

## **Outdoor Recreation in Shifting Societal and Natural Landscapes**

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## **Introduction**

Outdoor recreation contributes to public health, supports hundreds of thousands of jobs, and provides billions of dollars annually to rural economies. Visitors to federal lands alone spent \$51 billion in 2012 in nearby communities during their trips to recreate on public lands and waters (Forest Service National Center for Natural Resources Economic Research 2014). Outdoor recreation also promotes environmental stewardship and strengthens connections to public lands. However, access to and preferences for outdoor recreation are changing along with climate, natural resource conditions, demographics, and socioeconomic trends. Outdoor recreation trends and futures are an important consideration in this session aimed at developing a conservation agenda for the 21<sup>st</sup> century.

Here, we explore current and projected levels of participation in nature-based outdoor recreation. Specifically, we examine how population growth, along with changing socioeconomic conditions, demographics, land uses, climate, and changes in technology, may influence outdoor recreation. We present an assessment of recent trends and long-term projections for a number of outdoor recreation activities, with an emphasis on fishing, hunting, and wildlife viewing. Wildlife-based recreation is economically important, not only in the funds it contributes to local economies but also because many state agencies that manage wildlife and fish are funded primarily through revenues associated with hunting and fishing (Williams 2010). We conclude by discussing other factors, such as technology, which may influence outdoor recreation participation, and by providing an overview of the demographic factors that will be important to managers, including recreation planners, land managers, urban planners, and environmental educators, as they anticipate and prepare for changing patterns of outdoor recreation.

## **Methods and Data Sources**

Our presentation of outdoor recreation trends and projections draws largely on information compiled for the Renewable Resources Planning Act (RPA) Assessment (USDA FS 2012). Every 10 years the United States Forest Service conducts an assessment of all U.S. forest and rangeland conditions, including outdoor recreation; identifies drivers of change for natural resource conditions; and projects the effects of those drivers on resource conditions 50 years into the future. We use multiple datasets for these assessments, including information on population and demographic trends from the U.S. Census Bureau

and recreation information from the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) and the National Survey of Recreation and the Environment (NSRE).

From 1955 onward, wildlife-focused recreation activities have been monitored by FHWAR, funded by the U.S. Fish & Wildlife Service, and administered by the Census Bureau (USDI FWS and U.S. Census Bureau 2011). This is the longest running and most detailed record of the American public's participation in hunting and wildlife watching (watching was added in 1980). We use this dataset as well as peer-reviewed literature to overview current trends in recreation participation. We then model future participation by extending participation rates from the FHWAR dataset with information from the NSRE, which takes a broader inventory of participation in recreation by the American public (Bowker et al. 2012).

## **A Changing and Dynamic American Population**

The changing nature of recreation participation reflects our dynamic American population and cultural preferences. In recent decades, the U.S. population has become much more racially and ethnically diverse. Hispanic population growth in particular has been high: from 1980, the Hispanic population more than tripled, due to immigration, high fertility, and low mortality (Saenz 2010). By 2010, the U.S. population was 63.7 percent white, non-Hispanic, with substantial Hispanic (16.3 percent), African-American or black (12.2 percent), and Asian (4.7 percent) populations (Mather et al. 2011). From 2000 to 2010, racial and ethnic minorities accounted for almost all (92 percent) of the U.S. population growth (Mather et al. 2011). This diversification is expected to continue even more rapidly in the future. More than 500 U.S. counties had “majority-minority” populations of children by 2008, meaning minorities outnumbered the white, non-Hispanic populations (Johnson and Lichter 2010). These changing U.S. populations are important for natural resource managers because ethnic group members have historically demonstrated differing patterns of recreation participation and preferences, although racial and ethnic groups are of course not homogenous (Struglia and Winter 2002).

The American population is also aging, with important implications for outdoor recreation, as participation rates decline by age class after age 55 for nearly all outdoor recreation activities (Cordell et al. 2012). The nation's 65-and-older population is projected to nearly double from 2012 to 2050, growing from 43.1 million to 83.7 million. This increase in older Americans is expected as the baby boomers (individuals born in the United States between mid-1946 and mid-1964), transition into the over-65 age class (Ortmann et al. 2014).

The American population has also changed in distribution: by 2010, 80 percent of the U.S. population was living in urban areas, as defined by the U.S. Census Bureau (U.S. Census Bureau 2014). Much of this urban development has been with the expansion of low- or medium-density development (i.e., sprawl), not expansion of the highest-density urban cores (Johnson et al. 2005). The distribution of the U.S. population leads to different preferences and opportunities for recreation in several ways. Where people live has important implications for where and how people recreate—e.g., as the population becomes more urban we can expect to see more recreation in urban areas, more day trips from urban areas, and greater use on public lands near urban areas.

We also see concerns about the impacts of expanding development on public lands from low-density or exurban housing. During the past 40 years, we have seen substantial housing growth in rural areas near public lands, often caused by amenity migration and the influx of population, spurred by desires for a rural lifestyle and natural amenities such as lakes, mountains, forests, and mild climates (Radeloff et al. 2010; Bell 2007; McGranahan 1999). Many of these migrants are retirees, a life stage when Americans often move. Between 1960 and 2000, the net migration of retirement-age persons (age 50 to 69 years) added 1.5 million people to the West and 3.1 million to the Southeast, and amenity migration is expected to continue with the aging of the American population (Johnson et al. 2005).

## **Sociodemographic Characteristics and Recreation Participation**

For the majority of natural resource-based outdoor recreation participation, we see consistent patterns in participation with these sociodemographic characteristics. In general, participation rates are higher among individuals who are: male, non-Hispanic white, tend to live in rural areas, and have higher income (Cordell 2012). Minorities including African-Americans, Hispanics, and Asians are usually less likely than whites to participate in outdoor recreational activities (Cordell 2012). However, ethnicity is less of a factor on the intensity or annual days of participation, once the individual chooses to participate (Bowker et al. 2012). Men are more apt to participate in backcountry activities, such as hunting and fishing. Education beyond high school generally results in higher participation rates for most activities. However, the level of education varies. For example, the greater the education level, the more likely one participates in birding, nonmotorized winter activities, backcountry activities, and viewing activities. However, for fishing and hunting, motorized off-road use, and motorized snow activities, more than a high school education lowers the probability of participation. Income is positively associated with participation and use across all activities. However, for some activities such as birding, hiking, and hunting, the effect was small, while for others that require expensive equipment, such as developed skiing and motorized water use, the effect was large (Bowker et al. 2012).

Literature and surveys focused on wildlife-based recreation are consistent with general outdoor recreation patterns. For hunting, surveys of individuals show men are more likely to participate than women (Floyd and Lee 2002; Spence 2002; Walsh et al. 1992). Men are more likely to participate in wildlife viewing and photography, but women are more likely to view wildlife at home (Hay and McConnell 1979; Spence 2002; Walsh et al. 1992; Boxall and McFarlane 1995). Data from FHWAR on individuals who participate in hunting confirm that participants are mostly white and non-Hispanic (USDI FWS and U.S. Census Bureau 2011; more detail below). In 2011, fishing was most popular among whites and African-Americans. Anglers in 2011 were 86 percent white, 7 percent African-American, and 95 percent non-Hispanic. Of the adult American population, 16 percent of whites and 10 percent of African-Americans went fishing (USDI FWS and U.S. Census Bureau 2011). Adult participation rates were lower for hunting: 7 percent of the nation's white population, 2 percent of the African-American population, 2 percent of those identified as other races, and less than 0.5 percent of the Asian American population reported having hunted in 2011 (USDI FWS and U.S. Census Bureau 2011). In total, 94 percent of hunters were white and 98 percent non-Hispanic. Wildlife viewers were 94 percent non-Hispanic and predominantly white: 92 percent were white, 3 percent were African-American, 1 percent were Asian American, and 4 percent were other races (USDI FWS and U.S. Census Bureau 2011). Given changing demography in the United States, future participation in hunting and fishing could decline if participation across demographic segments does not improve.

## **Current Trends and Future Projections for Wildlife-Based Recreation**

While existing recreation patterns and their relationships to sociodemographics are useful to understand current levels of recreation, there is no guarantee that these trends and patterns will continue. As a result, we use current patterns of wildlife recreation, combined with underlying structural relationships of recreation participation, to simulate future recreation patterns based on projected changes in factors like economic conditions, population size and composition, age structure, climate, and land use patterns (Bowker et al. 2012).

We use information from FHWAR to inform our summaries of current and projected wildlife-based recreation trends. As a survey, FHWAR creates estimates of number of participants, days, and expenditures by interviewing a portion of the American public. This survey focuses on wildlife recreation as a primary activity, meaning the participant's central aim must be the wildlife-associated recreation activity. Data for unplanned hunting or wildlife watching while on trips taken for another purpose are not included in FHWAR. We report on wildlife watching that occurs away from (>1 mile) the home because it is an indication of outdoor recreation by individuals whose primary purpose is to view, feed, or

photograph wildlife. Because of changes in how the FHWAR survey was carried out, we present information on hunting, angling, and wildlife viewing from 1991 onwards (earlier surveys are not directly comparable to these later ones).

In 2011, the most commonly pursued activity was angling (33 million participants), followed by wildlife watching (22 million), and hunting (14 million). During the past 30 years, the number of participants and the rate of participation in these activities have remained relatively stable, with some variation from survey to survey (Figures 1a and 1b). Total number of days reported for each activity has also been fairly consistent from survey to survey, with fishing days nearly twice as many as days spent hunting. There were more total days viewing wildlife than hunting, although the difference between the two was not as great as the separation between number of participants and participation rate in the two activities, as hunters spent more days participating in their activity on average per year than wildlife watchers (Figure 1c).

Projections of future participation in wildlife-based recreation require extrapolating into the future. One approach is to simply extrapolate current trends, which assumes that the current population, resources, and preferences will continue along current trajectories. Alternatively we can use structural simulation to examine the underlying structural relationships of recreation participation and simulate future recreation patterns based on projected changes in factors like economic conditions, population, climate, and land use patterns. Here, we use such a structural approach, taking initial participation rates from the most recent FHWAR survey (2011), and combining them with information derived from statistical models of individual behavior based on the NSRE (Bowker et al. 2012).

We use a two-step approach to develop projections for participation and consumption of fishing, hunting, and wildlife viewing. The first step—model estimation—yields national-level statistical models of adult per capita participation and days of participation for each of these activities. The second step, or simulation step, combines these models with externally sourced projections of relevant explanatory variables (e.g., economic conditions, land use change, climate) to generate per capita participation and per participant days of participation for each activity at 10-year intervals to 2060. Per capita estimates for participation and days are then combined with population projections to derive estimates of adult participants (16-plus) and days of participation by activity. Below, we present projections for fishing, hunting, and wildlife viewing participation under the RPA scenario (A1B), which represents high GDP growth (domestic and foreign) and medium population growth (domestic and foreign).<sup>1</sup> It should be noted that the model results and projections herein do not account for factors outside the range of available data such as new technology, changes in relative costs, new infrastructure, and fundamental changes in tastes and preferences.

The future adult participation rates in the U.S. for fishing and wildlife viewing are expected to be essentially static during the next five decades, while the participation rate for hunting will decline somewhat (Figure 2a). By 2060, we predict that 4.3 percent of the American public will participate in hunting, 12.7 percent in fishing, and 10.2 percent in viewing. Combining projected changes in participation rates with expected population growth, we expect to see fishing and viewing participant numbers each increase by about 14 million (Figure 2a). Hunting, despite a decrease in participation rate, will increase by more than 2 million participants by 2060. The number of total days devoted to each activity is expected to rise in proportion with participants, showing consistent projected increases for angling and viewing, and a marginal increase for hunting (Figure 2c). In comparison with other outdoor recreation projections, traditional wildlife-based activities like fishing and hunting are among the slowest growing activities (Bowker et al. 2012).

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<sup>1</sup> While alternative scenarios for socioeconomic changes and climate changes are presented in Bowker et al. 2012, we chose the scenario most likely to represent the midpoint of all those examined.

## Discussion and Conclusions

Choices in outdoor recreation activities have changed over time in response to changing tastes and preferences, demographics, technological changes, economic conditions, and recreation opportunities. While we think outdoor recreation will continue to be an integral part of America's social and economic fabric for the foreseeable future, we anticipate changing patterns of participation. Growth in overall recreation numbers is likely to be driven by an increase in population numbers, as participation rates remain static or decline due to the growing age and diversity of the population (coupled with relatively low participation rates of most groups other than non-Hispanic whites). Activities dominated by rural residents are likely to decline as population becomes increasingly urban. However, a number of caveats and limitations to our modeling approach should be acknowledged. Despite having up to 10 years of data for model development, this was insufficient to establish any meaningful or statistically significant time-varying parametric relationships. Thus, the participation and days models are static, which is a substantial limitation when projecting demand over such longtime intervals. Our models are also national and so do not incorporate any regional or sub-regional variation that may occur.

Compared to other outdoor recreation activities, we predict hunting and fishing will have relatively low participant growth rates (Bowker et al. 2012). As the population ages and becomes more racially and ethnically diverse it is unclear how future recreation demand and supply will adjust. Regardless of projections for lower rates of participation, assuming the public land base for outdoor recreation remains stable into the future, a growing population will result in decreasing per person opportunities for recreation. Wildlife-based recreation relies heavily on public lands, so that increased congestion and possible declines in the quality of the outdoor recreation experience are likely to present important challenges to management (USDI FWS and U.S. Census Bureau 2011; Bowker et al. 2012). Therefore, a major challenge for natural resource managers and planners will be to ensure that recreation opportunities remain as population grows. This will probably have to be accomplished through creative and efficient management of site attribute inputs and plans, rather than through any major expansions or additions to the natural resource base for recreation. Trends toward more flexible work scheduling and telecommuting may well allow recreationists to allocate their leisure time more evenly across the seasons and through the week, thus facilitating less concentrated peak demands. On the other hand, technological innovations like GPS units and new forms of transportation such as OHVs or plastic kayaks will allow more people to more thoroughly use public lands.

Climate can affect individual willingness to participate in recreation activities and/or affect recreation resource availability and quality. We limited our projections herein to one externally generated climate scenario. However, Bowker et al. (2012) examined participation changes across a range of externally generated climate and socioeconomic conditions, finding that fishing, hunting, and wildlife viewing participation were less sensitive to climate change than selected winter and water-related activities. We note that the climate variables used in these recreation models were presumed to affect willingness to participate and frequency of participation directly. However, despite the lack of existing data, it is reasonable to expect that climate change will affect resource availability directly and indirectly. For example, in the case of hunting and fishing, increasing temperatures will likely affect the distribution of plant and animal species, which are fundamental to maintaining fish and game populations. In the case of wildlife viewing, climate changes could alter migration patterns as well as species' population densities. Understanding how recreation participation numbers and rates change over time will require tracking both increasing changes in these natural resources and the shifting nature of wildlife-based recreation itself. This continued analysis and research is necessary not only to inform the continued funding for wildlife management but also to maintain a strong connection between Americans and their wildlife resources.



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Figure 1. The participation rate (a), number of participants (b), and total days of participation (c) for wildlife viewing, fishing, and hunting from 1991 to 2011, from FHWAR data.

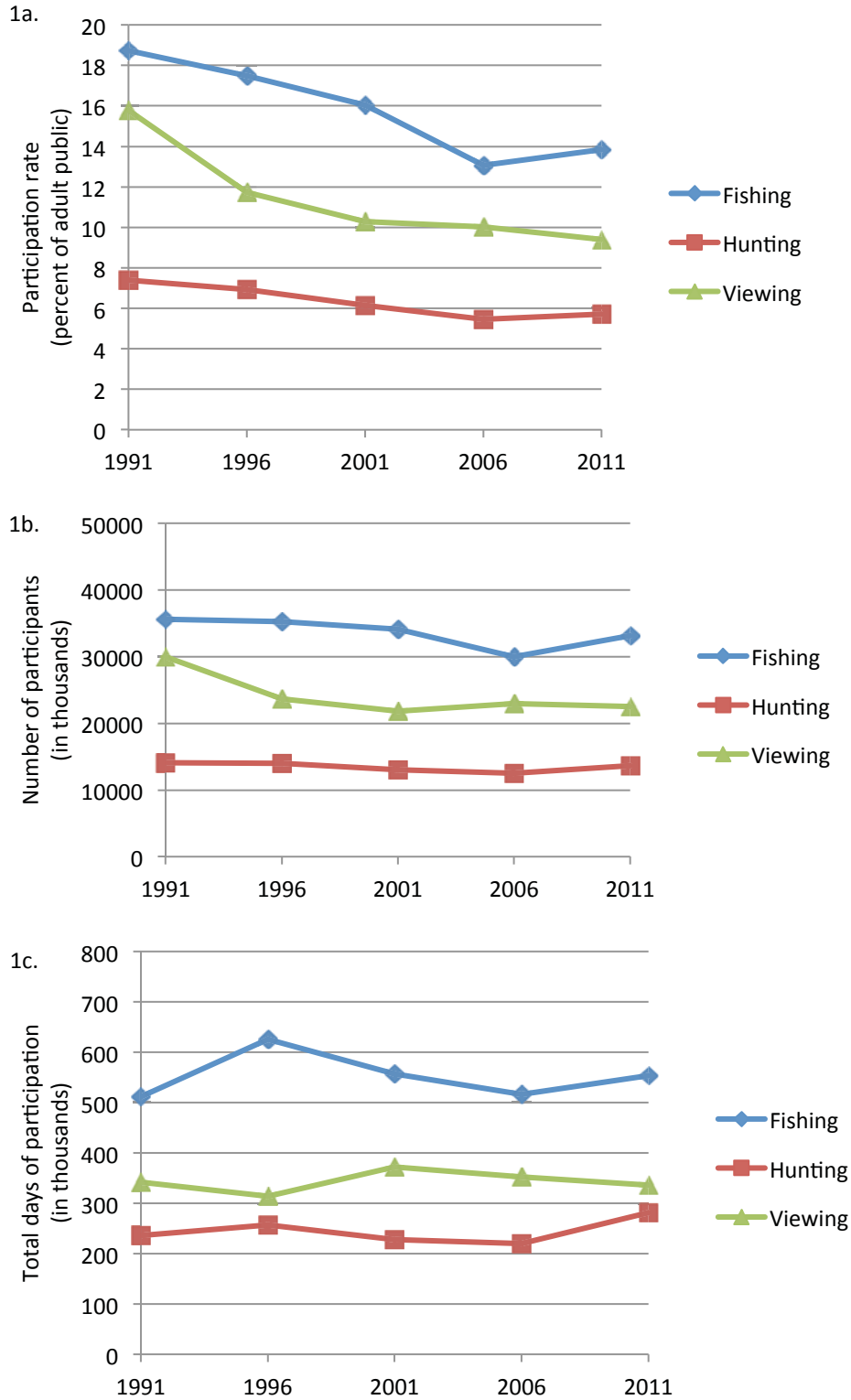




Figure 2. Projected participation rate (a), number of participants (b), and days per participant (c) for wildlife viewing, fishing, and hunting, from 2010 to 2060.

