



RECREATIONAL
BOATING & FISHING
FOUNDATION

Participation in Boating and Fishing

A Literature Review



September 2000

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Prepared for the:
Recreational Boating and Fishing Foundation
Alexandria, Virginia

September 2000

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About the Recreational Boating and Fishing Foundation

The Recreational Boating and Fishing Foundation (RBFF) is a 501(c)3 non-profit organization whose mission is to implement an informed, consensus-based national outreach strategy that will increase participation in recreational angling and boating and thereby increase public awareness and appreciation of the need for protecting, conserving and restoring this nation's aquatic natural resources.

The mission and tasks of RBFF are outlined in the Strategic Plan for the National Outreach and Communications Program as required by the Sportfishing and Boating Safety Act, passed by Congress in 1998. The Strategic Plan is the result of an exhaustive national consensus-building effort among user groups and stakeholders to identify problems, set objectives, and devise strategies to meet those objectives. The five objectives that resulted from this effort include:

- Objective #1: Create a top-of-mind recreational boating and fishing campaign to develop awareness, trial and continued participation.
- Objective #2: Educate people as to how and where to boat and fish.
- Objective #3: Prioritize target market segments and create messages that address each segment's specific needs.
- Objective #4: Educate stakeholders on marketing, outreach, and implementation of national strategies to targeted user groups.
- Objective #5: Make availability of and access to boating and fishing locations easy and simple.

RBFF has solicited stakeholders to volunteer on task force groups, specific to each objective, and charged with developing definitive plans for meeting these five objectives.

This literature review project addresses Objective #3 to "Prioritize target market segments and create messages that address each segment's needs," by examining characteristics of anglers and boaters, identifying groups which would be most susceptible to boating and angling participation, and identify types of messages that would increase their interest in boating and fishing participation. This project supports preparation for the National Boating and Fishing Campaign and helps meet the information needs of program partners and stakeholders.

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Participation in Boating and Fishing A Literature Review

EXECUTIVE SUMMARY

Statement of the Problem

The Recreational Boating and Fishing Foundation (RBFF) is implementing the Strategic Plan for the National Outreach and Communications Program required by the 1998 Sportfishing and Boating Safety Act. This Strategic Plan was a response to static or declining participation in recreational fishing and boating, and recognition of the need to increase public awareness about natural resource conservation. In order to develop the programs and materials needed to successfully accomplish the Plan's objectives, it is necessary to identify, describe and prioritize target market segments. The understanding gained from this analysis will help the RBFF and its partners design appropriate messages and programs for priority market segments.

Purpose

The purpose of this project was to assist the RBFF by reviewing the existing literature available on participation by individual market segments in recreational angling and boating. The RBFF has identified five criteria which priority market segments need to meet:

- Low current rates of participation.
- High projected population growth.
- High propensity to adopt behavior.
- High likelihood a marketing campaign is apt to alter participation.
- Potential for co-marketing with other outdoor-related marketing campaigns.

With these criteria providing the background, the literature was reviewed to provide current information on the status of recreational fishing and boating participation, an understanding of the factors that affect participation, and make recommendations that:

- Propose specific priority market segments for the marketing campaign.
- Suggest messages that would resonate with priority market segments.
- Detail the reasons why some segments should not be given immediate priority.
- Provide research priorities to better evaluate promising market segments currently having insufficient information.

Current Situation

Population growth in the United States is slowing. The estimated 2000 population of 275 million is comprised of 82% white, 13% black, and 5% other races (predominantly Asians). Between 2000 and 2020, the U.S. Census Bureau projects the nation's population to grow by 50 million people or by nine percent each decade. About 37% of the growth over the next 20 years will be comprised of minority populations, principally African American and Asians. Hispanics, who can be of any number of races, will comprise about 47% of U.S. population growth over then next twenty years. This growth will not be evenly distributed across the U.S. Further, minority and ethnic population growth will be most prevalent in southern and western states. With these projections in mind, it is clear that consideration of the long-term trends in U.S. population growth should be considered in any plan to market boating and fishing to the general population. However, we must be mindful that over the next several decades, the Anglo population will continue to be a large majority numerically and account for the majority of growth.

Within the U.S. resident population, there are an estimated 35 million active anglers 16 years and older and another 15 million youth anglers. The U.S. Fish and Wildlife Service's National Survey estimates of anglers for 1991 and 1996 were virtually unchanged. Recent national telephone surveys by Responsive Management also estimated the angling population at about 50 million. Fishing license sales, which have been on a slight downward trend for the past decade, have shown some improvements in recent years. Nationally, the total number of licenses sold in 1999 was up slightly to 29.5 million. License sales in 30 of the 50 states increased from 1998 to 1999.

Most of the nation's population has tried fishing at least once in their lives. Only 12% have never fished. About 18% tried fishing as children but have not carried the activity over into adulthood. One-quarter of the population has fished as adults but not within the past two years. Finally, nearly half of all adults (45%) have fished at least once in the past two years. Clearly, the U.S. population is familiar with recreational fishing, although there is substantial dropout and re-entry on an annual basis. Recent surveys by Responsive Management shows that the vast majority of Americans think that recreational fishing is a good thing.

Boating participation estimates have not been made as consistently as those for fishing. National boating surveys have estimated the number of adult boaters to range from 22 to 24 million. Nationally, between 37 and 46 million people take a boating trip each year. Overall, about 45% of the U.S. population has been boating at least once during their lifetimes. Unlike fishing licenses, boat registrations across the country have grown by nearly 14% from 1990 to 1998. Registration growth occurred in 44 of 50 states during this period.

Three population characteristics important to angling and boating participation are age, gender and race/ethnicity. There are two major age points in the life cycle where dramatic declines in fishing and boating occur. The first occurs between the ages of 15 and 16. At age 15, about 40% of all boys had fished while 60% had boated. Similarly, 28% of all girls were

actively fishing and 38% actively boating. By the following year, one-third of the boys and two-thirds of the girls had dropped out of fishing with similar amounts dropping out of boating. This is the highest participation rate decline for any age. Reasons for these dramatic declines have not been studied. However, the literature suggests that the process of socializing girls into women plays an important role. This process begins at an early age and streams girls into activities viewed by parents, teachers, and community members as conducive to femininity. There is evidence that the socialization process can be overcome in later life through marriage to an angler or boater, or through socialization with other anglers and boaters. Likewise, reasons for the sharp decline in fishing and boating participation among boys are also unknown.

The second major point of angling and boating decline is around age 45. Participation rates generally are consistent or increase slightly from age 16 upward and peaks at the 35-44 age group. Currently, about 22% of this age group are active anglers and 24% are active boaters. The proportion declines to about 20% for the 45-54 age group, 15% for the 55-64 age group, and 9% for those 65 and older. Reasons for the decline again are not well understood. Research on constraints to fishing and boating participation has not examined age-specific constraints. That is, nearly all the research on angler constraints has been based on entirely adult groups with some contrasts between males and females. Individual age and age group analyses are absent.

Minority and Ethnic Participation

Boating and fishing participation by Blacks, Asians, and Hispanics is very low. Minorities (Blacks, Asians, and Others) comprise about 10% of all anglers and 16% of the population. Hispanics encompass only 5% of the angling population and 10% of the population. Among boaters, 77% are White, 8% Black, and 15% Asian and other races. Hispanics comprise about 7% of the boating population. Most minority and ethnic groups live in urban areas and reside in cultural enclaves. These two factors tend to reinforce traditional outdoor recreation and leisure activities these groups are familiar with, such as picnicking and outdoor sports, because they inhibit acculturation and exposure to unfamiliar and often inaccessible activities. Knowledge and skills about recreational fishing and boating are often absent for these groups with few mechanisms available for acquiring them.

Constraints and Motivation

Women often face different constraints than men in their general recreation and angling activity. These differences are partially based on life situations. Women traditionally have been caregivers for children and responsible for most domestic chores. As a result, their leisure time is in shorter blocks, which are not conducive to many outdoor recreation activities in general, and fishing and boating specifically. Further, women are increasingly involved in working outside the home and engaging in professional careers. This further constrains the time available for recreational activities requiring more than an hour or two in duration.

Recent studies show that women's leisure involvement is motivated by personal growth, social interaction, identity, relaxation, learning, independence, and escape. These motives are

not easily achieved because women are often expected to extend their domestic roles when fishing or boating with family or friends. Thus, other activities are sought out which will allow for fulfillment, and which often involve participation with other women. Women-only outdoor programs which involve fishing, hunting, boating, hiking and camping have been very successful. Success has been achieved because skills are taught in a non-threatening (non-male dominant) and supportive manner. This process is underscored by educational research that shows women have different learning styles than men. Women are more task-oriented, qualitative, altruistic, and contemplative than men who are time-oriented, quantitative, self-interested and competitive.

Motivational differences between men and women have been studied very little. However, the few studies available confirmed the above observations. Men rated motives related to catching fish for sport and challenge, and catching trophies higher than women. On the other hand, women rated getting away from the demands of life, being with family and friends, and experiencing solitude higher than men. This underscores the desire by women not to engage in traditional roles, but to escape those roles and engage in an activity in a setting where they can focus on immediate family and close friends.

The motive of engaging in recreational activities with the family is a key element of participation that cuts across Anglos, minorities and ethnic groups. For Hispanics, participation with the family group automatically includes the extended family, which has implications for the types of facilities and experiences needed to support their fishing and boating participation.

The greatest amount of information on recreational fishing involves the motivations of its participants. Dozens of studies have consistently shown that involvement with family members and friends, as mentioned above, is consistently rated among the top five reasons for fishing. Additionally, the motives of escaping the daily routine, relaxation, being outdoors and close to nature, and the sport and challenge of fishing consistently have been rated among the most important reasons for fishing for over 30 years. Further, these motives remain at the top of the list regardless of the population or sub-population being studied. Given that most of the respondents in these studies were men, the stability was not surprising. What was unexpected was that the limited studies of women, minorities and ethnic groups showed these motives also were rated consistently higher than other motives, although the order was not always the same. When anglers were seeking large pelagic species (like billfish) or fishing in tournaments, other activity specific motives became important but did not supplant the top five.

The motivations of boaters parallel those of anglers. The top five angler motives also are the top five among boaters. The importance of speed, cruising, and water skiing as reasons for boating are similar to the activity-specific motives for fishing. The similarities between boater and angler motives are likely to be an artifact of the fact that over 60% of boaters use their boats to fish.

Earlier, constraints to fishing by women were mentioned. The concept of constraints has received considerable research attention over the past decade. Most of this literature has focused

on leisure constraints and not specifically in fishing and boating constraints. However, findings from the few fishing and boating constraint studies are in consonance with the larger leisure literature. Women generally face different constraints than men, not only because their social roles are different, but because of inherently being women as mentioned above. However, the universal constraint to both boating and fishing is time. Whether it is family or work obligations, allocating the time for fishing and boating is more difficult than exercising at the club, swimming, bicycling, playing softball, or going to a movie. These and other activities compete for available leisure time and can take over priority because of their ease of access and short duration. Involvement in new activities that take the place of fishing is significantly more prevalent among anglers who have become inactive or stopped fishing for several years, or who may have dropped out within the past two or three years.

Family and work obligations were also more prevalent constraints among inactive and recent dropouts than among active anglers. Further, inactive anglers reported a greater incidence of lack of knowledge and fishing skills than active anglers. Recent dropouts mentioned lack of fishing partners and access to fishing opportunities more frequently than inactive or active anglers. These constraints clearly can be addressed through education and outreach programs.

An important concern that cuts across women and minorities is personal safety. For women, the safety issue is prevalent in most outdoor recreation activities where women are isolated from others and vulnerable to attacks. This can occur in certain fishing and boating situations. The second aspect of safety is physical harm stemming from accidents in remote areas. This concern is generally based on lack of knowledge about the outdoors and confidence in outdoor skills. For minorities, lack of knowledge and skills creates discomfort in outdoor settings. In water-based settings, the fear of drowning among minorities is a significant constraint to participation.

Very few studies have looked at boating constraints. In the few that have, boaters reported “lack of time” as the primary reason for not boating or boating less frequently than in the past. Whereas equipment was less problematic for anglers, boat repairs, storage problems, and operation and maintenance expenses were issues for many boaters. While more information on the types of time constraints boaters face is needed, more in-depth information on differences between men and women, among age groups, among races and ethnic groups, and among active and inactive boaters is very important if programs are to be designed to help them negotiate these constraints successfully.

This holds true for anglers as well. Whereas we know more about the importance of various constraints for anglers, in general, than we do for boaters, we still have little understanding of differences across sub-groups of active and inactive anglers, and non-participants. We have a good idea of the size of these groups, but a relatively poor understanding of the factors that inhibit their participation.

Demographics

Standard socioeconomic characteristics of the population do little to discriminate among active anglers and boaters. We do know that anglers and boaters differ from the general population in several ways: 1) a greater proportion of rural residents fish and boat, but the majority of anglers and boaters live in large urban and suburban areas; 2) anglers and boaters are younger than the general population, 48% of the adult population is 45 years and older while 39% of anglers and 41% of boaters are 45 and older; 3) 48% of the population is male, but 73% of anglers and 57% of boaters are male; 4) 83% of the population is White while 90% of anglers are White and 77% of boaters are White; 5) angler incomes are slightly higher and boater incomes are moderately higher, on average, than the general population; and 6) anglers and boaters have slightly higher education levels. Removing angler and boater numbers from the general population and then comparing them to the non-boating and non-angling populations accentuates the differences above. However, these variables only account for a small amount of the differences between those who engage in the two activities and those who do not. They are virtually useless in analyzing differences among participants of different outdoor recreation activities.

Lifestyle Characteristics

Very little related research was found concerning the lifestyle characteristics of anglers and boaters. While some proprietary work has been conducted, it is not publicly available without substantial cost. The closest information that approximates the activity, interest, and opinion (AIO) research prevalent in the marketing literature is found in the literature on recreational specialization. These studies have focused mostly on activity participants. Some angler and boater studies have begun to arrange participants along a continuum. At one end is the least specialized and at the other the most specialized. The least specialized anglers and boaters are likely to be aware of and seek only the most superficial and apparent activity-specific elements of the experience. For anglers, catching any type of fish is sufficient; for boaters, cruising or water skiing is the major outcome sought. They generally have a simplistic view of the activity. Highly specialized anglers view the activity through greater knowledge and experience. They approach the social worlds of fishing and boating in a more holistic fashion. This type of angler or boater would view non activity-specific elements of their experience (i.e., escape, relaxation, nature) equally, if not more important, than activity-specific outcomes. Further, high specialization anglers and boaters immerse themselves in the activity through involvement with affinity organizations, socializing with similar-minded individuals, greater involvement in seeking information through the media, and greater involvement with the technology of the activity. While, the specialization concept has shown initial utility as a typology for understanding angler and boater participation, considerable work still needs to be conducted to solidify the framework for understanding participant differences and tying it more directly to the marketing literature. This is important if we are to be able to identify discrete market segments with unique characteristics, which can be targeted with effective messages through relevant communication channels, and develop appropriate programs that facilitate involvement.

Priority Market Segments

With the vast majority of the U.S. population supportive of recreational fishing and boating, and with a high percentage having experienced boating and fishing at some point during their lifetime, the opportunities for stimulating greater participation by the American public are quite good. The similarities between boaters and anglers in terms of the types of experiences they are seeking and constraints faced (with the exception of economic constraints by boaters) are quite close. Studies show 60-70% of boaters also fish, so many similarities should be expected. Based on the current population size and growth projections for the next 20 years, high priority market segments should include the following:

- **Males.** The current market should not be overlooked. Maintaining and increasing rates and frequency of participation among this group should be a priority. Adult men are mentors for children and can act as socialization agents for spouses and friends. Focusing on challenge, relaxation, and family are messages that should resonate with male anglers and boaters.
- **Recent dropouts.** This group is highly susceptible to fishing and boating participation and is larger than most minority populations. It contains a greater proportion of women. Focusing on the 45 and over group may payoff well because of the aging of the population and large number of people moving into the age group over the next 20 years. Messages concerning being in the outdoors, relaxation, escape, the challenge of fishing, and family fun should be appealing. Identifying why active participants over 45 years of age discontinue fishing and boating at a higher rate than younger anglers and boaters should be a priority.
- **Women.** This group comprises over half the U.S. population, but only 10% of females participate in fishing and 16% in boating. Growing interest in both activities by women has been stimulated by needs for independence, involvement with the outdoors, and escaping traditional social roles, which could be the basis for connecting with one segment of women. A second group of women seek involvement with the family away from traditional settings and domestic roles. Messages that accent these benefits should be appealing. One note of caution is warranted. Women place a lower priority on boating than men and view it as less affordable due to their role in family economic decisions. However, both these constraints can be addressed through education.
- **Youth.** A significant proportion of our young boys and girls have had fishing and boating experiences. The dropout rates are very high for both activities, but opportunities for increasing carryover into adulthood are good. Greater understanding of the reasons for this abrupt change in participation is needed to address this problem.

Market Segments Needing More Study

Recommending lower priority for some market segments is difficult because some of these market segments should be priorities in some instances. Hispanics comprise a substantial proportion of the state population and anglers and boaters in Arizona, Florida, Texas, New

Mexico and California. Further, they are one of the fastest growing segments of the U.S. population. Not marketing to this group would be inadvisable at the state level. From a national perspective, the population of Blacks and Asians is small and both have low participation rates. Specifically targeting these segments in a national campaign would require substantial resources.

Directly targeting Blacks and Hispanics at this time may be unwise for other reasons as well. We do not know much about their motivations, constraints, and participation patterns. This is a badly needed area of research that will help us understand their needs and concerns better so appropriate messages and programs can be designed and implemented.

Research Priorities

- Greater understanding of the motivations, attitudes, socialization patterns, and constraints of Blacks and Hispanics is needed. Efforts to reach out to these segments of the population are important. The focus group work conducted by Responsive Management highlights some of the differences these groups may have from White anglers. It may be possible to market to multiple racial and ethnic groups if visual messages contain racial and ethnic mixes. Research has shown that Blacks and Hispanics identify with messages depicting and directed at their race or ethnic group. Messages in Spanish are more effective with Hispanic groups because of their level of acculturation and important cultural reinforcement needs.
- The limited boater work that has been conducted has focused primarily on boating participation and use. A handful of studies provide a disjointed view of boater characteristics, motivations, attitudes, and constraints. Generalizability is limited. Further, the analysis of subgroups of boaters based on gender, age, race, and other useful segmentation characteristics is needed.
- For both boating and fishing a focused marketing study is necessary if there is a desire to fine-tune messages and direct them through appropriate channels to specific segments. The use of multivariate clustering techniques with a broader array of lifestyle variables (attitudes, interests, and opinions) would be very useful.

Participation in Boating and Fishing

A Literature Review

Statement of the Problem

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With these criteria providing the background, the literature was reviewed to provide current information on the status of recreational fishing and boating participation, an understanding of the factors that affect participation, and make recommendations that:

- Propose specific priority market segments for the marketing campaign.
- Suggest messages that would resonate with priority market segments.
- Detail the reasons why some segments should not be given immediate priority.
- Provide research priorities to better evaluate promising market segments currently having insufficient information.

Population Growth and Boating and Fishing Participation

To place recreational boating and fishing participation into context, a brief look at U.S. population, fishing and boating growth is necessary. This information provides the backdrop for later discussions of participant characteristics such as age, race, ethnicity, and gender. These characteristics are important to market segment identification as will be discussed later.

U.S. Population Growth

Population growth is based on changes in the birth, death, migration, and fertility rates. Changes in the U.S. population over time reflect changes in these rates that are responsible for the exponential growth of the U.S. population shown in Table 1. Between 1960 and 1990, the U.S. population has increased by 69 million people, even with the population growth rate declining. Based on the projected population for 2000, growth since 1990 appears to be about one percent per year. A major component of this change over the past four decades has been immigration from Spanish speaking countries. The increase in ethnic populations, particularly Hispanics, was noted by Murdock et al. (1996) who indicated that over the next 30 to 50 years a large disproportional increase in the Hispanic population will be due to both immigration and higher fertility rates. The nation's population is projected to grow by another 50 million people between 2000 and 2020.

Table 1.
Total Population of the United States and Percent Change: 1900 to 1990
With Projections to 2020

Year	Population	Total	Percent Change
1900	75,994,575		
1910	91,972,266		21.0%
1920	105,710,620		14.9%
1930	122,775,046		16.1%
1940	131,669,275		7.2%
1950	151,325,798		14.9%
1960	179,323,175		18.5%
1970	203,302,031		13.4%
1980	226,542,203		11.4%
1990	248,709,873		9.8%
1996	265,179,411*		6.6%**
2000	275,306,378*		10.7%**
2010	299,861,974*		8.9%
2020	324,926,698*		8.4%

*U.S. Census Bureau projections

**Change based on 1990 population

Table 2.

Proportion of the U.S. Population Aged 16 and Over That Fished: 1955 to 1996

Year	U.S. Anglers Aged 16 & Over	U.S. Population Aged 16 & Over	Percent of Population
1955	17,627,000	103,787,000	17%
1960	20,433,000	112,468,000	18%
1965	22,405,000	120,373,000	19%
1970	25,820,000	143,030,000	18%
1975	33,940,000	156,486,000	22%
1980	42,059,000	169,942,000	25%
1985	46,357,000	181,095,000	26%
1991	35,578,000	189,964,000	19%
1996	35,246,000	201,472,000	17%

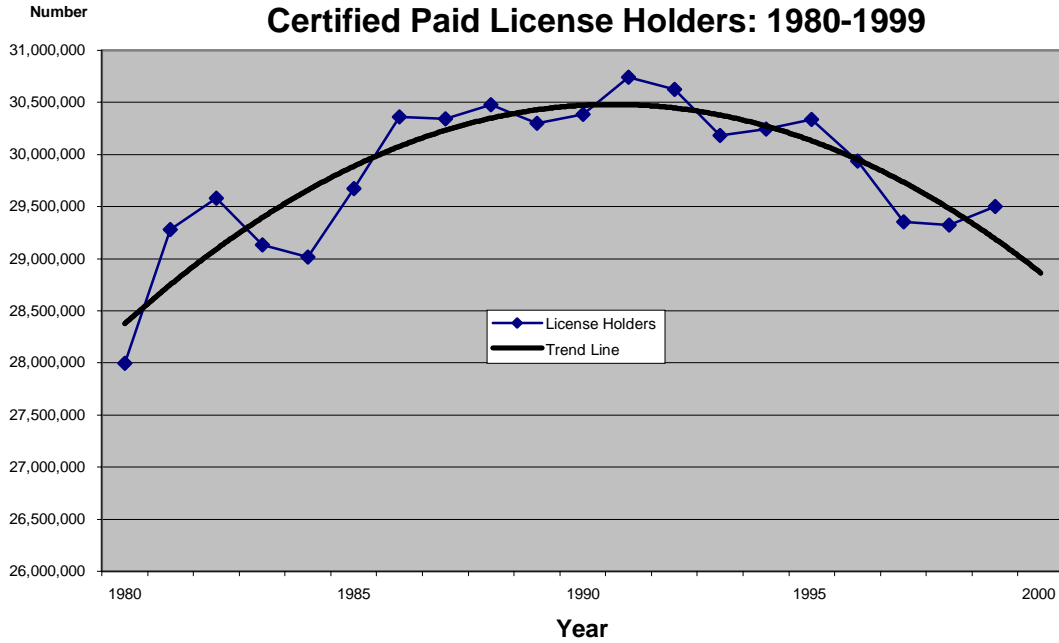
Source: U.S. fish & Wildlife Service, 1955 –1996 National Surveys of Fishing, Hunting and Wildlife-Associated Recreation

Fishing Participation

The national surveys of fishing and hunting date from 1955 when the U.S. Fish and Wildlife Service began estimating the number of anglers and describing their fishing and demographic characteristics. They are the oldest, continuous data collection on recreational angling in the country. These surveys were conducted at five-year intervals through 1985 and resumed the interval with the 1991 survey. The switch to 1991 was a concession to the U.S. Census Bureau, which conducts the survey, which wanted to avoid conflict with the 1990 and subsequent decennial population census. Table 2 shows the U.S. population age 16 and over for the years when the national surveys were conducted. Also shown are the number of anglers identified in the surveys and the proportion of anglers in the population. As seen in the table, both the number of anglers and the total population nearly doubled from 1955 to 1996.

It should be pointed out that the growth in angler numbers is misleading because of a change in survey methodology in 1991 that affected angler estimates. Prior to 1991, the national surveys employed a single interview survey methodology that required respondents to report their fishing participation over the previous 12-month period (annual recall). This procedure resulted in over-estimates of participants, fishing days, and trips according to a study conducted by Westat (1989) and further confirmed by a side-by-side survey conducted in conjunction with the 1991 National Survey. The 1991 and 1996 estimates of anglers (using a four-month or trimester recall period) were substantially lower than the 1985 estimates, thus making comparisons between the two time periods tenuous at best. However, Table 2 is still instructive from a trend standpoint. There was consistent growth in the number of anglers from 1955 through 1985 when the annual recall survey methodology was consistent. The fact that there was

Figure 1
Certified Paid License Holders: 1980-1999



little change in the number of anglers from 1991 to 1996 shows that the growth curve has flattened out. Aiken (1999) generally confirmed this pattern using annual recall fishing participation data from the 1980, 1985, 1990, and 1995 population screening surveys conducted prior to the national surveys. The screener surveys were used to identify a sample of anglers, hunters, and wildlife participants to receive the full national survey. This comparable data showed that angler numbers increased from 1980 through 1990 but declined in 1995, which supports the trend in Table 2.

Fishing license sales is another indicator of fishing participation. The number of license buyers serviced by each state is collected and certified by the U.S. Fish and Wildlife Service and used as part of the formula for allocating Sport Fish Restoration funds among states. The number of license holders from 1980 to 1999 by state is shown in Figure 1. The years shown correspond with the national surveys from 1980 to present plus 1998, the most recent year available.

License data in Figure 1 generally tracks with angler estimates from the national surveys. Between 1980 and 1990 licensed anglers grew by 8.4% nationally. This growth rate was similar to the 9.8% population growth during the same period. From 1990 to 1996 the number of anglers declined by 1.5% while the U.S. population increased by 6.6%. The decline in licensed anglers continued from 1996 through 1998, but increased slightly in 1999. The changes in the number of licensed anglers corresponded very closely with 1980 to 1996 national survey estimates of angler numbers.

Data in Appendix A show that license sales have been highly variable among states over the past two decades. For example, 19 states reported fewer licensed anglers in 1999 than in 1980. The declines ranged from -0.2% in Michigan to -24% in Washington. Conversely, increases ranged from a slight 1.6% in Illinois to 109% in Alaska. Maryland's 168% increase in licensed anglers was due in large measure to licensing saltwater anglers fishing in the Chesapeake Bay. During the period between 1990 and 1999, 29 of the 50 states recorded license sales drops totaling nearly 2.4 million licensed anglers. This was offset by the remaining 21 states gaining a total of 1.3 million licensed anglers. There is no clear pattern to the increases or decreases in licensed anglers from a regional standpoint. Nor can the declines in recent years be tied to any widespread environmental, economic, or social event.

Estimates of the number of anglers vary by survey methodology. The 1996 National Survey estimated that 35.2 million U.S. residents aged 16 and over enjoyed recreational fishing. Another 14.8 million youngsters 15 years and under also participated in fishing. Thus, the total number of anglers in 1996 was about 50 million. The Roper Starch Worldwide study (1999) reported 44.6 million anglers aged 18 and older from a previous survey they conducted in 1996. Adding youth anglers to this estimate would bring the total close to 60 million anglers. The difference between the Roper Starch and National Survey estimates is likely due to survey methodology. The Roper Starch surveys used an annual recall method whereas the National Survey used a trimester recall, as mentioned previously. The results of the Westat (1989) annual recall bias study would bring the two estimates for 1996 into close alignment. They estimated that annual recall surveys increase participation estimates from 10-15% over quarterly or trimester surveys. Responsive Management (1999) also estimated the total number of anglers at about 50 million in a national telephone survey.

In a nationwide survey, Responsive Management (1995) estimated that about 12% of the adult U.S. population were "non-anglers" and had no interest in fishing. Another 18% were termed "ex-anglers" who had fished as a child but not as an adult. A third group was labeled "inactive" anglers. This group comprised about 25% of the population and had fished as adults but not within the past two years. The final group was "active" anglers and comprised about 45% of the population. Active group members had fished at least once during the previous two years.

Active anglers were further subdivided based on their fishing activity over the past five years. Infrequent anglers (19%) fished one or two years during the past five years. Sporadic anglers (16%) fished during three or four of the previous five years. Avid anglers (65%) had fished during each of the previous five years. This classification of anglers, based on consistency of annual participation, shows that up to one-third of anglers each year may not be actively fishing. Some may have several years between fishing trips but apparently remain interested in the sport. Examining the constraints each of the active angler groups, as well as ex-anglers and inactive anglers, may help in understanding participation differences.

This classification system is somewhat useful relative to license sales trends. Its main limitation is that fishing avidity is not considered. Anglers may have fished one or 100 times

Table 3.
Most Recent Year of Fishing: by Age Group

Age Group	Total Anglers In the Population	Most Recent Year of Fishing					
		1995		1990 to 1994		Before 1990	
	Number	Number	Percent	Number	Percent	Number	Percent
6 to 11 years	10,825	8,873	82	1,567	14	107	1
12 to 15 years	8,314	5,930	71	1,856	22	426	5
16 to 17 years	3,684	2,086	57	1,147	31	400	11
18 to 24 years	10,024	5,251	52	2,696	27	1,771	18
25 to 34 years	19,168	10,384	54	4,571	24	3,924	20
35 to 44 years	25,051	12,935	52	6,229	25	5,681	23
45 to 54 years	19,408	8,755	45	4,357	22	6,179	32
55 to 64 years	11,719	4,530	39	2,393	20	4,723	40
65 years and older	15,516	3,996	26	2,810	18	8,618	56
Total, all ages	113,590	62,714	55	27,630	24	31,829	28

Source: USFWS 1997

during any single year. The term “avid angler” used above denotes fishing during five of the previous five years. Avidity, however, generally has been used to represent annual fishing frequency in the literature that is more appropriate to sales trends for bait and tackle and estimating fishing pressure.

Few studies have examined fishing involvement over time. Most of the studies in this area have asked individuals to recall their fishing activity for past several years. As part of the screener survey for the 1996 National Survey, sample members were asked if they had ever been fishing during 1995 or in earlier years. Those respondents indicating they had been fishing also were asked to identify the year of their most recent fishing trip. The screener survey estimated over 113,000,000 individuals who had been fishing during 1995 or in previous years (Table 3). Half of these anglers reported they had fished during 1995 and the remainder during earlier years. Over one-fourth of the anglers in the population made their last fishing trip prior to 1990.

Year of most recent fishing trip clearly was related to age (Table 3). Most young anglers (<16 years of age) having fishing experiences in 1994 or earlier were still active in 1995. However, once age 16 or 17 was reached, less than 60% of this group remained active. Participation rates and dropout patterns remain consistent from age 16 through age 44. Once anglers reach age 45, the dropout rate increased significantly. When anglers reached retirement age (65 years or older), only one-fourth remained active. Reasons for this precipitous decline from age 45 and over have not been studied directly. However, it is thought that changes in family structure (children leaving home), work commitments, health, and other factors all play roles. The impact of these and other constraints to fishing will be discussed in a later section.

Table 4.
 Number of Anglers and Dropouts: by Age Group
 (Numbers in thousands)

Age Group	94 & 95			89 & 90		
	Anglers	Not Fishing 1995	% Dropouts	Anglers	Not Fishing 1990	% Dropouts
6 to 8 Years	4,510	396	8.8%	4,653	621	13.3%
9 to 11 Years	5,312	553	10.4%	5,110	674	13.2%
12 to 15 Years	6,868	934	13.6%	6,197	875	14.1%
16 to 17Years	2,596	510	19.6%	2,558	403	15.8%
18 to 24 Years	6,266	1,021	16.3%	8,195	1,352	16.5%
25 to 34 Years	12,375	1,970	15.9%	16,544	2,610	15.8%
35 to 44 Years	15,717	2,769	17.6%	14,760	2,297	15.6%
45 to 54 Years	10,676	1,910	17.9%	8,550	1,344	15.7%
55 to 64 Years	5,460	928	17.0%	5,404	795	14.7%
65 years or older	4,968	948	19.1%	4,857	721	14.8%
Total of all ages	74,748	13,934	18.6%	76,828	13,682	17.8%

Table 5.
 Anglers Participating for the First Time in 1995, by Age Group
 (Numbers in thousands)

	Total Participating for First Time		
	Anglers	Number	Percent
6 - 8 Years	4,114	1,147	27.9%
9-11 Years	4,760	708	14.9%
12-15 Years	5,934	500	8.4%
16-17Years	2,086	166	8.0%
18-24 Years	5,258	360	6.8%
25-34 Years	10,408	576	5.5%
35-44 Years	12,948	581	4.5%
45-54 Years	8,766	251	2.9%
55-64 Years	4,532	126	2.8%
65 Years or older	4,020	100	2.5%
Total of all ages	62,826	4,516	7.2%

The screener surveys for both 1991 and 1996 National Surveys asked respondents to recall their fishing participation during past years. Data in Table 4 indicate that 17.8% of the anglers fishing in 1989 did not fish during 1990. Similarly, 18.6% of the 1994 anglers did not fish during 1995. Dropout rates were the highest for the 16-17 year old group from 1994 to 1995 and the 18-25 year old group from 1989 to 1990. The 1989 to 1990, dropout rates were within one or two percent across all age groups. However, during 1994 to 1995, dropout rates tended to increase with age.

More anglers 16 years of age and older reported having their first fishing experience during 1995 than individuals 15 and under (Table 5). Interestingly, 1.6 million people 25 years of age or older had their first fishing experience during 1995. Participation in fishing for the first time appears to decline with age. As individuals grow older, the probability for them to begin fishing is reduced. After youngsters reach age 15, the probability of becoming involved in fishing drops by nearly 50 percent.

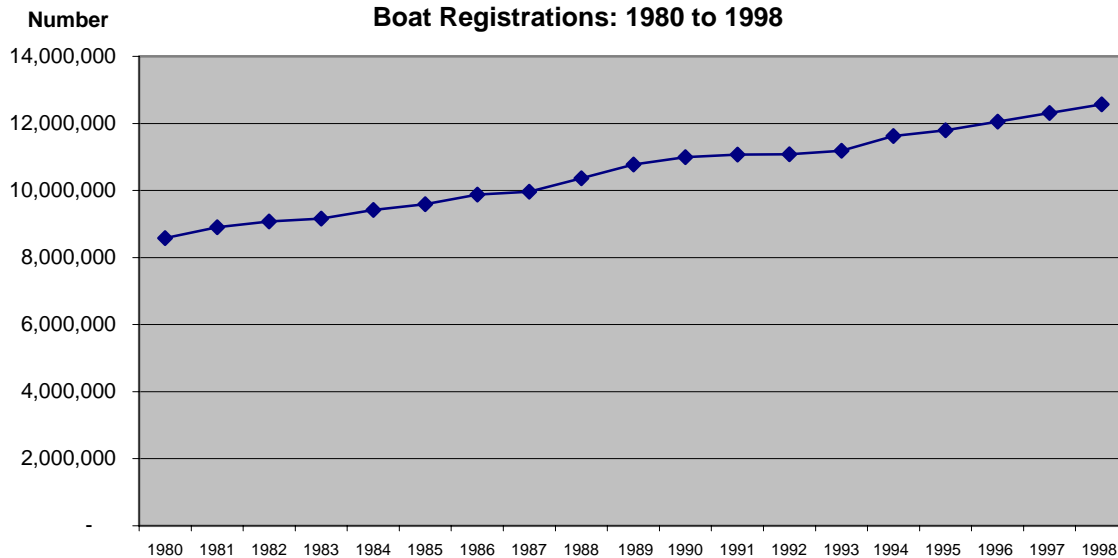
The importance of the dropout and recruitment information is two-fold. First, when anglers reach driving age there is a sharp drop-off in fishing activity. Whether socialization and leisure activity interests of youth change upon reaching high school age is not clear. Data in Table 4 indicates that half of the decline in fishing among 16 and 17 year olds occurs within the previous two years. This suggests a critical change period in personal and family leisure activity. Second, the marked decline beginning around age 45 coincides with when children are in high school or are leaving home to start college or work on their own. The loss of children (fishing partners) may be one of the main reasons for the decline. Again, the reasons for these changes are not fully understood, but the years between 45 and 55 are another critical time period in the life cycle of recreational anglers where the propensity to drop fishing as an active sport is heightened.

Boating Participation

Unlike recreational fishing participation, boating participation has been growing consistently for the past decade if boat registrations are any indicator (Figure 2). From 1990 to 1998 boat registrations increased from 10.9 to 12.5 million or 13.8%. Boat registration growth occurred in 44 of the 50 states during this period (Appendix B). Increases ranged from 2.3% in Connecticut to 125% in New Mexico. Of the six states experiencing declines in boat registrations, the smallest was in Colorado (-2.2%) and the largest in Massachusetts (-25.9%). Clearly, boat registrations reflect a much different participation picture during the 1990s than fishing.

Determining the total number of people who went boating during any particular year is a bit more difficult. One of the most recent studies by Roper Starch Worldwide, Inc. (1999) estimated the number of motor boaters at about 11% of the 1999 U.S. continental population 18 years and older. This calculation, based on an estimated population size of 202,491,000, would result in about 22.3 million adult boaters. This number would likely double or triple if children

Figure 2
Boat Registrations: 1980 to 1998



were added to the total. Statistics reported by the National Marine Manufacturers Association (NMMA) attempt to estimate all boating participants. While their literature does not describe the estimation process, yearly participation statistics involve multiplying the number of registered boats by the average number of individuals using a boat during a year (Petru 2000). NMMA (1991) estimated the total number of boaters in 1990 to be 73.3 million. Estimates were only 74.8 million or two percent larger for 1998 (NMMA 1999) which reflects a slight reduction in the number of individuals using each boat.

In a national household study, Hagler Bailly, Inc. (1997) estimated that 15.1% or 22.5 million households (from a total of 98.9 million) contained at least one person 16 years of age or older who was a recreational motor boater. Using an average of 1.5 recreational motor boaters per boating household, they estimated there were 37.4 million people who went motor boating during the April 1996 to March 1997 study year. A similar household study by the American Red Cross (1991) estimated that 15.4% of the households surveyed during the 1988-89 boating season contained a recreational boater (any type of boater). This is consistent with the percentage estimated in 1996-97 by Hagler and Bailly. The total number of boaters of all ages estimated in the Red Cross study for the 1988-89 boating season was 46.1 million. Thus, both household surveys produced compatible estimates. However, they differed markedly from the NMMA estimates. Differences are likely to be related to survey methodology and methods for extrapolating sample frequencies to population estimates. It is beyond the scope of this review to analyze methodologies to explore the differences more closely.

Future Boating and Fishing Participation

Participation in recreational fishing and boating over the next several decades will be affected by both demographic changes in the U.S. population and changes in recreational consumer tastes. Murdock and his associates (1992) were among the first to provide an in-depth examination of demographic trends and their likely impact on boating and fishing participation. They identified four trends that are likely to influence nearly all dimensions of American society: (1) decreased rates of population growth; (2) an aging population; (3) an increase in minority populations; and (4) a change in household composition. The effects of these trends were found to hold across regions of the nation, but the magnitude of the changes and their relative impacts varied from region to region. Differences across geographical regions were apparent in rates of population growth and the role minority populations will play in an area's total population growth. Aging of the population and changes in household composition were pervasive across all regions.

Implications of these trends have significant consequences for recreational fishing and boating because of their relationship to future growth of programs, goods, services, and because of their relationships to the social and economic characteristics of the population that affect its ability to support public services and businesses (Robey 1985). As population growth slows, so does growth in demand for goods and services. As characteristics of the population shift, so too may the general levels of education, income, and financial resources in the population (Murdock et al. 1992). To accent this point, Murdock et al. used U.S. Census Bureau statistics that showed that median household incomes for blacks and Hispanics were over 60% lower than for whites and that female head of households had incomes about 40% lower than male head of households. Because much of the U.S. population growth is expected to come from minority racial groups and Hispanics, involvement of these groups in fishing and boating in the future may be problematic.

One of the problems of projecting future angling and boating populations has been the assumption that participation rates would remain static over time (e.g., Loomis and Ditton 1988; Murdock et al. 1992a; Murdock et al. 1992b; Murdock et al. 1996). The data in Table 6 clearly shows that this is not the case. Thus, projections for future angler numbers should involve a series of projections based on available data and assumptions about future participation rates by age cohort. These assumptions can be monitored to adjust short-term predictions for planning purposes.

Building on the work of Loomis and Ditton (1988) and Murdock and his associates, Fedler and Holdnak (2000) developed scenarios for estimating the angling population for 2000, 2010, and 2020 that reflect three basic participation options. The first scenario assumed that per capita angling participation rates would remain at their 1996 level. The second scenario assumed that angling rates would revert back to a level similar to that found in 1991 (an increase over 1996). The final scenario assumed that the declining rates would continue for the 16-24 and 25-

Table 6.

Change in Fishing Participation Rates by Age: 1991 to 1996

Age Group	Rate	Rate	Change
	1991	1996	
16-24	18.3%	14.7%	-3.6%
25-34	23.5%	17.8%	-5.7%
35-44	21.9%	22.3%	0.4%
45-54	19.0%	21.7%	2.7%
55-64	15.6%	16.6%	1.0%
65 & Over	8.9%	9.2%	0.3%

34 age groups and would spill over into the 35-44 age group. This assumption is plausible because lower per capita rates in one age group will carry into the next older group unless some outside force increases the desirability of fishing among the older population. Voluntarily initiating fishing in middle and older adult life has been shown to be unlikely without some type of intervention (Responsive Management 1999).

Table 7 shows the projected population, by age group, for the U.S. population 16 years and older. The U.S. Census Bureau's middle series projections were shown as they historically have been the most accurate at predicting future population levels. Census Bureau projections call for the U.S. population aged 16 and older to increase from 201 million to 256 million or 20.4% by 2020 (Table 7). Changes in age cohort size from 2000 to 2020 are projected to vary widely. The population size of the 35 to 44 group, historically the largest angling group, will decline by nine percent. The projected population size for the 15-24 and 25-34 age groups will increase by 10% and 14%, respectively. The greatest population increases will come in the 55-64 (75%) and 65 and over (54%) groups. Increasing longevity and the large number of baby boomers born in the 1950s and 1960s accounted for these high growth rates.

The projected number of anglers for 2000, 2010, and 2020 was calculated in Table 7 using both the 1991 and 1996 participation rates. Comparison of these two rates yields results that show the effects of static (1996) and slightly increased (1991) participation rates. Additionally, a third scenario based on an extension of the rate changes from 1991 to 1996, termed the "Declining Rate" scenario, was used to show the effects of continued declines in participation rates over the next 20 years. The likelihood of such a scenario is about the same as the 1991 and 1996 rate scenarios given the absence of other fishing participation trend information.

The angler projections in Table 7 had considerable variation under each participation rate scenario. The 1991 rate scenario was the most optimistic of the three. Under this scenario, Fedler and Holdnak (2000) projected the number of anglers would increase (from 1996 levels) by 9.4 million (27%) by 2020. Using 1996 participation rates would result in 7.4 million (21%) anglers. The "Declining Rate" scenario would yield only 5.6 million (16%) anglers by 2020.

Table 7.

Estimates and Projections of the U.S. Population and Number of Anglers by Age for 1991, 1996, and Declining Rate Scenarios: 2000 to 2020
(in thousands)

Age Group	1996 Estimated U.S. Population	2000 Projected U.S. Population	2010 Projected U.S. Population	2020 Projected U.S. Population	2000 - 2020 Percent Change
16-24	32,147	34,472	38,702	38,047	10.4%
25-34	40,374	37,440	38,851	42,794	14.3%
35-44	43,311	44,894	39,442	40,710	-9.3%
45-54	32,341	37,166	44,160	38,837	4.5%
55-64	21,360	24,001	35,429	42,108	75.4%
65 & Over	33,872	34,835	39,715	53,733	54.3%
Total	203,405	212,808	236,299	256,229	20.4%

Age Group	1991 Rate Scenario	2000 Projected Anglers	2010 - Projected Anglers	2020 - Projected Anglers	2000 - 2020 Change
16-24	18.3%	6,308	7,082	6,963	10.4%
25-34	23.5%	8,798	9,130	10,057	14.3%
35-44	21.9%	9,832	8,638	8,915	-9.3%
45-54	19.0%	7,062	8,390	7,379	4.5%
55-64	15.6%	3,744	5,527	6,569	75.4%
65 & Over	8.9%	3,100	3,535	4,782	54.3%
Total		38,845	42,302	44,665	15.0%

Age Group	1996 Rate Scenario	2000 Projected Anglers	2010 - Projected Anglers	2020 - Projected Anglers	2000 - 2020 Change
16-24	14.7%	5,067	5,689	5,593	10.4%
25-34	17.8%	6,664	6,915	7,617	14.3%
35-44	22.3%	10,011	8,796	9,078	-9.3%
45-54	21.7%	8,065	9,583	8,428	4.5%
55-64	16.6%	3,984	5,881	6,990	75.4%
65 & Over	9.2%	3,205	3,654	4,943	54.3%
Total		36,997	40,518	42,650	15.3%

Age Group	Declining Rate Scenario	2000 Projected Anglers	2010 - Projected Anglers	2020 - Projected Anglers	2000 - 2020 Change
16-24	14.2%	4,895	5,496	5,403	10.4%
25-34	14.7%	5,504	5,711	6,291	14.3%
35-44	17.3%	7,767	6,823	7,043	-9.3%
45-54	21.1%	7,842	9,318	8,195	4.5%
55-64	21.3%	5,112	7,546	8,969	75.4%
65 & Over	9.2%	3,205	3,654	4,943	54.3%
Total		34,324	38,548	40,843	19.0%

Source: Fedler and Holdnak 2000

Table 8.

Total Population of the United States and Change by Race/Ethnicity: 1850 to 1996
With Projections to 2020

Year	White	Percent Change	Black	Percent Change	Other	Percent Change	Hispanic Origin	Percent Change
1850	19,553,000		3,639,000			n/a	n/a	n/a
1860	26,923,000	38%	4,442,000	22%	79,000	n/a	n/a	n/a
1870	33,589,000	25%	4,880,000	10%	89,000	13%	n/a	n/a
1880	43,403,000	29%	6,581,000	35%	172,000	93%	n/a	n/a
1890	55,101,000	27%	7,489,000	14%	358,000	108%	n/a	n/a
1900	68,809,000	25%	8,834,000	18%	351,000	-2%	n/a	n/a
1910	81,732,000	19%	9,828,000	11%	413,000	18%	n/a	n/a
1920	94,821,000	16%	10,463,000	6%	427,000	3%	n/a	n/a
1930	110,287,000	16%	11,981,000	14%	597,000	40%	n/a	n/a
1940	118,215,000	7%	12,886,000	8%	589,000	-1%	n/a	n/a
1950	135,150,000	14%	15,045,000	17%	1,131,000	92%	n/a	n/a
1960	158,832,000	18%	18,872,000	25%	1,620,000	43%	n/a	n/a
1970	178,098,000	12%	22,581,000	20%	2,557,000	58%	n/a	n/a
1980	194,713,000	9%	26,683,000	18%	5,150,000	101%	14,609,000	n/a
1990	208,704,000	7%	30,483,000	14%	9,523,000	85%	22,354,000	53%
1996*	219,686,000	5%	33,514,000	10%	12,096,000	27%	28,305,000	27%
2000*	226,265,000	8%	35,332,000	16%	13,708,000	44%	32,479,000	45%
2010	241,769,000	7%	39,982,000	13%	18,110,000	32%	43,688,000	35%
2020	257,394,000	6%	44,736,000	12%	22,797,000	26%	55,156,000	26%

* Population change for 1996 and 2000 were calculated from the 1990 base

Clearly, varying assumptions about participation rates can result in estimates differing by as much as 67 percent.

Data are not available for making detailed boating projections like those presented above. Information on the proportion of the population participating in boating by age is not available as it is for fishing. The absence of appropriate data for making boating projections leads to making crude projections based on growth in boat registrations inadvisable.

Racial and Ethnic Population Growth

Examining the growth of minority and ethnic populations in the United States, Fedler and Holdnak (2000) confirmed the assertions of Murdock et al. (1996) for the country's population. Table 8 shows historic white and black population levels from 1850 to 1990 with the estimate for 1996 and projections for 2000, 2010 and 2020. The table shows that proportion of whites in the population has been declining since before 1980. The black population has remained stable at

about 12% of the population, while Hispanics have increased their proportion since the Census Bureau began reporting ethnic data in 1980. Hispanics may classify themselves as one of several races but predominantly list themselves as white. The white population growth rate also has been in decline since 1960. The projected growth rate from 1990 to 2000 was also about eight percent. Growth for the white segment of the population is projected to increase by 14% over the next two decades. They will comprise 79% of the population in 2020, down from 84% in 1990.

The black population growth rate has been about twice the rate of the white population since 1970. Their proportion in the population will continue to grow as this segment of the U.S. population is projected to increase by 27% over the next twenty years. By 2020, the black population will comprise 14% of the U.S. population.

The remaining racial components of the U.S. population are shown combined in the "Other" category in Table 8. This category is comprised of American Indian, Eskimo, Asian and other races. Overall, these groups comprise a small proportion of the population, but have a very high growth rate. In 1990 they comprised four percent of the population. By 2020, this percentage is projected to double. Between 1980 and 1990, these minority races grew by 85% and were expected to increase by another 44% by 2000. This group will continue to be the fastest growing segment of the population through 2020 and will be driven by the Asiatic component

Growth of the Hispanic population of the United States mirrors that of the other racial groups. Whereas the Hispanic ethnic group crosses several races, their proportion in the population has been increasing since 1980. Hispanics comprised nine percent of the population in 1990. Their proportion is projected to grow to 17% by 2020. The growth rate of this population segment was 53% from 1980 to 1990 and was projected to be about 45% for the decade of the 1990's. This growth rate is expected to decline somewhat over the next two decades, but will still outpace the white and black populations.

It should be noted that the Hispanic population is not distributed evenly throughout the states, but concentrated in several southern states. Thus, while a small portion of the overall American population, Hispanics are approaching a majority in some states.

The proportion of each racial group and Hispanics that fished during 1996 is shown in the second column of Table 9. It is interesting that the "other" race category fished at a per capita rate similar to the White group. This finding is at variance with the 1996 National Survey estimate of 11 percent. The reason for this is that in this report, Census Bureau reports were used for all population estimates and projections. The 1996 Census Bureau estimate of individuals in the "other" racial category (American Indians, Alaska Natives, Asian, and Pacific Islanders) was approximately 12.1 million (Table 7) for all ages. The population estimate reported in the 1996 National Survey (ages 16 and over) was 15.2 million. Since we were unable to document the population estimate used in the national survey report, we used the data from Census Bureau

Table 9.

Population and Angler Numbers by Race/Ethnicity: 1996 to 2000
(16 years and older; in thousands)

	1996		2000	2010	2020
Population					
White	170,772		177,010	192,336	204,613
Black	23,929		25,676	30,313	34,189
Other	8,704		10,122	13,650	17,427
Hispanic	15,267		22,160	30,389	38,978
Total Population	203,405		212,808	236,299	256,229
1996					
Anglers		% of Pop.		Number of Anglers	
White	31,791	18.6%	32,952	35,805	38,091
Black	1,802	7.5%	1,934	2,283	2,575
Other	1,653	19.0%	1,922	2,592	3,310
Hispanic	1,185	7.8%	1,720	2,359	3,025
Total Anglers	35,246		36,808	40,680	43,975

reports for total population and aged 16 and over (USCB 1996). Black and Hispanic population segments participated at less than half the rate of whites and other racial groups.

Table 9 also shows the 1996 population estimate for each of the three racial groups and Hispanics aged 16 and over. Based on the proportion of each population segment that fished in 1996, angler numbers by race and ethnicity were estimated for 2000, 2010 and 2020. The number of anglers in all groups is expected to increase over the next two decades. White anglers, while still a large majority, were projected to increase by 20% from 1996 to 2020. If participation rates remain the same as in 1996, black anglers will double, and participation by the "Other" races will grow by 155 percent. Even with the growth in minority angling populations, white anglers will continue to dominate the fishing marketplace. By 2020, they are projected to comprise 86% of the market, down from 90% in 1996. The projection of angler numbers is based on the assumption that per capita participation rates for each of the races and for Hispanics will remain stable over time. The previous national surveys have shown that this is problematic. Some variation will occur. However, the general trends in population and angler growth in the racial and ethnic groups is helpful in understanding future growth of these angling population segments for planning and management purposes.

Angler and Boater Characteristics

Most angler and boater studies that have been conducted in past years provide little information beyond the characteristics of the sample or population being surveyed. Questions such as, "do the educational, income, age, or residence characteristics of boaters or anglers differ from those of the general population," are generally not addressed. The review

of angler demographics by Duda (1993) highlights this point. Knowing whether the angling or boating participants differ from the general public has service and marketing implications for agencies, organizations and businesses interested in boating and fishing activity.

Demographics

In two of the few publications that detail angler characteristics, Fedler (1994) and Fedler and Leahy (2000) profiled the characteristics of freshwater, saltwater, and Great Lakes anglers as well as those for specific freshwater and saltwater species. In both publications based on 1991 and 1996 National Survey of Fishing, Hunting and Wildlife Associated Recreation, residence location, age, income, and education patterns were noticeably different among freshwater, saltwater, and Great Lakes anglers. Although few of these differences were dramatic, many statistical differences were noted that help to characterize different types of anglers.

From a national perspective, Fedler and Leahy (2000) found that freshwater anglers had a greater propensity to be from rural areas, have lower educational levels, and have a greater percentage of women participating. Saltwater anglers tended to live in urban areas, have higher education levels, and also have a relatively higher percentage of women participating. Great Lakes anglers lived more predominantly in urban areas, generally had higher incomes than average, and had a lower proportion of women anglers. Freshwater, saltwater and Great Lakes anglers all had similar age and racial structures.

Demographic variables differentiated among anglers for different species as well. For freshwater species, women tended to fish less for crappie, black bass, walleye, trout, salmon, and steelhead than for panfish, striped bass, and catfish. Crappie and panfish anglers tended to be older, while catfish anglers were younger on average. Striped bass, catfish, and sauger anglers were apt to reside in urban areas, while trout, salmon, and steelhead anglers lived in greater numbers in small cities and towns. Anglers for the coldwater species of salmon and steelhead had significantly higher incomes, and trout anglers had higher education levels on average.

Fewer demographic differences were found among saltwater anglers seeking various species. Salmon anglers resided more frequently in urban areas, were older, and had higher education and income levels than other anglers. A greater percentage of lingcod anglers were male, were from small cities or towns, were younger, and had higher education levels than anglers for other species. Seatrout anglers were older and had fewer women amongst their ranks. Finally, mackerel anglers had relatively higher incomes and education levels than average for saltwater anglers and proportionally lived in rural areas with greater frequency.

There were also differences among anglers seeking Great Lakes species noted by Fedler and Leahy (2000). For example, fewer women fished for trout, lake trout, salmon, and steelhead than for perch, black bass, and walleye. Trout anglers had a greater propensity

to be from urban areas and to be middle aged, with higher than average income and education levels. Steelhead and lake trout anglers were younger than average and lived in small towns and rural areas with greater frequency.

The subtle, but significant, differences among anglers fishing in the three aquatic environments and seeking different species are likely to have more than descriptive value when used with other attitudinal, motivational, and lifestyle information to identify unique angling market segments. The diversity present within freshwater or saltwater anglers, and within anglers for specific species (Graefe 1980; Ditton 1980; Bryan 1978), requires the inclusion of a broader array of variables to develop profiles of anglers that will be useful for target market identification and development.

Gender

As mentioned above, women participate in fishing at a much lower rate than men. Although there is some variation by fishing environment and species sought, women are about one-third as likely to fish as men. The percentage of males and females in the U.S. population who fished during 1991 and 1996 was very consistent (USFWS 1993; 1997). About 28% of males and 10% of females aged 16 and over participated in fishing in each of the two years. During 1995 (as measured in the 1996 screener survey), 40% of boys aged 6 to 15 had a fishing experience. Nearly 28% of girls the same age also fished. However, it appears that about one-third of the boys and two-thirds of the girls drop out of fishing by the time they are 16 years old.

Some studies have focused on estimates of the proportion of anglers in the general population. These studies estimated the percentage of individuals who had participated in fishing at least once during their lifetime. Miller and Wasson (1991) found that 84% of males and 73% of females in Ohio had fished at least once during their lives. A similar study by Miller (1992) found 92% of males and 73% of women in the Ohio population had fished.

The gender distribution of anglers is one of the most obvious demographic characteristics where differences are apparent. Several studies have identified the percentage of males and female in an angler population (e.g., Dargitz 1988; Thompson et al. 1990; Duda and Colquitt 1991; Behavior Research Center, Inc. 1992) with the conclusion that males outnumber female anglers by a considerable margin. The 1996 National Survey (USFWS 1997) estimated that 73% of adult anglers were male and 27% female. This distribution differs substantially by state (Fedler and Holdnak 2000), but the pattern holds true in all 50 states. The percentage of male and female youth anglers is weighted (relatively) more towards girls at the younger ages. In 1995, about 36% of youth anglers were girls and 64% boys.

Youth participation in fishing is considerably higher than for adults according to the 1991 and 1996 National Surveys. About 40% of boys and 30% of girls aged 6 to 15 fished

during both 1990 and 1995. These rates were about 20 percentage points higher than for both adult males and females. Thus, the decline in fishing participation rates from youth (15 and under) to adult discussed above is prevalent among males and females, although it is more pronounced for girls.

Another difference between male and female recreational fishing participation is the age at which fishing participation begins to decline. Among males, the percentage of participants in each age group peaks at 35-44 years and then declines. For females, fishing peaks at the 25-34 age group and then declines. The decline begins earlier for women and is more precipitous. Reasons for the rapid decline are not well understood, but may be related to changes in family structure, work and home responsibilities, or other factors (Broh 1993).

Reasons for Gender Differences

Several authors suggest that the reason women participate less in fishing, boating and other outdoor recreation activities is that they have been socialized out of these typically male-oriented activities by a number of sources (Henderson et al. 1988; Henderson 1991). Henderson and Bialeschki (1991) suggests that the initial reluctance by girls to participate fully and enthusiastically in these activities may be the result of their early socialization into domestic and subsidiary roles which has implications for their choice of academic subjects and recreational activity. Leaman and Carrington (1985) found that girls might be marginalized in early school years, such that domestic activities are encouraged. They found that schools channel different sectors of the population, including minorities and ethnic groups, into different social roles. This starts with physical education and continues with academic subjects. The result is an apparent disdain by older women for activities typically viewed as male-oriented.

It should be recognized that existing patterns of recreational participation are not necessarily indicative of girl's and women's so-called "natural interests or abilities," but may well reflect the socialization process which stream females, from an early age, into activities viewed by parents, teachers, and community members as conducive to femininity (Lenskyj 1988). On the other hand, there is some evidence that this socialization process can be overcome in later life, particularly when spouses fish or boat (Jackson et al. 1989) or women become involved in organized outdoor programs designed specifically for them (Lueck and Thomas 1997; Thomas and Lueck 1996). Overcoming the constraints to fishing and boating involvement for women involves understanding their differences from men and using this information to design more gender appropriate messages and programs.

The feminism and psychological literature has identified several differences between men and women important for understanding how to design programs for effectively changing attitudes and behaviors toward fishing and boating. These studies suggest that women are task-oriented, qualitative, altruistic, and contemplative compared to the time-oriented, quantitative, self-interested, and competitive characteristics of men (Howard 1979; Lenskyj 1986, 1988; Philbin et al.1995). As a result, men and women learn differently

(Belenky et al. 1986; Kolb 1976). Learning style is defined as an “individual’s characteristic ways of processing information, feeling, and behaving in learning situations” (Smith 1982, p. 24). Men follow the traditional learning style we find in public education today. This style is primarily abstract and reflective and is characterized by thinking and watching, and using logical steps to break things down and analyze them. Females learn better in hands-on and practical settings, emphasizing the realm of the affective and doing. If women are watching and feeling, or doing and thinking, they learn best. In the male-dominated paradigm, women feel as if they are being talked at with no transfer of knowledge; just words without meaning being spoken.

The social component of recreation and leisure is also important to women. Social networks play an important role in motivation and development of women’s participation in outdoor recreation activities (Kiewa 1995). They are motivated by personal growth, social interaction, identity, relaxation, learning, independence and escape. They look to peers for support when entering a new activity (Kiewa 1995). Enduring involvement centers on attraction to and centrality of the recreational activity, and opportunities for self-expression. The factors that intervene, block or constrain involvement in an activity for women generally involve their inability to successfully negotiate or deal with them. These constraints differ in several aspects from those men encounter.

Race and Ethnicity

For many years social scientists have been interested in questions involving race, class, and leisure behavior (Mueller and Gurin 1962; Washburn 1978; Klobus-Edwards 1981; Stamps and Stamps 1985; Dwyer and Hutchinson 1990). This literature generally concludes that African Americans participate in many leisure activities at lower levels than Anglo or white Americans, or engage in different forms of leisure (Floyd et al. 1994). Two theories have been used to explain the divergence between blacks and whites; the marginality and ethnicity hypotheses.

The marginality hypothesis emphasizes minority status as a causal factor in explaining “under-participation” among black minorities which results primarily from limited economic resources. Hence, by historically occupying a subordinate class position, minorities have had limited access to society’s major institutions. This situation negatively influences life-chances and lifestyles, which is reflected in certain forms of recreation and leisure participation.

The ethnicity, or subcultural, explanation states that minority under-participation or inter-group variation results from differences between racial or ethnic groups value systems. This explanation suggests that regardless of socioeconomic standing, cultural processes are more important in explaining variation between blacks and whites in leisure participation patterns (Floyd et al. 1994).

In a review article, Allison (1988) concluded that empirical evidence favors the ethnicity hypothesis. This is in consonance with other literature that shows that blacks are under-represented in outdoor/nature-based recreation which is related more to black sub-culture rather than class (Washburn 1978; Washburn and Wall 1980; Klobus-Edwards 1981; McGuire et al. 1987; Dwyer and Hutchinson 1990). Floyd et al. (1994) have pointed out limitations of these studies. However, both McGuire et al (1987) and Dwyer and Hutchinson (1990) strongly suggest that race and class interact to define recreation choices. For fishing, these choices become blurred within a racial context because middle class blacks and whites participation patterns are very similar. Both differ from poor/working class blacks. Poor/working class whites had leisure participation patterns similar to middle class blacks and whites. Thus, race and social class appear to interact at the lower class levels.

Some researchers have shown that the motives or meaning structures of fishing differ by minority status. For example, Campbell (1989) found that minority groups approach recreational fishing from different cultural frameworks, which in part determine the sites they access and the resources they actually exploit. Whites fished primarily for diversion and relaxation, Southeast immigrant groups fished for consumption. Others have found that even in urban areas, blacks may view angling more for its contribution to household consumption than do whites (West et al. 1992). Blahna (1992), on the other hand, reported cultural similarity among ethnic groups, with the exception of blacks and Hispanics, which focused more on socializing than other outcomes when fishing.

Work by Toth and Brown (1997) supports the argument that gender and race are significant important components in the creation of meaning for fishing experiences. In this unique paper, they identified the structure of fishing experiences for black and white anglers, and male and female anglers in the Mississippi Delta region. Their research found that social groups based on race and gender play a significant role in defining the meaning of fishing, even if many are the same meanings. They conclude that although the same leisure activity (fishing) may mean different things to different people, there is continuity in meaning structures across larger demographic groups. In other words, similar structures may be present, but different aspects of these structures may be important to different groups. For example, blacks placed a greater importance on the consumptive aspect of fishing than whites. Toth and Brown found that their research did not support the previous research that black anglers are significantly more interested in socializing while fishing than white anglers. For white and male anglers (of both races), fishing for "sport" was the unique common factor. Female and male anglers (regardless of race) seemed to share common meanings for their fishing experiences.

Participation by Hispanics in fishing and boating is similar to that of blacks, other minorities, and women (Pullis 2000). However, as Gramann (1993) and Pfister (1993) point out, Hispanics use recreation as an important social space in which basic cultural values can be maintained and expressed. Burroughs and Reeff (1996) suggest that by examining the concepts of ethnic identity, acculturation, and selective acculturation we can better understand Hispanic participation in fishing, boating, and other outdoor recreation activities.

Ethnic identity refers to one's sense of belonging to an ethnic group and that part of one's thinking, feelings, perceptions and behavior are due to ethnic group membership (Pfister 1993). This strong sense of ethnic identity persists over time and is generally related to country of origin. The degree Hispanics become integrated into mainstream society is called acculturation. The process of acculturation involves a process of change in terms of language, cognitive style, identity, and attitudes (Marin and Marin 1991). As Zambrana (1995) points out, the degree of acculturation is dependent on the circumstances surrounding migration, years of U.S. residence, circumstances of migration, education and income level, and geographic location. Hispanics often form large communities that hinder acculturation through lack of contact with mainstream American culture.

Among Hispanics, selective acculturation generally occurs (Burroughs and Reef 1996). This allows them to selectively accept certain Anglo traits while retaining their own core values. This resistance to complete adoption of the foreign culture is caused by cultural pride, lack of English skills, and the belief that migration is temporary.

Central to the Hispanic value system is the family. Familialism is a value that involves strong individual identification with and attachment to nuclear and extended families. Among members of the same family there are strong feelings of loyalty, reciprocity, and solidarity (Marin and Marin 1991). These strong family ties influence recreation behavior. Several studies have shown that Hispanics recreate in groups larger than other ethnic groups (Hutchinson 1988). Their use of recreation facilities and participation styles were also different (Carr and Chavez 1993). Further, Carr and Williams (1993) and Gramann et al. (1993) reported that more established Hispanics placed greater importance on the family oriented benefits of recreation than other groups.

Floyd (1995), Gramann et al. (1993), and Floyd and Noe (1993) all found consistent results when they examined the relationship between acculturation and recreational activity participation. In each of the studies, the most acculturated Hispanic groups did not differ significantly from Anglos in the number or types of activities participated in, the perceived benefits of participation, and the style of participation. Less acculturated groups differed on all these participation characteristics. An interesting finding by Floyd (1995) showed that Mexican Americans participated in fishing, tent camping, and ORV use with greater frequency than Anglos. This is at odds with fishing participation data on Hispanics presented earlier, but may be explained by the population being surveyed and the way activity participation was measured.

One final observation on racial and ethnic group participation in outdoor recreation may add some additional perspective to under-participation. Recently, fear and racism in the outdoors has begun to receive attention in the literature. Ewert (1986) reported that physical dangers and socially based fears were the most often reported situational fears in outdoor recreation settings. Physical dangers included fear of falling, fast or deep water, and lack of food. Encounters with potential attackers, racial discrimination, and becoming

separated from the group were among some of the common socially based fears. In a study of forest recreationists, Virden and Walker (1999) found that blacks and Hispanics found forest environments more threatening and annoying than whites. Safety concerns were related to preferences for higher levels of service and development based on affective and perceptual/cognitive meanings involving fear, anxiousness, and real or perceived threats (Johnson 1998; Virden and Walker 1999). Wallace and Witter (1992) and Taylor (1989) found that blacks preferred outdoor recreation settings that were well lit and well supervised. Such preferences were based on negative feelings about natural environments caused by fear of wildlife or racism (West 1993). Concerns about personal safety by minorities have also been found in hunting, fishing, and boating focus groups reported by Bissell and Duda (1995) and Responsive Management (1998). These same concerns for personal safety by women have been noted earlier.

Blahna and Black (1993) reported findings from 22 focus groups with ethnic minority groups in Chicago that confirmed concerns about racism. Their findings suggest that racial barriers in outdoor recreation settings are much more prevalent and complex than have been indicated in past research. They conclude that racism fears may be a greater reason for minority and ethnic group under-participation in activities like fishing and boating than previously thought.

Socialization and Specialization

Outdoor recreation pursuits like fishing and boating are social activities in that they involve family and friends. In 1969, Burch proposed a personal community hypothesis as the basis for all recreation behavior. He suggested that people lived in personal communities at home and work containing immediate and extended family, friends, and colleagues. Within these communities, people shared various interests and activities and individuals were socialized into particular activities as a result. Burch's work helped to focus later research efforts toward understanding the broader influence of various sets of family and friends, not just those with whom one participated. Early studies revealed that socio-economic variables were poor predictors of which activities people participated in and with what frequency. However, when information on the social group participated with (family, friends, or some combination) was included with socio-economic variables, the amount of variance explained with regard to participation frequency increased significantly (Field and O'Leary 1973). Like fishing and boating, Etzkorn (1964) found that camping was primarily a family activity and suggested that campers were attracted to the activity because of the experience opportunities afforded by the social relationships or interactions involved within the camping party. Thus, social group composition is important as a mechanism for understanding the particular meanings that individuals attribute to their recreation activities. For example, going fishing or boating with the family is a different activity in terms of experience outcomes sought than going with either close friends or colleagues from work. Therefore, meanings attributed to recreation experiences are socially created by groups (Lee 1972).

Recreation socialization involves the acquisition of the "skills, experience, relational norms, equipment, attitudes, and frequently the taste required for participation" in leisure activities (Kelly 1974). McGuire et al. (1987) describe recreation socialization in terms of two major models: a childhood determination model and a leisure career model of participation. Both are useful for understanding socialization processes for fishing and boating.

According to the childhood determination model, participation in outdoor recreation activities is learned through childhood experiences. Particular skills are learned from parents, peers, and educational programs during the early years (Kelly 1982). Several studies have shown that early childhood experiences can influence participation styles, the type of activities chosen, and extent of involvement as an adult. From previous literature we would expect that adult fishing styles, i.e., freshwater fishing for bass, are influenced by childhood experiences where adults played a major role in socializing them accordingly.

According to work by Siemer et al. (1989), participation in Lake Ontario salmon fishing begins with a basic awareness of fishing and progresses through various stages of interest and involvement, with family and affiliative factors playing a major role. Siemer et al. (1989) found that most anglers started fishing for panfish in small ponds with their fathers when they are 6-8 years of age or younger and that their families and friends played a major role in providing them with the support they needed, positive outcomes, and plenty of opportunity to participate in fishing.

The influence of childhood socialization on adoption and continued involvement in hunting, for example, has been well documented (Applegate 1989; O'Leary et al. 1987) and could be useful to our understanding of the socialization process. O'Leary et al. (1987) report a statistically significant association between age of first hunting experience and frequency of adult participation; namely, more than 83% of those who hunt began their involvement by 18 years of age. Almost 70% of hunters were involved by their 15th birthday: less than five percent of the hunters studied in their national data set were socialized into hunting after age 30 (O'Leary et al. 1987).

Generally, hunters who grow up in rural areas, participate in hunting with family members, enjoy high levels of family involvement in hunting activity, and are exposed to hunting experiences before they are 16 years of age enjoy high levels of hunting activity later in life with high levels of commitment to the activity. Social influences and associated experiences are important to activity involvement and is reinforced by Purdy et al. (1989): "other people, not magazines, TV shows, or other forms of communication, recruit new hunters." Not surprisingly, anglers report they were introduced to fishing by family members and "relevant others" (Duda et al. 1995a; Dann 1993). In a study of youth recruitment to fishing, Dann (1993) reached the following conclusions:

"Teen involvement in fishing was the best predictor of long-term fishing involvement. Childhood fishing involvement was related indirectly to current

fishing by influencing teen fishing involvement. Childhood and teen fishing involvement were related to the presence of family fishing socialization agents. In particular, high angling involvement was associated with youth who had fathers who fished frequently and high proportions of extended family members who fished. Childhood and long-term fishing involvement were also predicted by very early fishing initiation (prior to age 5). Age of first fishing experience was substantially lower for males and for those with family fishing backgrounds than for those without such backgrounds. Sex was directly related to childhood, teen, and long-term fishing involvement, with males more involved at each life stage."

Fishing can be understood as an aspect of family life given the fact that most anglers are initiated within the context of the family. A large percentage of Americans who have fished once, did so in the context of fishing with another family member (Duda et al. 1995b). Most anglers prefer to fish with a family member or friend (Responsive Management 1996) and those who do not fish would be willing to learn from other family members more so than from friends or wildlife enforcement officers (Responsive Management 1999). This social aspect of fishing is probably more important than factors of catching large numbers fish or trophy size fish and may be as important as the naturalistic values of fishing (Responsive Management 1999). In all likelihood, fishing is best understood as a combination of social and natural values (Bissell and Duda, 1995). The social and naturalistic values are quite consistent across other demographic factors and appear to be the only values that can be taken as a generalization.

Although socialization during childhood has been shown to be a major influence on participation in outdoor recreation activities, the childhood determination model is not totally adequate to explain adult participation in activities. Kelly (1974; 1977) views this model as oversimplified and proposes instead that socialization into leisure activities occurs over a lifetime rather than just a refinement of activities learned as a youth. He found that some began activities during childhood and others took them up in adulthood. Further, he found no differences in the kinds of activities begun as a child and those initiated as an adult, nor with whom activities are begun in childhood and adulthood. While many activities learned early in life are part of an individual's recreation repertoire in later years, Kelly suggests that we have leisure participation careers just like we do in the workplace where skills, attitudes, roles, and resources change through the entire life cycle. Activities are added, dropped, expanded, and re-learned depending upon an individual's circumstances. This might explain why Christensen and Yoesting (1973) found that only 8 of the 45 outdoor recreation activities respondents reportedly participated in were carried over from childhood. Interestingly, fishing was not one of those activities currently participated in that carried over from childhood in this Iowa study area, but power boating and canoeing were participated in both childhood and adult life.

Individuals need both change and stability over the course of their lives (Iso-Ahola 1980). Also, activities like recreational fishing and boating may have different social meanings to participants at different times in their lives. Consequently, Kelly (1974, 1977) concluded the childhood determination model did not adequately explain why some participated in recreation activities and others did not; he viewed recreation participation as a dynamic and continuous process occurring over a lifetime.

The leisure career idea suggests that people will continue to be socialized into fishing during adulthood. As with the childhood determination model, the importance of social influences by "relevant others" and associated experiences will play a major role. There are simply too many people in the population above childhood and teen years who do not currently fish to not make efforts to introduce (or re-introduce) them to recreational fishing. McGuire et al. (1987) used a national data set to test whether lifelong learning of leisure activities takes place. They divided participants aged 65 and older into "expanders" and "contractors" based on whether they maintained their current leisure repertoire and initiated one new activity or not. The contractors had added few outdoor recreation activities to their repertoire after reaching adulthood. Expanders, on the other hand, reported they learned about 18% of the activities they were participating in currently before age 18 and only 2% between ages 18 and 21. Unfortunately from a marketing perspective, McGuire et al. (1987) were unable to differentiate between expanders and contractors on the basis of variables such as age and income. The explanation would appear to lie with their interactions in family, work, and friendship settings. Most participants in birding, for example, started birding after 18 years of age (McFarlane 1996). However, the most advanced or specialized birders were more likely to have been initiated during their childhood years (1-18) than during adulthood. National Survey data (USFWS 1997) shows that 44% of all anglers fishing for the first time in 1995 were 18 years of age or older.

Although the socialization process has been more thoroughly investigated for fishing and hunting, there is no reason to believe that the childhood determination model or the leisure career model are not useful for explaining boating participation. For example, if an individual participates as a child in boating as a family activity and has good experiences, the person is likely to continue to participate as an adult. Likewise, again for social interaction reasons, some individuals are likely to be socialized into boating later in life.

There is considerable diversity within angler and boater populations. Unfortunately, this diversity is often easily overlooked when averages and other central tendency measures are used to communicate results from angler and boater studies. This has been recognized previously as "the average angler that doesn't exist" except in research reports. Private sector marketing specialists and agency human dimensions specialists are quite familiar with the problems of thinking of participants "in aggregate." They know there are various groups or segments within each market that "view the world differently" regarding their fishing and boating pursuits.

There are various ways to segment angler and boater populations to better understand their within-group differences. They can be segmented by personal characteristics (social, demographic, and economic), fishing location (freshwater or saltwater), species sought, and fishing frequency among others. These segmentation efforts are single dimensional and considerable diversity remains within segments. These traditional means of segmentation do not provide an explanation for, or prediction of, group differences that are independent of the classification variable (Wilde and Ditton 1994).

The concept of recreation specialization provides an alternative means for understanding the diversity of the angler and boater markets. Bryan (1979) first defined specialization as "a continuum of behavior from the general to the particular reflected by equipment and skills used in the sport, and activity and setting preferences." He identified four types of anglers, each with a unique place on the specialization continuum. At the lower end were occasional anglers, followed by generalists, technique specialists and, finally, at the upper end, technique and setting specialists. Occasional anglers fished infrequently because they had not established the activity as a regular part of their leisure. Generalists included those anglers who had established the sport as a regular activity and used a variety of techniques. The third group, technique specialists, included anglers who focused on a particular technique to the exclusion of other techniques. And finally, technique and setting specialists exhibited distinct preferences for particular techniques and water types where they pursued their activity. Bryan suggested that the typology and location of anglers on the continuum were reflected in their frequency of participation, setting preferences, technique preferences, choice of equipment, importance of catch, social unit of participation, and resources management preferences.

Bryan's work stimulated other research efforts to understand angler diversity (e.g., Graefe 1980; McGurrin 1986; Chipman and Helfrich 1988; Ditton et al. 1992). Graefe (1980) completed the first empirical verification of this conceptual framework. He concluded that fishing frequency, namely, the number of days of fishing in the previous twelve months, was a useful surrogate for fishing specialization. Those anglers who fished most frequently were characterized by greater involvement with equipment, higher levels of skill, and greater resource dependency. McGurrin (1986) segmented a sample of trout anglers into three specialization groups and found differences in fishing activity patterns, fishing effort, gear use, water preferences, and water management preferences. Chipman and Helfrich (1988) used the specialization framework to classify river anglers in Virginia. They found group differences in angler motivations for fishing, perceptions, and fishing management preferences. In particular, they found years of fishing experience, fishing frequency, level of investment in fishing, and centrality of angling to lifestyle to be the four most important contributors to specialization. They found that high specialization bass anglers were likely to cite resource-related fishing motivations, rely on skill to catch a fish, prefer to catch and release large fish, and favor restrictive management regulations. On the other hand, less specialized bass anglers reported escape and family-oriented recreation as fishing benefits sought, placed more emphasis on luck to catch fish, were satisfied with catching smaller fish, and favored less restrictive fishing regulations.

Ditton et al. (1992) tested for group differences in resource dependency, mediated involvement of anglers, and importance attached to experience preferences for fishing using a conceptual scheme of four generalized subworlds developed by Unruh (1979, 1980). These four subworlds (strangers, tourists, regulars, and insiders) were defined in terms of their social proximity to knowledge about the social world of fishing, for example, and the activities therein. The four subworlds identified can be ordered along a theoretical dimension having four characteristics (orientation, experience, relationships, and commitment). Also, as Unruh (1979) suggests, movement from one subworld to another is probably not linear or inevitable.

Ditton et al. (1992) also found that high specialization anglers considered catching big, distinctive, or trophy fish to be an important part of their fishing experiences in contrast with the low specialization group who were generally disinterested in the "rare event" aspects of fishing. Further, high specialization anglers were shown to have a higher level of interaction with various fishing-oriented media than low specialization anglers. The former group was more dependent on several forms of mediated interaction, i.e., information provided by management agencies, newspaper articles, magazine articles, and television shows. And finally, high specialization anglers saw many of the non-fishing specific motivations as being equal to, if not of greater importance, than fishing-specific motivations; low specialization anglers had a superficial and perhaps naive view of fishing as being about catching fish to the exclusion of other important intrinsic benefits.

Constraints to Boating and Fishing

All individuals are constrained in their choice of and participation in recreation activities (Iso-Ahola and Mannell 1985). A constraint is defined as anything that inhibits people's ability to participate in leisure activities, to spend more time doing so, to take advantage of leisure services, or to achieve a desired level of satisfaction (Jackson 1988). By this definition, leisure is assumed to be a "good" and constraints seen as obstacles to obtaining what is desired (Jackson and Henderson 1995). The influence of constraints can be seen in various participation variables including activity chosen, frequency of participation, participation location, and even one's basic motivation to participate. Individuals change their behavior to varying degrees as a result of the constraints affecting them. Encountering constraints may lead to changes in the timing and frequency of participation. Constraints that are too difficult to deal with may result in the substitution of different activities. In some instances, constraints can become barriers to participation in activities, like fishing and boating, and individuals are forced to discontinue their participation.

All outdoor recreation activities have some degree of participant turnover. Anglers and boaters can be expected to drop out if they are no longer physically able to perform or their participation no longer provides the benefits they originally sought from the activity. Some individuals indicate a lack of (or a loss of) interest as the reason for ceasing their

participation in an activity. While this may be the case for some, for others this may represent their resignation to the effects of various constraints they are unable to negotiate for various reasons (Searle and Jackson 1985). In the latter case, efforts to identify and remove the constraints could lead to renewed participation. Efforts that seek to understand the causes of participant turnover, or that enhance retention, can be important strategies for maintaining and increasing the percentage of anglers and boaters in the U.S. population.

Research efforts to better understand how people are constrained from engaging in recreation activities (as well as constrained in terms of their participation frequency) have been carried out since the early seventies (e.g., Hendee and Burdge 1974). We can learn a great deal about participants and their activities by better understanding the factors related to reduced or non-participation. For example, a better understanding of the differential effect of constraints on males and females may help us to understand reasons for the historically low rate of participation in fishing and boating by females. Similar evaluations of racial and ethnic groups also will provide important insights.

Previous research has identified various social, economic, and physical variables that interfere with or constrain people's abilities to participate in recreation activities. Jackson (1988) reported over 100 constraints identified in previous studies. In terms of broad categories, these include work and family commitments, money, time, access to facilities, physical disabilities, and a lack of partners with whom to participate. Constraints occur at both global and situational levels. Global constraints include a self-perceived lack of skill, the disapproval of others, or the lack of access; these are present to some extent all of the time and play a role in every recreation participation decision. Situational constraints are those that occur under a given set of circumstances, but may not occur otherwise. Examples include no partners to participate with, crowding, and environmental conditions that preclude participation. These two different types of constraints are likely to vary in how they affect individual participation decisions.

Constraints act as influences on an individual's preferences and behavior but not as barriers to participation (Crawford and Godbey 1987; Shaw et al. 1991). Constraints vary in intensity and in how they affect participation (Jackson 1988). Usually no one single constraint is responsible for causing changes in recreational behavior; instead a combination of factors is usually responsible (Backman and Crompton 1989). Likewise, even high frequency participants in recreation activities indicate they have been affected by constraints (Kay and Jackson 1991; Jackson 1991; Shaw et al. 1991; Ritter et al. 1992). For example, Shaw et al. (1991) showed that individuals with high levels of particular constraints actually had higher levels of participation frequency. These results would seem to refute earlier thinking that when individuals encounter constraints the result is non-participation (Jackson et al. 1993). Some contend that these people are better adept at negotiating or dealing with constraints through experience or desire (Jackson et al. 1993).

Constraints have been conceptualized into three hierarchical categories: intrapersonal, interpersonal, and structural (Crawford and Godbey 1987; Crawford et al. 1991).

Intrapersonal constraints are those constraints that involve a person's psychological state and affect preferences for recreation activities. For example, an individual's subjective evaluation of the appropriateness of a particular activity has a great deal to do with whether he/she initiates participation. Interpersonal constraints are the result of personal interactions with others that can influence activity preferences as well participation frequency. Interpersonal constraints result when relevant others are seen as being non-supportive of participation for various reasons (e.g., "the people I know don't think it's cool to go fishing anymore" or "the people I know aren't interested in boating more often"). Finally, structural constraints encompass time and financial commitments, opportunity to fish, a lack of access, and family life cycle stage that generally interfere between one's desire to participate and the ability to do so (Fedler et al. 1998).

Crawford et al. (1991) proposed a model in which categories of constraints were encountered and negotiated sequentially by participants. In so doing, individuals would have to overcome intrapersonal constraints before they would be able to address interpersonal constraints and likewise interpersonal constraints would have to be overcome before structural constraints. Raymore et al. (1993) reported empirical support for this hierarchical model. This model applies to those considering angling and boating as prospective recreation pursuits as well as to those who are already active participants. All too often, service providers focus only on structural constraints such as access, for example, when prospective angling participants may not hold a totally favorable view of fishing, for example, which also may be reinforced by their immediate reference group. In this case, paying attention to access without attention to these additional psychological and social concerns will not likely result in recruitment to fishing and boating or increased participation in these activities if they already participate. Individuals must successfully negotiate all of the constraints they face if they are to begin participating in or participate more often in fishing and boating. With flat or decreasing participation in fishing or boating in many areas, it would appear there are numerous constraints "at work" and perhaps they are increasing in strength and number as a result of various changes in society such as environmental concern, cable television, and the lack of social cohesion. Or perhaps, there are insufficient efforts being made by service providers and the industry to help individuals negotiate the constraints they face today.

Participants in outdoor recreation activities, including fishing and boating, are generally more constrained than those engaging in other recreational activities (Jackson 1994). The amount of time necessary for planning, preparing equipment, traveling to the site, engaging in the activity, traveling back home, and cleaning and stowing equipment for a fishing or boating trip takes considerably longer than a trip to the fitness center, swimming pool, or neighborhood park. Each of the components of a fishing or boating trip represents a different constraint that must be negotiated. Each person may need a different approach for resolving the constraints depending on previous experience with the activity. Clearly, first-time anglers or boaters face several different obstacles in terms of cost, access, and knowledge than experienced anglers and boaters. Successful participation relies on good negotiation.

Further, and as mentioned above, women may face additional and different constraints than men (Jackson 1994). This is due in part to leisure time availability, the way women are able to use their leisure time, and their motivation for engaging in recreational activities. Broh (1993) measured the amount of leisure time available to men and women each week. Women averaged three fewer hours per week than men. Women spent about an hour per week more working and doing household chores than men and two additional hours on personal care activities. Broh's study found that men and women both spent about 34 hours per week socializing and entertaining. Men spent more time in 9 of 11 activities investigated, especially fishing and boating, and team and individual sports. They spent nearly twice as much time participating in recreational sports activities (7.9 hours) than women (4.4 hours). Women spent more time than men in exercise/aerobics and walking/jogging. For women, leisure is a relative freedom because of the multiple roles they play in family life. A study by Shaw (1992) emphasized that family activities have positive benefits and are valued by parents. However, these activities do involve work, and this work is inequitably divided between men and women.

Women's leisure embodies social interaction focused on family life (Henderson 1990). Women perceive themselves as family members first and individuals second. Because of this, major blocks of time for most women are not available, even on weekends (Schor 1991; Broh 1993). They place value on developing associations with other women and engaging in organized activity rather than competition. Further, the home is the base for women's leisure whether working or not (Henderson 1990).

Searle and Jackson (1985) identified six common barriers to participation between men and women; interest, time, money, facilities and opportunities, skills, and abilities. They also found six additional barriers to participation for women; lack of partners, family commitments, lack of information, shyness, lack of transportation, and physical inability. Henderson et al. (1988) probed women's constraints with greater depth and confirmed these barriers for women and added decision-making and social inappropriateness to the list. Further, some men do not want to take wives or women into the out-of-doors because they view outdoor recreation activities as "their" place to relax and actually get away from the family or other responsibilities (Responsive Management 1999). On the other hand, some men facilitate the involvement of women in outdoor recreation activity by inviting and involving spouses and women friends as their partners in outdoor pursuits

Recreational Fishing Constraints

The most common and most salient factor mentioned by anglers as a constraint to recreational fishing is a lack of time (USFWS 1997). Conflicts with family obligations, loss of social support, and other cultural issues are often lumped together in this category. The issue appears to be that in an increasingly complex culture, activities such as fishing and boating become more and more difficult to fit into the routine of life. In numerous studies, the factor of time has been overwhelmingly the primary reason inactive anglers report as a

reason for desertion and active anglers report as a reason for declining activity (Duda et al. 1995b; Responsive Management 1996). A good example illustrating this point involves a major fishing license sales decline in Pennsylvania in 1996 that occurred at the same time as a license price increase. In 1995, a license price increase was instituted and in 1996 about 100,000 fewer fishing licenses were sold compared to 1995 sales figures. To better understand the reasons why license sales declined so dramatically and to gather information on angler attitudes toward license sales and reasons for not purchasing a 1996 license, a telephone survey was conducted of 1995 license buyers who did not buy licenses in 1996. Surprisingly, the top three most frequent reasons were all related to lack of time: work obligations, family obligations, and not enough time in general, not the cost of the license (Responsive Management 1997).

Most previous research investigating fishing constraints has focused on structural constraints because fishery managers were mainly interested in those factors they could attempt to deal with. Not surprisingly, in a study of constraints facing the statewide angler population in Texas, the highest rated constraints to increased participation in fishing were lack of time, facilities, money, and interest. Additionally, management decision-making was perceived as an important constraint (Ritter et al. 1992). This project worked from open-ended responses where it was easier for anglers to generalize their constraints than to address more basic underlying concerns that prevent them from participating more frequently Fedler et al. (1998).

In a summary of their work on women's constraints relative to hunting and fishing, Thomas and Peterson (1993) reported several insightful factors hindering participation by women. In their studies, the image portrayed by animal rights groups emerged for the first time. The lack of female role models, being raised in a non-hunting or fishing family, and safety also surfaced. Their work also confirmed the importance of constraints identified in previous work; money, lack of social support, information, time, lack of places to go, "fear of looking stupid," and personal safety. The safety issue has become a growing concern by women in the out-of-doors. Mertig and Matthews (1999) echoed many of these constraints in a study of women attending a Michigan outdoor consumer show.

In a recent study of constraints among anglers in Texas, Clark (1996) reported several significant differences between males and females in perceived intrapersonal constraints to fishing more frequently. For example, women were significantly more in agreement with the following statements: "I believe increasing my fishing activity would be bad for the resource," "I don't like to kill fish," "Catching fish causes too much injury to the fish," "When fishing, I feel uncomfortable or self-conscious," "I don't feel it is appropriate to fish more often," and "I don't have the necessary skills." Likewise, women were more in agreement with men on only one interpersonal constraint item, "The people I know don't have the money to fish more." There were few significant group differences in structural constraints reported; women were significantly more in agreement that their lack of access and physical ability constrained them from fishing more frequently. Constraint items with the highest level of agreement overall were structural by definition: "I have too many family work

commitments," "Other activities take up my time that could be spent fishing," and "I don't have access to more fishing opportunities." There are few surprises here among the most important structural constraints; managers have been trying to meet access needs for years and would probably argue they have limited standing on the other two types. It could be that the interpersonal items identified as constraints were mainly responsible for individuals not participating more frequently. As Jackson (1988:115) points out, those individuals indicating structural constraints are likely "providing a shorthand and superficial response that masks the effects of true constraints." In other words, it would be much easier to report a lack of time as a constraint than to come to grips with various "internal states" that lead to a decision not to cut back on their involvement in non-fishing and boating activities.

A recent study by Fedler and Ditton (in press) built upon earlier work by Clark (1996) by examining the importance of constraints across four fishing participation groups. All anglers were active in the 1989-1990 base year of a four-year study, which included equal numbers of males and females. Respondents were categorized into four groups: inactive anglers, who had not fished since the first or second year of the study; recent dropouts, who had stopped fishing during the third or fourth year of the study; drop-ins, who had renewed their fishing after a year or two of inactivity; and active anglers, who had fished continuously during all four years. No demographic differences were found across the four groups with the exception of gender. Females comprised 64% of the inactive group, 56% of recent dropouts, 43% of the drop-ins, and 49% of active anglers. The primary reason given when asked why they stopped fishing, anglers in the inactive and recent dropout groups overwhelmingly said "lack of time."

To obtain more detail on why some anglers stopped fishing and others started again or remained active, intrapersonal, interpersonal, and structural constraints were examined for all groups. Among seven intrapersonal constraints examined, all groups indicated that lack of fishing skills most affected their resuming fishing (for inactive and dropout groups) or fishing more frequently (for drop-in and active groups). Among seven interpersonal constraints evaluated by respondents, fishing partners not having enough time to fish was selected by over 50% in all groups as the most important factor influencing ceased or reduced fishing participation. Structural constraints presented more problems to anglers than any other type of constraint. Family or work obligations, and competing recreational activities separated inactive and dropout anglers from their active counterparts. Access to fishing opportunities was significantly more troublesome for recent dropouts than others.

An additional question posed by Fedler and Ditton (in press) asked respondents if they were interested in becoming active anglers again or fishing more frequently in the future. The percentage of inactive (79%) and dropout (67%) anglers indicating interest in resuming fishing sometime in the future was surprising. Nearly all drop-in (97%) and active (89%) anglers reported the desire to fish more frequently. Clearly, previous anglers retain a strong identity with fishing and desire to become active again in the future.

There is still much we do not know about leisure constraints and how they may affect participation in recreational fishing and boating. Work has just begun to better understand gender differences in constraints, for example. Again, the small number of females has made research in this area difficult in previous studies of angler and boater samples. Generally, previous work has shown that women are more constrained than men by structural constraints like family commitments, access to transportation and information, and physical ability (Henderson et al.1988; Searle and Jackson 1985). Raymore et al. (1993) found that women reported higher intrapersonal constraints and total constraints overall than men, but no group differences between males and females in interpersonal and structural constraints were found. Those women who reported fewer constraints than other women had fewer family obligations, higher education, and higher incomes. While these factors may reduce the effect of structural constraints, women are still likely to face intrapersonal and interpersonal constraints.

Recreational Boating Constraints

The constraints boaters mention most frequently when asked why they don't participate more frequently or stopped participation are somewhat different than those reported by anglers. For example, a recent study by the National Marine Manufacturers Association (NMMA 1996) found that "not enough time" was cited by 55% of the boaters surveyed as the primary reason for reduced participation. Many of the remaining reasons given by boaters reflect intra-personal and structural constraints. The most frequently mentioned constraints after time were: boat repairs were needed (21%), lost interest (18%), no place to store it (18%), moved (15%), family not interested (13%), too expensive (10%), and no place to use it (8%). As with angling, more definitive work needs to be undertaken to elucidate the "lack of time" constraint. This reason can mean many different things. What causes this perceived lack of time and what has replaced the time boaters previously allocated to the sport are not known and provide the basis for some of the important research needs discussed below.

Overall, there needs to be much more research attention to the role of constraints on men's and women's participation in recreational fishing and boating activities. If efforts to recruit more women and men to recreational fishing and boating are to be successful, we will require greater insight into the effects of constraints and how they are negotiated. The same can be said as well for minorities, members of various ethnic groups, youth, and seniors. Likewise, there are probably different constraints facing current participants in fishing and boating depending on their specialization level or degree of involvement in these activities. Novice participants, for example, are more likely to be constrained by their lack of knowledge on where to access fishing and boating opportunities, whereas more experienced participants may feel constrained by their own self-perceived lack of skills or a lack of partners with whom to participate.

Social, demographic, and economic variables have been shown to play a role in the extent that individuals are affected by various constraints (Godbey 1985; Jackson 1988;

Raymore et al. 1994). Age, education, income, and household size and composition were significantly related to both the occurrence and influence of constraints and participation frequency (Searle and Jackson 1985). For example, the desire for increased participation in recreation activities and the number of structural constraints increase with income and education (Searle and Jackson 1985). This could indicate that those with higher incomes and more education have a greater ability to negotiate the intrapersonal and interpersonal constraints they faced. How demographic factors affect boating and fishing participation also is unknown.

Motivation

Reasons why people boat and fish has been a topic of interest for many years. Fedler and Ditton (1994) traced writings about recreational fishing back to the third century B.C. Writers from Dame Juliana Berners to Isaac Walton over the millennia have consistently reflected the appreciative and spiritual themes of angling. The importance of these themes has been reinforced in modern times through scientific studies of anglers. Further, these studies have identified the multidimensionality of angling motivations (Knopf et al, 1973; Hampton and Lackey 1975; Driver and Knopf 1976; Driver and Cooksey 1977; Fedler and Ditton 1994; Responsive Management 1999) that are consistent with the motivational domains identified and tested extensively for a broad array of outdoor recreation activities (Driver 1976).

Early studies found diverse angler motivations (Knopf et al. 1973; Driver and Knopf 1976). These studies suggested anglers were motivated by several principle factors: temporary escape, experiencing nature, mental change, exploration, getting away from other people, family togetherness, exploration, achievement, tension release, physical fitness, and seeking thrills. Numerous researchers expanded and tested the application of these factors to recreational fishing over the past two decades (Driver and Cooksey 1977; Hendee and Bryan 1978; Ditton and Graefe 1978; Fedler and Grove 1988; Fedler and Ditton 1994) to identify 16 motivational domains that cover most relevant motives for fishing (Table 10). A few additional motives, such as seeking solitude or catching a trophy or prize, have been studied and been found to be relevant to a very small group (e.g., wilderness anglers) or a specific type of fishing experience (tournament fishing) and generally have not been included in general angler surveys.

Measurement of motivations has not been consistent from study to study. Wording of motive statements has varied widely among studies as has response formats. Response formats have ranged from open-ended questions such as, "Why did you go fishing today?" to structured motive scales using five or seven-point agree-disagree or important-unimportant formats. These inconsistencies make comparing studies and results difficult (Fedler and Ditton 1994).

To identify consistencies and differences in angler motivations, Fedler and Ditton (1994) compared ratings of motivations among anglers from 17 separate studies in Texas and Maryland. In each study, motivational statements and response formats were identical, although the order of the statements was different. These studies encompassed general population and subpopulation groups of shore, boat, and tournament anglers, and anglers seeking specific species such as black bass, trout, catfish, shark, and billfish. They grouped 16 motives into five general categories: psychological and physiological, natural environment, social, fishery resource, and skill and equipment. Several conclusions from their study are consistent with other motivational research findings and suggest new avenues for understanding why people fish.

First, the motives of escaping the daily routine, relaxation, being outdoors and close to water, and for the sport and challenge of fishing are consistently rated high in all general angler population and subpopulation studies. This is supported by the earlier work cited above and more recent studies by Schramm et al. (1998), Wilde and Ditton (1994), and Responsive Management (1999). Conversely, all populations and subpopulations studied rated several motives low. These included going fishing for physical exercise, obtaining fish for eating, catching a trophy fish, developing skills, and testing equipment. Again, other studies have shown similar results (Graefe and Ditton 1986; Falk et al. 1981, 1985; Fedler and Grove 1988; Schramm et al. 1998). Fedler and Ditton (1994) concluded that further studying motivations of anglers at the population level was probably not necessary. The relative importance of motives from highest to lowest is very consistent. However, they point out that there is significant diversity in motivational ratings among subpopulations. Therefore, examining motivations and constraints for racial and ethnic groups is still needed.

When anglers are grouped by fishing mode or species sought, the importance of social and fisheries resource related motives showed significant variation. For example, the challenge of fishing and experience of the catch were very important to anglers targeting large fish, whereas these were less important to other groups. Likewise, some groups were much more interested in fishing to catch fish for eating or to obtain a trophy fish (Carls and Bresnan 1975; Graefe and Ditton 1986; Hicks et al. 1983). Freshwater anglers seeking specific species rated the social motives of fishing with family and getting away from other people more important than other groups. Again, this is consistent with some of the past research with warmwater anglers (Driver and Knopf 1976; Hunt and Ditton 1996). These subpopulations can be viewed as market segments that may respond differently when catching and eating fish, challenge, or family motives are emphasized.

Only one study was found which compared the motives of men and women. Data from Fedler and Grove (1988) compared 16 motives of male and female anglers in Maryland. Their results showed that men and women differed on five of these motives. Men rated fishing for sport and challenge and catching a trophy fish higher than women. On the other hand, women rated getting away from the demands of life, being with family and friends, and to experience solitude significantly higher than men. In this study, men were clearly more consumptive oriented than women, while women preferred to get away with the family for

Table 10:
Profile of Angler Populations and Subpopulations Based on Motivation Importance

----- Saltwater Subpopulations -----										
Motivation for Fishing by Category	Shore	Cons. Org.	Black Drum	Pvt. Boat	Off-shore Tourn.	Charter Boat	Charter Boat	Shark	Billfish Tourn.	Grand Mean
<i>Psychological & Physiological</i>										
To get away from the daily routine	--	--	--	--	--	--	H	--	--	4.00
For Relaxation	L	--	H	--	L	L	H	--	--	4.10
To experience new and different things	L	--	H	--	H	H	L	H	H	3.00
For physical exercise	--	--	--	--	--	--	--	H	--	2.60
<i>Natural Environment</i>										
To be outdoors	H	H	--	--	L	L	H	--	--	4.00
To experience natural surroundings	H	--	--	L	L	L	--	H	--	3.70
To be close to sea/water	H	L	--	--	--	--	--	H	H	3.50
<i>Social</i>										
To get away from other people	--	H	--	--	--	--	--	H	--	3.40
For family recreation	--	--	L	H	L	L	--	L	--	3.30
To be with friends	L	--	H	L	--	--	H	--	H	3.50
<i>Fishery Resource</i>										
For the challenge or sport of fishing	L	L	H	L	H	--	H	H	H	3.70
For the experience of the catch	L	--	H	L	H	H	H	H	H	3.60
To obtain fish for eating	L	--	H	--	L	H	L	--	L	2.80
To obtain a trophy fish	L	--	H	--	H	H	--	H	H	2.30
<i>Skills and Equipment</i>										
To develop skills	--	--	H	L	H	L	L	H	H	2.90
To test my equipment	L	--	H	--	H	L	L	H	H	2.10

Source: Fedler and Ditton (1994)

Notes: Grand Means are based on a 5-point scale: (1) Not at all important, (2) Slightly, (3) Moderately, (4) Very, (5) Extremely Important. (H) motive rating is 0.2 or more above the grand mean. (L) motive rating is 0.2 or more below the grand mean.

Table 10 (Continued):
 Profile of Angler Populations and Subpopulations Based on Motivation Importance

Motivation for Fishing by Category	Total Angler Population					Freshwater Subpopulations				Grand Mean
	Salt Water	Salt Water	Salt Water	Fresh Water	Fresh Water	Trout	Catfish	Black Bass		
<i>Psychological & Physiological</i>										
To get away from the daily routine	L	--	--	--	--	--	--	--	4.00	
For Relaxation	--	--	--	--	--	H	--	--	4.10	
To experience new and different things	--	--	--	--	--	L	--	--	3.00	
For physical exercise	--	L	L	--	L	--	--	--	2.60	
<i>Natural Environment</i>										
To be outdoors	--	--	--	--	H	H	--	--	4.00	
To experience natural surroundings	--	--	--	--	--	H	H	H	3.70	
To be close to sea/water	L	--	--	L	--	L	L	L	3.50	
<i>Social</i>										
To get away from other people	--	L	--	H	L	L	H	H	3.40	
For family recreation	--	H	--	H	--	--	H	H	3.30	
To be with friends	L	--	--	--	--	L	L	--	3.50	
<i>Fishery Resource</i>										
For the challenge or sport of fishing	L	L	--	L	--	H	L	--	3.70	
For the experience of the catch	--	L	L	--	--	--	--	H	3.60	
To obtain fish for eating	H	L	L	--	L	L	H	L	2.80	
To obtain a trophy fish	L	L	L	L	L	L	L	--	2.30	
<i>Skills and Equipment</i>										
To develop skills	L	L	--	--	--	H	L	--	2.90	
To test my equipment	--	L	--	--	--	--	--	--	2.10	

Source: Fedler and Ditton (1994)

Notes: Grand Means are based on a 5-point scale: (1) Not at all important, (2) Slightly, (3) Moderately, (4) Very, (5) Extremely Important
 (H) motive rating is 0.2 or more above the grand mean. (L) motive rating is 0.2 or more below the grand mean.

some time alone. These differences follow those discussed above with regard to constraints on fishing by men and women. However, additional research is necessary with regard to male and female differences in motivation, particularly if marketing messages are to be developed specifically for women and men.

Responsive Management's (1999) Future of Fishing survey provides additional insight into reasons why other population segments go fishing or would begin fishing. This study included the following seven motives:

- For relaxation
- To be with family and friends
- To be close to nature
- For the sport or to learn a new sport
- To catch fresh fish
- To catch large fish
- To catch many fish

Anglers and non-anglers were asked to select one of these seven reasons as their main reason for going fishing or fishing more. The responses to this question can be instructive even though the list of motives is incomplete and the results provide little information beyond what was the single most appealing reason to go fishing. For example, if a respondent selected "For relaxation" for their main reason, we do not know if it is significantly more important than any of the other reasons. Further, research has shown that fishing with family and fishing with friends are two separate motives in the social domain (Driver 1976) and may be rated differently by different subpopulations of anglers (Fedler and Grove 1988; Fedler and Ditton 1994). Likewise, "For the sport or to learn a new sport" encompasses two different motives. Nevertheless, results presented in the study are instructive, particularly since there is a scarcity of data on non-angler motives.

The Responsive Management (1999) study found that the percentage of anglers and non-anglers listing each of the seven reasons for fishing was very similar. Relaxation (35% anglers; 28% non-anglers) and being family and friends (33% both groups) were the two most frequently cited reasons for fishing. Being close to nature followed with 7% and 4%, respectively for anglers and non-anglers. The remaining four reasons were selected by seven percent or less of either group and had similar percentages. The main reason for fishing was not reported for ethnic or racial groups or by gender in the study. These results confirm the universal importance of relaxation, family and friends, and the natural environment to both anglers and non-anglers.

One interesting statistic reported in the Responsive Management (1999) study was that 14% of the non-anglers selected the "Nothing would make me want to fish" option as their main reason for fishing. This percentage is similar to other studies which have found about 15% of the population have no interest in fishing (Fedler and Holdnak 2000).

Priority Market Segments

With the vast majority of the U.S. population supportive of recreational fishing and boating, and with a high percentage having experienced boating and fishing at some point during their lifetime, the opportunities for stimulating greater participation by the American public are quite good. The similarities between boaters and anglers in terms of the types of experiences they are seeking and constraints faced (with the exception of economic constraints by boaters) are quite close. Studies show 60-70% of boaters also fish, so many similarities should be expected. Based on the current population size and growth projections for the next 20 years, priority market segments should include the following:

- **Males.** The current market should not be overlooked. Maintaining and increasing rates and frequency of participation among this group should be a priority. Adults are mentors for children and can act as socialization agents for spouses and friends. Focusing on challenge, relaxation, and family are messages that should resonate with anglers and boaters. Minority and ethnic groups also share these motivations, although not with the same level of importance or priority. Multi-cultural marketing efforts should reach many minorities. However, we still know comparative little about fishing and boating among minorities and ethnic groups. Research targeting these groups specifically is needed.
- **Recent dropouts.** This group should be highly susceptible to fishing and boating participation promotions and is much larger than most minority populations. Focusing on the 45 and over group may payoff well because of the aging of the population and large number of people moving into the age group over the next 20 years. Messages concerning being in the outdoors, relaxation, escape, the challenge of fishing, and family fun should be appealing. Identifying why they discontinue fishing and boating should be a priority.
- **Women.** This group comprises over half the U.S. population, but only 10% of females participate in fishing and 16% in boating. Growing interest in both activities by women has been stimulated by needs for independence, involvement with the outdoors, and escaping traditional social roles could be the basis for connecting with one segment of women. A second group of women seek involvement with the family away from traditional settings and domestic roles. Messages that accent these benefits should be appealing. One note of caution is warranted. Women place a lower priority on boating than men and view it as less affordable due to their role in family economic decisions. However, both these constraints can be addressed through education.
- **Youth.** A significant proportion of our young boys and girls have had fishing and boating experiences. The dropout rates are very high for both activities, but opportunities for increasing carryover into adulthood are good. Greater understanding of the reasons for this abrupt change in participation is needed to address this problem. Specifically, research efforts should focus on the 15-18 group to identify the reasons for the sharp decline in participation during these years.

Market Segments Needing Further Research

Recommending low priority market segments is difficult because some of these market segments should be priorities in some instances. Hispanics comprise a substantial proportion of the state population and anglers and boaters in Florida, Texas, New Mexico and California. Further, they are one of the fastest growing segments of the U.S. population. Not marketing to this group would be inadvisable at the state level. From a national perspective, the population of Blacks and Asians is small and have low participation rates. Specifically targeting these segments would require substantial resources.

Directly targeting Blacks and Hispanics at this time may be unwise for other reasons as well. We do not know much about their motivations, constraints, and participation patterns. This is a badly needed area of research that will help us to understand their needs and concerns better so appropriate messages and programs can be designed and implemented for them.

Research Priorities

- Greater understanding of the motivations, attitudes, socialization patterns, and constraints of Blacks and Hispanics is needed. Efforts to reach out to these segments of the population are important. The focus group work conducted by Responsive Management highlights some of the differences these groups may have from White anglers. It may be possible to market to multiple racial and ethnic groups if visual messages contain racial and ethnic mixes. Research has shown that Blacks and Hispanics identify with messages depicting and directed at their race or ethnic group. Messages in Spanish are more effective with Hispanic groups because of their level of acculturation and important cultural reinforcement needs.
- The limited boater research that has been conducted has focused primarily on boating participation and use. A handful of studies provide a disjointed view of boater characteristics, motivations, attitudes, and constraints. Generalizability is limited. Further, the analysis of subgroups of boaters based on gender, age, race, and other useful segmentation characteristics is needed. This research should also be a high priority particularly if non-fishing related boating activities are to be marketed.
- For both boating and fishing, a focused marketing study is probably necessary if there is a desire to fine-tune messages and direct them through appropriate channels to specific segments. The use of multivariate clustering techniques with a broader array of lifestyle variables (attitudes, interests, and opinions) would be very useful. This type of research has proven very useful for the industry for marketing other recreational activities, services, and products. However, it may be possible to accomplish limited research in with this type of analysis using existing national databases.

Implications for Use of the Literature Review

This project was designed to help program partners and stakeholders understand current trends in recreational boating and fishing by providing a broad-based review of the factors associated with participation. The consistency with which some angler and boater characteristics occur across different segments allows for generalizations to be made with some confidence. For example, nearly all anglers and boaters feel that relaxation, escape from the daily routine, being in the outdoors with family and friends are very important reasons for participating in boating and fishing. The importance of these reasons holds true for those who have stopped participating or who are thinking about participating in the future. Appealing to these motivations in marketing messages can be used at all levels from national campaigns to specific local events sponsored by agencies and organizations.

The broader literature on recreational constraints helped clarify the context within which boaters and anglers encounter factors that deter participation. The limited work specifically dealing with boaters and anglers suggests that for many potential and previous participants information on structural constraints such as access, skills, and opportunities can be addressed through public information and programs. Intrapersonal and interpersonal constraints, while more ephemeral, can be influenced by information that changes what people believe about recreational boating and angling. Further research by agencies and organizations is needed to provide the detailed information about constraints effecting specific angling and boating segments. This will allow for more efficient design and delivery of specific information and programs to meet the needs of individual market segments.

The lack of information on the participation patterns and characteristics of specific market segments such as minorities, women, and youth or about specific age groups presently does not allow us to design specific outreach campaigns for these groups. Directed research is imperative if these important segments are to receive attention. Again, the broader outdoor recreation literature has shown that Blacks and Hispanics, in particular, have different participation patterns and needs than the traditional White angler or boater. Marketing to these groups may take different approaches than those traditionally used. Results from this literature review should help states with large minority populations begin focusing on their unique needs. States with smaller minority populations who want to begin outreach programs should also benefit.

Overall, the literature review identifies a clear need for focused research, particularly for boating. Little is known about non-boaters or dropouts. The little information available concerning boating constraints indicates the importance of some constraints generally not found among anglers. State and federal fisheries and boating agencies as well as non-governmental organizations can use the recommendations and literature from this project to build targeted surveys to aid them with their market research. Going beyond a general national marketing campaign will require these more focused studies.

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Appendix A
Certified Fishing License Holders by State: 1980 to 1999

Appendix A.
 Certified Fishing License Holders by State: 1980 to 1999

Region	1980	1985	1990	1995	1999	Change	
						1980 to 1999	1990 to 1999
WA	907,339	824,618	965,825	820,940	692,755	-23.6%	-28.3%
OR	722,612	685,429	751,945	709,934	653,351	-9.6%	-13.1%
CA	2,186,178	2,616,121	1,970,879	2,300,463	2,109,827	-3.5%	7.1%
HI	7,594	6,907	9,679	7,552	5,937	-21.8%	-38.7%
ID	395,060	444,609	417,864	420,002	449,535	13.8%	7.6%
NV	171,441	186,090	142,914	156,131	174,700	1.9%	22.2%
TX	1,745,119	1,652,893	1,876,801	1,755,976	1,469,815	-15.8%	-21.7%
NM	220,504	249,274	245,753	235,714	228,063	3.4%	-7.2%
OK	620,051	632,673	575,613	551,517	641,313	3.4%	11.4%
AZ	457,760	498,799	429,952	468,527	472,927	3.3%	10.0%
IA	453,148	460,366	424,795	414,336	339,646	-25.0%	-20.0%
MO	873,973	972,086	1,047,205	1,011,279	909,026	4.0%	-13.2%
IL	751,531	888,827	820,395	818,017	763,490	1.6%	-6.9%
IN	716,107	650,711	655,191	650,620	617,887	-13.7%	-5.7%
MI	1,325,156	1,414,914	1,577,875	1,464,027	1,322,134	-0.2%	-16.2%
OH	1,004,038	1,189,217	1,358,991	990,387	1,168,134	16.3%	-14.0%
WI	1,515,046	1,536,412	1,470,521	1,357,428	1,261,902	-16.7%	-14.2%
MN	1,452,016	1,486,027	1,551,621	1,531,280	1,548,157	6.6%	-0.2%
AL	556,421	606,622	531,351	546,440	504,579	-9.3%	-5.0%
AR	638,023	597,156	738,989	590,782	737,964	15.7%	-0.1%
FL	704,610	823,333	928,135	1,049,704	1,202,501	70.7%	29.6%
GA	664,794	734,249	678,259	653,189	660,425	-0.7%	-2.6%
KY	614,047	627,250	635,336	581,858	570,522	-7.1%	-10.2%
LA	458,144	591,296	556,740	621,283	656,089	43.2%	17.8%
MS	441,260	475,388	423,627	415,858	419,802	-4.9%	-0.9%
NC	463,517	452,773	490,947	571,273	649,430	40.1%	32.3%
SC	422,573	421,784	442,717	500,804	507,252	20.0%	14.6%
TN	701,508	761,210	845,265	954,148	1,011,017	44.1%	19.6%

Appendix A - Continued
Certified Fishing License Holders by State: 1980 to 1999

Region	1980	1985	1990	1995	1999	Change	
						1980 to 1999	1990 to 1999
CT	198,984	198,263	227,510	189,696	173,774	-12.7%	-23.6%
DE	15,108	18,454	23,192	26,798	24,524	62.3%	5.7%
ME	255,639	248,426	296,011	270,024	272,528	6.6%	-7.9%
MD	140,200	238,360	311,528	554,252	376,453	168.5%	20.8%
MA	186,364	234,675	264,344	227,691	173,295	-7.0%	-34.4%
NH	135,472	164,323	156,183	156,352	162,702	20.1%	4.2%
NJ	182,079	213,413	265,892	241,741	175,536	-3.6%	-34.0%
NY	901,936	1,023,373	1,181,810	1,082,129	1,052,421	16.7%	-10.9%
RI	29,797	37,260	40,334	35,832	33,587	12.7%	-16.7%
VT	159,269	161,758	156,828	100,397	101,762	-36.1%	-35.1%
VA	503,494	567,299	535,824	634,115	630,374	25.2%	17.6%
WV	277,345	277,597	243,033	310,968	283,606	2.3%	16.7%
PA	1,005,406	1,036,430	1,186,373	1,164,989	1,093,598	8.8%	-7.8%
CO	707,024	720,163	694,362	736,242	760,683	7.6%	9.6%
UT	486,969	395,606	400,585	514,976	457,086	-6.1%	14.1%
MT	332,085	336,134	375,222	389,820	337,668	1.7%	-10.0%
WY	268,570	148,424	242,466	276,989	301,205	12.2%	24.2%
ND	141,065	169,178	145,954	122,863	155,145	10.0%	6.3%
SD	137,629	180,305	197,724	206,092	244,768	77.8%	23.8%
NE	207,762	229,295	244,926	233,841	213,332	2.7%	-12.9%
KS	337,017	299,758	291,753	306,943	318,134	-5.6%	9.0%
AK	196,133	287,662	338,962	402,405	410,479	109.3%	21.1%
TOTAL	27,994,917	29,673,190	30,386,001	30,334,624	29,500,840	4.7%	-3.5%

Appendix B
Boat Registrations by State: 1990 and 1998

Appendix B.
Boat Registrations by State: 1990 and 1998

Region	1990	1998	Change 1990 to 1998
WA	214,043	249,968	16.8%
OR	173,572	197,634	13.9%
CA	792,930	895,132	12.9%
HI	14,081	15,290	8.6%
ID	64,180	83,501	30.1%
NV	42,694	59,404	39.1%
TX	606,942	625,754	3.1%
NM	32,200	72,456	125.0%
OK	188,781	227,826	20.7%
AZ	143,334	158,726	10.7%
IA	192,645	211,972	10.0%
MO	272,442	326,879	20.0%
IL	350,235	396,945	13.3%
IN	273,759	214,474	-21.7%
MI	848,584	980,378	15.5%
OH	378,249	407,686	7.8%
WI	497,080	559,321	12.5%
MN	714,802	780,097	9.1%
AL	231,985	265,592	14.5%
AR	150,020	210,599	40.4%
FL	681,240	805,581	18.3%
GA	274,081	303,129	10.6%
KY	139,852	162,780	16.4%
LA	288,011	305,386	6.0%
MS	182,378	270,868	48.5%
NC	275,424	334,862	21.6%
SC	319,132	394,842	23.7%
TN	241,632	312,030	29.1%

Appendix B: Continued
 Boat Registrations by State: 1990 and 1998

Region	1990	1998	Change 1990 to 1998
CT	100,366	102,630	2.3%
DE	40,139	44,458	10.8%
ME	112,559	117,706	4.6%
NJ	164,539	197,672	20.1%
NY	425,756	514,749	20.9%
RI	31,931	35,378	10.8%
VT	41,852	38,105	-9.0%
VA	202,600	232,409	14.7%
WV	40,880	67,382	64.8%
PA	286,826	348,727	21.6%
CO	100,366	98,190	-2.2%
UT	59,869	76,346	27.5%
MT	43,360	49,336	13.8%
WY	22,940	25,828	12.6%
ND	36,186	48,523	34.1%
SD	53,413	47,465	-11.1%
NE	58,683	72,649	23.8%
KS	90,255	101,306	12.2%
AK	30,911	26,230	-15.1%
TOTAL	10,985,558	12,506,272	13.8%