A Qualitative Analysis of National Outdoor Recreation Surveys

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EXECUTIVE SUMMARY: Changes in outdoor recreation participation make it increasingly important to use dependable data to guide planning, management, and business decisions. In the last two decades, various agencies, non-profit organizations and private marketing firms have collected data on outdoor recreation, which has shed some light on participation trends. However, little research has been conducted to comprehensively examine and compare the content, method, and reliability of these data sources and their uses. Therefore, the purpose of this study was to analyze and compare selected national outdoor recreation participation data. The specific study objectives were: (1) to describe the purpose and content of selected national outdoor recreation participation surveys, and (2) to examine the data-collection methods used in each study. The results showed that these data sets provide a vast amount of information for planners, marketing professionals, commercial recreation operators, retailers, and industry managers to gauge past, present, and future outdoor recreation participation. These data sets also exhibited numerous differences in several key aspects including data-collection methods, activities, participation measurement, and availability. Future research and recommendations are discussed on market share analysis, new data-collection methods, and secondary data usage.

KEYWORDS: Outdoor recreation participation, secondary data, national recreation surveys.

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Outdoor recreation is a significant part of the American way of life (Driver, Douglass, & Loomis, 1999). Our public lands and other protected areas have experienced considerable use in the last generation. In some protected areas, this popularity has changed and sometimes negatively influenced people’s pursuit of their favorite outdoor recreation activities (Moore & Driver, 2005). Emerging outdoor activities, e.g., rockcrawling and geocaching, have also prompted managers and retailers to better understand participation trends impacting sales, training, and future management strategies (Moore & Driver, 2005).

Considering our limited recreation resources in the 21st century, it is imperative to assess and predict outdoor recreation participation in order to anticipate changes in supply and demand (Cordell, 2004). While a plethora of information about outdoor recreation is readily available online, it is challenging to identify which sources best describe the activities in which people participate. This issue becomes even more problematic for resource managers, planners, marketers, and tourism officials, as one tries to understand the results and how to use these data sources. The significance of this issue becomes vexing for those who manage outdoor recreation areas or provide fee-based services where the analysis of recreation demand is critical.

When obtaining recreation data from various sources, it is important to know whether data are applicable to one’s information needs. One can easily become overwhelmed at the amount of available information without really understanding how data are collected, how they should be analyzed and interpreted, and what similarities or differences exist across sources. To date, while the need is clear, no comprehensive analysis of these national outdoor recreation participation data sources exists in the literature.

Examples of how park and recreation managers might use such data include simple trend analysis and historic market-demand analysis. As park and recreation managers prepare for a new season, it would be helpful to know from a trend-analysis perspective what activities are growing, declining, or remaining steady in demand. Data from national, regional, and state perspectives would be helpful. Relevant data includes not only how many are participating but at what volume levels. It is far different to note that 10% of the population is active, but they only participate perhaps two to three times per year as opposed to a population where 8% are involved in the activity but participate an average of 20 times per year. This type of information is also best understood when it is analyzed over time.

Furthermore, a planner who keeps solid trend data may be able to anticipate needs associated with seasonal fluctuations and time of week, month or year. Historical trend analysis may also help the manager predict rebounding trends of age cohorts as they move through a family or aging life cycle. Finally, those park and recreation agencies located near major metro areas or areas with changing population may benefit from knowing the size of the market within those regions and how they are changing over time—the historical demand analysis of activities. Some data sets provide such information and when collectively pooled over time provide some perspectives on changes in demand: the growth, decline, and stability of demand. Consequently, secondary data sets can offer a number of insights into both trend and demand analysis if tracked over time in nearby population centers.

Users of secondary data may need guidance on how to access, purchase, and use these resources so they can glean pertinent information to make informed decisions. Therefore, the purpose of this study was to analyze and compare selected national outdoor recreation data. Specific study objectives were: (1) to describe the purpose and content of selected national outdoor recreation participation data, and (2) to examine the activities and data-collection methods used in each study.
**Background**

Data collection on national outdoor recreation participation does not have a long history. When examining recreation participation data with other types of national data collection, such as U.S. Census data or labor statistics, the depth of the information is limited. With the completion of the 27 reports from the Outdoor Recreation Resources Review Commission (ORRRC) in 1962, baseline data on outdoor recreation sites and participation began to emerge. From a managerial perspective, these reports were instrumental in formalizing planning to assess future demand/supply for facilities and services, and prompt future policy changes (Jensen & Guthrie, 2006). Nationally, participation in outdoor recreation activities is now estimated in the hundreds of millions for actual participation days (Cordell, 2004). Its economic impact, as cited from one source is considerable, contributing $730 billion to the U.S. economy (“The Active Outdoor Recreation Economy,” 2006). On a state level, agencies use a combination of national data as well as local sources to complete their state comprehensive outdoor recreation plans (SCORP). Thus, reliable data can be used to allocate funding resources, predict demand, and improve the management of outdoor recreation pursuits.

Theoretically, secondary data sets provide tremendous potential to explain outdoor recreation behavior, activity, and trend patterns. Additional secondary data sources such as the U.S. Census can be used to supplement participation findings. These data can be used to help explain social or cultural phenomenon such as childhood and adult obesity, migration patterns, concerns for the environment, and community transformations, i.e., rural communities evolving into tourism destinations. Over time, more credible longitudinal data opens the door for continued research on age cohorts, health indicators, and generational differences (Strauss & Howe, 1991); it is an area of analysis that is lacking in longitudinal data collection and review in recreation, parks, and tourism.

**Method**

The following criteria were used to determine the studies and data to be included in the analysis: (1) access to results such as reports and raw data, (2) availability of information about data-collection methods, (3) types of questionnaire items, (4) comparable outdoor recreation activities, (5) established history in data collection, and (6) surveys that are ongoing.

This study used the following six data sources: (1) The National Survey on Recreation and the Environment (NSRE), (2) National Survey of Fishing, Hunting and Wildlife-Associated Recreation, (FHWAR), (3) Outdoor Industry Foundation (OIF), (4) National Sporting Goods Association (NSGA), (5) American Sports Data, Inc., (ASD), and (6) Simmons Market Research Bureau’s National Consumer Survey (SMM). The abbreviations shown in the parentheses will be used throughout this article. The most current and accessible data were used from each group.

Initially, published reports were obtained and a review of websites was conducted to critique the data sets from each source. To fully understand the details of these data sets, personal interviews were completed with key individuals representing each organization or agency when published information was not readily available. Each group was initially contacted via email or phone and informed about the study. An individual in the company, organization, or a partner was then identified that is involved in the study design and data collection. These individuals were all contacted by email, and phone interviews were completed. These individuals were asked a series of specific questions on the following topics: (1) purpose and use of their study, (2) study design, (3) instrumentation, and (4) data-collection procedures. Archival data about the research studies were also obtained from websites, electronic documents, published books, and technical reports.
Results

All six data groups were contacted and responded via email; five of the six data groups participated in a follow-up phone interview. In several of the cases, multiple interviews and emails took place because additional partners were interviewed, i.e., marketing firms, university call centers, etc. Hard copies of their main reports were collected as well. Table 1 shows an overview of key aspects of the outdoor recreation participation data by source. These data sets are described in detail in the next section.

Overview of Data Sources

NSRE. The U.S. Forest Service conducts The National Survey on Recreation and the Environment (NSRE). The Recreation, Wilderness, Urban Forestry and Demographic Trends Research Unit in Athens, Georgia conduct this research. The purpose of the NSRE study is to discover and describe participation by Americans in outdoor recreation activities. This study examines recreation participation, youth participation in outdoor activities, national forest and wilderness values, public land management, environmental opinions and attitudes, and socio-demographic information. As currently named, the NSRE began in 1999 and continues today. (For the complete history of the NSRE since its inception, see K. Cordell, 2004). Participation figures are available at the national and state level. Data are compiled by region as part of the Renewable Resources Planning Act decennial assessment.

NSRE data are used by a host of individuals in the outdoor recreation community. Examples of users include U.S. Forest Service personnel, state planners, academics, the outdoor recreation industry, and advocacy groups. Sixteen versions of NSRE 2000 were conducted from 1999 through 2004 with various question modules in each version; core participation and sociodemographic items are included in each version. Data are currently being collected on NSRE version 2005-2008. Over the years, numerous reports, books, and journal articles have been written, e.g., Outdoor recreation for 21st century America (Cordell, 2004). Information about NSRE, publications, its documentation, and questionnaire items is available at there website: http://www.srs.fs.usda.gov/trends/Nsre/nsre2.html

FHWAR. The U.S. Fish and Wildlife Agency conducted the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. The purpose of the study is to gather information on the number of anglers, hunters, and wildlife-watching participants in the United States. Data are also collected on frequency of participation, expenditures, and sociodemographics. State fish and game agencies, outdoor recreation planners, and academics, as well as those in the outdoor industry use the information from this study. This study has been completed every five years since 1955. Results are available at a state and national level. The report, 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation is free and more detailed information is available on this website: http://wsfrprograms.fws.gov/Subpages/NationalSurvey/National_Survey.htm

ASD. American Sports Data, Inc., specializes in consumer research for the sporting goods, fitness, and the health club industries. The purpose of its research is to collect data on sports participation and to conduct trend research. The audience for their data varies from large corporations to those in the health, sports, and outdoor industry. Their data have been collected every year since 1983. Data are obtained on sports and recreation activities and also include participation, lifestyles, and sociodemographics. The number of activities has changed slightly over time. Results are published in three volumes called the Superstudy of Sports Participation (2006) that focuses on: Fitness, Recreation, and the Outdoors. Participation figures are available at a national and regional level, e.g., Northeast,
South, etc. All three studies are available for $700.00. An overview of the study and sample spreadsheets can be found on the website: http://www.americansportsdata.com/.

**OIF.** The Outdoor Industry Foundation is an industry group that worked in conjunction with the National Golf Foundation, Sporting Goods Manufacturing Association and Snowsports Industries America to produce a study on outdoor recreation participation. The purpose of this study, published as *The Next Generation of Outdoor Participants* (2007) is to gauge and understand outdoor participants, particularly the youth markets. Outdoor Industry Foundation members, managers in product sales, and the overall outdoor industry use the information in this report. The report shows outdoor recreation participation, frequency of participation, and sociodemographics for outdoor activities. Previous studies conducted by OIF (1998-2005) were completed with other partners using a different methodology and thus are not directly comparable. No state level data are available. This 2007 study and some past studies are available for free on their website: http://www.outdoorindustryfoundation.org/.

**NSGA.** The National Sporting Goods Association is an industry group that conducts several studies on sports participation that includes outdoor recreation activities. The purpose of their research is to obtain information on sports participation, frequency of participation, sociodemographics, and trends on outdoor recreation activities. Their audience is the retail sporting goods and outdoor industries. Memberships are available to the NSGA. This organization has been conducting these studies for 20 years. The outdoor activity participation results are divided in two reports, *Sports Participation in 2006 Series I & II*. Data for this study are collected annually. Their reports are available for several hundred dollars each; discounts are available for members. A separate report for state participation data is also available for purchase. A description of all the reports is available on their website: http://www.nsga.org/public/pages/index.cfm?pageid=864

**SMM.** Simmons is a private market research company that conducts research in order to better understand consumer behavior and to assist private companies in media buys. The audience for their research is quite extensive and includes companies in retail, media entertainment, and the travel industry. In their *National Consumer Survey*, data are collected on recreation, consumer purchases, media use habits, entertainment, lifestyle, and sociodemographics. Participation is measured on recreational activities and an additional set of travel and tourism activities. SMM makes its *National Consumer Survey* data available for purchase. Customized reports can be ordered and as well as access to their national data sets that can be further manipulated. The most current data available, which we accessed at a university library, is 2004 (2005 available soon), and the cost of the data set is about $3000. The website provides information on other reports and data for purchase. Data are not available at a state level but are available for eight Nielsen Media Research Designated Television Market Areas or DMAs, e.g., Chicago, Houston, and four U.S. regions. SMM can be contacted at http://www.smrb.net/.

### Analysis and Discussion

The purpose of this study was to analyze and compare selected national outdoor recreation data sets, describing their content, purpose, and data-collection methods. This analysis does not attempt to answer all questions for potential users of secondary data in outdoor recreation but concentrates on the most critical factors managers should consider in choosing secondary data sets in recreation and parks. When examining the various sources of secondary data in outdoor recreation, it is important to note that each study has strengths and weaknesses, with each survey filling a niche in the field.
Range of Activities

The OIF’s report, *The Next Generation*, has the most activities measured, with 114. Their selection of activities is vast, including fitness, sports, and outdoor recreation, both water- and land-based, such as hiking, bicycling, and fishing. Another extensive activity listing is available from ASD. The ASD study provides data on 103 activities. The three reports it sells covers three major recreational activity areas: 1) Fitness—including activities such as aerobics and gymnastics; 2) Recreation—including activities such as hockey and baseball, and 3) Outdoors—including activities such as kayaking and hunting. For ASD and OIF, activities have been added and subtracted over time based on popularity and technology. The advantage of both of these data sets is the range of activities and more than 20 years worth of results to track trends.

The NSRE collects data on 80 activities and has been using this number of activities since 2001. Previous data collection starting in 1999 was limited to 50 activities. A sample of activities includes such examples as hiking, backpacking, kayaking, and sledding. Other passive activities include picnicking, viewing natural scenery, attending outdoor sports, and driving for pleasure.

The NSGA collects data on 44 activities that are documented in two reports. The reports are not divided by specific areas and include fitness, sports and outdoor recreation activities. Sample outdoor activities include hiking, camping, hunting, and skiing.

SMM data include 56 recreation activities; the list of activities includes sports, fitness, as well as outdoor activities, including motor-boating, camping, fishing, and outdoor photography. The advantage of the SMM data is that it also examines other consumer behavior on 6,000 variables such as travel, lifestyle, retail purchases, and attitudes.

The FHWAR results are the most limiting when it comes to the number of outdoor activities because it only concentrates on hunting, fishing and other wildlife-associated recreation activities. However, there is some added detail in the measurement of these three activity groups. For example, with hunting participation, it is subdivided into big game, small game, migratory birds, and other animals. In other studies, some of these variables are not considered. This level of specificity is the same for fishing (*freshwater, Great Lakes, and saltwater*). For wildlife watching, it is divided into *away from home* and *around the home* with several choices in these two categories (*observe, feed, and photograph wildlife and birds*).

Current and Past Results

The most recent data are important for managers in meeting existing planning needs and assessing trends over time. In examining how frequently and consistently these studies are completed, several options exist. The most current results come from the NSRE, NSGA, ASD, and OIF (Table 1). Professionals in the field would find that these four data sets provide the most up-to-date information. Trend data are available for NSRE for nine activities since 1960, 28 activities since 1982-83, and 80 activities since 1999. NSRE has been collecting data *every day* since 1999, which gives this survey a level of consistency that most surveys do not have. The advantage with NSGA as well as ASD data is that both groups have been collecting data *every year* for 20 years or more. Trend data are not available for OIF because of a change in sample and data collection starting with the *Next Generation* report.

Specifically, for hunting, fishing, and wildlife-associated recreation, the FHWAR survey is done every five years. The FHWAR data have been collected since 1955, so some trend data are available, although direct comparisons are problematic due to changes in data-collection techniques over time. SMM’s data can only be purchased after it is a few years old. The most recent year available is 2004; the 2005 data will be available soon. The
Participation Measurement

One of the most critical aspects of using recreation participation data is being cognizant of how questions are posed to respondents to determine exactly what has been measured. Information on how participation is defined is available for all of the sources in this study, but reading the reports and result tables closely is still necessary. Not knowing how participation is defined can create some confusion if activities or participation figures are compared for each study.

Most studies measure participation one or more times in the last 12 months and also number of participation days per year. The actual participation variables for NSGA, OIF, SMM, ASD, and NSRE are very similar. However, there are several differences in the question wording and activity definition worth noting, which can help any potential user in choosing which source to use. The OIF asks if an individual has participated \textit{one time or more in a given time period} (2005 and/or 2006). SMM asks if they have participated \textit{once in the last 12 months}. ASD asks individuals if they participated \textit{in the last 12 months}. For NSRE, participants are asked if they have participated \textit{in the last 12 months}. NSGA asks individuals if they participated \textit{more than once in the last 12 months} and those who participated \textit{one time} in the last 12 months. Thus, NSGA is slightly different because results are not just made up of “one-timers.” SMM collects data on those who participated in the last 12 months. They create a profile group comprised of heavy or frequent participants.

**National Consumer Survey** has been done since 1982. However, SMM changed its data-collection methods in 2003, so data are not comparable prior to that year.

### Table 1. Summary of content and methods for data sources

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<tbody>
<tr>
<td>State-wide data</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Final sample size</td>
<td>20,000</td>
<td>25,375</td>
<td>60,169</td>
<td>16,148</td>
<td>22,000/11,300</td>
<td>6,000/6,200</td>
</tr>
<tr>
<td>Response rate</td>
<td>11%-21%</td>
<td>75%-80%</td>
<td>30%-40%</td>
<td>56%</td>
<td>77%-78%</td>
<td>60%-62%</td>
</tr>
<tr>
<td>Sample age</td>
<td>6 and older</td>
<td>6 and older</td>
<td>6 and older</td>
<td>6 and older</td>
<td>16 and older</td>
<td>7 and older</td>
</tr>
<tr>
<td>Data collection method</td>
<td>Phone Survey</td>
<td>Mail Survey</td>
<td>On-line Survey</td>
<td>Mail survey</td>
<td>Phone Survey</td>
<td>Mail survey</td>
</tr>
<tr>
<td>Data/Report access</td>
<td>Free</td>
<td>Cost</td>
<td>Free</td>
<td>Cost</td>
<td>Free</td>
<td>Cost</td>
</tr>
<tr>
<td>Number of activities</td>
<td>80-85</td>
<td>56</td>
<td>114</td>
<td>103</td>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>Data format</td>
<td>Selected reports/raw data</td>
<td>Raw data and analysis software</td>
<td>PDF report</td>
<td>Hard copy</td>
<td>Raw data/PDF report/hard copy</td>
<td>PDF report/hard copy</td>
</tr>
</tbody>
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1. Three versions conducted to date; 5000 is initial sample size, net sample varies for each version.
2. Sample size listed is for Volume III showing Outdoor Recreation Activities.
3. The sample size for sportspersons is 22,000; the sample size for wildlife watchers is 11,300.
4. The sample size for the Series I report is 6,000; the sample size for the Series II report is 6,200.
5. Response rate reported is RR1 (For precise details see “Standard Definitions,” 2008 in references).
6. The response rate for sportspersons is 77%; the response rate for wildlife watchers is 78%.
7. The response rate for the Series I report is 60%; the response rate for the Series II report is 62%.
However, the frequent or heavy-use segment is not defined the same across all activities. For example, a “frequent” participant in distance running is one who participates 110 days or more, while a “frequent” participant in downhill skiing is one who skis 10 or more days per year. None of the surveys exclusively consist of one-timers, but they do include them in their sample.

The participation measurement for the FHWAR is slightly different than the other studies. FHWAR measures primary participation in three activities, based on a screening process. In the latest survey, FHWAR screens by asking sportspersons i.e., that those who hunt or fish and wildlife watchers, if they had participated in 2006, did not participate in 2006 but had in 2005, did not participate in 2005 or 2006 but were likely to participate in 2006. If they did not participate in 2005 or 2006 and did not intend on participating in 2006, they were not included in the final sample. It also asks individuals about future participation; the other studies do not investigate this behavior. The other surveys query respondents about what activities they participated in from an extensive list, so the FHWAR participation measurement is more restrictive.

State activity participation results are particularly valuable for managers that need data for local decision-making purposes. The FHWAR, NSRE, and NSGA provide this information so managers have some choices. The FHWAR study is used extensively by managers who need this type of data for State Comprehensive Outdoor Recreation Plans (SCORPS) or other fish and wildlife management activities (Richard Aiken, personal communication, 11/15/07). The NSRE does not have state quotas but over a two-to-three-year period can complete at least 400 interviews per state so states can use these numbers for SCORPS as well. NSRE state data are available on a contractual basis. The NSGA sells a separate report showing activity participation by each state; however, participation numbers by specific activity can be fairly low or even nonexistent. The NSGA and NSRE would be the two viable choices for wanting to examine state participation figures in a variety of outdoor activities. Regional activity participation figures are available from ASD in their reports. OIF data are not available at a state level. SMM’s data only allow analysis for large metropolitan areas, regions or counties. NSRE does produce regional estimates as well. Overall, differences in participation measurement are one of the main factors resulting in divergent participation percentages when outdoor recreation activities are compared.

Reliability and Validity

Reliability refers to consistency of measurement (Babbie, 1986). Methods to check reliability includes test-retest, inter-rater, parallel forms, and internal consistency. For validity, it is necessary to determine that the instrument is intended to measure actually what it is supposed to measure. Internally, there are checks for numerous factors such as instrumentation and sample. Externally checks are done to determine whether the results can be generalized to the targeted population. There are several types of validity to check for with the instrumentation including face, predictive, and construct (Babbie, 1986; Kerlinger & Lee, 1999).

This category was the most problematic to gather and confirm. Little documentation was available and several groups would not divulge what they considered to be proprietary information. The reliability and validity information was gleaned from the interviews, reports, and documents that were available online and other details were obtained by request.

NSRE. Measurement testing is done before items are used in the survey. Checks for reliability and validity on attitudinal scales such as the Wilderness Values Scale were
done prior to use by the Forest Service social scientists and academics (Gary Green, personal
communication, 11/27/07). Close scrutiny is used to obtain a representative sample of the
national population to ensure internal validity as well as external validity. Given the fact that the
NSRE has been done over several years, correlations are run on past results to determine how
closely they compare. Those making the phone calls for the survey are supervised and evaluated
to determine consistency in the data-collection process as well.

**FHWAR.** Checks for reliability and validity are done in several ways. Data from sub-
samples are analyzed with the larger sample to determine reliability. Results are compared with
past studies and cross-checked with license sales to determine levels of accuracy. Questionnaire
items, especially if new ones are used, are tested internally for face and content validity. The
representative nature of the sample makes the results generalizable to the national population of
outdoor recreation users. Those who make the phone calls are also supervised and evaluated to
check for consistency and quality (Richard Aiken, personal communication, 11/15/07).

**ASD.** Little information could be obtained on reliability and validity beyond the
documentation on data collection and sampling in a methodology narrative available online.
Thus, checks for the representative nature of their sample, based on selected sociodemographics,
are described in their reports so results can be generalized to the larger population.

**OIF.** Reliability and validity checks are done on the actual questionnaire by Sports
Marketing Surveys, the firm that conducts the online survey. Items used on the questionnaire are
tested for face and content validity by marketing researchers and statisticians in the company.
Further data analysis is conducted to check for internal consistency reliability by comparing
results with random sub-samples on age and gender (Keith Storey, personal communication,
11/26/07).

**NSGA.** This study has been conducted for over 20 years, and little change has been done
on the items in the study. Analysis of sub-samples is done with the larger sample to check for
reliability. Data results are compared with past study results. No other checks for reliability or
validity are available. The representative nature of the sample from the panel provides some
assurances to generalize to the sociodemographic characteristics of the national population
(Tom Doyle, personal communication, 11/13/07).

**SMM.** Checks for reliability and validity are handled by their product development team.
Items are tested, added, and removed by their staff when deemed appropriate. Access to the
product development team was not possible. The random nature of the sample aids in its ability
to be generalized to the national population (Dan Levin, personal communication, 11/20/07.)

**Sampling**
All groups describe procedures that incorporate scientific rigor into how they choose their
sample and how they report their results. Some groups are more aggressive and detailed in
their description of data collection than others, and this is especially critical in making national
projections or tracking trends. Some information about sample selection and data collection
could not be obtained. The explanation for this response was that proprietary methods would
not be disclosed.

Three of the six studies draw their sample from panels in conducting their survey, e.g.,
OIF, ASD, and NSGA. A panel is made up of individuals who have agreed to take part in
surveys and have shared specific information about themselves and others in their households
so they can be included in research studies. Some marketing firms have millions of participants
from which they draw a sample and take considerable care in matching these individuals to the
general population using various sociodemographic characteristics. By using the same type of
individuals in a sample, panel studies can be used effectively to monitor performance of a target
market over time (Kotler & Andreasen, 1991).
Of the studies that use panels, a few comments can be made about their sampling. The OIF panel is conducted online; the only one that uses this method. The panel used in the OIF study may have some additional limitations because everyone does not have online access, and OIF focuses on people more likely to participate in the activities they are most interested. Research has shown that on-line panel participants tend to be younger and more affluent (Sparrow & Curtice, 2004). In contrast, SMM and FHWAR are randomly sampled from nationwide lists of phone numbers (SMM) and address lists (FHWAR). The SMM sample is drawn from a sampling frame of all telephone numbers in the United States except for Alaska and Hawaii. The description of the patented multiframe design that they use is lengthy, extremely detailed, and available from SMM upon request. The sample for FWHAR is screened to select only those individuals that had participated in fishing, hunting, and wildlife associated recreation in 2006, did not participate in 2006 but had in 2005, did not participate in 2005 or 2006 but were likely to participate in 2006. (A detail description of sampling is in Appendix D in the 2007 FHWAR report).

NSRE uses a random digit-dial survey and is not limited to directory listed numbers. Only about 40% of the NSRE phone numbers are directory listed (Gary Green, personal communication, 11/27/07). Therefore, the samples for SMM, FHWAR, and NSRE are drawn from a different type of sampling frame. Ultimately, the three groups that use panel participants originated from a sampling frame that consists of individuals who volunteered to be in that list versus those that were drawn from list of phone numbers or addresses.

Sample size is another factor that differs by data set. The sample sizes vary from 5,000 per version for NSRE to a high of just over 60,000 (net sample) for the online survey for OIF (Table 1). Since 1999, the NSRE sample is well over 100,000. The larger the sample, the lower the sampling error, but after 1,000 respondents, the improvement becomes minor (Maisel & Persell, 1996). All of the samples in these six studies are adequate for numerous types of data analysis such as cross tabs. Of course, the specific type of analysis by activity could be problematic if the “n” is too small. Sample size impacts margin of error, or more correctly termed, margin of sampling error. This is the error in a survey based on uncertainty, which is caused by using a sample, instead of a census, to estimate the value of a characteristic in the population (Schaeffer, Mendenhall, & Ott, 1996). All of the studies have this challenge because they all draw samples from some type of sampling frame. Every margin of error has a confidence interval. Confidence intervals are stated in percentages, e.g., ± 3.1%, and at specific levels usually 95%. These measures basically state a level of confidence in the results, showing that the average estimate of all possible samples would fall into that range. Confidence intervals are given for the number of participants nationally by every data set except the ASD. Sample size also matters if one wishes to break data down further to examine sub-samples. For example, if there are 500 subjects in a statewide sample, and if 5% participate in cross-country skiing, data would be obtained from only 25 subjects. To further analyze this sample by age, income, or educational levels would expose the results to increased sampling error. However, a sample of 25,000 subjects where 5% of the participants cross-country ski would yield a subgroup of 1,250 cross-country skiers. Further analysis would be more reliable in the second example. Even though the OIF has the largest final sample, it does not show state figures so this survey would not help those interested in needing state participation figures. Not being able to compare all the characteristics of sampling makes it complex to analyze, but sampling differences are another reason why comparing activity participation numbers can be problematic.
Data Collection

Telephone surveys. The University of Tennessee conducts the NSRE survey. Between 1999 and 2004, 16 studies (versions) were completed. Each version varies slightly using various modules for each study, but all versions have demographic and participation items. Sponsors pay to add items to these versions. NSRE has worked with about 60 sponsors since 1999 (Gary Green, personal communication, 12/6/2007). Starting in 2005 three versions of the next round, the 2005-2007 study has been completed to date.

The U.S. Census Bureau conducts the phone survey for the FHWAR. If individuals do not respond to repeated phone calls (approximately 20 attempts), they are eventually visited in person to finish the survey. This situation happens for about 25% of the sample and can be very expensive (Richard Aiken, personal communication 11/15/07).

Mail surveys. ASD uses a mail survey to conduct their study. Little information about the mail survey procedures was obtained or is available via the website or in its reports. ASD works with National Family Opinion Research, Inc., (NFO) to conduct their study.

SMM uses three phases in their data collection. A postcard or letter is sent to a household to let respondents know that they will be contacted by phone for an interview. A phone survey is done to obtain demographic information about the household. Next, a questionnaire with all the activity information is mailed to the primary contact that completed the phone interview. Each survey packet contains a cash incentive ($10.00), a small premium gift item (unknown) and a personalized letter. Upon completion of the questionnaire and its return, respondents receive an additional $10.00-$20.00 depending on sampling frame and geography to participate in the final versions or sub-groups of the study. Two reminder letters are sent to the households.

The NSGA conducts their survey by mail. The NSGA contracts with Ipsos-Insight, a marketing firm, to conduct their mail survey. One questionnaire is sent out, but no postcard reminders or follow-up questionnaires are sent to study participants.

On-line surveys. The OIF collects its data using an online survey. The OIF contracts with Sports Marketing Surveys, an international marketing firm, to conduct their online survey. Previous studies conducted by the OIF on outdoor recreation participation (1998 to 2005) were conducted by telephone survey using a different methodology and thus are not directly comparable.

Given the three different types of data-collection procedures used for each survey, it becomes even more critical for each group to pay close attention to the representative nature of their sample. Considering the unique challenges that exist for each data-collection procedure, i.e., increasing survey costs, less land phone lines at home, computers not present in every household, time will determine if these agencies/companies begin to reexamine how data are obtained based on technological and social trends. OIF is a current example of a switch in data collection to an on-line format; others could go this route or may decide to stay the course to maintain a level of consistency.

Response Rates

In its simplest terms, a response rate is the number of people surveyed divided by the number of people you tried to survey (Babbie, 1986); basically a ratio between two numbers.

The American Association for Public Opinion Research (AAPOR) provides specific descriptions of response rates and final dispositions. The AAPOR defines response rate as, “the number of complete interviews with reporting units divided by the number of eligible reporting units in the sample” (“Standards Definitions,” 2008, p. 35).

In a response rate for a phone survey, for example, contact and cooperation rates can be considered as well as refusals. Contact rates measure the proportion of dialed numbers
that actually go through reaching a live person. Cooperation rates are the number of people who are reached that actually agree to participate in the survey. The same level of detail can be provided with other types of surveys, too. For a complete explanation of the various response rates (RR1-RR6), definitions, and their formulas consult the “Standards Definitions” manual (2008) from AAPOR. There are very technical explanations given for specific types of response rates in the AAPOR documents, going beyond the scope of this article. Definitions vary depending whether complete or partial interviews, refusals, eligibility, contacts or refusals are in the formula.

There is some debate in the literature about overall responses rates going up and down over the years and ways to improve them. Comparing studies can be extremely difficult unless the researcher knows what type of response rate is actually reported (Langer, 2003; McCarty, 2003). Researchers or consumers would not know how rates were calculated unless details are shown in their reports.

According to Babbie (1986), a response rate of 50% for a mail survey is adequate for reporting, 60% is good and 70% or more is very good, but response rates vary considerably as previously discussed. However, given the numerous factors that impact response rates, such as questionnaire length, sampling frame, follow-ups, and method of data collection (Bailey, 2007), it is difficult to rely on any one number as the rule of thumb. Ultimately, a lower response will mean fewer cases for analysis, thus reducing the precision of any estimates (Lynn, Beerten, Laiho, & Martin, 2001). Equally important as response rates are checks for nonresponse error. This is done in order to compare nonresponders to those who have responded ensuring validity of the study results (Mangione, 1995).

The variety of data-collection procedures used in the six studies yield a host of response rates, which is an important factor to consider in any survey research study. The groups that conduct the phone surveys (NSRE, FHWAR, and SMM) are diligent in trying to complete their calls to obtain the highest response possible. For example, up to 20 calls are attempted per phone number in each NSRE version before the caller is no longer pursued (Becky Stephens, personal communication, 11/27/07). The OIF’s data collection is done online with reminder emails sent to the respondents. Follow-ups for the other groups are less extensive. The NSGA and ASD use mail surveys but do not follow the Dillman (2000) tailored design method. No second mailings, postcard reminders or incentives are used. Dillman (2000) provides numerous factors that contribute to response rates, i.e., length of the questionnaire, number/type of follow-ups, etc., but these details are not always available. Since response rates can vary by data-collection methods (phone vs. mail vs. online) as well as questionnaire content, a specific percentage can be very misleading. An important goal is to minimize nonresponse bids and obtain the highest response rate that is feasible.

For the data sets used in this analysis, it is difficult to compare or critique survey response rates, because the specific details about which ones they use, i.e., RR1, RR2, etc. (Standard Definitions 2008), and how they are calculated, is largely unavailable. The NSRE uses the definition of response rate from the American Association for Public Opinion Research (AAPOR). The NSRE uses Response Rate1, which is calculated through a very detailed formula. The NSRE rate varies from 11.1%-21.7%. The NSRE gives the most complete explanation of their response rates of any of the studies; this detail is available upon request in a separate document. FHWAR lists its response rate in its 2006 report in Appendix D, but it is just noted as a percentage of those in the sample and number of interviews completed. For example, for wildlife watchers, 14,400 were designated for interviews and 11,300 completed for a 78% response rate. For every other source in this study, the formula used to obtain the
percentage is not stated, so no specific details on how the response rates was calculated is shown in their reports nor was it shared with researchers. The private firms seem reluctant to share this proprietary information on how the response rate was calculated.

In summary, the data sets examined in this study are complex and provide a host of information for specific outdoor recreation markets, both public and private. One data set may not meet all management needs; so potential users may make a decision based on cost, familiarity with the source or specific activity information. Users should pay close attention to the research methods for each study because this will drive the integrity and utility of the results.

**Future Research**

With more secondary data now available, it may be possible to further analyze market share and various other types of participation variables that better explain participant or consumer behavior. These analyses might also include participant beliefs, interests, and lifestyle variables in clusters or profiles by selected recreational activities, which would provide a more comprehensive picture of consumer behavior. New wireless devices will also help to realize new data-collection methods in the future. Outdoor recreation planners can be innovators in adopting wireless technology to measure resource use, keep enthusiasts in safe places, and help to protect our natural resources. Finally, researchers should scrutinize the use of secondary data in the field of parks and recreation. Potential users and producers of these studies can learn more about who is using these data sets, for what purpose, and their level of effectiveness.

**Conclusion**

The findings in this investigation provide a systematic analysis of ongoing national surveys conducted by various organizations, agencies, and companies on outdoor recreation data. These data sets provide a vast amount of information to gauge past, present, and future outdoor recreation participation levels. This article contributes to the literature by critically examining available data for measuring outdoor recreation participation, and analyzes the similarities, differences, strengths, and limitations within these resources. There is no “best” data set of the six we reviewed; all have their strengths and limitations. The take-home message of this study is that individuals should become more aware of what types of outdoor recreation data exist, what information they can provide, how data are collected, and how they can be used.

If managers or researchers are considering using data of this type in the future, individuals will need to ask critical methodological questions to the survey managers. The agencies, organizations, and companies that collect these data must constantly review their procedures and learn to respond to social, cultural, and economic trends. Continued research on secondary data will be needed so the planning, management, and retail decisions managers or researchers make are based on precise and reliable results.

**References**


