhancement Program
FL	Florida Forever	NC	Natural Heritage Trust Fund
GA	Georgia Land Conservation Program	NE	Nebraska Environmental Trust
HI	The Hawai'i Legacy Land Conservation Program	NH	Land and Community Heritage Investment Program
IA	Resource Enhancement and Protection	NJ	Garden State Preservation Act (through Green Acres Program)
IL	Conservation 2000	NJ	Farmland Preservation Program
IL	Open Space Lands Acquisition and Development	NM	Habitat Stamp Program
IN	The Heritage Fund	NV	Q-1 Bond Money Acquisitions
KY	Kentucky Heritage Land Conservation Fund	NY	New York Environmental Protection Fund
KY	Purchase of Agricultural Conservation Easements (PACE) and donations of easements for federal and state income tax benefits	NY	Farmland Protection Program
LA	Duck Stamp Fund	OH	Clean Ohio Fund
LA	Wildlife Habitat and Natural Heritage Trust Fund	OR	Lottery proceeds
MA	Agricultural Preservation Restriction Program (APR)	PA	Wild Resource Conservation Fund
MA	Community Preservation Act	SC	Conservation Bank Act
MA	Local Acquisitions for Natural Diversity Program (LAND)	SC	Heritage Land Trust Fund
MA	Parkland Acquisitions and Renovations for Communities Program (PARC)	SC	Recreation Land Trust Fund (RELT)
MA	Conservation Partnership Program	TN	State Lands Acquisition Fund
MA	Department of Fish and Game	TN	Local Parks and Recreation Fund
MA	Department of Conservation and Recreation	TX	Sporting Goods Sales Tax
MD	Program Open Space	UT	LeRay McAllister Critical Land Conservation Fund
MD	Maryland Agricultural Land Preservation Foundation	VA	Department of Conservation and Recreation
		VA	Virginia Land Conservation Foundation
		VT	Vermont Housing and Conservation Board
		WA	Forestry Riparian Easement Program
		WI	Knowles-Nelson Stewardship Program
		WY	Wyoming Wildlife and Natural Resource Trust



over half—were initiated in the 1990s and 2000s. For the most part, states have one or two programs, but we identified seven programs in operation in Massachusetts and five each in California and Minnesota. These separate programs often target particular outcomes, such as farmland preservation, wildlife habitat, or parks. In other states, it may be that a single program includes multiple activities. We were unable to document any dedicated

conservation funding programs in Idaho, Kansas, North Dakota, Oklahoma, Rhode Island, South Dakota, or West Virginia. These states may support conservation through federal grants and private activities, but we could not identify separate dedicated state funding.

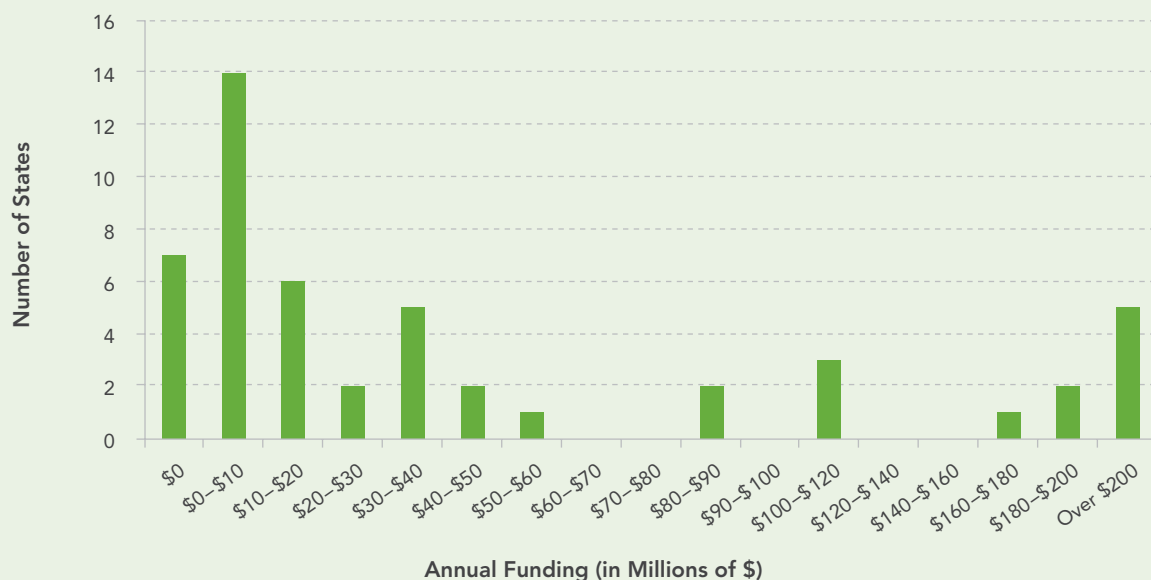
Annual funding levels range from a low of \$500,000 for Louisiana's Duck Stamp program to \$300 million for the Florida Forever program.⁴ Figure 4-6 shows the distribution of funding levels across states. As the figure makes clear, there is a great deal of variation. Fourteen states that have programs spend less than \$10 million per year, but five—California, Florida, Minnesota, North Carolina, and New York—spend more than \$200 million. The median level across all states is \$26 million.⁵ Figure 4-7 shows the same information but adjusted for state population. The median per capita annual spending is \$6.29. Again, some states are far beyond this level. The states spending the most on a per-capita basis are Oregon and Minnesota, both well above \$32 per person per year, followed by Arkansas and Maryland, which spend between \$28 and \$32 per person per year.

4 For multiyear bonds such as those in California, where the specific annual allocation is unclear, we divide the funding equally over the bond term.

5 The average annual spending is \$77 million, but this is inflated by the high level of spending in a few states, thus the median is a more representative figure.

FIGURE 4-6

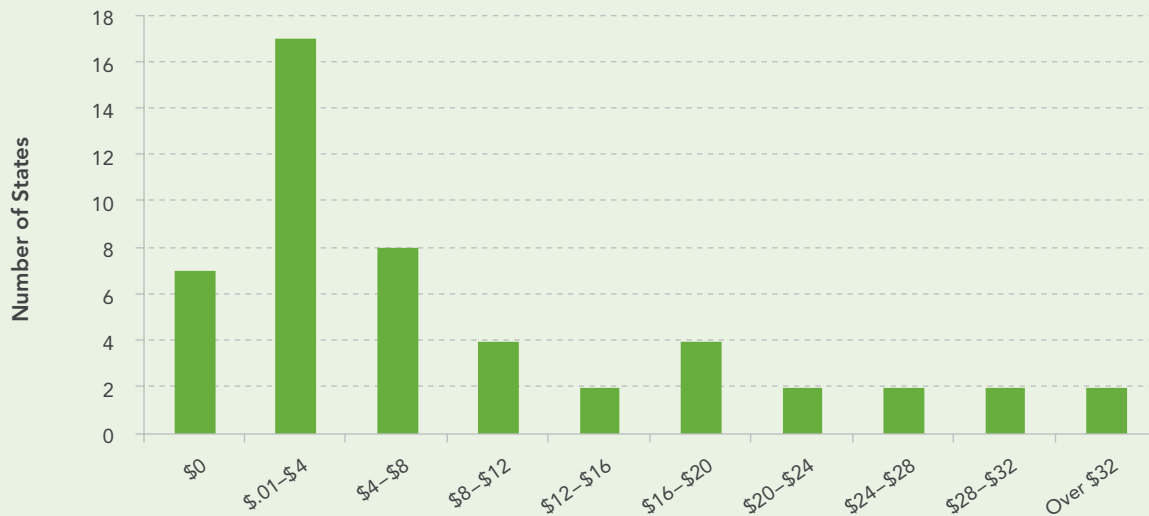
Funding for State Conservation Programs



Source: Based on authors' calculations from information collected for programs in Table 4-2.

FIGURE 4-7

Funding per Capita for State Conservation Programs



Source: Based on authors' calculations from information collected for programs in Table 4-2.

Most programs at the state level are financed, at least in part, by legislative appropriations, leaving their funding levels open to significant changes from year to year. Others receive dedicated funds from state lotteries, real estate transfer taxes, state sales taxes, and state bonds. The bonds are sometimes financed with a dedicated funding stream—for example, Florida backs its Florida Forever bonds with the proceeds from a document stamp tax. Most states, however, issue general obligation bonds. Although programs funded with a dedicated revenue stream are more secure than those funded through legislative appropriations, funds are often diverted to other uses during budget shortfalls.⁶ Several states established trust funds with an initial investment and now use the annual interest to fund conservation activities; often, the state supplements the trust fund with additional yearly appropriations. Conservation trust funds are usually managed by independent boards or commissions somewhat removed from the political realm. These entities often prioritize and decide on funding levels for conservation projects within the state. Alabama's Forever Wild program is one example. Another is Wyoming's Wildlife and Natural Resource Trust fund. The Great Outdoors Colorado program and Missouri's

Conservation Sales Tax program also use an independent board or commission.

States focus most of their attention in these programs on land acquisition and purchase of conservation easements. Fifty-eight percent of the programs we identified engage in fee-based land acquisition; 26 percent in purchase of easements. Of the easement programs, 45 percent target farmland, 45 percent wildlife habitat, and 36 percent open space.⁷ Many states provide funding to local communities, either through a formula apportionment or through a competitive matching grant program. Thirty-one percent of the programs we identified pass funding through to local communities. And several states use their money for capital projects, trail construction, and, in some cases, even operations and maintenance of state parks and reserves—though this last activity is less common, as operations and maintenance expenditures are usually covered out of agency budgets.

It is extremely difficult to come up with an overall estimate of accomplishments for state conservation programs. We did not have the time and resources to undertake such an exercise. However, Trust for Public Land's *Conservation*

⁶ Maryland's Program Open Space, funded through a real estate transfer tax, is one example. Arizona's Heritage Fund and the Environmental Protection Fund in New York are two others.

⁷ Many programs have multiple objectives, thus the percentages total more than 100.

Almanac estimates that between 1998 and 2005, state conservation programs had protected approximately 6.5 million acres through fee-based acquisition and 2.5 million acres through conservation easements.⁸

Three states with very active and well-funded conservation programs are California, Florida, and New York—all spending

more than \$200 million per year, the highest category in our distributional graph in Figure 4-6. We briefly describe these programs to illustrate how some of the larger programs work. We also discuss Maryland, which spends the second-highest amount on conservation on a per-capita basis of any state, and its centerpiece effort, Program Open Space. Finally, we discuss the Great Outdoors Colorado program, which is widely regarded as an example of a successful and comprehensive state conservation program.

⁸ See <http://www.conservationalmanac.org/secure/almanac/index.shtml> for more information.

California

California uses the voter referendum process to fund land conservation in the state. Five referenda approved in recent years have led to bonds issued for more than \$15 billion over 25 years. The bonds were passed for Propositions 12 and 13 in 2000, Propositions 40 and 50 in 2002, and Proposition 84 in 2006. Proposition 12 provides funding for local governments for parks and recreation land acquisition, improvements, and capital projects as well as funding for state parks and recreation areas. Proposition 13 focuses on clean water, watershed protection, and flood protection. Although money is allocated to wastewater treatment and public water system capital improvements, a significant amount also goes toward land and easement acquisition for protecting riparian areas, habitat, and flood control areas. Proposition 40 has three focus areas: land, air, and water conservation; parks and recreation (including urban, regional, and state parks); and preservation of historical and cultural resources. Coastal areas are given specific attention in Propositions 50 and 84. Proposition 50 is focused entirely on water—clean water, flood control, safe drinking water, regional water management, and water security. Proposition 84, the most recent, has a strong water focus as well but also targets forest conservation, protection of farms and ranches, beach restoration, protection of wildlife habitat, funding for local planning efforts, and development of parks and recreation projects at the state and local levels, including nature education programs.

Florida

The Florida Forever Act, passed in 2001, provides financing for land acquisition to protect environmentally significant lands, protect ground and surface water, provide high-quality recreational

opportunities in urban areas, and help local governments implement their comprehensive plans. The program extended and expanded an earlier program, Preserve 2000 (P2000), which operated from 1990 to 2000. Florida Forever is funded by the issuance of \$300 million per year of Florida Forever bonds, which are backed by revenues from a document stamp tax.

The Florida Forever program is administered by the Department of Environmental Protection (DEP) and funding is roughly divided in the following way: 35 percent to DEP's Division of State Lands, 30 percent to five water management districts, 21 percent to the Florida Communities Trust for its Parks and Open Space grant program, and 14 percent to a variety of other programs, including the Department of Community Affairs' Working Waterfronts program, the Recreation Development Assistance Program, DEP's Office of Greenways and Trails, and the Florida Division of Forestry. The Parks and Open Space grant program is a land acquisition grant program that provides funding to local governments and eligible nonprofit organizations for parks, open space and greenways, and natural resource protection needs identified in local comprehensive plans. Seventy-five percent of the funding must be matched on a one-to-one basis by other funding sources. The funding for the Division of State Lands is to be used for land acquisition and capital projects. An annual priority list is developed by the division and must be approved by an independent group called the Acquisition and Restoration Council. Each of the five Water Management Districts receives an allocation based on a formula in the act. The money may be spent on capital projects and land acquisition, but 50 percent of the funding, over the life of the program, must be spent on land

acquisition. Under the Florida Forever program, 627,500 acres have been protected, and a total of 2.4 million acres under both the Florida Forever and the P2000 programs. Florida has more state-owned conservation land as a percentage of total land area than any other state—15 percent, or 5.2 million acres.

In May 2009, the Florida legislature passed a budget that did not include debt service for issuance of new Florida Forever bonds for 2009 to 2010. This is the first time in the program's history when the legislature failed to authorize new funding.

New York

The New York Environmental Protection Fund (EPF) was created in 1993 to provide funding for restoration of the state's natural environments. It is financed primarily by real-estate transfer tax revenues, with money allocated by the legislature through the annual appropriations process. The EPF is divided into three main accounts: open space; parks, recreation, and historical preservation; and solid waste. The amount for each category is determined through appropriations, but over the life of the program funding has been divided in the following way: 48 percent for open space, 32 percent for parks and recreation, 17 percent for solid waste, and the remaining 3 percent for EPF program enhancement. Of the money spent on open space—\$739 million over the 15-year history—approximately 55 percent has gone toward land acquisition. Of the money spent on parks and recreation—\$491 million in total—28 percent has gone to local parks and 14 percent to state land stewardship. EPF funds are almost never the sole source of funding for projects; rather, the program leverages contributions from local governments, nonprofit as well as corporate organizations, and others. The EPF has grown from an annual budget of \$31 million in 1994 to \$255 million in 2008.

The EPF program was a victim of state budget problems in FY2008 when \$50 million was swept from the program to the general fund. However, to the surprise of some observers, the program was funded at a \$222 million level for FY2009. In addition, the legislature passed an expanded bottle bill that will provide additional secure funding for the EPF.

Maryland

Maryland passed the Outdoor Recreation Land Loan in 1969, which created a 0.5 percent real estate transfer tax to serve as a dedicated funding source for conservation and outdoor recreation. Funds are allocated annually to Program Open Space (POS), the Maryland Agricultural Land Preservation Foundation, the Rural Legacy Program, and the Heritage Conservation Fund. In FY2009, the tax proceeds are estimated to be \$109.4 million; almost two-thirds, or \$70.8 million, has gone to POS.

POS spending is broken into two components—POS State, reserved for state-level land acquisition and capital development, and POS Local, which distributes grants to local governments for land acquisition and park improvement. Historically, the funds have been divided approximately equally between the two categories. However, in recent fiscal years, most of the POS Local funds have been transferred to a new POS Forest and Park Service program. This diverted money has been given to the Maryland Park Service for park operations as an offset to budget cuts from the general fund. More than 335,000 acres of land have been preserved through POS, and the state claims that more than 5,000 new parks and conservation areas have been created through the program.

As mentioned, Maryland is one of the states that has seen its conservation funding diverted to other uses in times of budget problems. Between 2002 and 2006, more than \$480 million was diverted from POS to the general fund. However, like New York, Maryland recently passed a state budget for FY2009 that essentially fully funds the program.

Colorado

Passed by voters in 1992, the Great Outdoors Colorado Amendment dedicates Colorado lottery proceeds—about \$122 million in 2008—to three distinct state conservation funds, which serve a wide variety of purposes. Colorado's multifaceted program distributes funding and decisionmaking power across multiple levels of government and many sectors within the conservation and recreation field.

Colorado state parks directly receive 10 percent of lottery proceeds, which is administered by the Division of Parks and Outdoor Recreation to improve state parks, reservoirs, and recreational facilities through land acquisition, trail maintenance, and park renovation. The Conservation Trust Fund, which is administered by the Department of Local Affairs, receives 40 percent of lottery proceeds. These funds are allocated to local governments on a per capita basis to fund land acquisition and capital improvements for parks, recreation, and open space.

The Great Outdoors Colorado Trust Fund can receive as much as 50 percent of lottery proceeds in a given year, up to a cap of \$35 million (in 1992 inflation-adjusted dollars).⁹ These funds are administered by the Great Outdoors Colorado (GOCO) Trust Fund Board. The 17-member GOCO Board is designed to be bipartisan and representative of all parts of the state (by population) as well as various sectors within the conservation and recreation field (agriculture, wildlife, parks, and so on). The board allocates funds equally, over time, to four

areas: investments through the Colorado Division of Wildlife for habitat acquisition and restoration, nongame species preservation, wildlife watching, and youth education; investments through Colorado state parks for trails, facility construction and improvement, land acquisition, and youth education; competitive grants for the protection of open space to state and local governments and to nonprofits that fund fee-title and conservation easement purchases; and competitive matching grants to local governments to acquire, develop, or manage open lands and parks.

Allocating the GOCO funds across a wide range of actors and to serve a wide range of objectives has, in turn, resulted in a diverse set of accomplishments. Over the last 15 years, GOCO funding has helped to permanently protect 850,000 acres of open space, to build or restore 764 miles of trail, to create or enhance 1,049 community parks and outdoor recreation areas, and to make major strides in improving state parks, protecting wildlife, providing youth education, and inventorying the state's open space lands.

⁹ Any excess funds above the cap are directed to the Public School Capital Construction Assistance Funds.

State and Federal Tax Incentives

An important incentive for private conservation is provided at both the state and federal levels in the form of income tax credits and deductions. Section 170(h) of the Internal Revenue code provides an income tax deduction for the donation of a "qualified conservation contribution" to a "qualified organization" for "conservation purposes." Specifically, donations of land or conservation easements to a land trust or the government would qualify for the deduction. The deduction—that is, the value of the donation—is generally equal to the fair market value of the property before the conservation easement minus the fair market value of the property after the easement. From 1980 through August 2006, the rules stated that an individual could deduct the value of a donation up to 30 percent of adjusted gross income. In 2006, Congress passed the Pension Protection Act, which raised the deduction to 50 percent of adjusted gross income for most landowners and 100 percent for qualified farmers and ranchers

who meet certain criteria. It also increased the carry-forward period for the deduction from 5 to 15 years. This expansion of the program is scheduled to expire at the end of 2009, but two bills have been introduced in Congress that would extend it. Based on surveys of local land trusts, the Land Trust Alliance claims that the expansion has made a big difference in the number of donations. It estimates that 535,000 additional acres were protected in 2006 and 2007 compared to 2004 and 2005 and that much of this increase was due to the larger deduction (Land Trust Alliance 2009a).

At the state level, 15 states offer income tax credits for landowners who donate land or conservation easements (Land Trust Alliance 2009a). Each program operates slightly differently, but in general, landowners are offered a credit on their income taxes equal to some percentage of the fair market value of the property, up to a maximum limit. Percentages currently vary between 25 and 55 percent. In some states, the credit can be carried forward to future tax years if it cannot be used in a single

TABLE 4-3

Key Features of State Conservation Tax Credits

State	Year Enacted	Percentage of Fair Market Value	Maximum Credit	Carry Forward Years	Transferability
Arkansas ¹	2009	50	\$50,000	9	No
California	2000	55	Unlimited	8	No
Colorado	1999	50	\$375,000	20	Yes
Connecticut	1999	50	Unlimited	10	No
Delaware	1999	40	\$50,000	5	No
Georgia	2006	25	\$250,000 ²	5	No
Iowa	2008	50	\$100,000	20	No
Maryland ³	2001	NA	\$5,000	15	No
Massachusetts ⁴	2009	50	\$50,000	10	No
Mississippi ⁵	2003	NA	\$10,000	10	No
New Mexico	2003	50	\$100,000	20	No
New York ⁶	2008	NA	\$5,000	0	No
North Carolina	1983	25	\$250,000 ⁷	5	No
South Carolina ⁸	2000	NA	\$250/acre or \$52,500	Indefinite	Yes
Virginia	1999	40	\$50,000 ⁹	10	Yes

NA = not applicable. These states do not base the credit on a percentage of fair market value.

1 Arkansas' program covers donation of conservation easements in wetland and riparian zones. The total program is capped at \$500,000 per year.

2 Corporations have a maximum of \$500,000 in Georgia.

3 Maryland offers a credit equal to the lower of taxes owed or \$5,000; only conservation easements, and not land donations, are eligible.

4 The Massachusetts program is capped at \$2 million per year.

5 Mississippi offers a credit toward 50% of allowable transaction costs associated with donating an easement.

6 The income tax credit in New York is equal to 25% of the property taxes paid on the land placed under easement, up to an annual maximum of \$5,000. Only easements receive the tax credit and not land donations.

7 Corporations have a maximum of \$500,000 in North Carolina.

8 South Carolina sets the credit at 25% of the allowed federal deduction rather than a percent of fair market value.

9 Until 2009, Virginia capped credit values at \$100,000; in 2009, the limit was reduced to \$50,000. Beginning in 2007, the state placed a cap on total credits of \$1 million (though there can be carryovers if the cap is not met in a given year).

Source: Land Trust Alliance 2009b.

year. In a handful of states, the credit is transferable to another individual or corporation—that is, if the landowner does not have enough income tax liability to make use of the credit, he or she can sell it to someone else who can use it. This innovation was first pioneered by Colorado in 2000, followed by South Carolina in 2001, Virginia in 2002, and most recently New Mexico in 2008.

Internal Revenue Service guidelines pertaining to federal income tax deductions are often a starting point for setting eligibility guidelines. However, many states impose additional restrictions. For example, California stipulates that landowners must meet the goals of a conservation plan, protect species or habitat, conserve threatened agricultural land, or increase public access to open space or archaeological resources. Delaware requires that the land conserved include open space, natural habitat, recreational properties, resource

conservation, or historic properties. North Carolina maintains that land must provide public access, fish or wildlife habitat, or have a “similar conservation purpose.” Mississippi has one of the most restrictive programs, requiring that the donated land or easement have a state-designated “scenic stream” or “natural heritage” resources. Table 4-3 shows the key features of the 15 state programs in existence as of early 2009.

Two states offer incentives through the property tax system. In Maryland, properties with easements held by the Maryland Environmental Trust are exempt from all state and local property taxes for 15 years. After this credit is exhausted, conservation easement properties must be assessed as open space properties; such properties are assessed at lower farmland rates. In Florida, voters in November 2008 opted for a similar approach: they voted to exempt all land under perpetual easement from state property taxes and

approved a “conservation assessment” on land that is in conservation use.¹⁰

Land trusts and conservation advocates argue strongly in favor of the federal deduction and state conservation tax credits. As described, the Land Trust Alliance, based on surveys of local land trusts, believes that the 2006 expansion of the federal charitable deduction provisions greatly increased donations. Land trusts often lobby state legislators to keep or expand state credit programs, especially when budget problems put the programs at risk. However, some studies have found that state programs have had limited impact in some cases. Only those with a high credit value—that is, relatively high percentage of fair market value and, more important, a high cap—and those that allow transferability appear to have had a significant impact on acreage donated.

Pentz (2007) found that five states—Delaware, Maryland, Mississippi, New York, and South Carolina—had programs with little or no significant impact on land donation. On the other hand, the tax credits had increased donations by 20 to 25 percent in five other states—North Carolina, Virginia, Colorado, New Mexico, and Georgia. Each of these states has a credit cap of \$100,000 or more or has a program with transferable credits.¹¹ Pentz shows that land donations have tripled in Colorado and quadrupled in Virginia since 1999 and argues that adding transferability to other state conservation tax credit programs could significantly increase program effectiveness. A study by Sundberg (2007) essentially supports the Pentz findings: only programs that offer income tax credits in excess of \$100,000 or have a transferability feature were found to be capable of impacting state-level land donations.

Perhaps a more accurate gauge of program effectiveness than the number of donations or acres donated is the conservation value of the lands donated. Sundberg and Dye (2006) address this aspect. They find that landowners with the largest potential tax benefits are much more likely to donate conservation easements, and individuals with low levels of income and low property values are less likely. They find no correlation between the conservation value of land and the tax benefits accorded to landowners, indicating that parcels chosen for conservation are not necessarily those with the highest conservation value. Allowing transferability

of credits does not get around this problem, as the tax credit program still favors lands with high tax benefits but not necessarily high conservation value. In fact, transferability has led to some problems in the Colorado program. In October 2007, news broke that appraisers were fraudulently appraising land, inflating values to obtain higher tax benefits (Steele 2008). This controversy resulted in widespread media attention and led to the formation of a task force and subsequent state laws enhancing accountability and standards.

Problems with appraisals and what constitutes fair market value have dogged state programs and the federal tax deduction. Small (2004) describes some of the problems. One of these is assigning a market value (before the easement) to a parcel assuming it would have been developed to its full zoning limits without any regard for whether market demand would have dictated that outcome. Another is assuming a conservation benefit when a parcel is not built to its zoning limits or when some open space is reserved within a subdivision. In general, the federal deduction is not set up for these purposes but is supposed to be focused on land with clear conservation value.

As experience with use of the charitable deduction for conservation purposes has grown and state programs have matured, some of these problems are beginning to be addressed with rules, procedures, and program oversight. In the future, it is likely that these tax incentives will continue, as they provide private landowners with valuable direct incentives for conservation. However, the success of the Colorado and Virginia programs has been a two-edged sword: on one hand, the programs, by most accounts, have greatly increased the number of acres preserved in these states; but on the other, their success has cost the state coffers significant amounts of tax revenues, leading the legislatures to review the programs and, in Virginia, reduce the allowable credit. Moreover, tighter scrutiny on the conservation outcomes is required to ensure that the programs are as effective as possible.

Local Referenda

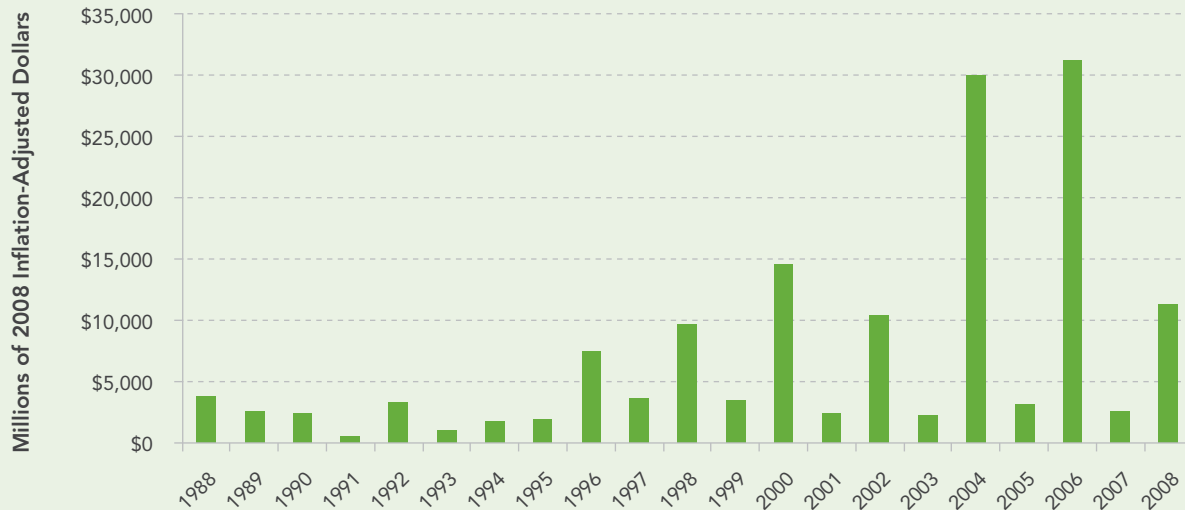
Since the late 1980s, local ballot initiatives have become an increasingly popular way to raise money for land conservation activities. These referenda ask voters to approve a bond or tax measure, such as a surcharge on a local sales or property tax, to finance various kinds of open space and conservation programs. Between 1988 and 2008, and not adjusting for inflation, \$122 billion

¹⁰ Florida has no state income tax.

¹¹ Until 2009, Virginia capped credit values at \$100,000. South Carolina has a transferable credit program but the value of the credit is quite low—only 25 percent of the allowable federal deduction.

FIGURE 4-8

Total Funding Approved through Voting on Local Referenda



Source: Trust for Public Land 2009.

was approved by the voters through state and local referenda. Approximately 76 percent of the referenda placed on ballots over that time were passed (Trust for Public Land 2009). Figure 4-8 shows the dollars approved in ballot initiatives nationwide since 1988, in inflation-adjusted 2008 dollars. At the peak year, 2006, more than \$30 billion (in 2008 dollars) was raised for open space, conservation, and recreation.

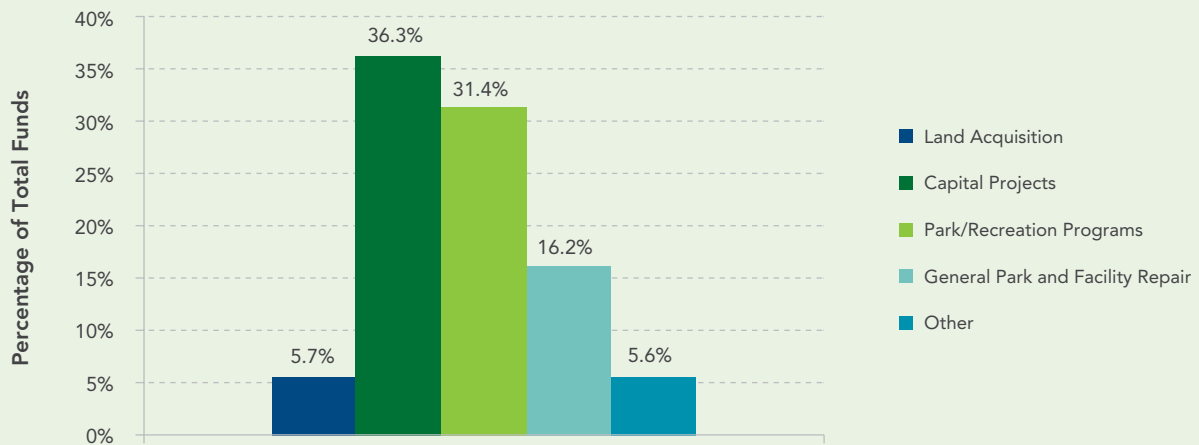
A closer look at the data reveals several interesting facts. Although referenda are popular in communities in some states, 17 states have passed fewer than three measures in 20 years, and 7 states have never passed any. In fact, a handful of states are constitutionally barred from taking such measures to the voters. Massachusetts and New Jersey account for one-third of all measures that have passed. These states have innovative state matching grant programs—the Community Preservation Fund in Massachusetts and the Garden State Preservation Trust in New Jersey, which operates the farmland preservation program Green Acres and a separate historic preservation program. These programs provide matching state funds for money that local communities raise themselves through referenda, thus providing a strong incentive for communities to put measures on the ballots. Over the 1998 to 2008 period,

California accounted for one-half of all funds approved. And finally, nearly a quarter of the ballot initiatives passed between 2000 and 2004 targeted farmland preservation. In other words, not all of these dollars raised—in fact not many of the dollars raised—are going to parks and other publicly accessible recreation sites.

Some studies by economists in recent years have used the LandVote data to econometrically analyze the factors that both explain a conservation measure being placed on a ballot and determine the likelihood that it passes. Banzhaf and his colleagues (2007) find that measures are more likely to be placed on the ballot in wealthier communities, in urbanized areas, and in areas with more surface water and more endangered species, all else being equal. They find that measures are more likely to pass in communities that have a significant land trust presence—a finding confirmed in a study by Sundberg (2006)—and in wealthier communities. They also find that bond measures are significantly more likely to pass than measures that raise taxes. This finding was confirmed in Kotchen and Powers (2006). Somewhat surprisingly, Banzhaf and colleagues (2007) find that once they control for other factors, measures are not any more likely to pass in New Jersey and Massachusetts than in other states.

FIGURE 4-9

Use of Funds Raised through Conservancies, Park Foundations, and Friends Groups



Source: Walls et al. 2009a.

Note: Average percentage for each category as reported by respondents to RFF survey.

The Role of Conservancies, Foundations, and Friends of the Park Groups

A growing trend in recent years is the involvement of the nonprofit community in supplying funding and manpower to state and local parks. These organizations range from small friends of the park groups that work with individual parks to large conservancies and foundations that work across park systems. The City Parks Foundation in New York City, for example, has an annual operating budget of \$10 million and works across 1,800 parks in the city. The California State Parks Foundation assists with deferred maintenance, education programs, habitat restoration, and land acquisition for the 279 state parks in California. Its annual operating expenses in 2008 were \$11.5 million, and it has spent \$150 million since it was founded in 1969 (California State Parks Foundation 2008).

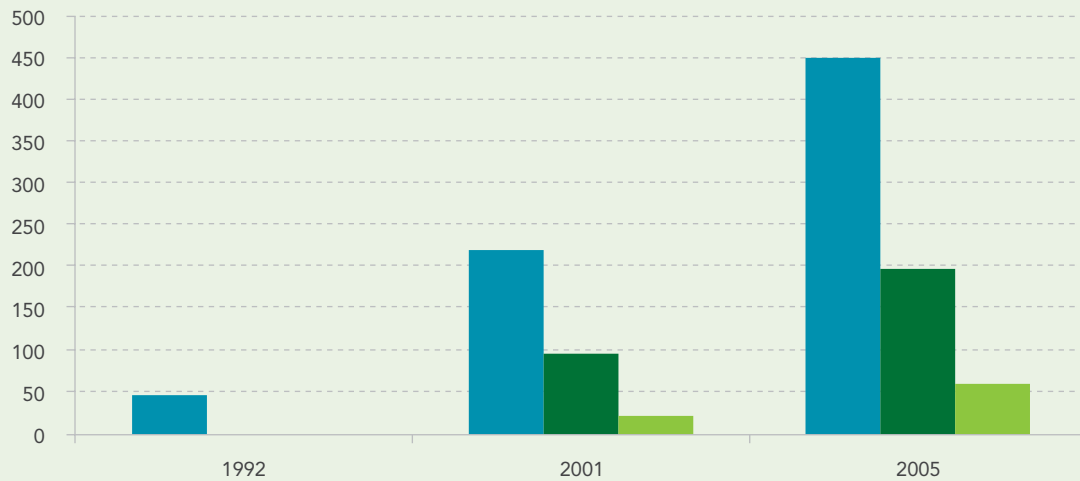
Such nonprofit organizations seem to be particularly important for city parks. The RFF survey of local park directors described earlier asked how much money was generated for local park systems by park foundations, conservancies, friends groups, or other private donors (wills, gifts, special fundraisers) in the most recent fiscal year. For the 44 directors who responded, a total of \$143

million was reported. As a point of comparison, the total annual operating expenses of all cities in the survey were approximately \$3 billion. More than half of the money reported from conservancies came from New York City alone, but eight cities reported between \$2 million and \$12 million and only five reported zero. The survey asked local park directors what percentage of the funds raised from this sector went for capital projects, park programs, general park and facility repair, land acquisitions, and other activities. The findings are shown in Figure 4-9, which makes clear that most of these groups spend their time and money on capital projects and park programs. In general, routine operations and maintenance are not covered by these support groups.

The National Association of State Park Directors (2008) reports on the number of support groups and endowment funds in each state in 2007, whether for the system as a whole or for individual parks. Almost every state has a support group for individual parks and 32 have them for the system as a whole. Endowment funds, however, are less common: only 13 states have systemwide funds. Responses to the RFF survey of state park directors indicate that funding from private groups is insignificant. Only California appears to receive substantial funding (26 percent of its 2008 operating

FIGURE 4-10

Number of Wetland Migration Banks



Source: U.S. EPA 2009.

■ Permitted ■ Pending ■ Sold Out

budget) from private-sector grants. In other states, the percentages are zero or quite small.

It is not clear what the full implications of the conservancy movement are for park financing and operations, nor how this movement will evolve in the future. At the local level, where the organizations are now the more important actors, it is possible that governments may come to rely on these organizations to provide more and more of the park resources in a community and thus cut back government funding. This can be problematic. One issue is funding stability: because these nongovernmental organizations have no taxing authority and typically rely on donations, their funding streams are highly uncertain. Moreover, citizens have a tendency to free-ride, presenting a classic problem of public goods, where people enjoy the benefits without paying the costs. Another problem can arise in communities that have friends groups for individual parks. A community of haves and have-nots might arise, with parks in wealthier areas better funded than those in poorer neighborhoods. Clearly, good coordination and cooperation between local government agencies and their nonprofit partners are essential. Further study of these relationships and development of models for best practices going forward would be worthwhile.

Wetlands Mitigation Banking

The 1972 Clean Water Act (CWA), through its Section 404, mandates compensatory mitigation of wetlands and wetland-related services, but the use of mitigation banks did not start until 1983, when the FWS issued specific guidance on wetland mitigation banking. By 1992, 46 mitigation banks had been established, albeit composed almost entirely of single-user banks by public agencies or large corporations. The first commercial mitigation banks were established in the early 1990s, but their number grew after 1995 when the U.S. Environmental Protection Agency (EPA) and the Army Corps of Engineers released banking guidance. It gave mitigation banks and their customers the necessary regulatory certainty to move forward, and the popularity of mitigation banking considerably increased. According to the Environmental Law Institute (ELI; 2002), by the end of 2001, 219 wetland mitigation banks with about 140,000 acres of habitat operated, with over half of the banks entrepreneurial.

In the federal guidance document for mitigation banking, a wetland bank is defined as “a site where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory

mitigation in advance of authorized impacts to similar resources” (U.S. EPA 1995). Mitigation banks consist of four distinct parts:

- bank site—the location of the restored, enhanced, or preserved acreage;
- bank instrument—an agreement between the bank owners and regulators delineating liability, performance standards, management and monitoring requirements, and the terms of bank credit approval;
- mitigation bank review team (MBRT)¹²—the government body that reviews prospective bank applications, provides approval for the bank, and supervises the bank; and
- service area—the geographic area in which environmental impacts may be compensated for by a given bank.

The MBRT reviews prospective banking sites and determines the number of credits available for purchase on the basis of acres, as well as method of conservation: creation, restoration, or enhancement.¹³ The entity purchasing mitigation credits must purchase them from a designated bank within the geographic area previously determined in the banking instrument. In practice, the same method used to value banking credits must be used to evaluate the number of credits needed to satisfy CWA requirements. Many states have passed regulations authorizing the establishment of wetland mitigation banks in addition to federal requirements—often working with MBRTs to establish cohesive networks of wetland banks, reflective of individual states’ environmental goals (U.S. EPA 2009; Bean et al. 2008).

Figure 4-10 displays trends in wetland mitigation banks, from 1992 to 2005. Permitted wetland mitigation banks have increased almost ninefold, and banks pending approval and banks sold out also have seen increases in numbers. Figure 4-11 demonstrates that in 2005, the majority of wetland mitigation banks—70.4 percent—were created by private entrepreneurs to serve multiple clients, demonstrating the vitality of the national banking market.¹⁴ The ELI estimates that in 2003, approximately \$2.5 billion was spent on wetland mitigation banking in compliance with Section 404 of the Clean Water Act. It also estimates that more than 14,000 acres are preserved annually through wetland conservation banking.

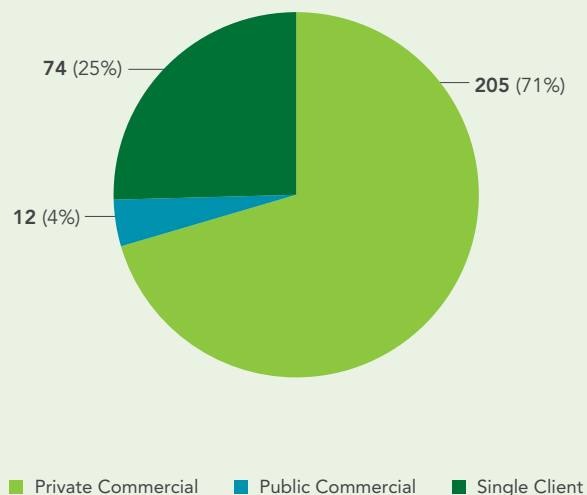
¹² An MBRT is composed of representatives from the Corps, EPA, FWS, National Marine Fisheries Service (NMFS), and the USDA’s Natural Resource Conservation Service. In addition, as appropriate, representatives from state, local, and tribal resource agencies may participate.

¹³ In general, MBRTs favor the creation of wetlands over other compensatory mitigation methods and generally accept preserved acreage for credits only under exceptional circumstances

¹⁴ Data were available for 291 of 450 authorized banks.

FIGURE 4-11

Types and Distribution of Wetland Mitigation Banks (as of 2005)



Source: U.S. EPA 2009.

At the state level, there is little to no documentation of the total number of wetland banks or funding. As of 2007, however, at least 20 states have statutes authorizing state-level wetland mitigation banking, at least 16 have wetland mitigation-banking regulations, and 18 have developed guidance on wetland mitigation banking (Bean et al. 2008).

Conservation Banking

Unlike wetland mitigation banking, which has its origins in federal-level regulations, conservation banking was promulgated by state-level initiatives. In an attempt to protect rare habitat and support rare and endangered species, the state of California in 1995 first established a formal policy toward conservation banking (Bean et al. 2008). At that time, in cooperation with the state of California and federal agencies, the U.S. Fish and Wildlife Service began approving conservation banks for species listed under the Endangered Species Act (ESA). Formal federal guidance for the use of conservation credits to meet the mitigation requirements under the ESA was established in 2003, making the FWS responsible for the administration of conservation-banking markets in the United States.

The federal administration of conservation banks is less detailed and more flexible than that of wetland mitigation banks. The FWS requires that banks meet the conservation needs of one or more listed species under the ESA. To gain approval, a bank must prove that it will adequately offset authorized adverse impacts in that species' conservation zone.¹⁵ With the rehabilitation of species as a goal, credits are awarded for conservation outcomes rather than management actions. Each conservation bank must prepare a conservation banking agreement that provides for the permanent protection of the land in question, and ensures long-term funding viability and provisions for remedial action.¹⁶

At the state level, California has the most active conservation-banking plan, and banking is extended beyond endangered species to rare and threatened habitats. More generally, conservation banking at the state level remains in its infancy: each state is required to draft a state wildlife action plan, but as of 2007, only 11 states have made any reference in their plans to habitat banking as a possible conservation option (Bean et al. 2008)

Information regarding the number of banks, acreage, and funding is difficult to accumulate owing to the largely decentralized nature of conservation banking in the United States. A survey by Fox and Nino-Murcia (2005) estimated that as of December 2003, 76 conservation banks operated in the United States, though only 35 had been established through a conservation-banking agreement provided by the FWS. In California, the Sacramento field office reports that there are currently more than 17,000 acres registered as approved conservation banks in the area supervised by that office.

Mitigation Banking in the Future

Mitigation banking has the potential to lower the costs of meeting regulatory requirements related to wetlands and endangered species and also the potential to achieve better conservation outcomes. It lowers costs by providing another alternative for meeting regulatory requirements besides onsite mitigation and by allowing landowners to pass the responsibility for meeting those requirements on to third parties, which may have greater interests and experience in successful conservation. It may achieve better conservation outcomes by allowing for exchange of fragmented habitats with habitats that

are larger, more strategically located, and better able to achieve goals related to species' recovery.

How well mitigation banks work in practice is up for debate, however. The startup costs of mitigation banks are high, and it is often necessary to offer initial credits before a bank is established, thus there is usually some temporal loss of ecosystem services (Robertson 2006). The use of acres as a metric for wetland credits is complicated; an acre of high-quality wetlands lost may not be adequately compensated by the creation of an acre of low-quality wetlands. In principle, this problem can be avoided by determining "exchange rates" between the acres lost and established to accurately account for the differences in their ecological value. In practice, of course, accurately setting the exchange rates between different kinds of areas is difficult. Further development of state- and local-level mitigation-banking initiatives may help ensure that ecosystem services are adequately compensated on an ecosystem basis, rather than purely on a national or state level.

The effectiveness of the mitigation market has also been questioned. For example, regarding wetland banking in the Chicago District of the U.S. Army Corps of Engineers, Robertson (2006) concludes that the Chicago wetland-banking market was not truly responsive to shifts in supply and demand. This problem arises because these markets are often made up of a limited number of bankers and are heavily influenced by government regulation.

Although mitigation banking may not realize all of the proposed benefits that its proponents advocate, it has considerable potential as a conservation option. It is still in its infancy in many regions of the United States, but it may be poised to become a major instrument for future conservation. A significant driver could be climate change legislation. If Congress passes a cap-and-trade rule for greenhouse gases, a key issue will be the treatment of so-called offsets. Offsets represent a reduction, avoidance, destruction, or sequestration of emissions from a source not covered by the emissions cap. Biological sequestration of carbon—that is, the storage of carbon in trees and other plants—is one type of offset. The role of conservation banks in the offset market will be critical.

Government Spending on Operations

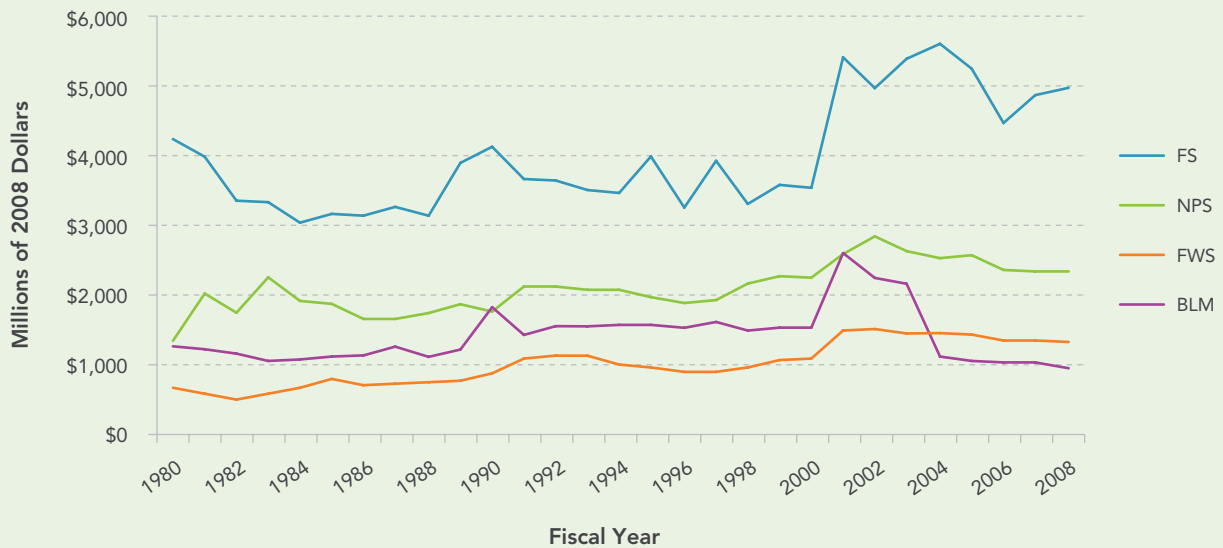
Federal, state, and local parks and recreation agencies and departments must have funding to cover the normal

¹⁵ To this end, the FWS recommends situating conservation banks in large, unfragmented conservation regions next to other conservation regions or in migratory pathways.

¹⁶ To be successfully rehabilitated, most endangered species require some form of active management to protect against invasive species.

FIGURE 4-12

Inflation-Adjusted Appropriations by Agency



Sources: Gorte 2008; Vincent 2001, 2003, 2008; Vincent et al. 2008; Greenwood et al. 1998.

operating expenses that they incur. These budgets are in addition to the programs described earlier, which focus on funds provided for land conservation (namely, fee acquisition and purchase of conservation easements) and for capital projects such as new parks, trails, and facilities. Once these conservation investments are made, public agencies need to have funds at their disposal to manage the lands and facilities. Here we describe trends in funding levels at the federal, state, and local levels, as well as where funding comes from at the state and local levels, with particular attention to the breakdown between user fees and general funds.

Federal Spending

Figure 4-12 shows annual congressional appropriations over the 1980 to 2008 time period for the four main land management agencies in the federal government, the National Park Service, BLM, Forest Service, and FWS. All figures are in 2008 inflation-adjusted dollars. The Forest Service receives the greatest funding; in FY2008, its appropriations were more than twice as high as the next-highest agency, the National Park Service. A significant portion of the Forest Service budget each year goes toward fire management—in FY2008, 53 percent of total appropriations. All agencies had relatively constant budgets from year to year from 1980 to 2000 but saw

a spike upward in 2001. After that time, appropriations gradually declined. BLM has seen the sharpest decline; its FY2008 budget, in real terms, was the lowest of any year in the 28-year time period shown.

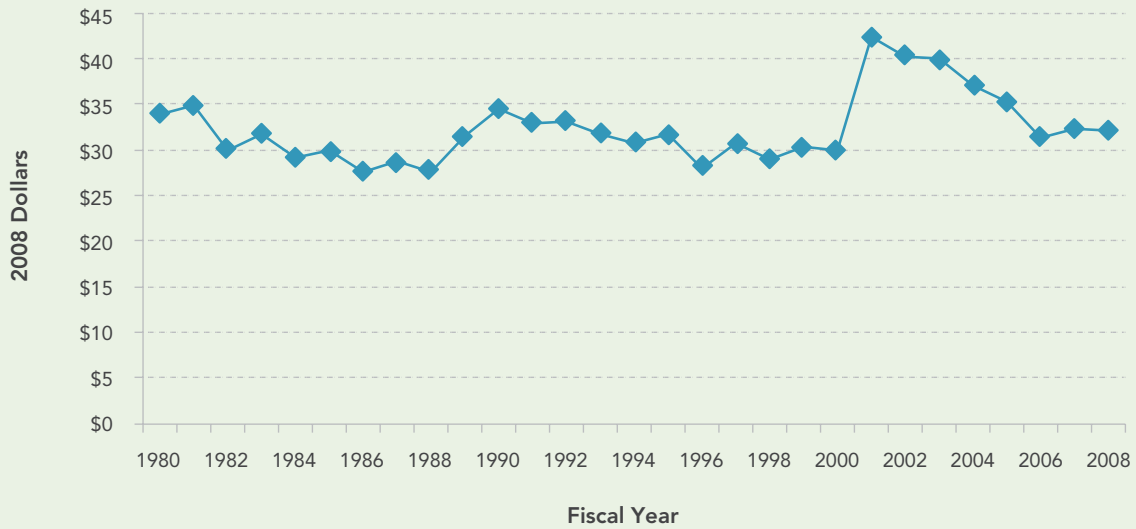
Figure 4-13 shows total appropriations summed across all four agencies on a per-capita basis for the fiscal years 1980 through 2008. The federal government appropriated approximately \$9.8 billion for the four agencies in FY2008, or \$32 per U.S. resident. In inflation-adjusted dollars, this is just slightly below the amount spent in FY1980. As the graph makes clear, there has been little variation across the years in the amount of appropriations per U.S. resident with the exception of the spike upward in FY2001. That spike was followed by a gradual decline in spending until FY2007.

State Spending

Figure 4-14 shows total annual state park operating expenditures from 1978 through 2007 for all states as well as operating expenditures per state park visit. Even after adjusting for inflation, expenditures have risen over the past three decades, on both a total and per-visit basis. States spent a total of \$2.3 billion on parks in 2007 compared to \$1.3 billion in 1978 (in 2007 dollars), an increase of 81 percent. Although state park acreage has risen, as we

FIGURE 4-13

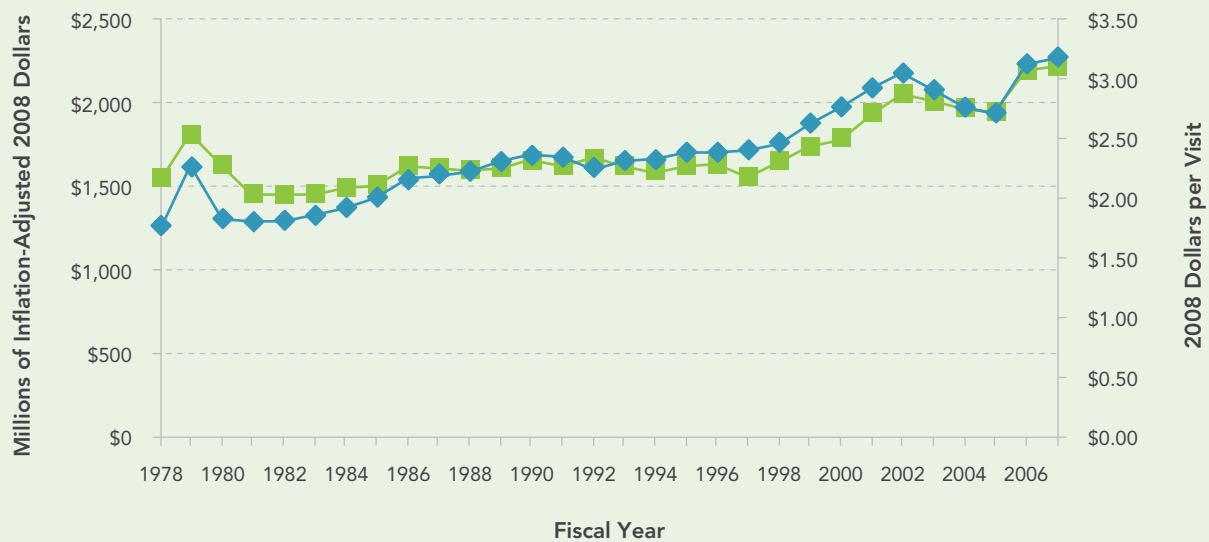
Total Inflation-Adjusted Appropriations Per Capita for the Bureau of Land Management, Fish and Wildlife Service, Forest Service, and National Park Service



Sources: Gorte 2008; Vincent 2001, 2003, 2008; Vincent et al. 2008; Greenwood et al. 1998.

FIGURE 4-14

State Park Operating Expenditures

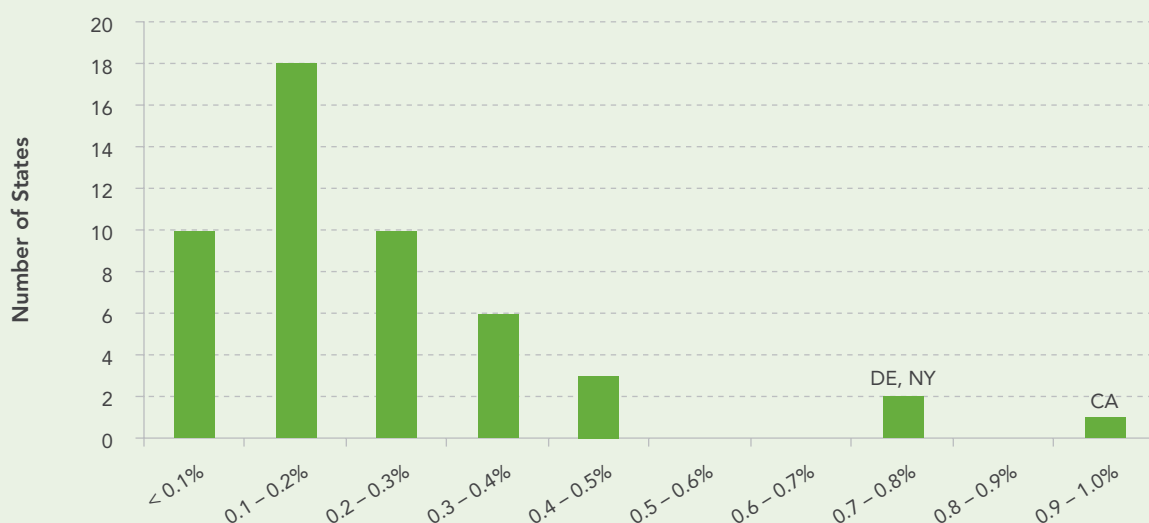


Source: National Association of State Park Directors various years.

—◆— Total Expenditures —■— Expenditures per Visit

FIGURE 4-15

State Park Operating Budget as Percentage of Total State Budget



Source: National Association of State Park Directors 2008.

showed earlier, the percentage increase in operating costs is greater than the percentage increase in acreage.

Spending varies across states, as might be expected. As described, some states have lodges, golf courses, and highly developed campsites and other facilities, and others only more primitive facilities. But even states with relatively high operating costs spend only a small fraction of the total state budget on the state park system—on average, in 2007, 0.25 percent. Figure 4-15 shows the distribution across states. Three states are outliers: California, spending slightly less than 1 percent of the state budget on parks, and Delaware and New York at 0.7 percent each.

States get funds for parks from a variety of sources. User fees (entrance fees, campground fees, charges for lodging, and park passes) are important in almost every state. According to the National Association of State Park Directors (2008), only seven states received no money from park entrance fees in 2007. The remaining states received more than 25 percent of their operating funds from entrance fees and a significant additional percentage from campground and lodging fees. Registration fees for boats, off-highway vehicles, and snowmobiles, as well as a portion of hunting license fees,

provide park funds in some states; other states have special taxes devoted to parks and recreation, such as tobacco taxes or taxes on sporting goods, and many get funds from concessionaire licensing and souvenir sales. In the 2008 RFF survey of state park directors, the average proportion of states' operating budgets covered by user fees was 42 percent.

In almost every state, parks receive money from the state government's general fund. Responses to the RFF survey indicate an average of 41 percent of the operating budget from the general fund. However, 7 of the 46 states responding to the survey reported that they received no such money in 2007.¹⁷ According to Landrum (1999), state park agencies have been increasingly expected to rely on revenue generation from park operations to cover their costs. Landrum finds that the degree of operating cost recovery rose from slightly less than 36 percent in 1975 to 43 percent in 1995.¹⁸

17 The National Association of State Park Directors survey also asks this question but gets slightly conflicting responses in different parts of its questionnaire. Seven states reported a zero dollar contribution to operating expenses from the general fund, but in a separate yes-no question about sources of funds, nine states reported that they receive no general funds.

18 The RFF survey did not ask for this specific piece of information, nor does the National Association of State Park Directors survey; thus it is difficult for us to say for sure how this figure has changed in the past 10 to 12 years. However, if the average covered by the general fund is 40 percent, an average of 60 percent is recovered by fees, grants, and other revenue sources dedicated to the park agency.

FIGURE 4-16

Local Parks and Recreation Spending



Source: U.S. Census Bureau various years.

A much smaller percentage of park agencies' operating budgets is provided by other sources, including grants from the federal government and from private groups, such as nonprofit organizations. State park agencies, Landrum says, have looked increasingly to the nonprofit sector (for example, friends groups, park foundations, and support organizations) to provide financial and other help with various problems. Funding from these sources is small relative to state budgets, however.

Local Spending

Local governments spent just under \$30 billion on parks and recreation in FY2006, according to data from the U.S. Census Bureau. As shown in Figure 4-16, spending has risen over time. The figure shows annual spending, in inflation-adjusted dollars, from FY1992 through FY2006.¹⁹ Over those 15 years, total local parks and recreation spending rose 56 percent. Population rose by only 17 percent, however. Communities have thus been spending more money per person on parks since

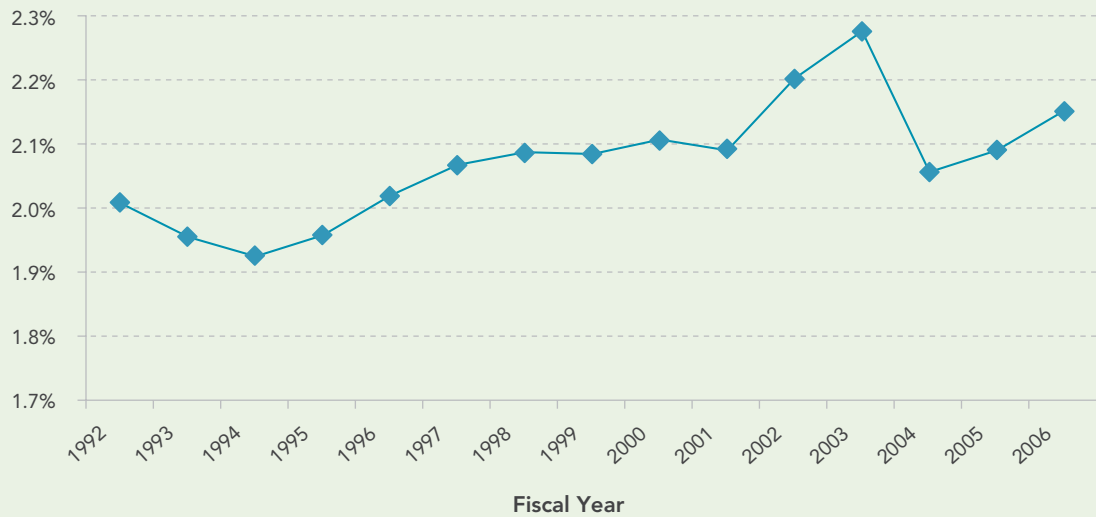
the early 1990s. They also, though, have been spending more money on everything. Figure 4-17 shows local spending on parks and recreation as a percentage of all local government spending. Although there have been slight ups and downs from year to year, the changes are quite small—parks spending has stayed roughly constant at about 2 percent of total spending over the 15 years covered by the census data.

The census data are the only consistent data over a long period on local government spending. They are comprehensive and thus provide a good estimate of total spending across all communities. However, they include municipalities as small as 67 people, along with Los Angeles County and its population of nearly 7 million. Information on a smaller but more uniform set of larger communities is available from the Trust for Public Land's Center for City Park Excellence. In 2006, spending by 75 cities, home to nearly 55 million people, totaled approximately \$5 billion. On a per capita basis, these cities spent an average of \$91 per city resident. Information collected in the 2008 RFF survey of local park directors, described earlier, provides estimates that lie in a similar range. Average spending for communities in the RFF survey—mainly urban and suburban communities—was \$106 per person.

¹⁹ The annual census data are not based on a complete census of all units of government; the census estimates total spending based on sampling numbers, thus there is some sampling error involved. The full census is conducted every five years with the most recent data available for 2002. In that year, there were 38,976 general purpose local governments—3,043 counties, 19,429 municipalities, and 16,504 townships—ranging greatly in size of population served (see U.S. Census Bureau 2005).

FIGURE 4-17

Local Parks and Recreation Spending as a Percentage of Total Local Government Spending



Source: U.S. Census Bureau various years.

Money for local park operations comes from the general fund in most communities. The RFF survey showed that, on average, 76 percent of park operating budgets comes from the general fund. Four respondents reported that all of their funding comes from the general fund. Only 15 percent, on average, comes from user fees such as park entrance fees or passes. This contrasts with state parks, which cover 42 percent of their operating budgets, on average, with revenues from user fees, as described.

Conclusions

The funding landscape for conservation and recreation has changed dramatically over the past quarter century. As the Land and Water Conservation Fund diminished in importance, other federal programs proliferated. These programs have a variety of different missions and objectives. States have also put several new programs in place in recent years, along with tax incentives to promote conservation. However, there is substantial variation across states. Some do a lot, and some appear to do very little. At the local level, two new trends have emerged: the use of referenda as a way to generate new funding for conservation and open space and the growth in the conservancy and park foundation movement. Again,

however, there is substantial geographic variability. In some states, not a single referendum has been held, but in others, large amounts of money have been raised; likewise, conservancies are quite active in some communities but nonexistent in others. Another new phenomenon is the use of mitigation and conservation banks to meet regulatory requirements. These banks can conserve large landscapes and be a cost-effective way of meeting regulatory requirements. They are still in their infancy, but with climate change cap-and-trade legislation on the horizon, they could become a critical supplier of offset credits

In short, new and varied sources of funds are available and the time is ripe for a broad evaluation of funding programs at the state, federal, and local levels. Such an evaluation needs not only to look at achievements and costs but also to figure out how well the programs work together to achieve a set of goals, whether some programs are redundant and whether some may actually work at cross-purposes with each other. Gaps may also need to be identified. For example, many of these programs are not focused on public access and recreation, as is the LWCF. Finally, with new challenges looming on the horizon—most notably, climate change—it is time to assess whether our funding and financing of conservation and outdoor resources are adequate for addressing those challenges.



5

Major Changes over the Past Quarter Century and Directions for the Future

We have taken a retrospective look at the supply of outdoor resources, open space, and conservation lands; the recreational use of such lands; and the funding and financing of conservation and recreation over the past quarter century. Perhaps more important, we have also attempted to look ahead by examining how emerging trends will shape the use of outdoor resources in years to come and identifying funding needs and gaps. In this final chapter, we highlight these new issues and also note several areas where additional information and research are needed.

New Issues in the Supply of Lands

The United States is endowed with numerous and diverse outdoor resources. The acreage protected from development remains high and private conservation has added significantly to this inventory in recent years. One of the most notable trends in the past quarter century, in fact, is the growth in conservation land trusts and the innovative conservation financing tools now used in a variety of ways to protect outdoor resources. Conservation tax credits adopted in several states, the federal government's tax deduction, and regulation-induced mitigation banks have all spurred private conservation efforts. Moreover, partnerships between government agencies and land trusts are now quite common and have led to more acreage protected at a lower cost than would have been the case with pure fee acquisitions by government.

But acreage protected is not the only metric by which one judges the adequacy of supply. Our research identified three issues of particular concern:

- First, funding challenges for federal, state, and local parks and land management agencies have led to maintenance backlogs, deteriorating infrastructure, resource degradation, and overall reductions in the quality of the recreational experience in many

locations. Although many agencies have patched together temporary solutions to these problems, it is not clear that the quality of the resources available, especially at developed recreation sites and parks, is fully meeting the needs of the public.

- Second, new challenges loom large. We believe that the most significant of these is climate change. Coastal areas, which include valuable wetlands, wildlife habitat, and recreation sites, are likely to experience grave problems due to sea-level rise. Problems on western public lands related to reduced streamflows and warmer weather are wide-ranging and serious. Development of effective adaptation policies should be a top priority of policymakers at all levels of government, but particularly for federal land-management agencies.
- Third, although data are limited—a problem we say more about below—some evidence suggests that the supply of urban parks and open space is inadequate to meet the demands of a growing urban population with an increasing need for recreation close to home. Although local governments have found new ways to fund parks and open space—namely, voter referenda and partnerships with nonprofit friends groups, conservancies, and foundations—and some states such as Florida, California, and Colorado have adopted innovative programs that provide grants to local governments, our assessment is that efforts are falling short in many locations.

A Complex Picture of Recreation Demand

Close-to-home recreation opportunities are even more important today with what appears to be a decline in available leisure time for many Americans. Our statistical research of time-use data showed that leisure time

availability is significant to explaining time spent in outdoor recreation. This time has increased substantially since the 1960s, we discovered, but has declined from its 1993 peak. Less leisure time is one reason for the recent decline.

The critical role played by leisure time has been noted by others. Some authors have suggested that leisure today is available in smaller blocks of time than it used to be, making longer vacations to distant recreation sites less feasible for many Americans. We offer the possibility, as have others, that these factors have contributed to the drop in fishing and hunting in recent years—a trend that is a concern to many in the wildlife and conservation communities. Experts point to declining leisure, increasing urbanization of the population, lack of access—particularly related to development of private lands on the urban fringe—high costs, and competing leisure opportunities as reasons for the decline, also arguing that the problem is exacerbated by adults not passing on knowledge and interests to children.

Some authors have expressed concern about a decline in participation in many outdoor activities, not just hunting and fishing. They have decried what they call “nature-deficit disorder” among children and a general lack of connection with nature and the outdoors by all Americans. The decline in outdoor recreation these authors lament is thought to be contributing to the nation’s obesity problems, another particular concern for children. Indeed, some information supports the conclusion that recreation is down from previous years. On the other hand, other survey information seems to show that overall participation has held steady, but that shifts have occurred among specific activities.

We identified three important areas of concern since the 1987 President’s Commission on Americans Outdoors review, all of which require additional data and research.

- Recreation demand is multifaceted and not easily characterized in a single statistic. The overall trend in participation and time use seems to be up since the 1960s, but some evidence suggests a recent decline. Visitation statistics for parks and public lands show that total visits are holding steady, but on a per-capita basis, visitation seems to be declining slightly. Some national surveys of participation provide conflicting evidence and the reasons for the differences are unclear.

- Children’s health is an area of emerging concern, particularly problems related to obesity. The extent to which lack of time spent outdoors is contributing to the problem is unclear, as good data on children’s participation in outdoor recreation is only just becoming available.
- National data on urban park use is very limited. With increasing urbanization of the population and changing land-use patterns in many metropolitan areas, a better understanding of urban recreation demands is needed. Our survey of city park directors suggested that outdoor recreation participation is high in city parks, but more detailed national data are needed.

Further study of these important demand-side issues is one of our key recommendations from this report. Specifically, we assert that new research and analysis needs to focus on four areas. First is a better understanding of national demand trends for both adults and children—through either unraveling contradictions in existing surveys or developing new surveys. Second is assessing the impact that access to outdoor recreation opportunities has on participation and time spent in outdoor pursuits by using geographically detailed data and GIS systems for more sophisticated examination. This research would be of particular value to policymakers dedicating limited resources to conservation and recreation. Third is linking access and other factors to physical activity outdoors and, therefore, to health. Last, filling the serious data gap with respect to urban park use and recreational activities is critical.

An Evolving Landscape of Funding and Financing

Probably the greatest change to the conservation and recreation landscape over the past quarter century concerns public and private sector funding and financing. Although the Land and Water Conservation Fund (LWCF) has been the principal funding source for federal land acquisition and state grants for parks and recreation projects since 1965, it has diminished in importance over the years. By all accounts, it has been an enormously successful program—permanently protecting more than 7 million acres of land—but annual funding levels have been erratic and the state grants portion of the program has declined sharply. In 2008, state grants totaled only \$25 million, compared to \$370 million at the program’s peak in 1979. In inflation-adjusted dollars, the drop is even more precipitous.

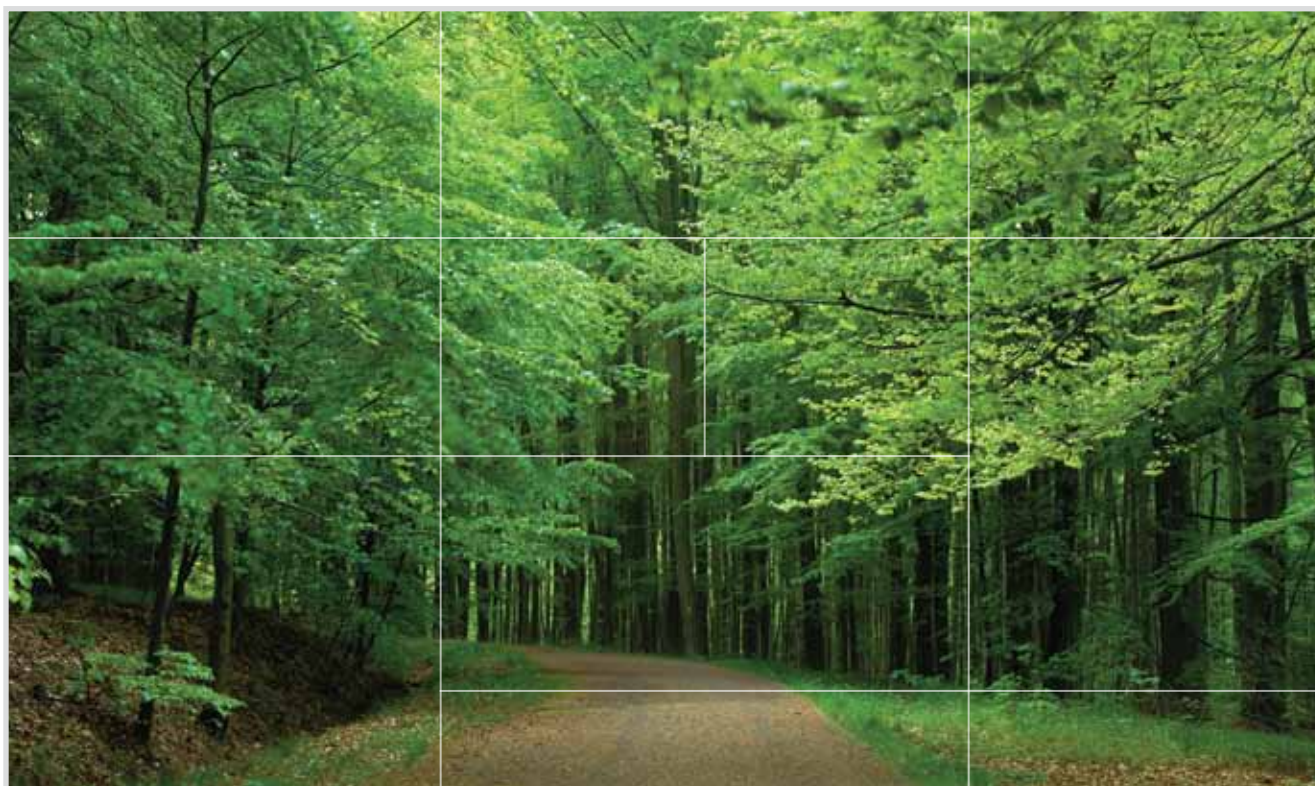
The waning of the LWCF has been accompanied by a proliferation of new programs and incentives at the federal, state, and local levels:

- More than 30 federal programs now exist, with two-thirds of these adopted in the 1990s and 2000s. These programs target a range of objectives—farmland protection, wildlife habitat restoration, trail construction, wetlands renewal, and more. However, most do not focus on permanent protection of publicly accessible recreation lands.
- States and localities have adopted an array of new funding tools as well. We identified 79 programs in 43 states totaling \$3.3 billion in FY2008. In addition, 15 states provide income tax credits for conservation land and easement donations. At the local level, voter referenda have risen in importance, as have nonprofit park conservancies and friends groups.
- The geographic coverage of these new efforts is uneven. We found that some states and local communities do a lot and some do very little.

We strongly recommend further study of the accomplishments and costs of this complex web of

funding and financing programs. Specifically, answers to the following questions are needed: First, at the federal policy level, how well are the more than 30 programs working in concert to achieve a broad set of conservation and recreation objectives? Second, what role should the federal government play vis-à-vis states, localities, and the private sector? Third, how are all of these efforts positioned to address the problems of the 21st century? In particular, are resources directed toward the key challenges of climate change, health, and increasing urbanization? Future research should be directed at these important issues.

In summary, the United States has seen significant changes in the past 25 years in its demand and supply of outdoor resources and funding for conservation, parks, and open space. With limited financial resources at the federal, state, and local government levels, it is essential that policymakers have good information at their disposal in order to make smart decisions about the allocation of those resources. Our research has provided some basic information, documented important changes that have taken place, and highlighted issues that loom large for the future. It has also illuminated the data and research gaps that need to be filled for a more complete understanding of outdoor resources supply and use. Filling these gaps should be a priority for policymakers.



References

Anonymous. 2008. Proposal Suggests Closing 48 California State Parks. *Parks and Recreation* 43(3): 18.

ASCE (American Society of Civil Engineers). 2009. Report Card for America's Infrastructure. Reston, VA: ASCE. www.infrastructurereportcard.org/fact-sheet/public-facilities-public-parks-and-recreation (accessed July 6, 2009).

Banzhaf, Spencer, Wallace Oates, and James Sanchirico. 2007. The Conservation Movement: Success through the Selection and Design of Local Referenda. Lincoln Institute of Land Policy Working Paper. Cambridge, MA: Lincoln Institute.

Basker, Ray, Ben Alexander, Jeff van den Noort, and Rebecca Carter. 2004. Prosperity in the 21st Century West: The Role of Protected Public Lands. Tucson, AZ: Sonoran Institute (July).

Bean, Michael, Rebecca Kihlsinger, and Jessica Wilkinson. 2008. *Design of U.S. Habitat Banking Systems to Support the Conservation of Wildlife Habitat and At-Risk Species*. Washington, DC: Environmental Law Institute.

Bently, Shaun. 2008. Personal communication between Shaun Bently, U.S. National Park Service, Washington Support Office—Land Resources, and the author. August 28.

Bruno, Laura. 2008. Tourist Stops, Parks Falling on Hard Times. *USA Today*, Dec. 14. www.usatoday.com/news/nation/2008-12-14-parkcuts_N.htm.

California State Parks Foundation. 2008. Your Voice for Parks: 2008 Annual Report. San Francisco: CSPF. www.calparks.org (accessed July 7, 2009).

Callihan, David. 2009. Email from David Callihan, director, Management Systems International, to the author. January 30.

Chang, Wen-Huei. 2008a. Email from Wen-Huei Chang, recreation research specialist, Engineer Research and Development Center, U.S. Army Corps of Engineers, to the author. October 17.

———. 2008b. Email from Wen-Huei Chang, recreation research specialist, Engineer Research and Development Center, U.S. Army Corps of Engineers, to the author. November 6.

———. 2009. Email from Wen-Huei Chang, recreation research specialist, Engineer Research and Development Center, U.S. Army Corps of Engineers, to the author. January 14.

Christensen, N.S., A.W. Wood, N. Voisin, D.P. Lettenmaier, and R.N. Palmer. 2004. The Effects of Climate Change on the Hydrology and Water Resources of the Colorado River Basin. *Climatic Change* 62: 377–363.

Clawson, Marion. 1959. *Methods for Measuring the Demand for and Value of Outdoor Recreation*. Reprint No. 10. Washington, DC: Resources for the Future.

Clawson, Marion and Jack Knetsch. 1966. *Economics of Outdoor Recreation*. Baltimore: Johns Hopkins University Press for Resources for the Future.

Clayton, Mark. 2005. Hunters as Endangered Species? A Bid to Rebuild Ranks. *Christian Science Monitor* (September 27).

Conservation Biology Institute, GreenInfo Network. 2009. California Protected Areas Database. www.calands.org.

Conservation Biology Institute, World Wildlife Fund. 2008. Protected Areas Database. www.consbio.org/what-we-do/protected-areas-database-pad-version-4/?searchterm=pad.%92

CARE (Cooperative Alliance for Refuge Enhancement). 2009. *Restoring America's Wildlife Refuges 2009: A Plan to Solve the Refuge System Funding Crisis*. Washington, DC: CARE. www.FundRefuges.org/CARE/CareHome.html.

Cordell, H. Ken. 2004. *Outdoor Recreation for 21st Century America*. State College, PA: Venture Publishing.

———. 2008a. The Latest on Trends in Nature-based Outdoor Recreation. *Forest History Today* (Spring): 4–10.

———. 2008b. Recreation Demand Trends in the United States. Presentation to the Outdoor Resources Review Group. September 29, Washington, DC.

Cordell, H. Ken, Carter Betz, J.M. Bowker, Donald B.K. English, Sheila H. Mou, John C. Bergstrom, R. Jeff Teasley, Michael Tarrant, John Loomis, and Susan M. McKinney. 1999. *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends*. Champaign, IL: Sagamore Publishing.

Cordell, H. Ken, Carter Betz, and Gary Green. 2008. Nature-based Outdoor Recreation Trends and Wilderness. *International Journal of Wilderness* 14(2): 7–13.

———. 2009a. *National Kids Survey Part I: How Much Time Do Kids Spend Outdoors?* IRIS Report. Athens, GA: University of Georgia. June. <http://warnell.forestry.uga.edu/nrrt/nsre/IrisReports.html> (accessed July 8, 2009).

———. 2009b. *National Kids Survey Part II: Do the Demographics of Kids Affect the Time They Spend Outdoors?* IRIS Report. Athens, GA: University of Georgia. <http://warnell.forestry.uga.edu/nrrt/nsre/IrisReports.html> (accessed July 8, 2009).

———. 2009c. *National Kids Survey Part III: What Do Kids Do Outdoors?* IRIS Report. Athens, GA: University of Georgia. <http://warnell.forestry.uga.edu/nrrt/nsre/IRISRec/IRISRec11rpt.pdf> (accessed August 24, 2009).

Cordell, H. Ken and Michael A. Tarrant. 2002. Forest-Based Outdoor Recreation. In *Southern Forest Resource Assessment*, edited by David N. Wear and John G. Greis. General Technical Report SRS-53. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station.

Devaney, Earl E. 2008. Final Audit Report: Abandoned Mine Lands in the Department of the Interior. U.S. Department of the Interior, Office of Inspector General. Report No. C-IN-MOA-0004 (July). www.doi.gov/upload/2008-G-00241.pdf.

D.J. Case and Associates. 2009. *Highlights of Key Access Research: Hunting Heritage Action Plan Project*. Report for Wildlife Management Institute (May).

Douglass, R.W. 1999. History of Outdoor Recreation and Nature-Based Tourism in the United States. In *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends*, edited by H. Ken Cordell et al. Champaign, IL: Sagamore Publishing, 15–24.

Duda, Mark Damian, Steven J. Bissell, and Kira C. Young. 1998. *Wildlife and the American Mind: Public Opinion on and Attitudes toward Fish and Wildlife Management*. Harrisonburg, VA: Responsive Management.

Eilperin, Juliet. 2005. Forests' Recreational Value Is Scaled Back: U.S. Lowers Estimate of GDP Contribution. *Washington Post*. August 15. www.washingtonpost.com/wp-dyn/content/article/2005/08/14/AR2005081401103.html

English, Don. 2008. Personal communication between Don English, Visitor Use Monitoring program manager, U.S. Department of Agriculture, Forest Service, and the author. December 17.

———. 2009. Personal communication between Don English, Visitor Use Monitoring program manager, U.S. Department of Agriculture, Forest Service, and the author. June 10.

English, Don, Susan M. Kocis, Stanley J. Zarnoch, and J. Ross Arnold. 2002. *Forest Service National Visitor Use Monitoring Process: Research Method Documentation*. General Technical Report SRS-57. Asheville, NC: U.S. Department of Agriculture, Forest Service Southern Research Station.

Environmental Law Institute (ELI). 2002. The Federal Context for In-Lieu-Fee Mitigation. www.eli.org/Program_Areas/wmb/StateFedb.cfm (accessed April 28, 2009).

Esteve, Harry. 2008. Governor Proposes Big Jump in Most Fees. *Oregonian*, Dec. 8, A-01. www.oregonlive.com/politics/index.ssf/2008/12/kulongoski_proposes_big_jump_i.html.

Fanning, Chris. 2009. Personal communication between Chris Fanning, executive director, Outdoor Foundation, and the author. June 30.

Fedkiw, John. 1998. *Managing Multiple Uses on National Forests, 1905–1995*. FS-628. Washington, DC: U.S. Department of Agriculture, Forest Service.

Ferris, Jeffrey and Juha Siikamäki. 2009. Conservation Reserve Program and Wetland Reserve Program: Primary Land Retirement Programs for Promoting Farmland Conservation. Backgrounder (August). Washington, DC: Resources for the Future. www.rff.org/RFF/Documents/RFF-BCK-ORRG-CRP_and_WRP.pdf

Fisher, K., M. Egerton, N. Torres, A. Polman, and J. Gershuny. 2006. *American Heritage Time Use Study (AHTUS), Codebook*. Colchester, Essex, UK: Institute for Social and Economic Research.

Fox, Jessica and Anamaria Nino-Murcia. 2005. Status of Species Conservation Banking in the United States. *Conservation Biology* 19(4): 996–1007.

Garder, John. 2009a. *A Funding Guide for the National Landscape Conservation System*. Washington, DC: The Wilderness Society. <http://wilderness.org/files/Funding-Guide-Conservation-System.pdf>.

———. 2009b. Personal communication between John Garder, Wilderness Society public lands associate, and the author. May 27.

Godbey, Geoffrey. 2009. Outdoor Recreation, Health, and Wellness: Understanding and Enhancing the Relationship. Discussion paper 09-21. Washington, DC: Resources for the Future.

Gorte, Ross. 2008. Email from Ross Gorte, specialist in natural resources policy, Resources, Science, and Industry Division, Congressional Research Service, to the author. September 24.

Gorte, Ross W., Carol H. Vincent, Kristina Alexander, and Marc Humphries. 2009. *Federal Lands Managed by the Bureau of Land Management (BLM) and the Forest Service (FS): Issues for the 111th Congress*. Washington, DC: Congressional Research Service.

Greenwood, Alfred. 1998. *Appropriations for FY 1999: Interior and Related Agencies*. 98-206 ENR. Washington, DC: Congressional Research Service.

Hall, M.H., and D.B. Fagre. 2003. Modeled Climate-Induced Glacier Change in Glacier National Park, 1850–2100. *BioScience* 53(2): 131–140.

Harnik, Peter. 2008. Email from Peter Harnik, director, Center for City Park Excellence, Trust for Public Land, to the author. October 3.

Hungerford, Harold and Trudi Volk. 1990. Changing Learner Behaviour through Environmental Education. *Journal of Environmental Education* 21: 8–21.

Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Edited by M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden, and C.E. Hanson. Cambridge, UK: Cambridge University Press.

International Association of Fish and Wildlife Agencies and Ecosystem Management Initiative at University of Michigan School of Natural Resources and the Environment. 2005. *Investing in Wildlife: State Wildlife Funding Campaigns, Summary of Findings*. Report prepared for the Teaming with Wildlife Coalition. Available at www.teaming.com (accessed August 25, 2009).

Jacobs, M.H. and M.J. Manfredo. 2008. Decline in Nature-based Recreation is Not Evident. *Proceedings of the National Academy of Sciences* 105: E40.

Johnson, W.C., B.V. Millett, T. Gilmanov, R.A. Voldseth, G.R. Guntenspergen, and D.E. Naugle. 2005. Vulnerability of Northern Prairie Wetlands to Climate Change. *BioScience* 55(10): 863–872.

Kareiva, Peter. 2008. Ominous Trends in Nature Recreation. *Proceedings of the National Academy of Sciences* 105(8): 2757–2758.

Kaval, Pamela. 2007. Recreation Benefits of U.S. Parks. University of Waikato, Department of Economics Working Paper in Economics 12/07 (June). Hamilton, New Zealand: University of Waikato.

Kaval, Pamela and John Loomis. 2003. *Updated Outdoor Recreation Use Values with Emphasis on National Park Recreation*. Colorado State University Department of Agricultural and Resource Economics. Report Prepared for National Park Service (October).

Kilcullen, Kevin. 2009. Email from Kevin Kilcullen, chief of visitor services, National Wildlife Refuge Service, U.S. Fish & Wildlife Service to the author. February 4.

Kotchen, Matthew J. and Shawn M. Powers. 2006. Explaining the Appearance and Success of Voter Referenda for Open-Space Conservation. *Journal of Environmental Economics and Management* 52: 373–390.

Landrum, Ney C. 1999. America's State Parks—An End-of-Century Assessment. In *Outdoor Recreation in American Life: A National Assessment of Demand and Supply Trends*, edited by H. Ken Cordell et al. Champaign, IL: Sagamore Publishing, 112–115.

Loomis, John. 2005. *Updated Outdoor Recreation Use Values on National Forests and Other Public Lands*. General Technical Report PNW-GTR-658 (October). U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Louv, Richard. 2005. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*. Chapel Hill, NC: Algonquin Books.

Lovejoy, Vernon and Bruce Brown. 2004. *Recreation at Bureau of Reclamation Projects: Report to the Commissioner*. Washington DC: U.S. Bureau of Reclamation (April). www.usbr.gov/recreation/publications/ProjectsRecre.pdf.

LTA (Land Trust Alliance). 2006. *The 2005 National Land Trust Census Report*. Washington, DC: Land Trust Alliance, 11–12, Figures 5 and 6.

———. 2009a. Factsheet: Tax Incentive for Conservation Easements. Washington, DC: LTA. www.landtrustalliance.org/policy/taxincentives/federal (accessed April 28, 2009).

———. 2009b. State and Local Tax Incentives. Washington, DC: LTA. www.landtrustalliance.org/policy/taxincentives/state (accessed July 8, 2009).

Mathews, Kenneth, Kevin Ingram, Jan Lewandrowski, and John Dunmore. 2002. Public Lands and Western Communities. *Agricultural Outlook* (June–July): 18–22. www.ers.usda.gov/publications/agoutlook/JuneJuly2002/ao292g.pdf (accessed July 6, 2009).

McConnell, Virginia and Margaret Walls. 2005. *The Value of Open Space: Evidence from Studies of Nonmarket Benefits*. Washington, DC: Resources for the Future.

Morris, Daniel and Margaret Walls. 2009. Climate Change and Outdoor Recreation Resources. Backgrounder (March). Washington, DC: Resources for the Future. www.rff.org/RFF/Documents/RFF-BCK-ORRG_ClimateChange.pdf (accessed July 6, 2009).

National Association of State Park Directors. 2008. *Annual Information Exchange*. Report years: 1979–2008. Washington, DC: National Association of State Park Directors.

———. Various years. *Annual Information Exchange*. Washington, DC: National Association of State Park Directors.

National Recreation Lakes Study Commission. 1999. *Reservoirs of Opportunity: National Recreation Lakes Study Final Report*. Washington, DC: U.S. Department of the Interior.

National Wildlife Refuge System Improvement Act. 1997. Public Law 105–57, 111 Stat. 1252. www.fws.gov/Northeast/planning/downloads/NWRSimprovementact.pdf.

Natural Resource Council of Maine and the National Wilderness Institute. 1999. Public Land Ownership by State. www.maineenvironment.org/documents/publiclandownership.pdf (accessed December 2, 2008).

Nelson, Dan. 2008. The Vanishing Hunter, Part I: Hunting Participation Continues Long-Term Retreat. *Delta Waterfowl* (Spring).

Niquette, Mark. 2008. Budget Cuts for Ohio. *The Columbus Dispatch*, Dec 12: A-01. www.dispatchpolitics.com/live/content/local_news/stories/2008/12/12/copy/scary_cuts.ART_ART_12-12-08_A1_7GC79H8.html?adsec=politics&sid=101.

NPCA (National Parks Conservation Association). No date. About the Parks: Definitions for National Park System Units. Washington, DC: NPCA. www.npca.org/parks/park_definitions.html.

———. 2008a. The State of Our National Parks: A Resources Index. Washington, DC: NPCA. www.npca.org/stateoftheparks/npri/.

———. 2008b. *Dark Horizons: 10 National Parks Most Threatened by New Coal-Fired Power Plants*. Washington, DC: NPCA. www.npca.org/darkhorizons/pdf/Dark_Horizons_Report.pdf (accessed July 6, 2009).

NPS (National Park Service). No date, a. *NPS Stats*. Washington, DC: National Park Service. www.nature.nps.gov/ (accessed July 6, 2009).

———. No date, b. Quick Facts. Washington, DC: National Park Service. www.npsca.org/parks/park_definitions.html.

———. Various years, 1950–2005. Acreage reports. Washington, DC: U.S. National Park Service.

NRPA (National Recreation and Park Association). No date. *Land and Water Conservation Fund State Assistance Program*. Washington, DC: NRPA. www.nrpa.org.

NSRE (National Survey on Recreation and the Environment). Various years. The Interagency National Survey Consortium, Coordinated by the USDA Forest Service; Recreation, Wilderness, and Demographics Trends Research Group, Athens, GA; and the Human Dimensions Research Laboratory, University of Tennessee, Knoxville, TN. www.srs.fs.usda.gov/trends/Nsre/nsre2.html.

O'Toole, Randal. 2007. The Perfect Firestorm: Bringing Forest Service Wildfire Costs under Control. *Policy Analysis* 591 (April 30). Washington, DC: Cato Institute.

Outdoor Foundation. 2008. *Outdoor Recreation Participation Report, 2008*. Boulder, CO: Outdoor Foundation. www.outdoorfoundation.org/research.participation.2008.html.

———. 2009. *Outdoor Recreation Participation Topline Report, 2009*. Boulder, CO: Outdoor Foundation. www.outdoorfoundation.org/research.participation.2009.topline.html.

Outdoor Industry Foundation. 2006. *Outdoor Recreation Participation Study: Eighth Edition, for Year 2005*. Boulder, CO: Outdoor Industry Foundation. www.outdoorfoundation.org/research.participation.2006.html.

Pentz, Debra. 2007. *State Conservation Tax Credits: Impact and Analysis*. Boulder, CO: Conservation Resource Center.

Pergams, Oliver and Patricia Zaradic. 2006. Is Love of Nature in the U.S. Becoming Love of Electronic Media? 16-year Downtrend in National Park Visits Explained by Watching Movies, Playing Video Games, Internet Use, and Oil Prices. *Journal of Environmental Management* 80: 387–393.

———. 2008. Evidence for a Fundamental and Pervasive Shift Away from Nature-based Recreation. *Proceedings of the National Academy of Sciences* 105(7): 2295–2300.

Phaneuf, Dan and V. Kerry Smith. 2005. Recreation Demand Models. Chapter 15 in *Handbook of Environmental Economics*, Vol. 2, *Valuing Environmental Changes*, edited by K.G. Maler and J.F. Vincent. Amsterdam, Netherlands: North Holland.

Poole, Robert M. 2007. Conserving Hunters. *National Geographic* (November).

Robbins, Jim. 2008. Bark Beetles Kill Millions of Acres of Trees in West. *New York Times*, November 18, D3.

Robertson, Morgan M. 2006. Emerging Ecosystem Service Markets: Trends in a Decade of Entrepreneurial Wetland Banking. *Frontiers in Ecology and the Environment* 4(6): 297–302.

Rosenberger, Randall and John Loomis. 2001. *Benefit Transfer of Outdoor Recreation Use Values: A Technical Report Supporting the Forest Service Strategic Plan (2000 Revision)*. Rocky Mountain Research Station General Technical Report RMRS-GTR-72. Washington, DC: U.S. Department of Agriculture, Forest Service.

Save Our State Parks. 2008. www.savestateparks.org/facts/park-closures.html.

Schuett, Michael, Rodney Warnick, and Jialing Lu. 2009. A Qualitative Analysis of National Outdoor Recreation Surveys. *Journal of Park and Recreation Administration* 27(2): 47–59.

Scott, J. Michael, B. Griffith, B. Adamcik, D. Ashe, B. Czech, R. Fischman, P. Gonzales, and A. Pidgorna. 2008. Managing for Change: Climate Change and the National Wildlife Refuge System. Presentation for the National Wildlife Refuge Association. www.refugenet.org/new-pdf-files/jms_climate08.pdf.

Shogren, Elizabeth. 2008. Outlook Bleak for Joshua Trees. *All Things Considered*. National Public Radio, February 8.

Siehl, George H. 2008. The Policy Path to the Great Outdoors: A History of the Outdoor Recreation Review Commissions. Discussion paper 08-44. Washington, DC: Resources for the Future.

Sierra Club. 2008. Impacts of Livestock Production on Our Public Lands: Ecological Impacts. www.sierraclub.org/grazing/livestock/ecological.asp (accessed July 6, 2009).

Siikamäki, Juha. 2009. Use of Time for Outdoor Recreation in the United States. Discussion paper 09-18. Washington, DC: Resources for the Future. www.rff.org/RFF/Documents/RFF-DP-09-18.pdf (accessed July 8, 2009).

Small, Stephen. 2004. Proper and Improper Deductions for Conservation Easement Donations, Including Developer Donations. *Tax Notes* 105(2), October 11.

State of Georgia. 2007. 20,000 Acres of Forest Land Permanently Protected through Georgia Land Conservation Program. Office of the Governor Press Release, December 5. http://glcp.georgia.gov/vgn/images/portal/cit_1210/35/53/10026264012-5-07%20press%20release.pdf (accessed July 6, 2009).

Steele, Ariel. 2008. Experimenting with Tax Credits for Conservation. *PERC Reports* 26(4). www.perc.org/articles/article1101.php (accessed June 25, 2009).

Stevens, Jan and Richard Frank. 2009. Current Policy and Legal Issues Affecting Recreational Use of Public Lands in the American West. Discussion paper 09-23. Washington, DC: Resources for the Future.

Strum, Wayne. 2009. Personal communication between Wayne Strum, program leader, Recreation Grants, State and Local Assistance Programs, National Park Service, and the author. January 13.

Sundberg, Jeffrey O. 2007. Measuring the Effect of State Income Tax Incentives on Land Conservation. Working paper. Cambridge, MA: Lincoln Institute of Land Policy.

Sundberg, Jeffrey O. and Richard F. Dye. 2006. *Tax and Property Value Effects of Conservation Easements*. Cambridge, MA: Lincoln Institute of Land Policy.

Trust for Public Land. 2008. Center for City Park Excellence. City Park Facts database. www.tpl.org/tier3_cd.cfm?content_item_id=20531&folder_id=3208.

———. 2009. TPL LandVote Database. www.tpl.org/tier2_kad.cfm?folder_id=2386 (accessed July 8, 2009).

U.S. Army Corps of Engineers. 2008. *Recreation Value to the Nation: Individuals, Communities, Economy, Environment*. www.vtn.iwr.usace.army.mil/docs/VTNRecreationBro_loresprd.pdf.

U.S. Bureau of Labor Statistics. 2003–2007. American Time Use Survey Multi-year Microdata Files. www.bls.gov/tus/datafiles_0307.htm.

———. 2008. *American Time Use Survey User's Guide: Understanding ATUS 2003 to 2007*. Washington, DC: Bureau of Labor Statistics, U.S. Census Bureau.

U.S. Census Bureau. Various years. State and Local Government Finances. www.census.gov/govs/www/estimate.html (accessed July 2009).

———. 2005. State and Local Government Finances. www.census.gov/govs/www/estimate06.html (accessed September 8, 2009).

———. 2009. U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin: 2000–2050. Washington, DC: U.S. Census Bureau. www.census.gov/population/www/projections/usinterimproj/.

USDA (U.S. Department of Agriculture). No date. Natural Resources Conservation Service. National Resources Inventory: 2001 Annual NRI Glossary of Key Terms. www.nrcs.usda.gov/technical/NRI/2001/glossary.html.

———. 2001. Special Areas; Roadless Area Conservation Final Rule. *Federal Register* 66(9): 3244, January 12. Washington, DC: Forest Service, USDA. http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5050459.pdf.

———. 2005. *Land Use, Value, and Management: Urbanization and Agricultural Land*. Economic Research Service Briefing Room Report. Washington, DC: USDA. www.ers.usda.gov/briefing/landuse/urbanchapter.htm (accessed July 6, 2009).

———. 2007a. *Major Land Uses* dataset. Washington, DC: Economic Research Service, USDA. www.ers.usda.gov/Data/MajorLandUses/ (accessed July 6, 2009).

———. 2007b. Fiscal Year 2008 President's Budget: Overview. Washington, DC: Forest Service, USDA. www.fs.fed.us/publications/budget-2008/fy2008-forest-service-budget-overview.pdf (accessed August 27, 2009).

———. 2008a. Table 21 from *National Forest Lands — Annual Acreage (1891 to present)*. Washington, DC: Forest Service, USDA. www.fs.fed.us/land/staff/lar/2008/TABLE_21.htm.

———. 2008b. *National Visitor Use Monitoring Results: National Summary Report*. October 28. Washington, DC: Forest Service, USDA. www.fs.fed.us/recreation/programs/nvum/nvum_national_summary_fy2007.pdf.

———. 2009. *Wilderness Stewardship: 10-Years of Stewardship Challenge*. Washington, DC: Forest Service, USDA. www.fs.fed.us/r9/forests/superior/bwcaw/documents/10yearwildernesschallenge.pdf

U.S. DOI (Department of the Interior). No date. Nevada Federal Agency Acres Managed by County. Nevada District Office, Bureau of Land Management, U.S. DOI. www.nv.blm.gov/landsales/LandFedAcresAgency.pdf.

———. Various years, 1950–2007. *Public Land Statistics*. Washington, DC: Bureau of Land Management, U.S. DOI. www.blm.gov/public_land_statistics/index.htm.

———. Various years, 1950–2005. *Annual Report of Lands Under Control of the FWS*. Washington, DC: Fish and Wildlife Service, U.S. DOI.

———. 1950. *Areas of National Wildlife Refuge Units*. Washington, DC: Fish and Wildlife Service, U.S. DOI.

———. 1994. *U.S. Department of the Interior Annual Report*. Washington, DC: U.S. DOI.

———. 1995. *U.S. Department of the Interior Annual Report*. Washington, DC: U.S. DOI.

———. 2000. Rules and Regulations: 50 CFR parts 25, 26 and 29. *Federal Register* 65(202): 62457, October 18. Washington, DC: Fish and Wildlife Service, U.S. DOI. www.fws.gov/policy/library/00fr62457.pdf (accessed July 6, 2009).

———. 2001. Managing the Public Lands: A Snapshot of pre- and post-FLPMA Management, 1976 & 2000. Washington, DC: Bureau of Land Management, U.S. DOI. www.blm.gov/flpma/snapshot.htm (accessed July 6, 2009).

———. 2007. Waterfowl Production Areas: Prairie Jewels of the National Wildlife Refuge System. June 7. Washington, DC: Fish and Wildlife Service, U.S. DOI. www.fws.gov/refuges/pdfs/factsheets/FactSheetWPA.pdf (accessed July 6, 2009).

———. 2008a. Discover Nature's Best Hunting and Fishing: The National Wildlife Refuge System. October 31. Washington, DC: Fish and Wildlife Service, U.S. DOI. www.fws.gov/refuges/pdfs/factsheets/FactSheetHuntFish.pdf (accessed July 6, 2009).

———. 2008b. *Audit Report: Abandoned Mine Lands in the Department of the Interior*. July. Office of Inspector General. Washington, DC: U.S. DOI. <http://www.doioig.gov/upload/2008-G-00241.pdf> (accessed July 6, 2009).

———. 2008c. Budget Background Information, Land and Water Conservation Fund. Washington, DC: Office of Policy, Management and Budget, U.S. DOI. www.doi.gov/budget/budget_general/bgindex.html (accessed July 8, 2009).

———. 2009a. NLCS Factsheet. February 11. Washington, DC: Bureau of Land Management, U.S. DOI. www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS/fact_sheet.html (accessed July 6, 2009).

———. 2009b. Secretary Salazar Announces \$750 Million Investment to Restore and Protect America's National Parks, Create Jobs. Interior Recovery News Release, National Park Service Office of Communications and Public Affairs. Washington, DC: U.S. DOI. www.doi.gov/news/09_News_Releases/042209.html.

———. 2009c. Fact Sheet on the BLM's Management of Livestock Grazing. Washington, DC: Bureau of Land Management, U.S. DOI (August). www.blm.gov/wo/st/en/prog/grazing.1.html.

U.S. DOI (Department of the Interior) Fish and Wildlife Service and U.S. Census Bureau. 1992, 1997, 2002, 2007. FHWAR Study. Washington, DC: U.S. Department of the Interior. www.census.gov/prod/www/abs/fishing.html.

U.S. EPA (Environmental Protection Agency). 1995. Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. *Federal Register* 60(228): 58605–58614, November 28.

———. 2009. Mitigation Banking Factsheet: Compensating for Impacts to Wetlands and Streams. January 12, 2009. www.epa.gov/owow/wetlands/facts/fact16.html (accessed April 28, 2009).

U.S. GAO (Government Accountability Office). 2008. *Wildlife Refuges: Changes in Funding, Staffing, and Other Factors Create Concerns about Future Sustainability*. Report No. GAO-08-797. September. Washington, DC: U.S. GAO.

U.S. GCRP (Global Change Research Program). 2000. *National Assessment Synthesis Team. Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*. Washington, DC: USGCRP.

USGS (U.S. Geological Survey). 2002. Vulnerability of U.S. National Parks to Sea-Level Rise and Coastal Change. USGS Fact Sheet FS-095-02. Washington, DC: USGS.

U.S. OMB (Office of Management and Budget). 2009. Detailed Information on the Forest Service: Recreation Assessment. Washington, DC: Executive Office of the President, U.S. OMB. www.whitehouse.gov/omb/expectmore/summary/10003014.2005.html (accessed June 11, 2009).

Vincent, Carol Hardy. 2001. *Appropriations for FY 2002: Interior and Related Agencies*. Congressional Research Service (CRS) Report RL31006, updated November 9, 2001. Washington, DC: CRS.

———. 2003. *Appropriations for FY 2004: Interior and Related Agencies*. Congressional Research Service (CRS) Report RL31806, updated August 1, 2003. Washington, DC: CRS.

———. 2006. *Land and Water Conservation Fund: Overview, Funding History, and Current Issues*. Congressional Research Service (CRS) Report for Congress, July 10. Washington, DC: CRS.

———. 2008. *Interior, Environment, and Related Agencies: FY2009 Appropriations*. Congressional Research Service (CRS) Report RL34461, April 25, 2008. Washington, DC: CRS.

Vincent, Carol Hardy, Betsy A. Cody, M. Lynne Corn, Ross W. Gorte, Sandra L. Johnson, and David Whiteman. 2001. *Federal Land Management Agencies: Background on Land and Resource Management*. Congressional Research Service (CRS) Report for Congress, February 27. Washington, DC: CRS.

Vincent, Carol Hardy, Robert Bamberger, David M. Bearden, et al. 2008. *Interior Environment and Related Agencies: FY2008 Appropriations*. Congressional Research Service (CRS) Report for Congress, order code RL34461. Washington, DC: CRS. http://assets.opencrs.com/rpts/RL34461_20080425.pdf.

Walls, Margaret. 2009. Parks and Recreation in the United States: Local Parks Backgrounder. Backgrounder (June). Washington, DC: Resources for the Future. www.rff.org/rff/documents/RFF-BCK-ORRG_Local%20Parks.pdf.

Walls, Margaret, Juha Siikamäki, Sarah Darley, Jeff Ferris, and Joe Maher. 2009a. Current Challenges, Funding, and Popularity Trends in Local Parks and Recreation Areas: Responses to a Survey of Park Directors. Backgrounder (March). Washington, DC: Resources for the Future. www.rff.org/RFF/Documents/RFF-BCK-ORRG_UrbanSurvey.pdf (accessed July 8, 2009).

———. 2009b. Current Challenges, Funding, and Popularity Trends in State Parks and Recreation Areas: Responses to a Survey of Park Directors. Backgrounder (March). Washington, DC: Resources for the Future. www.rff.org/RFF/Documents/RFF-BCK-ORRG_StateSurvey.pdf (accessed July 8, 2009).

Wells, Nancy M. and Kristi S. Lekies. 2006. Nature and the Life Course: Pathways from Childhood Nature Experiences to Adult Environmentalism. *Children, Youth, and Environments* 16: 1–24.

Wildlife Management Institute. 2008. Senate Committee Holds Hearing on OHV Use. *Outdoor News Bulletin*. www.wildlifemanagementinstitute.org/index.php?option=com_content&view=article&id=267:ohv-use&catid=34:ONB%20Articles&Itemid=54.

Zinn, Jeffrey. 2005. *Land and Water Conservation Fund: Current Status and Issues*. Congressional Research Service (CRS) Report for Congress, June 10. Washington, DC: CRS.



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