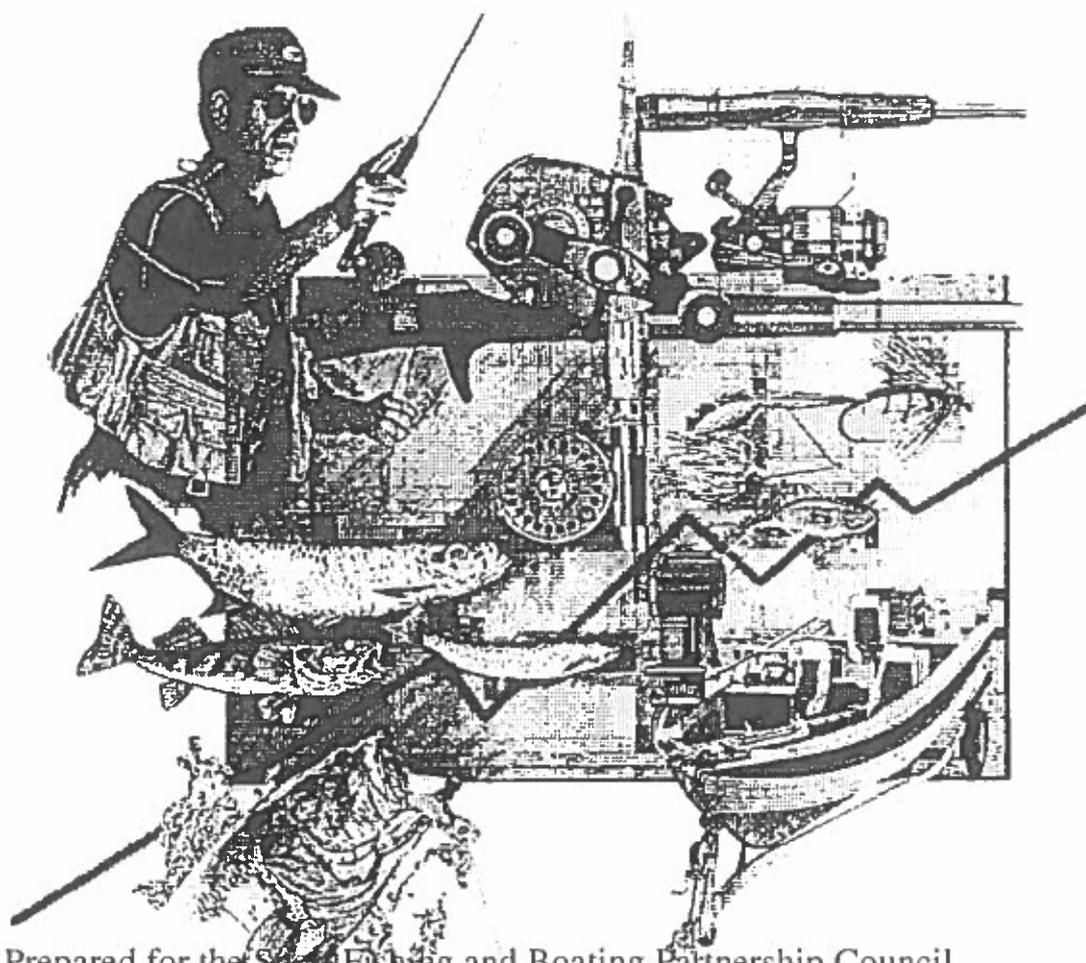


Factors Influencing Recreational Fishing and Boating Participation



Prepared for the Sport Fishing and Boating Partnership Council

Prepared by the Technical Review Group
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FACTORS INFLUENCING RECREATIONAL FISHING AND BOATING PARTICIPATION

Introduction

Recreational fishing and boating have been recorded among the leading outdoor activities of Americans for the past thirty years (Table 1). From the time of the first comprehensive study of outdoor recreation in the early 1960's (ORRRC 1962; Mueller and Gurin 1962) and National Survey of Fishing and Hunting (U.S. Fish and Wildlife Service 1956), recreational fishing and boating have experienced phenomenal growth. Numerous national surveys, conducted by both public agencies and private organizations, have documented this growth. In recent years, however, growth in both boating and fishing has slowed to the point that during the past few years many states have experienced declines in the number of anglers and boaters. Sales of fishing licenses, boat registrations, and participant / population surveys also lend support to this new trend.

Several states have experienced severe declines in fishing license sales beginning in the early 1990's (Table 2). In Ohio, between 1990 and 1995, 368,000 fewer fishing licenses were sold. Between 1995 and 1996, the Pennsylvania Fish and Boat Commission sold 100,000 fewer fishing licenses. The Florida Game and Fresh Water Fish Commission reported a 3% decline in resident freshwater licenses and a 6% decline in nonresident licenses between 1995 and 1996. A 3% decline may seem small, but consider that during this same time period Florida's population grew by about 700 people each day.

Table 1: Percent and Number of People 16 years and Older in the U.S. Participating in Outdoor recreational activities, 1994-1995

Type of Outdoor Activity	Percent of Population	
	16 and older	Number (millions)
Participated in any type of activity	94.5	189.3
Outdoor Spectator Activities	58.7	117.6
Swimming (non-pool)	39.0	78.1
Fishing	28.9	57.9
Team Sports	26.4	53.0
Camping (all overnight)	26.3	52.8
Individual Sports	22.0	44.1
Hunting	9.3	18.6

Table 2: Number of Certified License Holders by State, 1980-1996

State	1980	1985	1990	1995	1996	1980 to 1996	1990 to 1996
AL	556,421	606,622	531,351	546,440	478,023	-14.1%	-10.0%
AK	196,133	287,662	338,962	402,405	402,913	105.4%	18.9%
AZ	457,760	498,799	429,952	468,527	444,963	-2.8%	3.5%
AR	638,023	597,156	738,989	590,782	578,464	-9.3%	-21.7%
CA	2,186,178	2,616,121	1,970,879	2,300,463	2,320,695	6.2%	17.7%
CO	707,024	720,163	694,362	736,242	760,614	7.6%	9.5%
CT	198,984	198,263	227,510	189,696	177,587	-10.8%	-21.9%
DE	15,108	18,454	23,192	26,798	27,834	84.2%	20.0%
FL	704,610	823,333	928,135	1,049,704	1,013,960	43.9%	9.2%
GA	664,794	734,249	678,259	653,189	657,999	-1.0%	-3.0%
HI	7,594	6,907	9,679	7,552	6,396	-15.8%	-33.9%
ID	395,060	444,609	417,864	420,002	508,937	28.8%	21.8%
IL	751,531	888,827	820,395	818,017	789,880	5.1%	-3.7%
IN	716,107	650,711	655,191	650,620	604,399	-15.6%	-7.8%
IA	453,148	460,366	424,295	414,336	395,532	-12.7%	-6.9%
KS	337,017	299,758	291,753	306,943	295,996	-12.2%	1.5%
KY	614,047	627,250	635,336	581,858	576,634	-6.1%	-9.2%
LA	458,144	591,296	556,740	621,283	662,960	44.7%	19.1%
ME	255,639	248,426	296,011	270,024	256,684	0.4%	-13.3%
MD	140,200	238,360	311,528	554,252	520,738	271.4%	67.2%
MA	186,364	234,675	264,344	227,691	193,299	3.7%	-26.9%
MI	1,325,156	1,414,914	1,577,875	1,464,027	1,348,107	1.7%	-14.6%
MN	1,452,016	1,486,027	1,551,621	1,531,280	1,535,122	5.7%	-1.1%
MS	441,260	475,388	423,627	415,858	401,918	-8.9%	-5.1%
MO	873,973	972,086	1,047,205	1,011,279	994,681	13.8%	-5.0%
MT	332,085	336,134	375,222	389,820	383,074	15.4%	2.1%
NE	207,762	229,295	244,926	233,841	225,114	8.4%	-8.1%
NV	171,441	186,090	142,914	156,131	159,198	-7.1%	11.4%
NH	135,472	164,323	156,183	156,352	156,985	15.9%	0.5%
NJ	182,079	213,413	265,892	241,741	229,398	26.0%	-13.7%
NM	220,504	249,274	245,753	235,714	265,470	20.4%	8.0%
NY	901,936	1,023,373	1,181,810	1,082,129	1,051,781	16.6%	-11.0%
NC	463,517	452,773	490,947	571,273	558,048	20.4%	13.7%
ND	141,065	169,178	145,954	122,863	126,204	-10.5%	-13.5%
OH	1,004,038	1,189,217	1,358,991	990,387	1,041,662	3.7%	-23.4%
OK	620,051	632,673	575,613	551,517	620,585	0.1%	7.8%
OR	722,612	685,429	751,945	709,934	678,508	-6.1%	-9.8%
PA	1,005,406	1,036,430	1,186,373	1,164,989	1,183,432	17.7%	-0.2%
RI	29,797	37,260	40,334	35,832	34,774	16.7%	-13.8%
SC	422,573	421,784	442,717	500,804	502,309	18.9%	13.5%
SD	137,629	180,305	197,724	206,092	212,132	54.1%	7.3%
TN	701,508	761,210	845,265	954,148	908,807	29.6%	7.5%
TX	1,745,119	1,652,893	1,876,801	1,755,976	1,699,199	-2.6%	-9.5%
UT	486,969	395,606	400,585	514,976	491,014	0.8%	22.6%
VT	159,269	161,758	156,828	100,397	96,733	-39.3%	-38.3%
VA	503,494	567,299	535,824	634,115	604,951	20.2%	12.9%
WA	907,339	824,618	965,825	820,940	793,598	-12.5%	-17.8%
WV	277,345	277,597	243,033	310,968	296,367	6.9%	21.9%
WI	1,515,046	1,536,412	1,470,521	1,357,428	1,374,809	-9.3%	-6.5%
WY	268,570	148,424	242,466	276,989	287,046	6.9%	18.4%

Table 3: Ten Fastest Growing Outdoor Activities Among Persons 16 Years or Older in the United States, 1982-1995.

Activity	Number (millions) 1994-1995	Percentage Growth 1982-1995
Birdwatching	54.1	155.2
Hiking	47.7	93.0
Backpacking	15.2	72.7
Downhill Skiing	16.8	58.5
Primitive Camping	28.0	58.2
Walking	133.6	42.7
Motor Boating	46.9	39.9
Sightseeing	113.4	39.5
Developed Camping	41.5	38.3
Swimming in Natural Waters	78.1	38.2

Source: NSRE (1996)

Further, fishing and boating are not among the fastest growing outdoor recreation activities (Table 3). While motor boating was mentioned, growth of this activity reflects a large increase in personal watercraft use. Traditional power boating has been growing slowly for the past ten years.

This change in boating and fishing participation has prompted many resource management agencies and industry businesses to express concern over the downturn in participation. They have asked questions about what is causing changes in the boating and fishing markets and what can be done to reverse the declining trend. Participation declines have been noted in both the number of individuals participating in the activity and the frequency with which they participate annually. This concern has been galvanized into this initiative "to recommend 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 the nation's aquatic natural resources." In order to develop this strategy, a cohesive science-based understanding of angling and boating participants and their behavior was considered important for generating, selecting, and supporting alternative solutions to these problems.

The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation has been conducted since 1955 and is the longest continuous data collection on outdoor recreation activities in the U.S. While it provides insights to changing participation patterns over time, it does not provide answers to many of the questions being posed by management agencies and representatives of the boating and fishing industries. In some cases, trade associations

have conducted or commissioned studies of outdoor recreation participants and their activities to learn more about their customers so they may better meet their needs.

Numerous other angler and boater studies have been completed to find the answers to various management and public policy problems. These have been a part of the largely applied outdoor recreation literature developed over the past thirty years with financial support from land and water management agencies at both the federal and state level. Most of these studies are in the difficult-to-find "grey literature;" some have been published in various journal outlets where they have been subjected to external review and verification of methods and results. Whether or not all of this literature deals with boating and fishing per se, it can provide guidance to understanding anglers and boaters and their activity. Thus, it is not necessary to study anglers and boaters in every state and jurisdiction to know something about them, their experience preferences, their attitudes, and participation patterns. Much can be learned in the way of informed expectations from studies of participants in other outdoor recreation pursuits.

We begin developing this understanding by documenting the changes in boating and angling participation over the past two decades. This change is placed within the context of the demographic characteristics of the U. S. population. Following the discussion of demographics, we examine the social context of boating and fishing participation. Here the process of becoming involved in angling and boating is presented. Next we discuss the concept of angler and boater specialization which presents a framework for understanding the diversity within these respective populations. Further, we examine the constraints to fishing and boating frequently cited in previous studies. This paper concludes with a listing of research needs we feel are necessary to better understand boating and fishing participation so successful strategies can be developed to enhance participation.

Demographics of the Angling and Boating Population

Examining the characteristics of the U.S. population growth over the past three decades and looking at future growth predictions helps place fishing and boating participation in perspective. The changes in our population and its growth characteristics into the next century has significant implications for the future of both fishing and boating. According to Murdock et al. (1996), the population of the U.S. is expected to increase by about 30% or 10% per decade over the next 30 years. However, as shown in Table 4, most of this growth is expected to occur among minority population segments. The Anglo population will grow about 10% from 1990 to 2020. Minority populations are expected to grow much faster. The African-American population is projected to increase by 42%, the Hispanic population by 36%, and the remaining minorities (primarily Asians) by 35 percent during this time frame. By 2020, if these projections hold true, the Anglo population would decline from its current 75% to 64% in 2020. By 2050, Anglos would comprise only 53% of the population if immigration rates remain relatively constant. These statistics demonstrate that the demographics of the U.S. population are changing and will continue to change.

These demographic trends are problematic because the U.S. angling population is largely Anglo and male oriented. About 90% of all anglers in 1996 were Anglo, 5% Black, and 5% other minorities. Likewise, males constituted 73% of the angling population and females 27 percent. Clearly, minority and female populations are vastly under-represented in the

current angling population.

Only about 20% of the American population fishes and purchases licenses in any single year. There appears to be a consensus on the number of anglers nationwide. Current estimates are slightly over 50 million. In a 1995 nationwide study, Responsive

Table 4: U.S. Bureau of the Census Projections of the Population of the United States by Race/Ethnicity, 1990-2050 for the Middle Immigration Scenario

Year	Anglo	Black	Hispanic	Other	
Total					
1990	188,128,296	29,216,293	22,354,059	9,011,225	248,709,837
2000	197,061,204	33,568,144	31,365,806	12,638,488	274,633,642
2010	202,389,687	37,465,695	41,139,053	16,721,854	297,716,289
2020	207,392,991	41,538,365	52,652,350	21,158,235	322,741,941
2030	209,997,665	45,447,803	65,570,344	25,833,548	346,899,360
2040	209,620,908	49,378,524	80,163,857	30,816,855	369,980,144
2050	207,901,472	53,555,336	96,508,378	35,965,491	393,930,677

Source: Murdock et. al. (1996)

Management (1996) estimated the total fishing population at 50.1 million. Similarly, screener data from the 1996 National Survey estimated 50 million anglers aged six and over (U.S. Fish and Wildlife Service 1997). Between 1980 and 1990, fishing participation among those aged six and over increased 20% (U.S. Fish and Wildlife Service 1997). However, between 1991 and 1996, National Survey results showed fishing participation declining from 35.6 million to 35.2 million among anglers 16 years and older. While this was not a statistically significant decline, it does underscore the lack of angling growth during this decade. As a percentage of the general population, fishing has also declined slightly. In 1991, an estimated 19% of the U.S. population 16 years and older fished, (USFWS 1993), while 17% of the population fished in 1996 (U.S. Fish and Wildlife Service 1997).

Prior to 1990, the number of anglers fishing each year was increasing at a rate faster than that of the U.S. population. Fishing license sales increased annually in most states spurred by the creation of thousands of reservoirs designed for flood control, irrigation, water supplies, and hydropower. During the late 1980's, however, angling participation leveled off. Both license sales and national surveys have documented this change. Understanding why this has occurred is the focus of the remainder of this paper. Between now and 2050, the U.S. population will increase by 58% while the number of angling participants will increase by 25% if

current trends continue (Table 5). These predictions are based on historic fishing participation rates (percent that participated) and do not take into account the results of successful interventions that might result in higher rates of participation in the future.

For Americans, fishing is a nearly ubiquitous activity. About 88% of Americans have fished at least once during their lives. Further, about 70% have fished after the age of 16 (Duda et al. 1995a and 1995b). While most Americans have fished during some point in their lives,

Table 5: Projected Number of Total Fishing Participants in the United States by Race/Ethnicity, 1990-2050 for the Middle Immigration Scenario

Year	Anglo	Black	Hispanic	Other	Total
1990	30,761,484	1,657,735	1,148,394	718,480	34,304,093
2000	31,890,318	2,009,103	1,546,329	1,016,332	36,462,082
2010	32,646,956	2,311,985	2,013,672	1,347,159	38,319,772
2030	32,401,020	2,807,902	3,161,964	2,055,745	40,426,631
2050	31,968,516	3,335,661	4,655,395	2,882,697	42,842,269

Source: Murdock et al. (1996)

18% have tried fishing but have abandoned the activity for some reason. Another 25% have become inactive and have not fished within the past five years but still consider themselves anglers. A small percentage of the population (8%) are infrequent anglers and have fished during only one or two of the past five years. A similar percentage of the population (7%) are sporadic anglers and have fished three or four of the past five years. About 30% of the individuals in the survey reported fishing in all five of the previous years. In a related finding, nearly 95% of the population in the United States approved of "legal fishing" (Duda et al. 1995b).

Men are more likely to fish than woman, but nearly 10% of all women over the age of 16 fish (U.S. Fish and Wildlife Service 1997). Fishing activity occurs at nearly all age cohorts, although older Americans (55 years old and older) are less likely to fish than those between the ages of 25 and 54. Americans in rural settings are more likely to fish than their urban counterparts, but all segments fish at significant rates.

Duda et al. (1995b) examined the relationship of selected demographic characteristics to angling participation among males and females to identify factors affecting participation. In a regression analysis of National Survey screener data between 1980 and 1990, fishing participation among American males remained stable while participation among American females increased. There were three major demographic variables related to male angling participation: increasing age, fewer males growing up in rural areas and a decreasing proportion of white males as a percentage of the U. S. population. In general, younger

individuals are more likely to fish than older individuals, and America's population is aging. Males growing up in rural areas are more likely to fish than individuals growing up in urban areas, and there are less men growing up in rural areas. Finally, white males are more likely to fish than non-white males and white males as a percentage of the U. S. population is decreasing (Duda et al. 1995b).

Age, education and residence location were important factors impacting fishing participation among females. Older females were less likely to fish than younger females; and America's female population is getting older. Further, as women's education level increased, women became less likely to fish; and the proportion of educated women in the U.S. is increasing. Finally, a female living in an urban environment was less likely to fish than a female living in a rural environment; and more females are now living in urban environments (Duda et al. 1995b).

Income does not seem to be a barrier to fishing, but the highest per capita fishing rates occur in households with annual incomes between \$25,000 and \$75,000. It is interesting to note that within this large economic range, there are comparable rates of participation. Over one half of anglers are married, but the presence or absence of children in the family does not appear to impact participation. There is little difference in education as a factor in fishing other than those Americans with less than 8 years of education tend to fish at about half the rate of the rest of the population.

To participate in fishing as an adult, it would seem an individual must fish as a child. Among active anglers, 95% fished as a child while 5% did not (Duda et al. 1995b). Among all children who fished as a child, 21% did not fish as an adult, 26% fished as an adult but not in the past two years, while 52% fished in the past two years (Duda et al. 1995b).

Demographic information on the boating population is much more scattered among state reports and two major national studies. This available literature presents a consistent picture of boaters nationwide. The two national studies conducted by the American Red Cross (1991) and Hagler Bailly (1997) both found about 25% of U.S. households contained at least one recreational boater. Similar to the angler population, a greater proportion of households in rural areas, and small towns and cities contained boaters than in households located in metropolitan areas. Nationally, 28% of the nation's boaters live in metropolitan areas, 44% in small cities and towns, and 28% in rural areas.

Boaters tend to be more educated (37% college graduates) than non-boaters (30%). They also have substantially household incomes. About 47% of boater households have incomes greater than \$50,000 while only 29% of non-boater households have incomes exceeding \$50,000.

The boating population, like angling, is predominantly Caucasian. The study by Hagler Bailly, Inc. (1997) found 84% of U.S. boaters were Caucasian and the American Red Cross study reported 93% were Caucasian. Also similar to anglers, boaters were introduced to the activity by parents and friends.

One of the important limitations of the boating studies to date has been the lack of focus on participation by minorities or women. Little is known about the demographic or participation characteristics of minorities and women since they seldom occur with enough frequency in general population survey samples to provide statistically reliable analysis to occur.

Participation Characteristics of the Fishing and Boating Population

One way to view fishing participation is to examine the consistency with which individuals fish from year to year. For example, knowing which years an angler fished within the past 5 years would provide a good indication of this consistency. In a 1995 survey of anglers who had fished at least once during the previous five years, 19% reportedly fished 1-2 years of the five years (referred to as infrequent anglers). These anglers were more likely to go fishing to be with friends and family, were less likely to fish as a child, were less likely to grow up in a rural environment, were more likely to be a minority, and were more likely to be female. Another 16% fished 3-4 years of the past 5 (sporadic anglers). These anglers were more likely to fish for relaxation, were more likely to be female, and were more likely to be 65 years old or older. The final group of anglers, comprising 65% of all anglers, fished during each year of the past 5 years (active anglers). These anglers were more likely to have family members who fish, fished for the sport or to catch fresh fish, grew up and lived in rural environments, and were more likely to be white and male (Duda et al. 1995a). It is important to realize that most American anglers began fishing within the context of a social group such as family or friends. Retention and, to a lesser extent desertion, also occur within social, cultural, and familial contexts (Duda et al. 1995a).

In a nationwide survey administered in 1996, using self-reported estimates of participation, over one half of active freshwater anglers felt their fishing activity would increase or stay the same (Responsive Management 1996a). Another 38% of active freshwater anglers felt that they would probably fish less often. However, this same group, when asked if they would like to fish more often, overwhelmingly responded in the affirmative which indicates that appropriate interventions may be able to reverse declines in activity.

The National Recreational Boating Needs Assessment Survey (Hagler and Bailly, Inc. 1997) found that only six percent of the nation's boaters were first-time participants during the 1996-97 study year. Annually, boaters average 17 days on the water. Participation among active boaters appears to be remaining constant over the past four to five years. Days of recreational boating also seem to be stable. About 20% of the boaters during the 1996-97 study year reported spending more days on the water than in previous year. The majority of boaters (59%) said they spent the same number of days and 21% indicated spending fewer days on the water than in the previous year.

Theoretical Perspectives on Angler and Boater Participation

Scientific theory provides a means for better understanding behavior through deductive reasoning. With this approach, social science researchers apply general laws, theories, and

previous study results to a particular instance, i.e., understanding how people get involved in fishing and boating, and why some move to become expert anglers while others seem to remain novices all of their lives. This approach stands in contrast to inductive reasoning whereby researchers start with observed data and develop one or more generalizations that explain the relationships between the objects observed. Social science theory and results from previous outdoor recreation research provide researchers with the basis for developing testable hypotheses for understanding angler and boater participation.

Theories and previous observations provide useful insights to better understanding socialization processes or why some individuals participate in recreational fishing and boating where others do not. Likewise, we have insights as to why some people make these activities central life interests and participate more frequently than others who seem to remain novices and are involved in fishing and boating to a much more limited extent. Further, we have a good understanding of those various factors that constrain individuals from participating in activities like fishing and boating as well as constrain those who engage in these activities from participating more than they presently do. Research will be reviewed from theoretical and observational perspectives in these four areas of our current understandings of angler and boater behaviors: motivation, socialization, specialization, and constraints.

Motivation

Over the past two decades there has been a growing recognition by both industry organizations and management agencies that they need to better define the "products" they produce and relate them to needs of the angling and boating public. Linking products with angler and boater needs brings us to the basic question of "Why do people go fishing and boating?" An answer is important for three reasons. First, the response is basic to explanations and predictions of angling and boating behavior (Ingham 1986; 1987). Nothing is more fundamental to angling and boating behavior than the factors prompting it. Second, we also need to know how much these factors vary with differing angling and boating groups.

Finally, practical reasons exist for studying motivations. To the extent the basic components of motivation are understood by industry and agency personnel, they can more effectively develop programs and services (Driver 1985). For example, if a subpopulation of anglers is increasingly interested in high catch rates but places low importance on harvesting fish, managers could devote more effort to catch-and-release programs and might consider supplemental stocking. By ignoring angler and boater motivations, managers may not be providing an appropriate balance of opportunities to fully meet public needs. This is important because motives have been shown to be inextricably linked to the satisfactions derived from angling and boating participation (Knopf 1983; Fedler 1984; Graefe and Fedler 1986). These items are also important in that they provide a good overview of the social and psychological benefits derived from fishing; fishing is much more than catching fish.

Early studies found that motivations of outdoor recreationists generally, and anglers and boaters specifically, were diverse. Knopf et al. (1973) suggested anglers were strongly

motivated by four principal factors: temporary escape, achievement, exploration, and experiencing natural settings. In a related study, Driver and Knopf (1976) asked Michigan warmwater lake anglers to rate 11 motivations or reasons for fishing on a scale ranging from not at all important to extremely important. In decreasing order of mean importance, these motivations were: (1) experiencing nature; (2) escaping; (3) making a mental change; (4) exploring; (5) avoiding others' expectations; (6) enjoying family togetherness; (7) releasing tension; (8) achieving; (9) keeping physically fit; (10) controlling or dominating; and (11) seeking thrills.

Numerous studies of angler populations and subpopulation groups (Ditton and Fedler 1983; Fedler and Grove 1988; Ditton et al. 1990) have built on Driver's early motivational characteristics. Subpopulation group studies have focused on tournament anglers (Ditton and Loomis 1985; Falk et al. 1985), boat anglers (Ditton and Graefe 1978; Dawson and Wilkins 1981), and fee fishing anglers (Hicks et al. 1983) among others. Additional motivation studies have examined differences among anglers using different types of bait (Manfredo and Anderson 1982), location (Hudgins 1984), and management regimes (Buchanan 1983).

Most research on angler motivations has revealed not only the diversity of reasons of why people participate in fishing, but the low reported importance of catching and keeping fish vis-a-vis other motivations. When anglers indicate the importance of various reasons for fishing, these data should be used with caution to predict how anglers will behave under a particular set of circumstances. This is because motivation results have generally not been analyzed statistically. For example, when Fedler (1984) reviewed 13 studies on motivations for saltwater fishing, his analysis was reduced to an ordinal ranking of the four most important reasons for fishing because few studies used the same question wording or response formats. As a result, few comparisons have been made of fishing motivations for specific angler subpopulations to understand group differences (Falk et al. 1985).

Whereas the heterogeneity of recreational fishing is widely recognized intuitively, a tendency exists to generalize motivation results from specific contexts - i.e., angler groups by fishing mode or species sought to the entire population, or vice versa. We would not expect many differences in motivations at the population level between saltwater and freshwater anglers within or among states. At the population level, context differences disappear in the profile of the "average angler" which as Shafer (1969) reminded us doesn't exist except in research reports. However, we would expect numerous differences in motivations among angler groups, and between angler subpopulation groups and the entire population.

Fedler and Ditton (1994) examined these propositions by analyzing data from 17 angler studies which used consistent question wording and response formats. Examination of the results of their study, shown in Table 6, generally confirms the propositions above. When anglers were aggregated at the population level, several non-catch-related motivations for fishing were rated consistently more important than catch related motivations. Also, a few differences existed in motivational importance between freshwater and saltwater populations. Motivational results from the population studies were artificial since they were the result of aggregating diverse angler groups; therefore, caution should be taken not to generalize population results to subpopulation groups.

Further, context was shown to be important to the issue of angler motivation. When anglers were grouped by fishing mode or species sought, the importance of catch-related motivations varied significantly. For example, the challenge of fishing and the experience of the catch were very important to angler groups 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 obtain a trophy fish. Although far fewer group differences were found for non-catch-related motives, some important differences seemed to make intuitive sense. Angler groupings by fishing mode or species sought are useful from a management perspective, but fisheries professionals should realize that variation still occurs within these groups, and anglers often engage in other forms of fishing. Nevertheless, the data provided in the study provides a useful demonstration of the diversity within the angling population.

Socialization

Outdoor recreation pursuits like fishing are social activities in that they involve family and friends. In 1969, Burch (1969) 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 predictors, 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

Table 6: Profile of Angler Populations and Subpopulations Based on Motivation Importance

Motivation for Fishing by Category	----- Saltwater Subpopulations -----									
	Shore	Cons. Org.	Black Drum	Pvt. Boat	Offshore 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

Social										
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
Fishery Resource										
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
Skills and Equipment										
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 6: Profile of Angler Populations and Subpopulations Based on Motivation Importance (Continued)

Motivation for Fishing by Category	Population					Freshwater Subpopulations			Grand Mean
	Salt Water	Salt Water	Salt Water	Fresh Water	Fresh Water	Trout	Catfish	Black Bass	
Psychological & Physiological									
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
Natural Environment									
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
Social									
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
Fishery Resource									
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
Skills and Equipment									
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.

attracted to the activity because of the experience opportunities afforded by the social relationships or interactions involved within the camping party. Social group composition is also important as a meaning for understanding the particular meanings that individuals attribute to their recreation activities. For example, going fishing with the family is a different activity in terms of experience outcomes sought than going with either close fishing friends or friends from work. Therefore, the meanings attributed to recreation experiences are socially created by groups (Lee 1972).

Leisure socialization occurs from the cradle to the grave. By socialization, we mean the means by which individuals are initiated into the culture of an activity and learn various aspects of that culture, such as the rules of childhood pursuits and other structured uses of free time (Kelly 1974). More specifically, 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. The importance of social influences and

associated experiences is reinforced by the following quote 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 recent 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 1996a). 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. 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 which 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, today 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.

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 are not useful for explaining boating participation. For example, if an individual participates as a child in boating as 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.

Specialization

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), their 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, nor 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 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" (Bryan 1979). 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 have not established the activity as a regular part of their leisure. Generalists included those anglers who have established the sport as a regular activity and use a variety of techniques. The third group, technique specialists, includes anglers who focus on a particular technique to the exclusion of other techniques. And finally, there are technique and setting specialists. They exhibit distinct preferences for particular techniques and water types where they pursue their activity. He 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, Loomis and Choi 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). His 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). From left to right, they indicate the changes in participants as they move from strangers, to tourists, to regulars, to insiders (Table 7). Also, as Unruh (1979) suggests, the process 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 was shown to have a higher level of interaction with various fishing-oriented fishing media than low specialization anglers. The former group were 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

Table 7: Characteristics and Types of Participation in Social Worlds

<u>Characteristics</u>	<u>Subworld Types</u>			
	<u>Strangers</u>	<u>Tourists</u>	<u>Regulars</u>	<u>Insiders</u>
Orientation	Naivete	Curiosity	Habituation	Identity
Experiences	Disorientation	Orientation	Integration	Creation
Relationships	Superficiality	Transiency	Familiarity	Intimacy
Commitment	Detachment	Entertainment	Attachment	Recruit ment

Source: Unruh (1979)

of greater importance, than fishing-specific motivations; low specialization anglers had a superficial and perhaps naive view of fishing as being about fish to the exclusion of other important intrinsic benefits. While most of these previous research efforts provided some empirical support for Bryan's framework, their results have generally provided limited insight to the number and size of specialization groups in various populations because angler samples studied were not necessarily representative of the entire angler population at the state level, for

example. This occurred because sampling frames were selected based on cost considerations, availability, or convenience. While these results are useful for understanding angler diversity, they are limited for marketing purposes because they fail to yield an understanding of the size, number, and characteristics of specialization groups. Understanding angler diversity is one thing; understanding how many novices, generalists, and various types of specialists there are in the angling population is quite another. More studies of angler specialization with national and statewide angler surveys will be necessary before we have a thorough understanding of how anglers are distributed along the specialization continuum.

Several issues emerge from our predictive inability to understand angler diversity. First, there are numerous examples where the fishing industry has used a particular image of an angler to communicate with current and prospective anglers. Typically, the angler portrayed

is involved in some high-end or expensive form of fishing, heavily gear dependent, fishing from a boat, and catch oriented. Just how representative is this image of all anglers and what is the basis for this generalization and to what extent does it attract new anglers? Such an image portrays a singular view of the angler and the fishing experience involved. From an economic demand theory perspective, we would expect a much higher volume of more inexpensive fishing trips than expensive trips. Thus intuitively, we would expect many more low specialization anglers than high specialization anglers. And efforts to communicate with the former group may be missing their mark because none of the elements that characterize this group are present. Second, there is no reason to believe that movement along the specialization continuum is linear or inevitable. There is no evidence to support the idea that all or even most novices "grow up" to become angling specialists. Some do, most don't. We have little to no predictive understanding in this regard because there have been no longitudinal studies that follow anglers through time in an effort to understand why some individuals are further socialized into angling than others. Third, we have heard that a minority of the anglers catch a majority of the fish for some time.

Several studies have examined the distribution of angler effort to see if it is distributed unequally too, lending some further credence to the specialization concept. Since fishing frequency is such an important aspect of specialization, the distribution of fishing days (in the previous 12 months, for example) has been viewed across quantities of statewide or national angler samples. In a statewide survey of largemouth bass anglers in Texas, Ditton (1996) observed that 20% of the angler sample accounted for 58% of the total largemouth bass fishing days. Overall, 40% of the angler sample accounted for 79% of the total number of fishing days. The remaining 60% of the angler sample accounted for the remaining 21% of the fishing days. The same pattern was demonstrated in three other angler studies, namely, Romsa and Girling (1976), Ditton (1980), and O'Leary and Pate (1979) who reported that 20% of their angler samples accounted for 66%, 67%, and 73% of activity occasions in the previous year. A better understanding of the most avid and least avid anglers would be useful to agency managers and industry marketing specialists in that it would at least establish a range of angler capabilities, thinking, wants, and preferences. As agencies and the industry reach out to under served constituencies, perhaps they can overcome some of the constraints of those who participate least in fishing.

There are several additional data gaps worthy of mention. In addition to a lack of a national perspective on angler specialization using national survey data sets, further studies of angler diversity are necessary at the state level too. Previous understandings have been developed with small, localized, or species-specific samples. Most of the previous angler and boater study results pertain mainly to white middle-aged males because they dominate random samples for these two groups of participants. Even the most current National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (U. S. Fish and Wildlife Service 1997) has insufficient sample size to provide adequate attention to ethnic groups; Hispanics are currently aggregated in the "Other" category. As efforts are made to socialize more women and minorities into recreational fishing, these gaps in research understanding will need to be overcome. Understanding the distribution of women, minorities, members of various ethnic groups, and seniors along the specialization continuum is not now possible. Typically, there are just too few of these individuals selected in traditional random sample surveys where interest is focused on the majority participation group. Several informed hypotheses come to

mind for future testing. We would expect a much higher proportion of women and minorities to be at the low specialization end of the continuum than males because of recent efforts to recruit the former into fishing. Likewise, we would expect a much higher proportion of seniors at the high end of specialization continuum simply because of their longer tenure in fishing, and higher numbers as well, due to the aging of the population.

Constraints to Participation

All individuals are constrained in their choice of and participation in recreation activities (Iso-Ahola and Mannell 1985). 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, for example, and individuals are forced to discontinue their participation.

All outdoor recreation activities have some degree of participant turnover. Without computerized fishing license files where individuals purchasing licenses through time can be verified, overall angler numbers in each state will not provide an accurate view of angler annual turnover. In fact, without computerized files, it is impossible to determine whether discontinuous use has led to ceasing behavior. 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. This is a good reason why fisheries management agencies need to be much more clientele oriented than they have been previously. 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 many, 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 increase retention can be an important strategy to 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 (percent that participate) in fishing by females. Exactly why are there differences in participation rates by gender, race, and ethnic group?

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 recreation behavior; instead a combination of factors are 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).

Constraints have been conceptualized into three hierarchical categories: intrapersonal, interpersonal, and structural (Crawford and Godbey 1987; Crawford et al. 1991). Intrapersonal constraints (i.e., those constraints that involve a person's psychological state) 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 (i.e., those constraints that are the result of personal interactions with others) 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 fishing more often." And finally, structural constraints (i.e., time and financial commitments, opportunity to fish, a lack of access, and family life-cycle stage) are those items that generally interfere between one's desire to participate and the ability to do so.

The most common and most salient factor mentioned by anglers as a constraint to recreational fishing and boating, is a lack of time; conflicts with family obligations, loss of social support, and other cultural issues are often lumped together. 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 1996a). A major fishing license sales decline in Pennsylvania in 1996 occurring at the same time as a license price increase highlights the importance of the time issue. 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. They did not feel equipped to deal adequately with what people thought about fishing (psychological states) or what affects other people had on choice making (social influences). 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 identify the "usual suspects" as constraints than to address those underlying concerns that prevent them from participating more frequently.

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. Empirical support for this hierarchical model was reported by Raymore et al. (1993). This model applies to those considering angling and boating as prospective recreation pursuits as well as 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, and this 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 participate in fishing or participate more often. 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 the environmental movement, cable television, and the lack of social cohesion. Or perhaps, there are being insufficient efforts made by service providers and the industry to help individuals negotiate the constraints they face today.

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, research in this area has been made difficult by the small number of females 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 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.

In a recent study of gender differences in constraints, Clark (1996) reported several significant differences between males and females in perceived intrapersonal constraints to fishing more frequently in Texas. 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 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 constraint items identified as constraints are 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 other activities.

Overall, there needs to be much more research attention to the role of these constraints on women's participation in outdoor recreation activities. If efforts to recruit more women to recreational fishing and boating are to be successful, we will require greater insight into the effects of constraints on women. The same can be said as well for minorities, members of various ethnic groups, youth, seniors and urban dwellers. 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 have all been found to be 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.

Recreational Fishing Constraints

Below is a summary of some of the more common constraints listed by fisheries managers and anglers. Applicable data summarized from several reports are used to shed some light on the veracity of these constraints.

There has been some perception that an increasing divorce rate and children growing up in a family with a female head of household has contributed to a decline in fishing initiation. However, two studies indicate that there is no statistically significant differences between fishing participation among those who grew up in a single-parent household and fishing participation among those who grew up in a dual-parent household (Duda et al. 1995b; and Dann 1993).

While catch rate in fishing is one of many satisfactions, it is not a major factor in desertion or decreased activity. Anglers seem to have a high tolerance for lower success rates if the reason, such as increasing fish populations, is explained to them (Bissell and Duda 1995).

There are no data to suggest that desertion due to not catching large fish is a factor. A small percentage of anglers place a high value on the size of fish, but these tend to be trophy anglers who also have other values associated with their recreation fishing experience (Bissell and Duda 1995).

It appears that traditional management regimes, which focus on bag limits, size, access and other physical factors, ignore the social factors which, for a majority of anglers, are of the most importance (Bissell and Duda 1995).

There are no data to indicate that cost of fishing licenses is a problem in and of itself. However, if costs rise along with other, more important issues, there may be some specific degree of desertion due to that factor. Although fish and wildlife agencies experience a slight decline in fishing license purchases immediately after raising license costs, sales tend to stabilize after two or three years in most cases. However, fishing license costs should not be considered as a single factor nor should they be manipulated independent of other factors.

Crowding or conflicts with other anglers has been reported by about 12% of the respondents on one survey (Responsive Management 1996). While this is not a large number, the fact that it is being reported in a flat to declining participation scenario is interesting. The most logical interpretation is that the perception of crowding is becoming more important as naturalistic values have increased and competition from other water resource users has grown. In all likelihood, utilitarian anglers would be less concerned about this issue.

As is well documented by research over the past several decades, anglers derive satisfaction from a wide variety of experiences. However, in general we see that relaxation, social values and the ability to experience outdoor recreation in natural settings are the primary values. If fishing is taken in other contexts, utilitarian or consumptive resource exploitation for example, then the most significant aspects will be overlooked (Bissell and Duda 1995).

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 reflected 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.

Research Needs

We found extensive research on many aspects of recreational fishing and relatively few studies on recreational boating. The depth of information on fishing is substantial from a descriptive standpoint but lacks the focus on subgroups, demographic or otherwise, to address all the issues associated with the development of a national outreach plan. While this is a limitation, there is substantial evidence to assist in shaping such a plan. Below are several areas where additional research would be beneficial. These data gaps, if filled, would result in additional focused information which could be directly applied to designing programs and messages to stimulate recreational fishing and boating.

1. Since most previous research has focused on random samples of anglers and boaters, available understandings of participants pertain mainly to white males between the ages of 30 and 49. Study samples with sufficient numbers of women, minorities, members of ethnic group populations, and seniors are essential to understanding their motivations, socialization processes, constraints to participation, and within group specialization differences. This information must be the basis for programs and other efforts to attract additional members of these groups to participate in fishing and boating and to remain involved over time.
2. While the National Survey of Fishing, Hunting and Wildlife-Associated Recreation provides an important overview of these outdoor recreation activities and their economic importance, the data collected do not focus sufficiently on the antecedent factors associated with participation and angler's continued involvement in fishing. More attention should go to understanding motivations for participation, and constraints to participation, as well as measures of participant satisfaction with their fishing experiences. If the current national study is intended to provide mainly an overview, then additional national-level studies need to be conducted to better understand why people vary in their motivations for fishing and boating and why some individuals choose to continue to participate while others cease participation.

3. Longitudinal study designs may be necessary to shed new light on the above matters instead of depending totally on cross-sectional studies. Many of the concerns expressed at the first Continental Congress, as well as the regional meetings, involve a perception of change; most available research results for fishing and boating are not useful for understanding angler and boater change over time with regard to their motivations, attitudes, behavior, constraints, and satisfaction levels.
4. Fisheries and boating managers should be encouraged to cooperate with their state-designated demographer to better understand the demographic implications for fishing and boating participation in their respective jurisdictions. Since the population structure of each state varies, along with participation rates for various population sub-groups, these analyses are essential for developing recruitment strategies and programs for each state.
5. There are a plethora of public and private programs intended to socialize new recruits to fishing and boating. Whether these efforts are effective or not will remain unknown without more attention to evaluation efforts. All programs that seek to recruit new anglers and boaters should have clear and measurable objectives and research efforts are needed to ascertain whether they have been achieved. This will require more attention to methods for tracking participants over time as well as longitudinal study designs.
6. In addition to continued studies of licensed anglers and registered boat owners, additional population studies are needed at the regional and national levels to better understand what specifically constrains people from participation in these and other related activities. The conceptual literature developed for broad use with leisure activities needs to be put to use to understand the working dynamics of constraints to participation so that marketing, policy, and structural solutions can be found.
7. In depth, qualitative research on the time issue as it relates to fishing and boating participation is needed. Focus groups with people who had bought a license (fishing or boat) on a regular basis in the past but no longer purchase one would be useful group to probe.
8. Predictive models need to be developed to help identify the salient factors affecting the sale of fishing and boating licenses. This would not only help management agency financial stability, it would help focus marketing efforts on important constraints.
9. The final, but possibly the most important research need is an evaluation of existing fishing and boating marketing initiatives. It is very important to build in evaluation research of promotion efforts to document the impacts of these efforts on the goals of the programs. For example, if promotion efforts to increase fishing participation and license sales in Pennsylvania are implemented, we would need to be able to measure participation and license sales before and after the promotion. We need to evaluate the message of the promotional efforts, the target markets, and mediums used. Once these efforts are implemented and evaluated, we will have a much clearer picture of what works and what doesn't work.

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