



Recreation and the Environment as Cultural Dimensions in Contemporary American Society

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This paper broadly explores changing outdoor recreation demands, environmental opinions and demographics in the United States. With this country's population predicted to more than double by the end of this century, it is imperative that we understand these trends and their implications for better managing our natural environment and providing opportunities for outdoor recreation in that environment. Using national survey data, we have described differences in recreation behavior (participation) and environmental attitudes nationwide across six socio-demographic factors—race, country of birth, rural-urban residence, region of the country, age and income. Results indicate that demographic differences, recreation activity choices and people's environmental positions are linked.

Keywords cultural dimensions, demographics, environmental opinions, national recreation surveys, outdoor recreation participation, population trends

Two of the primary cultural dimensions of contemporary American Society—outdoor recreation and environmental opinion—are examined in this paper. Specifically, a contextual, U.S. population-wide description of outdoor recreation participation and environmental attitudes, as well as differences across a number of social strata, are provided as a context for reading and reflecting on the important papers that follow in this issue of *Leisure Sciences*. Our research data came from the National Survey on Recreation and the Environment (NSRE). Like the Census of Population, the National Transportation Survey, and a number of others, NSRE is one of the United States' on-going, nationwide federal surveys. It dates back to the Outdoor Recreation Resources Review Commission of 1960 (Cordell et al., 1996; Cordell, 1999).

In 1960 the federal government conducted the first of its nationwide outdoor recreation surveys. Named the National Recreation Survey (NRS), the results highlighted outdoor recreation interests and participation in the United States. Since that first "in-the-home"

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survey, seven additional NRSs have been conducted, in 1965, 1970, 1972, 1977, 1982–83, 1994–95 and 2000–01. In 1994 the NRS series was renamed the National Survey on Recreation and the Environment (NSRE). This expanded name was introduced to reflect growing interest across the U.S. population in the natural environment, including nature-based recreational experiences. Working within the framework of this new name and mission, the scope of questions asked of respondents was broadened to include their wildlife and wilderness interests, environmental values, attitudes regarding public natural lands policy and other environmental dimensions. Additional content pertaining to the recreational needs of people with challenging and disabling conditions also was added (Cordell et al., 1996; Cordell, 1999).

The most recent NSRE (i.e., 2000–01) was completed in the fall of 2001. Interviews with 50,000 individuals across all ethnicities and locations throughout the United States included questions regarding outdoor recreation participation, demographics, household structure, lifestyle interests, environmental attitudes, natural resource values (for example, concerning clean water and wildlife), constraints to participation, and attitudes toward public land management policies. Thus, this latest version of the NSRE focused in greater depth than any of its predecessors on the outdoor recreational and environmental interests of the American people. This greater depth was built upon the recognition that American's participation in outdoor recreation, as well as their feelings toward the natural environment are two of the more important cultural dimensions of today's society.

Growing Outdoor Recreation Interest

Continuing research on outdoor recreation participation is important because for many Americans recreation is a fundamental, although ever-changing part of their lifestyle. Over the years, outdoor recreation has remained popular (Douglass, 1999), even gaining in popularity in recent decades, as measured by percentages of the population who participate. Both short- and long-term participation trends indicate that this growth in popularity continues across most segments of the population (Cordell et al., 1996). With growth in numbers and greater diversity of those who use outdoor recreation sites and facilities comes new and different challenges to the managers of our recreational resources, such as those on our public natural lands. These new challenges arise from issues such as access and accessibility, resource impacts, conflicts from crowding and incompatible activities, keeping facility design up to date, and emergence of a wide variety of new activities. Unprecedented diversification of this country's population will in all likelihood make obsolete many of the approaches successfully used in the past to address such challenges.

The current U.S. population, which is comprised of generations that have grown up and lived through different social contexts, will undoubtedly have different experience preferences, expectations, and participation styles than generations past (Cordell et al., 1996). Thus, a major challenge facing researchers is trying to understand how past, current and future populations differ in their recreation demands. One of the primary focuses of the NSRE is tracking recreation participation trends. Population-wide survey research such as this, that keeps track of how recreation demands are changing as the population changes, is significant because it provides a better understanding of the inevitable evolution of outdoor recreation demand. Without such forward-looking research, those charged with deciding how to evolve and realign the outdoor opportunities being offered are forced to guess at what new to provide, or what could be worse, continue to provide what always has been provided.

Persistent Public Environmental Concern

Another and equally important dimension of the NSRE survey, and seemingly at least equal to outdoor recreation as a cultural dimension of the American public, is people's concern about the natural environment. Over the years, in survey after survey, Americans have expressed their concern for the environment and the sustained welfare of our natural lands (Shabecoff, 2000). In fact, after reviewing available literature and summarizing what it indicates about Americans' feelings toward the "environment," especially toward natural lands as a crucial part of that environment, one cannot help but conclude that "Americans are an environmental group" (Cordell & Overdevest, 2001). The consistency and persistence with which Americans continue to express concern over the condition and future of our environment is compelling. It is not a concern isolated to a few organized, radical groups. It is a concern shared broadly throughout our society cutting across the cultural diversity that defines the United States (Dukakis, 1996; Jones, 1998; Nie, 1999; Shabecoff, 2000; The Recreation Roundtable, 1999).

An example of one shared concern is that of environmental regulation. To some, regulation seems tantamount to being anti-American. But, clearly, Americans are in support of government regulations designed to protect the environment. According to Roper surveys conducted over 25 years, from 1973 to 1998, there is a clearly persistent pattern of support for such regulations (Times Mirror, 1994). In the 1970s and persisting throughout the 1980s there was growing support for environmental regulations. By 1989, 55% of Americans felt that environmental regulations needed to be even stronger than they were at that time. Fifty-five percent also agreed that they would vote against any candidate who did not advocate stronger government protection of the environment (Roper Organization, 1990). Since then, and following a peak in support for regulation surrounding Earth Day in 1990, there has been a slight downward drift in support. Fifty-three percent of respondents to the 1994 Roper survey reported that environmental laws and regulations needed to be stronger (Times Mirror, 1994).

In 1998, the proportion of Americans who felt environmental laws had not gone far enough to protect the environment dropped just under 50%. But, an additional 29% of Americans expressed support for environmental regulation by indicating that the level of environmental protection provided by government was just right and that it provided "just the right balance" (Dujack, 1997). More recently, in 2000 and 2001, 41% of Americans suggested that environmental laws have not gone far enough, but only 14% indicated environmental laws have gone too far (Cordell, Green, & Betz, forthcoming).

Obviously, environmental issues such as environmental regulation will continue to be important topics for debate and concern for the American people and their official representatives. Thus, the need for our representatives to be well informed about the positions of those they represent makes survey research, such as the NSRE, all the more important, even essential.

Previous research, including our own, has demonstrated that recreation preferences and environmental opinions differ in some important ways between social strata (Dwyer & Hutchinson, 1990; Floyd, Shiner, McGuire, & Noe, 1994; Newell & Green, 1997; Virden & Walker, 1999). As proportions of our national population shift among these strata over time, so too will society-wide demands and attitudes. Keeping up with demographic trends and understanding how they influence recreation demand and environmental attitudes, therefore, needs to be a part of ongoing research.

Shifting American Demographics

In addition to revealing current, population-wide conditions, the NSRE also enables us to look for differences in outdoor recreation participation and environmental opinions among the ethnic, country of birth, rural/urban residency, region of country, age and income strata that make up this nation's increasingly diverse population. Differences that may exist between social strata are especially significant in light of continuing major shifts in the demographic composition of the United States population. These shifts are likely to persist well into the future thus sustaining our need to know all we can know about how changing social composition is likely to affect the recreation demands and environmental opinions of the future.

Currently, the population of the United States is approximately 284 million men, women and children, a number the Bureau of Census expects will more than double by the end of this century (U.S. Census Bureau, 2000). By 2020, the U.S. population is projected to be 325 million, by 2050 almost 404 million, and by 2075 nearly 481 million. By 2100, in less than 100 years, the U.S. population is projected to be 571 million. This growth of over 300 million, will exceed the total growth of population over the last 10,000 years within the geographic area we now know as the United States.

To reach the projected level of 571 million by 2100, the rate of population growth is expected to accelerate. By 2020, growth will be around 2.4 million added persons per year. Between 2020 and 2050, growth will accelerate to over 2.6 million people per year. Between 2050 and 2100, population growth is expected to exceed 3.3 million per year. In that last year before the beginning of the 22nd Century, almost four million new residents will be added, more people than currently reside in the state of Colorado.

Not only is population dramatically growing in the United States, so too is social diversity. Changes in social composition are driven by a number of factors. Prominent among these change factors are the aging of the U.S. population, changing percentages of population among ethnic and racial groups and immigration (U.S. Census Bureau, 2000). America is becoming more ethnically diverse through immigration and differing birth rates among ethnic groups (Pollard & O'Hare, 1999).

Ethnic diversity is expected to increase substantially during the first half of the 21st Century. Between 1990 and 2050, the proportion who are Anglo Americans is expected to decline from its current level of more than 76% to just over 50%. Over this same time period, the proportion who are African Americans will increase from 12 to 15%, the proportion who are Hispanic will increase from 9 to 21%, and the proportion who are of other ethnic origins (including Asians and other ethnic classifications) will increase from less than 4% to more than 11%.

A major source of growth for minority populations, particularly Hispanics, will be from natural increases (e.g., birth rates), rather than from immigration (Del Pinal & Singer, 1997; Exter, 1993). Ninety-five percent of the projected twenty-year growth in Hispanic populations will be due to natural increases. Only five percent will be due to immigration. By 2010 the projected proportion of the country's population that is Hispanic will, for the first time, exceed the proportion who are African-American. During just 25 years, from 1995 to 2020, the Hispanic population in the United States is expected to increase by nearly 100%, going from almost 27 million in 1995 to over 52 million in 2020. Higher Hispanic birth rates will contribute substantially to the escalating national population. Recent estimates indicate that Hispanic birth rates are approximately 105 per 1000 women aged 15-44. In comparison, African American and Anglo American women showed birth rates of 71 and 65 per 1000, respectively (Exter, 1993).

Most of the African American population of the country resides in the Southern and Northern regions of the country, with heaviest concentrations ranging from eastern Texas to New York City. Over 15 million, or 46.9% of the African American population nationwide, resides in the South. Another 42.6% lives in the North. These regional populations typically are clustered around major urban centers, particularly in the South, Midwest, and West Coast. The current geographic distribution of African Americans is expected to persist for the foreseeable future with greatest concentrations continuing to reside in the South and North.

For the Asian population in the U.S., the greatest concentrations are found along the Pacific Coast (particularly around Seattle, San Francisco, Los Angeles, and San Diego). Asian population concentrations are also found in various other major metropolitan areas such as in the Dallas-Fort Worth metropex and in Houston, Atlanta, Chicago, Minneapolis-Saint Paul, Washington DC, and New York City. Over 4.4 million Asians currently live in Pacific Coast states, representing 42.1% of the national total of this ethnic group. Another 30.2%, 3.2 million, live in the North region.

From the above, one can readily see there is a trend toward an increasingly diverse population with increasingly diverse cultural roots living in this country. In the following sections of this paper, we examine linkages between this increasing diversity and Americans' recreation choices and environmental opinions.

Purpose of the Study

The purpose of this paper is to examine a portion of the NSRE survey data in order to describe differences in recreation behaviors (participation) and environmental attitudes nationwide across the strata for six socio-demographic factors—race, country of birth, rural-urban residence, region of the country, age and income.

Methods

Data and Approach

As mentioned earlier, our source of data was the National Survey on Recreation and the Environment (NSRE). NSRE is the United States' on-going federal survey, the earliest one dating back to the Outdoor Recreation Resources Review Commission of 1960 (Cordell et al., 1996). Several of the modules of questions in the most recent NSRE (e.g., outdoor recreation participation, demographics) were adopted from well tested applications in earlier versions of the NRS. The format and context of those questions have been kept as consistent as possible over the years so that participation and other trend analyses could be executed (Cordell et al., 1996). The activity participation module is a particular focus of this paper. Its evolution and current design are described briefly below. This paper also draws heavily on the demographics module of NSRE, which was adopted almost verbatim from the Census 2000 questions.

Finally, our module of questions concerning American's environmental attitudes draws on the well tested and widely accepted New Ecological Paradigm (formerly known as the New Environmental Paradigm) (Dunlap et al., 1992). All new modules of questions, including our adaptation of the NEP, were subjected to rigorous review, pretesting, analysis and refinement before being adopted for final population-wide application. Each of the three modules of questions used and presented in this paper are described briefly below.

Activity Participation Module

In the 1960 National Recreation Survey, 23 outdoor activities ranging from playing outdoor sports and games to mountain climbing were included (Outdoor Recreation Resources Review Commission, 1962). In each successive National Survey, activities were added as the scope of outdoor activities in which Americans were participating broadened. The current survey, NSRE 2000-01, includes 77 specific activities that range from walking for pleasure to snowboarding to rock climbing. The recreation itinerary of Americans has expanded enormously since the 1960s and the participation module in the NSRE has been broadened accordingly. A full listing of the activities included can be reviewed at www.srs.fs.fed.us/trends.

For this paper, only 10 of the 77 activities are used to analyze differences in participation between social strata. These include: swimming, motorized off-road driving, outdoor team sports, downhill snow skiing, big game hunting, walking for pleasure, hiking, motor boating, canoeing, and surfing. These were selected because they represent a breadth of land, water and snow/ice activities, and because they also represent a range of physical exertion and skills required for participation. For each of the 77 activities, survey respondents were asked whether they had participated to any extent during the previous 12 months. Thus, the data we draw upon for this paper are binomial measures for each activity indicating whether the respondent had participated (yes = 1) or not (no = 0). Later applications of the NSRE also involved the collection of data on days of participation and number of trips away from home for outdoor recreation.

Demographic Profile Module

The NSRE demographics module follows the Census 2000 design for generating population profiles across a variety of social strata (Office of Management & Budget, 1997). For federal surveys, alignment with Census designed population descriptors is required, not optional. To meet this requirement, and more importantly, to permit comparisons of percentage distributions of NSRE respondents across a range of demographic descriptors with percentage distributions representative of the U.S. population, close alignment with Census was necessary. This alignment allowed us to weight the NSRE data to compensate for over or under representation of age, race, sex, education and urban-rural residency. Questions asked of respondents included age, household structure, income, race, ethnicity, country of birth, income, tenure at current address, and other characteristics. The content and design of the demographics module of the NSRE can be reviewed at www.srs.fs.fed.us/trends.

New Ecological Paradigm (NEP)

Human perceptions of the Earth and the human role in it are addressed through the NEP. More particularly, people's level of endorsement of an ecological world view is measured. While other environmental scales were included in NSRE, we felt the NEP was most appropriate for this paper since it reflects people's fundamental position on the human-earth relationship. Of the 15 items in the revised NEP (Dunlap et al., 1992), we selected 10 for use in the NSRE. Reducing the number of items to 10 was necessary in order to stay within our allowed minutes of on-line interviewing time per respondent. These 10 items were selected based upon a recent analysis of the NEP scale and its items (Bright & Porter, in press) and feedback from the initial pretesting of the modified scale. Minor changes in wording for a few of these items were made to improve clarity based on pre-test results from 198 randomly drawn respondents. The 10 items (statements) selected represent all 5 of the primary NEP domains—ecological limits, balance of nature, anti-anthropocentrism, rejection

of exemptionalism, and ecological catastrophe—as described by Dunlap et al. (1992). They are as follows:

Ecological Limits

We are approaching the limit to the number of people this earth can support.

Balance of Nature

When humans interfere with nature, it often produces disastrous consequences. The balance of nature is delicate and easily upset.

Anti-Anthropocentrism

Humans have the right to modify the natural environment to suit their needs. Humans were meant to rule over nature.

Rejection of Exemptionalism

Human skill and resources will insure that we do not make the earth unliveable. Humans will eventually learn enough about how nature works to be able to control it.

Ecological Catastrophe

Humans are severely abusing the environment. The so-called “environmental crisis” has been greatly exaggerated. If things continue on their present course, we will soon experience a major catastrophe.

Respondents were asked to react to each of the above 10 items on a 5-point scale ranging from 1 = strongly agree to 5 = strongly disagree. The order of the 10 items was randomized for each respondent to avoid order bias to the extent possible.

Operating Procedures for the NSRE

Guided by specifications of sample size and geographic distribution from the overall NSRE sampling plan, phone numbers for phone interviewing were obtained from Survey Sampling, Inc (SSI), a Connecticut-based phone sampling firm. SSI was chosen because the company subjects all numbers to extensive cleaning and validation to ensure that listed exchanges are currently valid, and can provide customers with a random digit dial (RDD) sample using a phone number database of working blocks. A block is a set of 100 contiguous numbers identified by the first two digits of the last four numbers (e.g., in number 559-4200, 42 is the block).

These working blocks are entered into a computer-aided telephone interviewing system (CATI). Once the CATI system has randomly selected and dialed a telephone number, the interviewer, upon hearing someone answer, identifies the survey, its main purpose, and the name of the research laboratory (Presser, Blair, & Triplett, 1992). The interviewer then inquires how many people in the household are 16 years or older, and asks to speak to the person 16 or older who had the most recent birthday (Link & Oldendick, 1998; Oldendick, Bishop, Sorenson, & Tuchfarber, 1988). Upon reaching an appropriate person and receiving agreement to be interviewed, the interviewer then reads the survey questions as they appear on the computer screen. Using a computer to control the progression of the survey, programmed skip patterns are executed and data are entered as the survey is being administered. As responses are fed through the programmed data entry and management system, they are reviewed to assure they are within the permissible range of values and missing data problems are resolved. If no person is contacted or an answering machine is

obtained, the interviewer enters a code (e.g., busy or no answer). If the timing of the call is inconvenient, a call back is scheduled for another date and time (Presser et al., 1992).

Sampling

Sampling across the country's population and locations was designed to provide a minimum number of interviews for each state so that individual state reports on participation across all activities could be generated and so that reliable estimates of activity participation could be computed for activities with less than a 10% national participation rate. To achieve these objectives, a sampling strategy for a national sample of 50,000 completed interviews was developed. The strategy combined proportional nationwide population sampling aiming for 29,400 completed interviews and a quota sample distributing 400 interviews to each state and totaling 20,600 completed interviews. Sampling occurred throughout the year(s) during which the NSRE was being conducted to minimize seasonal recall bias to the extent possible.

Sources of bias were addressed through data weighting and other approaches as necessary. For example, equally distributing a quota of 400 across the 50 states results in over-sampling of rural areas (e.g., 65% Urban, 25% Near Urban, and 10% Rural). Thus, we used a sampling strategy that combined the quota of 400 per state with a proportional nationwide sample (e.g., 64.6% Urban, 27.4% Near Urban, and 8.0% Rural). In addition, random digit dialing reaches a random sample of telephone numbers, rather than of people. Affluent families are virtually certain to have a telephone number (97%), often more than one. At the other end of the scale, many low-income households do not have a telephone (ranging from 8 to 23% depending on geographic area). As a result, affluent people are likely to be somewhat over represented in the survey sample (Bowen, 1994; Groves, 1990; Tucker, Lepkowski, Casady, & Groves, 1992). To compensate for these types of sampling biases, the NSRE data set was weighted based on comparisons with Census data.

Another source of bias comes from language barriers through the undesirable but unavoidable exclusion of people who cannot speak either English or Spanish. According to the 2000 Census, 12.5% of the U.S. population is Hispanic. For the non-English speaking segment of the Hispanic population, the NSRE was conducted in Spanish. The most difficult part of this process was getting the translation generic enough for overall comprehension by all the various Hispanic dialects. Other non-English speaking U.S. residents were excluded from the survey. The complexity of the translation and interviewing processes made interviewing in all languages prohibitively costly.

All results provided within this paper are based upon the number of NSRE survey's completed at the time the analysis for this paper was conducted ($n = 22,847$). As of the writing of this paper, data collection for the NSRE was on-going. Obviously, then, as more data are collected final estimates of the percentages and numbers of people participating in different activities may change slightly from those reported in this paper.

Weighting Procedures

As blocks of interviews were completed and compiled, they were examined to identify differences in demographic profiles between those surveyed and the overall population of the country as described in Bureau of Census website reports. Indeed, sufficient differences are typically found to require weighting adjustments for over or under sampling. Weighting was achieved using a composite of multi-variate and multiplicative weights to account for age, race, gender, education, and urban/rural differences. This composite weighting helped adjust estimates of recreation participation and other NSRE estimates to better represent

what those estimates would have been had the sample been truly proportionately distributed across social strata.

This type of weighting procedure, referred to as *post-stratification* (Holt & Smith, 1979), is the most widely accepted method for adjusting sample proportions to mirror population distributions (Zhang, 2000). Post-stratification has been successfully applied in similar national surveys in the U.S. and in other countries (Thomsen & Halmoy, 1998). For NSRE, a total of 60 strata (6 age \times 2 gender \times 5 race) were identified to match identical strata in the U.S. Census. Each individual strata weight, Sw_i , is the ratio of the Census population proportion to the NSRE sample proportion:

$$Sw_i = P_i/p_i$$

where P_i = U.S. Census proportion for strata i
 p_i = NSRE 2000 sample proportion for strata i

A weight $Sw_i > 1.0$ indicated that the particular strata was a smaller proportion of the sample than of the U.S. population based on Census estimates. Likewise, weights with a value less than 1.0 indicated that the strata was randomly sampled in greater numbers than its proportion of the U.S. population age 16 and over. A unitary weight (i.e., no adjustment) means the sample strata was sampled at the same rate as its proportion of the population. Each individual respondent was assigned to one and only one of the 60 age-gender-race strata and thus assigned an Sw_i for that strata.

We took an additional step to account for the sampling proportions of two other socioeconomic strata: educational attainment and place of residence (rural/urban). Weights for each of these were calculated separately in a similar fashion to the age-gender-race weight. The education weight, Ew_i , is the ratio of Census: sample proportions for nine different levels of educational attainment, ranging from "8th grade or less" to "Doctorate Degree." The residence weight, Rw_i , is simply the ratio of the percentage of the U.S. population living either in metropolitan statistical areas or not divided by their counterparts in the NSRE data. This was adjusted for the fact that urban or metropolitan residents were slightly under sampled in the survey. A single weight, W_i , for each individual survey respondent was then calculated as the product of the three intermediate weights:

$$W_i = Sw_i \cdot Ew_i \cdot Rw_i$$

The largest composite weights, therefore, were applied to respondents whose numbers were under represented in the total sample. The smallest weights were applied to strata which were over represented. The sample had a potential total of 1,080 (60 \times 9 \times 2) unique weights, with each individual assigned a weight, W_i , depending on his or her combination of the three intermediate weights.

Data Analysis

After weighting the data as an adjustment for disproportionate sampling, differences in recreation behavior and environmental attitudes across six socio-demographic factors (i.e., race, age, income, country of birth, place of residence [rural/urban], and region of residence [Census divisions]) were compared. Recreation behavior was operationalized as the percentage of respondents who said they participated in one or more of ten different outdoor recreation activities one or more times in the past year. Hypothesis tests (Z statistic) were computed for each strata to see if the strata proportion of participants (H_A) differed

significantly from the overall sample proportion for that strata (H_O). For example, the percentage of males in the weighted NSRE sample is 47.5 percent. This was treated as the null hypothesis. For mountain bikers, however, the proportion who are male was 57.3 percent. This comparison between 47.5 percent and 57.3 percent was highly significant ($z = 27.0$, $p < .0001$). These pair-wise comparisons were repeated for each demographic strata across all 10 of the recreation activities selected.

Similar hypothesis tests were conducted on the strata proportions who agreed with each of the 10 NEP environmental attitude statements (H_A) versus the overall sample proportion of that strata (H_O). For example, 51.6% of the respondents who agreed with the statement "Humans have the right to modify the natural environment to suit their needs" were male, compared to 47.4% of the total sample who were male. This was also a significant difference ($z = 7.43$, $p < .0001$). The same hypothesis test was conducted on all demographic strata across the 10 NEP attitude items. Where significant differences were found, a Bonferroni (familywise) adjustment (i.e., alpha value divided by the number of tests) was applied in order to identify which comparisons were genuinely significant (Huck & Cormier, 1996).

Finally, two-way Chi-square tests of independence (with associated Phi coefficients of the strength of association) were run on the dichotomous variables of yes/no participation in an activity versus yes/no agreement with each NEP environmental attitude statement (Huck & Cormier, 1996). These tests were run for each environmental attitude-by-recreation-activity combination to identify associations between recreation participation and environmental attitudes.

Results

Outdoor Recreation Profiles and Trends

The first dimension explored in this paper is public participation in outdoor recreation. Before examining differences between social strata, we first provide a general overview of population-wide participation and trends. NSRE results indicated that 97% of respondents participated at some level in at least one outdoor recreation activity over the 12 months just prior to their being interviewed. That percentage translates into approximately 206 million people over age 15 participating in 1 or more of the 77 outdoor activities listed in the NSRE survey nationwide. Walking is and has continued to be the single most popular activity (83.8% participation, a finding consistent with the 1998 Recreation Roundtable). Other popular activities include attending a gathering outdoors with family or friends (73.5%); visiting nature centers, nature trails, visitor centers and zoos (57.2%); picnicking (55.3%); and viewing or photographing natural scenery (54.0%). The least popular activities in the NSRE list include migratory bird hunting (2.3%), scuba diving (1.9%), surfing (1.5%), and wind surfing (0.8%).

Table 1 shows the 10 fastest growing outdoor activities for 2000 among the 21 we have been tracking since the 1983 National Recreation Survey. It also shows the total number and percent of people aged 16 or older in 2000 who reported participating in at least one outdoor recreation activity in the last 12 months. As was the case for the 1995 NSRE, birding tops the growth list at a phenomenal rate of over 236% in the 17 years since 1983 (Cordell & Herbert, in press). Birding is fast becoming one of the more popular activities in the country in terms of number of participants. Rising numbers of seniors, rising interest more broadly in nature and learning about our natural heritage, and active promotion by birding groups are major reasons behind this rise in popularity. Following behind birding in terms of the 17-year growth trends are 9 activities ranging from hiking (196%) to swimming in natural waters (excluding pool swimming) (64%). Growth rates among these nine activities indicate a rapid rise in popularity of trail, motorized, camping and skiing activities.

TABLE 1 The 10 Fastest Growing Activities by Percentage Change in Number of Participants Aged 16 and Over (1983–2001)

	Growth (%)	Number of participants in 2001 (millions)	Percent of population participating in 2001
Bird watching	235.9	71.2	33.4
Hiking	195.9	73.1	34.3
Backpacking	165.9	23.4	10.9
Snow-mobiling	107.5	66.9	31.4
Walking	91.2	179.0	83.9
Off-road driving	89.2	27.9	13.1
Primitive camping	81.9	32.2	15.1
Developed camping	76.0	52.8	24.8
Downhill skiing	66.9	17.7	8.3
Swimming/river, lake or ocean	64.4	78.1	36.6

Note. All percentages and figures shown are based upon NSRE data collected ($n = 22,847$) up to the time this manuscript was written. As data collection proceeds toward the ultimate goal of 50,000 completed interviews, some of the estimates in this table may change slightly.

Public Opinions on the Environment

To examine Americans' opinions on the environment, we summarized results from the modified New Ecological Paradigm scale described earlier (see Dunlap et al., 1992). Estimates of percentages of the U.S. population "agreeing to strongly agreeing" (from the earlier described five-point scale) with each of the 10 slightly modified NEP items are presented in Table 2. Items 1 through 5 represent attitudes more empathetic to nature where humans are not put above nature. Items 6 through 10 represent attitudes more anthropocentrically oriented and include respondents who tend more to put humans above nature. From the NSRE results, it is clear that many more Americans are empathetic toward the environment; that more believe we are significantly impacting our natural environment, and that in the end a major environmental catastrophe will result. Many fewer believe that our science and ingenuity will overcome our impacts on the earth and that we were meant to rule over nature. The three items with the highest percentages "agreeing to strongly agreeing" (1, 2 and 3, each with over 80 percent of respondents) represent an opinion that the earth is fragile and that humans are upsetting its balance. The three items that respondents were least likely to agree with (8, 9 and 10) represent an opinion that humans have the right to dominate nature and that our impacts have been exaggerated. Only 30 to 40% hold this set of opinions.

In the following sections, we address recreation participation and environmental opinion by social strata (race, country of birth, urban/rural residence, etc). These differences are expressed as ratios of the percentage of participants (or of respondents agreeing with NEP scale items) who are within a social strata (e.g., American Indian) to the percentage of the total population (i.e., 16 or older) within that strata. Expressing differences as ratios enables a reader to quickly scan the tables for numbers over or under 1.0 as indications of the differences found. For both recreation participation and environmental opinions (see Tables 3 to 8), a strata ratio close to 1.0 indicates that the percentage of people who participate in an activity (or the percentage who hold a particular environmental opinion) who are in a strata is about the same as their proportion of the U.S. population. A ratio significantly above 1.0 indicates a higher than proportionate representation of a strata in the composition

TABLE 2 Estimates of Percentages of Americans Agreeing or Strongly Agreeing with NEP Statements

	Percentage	Confidence interval (95%)
1. The balance of nature is delicate and easily upset	85.7	84.92–86.48
2. Humans are severely abusing the environment	84.3	83.49–85.11
3. When humans interfere with nature, it often produces disastrous consequences	82.0	81.15–82.85
4. If things continue on present course, there will soon be a major ecological catastrophe	71.8	70.80–72.80
5. We are approaching the limit to the number of people this earth can support	63.9	62.83–64.97
6. Human skill and resources will insure that we do not make the earth unliveable	58.7	57.61–59.79
7. Humans will eventually learn enough about how nature works to be able to control it	43.2	42.10–44.30
8. Humans have the right to modify the natural environment to suit their needs	41.2	40.11–42.29
9. The so-called environmental crisis has been greatly exaggerated	39.4	38.32–40.48
10. Humans were meant to rule over nature	32.2	31.16–33.24

Source: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends).

Note. All percentages and figures shown are based upon NSRE data collected ($n = 22,847$) up to the time this manuscript was written. As data collection proceeds toward the ultimate goal of 50,000 completed interviews, some of the estimates in this table may change slightly.

of participants in a particular activity or in the composition of persons supporting a particular environmental position. A ratio significantly less than 1.0 indicates a proportionately lower representation of a particular strata relative to that strata's proportion of the U.S. population. Significance of ratios are denoted in Tables 3 through 8 by z statistics with Bonferroni Familywise adjustments across race, country of birth, urban-rural residence, region, age and income strata (Agresti & Agresti, 1979).

Recreation Participation by Race and Country of Birth

Ten outdoor recreation activities from the seventy-seven tracked by NSRE were selected for comparison of participation rates across race and country-of-birth strata. Table 3 shows computed ratios between percentage race and percentage country-of-birth composition of participants for each of the 10 outdoor recreation activities, relative to percentage composition of the total population of the country. Population composition was based on Census-weighted demographic data from NSRE. The size of the ratios relative to 1.0 indicate whether people in a social strata are over (a ratio significantly greater than 1.0) or under (a ratio significantly less than 1.0) represented relative to their proportion of the population.

The ratios in Table 3 reveal some interesting differences in recreation participation among social strata. First, we arranged the 10 activities in descending order from left to right by percentage of the U.S. population which reported participating in those activities. From the activities with the highest percentages to those with the lowest, participation

TABLE 3 Estimated Ratios of Percentage of Participants to Percentage of Total Population for 10 Outdoor Activities by Race and Country of Birth (with Significant Ratios Denoted)¹

Group	Outdoor									
	Walking	Swimming outdoors	Hiking	Motor boating	team sports	Driving off-road	Canoeing	Downhill skiing	Big game hunting	Surfing
Percent of total population	83.8	43.8	33.4	24.4	22.0	17.4	9.5	8.3	8.2	1.5
Race										
White	1.02**	1.15**	1.03**	1.25**	0.93**	1.13**	1.27**	1.20**	1.28**	1.05
Black	1.00	0.49**	0.34**	0.34**	1.13**	0.63**	0.34**	0.33**	0.27**	0.33**
American Indian	1.00	1.00	1.14	1.14**	1.14**	1.57**	1.29**	1.57**	2.00**	0.86
Asian/Pacific Islander	1.08	0.92	0.96	0.54**	1.23**	0.85	0.85**	1.46**	0.23**	3.31**
Hispanic	0.88**	0.75**	1.42**	0.50**	1.14**	0.74**	0.35**	0.55**	0.43**	0.97**
Place of birth										
United States	1.02***	1.04***	0.93***	1.06***	1.00	1.05***	1.07***	1.05***	1.07***	1.06***
Another country	0.81***	0.56***	1.67***	0.37***	1.01	0.48***	0.33***	0.44***	0.30***	0.42***

Sources: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends/).

¹Hypothesis tests (z statistic) of the difference between a strata's proportion in the population (H₀) and its proportion for activity participants only (H_A).

*** Denotes Bonferroni Familywise adjustment ($p/df = .05/50$) and results are significant at $p \leq .001$.

**** Denotes Bonferroni Familywise adjustment ($p/df = .05/20$) and results are significant at $p \leq .002$.

becomes increasingly specialized, expensive and/or skill based. Greater differences can be seen between the race strata among the more specialized, expensive and skill-based activities toward the right side of Table 3. Greater differences can be seen between the race strata among the more specialized, expensive and skill-based activities toward the right side of Table 3. Since the z-test statistic is highly sensitive to number of observations, different magnitudes of percentage difference as indicated by the ratios show up significant because number of observations varies from Whites, with the highest number of observations, to American Indians with the lowest number of observations (Huck & Cormier, 1996).

For the most part, walking is popular among members of all strata, from Blacks to Non-Hispanic Whites to Asian/Pacific Islanders. Motor boating is favored more by Whites and American Indians (they being over represented as proportions of participants relative to their proportion of the national population) than by Asian/Pacific Islanders and Hispanics. Motor boating is favored much more among Whites than among Blacks. Surfing is especially favored by Asians/Pacific Islanders and much less favored by Blacks ($p < .001$). Across all activities, except outdoor team sports, Blacks are significantly under represented. Whites are slightly over represented, and American Indians are slightly to substantially over represented. Hispanics are under represented across all activities except for hiking, and Asians/Pacific Islanders are over represented, except for motor boating and hunting ($p < .001$). Whites seem disproportionately to favor motor boating, canoeing, and big game hunting. Hispanics seem to favor hiking. Asian/Pacific Islanders favor downhill skiing and surfing, they do not favor hunting. American Indians favor driving motor vehicles off road, downhill skiing, and big game hunting ($p < .001$). Ratios for U.S. and foreign born residents of the country, as presented in Table 3, likewise indicate some substantial differences. Except for hiking and outdoor team sports, foreign born residents are significantly ($p < .002$) under represented as activity participants. As participants in outdoor team sports, foreign-born residents are about proportionately represented.

Recreation Participation by Urban-Rural Residence and Region of the Country

Table 4 provides computed ratios of percentages participating to percentages of total population for rural-urban and region-of-the-country strata. For the rural strata, there is a significantly ($p < .002$) greater than proportionate percentage who participate in motor boating, driving motor vehicles off road, and big game hunting. Rural residents are significantly ($p < .002$) under represented in participation in surfing, and somewhat under represented in participation in outdoor team sports and downhill skiing. Urban residents are somewhat under represented in off-road driving and hunting.

By region of the country, very little difference is seen in percentages participating in walking for pleasure, relative to each region's percentage of the population (See the list of states in each Census region in footnote 1 to Table 4). Significantly high ratios ($p < .0005$) for the New England states are found for swimming outdoors, motor boating, canoeing and downhill skiing. The ratio for big game hunting for this region is disproportionately low. For the Middle Atlantic region, generally the population is under represented in the composition of participants for a number of activities, reflecting the older, more urban population makeup of the states in this region—New Jersey, New York and Pennsylvania. Participation percentages across activities for residents of the East and West North Central regions are similar, except for motor boating, canoeing, hunting, and driving off-road. People in the western cluster of the Plains states which make up the West North Central region participate significantly ($p < .0005$) more in hunting, while people in East North Central

TABLE 4 Estimated Ratios of Percentage of Participants to Percentage of Total Population for 10 Outdoor Activities by Rural/Urban Residence and Region of the Country¹

Group	Outdoor									
	Walking	Swimming outdoors	Hiking	Motor boating	Outdoor team sports	Driving off-road	Canoeing	Downhill skiing	Big game Hunting	Surfing
Percent of total population	83.8	43.8	33.4	24.4	22.0	17.4	9.5	8.3	8.2	1.5
Residence										
Rural	0.98	0.94**	0.94**	1.15**	0.86**	1.38**	1.01	0.77**	2.09**	0.52**
Urban	1.01	1.02**	1.02**	0.96**	1.04**	0.90**	1.00	1.06**	0.72**	1.12**
Region ¹										
New England	1.07	1.44***	1.16***	1.21***	0.93	0.93	2.08***	1.85***	0.61***	0.85***
Middle Atlantic	1.03	1.05	0.84***	0.80***	1.05	0.80***	1.05	1.07	0.85***	0.65***
East North Central	1.01	1.01	0.94	1.17***	1.01	0.88***	1.38***	1.11***	0.93***	0.45***
West North Central	0.99	0.94	0.90***	1.30***	1.01	1.05	1.50***	1.06	1.54***	0.36***
South Atlantic	0.99	1.09***	0.78***	1.01	1.03	1.00	0.91***	0.74***	1.01	1.48***
East South Central	0.99	0.88***	0.78***	0.99	0.90	1.14***	0.68***	0.39***	1.32***	0.19***
West South Central	0.96	0.81***	0.87***	0.98	0.94	0.99	0.72***	0.47***	1.20***	0.49***
Mountain	1.00	0.87***	1.46***	0.98	0.93	1.49***	0.59***	1.63***	1.34***	0.55***
Pacific	1.00	0.96	1.37***	0.80***	1.05	0.95	0.59***	1.11***	0.56***	2.63***

Sources: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends/).

¹Include states making up each region: New England—CT, ME, MA, NH, RI, VT; Middle Atlantic—NJ, NY, PA; East North Central—IL, IN, MI, OH, WI, WI; West North Central—IA, KS, MN, MO, NE, ND, SD; South Atlantic—DE, DC, FL, GA, MD, NC, SC, VA, WV; East South Central—AL, KY, MS, TN; West South Central—AR, LA, OK, TX; Mountain—AZ, CO, ID, MT, NV, NM, UT, WY; Pacific—AK, CA, HI, OR, WA.

Sources: Source of U.S. percentages is the Census Bureau. Age, sex, and race estimates are as of November 2000. Foreign born, residence, and Census Division estimates are as of July 1999. Age and sex percentages are based on the 16 and over population. All others are based on the total U.S. population.

"!" Hypothesis tests (z statistic) of the difference between a strata's proportion in the population (H_0) and its proportion for activity participants only (H_A).

** Denotes Bonferroni Familywise adjustment ($p/df = .05/20$) and results are significant at $p \leq .002$.

*** Denotes Bonferroni Familywise adjustment ($p/df = .05/90$) and results are significant at $p \leq .0005$.

participate slightly more in downhill skiing. People in the South Atlantic states, Delaware to Florida, are over represented in swimming outdoors and surfing, but otherwise they are roughly proportionately represented.

The two southern regions, East and West South Central, are very comparable in percentages participating in the 10 outdoor recreation activities relative to their composition of the U.S. population, except for some difference in driving off road. Generally these regions are proportionately to under represented across all activities, with the exception of driving off road and big game hunting. Historically, smaller percentages of people living in these regions participate in outdoor activities, especially in downhill skiing and surfing (Cordell, 1999). Participation percentages among people of the western Mountain region, Montana to Arizona, are mixed. They are significantly ($p < .0005$) over represented in hiking, driving off road, downhill skiing and hunting. They are significantly ($p < .0005$) under represented in participation in canoeing and surfing. People residing in the Pacific Coast states, from Alaska to California, somewhat favor hiking and downhill skiing, but they are very much over represented among participants in surfing. They don't tend to favor motor boating, canoeing and hunting. When examining the percentages of people participating in the South, and for that matter for all regions of the country, one must bear in mind that the availability of opportunities to participate in certain outdoor recreation activities (e.g., surfing) may vary greatly from region to region.

Recreation Participation by Age and Income

Except for hunting, participation percentages relative to population percentages are higher for the younger age strata and then progressively decrease for the older age strata (Table 5). In addition, participation percentages decrease noticeably for all activities except walking as one moves from the youngest age group of 16-to-24 year olds down to seniors over 65. This decrease in representation of the older age groups is especially significant ($p < .0008$) for the activities of outdoor team sports (baseball, football, soccer, etc.), canoeing, downhill skiing, and surfing.

The highest disproportionate representation of people under 25 is for participation in the activities of surfing, team sports, downhill skiing, canoeing, and driving off road. The greatest over representation of people between 25 and 34 is in the activities of driving off road and downhill skiing. People 35 to 44 are slightly over represented across all activities except surfing. They are substantially over represented as participants in hiking. People 45 to 54, deep into their careers and mid-life, are roughly proportionate to their percentage of the population, except for team sports, downhill skiing, driving off-road, and surfing. Only for walking, motor boating and hunting are the percentages of those 55 to 64 years old close to their proportion of the population. They are significantly ($p < .0008$) under represented in all other activities. Very few people over 65 are among those who swim outdoors, play team sports, drive off road, canoe, downhill ski, or surf, relative to their increasing numbers as a proportion of the population.

With regard to differences among income strata, almost all are significant at the $p < .0001$ level (Table 5). Generally, persons earning under \$25,000 per year are proportionally under represented as activity participants across all 10 of the selected activities. Persons earning between \$25,000 and \$50,000 are roughly proportionally represented, except for under representation as participants in downhill skiing and surfing and over representation in hunting. People in all income categories above \$50,000 are over represented, with minor exceptions. The highest income group is over represented in activities such as motor boating, canoeing, downhill skiing, and surfing. All income groups are roughly proportionally represented as participants in the activity of walking.

TABLE 5 Estimated Ratios of Percentage of Participants to Percentage of Total Population for 10 Outdoor Activities by Age and Income¹

Group	Outdoor									
	Walking	Swimming outdoors	Hiking	Motor boating	Outdoor team sports	Driving off-road	Canoeing	Downhill skiing	Big game hunting	Surfing
Percent of total population	83.8	43.8	33.4	24.4	22.0	17.4	9.5	8.3	8.2	1.5
Age										
16-24	1.02	1.37***	1.11***	1.24***	2.14***	1.62***	1.67***	1.89***	1.17***	2.70***
25-34	1.01	1.21***	1.20***	1.16***	1.25***	1.38***	1.12***	1.32***	1.25***	1.29***
35-44	1.03	1.19***	1.21***	1.15***	1.05***	1.02	1.15***	1.14***	1.13***	0.51***
45-54	1.01	0.99	1.04	1.00	0.62***	0.81***	0.96	0.78***	0.99	0.56***
55-64	0.98	0.68***	0.78***	0.81***	0.32***	0.59***	0.53***	0.32***	0.82***	0.42***
65+	0.94***	0.37***	0.55***	0.51***	0.16***	0.32***	0.28***	0.12***	0.54***	0.09***
Income										
<\$15,000	0.91	0.62***	0.88***	0.57***	0.57***	0.58***	0.48***	0.48***	0.38***	0.75***
\$15,000-\$24,999	0.98	0.79***	0.98	0.63***	0.81***	0.83***	0.59***	0.41***	0.81***	0.36***
\$25,000-\$49,999	1.02	1.10***	1.04	1.07***	0.92***	1.09***	0.99	0.75***	1.31***	0.77***
\$50,000-\$74,999	1.08***	1.28***	1.11***	1.36***	1.10***	1.27***	1.38***	1.17***	1.38***	0.85***
\$75,000-\$99,999	1.09	1.39***	1.20***	1.59***	1.13***	1.23***	1.61***	1.86***	1.21***	1.23
\$100,000+	1.09	1.43***	1.29***	1.67***	1.36***	1.47***	1.74***	2.76***	1.09	2.52***

Sources: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends/).

¹Hypothesis tests (z statistic) of the difference between a strata's proportion in the population (H₀) and its proportion for activity participants only (H_A).

***Denotes Bonferroni Familywise adjustment ($p/df = .05/60$) and results are significant at $p \leq .0008$.

Environmental Opinions by Race and Country of Birth

We used the 10 NEP items to examine whether there were opinion differences by race and country of birth. Ratios of the proportions “agreeing or strongly agreeing” with each NEP item in each race and country of birth strata relative to the proportions of the U.S. population in those strata are shown in Table 6. What is particularly striking about Table 6 is that there are relatively few significant differences. From left to right, the weighted percentage of respondents “agreeing to strongly agreeing” with the NEP items goes from 85.7% to 32.2%. Generally, Whites cast their opinion approximately proportionate to their percentage of the population across all NEP items. This is not a particularly surprising result since whites make up the majority of the population and this weights the overall percentages toward their majority positions. Whites as a group tend somewhat more to feel that the balance of nature is delicate and humans do not have a right to rule over nature. Whites are somewhat under-represented in agreeing that humans can control and have a right to modify the environment ($p < .001$).

Blacks, on the other hand, tend to feel more so than other groups that we have a right to modify, control, and rule over nature and that we are not approaching the limit to the number of people who can inhabit the earth ($p < .001$). American Indians seem to feel more strongly than all other races that we are abusing the environment and that humans were not meant to rule over nature. Asian and Pacific Islanders tend to feel we will ultimately be able to control nature and avoid ecological catastrophe. Hispanics stand out in the position that we will be able to control nature and that we have a right to do so. Foreign born respondents are very similar to Hispanics in their opinions about the human-environment relationship. Generally stated, significantly ($p < .002$) higher percentages of foreign born residents take the position that humans have a right to modify the environment and control nature, the environmental crisis is exaggerated, and the balance of nature is not all that delicate.

Environmental Opinions by Urban/Rural Residence and Region of the Country

In Table 7, rural residents are shown to indicate in significantly ($p < .002$) greater percentages than their proportion of the population that human skills will insure the future of the earth, the environmental crisis is exaggerated and humans were meant to rule over nature. Urban residents, on the other hand, are very close to being proportionately represented across all NEP items. Across regions, there were significant ($p < .0005$) differences in four of the five NEP items placing humans over nature. For the most part, fewer residents of the New England, Mountains, Middle and South Atlantic regions took the positions of agreeing that the environmental crisis is exaggerated and that humans were meant to rule over nature. Residents of the West North Central (Prairie states), East South Central and West South Central (the deep South), however, indicate more strongly the opinion that humans are meant to rule over nature, the environmental crisis is exaggerated and humans will eventually be able to control nature.

Environmental Opinions by Age and Income

In Table 8, one finds relatively few significant differences among age strata in taking the position that humans are responsible for abusing the environment and that human interference with nature could be disastrous. More significant ($p < .0008$) differences among age strata are found as one moves right toward NEP positions placing humans over nature, having a right to modify the environment, and feeling that humans were meant to rule over nature. Generally, the older age strata are over represented in NEP environmental positions that place humans over nature.

TABLE 6 Estimated Ratios of Percentage Agreeing or Strongly Agreeing to Percentage of Total Population for Environmental Opinions by Race and Country of Birth¹

Group	Balance of nature is delicate	Humans abuse environment	Human interference disastrous	Ecological catastrophe	Approaching number of people limit	Human skill insures earth liveable	Humans will eventually control nature	Humans have right to modify environment	Environmental crisis exaggerated	Humans meant to rule
Percent of total population	85.7	84.3	82.0	71.8	63.9	58.7	43.2	41.2	39.4	32.2
Race										
White	1.05**	1.02	1.02	0.98	1.02	1.00	0.91**	0.90**	0.98	0.92**
Black	0.92	0.97	1.02	1.06	0.81**	1.02	1.12**	1.17**	0.94	1.20**
American Indian	1.17	1.17	1.17	1.17	1.00	1.00	1.00	0.83	0.83	0.67
Asian/Pacific										
Islander	0.84	0.84	0.84	1.04	0.96	0.88	1.00	0.92	0.76**	0.92**
Hispanic	0.89**	0.95	0.92	1.04	1.06	1.03	1.30**	1.33**	1.21**	1.20**
Country of birth										
United States	1.02***	1.01***	1.01***	1.00	1.00	1.00	0.97***	0.96***	0.97***	0.97***
Another country	0.81***	0.89***	0.88***	1.01	0.99	0.97	1.32***	1.42***	1.31***	1.28***

Sources: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends/).
¹"I" Hypothesis tests (z statistic) of the difference between a strata's proportion in the population (H₀) and its proportion for activity participants only (H_A).
 "***" Denotes Bonferroni Familywise adjustment ($p/df = .05/50$) and results are significant at $p \leq .001$.
 "****" Denotes Bonferroni Familywise adjustment ($p/df = .05/20$) and results are significant at $p \leq .002$.

TABLE 7 Estimated Ratios of Percentage Agreeing or Strongly Agreeing to Percentage of Total Population for Environmental Opinions by Rural/Urban Residence and Region¹

Group	Balance of nature is delicate	Humans abuse environment	Human interference disastrous	Ecological catastrophe	Approaching number of people limit	Human skill insures earth liveable	Humans will eventually control nature environment	Humans have right to modify environment	Environmental crisis exaggerated	Humans meant to rule
Percent of total population	85.7	84.3	82.0	71.8	63.9	58.7	43.2	41.2	39.4	32.2
Residence										
Rural	1.08**	1.09**	1.09**	1.05	1.09**	1.13**	1.06	1.04	1.20**	1.16**
Urban	0.98**	0.98**	0.98**	0.99	0.98**	0.97**	0.99	0.99	0.95**	0.96**
Region										
New England	1.06	1.06	1.02	1.04	1.10	1.04	0.96	0.94	0.79***	0.79***
Middle Atlantic	0.98	0.93	0.93	0.99	0.94	0.88***	1.10***	0.98	0.88***	0.80***
East No. Central	1.05	1.06	1.06	0.98	0.99	1.02	1.07	0.93	1.01	1.02
West No. Central	1.10	1.08	1.06	1.00	1.08	1.10	0.99	1.00	1.23***	0.99
South Atlantic	1.01	1.03	1.04	1.03	0.97	0.96	0.93	1.00	0.89***	1.01
East So. Central	1.04	1.03	1.03	1.04	1.04	1.11	0.93	0.96	1.23***	1.18***
West So. Central	0.92	0.95	0.97	1.01	1.00	1.06	1.11***	1.10	1.08	1.35***
Mountain	0.96	0.91	0.91	0.91	0.99	0.97	0.85***	0.92	1.05	0.80***
Pacific	0.95	0.99	0.96	1.01	1.03	0.99	0.97	1.08	0.98	0.96

Sources: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends/).

¹Include states making up each region: New England—CT, ME, MA, NH, RI, VT; Middle Atlantic—NJ, NY, PA; East North Central—IL, IN, MI, OH, WI, WI; West North Central—IA, KS, MN, MO, NE, ND, SD; South Atlantic—DE, DC, FL, GA, MD, NC, SC, VA, WV; East South Central—AL, KY, MS, TN; West South Central—AR, LA, OK, TX; Mountain—AZ, CO, ID, MT, NV, NM, UT, WY; Pacific—AK, CA, HI, OR, WA.

Sources: Source of U.S. percentages is the Census Bureau. Age, sex, and race estimates are as of November 2000. Foreign born, residence, and Census Division estimates are as of July 1999. Age and sex percentages are based on the 16 and over population. All others are based on the total U.S. population.

²Hypothesis tests (z statistic) of the difference between a strata's proportion in the population (H_0) and its proportion for activity participants only (H_A).

**Denotes Bonferroni Familywise adjustment ($p/df = .05/20$) and results are significant at $p \leq .002$.

***Denotes Bonferroni Familywise adjustment ($p/df = .05/90$) and results are significant at $p \leq .0005$.

TABLE 8 Estimated Ratios of Percentage Agreeing or Strongly Agreeing to Percentage of Total Population for Environmental Opinions by Age and Income¹

Group	Balance of nature is delicate	Humans abuse environment	Human interference disastrous	Ecological catastrophe	Approaching number of people limit	Human skill insures earth liveable	Humans will eventually control nature	Humans have right to modify environment	Environmental crisis exaggerated	Humans meant to rule
Percent of total population	85.7	84.3	82.0	71.8	63.9	58.7	43.2	41.2	39.4	32.2
Age										
16-24	1.00	0.99	0.98	1.06	1.07	0.99	1.14***	1.04	1.01	0.79***
25-34	1.00	1.01	0.99	1.03	0.96	0.91***	0.84***	0.97	0.85***	0.84***
35-44	1.02	1.00	0.98	1.01	0.97	1.00	0.89***	0.93	0.97	0.92***
45-54	1.03	1.01	1.03	0.98	0.99	1.04	0.93	0.85***	0.94	0.99
55-64	1.04	1.03	1.05	1.01	1.03	1.11***	1.06	1.09	1.22***	1.24***
65+	0.92	0.98	1.01	0.90***	0.99	1.00	1.15***	1.14***	1.09***	1.36
Income										
<\$15,000	0.89	0.99	0.95	0.96	0.97	0.91	0.99	1.16***	1.07	1.18***
\$15,000-\$24,999	1.07	1.13***	1.13***	1.13***	1.17***	1.21***	1.20***	1.16***	1.20***	1.13
\$25,000-\$49,999	1.05	1.05	1.03	1.04	1.04	1.03	0.86***	0.79***	0.95	0.91***
\$50,000-\$74,999	1.03	1.01	1.02	1.01	0.98	0.97	0.85***	0.93	0.84***	0.94
\$75,000-\$99,999	1.04	0.98	0.96	0.96	0.91	1.04	0.91	0.89	0.91	0.98
\$100,000+	1.02	0.97	0.95	0.90	0.86	0.95	0.90	1.08	0.97	0.86

Sources: USDA Forest Service, National Survey on Recreation and the Environment (NSRE 2000), Athens, Georgia (www.srs.fs.fed.us/trends/).

¹Hypothesis tests (z statistic) of the difference between a strata's proportion in the population (H₀) and its proportion for activity participants only (H_A).

*** Denotes Bonferroni Familywise adjustment ($p/df = .05/60$) and results are significant at $p \leq .0008$.

Generally, an inverse proportional relationship exists between income levels and NEP positions. Especially for the NEP items placing humans over nature, the lower income earners (i.e., under \$25,000) tend to be over represented. There are fewer differences between income strata for NEP items placing nature and the environment in a more equal status with humans. The exception is for people earning between \$15,000 and \$25,000 per year, who, for the most part, are significantly ($p < .0008$) over represented across all NEP items. However, this income strata is especially over represented on the NEP items stating that humans will insure the future of the earth, have the right to modify the environment, and be able to control nature. This group is also over represented in the opinion that the environmental crisis is exaggerated. People earning between \$25,000 and \$75,000 tend to be significantly ($p < .0008$) under represented among those feeling the environmental crisis is exaggerated and humans have the right to modify the environment or that we will eventually be able to control nature.

Linkages Between Recreation Choices and Environmental Attitudes

A number of previous studies have suggested a positive association between participation in outdoor recreation activities and pro-environmental behavior (e.g., Jewell, 2000; Theodori, Luloff, & Willits, 1998). Frequency of recreational visits to forest areas and participation in forest recreation activities were found by Nord, Luloff, and Bridger (1998) to be moderately associated with pro-environmental behavior, but only weakly associated with environmental concern. They found, however, that membership in recreation clubs or organizations is positively correlated with both nature appreciation and environmental concern. In general, outdoor recreation activities that lead to appreciative leisure behavior are associated with attitudes of nature appreciation, which in turn, is associated with environmental concern. Environmental concern and appreciative leisure participation have been found to be significant predictors of pro-environmental behaviors (Jewell, 2000).

To look further at possible associations between recreation participation and environmental attitudes, as addressed in the most recent NSRE, we computed correlation coefficients between recreation activity participation and NEP responses. Phi coefficients for 2×2 tables of agreement were computed and are shown in Table 9 (Huck & Cormier, 1996). Significant correlations between activity participation (yes/no) and NEP environmental responses (agree/strongly agree or not) revealed four types of respondents:

People who feel humans are not above nature and that an environmental crisis looms or is possible are associated with the activities of walking and surfing (from the list of 10 activities we selected for this analysis). There is a tendency for Asian/Pacific Islanders and persons born in this country to be over represented among those who walk and surf. As well, there is a tendency for middle-to-high-income persons to be over represented among participants in both of these activities. But, there the demographic likeness ends. Participants in these two activities, and thus people falling into this environmental position group differ considerably in age and region of residence.

People who feel humans are not above nature, but to whom no environmental crisis looms are associated with the activities of swimming, motor boating, driving off road, canoeing, and downhill skiing. There is a tendency for Whites and American Indians, as well as persons born in the United States, to be over represented among swimmers, motor boaters, off-road drivers, canoers and downhill skiers. Similarly, younger persons, from 44 down to 16 years, and persons earning over \$50,000 per year tend to be over represented in these activities, and thus in this environmental position group.

People who feel humans are above nature and an environmental crisis is possible are associated only with hiking. American Indians and Hispanics are over represented among

TABLE 9 Environmental Positions Based on Correlations (Phi Coefficients for 2 × 2 Tables of Agreement) Between NEP Items and Recreation Activity Participation

Description of environmental position	Humans <i>not</i> above nature, and crisis looms	Humans above nature, but crisis possible	Humans <i>not</i> above nature, but no crisis	Humans above nature, but no crisis	Humans <i>not</i> above nature	Humans <i>not</i> above nature, but no crisis	Humans above nature, but no crisis	Humans <i>not</i> above nature, but no crisis	Humans above nature, but no crisis	Humans <i>not</i> above nature, but no crisis
	Walking	Hiking outdoors	Motor boating	Team sports	Drive off-road	Canoeing	Downhill skiing	Big game hunting	Surfing	Surfing
Human skill and resources will insure that we do not make the earth unliveable (59%)	-.040*					-.032*	-.029**			-.033*
Humans are severely abusing the environment (84%)	-.051*		-.065*			-.039*	-.026**	-.039*		
Humans have the right to modify the natural environment to suit their needs (41%)	-.080*	.032*	-.062*	-.030*	-.058*	-.063*	-.053*			-.029**
Humans were meant to rule over nature (32%)	-.061*	-.070*	-.060*	.028**	-.033*	-.034*	-.029**			
Humans will eventually learn enough about how nature works to be able to control it (43%)				-.048*				-.048*		-.030**
If things continue on present course there will soon be a major ecological catastrophe (72%)	.025**	.048*				.026**				.023**
The balance of nature is delicate and easily upset (86%)	-.053*	-.101*	-.033*			-.037*				.037*
The so-called environmental crisis has been greatly exaggerated (39%)	-.043*	.023**	-.034*	-.032*			-.040*			
We are approaching the limit to the number of people this earth can support (64%)										
When humans interfere with nature it often produces disastrous consequences (82%)	-.028**	-.024**		-.026**		-.047*	-.028**			

*Chi-square significant at .01; **Chi-square significant at .05.

hikers, as are persons born in another country. Persons residing in the New England, Rocky Mountain, and Pacific Coast states, and people in the younger age and higher income groups, tend to be over represented among hikers.

People who feel there is no environmental crisis are associated with participation in team sports outdoors and hunting for big game. The race of participants in these two activities differs substantially, as do the percentages of participants who are foreign born. Their composition by urban-rural residence and by region also differ substantially, as do their ages and incomes. Their only similarity is in what they believe about the environment; that is, that there is no looming environmental crisis.

These results and identification of the above four groupings of environmental positions point out that across the diversity of Americans a number of statistically significant associations may be observed between recreation activity choices and environmental attitudes. These associations allow us to group participants in different activities by similarity of positions on the environment. Such groupings can be highly useful, for example, in designing outreach, education and involvement programs, a strong and growing interest and need among natural resource management agencies from local to federal. An examination of within-group demographic profiles across activities within the same environmental position group, except for those who feel there is no environmental crisis, reveals a great deal of similarity in social composition.

Summary and Implications

According to the NSRE results, over 97% of Americans participated in at least one outdoor activity during the year 2000. That percentage translates into approximately 206 million people over age 15 participating in one or more of the 77 outdoor activities in the survey. Walking continues to be the single most popular of these activities, although birding is growing fastest and is joining the ranks of activities Americans most favor. Following birding are a number of other fast growing activities ranging from hiking, which grew 196%, to swimming in natural waters at 64% for the period of 1983–2001. The composition of these fastest growing activities indicate a rapid rise in popularity of trail, motorized, camping and snow skiing activities.

Also, it appears that many Americans are concerned about the natural environment. There apparently are many more Americans who believe, than there are who don't believe, that we are significantly impacting the natural environment and may be heading for a major environmental catastrophe. Fewer believe that our science and ingenuity will overcome our impacts or that we were meant to rule over nature. The three NEP items with the highest percentages "agreeing to strongly agreeing," each with over eighty percent of respondents, represent an opinion that the earth is fragile and that humans are upsetting its balance. The three items with the lowest percentages represent an opinion that humans have the right to dominate nature and that our impacts have been exaggerated.

Recreation participation and environmental opinions, the dimensions of focus in this paper, are obviously important across all of this country's diverse population. As we examined these dimensions and compared them across race, residence, age, and income strata, substantial and noteworthy differences were observed. In the following few paragraphs we interpret the importance of the differences we observed in recreation participation and environmental opinions in light of forecasted demographic trends (Cordell & Overdevest, 2001).

Few would argue against the notion that the composition of the United States' population is rapidly changing. Likewise, few would argue that in all likelihood that composition will continue to change. Perhaps, then, our examination of differences in recreation participation and environmental opinion among those social strata predicted to change (by the

U.S. Census Bureau) might provide insights into future recreation and environmental opinion trends. Across the demographic factors of race, country of birth, rural-urban residence, region of residence, age and income, we found a number of differences in recreation participation and environmental opinions. First, most of the comparisons made were significant and indicate sweeping, significant differences in the recreation choices among people in different social strata. Similarly, although somewhat less sweeping, comparisons across NEP items indicated significant differences in environmental attitudes between many of these same social strata.

Projections from the United States Census Bureau presented earlier in this paper, and from other sources, detail the dramatic changes in the demographic composition of the United States population that are expected in coming years (U.S. Census Bureau 2000). Given, then, the connections we have observed between demographic characteristics, recreation participation and environmental positions, it seems obvious that future recreation and environmental planning and policy will need to account for these differences. Assuming that the connections we observed and report in this paper hold, we offer the following prognostications for the future.

The Rising Proportions of the U.S. Population who are Hispanic, Black, Asian/Pacific Islander and Born in Another Country will Result in Shifts in the Type of Participation in and Attitude Toward Outdoor Recreation

Predictions from all sources indicate that the social changes we are observing now will very likely continue well into the future. Between 2000 and 2050, the U.S. Census Bureau predicts the percentage of the population made up by Whites will fall from 76% to 50%. Meanwhile, the percentage who are Black will rise from 12 to 15%, the percentage who are Hispanic will rise from 9 to 21%, and the percentage who are Asian or Pacific Islander will rise from 4 to 11%. Additionally, unless national immigration policy changes, each year into the foreseeable future there will be around one million additional people coming to live in the United States from other parts of the world. By 2050, that would mean around 50 million residents of foreign origins that will have been added since 2000.

With these changes in population composition, demand for activities such as walking, hiking, outdoor team sports, downhill skiing and surfing are likely to rise in the future (Cordell et al., 1996). They are likely to rise in popularity much faster than activities such as swimming, motor boating, driving motor vehicles off road and hunting. The infusion of more people born outside the United States should add demand pressure to hiking and outdoor team sports.

As ethnic proportions continue to shift, we can also expect a number of shifts in environmental "leanings." First, the slower-growing population current majority made up mostly of non-Hispanics, most of whom are Whites, along with the American Indians of this country, will likely continue to feel that humans do not have a right to rule over nature and that our ingenuity and technology will not make an environmentally stressed earth more liveable in the end. But this persistent "majority" opinion will increasingly be offset by more rapidly increasing populations of Hispanics, Blacks, and Asian/Pacific Islanders who tend more to feel that we have a right to modify the environment and control nature, and that our technology will ultimately allow us to correct large-scale impacts of human habitation and activity on the earth. Growing percentages of foreign born residents who also generally take the position that humans have a right to modify the environment and control nature will add to the decay of this White/American Indian majority opinion.

The Rise in Proportion of the Population Which Lives in Urban Areas will Affect Recreation Participation, But not Environmental Opinion

In 1790, when the earliest U.S. census of population was done, a mere 5% of the country's population lived in urban areas. By 1920, the population balance between rural and urban shifted and this country became predominantly urban. By 1990, 75% of the people in the United States lived in urban areas. Since 1990, metropolitan growth has accounted for an estimated 82% of total U.S. population growth, even though metropolitan counties thus far account for only 18% of the total U.S. land base (U.S. Census Bureau, 1997). Across regions, the cities with the largest overall predicted population increase include Phoenix, San Diego, Tampa, and Atlanta, all expected to grow 50% or more over their 1995 population by 2020. This country has transformed from one in which almost 40% of its population was rural, to one which now is over 80% urban.

Urban and rural residents differ in the outdoor recreation activities they choose and the environmental positions they take. Thus, the more rapidly increasing urban population of the future will likely cause increases in participation in and demand for more vigorous activities like walking, swimming, hiking, outdoor team sports, canoeing, downhill skiing and surfing. Activities like motor boating, driving off road and hunting are likely to be slower growing.

Both urban and rural populations are expected to grow in the future, with urban growth outpacing rural growth. While the pro-environmental leaning of this faster growing urban population will continue to dominate country-wide opinion, it is likely to be mediated somewhat by disproportionately higher representation of rural residents among those in the country who hold the opinion that human skill will insure the earth's livability, that the environmental crisis is exaggerated, and that humans were meant to rule over nature. The net effect of the more human centered position on the environment held by rural residents, however, will not likely have a large effect on society-wide environmental opinion given that rural residents make up only about 20% of the population.

Rising Median Age and Proportions in Older Age Groups will Moderate Demand Growth in Some Outdoor Activities and Move Environmental Opinion a Bit Toward Earth over Humans

Not only are we becoming more urban, we are also growing older. Median age is predicted to rise from around 35 years in 2000 to just over 38 in 2050 (Day, 1996). Most of this increase will occur in the next 20 years. The U.S. population age 65 and over is projected to increase from about 13% to between 16 and 18% by 2020 (Cordell & Overdevest, 2001).

Increasing age leads to decreasing percentages of people who participate in outdoor recreation, especially in activities that are more physically challenging. Thus, the general aging of the country's population will moderate future growth of activities such as swimming, outdoor team sports, driving off road, canoeing, downhill skiing and surfing. Participation percentages in activities such as walking and hiking are likely to see some increases in demand pressures due to a more rapidly increasing proportion of people aged 55 and older.

Increasing numbers of people now between 35 and 54, who will be moving into the ranks of seniors 55 and older, will tend, over time, to move the overall societal environmental position toward humans not being over the environment. However, increasing numbers of younger people who feel we will eventually be able to control nature and who are moving into this middle age category will over time tend to moderate the influence of increasing numbers of older, environmentally leaning people. Dwindling numbers of the current oldest age cohort who feel the environmental crisis is exaggerated and humans were meant to rule

over nature will slowly make a shift in society-wide environmental position toward nature as those now younger move into these older age groups.

Continued Increases in Incomes will Likely Result in Overall Increases in Recreation Participation and a Greener Environmental Attitude

Finally, if real income (inflation adjusted) continues to rise in this country, as it did between 1960 and 2000, gains will be realized by almost all Americans. In 1960, the lowest 20% earned just over \$14,000 per year. The highest 5% earned over \$68,000. By 2000, the lowest 20% were earning almost \$22,000 per year and the highest 5% were earning over \$145,000. This represents a growing disparity, but widespread growth nonetheless.

Over time, as real incomes continue to rise in this country, we can expect upward pressure for participation in all outdoor activities. This growth pressure can especially be expected for expensive activities like motor boating, driving off road, canoeing, downhill skiing, and surfing, which require expensive equipment or travel of appreciable distances from home for participation. Least affected by rising incomes are likely to be activities such as walking, which are inexpensive, and hunting (i.e., deer, wildfowl, etc) which is not highly income dependent. Rising incomes may also influence some people's positions on the environment. Since lower-income people tend to be less environmentally oriented and more trusting that humans can eventually control nature, rising incomes may tend to moderate these views somewhat since lower income people also tend to feel we are approaching the limits of human effects on the environment.

In conclusion, continuing diversification of this country's population matters. As we contemplate the future for recreation and environmental planning in this country, diversity has to be a deliberately considered factor. Passing reference to increasing diversity without its being hard linked to decisions and anticipated outcomes of planning just will not suffice any more. As the papers in this special issue of *Leisure Sciences* show, demographic, behavioral, and cultural differences are linked to differences in outdoor recreation participation and environmental opinions. Thus, changes in this country's demographic composition will likely result in changes in how we engage and how we perceive of the out-of-doors. How we Americans use and view our vast natural world has a lot to do with that world's future. We in the research community must continue to keep our fingers on the quickening pace of the American pulse and keep this information flowing freely for use in better connecting the public with those who are charged with the stewardship of our natural resources.

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