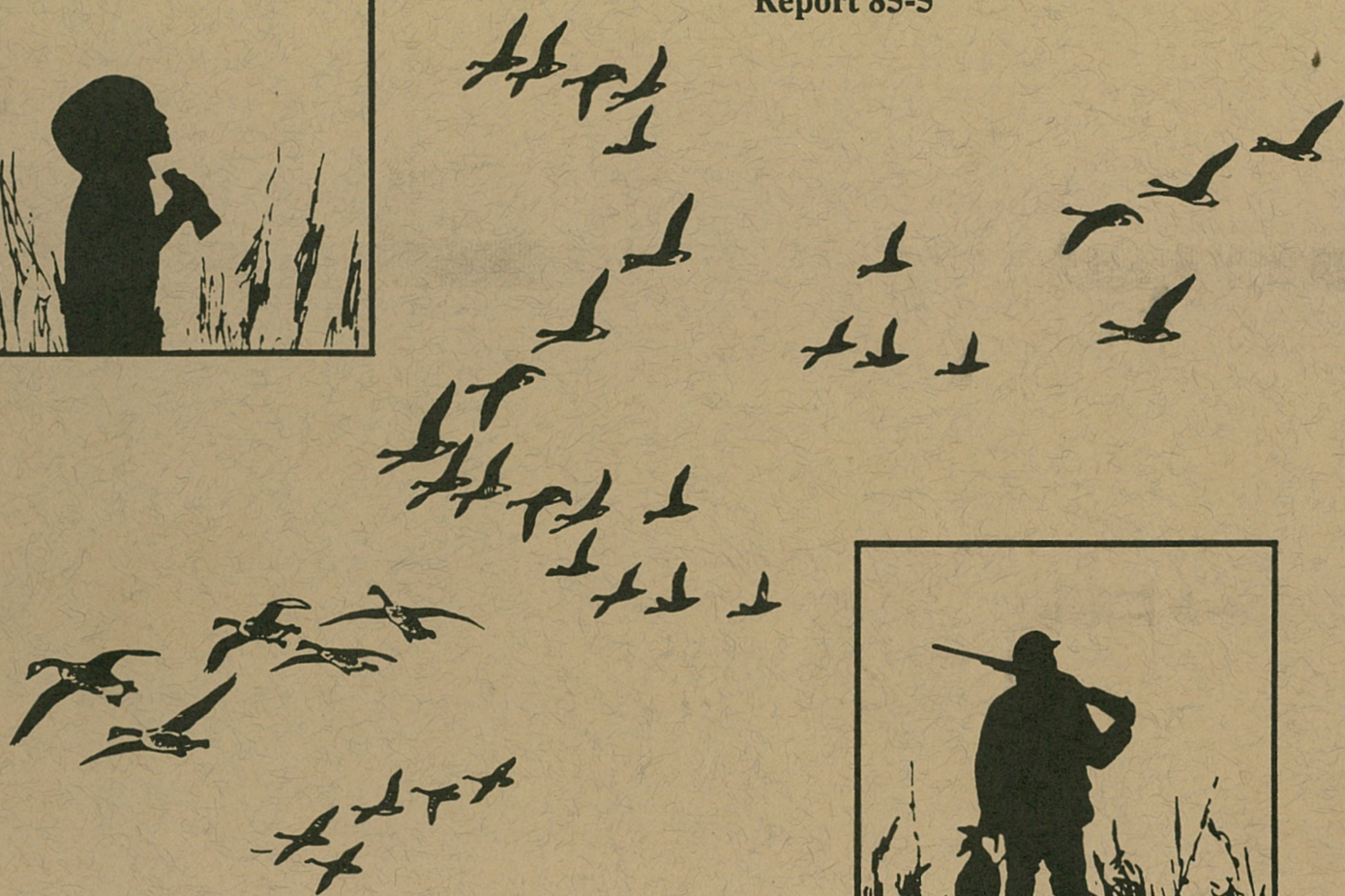


# Analysis of the 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

Black Bass Fishing in the U.S.; 1985

Report 85-5



U.S. Department of the Interior  
Fish and Wildlife Service



**ANALYSIS OF THE 1985 NATIONAL SURVEY OF  
FISHING, HUNTING, AND WILDLIFE-  
ASSOCIATED RECREATION**

**Report 85-5**

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October 1989

Division of Federal Aid  
U.S. Fish and Wildlife Service  
Washington, D.C. 20240

This paper is one of a series designed to complement the National and State reports of the 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation with investigations of particular fish and wildlife related trends and other topics of interest. The results presented and conclusions reached are the author's and are not necessarily endorsed by the U.S. Fish and Wildlife Service.

# **BLACK BASS FISHING IN THE U.S.; 1985**

Anne Grambsch

Division of Federal Aid

U.S. Fish and Wildlife Service

Washington, D.C.

October 1989

## *Abstract*

This paper presents estimates of the number of black bass anglers and days of fishing for black bass for the nation as a whole and for each of the 50 states. Sociodemographic characteristics of those who fish for black bass are compared with the U.S. population. Black bass anglers are also compared to freshwater anglers in general in order to determine if there are systematic differences between the two groups.

## Introduction

This report summarizes and discusses the extent of black bass fishing in the United States. Black bass includes largemouth bass, smallmouth bass, spotted bass, etc. but does not include white bass, striped bass, rock bass etc. This report covers anglers 16 years old or older who fished in rivers or streams, manmade ponds or reservoirs, or natural lakes or ponds (excluding the Great Lakes). These estimates are based upon results from the 1985 National Survey of Fishing, Hunting, and Wildlife Associated Recreation<sup>1</sup>.

The next section consists of estimates of fishing for black bass for the nation as a whole and for each of the 50 states. The third section consists of a discussion of the sociodemographic characteristics of those who fish for black bass and comparisons with all freshwater anglers in order to determine if there are systematic differences between the two groups. This section will rely on both descriptive statistics and a probability of participation model. The final section provides a summary and closing comments.

## Fishing for black bass

Black bass was the most popularly sought after fish species in 1985. As Table 1 shows, over 16 million

freshwater anglers 16 years old or older fished for black bass in the U.S. This meant that about four out of every ten freshwater anglers (42 percent) fished for bass. In comparison, about 14 million anglers fished for catfish (36 percent), nearly 12 million fished for crappie (31 percent), and more than 11 million fished for trout (29 percent). Of course, anglers can fish for more than one species so that summing the number of anglers who fished for the various species will result in a total that is greater than the number of freshwater anglers (38.4 million). Black bass anglers spent more than 342 million days on the water pursuing that lunker bass, accounting for 44 percent of freshwater fishing days. As noted above, anglers can fish for more than one species and they can do this on a particular day, so that the number of freshwater fishing days (785.9 million) is less than the total from summing the days for each species.

Tables 2, 3, and 4 provide estimates of fishing for black bass on a state by state basis. These estimates represent freshwater and black bass fishing in-state by residents and nonresidents combined. Sample sizes for bass fishing in Alaska and Hawaii were too small to permit estimates in those states<sup>2</sup>. As a result, the map which shows participation in bass fishing by state includes only the contiguous 48 states.

**Table 1. Anglers and Days of Fishing for Black Bass and Other Fish: 1985**

(Anglers 16 years old or older. Numbers in thousands. Excludes Great Lakes Fishing.)

Type of Fish Sought	Anglers		Days of Fishing	
	Number	Percent	Number	Percent
Total, all freshwater anglers	38,433	100	785,855	100
Black bass	16,241	42	342,587	44
Panfish	14,160	37	264,493	34
Catfish	14,023	36	284,516	36
Crappie	11,747	31	229,824	29
Trout	11,317	29	159,255	20
Walleye/sauger	4,122	11	79,461	10
Northern pike/pickereel	3,512	9	69,508	9
White bass	3,102	8	69,141	9
Striped bass	3,032	8	70,025	9
Salmon	1,170	3	15,562	2

1 Many of the estimates presented here can be found in the 1985 Survey's national and state reports (USDI 1988).

2 Estimates based on sample sizes of less than 10 observations were considered too unreliable to report and are indicated by . . . in the tables.

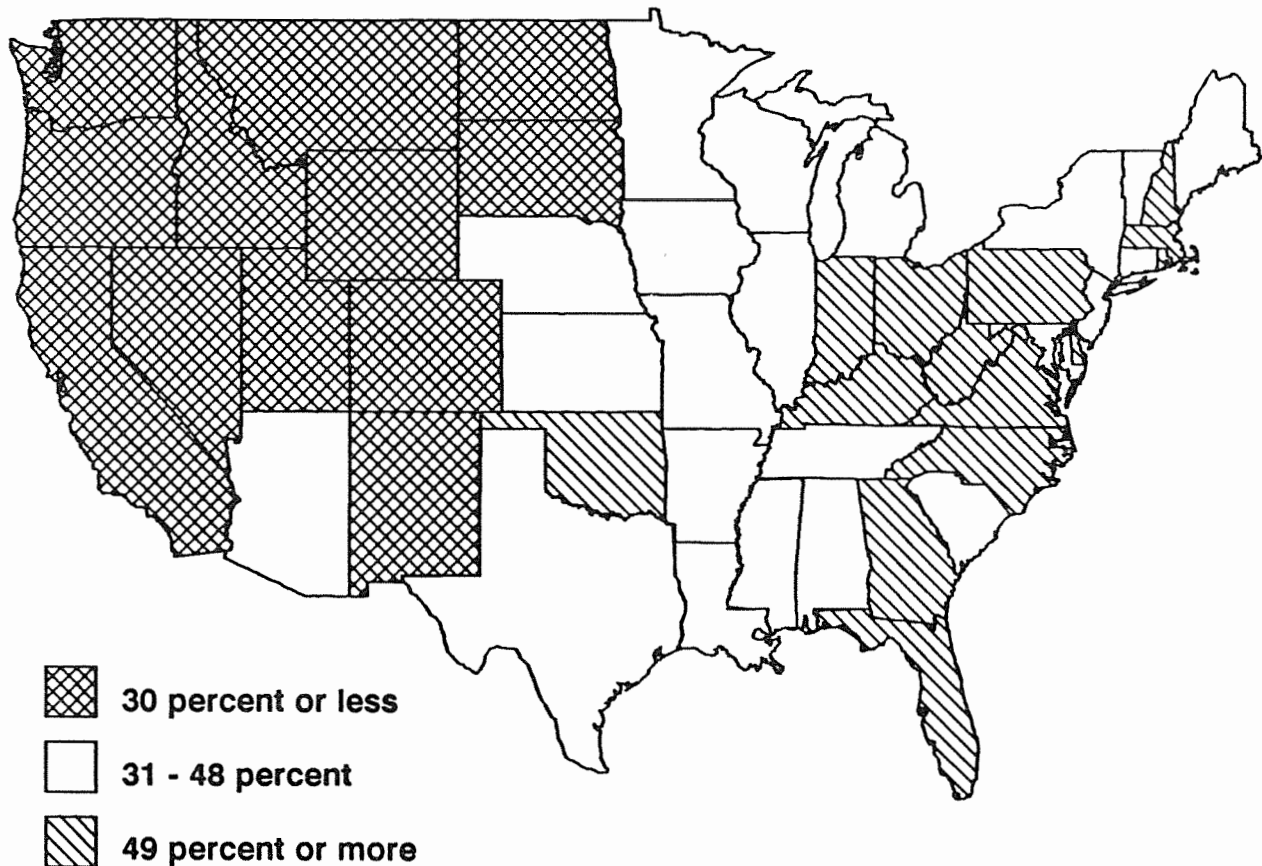
Table 2 shows that the percentage of freshwater anglers who fished for black bass varied considerably across states. Participation rates ranged from a low of 3 percent in Wyoming to 60 percent in Florida and Rhode Island. In general, a lower percentage of freshwater anglers fished for black bass in the western states. Conversely, states with a higher percentage of anglers fishing for bass were concentrated in the eastern and southern states (Oklahoma was a notable exception for this general pattern).

The map below reinforces this observation. Relatively lower participation rates (30 percent or less) occurred only in states west of the Mississippi, as shown by the cross-hatched area. States with an open white background had participation rates ranging from 31 to 48 percent, which bracketed the national rate of 42 percent. This can be considered an

average or medium rate of participation in bass fishing. In the remaining states, 49 percent or more of freshwater anglers fished for black bass. Of course, these divisions are somewhat arbitrary. A number of states just missed the cutoff, such as Mississippi and Missouri (both at 48 percent), Maryland (47 percent), and Alabama, Louisiana, and New Jersey (all at 46 percent).

Table 3 shows the relative shares of freshwater fishing days that were spent fishing for black bass. To a certain extent days of bass fishing follow the pattern of bass anglers, i.e. where there were many bass anglers there were many bass fishing days. However, differences in the percentage of anglers who fished for black bass and the percentage of freshwater days spent fishing for black bass existed in almost every state. In many cases these differences were probably not statistically significant, due to the large standard errors caused by the relatively

**Participation of Freshwater Anglers in Bass Fishing,  
by State Where Fishing Occurred**



**Table 2. Freshwater Anglers and Black Bass Anglers, by State Where Fishing Occurred**

(Anglers 16 years old or older. Numbers in thousands. Excludes Great Lakes Fishing.)

State	Freshwater Anglers	Bass Anglers	
		Number	Percent
United States	38,433	16,241	42
Alabama	1,061	483	46
Alaska	223	...	...
Arizona	638	232	36
Arkansas	932	392	42
California	3,061	922	30
Colorado	1,174	119	10
Connecticut	360	154	43
Delaware	60	30	50
Florida	1,914	1,156	60
Georgia	1,355	688	51
Hawaii	11	...	...
Idaho	455	44	10
Illinois	1,423	643	45
Indiana	1,311	697	53
Iowa	771	302	39
Kansas	554	238	43
Kentucky	1,102	602	55
Louisiana	1,054	480	46
Maine	365	133	36
Maryland	382	179	47
Massachusetts	492	257	52
Michigan	1,697	729	43
Minnesota	1,777	563	32
Mississippi	926	440	48
Missouri	1,600	761	48
Montana	372	22	6
Nebraska	356	115	32
Nevada	237	49	21
New Hampshire	272	152	56
New Jersey	505	233	46
New Mexico	413	52	13
New York	1,148	492	43
North Carolina	1,273	630	49
North Dakota	202	17	8
Ohio	1,571	768	49
Oklahoma	1,086	544	50
Oregon	871	138	16
Pennsylvania	1,573	768	49
Rhode Island	96	58	60
South Carolina	740	331	45
South Dakota	230	38	17
Tennessee	1,144	544	48
Texas	2,479	1,127	45
Utah	433	42	10
Vermont	188	62	33
Virginia	903	491	54
Washington	928	116	13
West Virginia	463	243	52
Wisconsin	1,642	663	40
Wyoming	353	11	3

... Sample size too small to report data reliably.

State detail does not add to national total because of multiple responses.

**Table 3. Days of Fishing in Freshwater and for Bass, by State Where Fishing Occurred**

(Days of fishing by anglers 16 years old or older. Numbers in thousands. Excludes Great Lakes fishing.)

State	Days of Fishing in Freshwater	Days of Bass Fishing	
		Number	Percent
United States	785,855	342,587	44
Alabama	20,962	9,713	46
Alaska	2,648	...	...
Arizona	7,800	3,717	48
Arkansas	19,076	7,909	41
California	43,888	14,228	32
Colorado	15,452	3,201	21
Connecticut	7,045	3,280	47
Delaware	866	472	55
Florida	39,978	25,418	64
Georgia	28,454	16,485	58
Hawaii	53	...	...
Idaho	6,622	471	7
Illinois	27,489	11,213	41
Indiana	27,158	15,080	56
Iowa	14,500	6,121	42
Kansas	10,203	4,652	46
Kentucky	20,715	10,221	49
Louisiana	24,278	12,636	52
Maine	5,746	1,628	28
Maryland	3,895	2,137	55
Massachusetts	9,687	5,746	59
Michigan	30,387	12,919	43
Minnesota	27,850	9,962	36
Mississippi	15,407	7,521	49
Missouri	29,607	14,385	49
Montana	4,952	397	8
Nebraska	6,860	2,186	32
Nevada	3,224	583	18
New Hampshire	4,315	1,843	43
New Jersey	8,609	4,449	52
New Mexico	4,772	555	12
New York	18,011	7,346	41
North Carolina	21,857	10,999	50
North Dakota	2,894	199	7
Ohio	34,339	17,652	51
Oklahoma	21,937	12,734	58
Oregon	12,863	1,117	9
Pennsylvania	39,252	16,128	41
Rhode Island	1,777	1,214	68
South Carolina	14,770	6,508	44
South Dakota	2,891	596	21
Tennessee	22,698	9,447	42
Texas	40,462	18,557	46
Utah	5,263	377	7
Vermont	3,186	886	28
Virginia	15,984	9,648	60
Washington	15,348	2,654	17
West Virginia	8,674	4,703	54
Wisconsin	25,991	10,795	42
Wyoming	3,132	122	4

... Sample size too small to report data reliably.

**Table 4. Average Days of Fishing in Freshwater and for Bass,  
by State Where Fishing Occurred**

(Anglers 16 years old or older. Excludes Great Lakes fishing.)

State	Average Days of Freshwater Fishing	Average Days of Bass Fishing
United States	20	21
Alabama	20	20
Alaska	12	...
Arizona	12	16
Arkansas	20	20
California	14	15
Colorado	13	27
Connecticut	20	21
Delaware	14	16
Florida	21	22
Georgia	21	24
Hawaii	5	...
Idaho	15	11
Illinois	19	17
Indiana	21	22
Iowa	19	20
Kansas	18	20
Kentucky	19	17
Louisiana	23	26
Maine	16	12
Maryland	10	12
Massachusetts	20	22
Michigan	18	18
Minnesota	16	18
Mississippi	17	17
Missouri	19	19
Montana	13	18
Nebraska	19	19
Nevada	14	12
New Hampshire	16	12
New Jersey	17	19
New Mexico	12	11
New York	16	15
North Carolina	17	17
North Dakota	14	12
Ohio	22	23
Oklahoma	20	23
Oregon	15	8
Pennsylvania	25	21
Rhode Island	19	21
South Carolina	20	20
South Dakota	13	16
Tennessee	20	17
Texas	16	16
Utah	12	9
Vermont	17	14
Virginia	18	20
Washington	17	23
West Virginia	19	19
Wisconsin	16	16
Wyoming	10	11

... Sample size too small to report data reliably.



small sample sizes at the state level<sup>3</sup>. But in cases where these differences were significant, they would indicate that bass was fished for more intensively than freshwater fish in total in some states and less intensively in others.

Another way to characterize this phenomenon is shown in Table 4, which provides estimates of average days of freshwater fishing and bass fishing. In some states the average days of fishing for black bass is greater than the average days spent fishing in freshwater, and in other states the average is less. There does not appear to be an easily discernable pattern to the observed, perhaps significant, intensity differences between states. A simple correlation between intensity (as measured by average days of fishing) and participation rates was not apparent. Further study using combined data from the 1980 and 1985 National Surveys may yield large enough sample sizes to determine if the differences were statistically significant and if there was a systematic pattern to these differences.

#### Characteristics of Black Bass Anglers

There are a number ways to describe the population that goes fishing for black bass. One approach would be to list the percentages of people who fished for black bass (e.g. the percentage of women who fished for black bass). This would measure the participation rate of the

particular population group in black bass fishing. Another approach would be to list the percentages of anglers who fished for black bass (e.g. the percentage of female anglers who fished for black bass). This conditional participation rate (conditional on the person being an angler) will be discussed below and in the context of a participation model. Finally the distribution of sociodemographic characteristics within the black bass angler population could be used to describe these anglers. In the discussions below, comparisons of the distribution of characteristics of the U.S. population, freshwater anglers, and black bass anglers will be highlighted.

#### Age

Fishing for black bass appealed to anglers of all ages. At least 35 percent of the freshwater anglers in each age group fished for black bass. Participation rates for freshwater anglers in bass fishing were highest for the 18-24 year old age group (45 percent). The lowest rates were for anglers in the oldest age group, those 65 years old or older (35 percent).

Bass anglers tend to be younger than the U.S. population as a whole. About 71 percent of bass anglers were between the ages of 16 and 44, while only 59 percent of the U.S. population fell into this age

**Table 5. Age Distribution of the U.S. Population, Freshwater Anglers and Bass Anglers**

(Numbers in thousands. Excludes Great Lakes fishing.)

Age Group	U.S. Population		Freshwater Anglers		Bass Anglers		
	Number	Percent	Number	Percent	Number	Percent	Percent of Freshwater Anglers
Total	181,095	100	38,433	100	16,241	100	42
16-17 years old	7,659	4	2,064	5	854	5	41
18-24 years old	25,509	14	5,948	15	2,692	17	45
25-34 years old	39,470	22	10,395	27	4,474	28	43
35-44 years old	33,787	19	8,424	22	3,574	22	42
45-54 years old	23,885	13	4,721	12	2,028	12	43
55-64 years old	22,754	13	3,829	10	1,551	10	41
65 years old or older	28,030	15	3,053	8	1,063	6	35

<sup>3</sup> Unless otherwise noted, comparisons are based on tests of statistical significance at the 90% level of confidence.

**Table 6. Sex Distribution of the U.S. Population, Freshwater Anglers, and Bass Anglers**

(Numbers in thousands. Excludes Great Lakes fishing.)

Sex Group	U.S. Population		Freshwater Anglers		Bass Anglers		
					Number	Percent	Percent of Freshwater Anglers
	Number	Percent	Number	Percent			
Total	181,095	100	38,433	100	16,241	100	42
Male	85,781	47	26,106	68	12,440	77	48
Female	95,314	53	12,327	32	3,797	23	31

group. Bass anglers were also slightly younger than freshwater anglers, with 70 percent of freshwater anglers between the ages of 16 and 44. For the older age groups the situation was reversed. In the U.S., 28 percent of the population was 55 years of age or older. For freshwater anglers, 18 percent were 55 or older and for bass anglers the percentage fell to 16 percent.

#### Sex

Bass fishing has a higher concentration of men than freshwater fishing in general. In the U.S. women are a majority of the population (53 percent). While the number of women participating in fishing has been increasing over time, they accounted for only 32 percent of freshwater anglers and 23 percent of bass anglers. Men accounted for 47 percent of the U.S. population, 68 percent of the freshwater fishing population, and 77 percent of the bass fishing population.

Almost half (48 percent) of the men who fished in freshwater fished for black bass. For women anglers, 31 percent fished for black bass.

#### Education

About one out of every four Americans 16 years old or older (25 percent) had 11 or fewer years of education. Freshwater anglers had a slightly lower percentage (23 percent) in this educational attainment category. Bass anglers on the other hand had a substantially lower percentage (18 percent) than either the U.S. population or freshwater anglers falling in this category. Bass fishing had a correspondingly higher percentage (43 percent) of its anglers with 12 years of school. In the U.S., 39 percent of the population and freshwater anglers attained this level of education. The percentages of those with some college education are also slightly higher for bass anglers than for the U.S.

**Table 7. Education Distribution of the U.S. Population, Freshwater Anglers, and Bass Anglers**

(Numbers in thousands. Excludes Great Lakes fishing.)

Education Group	U.S. Population		Freshwater Anglers		Bass Anglers		
					Number	Percent	Percent of Freshwater Anglers
	Number	Percent	Number	Percent			
Total	181,095	100	38,433	100	16,241	100	42
0-11 years	44,783	25	9,032	23	2,910	18	32
12 years	69,752	39	14,936	39	6,996	43	47
1-3 years college	34,272	19	7,730	20	3,186	20	41
4 or more years of college	32,289	18	6,735	18	3,123	19	46

population (39 percent versus 37 percent) although the differences are not as great as for those with lower educational attainment levels.

Participation rates for freshwater anglers in bass fishing varied considerably with education levels. Roughly one third of freshwater anglers with less than 12 years of school (32 percent) fished for bass. In comparison, 46 percent of freshwater anglers with 4 years of college or more fished for black bass. There does not appear to be a strictly positive relationship between participation in bass fishing and education level since participation rates were lower for anglers with 1-3 years of college (41 percent) than for anglers with 12 years of education (47 percent).

#### Annual Household Income

In 1985 the median household income for the U.S. was about \$25,000. As shown in the table, 47 percent of the U.S. population 16 years or older lived in households with incomes under \$25,000, 48 percent lived in households with incomes over \$25,000, and 5 percent lived in households that did not report their income. For freshwater fishing, 43 percent of freshwater anglers lived in households with incomes under \$25,000, and the percentage of black bass anglers in this income group was even lower at 40 percent. Of course the opposite is true for the higher income groups. Anglers who lived in households with incomes above the median (\$25,000) accounted for 53 percent of freshwater anglers and 57 percent of black bass anglers. About 3 percent of

freshwater anglers and bass anglers lived in households that did not report their income.

At least 34 percent of the freshwater anglers in each income category fished for black bass. There appears to be a positive correlation between the participation rate of freshwater anglers in bass fishing and income. The participation rate rises from 34 percent for the lowest income group (under \$10,000) to a peak of 47 percent for the \$50,000 - \$74,999 income category. The relationship may not be strictly positive since the percentage of freshwater anglers fishing for black bass in the \$75,000 or more income category falls to 43 percent, although the differences in the higher income groups was not significant.

#### Census Geographic Region

The percentage of freshwater anglers fishing for black bass varied considerably across the country. Not surprisingly, the smallest percentages of freshwater anglers fishing for black bass were found in the Mountain and Pacific Regions (20 percent and 25 percent respectively). As expected, the highest participation rates for freshwater anglers in bass fishing occurred in the South Atlantic and East South Central Regions, where over half the freshwater anglers fished for black bass. The participation rate in the West North Central Region was relatively low, with 38 percent of freshwater anglers fishing for black bass. The Northeast, Middle Atlantic, and East North Central regions all had participation rates significantly greater than the overall U.S. participation rate of 42 percent.

**Table 8. Income Distribution of the U.S. Population, Freshwater Anglers, and Bass Anglers**

(Numbers in thousands. Excludes Great Lakes fishing.)

Income Group	U.S. Population		Freshwater Anglers		Bass Anglers		
	Number	Percent	Number	Percent	Number	Percent	Percent of Freshwater Anglers
Total	181,095	100	38,433	100	16,241	100	42
Under \$10,000	27,670	15	4,164	11	1,416	9	34
\$10,000 - \$19,999	40,768	23	8,632	22	3,507	22	41
\$20,000 - \$24,999	16,350	9	3,806	10	1,546	10	41
\$25,000 - \$29,999	25,517	14	6,110	16	2,678	16	44
\$30,000 - \$49,999	40,255	22	10,015	26	4,543	28	45
\$50,000 - \$74,999	13,750	8	2,966	8	1,390	9	47
\$75,000 or more	7,520	4	1,445	4	618	4	43
Not Reported	9,264	5	1,295	3	539	3	42

**Table 9. Census Geographic Distribution of the U.S. Population, Freshwater Anglers, and Bass Anglers**

(Numbers in thousands. Excludes Great Lakes fishing.)

Geographic Region	U.S. Population		Freshwater Anglers		Bass Anglers		
	Number	Percent	Number	Percent	Number	Percent	Percent of
							Freshwater Anglers
Total	181,095	100	38,433	100	16,241	100	42
New England	9,825	5	1,406	4	671	4	48
Middle Atlantic	28,977	16	2,967	8	1,460	9	49
E. North Central	31,057	17	7,122	19	3,306	20	46
W. North Central	13,093	7	4,684	12	1,773	11	38
South Atlantic	31,163	17	6,218	16	3,283	20	53
E. South Central	11,377	6	3,311	9	1,700	10	51
W. South Central	19,503	11	5,087	13	2,266	14	45
Mountain	9,444	5	2,732	7	560	3	20
Pacific	26,657	15	4,906	13	1,226	8	25

These regional variations were also present when comparing the composition of the U.S. population, freshwater anglers, and bass anglers. For example, 16 percent of the U.S. population lived in the Middle Atlantic Region, but only 8 percent of freshwater anglers and 9 percent of bass anglers lived there.

Another large discrepancy occurred in the Pacific Region where 15 percent of the population lived, but accounted for only 8 percent of the bass anglers in this country. In the East North Central Region there was a greater concentration of bass anglers (20 percent) than was true for the U.S. population (17 percent). In part this reflects the greater concentration of freshwater anglers (19 percent) in this region. The South Atlantic Region also contained 17 percent of the U.S. population and 20 percent of the bass anglers. Unlike the East North Central Region, a smaller percentage of freshwater anglers (16 percent) lived in this region. Regions which had higher percentages of bass anglers than the corresponding population percentages were the East North Central, West North Central, South Atlantic, East South Central and West South Central Regions. Regions which had lower percentages were the New England, Middle Atlantic, Mountain, and Pacific Region.

#### Population Density of Residence

In 1985, the Survey asked respondents whether they considered their place of residence to be in a big city or urban area, a small city or town, or a rural area. These

categories were not defined for the respondent (e.g. by big city we mean a city with a population of 500,000 or more). Consequently, one respondent may consider an area to be a big city while another respondent may consider an area of the same size to be a small town. Nonetheless, there were interesting differences between anglers and the general population. The composition of the freshwater fishing population and the bass fishing population were very similar (differences were less than one percent). A comparison of the U.S. population and anglers, however, revealed striking differences. About 36 percent of the U.S. population would characterize where they live as a big city, but only 28 percent of freshwater anglers and 27 percent of bass anglers would say they lived in a big city. The opposite is true for rural areas. Approximately 20 percent of the U.S. population would say they lived in a rural area, but a greater percentage of bass anglers (29 percent) and freshwater anglers (28 percent) would say that where they lived was a rural area.

Except for the anglers who fell into the no response category, the participation rate of freshwater anglers in bass fishing clustered around the national participation rate of 42 percent. These roughly equal participation rates reflect the fact that the composition of the freshwater fishing population and the bass fishing population were similar, as far as population density of their residence was concerned.

**Table 10. Population Density Distribution of the U.S. Population, Freshwater Anglers, and Bass Anglers**

(Numbers in thousands. Excludes Great Lakes fishing.)

Population Density	U.S. Population		Freshwater Anglers		Bass Anglers		
	Number	Percent	Number	Percent	Number	Percent	Percent of Freshwater Anglers
Total	181,095	100	38,433	100	16,241	100	42
Big city or urban area	64,946	36	10,731	28	4,322	27	40
Small city or town	74,859	41	16,026	42	6,892	42	43
Rural area	36,474	20	10,947	28	4,772	29	44
No response	4,817	3	729	2	251	2	34

#### Participation Model

The descriptive statistics presented in the previous section show that bass anglers were different from freshwater anglers in general. These descriptive characterizations of anglers have limitations. First, without conducting the appropriate statistical test, it is impossible to determine whether the observed difference in a characteristic between the groups was statistically significant<sup>4</sup>. Second, even if the difference was statistically significant, the individual effect of the characteristic on an angler's decision to fish for bass cannot be measured. For example, were men more likely to have fished for bass because of their sex or because they were more likely than women to come from households with higher income levels, a factor with which sex was correlated and which was also associated with higher participation in bass fishing?

A participation model may be used to analyze the angler's decision about fishing for black bass. In this instance, a probability of fishing for black bass model was estimated in order to predict what sort of angler was most likely to fish for black bass and to evaluate the individual effects of sociodemographic and other factors on that decision. In participation models the effect of a particular characteristic is calculated in an "other things

being equal" context. In the example above, this procedure would remove the confounding effects of the correlation between sex and household income.

The model hypothesizes that a freshwater angler's decision whether or not to fish for black bass, given that he or she already fishes in freshwater, depends on the angler's sociodemographic characteristics, whether the angler fished more than average, and the region of the country where he or she resides. For the purposes of the participation model, if an angler fished 20 days or more in 1985, he or she was classified as avid. The region of residence provides a rough measure of the availability of quality bass fishing sites. The dependent variable is either 1 or 0, because the angler either fishes for bass or does not fish for bass.

Equation 1 was the probability of fishing for black bass model that was estimated..

$$(1) \quad \text{Ln} \frac{p_i}{(1 - p_i)} = \alpha + Bx_i$$

4 The 1985 National and State reports provide formulas for calculating the standard errors necessary for such tests. However, because of the relatively large sample sizes for national estimates, small differences were statistically significant in many cases. Differences in characteristics that were 2 percent or larger were usually significant at the 90 percent confidence level.





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