

# STATEWIDE SURVEY OF 1986, 1989 AND 1992 ARIZONA ANGLERS



GLEN CANYON ENVIRONMENTAL  
STUDIES OFFICE

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## SUMMARY

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\*\*\*\*\* The appendices referenced in this summary \*\*\*\*\*  
document are not included. If needed  
they may be obtained by contacting the  
Arizona Game and Fish Departments  
Fisheries Branch.

## EXECUTIVE SUMMARY

Arizona anglers are an assorted group of recreational users and as such it is difficult to depict the "average" angler. Some fish high-mountain streams for trout with artificial lures and flies, while others are more opportunistic and fish for a variety of species using a mixture of bait and lures. The States anglers are as diverse as the vast array of angling opportunities available to them. Angler surveys provide useful information to fisheries planners and managers so angler expectations might be met.

One of the Arizona Game and Fish Department's jobs is to provide a variety of fishing activities and opportunities. To meet that goal it is necessary to understand the desires and attitudes of our license buyers. During the 1992 statewide angler survey, conducted as part of our ongoing responsive management and strategic-planning process, we received responses from over 2100 anglers.

### Where They Fished

Resident trout anglers in 1992 spent most of their time fishing lakes like Big, Woods Canyon and Willow. Resident warmwater anglers, on the other hand, devoted most of their fishing days at large inland reservoirs such as Roosevelt, Canyon, and Bartlett lakes. Nonresident anglers, both trout and warmwater, spent most of their time fishing the Colorado River and its reservoirs.

Overall, anglers fished approximately 7.2 million days on Arizona waters during 1992. Of this, 2.5 million days included fishing for trout and 4.7 million days fishing for warmwater fishes.

### What They Fished For

Most Arizona anglers fished for more than one species during 1992. Of the anglers surveyed, 12 percent fished solely for trout and about 4 percent fished only for largemouth bass. The next two species exclusively sought by anglers are channel catfish and striped bass. Thirteen percent of the survey respondents expressed a singular effort for the category of "Anything That Bites".

### What They Preferred to Catch

Anglers were asked to select which species they preferred to catch. Trout, largemouth bass, channel catfish, and striped bass were the stated preferred fish. They were also asked, if given the choice, what size trout they would prefer to catch. Forty five percent said they would prefer to catch four 12-inch trout rather than six 8.5-inch trout (12%).

## What They Preferred to Use

Anglers were asked to indicate what percentage of their fishing was done with artificial lures and flies. The majority use a blend of bait and lures, 67 percent. Anglers that exclusively use only artificial lures and flies comprised 18 percent. Those who only used bait represented 15 percent of the anglers.

## How Much Did They Spend Fishing

Anglers were asked how much they spend on an "average" fishing trip in 1992. They were asked to consider miscellaneous costs such as gas, food, lodging, etc. when determining their expenses. Of the people surveyed, the range of fishing expenditures varied from zero to well over one thousand dollars per day. Those individuals spending over one thousand dollar per day must have very sophisticated tastes in fishing.

Arizona anglers frequently spent roughly fifty dollars per day on their fishing activities. This expenditure multiplied by 7.2 million angler user-days totals the amount spent by the fishing community. The 1991 U. S. Fish and Wildlife Service Survey on Hunting, Fishing and Associated Wildlife Recreation showed, that around seventy-nine dollars on average was spent in Arizona on fishing per day. Considering this, the amount spent on fishing is between 360 and 569 million dollars per year in Arizona.

When considering this yearly expenditure, you must also be aware that this figure is only part of the total economic picture. When the 360 million per year is multiplied, using the current state average of 1.8 from the U.S. Dept of Commerce, it yields a economic benefit to the State of approximately 648 million.

## Anglers Opinions Regarding Native Fish

Two questions were ask of anglers regarding the management of Arizona's native fish species. The first question dealt with sport fish management versus native fish. Anglers were ask to select one of three statements that came closest to their point of view. The attitude that sport fish management should not be disrupted to protect native fish comprised 37 percent of the sample followed by 26 percent of the anglers who felt we should do more to protect native fish even if means restricting current sport fish management efforts. Thirty seven percent of the respondents were undecided regarding this question.

Anglers were then asked if Arizona native fish, such as squawfish, roundtail chub, and Apache trout, should be managed as sportfish. Thirty one percent answered yes with 22 percent responding no to the question. Almost half, 47 percent, of the anglers had no opinion regarding this question showing that there is a vast number of individuals undecided with regards to how native fish should be managed.

## General Trend of the State's Anglers

This survey is the third in a series of statewide angler surveys starting in 1986. Since 1986 angler user-days have consistently hovered around 7.1 million, but since that time there has been a decline in license sales. The average number of days anglers fish per year has increased from 17.5 days in 1986 to almost 23 in 1992. This explains the consistent user-days over time even though license sales have dropped.

The preferred species of fish to catch has also remained stable over the years. The top four fish anglers prefer since 1986, in decreasing order, are trout, largemouth bass, channel catfish and striped bass.

## How This Information Is Used

Statewide angler surveys have been an integral part of the Department's responsive management and strategic planning efforts since 1980. Data gathered by these studies have been used to develop Coldwater and Warmwater Fisheries Strategic Plans. The 1992 anglers survey, along with past data, will be incorporated into the "Wildlife 2000 Strategic Plan". Wildlife 2000 will be the Department's guiding document to the year 2000 and will encompass all wildlife, including fish, game, and nongame. By actively gathering input from our angling public the Arizona Game and Fish Department can provide a variety of fishing opportunities and also preserve and protect Arizona's fisheries resources.



Table 1. Arizona population and license sales 1964 - 1993.

Year	Population	Resident Hunt & Fish	Nonres Hunt & Fish	Resident Fish	Nonres Fish	1-Day	Nonres 5-Day	Nonres 9-Day	Resident Trout Stamps	Nonres Trout Stamps	Nonres Colo. River	Urban
1964	1,556,000	37,678	672	112,678	3,924	13,288	22,650	-	87,366	2,014	3,065	-
1965	1,584,000	39,557	844	114,104	4,092	13,922	24,763	-	89,969	2,134	4,419	-
1966	1,614,000	42,530	1,033	123,966	4,648	16,149	27,613	-	102,241	2,249	5,294	-
1967	1,646,000	47,843	1,262	135,005	4,729	18,388	30,630	-	107,675	2,537	6,277	-
1968	1,682,000	51,322	1,460	142,409	4,968	17,612	31,453	-	111,116	2,650	6,338	-
1969	1,737,000	58,781	1,777	154,002	5,628	19,256	35,294	-	124,685	3,003	6,899	-
1970	1,775,339	66,495	1,857	167,858	5,912	19,722	36,348	-	135,533	3,170	7,460	-
1971	1,896,000	66,164	1,814	153,337	5,819	18,091	33,863	-	121,854	3,083	7,611	-
1972	2,009,000	64,737	385	165,810	5,249	20,256	-	19,591	107,842	2,284	9,221	-
1973	2,125,000	73,979	361	177,163	5,413	19,101	-	20,550	116,865	2,345	11,441	-
1974	2,224,000	82,192	383	182,148	4,935	16,481	-	19,629	116,438	1,880	12,219	-
1975	2,286,000	89,714	382	185,224	4,691	10,378	30,427	3,969	114,947	1,703	10,015	-
1976	2,348,000	94,762	478	176,445	5,037	8,940	36,023	3,821	107,540	1,700	9,238	-
1977	2,427,000	96,109	492	168,791	4,911	10,058	32,994	3,927	107,990	1,785	10,744	-
1978	2,518,000	99,490	480	175,800	5,576	9,719	33,034	3,744	111,227	2,036	11,071	-
1979	2,639,000	106,603	234	182,390	3,409	8,495	28,365	2,688	106,215	904	11,304	-
1980	2,718,000	109,085	199	193,648	3,780	10,601	29,856	2,851	106,797	877	10,908	-
1981	2,804,600	104,714	329	204,076	4,409	12,459	31,357	3,030	114,791	1,149	11,132	-
1982	2,893,000	94,824	201	215,761	4,714	13,120	35,458	3,100	120,154	1,153	11,378	-
1983	2,988,000	93,554	141	218,238	3,599	9,731	29,687	2,218	120,301	487	9,130	-
1984	3,134,500	95,034	174	229,423	3,768	10,500	27,078	1,955	128,305	451	8,271	-
1985	3,197,700	93,836	175	246,377	3,910	12,056	28,507	2,055	127,003	409	7,921	-
1986	3,351,900	93,765	182	252,229	4,684	15,243	29,231	2,148	122,484	597	7,559	12,381
1987	3,469,000	88,946	229	236,004	4,627	18,620	27,759	1,933	110,624	436	7,285	20,392
1988	3,548,400	87,738	280	236,282	4,575	20,774	29,817	1,950	113,183	441	7,492	21,904
1989	3,654,700	82,826	223	218,129	4,430	21,678	30,696	2,162	104,965	349	7,805	23,564
1990	3,680,800	76,688	295	195,496	4,423	20,274	30,317	1,782	97,723	499	7,204	23,268
1991	3,767,000	69,472	188	198,869	3,162	24,267	22,627	1,338	97,817	333	5,185	25,642
1992	3,858,825	70,505	217	202,744	3,171	26,993	21,299	1,136	98,688	428	4,415	25,010
1993	3,958,875	76,856	300	204,962	2,182	26,039	17,303	-	103,773	-	2,714	27,642

Although Arizona's population has increased since 1960, license sales have shown a recent decline. In the past we were able to project future license sales as a percentage of population. However, changing demographics, economic conditions, and other factors make this relationship unreliable (Figure 1).

# Population & License Sales

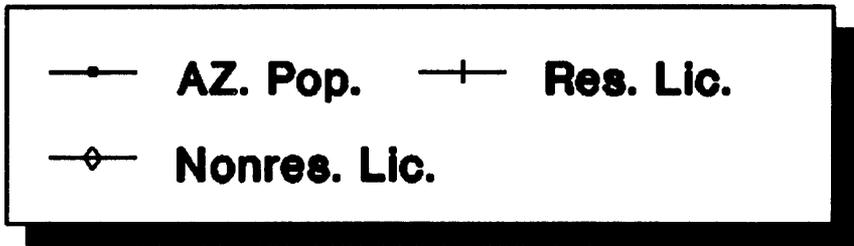
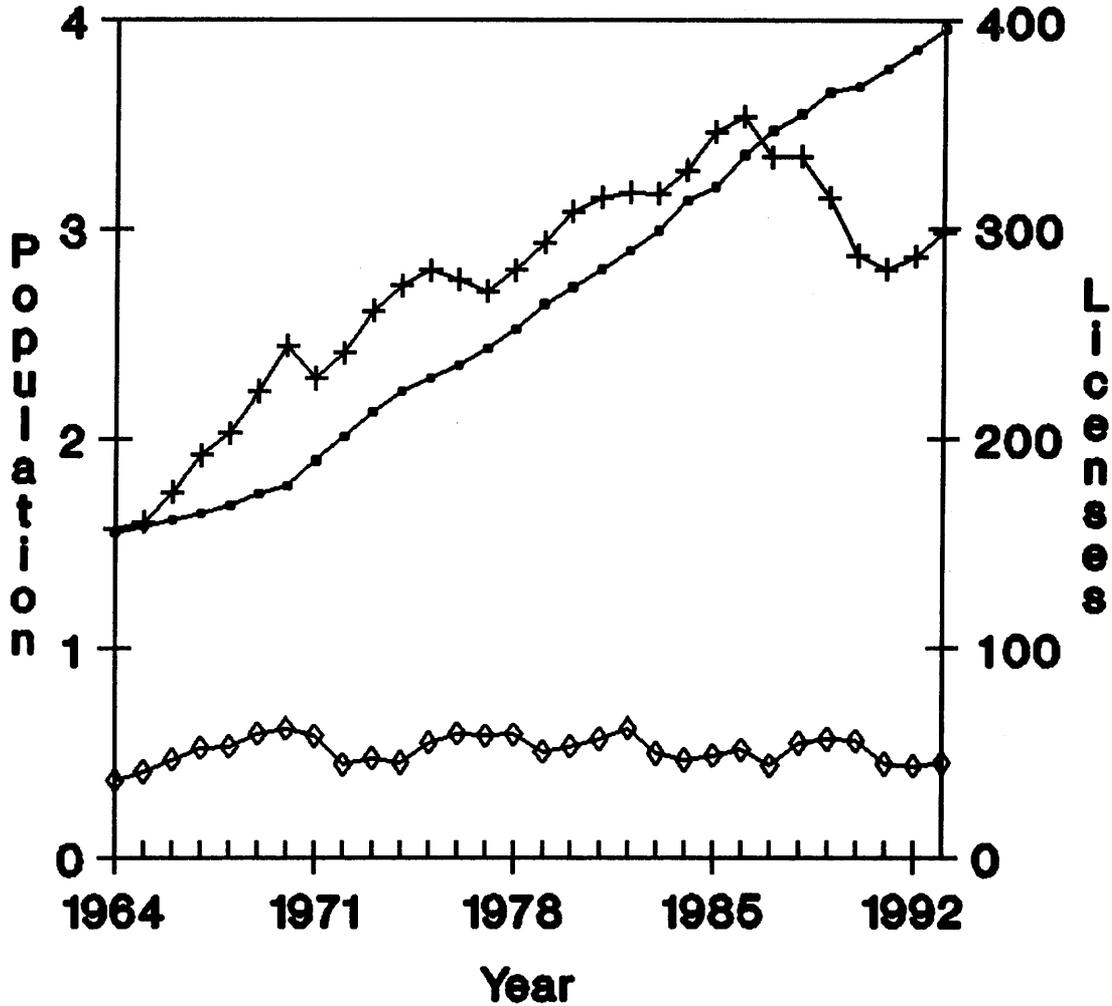


Figure 1. Arizona population (millions) and fishing license sales (thousands) 1964 - 1993.

## METHODS

Sampling.

The target population consisted of all the people who were licensed to fish in Arizona in 1986, 1989 and 1992. There were eight license classes as follows.

1. General fishing resident
2. General fishing nonresident
3. Combination hunting and fishing, resident
4. Combination hunting and fishing, nonresident
5. Colorado River nonresident
6. 9-Day nonresident
7. 5-Day nonresident
8. Urban.

Sampling, 1986

Samples were taken from license sales and a mailing list was generated from license sales through September of 1986 for 1986 anglers. A 4% sample, about 15,000 anglers, was determined to be large enough to obtain estimates of adequate precision within budget constraints in 1986. Expecting an ultimate return of approximately 8,000 completed questionnaires from a population of about 400,000 license holders, proportions of all license holders could be estimated within  $\pm 0.01$  and numbers of anglers within  $\pm 5,000$  with 95% confidence. It was recognized that adjustments for non-response bias would increase the standard errors somewhat, and that percentages of subgroups could not be estimated so precisely.

Sampling, 1989

Samples were taken from 1989 license sales and a mailing list was generated from sales through December 1989. A smaller sample of 8,000 was used due to budget constraints.

Sampling, 1992

Samples were taken from 1992 license sales and a mailing list was generated from sales through December 1992. A smaller sample of 7,982 was used due to budget constraints.

Mailing, 1986

The questionnaires were mailed along with a cover letter signed by the Fisheries Branch Supervisor. Return postage was provided. The original mailing was succeeded by two follow-up mailing, three and seven weeks later. All outgoing mail was bulk rate, all return in first class business reply envelopes. All questionnaires returned as undeliverable with a forwarding address were remailed prior to the succeeding wave.

Table 2. Summary of mailing procedures and returns, 1986.

<u>Date of Mailing</u>	<u>Number Mailed</u>	<u>Number Returned and Completed</u>
January 15, 1987	15,387	5,101
February 13, 1987	10,957	1,834
March 12, 1987	8,770	708
Total		7,643

Response Rate, 1986

If the response rate is defined to be the ratio of the number of questionnaires returned and completed to the number mailed, the response rate was 50%. By waves the response resulting from the first wave was 33%, from the second 17%, and from the third 8%.

Mailing, 1989

Because of time and budget constraints, a single mailing was used for the 1989 anglers. Questionnaires were mailed along with a cover letter signed by the Fisheries Branch Supervisor. Return postage was provided. Outgoing mail was first class so that questionnaires could be forwarded by the Postal Service. All returns were first class business reply. Questionnaires returned as undeliverable with a forwarding address were remailed. However, 847 surveys were returned with insufficient addresses to be delivered (usually no Apartment number).

Table 3. Summary of mailing procedures and returns, 1989 survey.

<u>Date of Mailing</u>	<u>Number Mailed</u>	<u>Number Returned and Completed</u>
April 30, 1990	7,991	2,024

Response Rate, 1989

If the response rate is defined to be the ratio of the number of questionnaires returned and completed to the number mailed, the response rate was 25%.

Mailing, 1992

Because of time and budget constraints, a single mailing was used for the 1992 anglers. Questionnaires were mailed along with a cover letter signed by the Fisheries Branch Supervisor. Return postage was provided. Outgoing mail was first class so that questionnaires could be forwarded by the Postal Service. All returns were first class business reply. Questionnaires returned as undeliverable with a forwarding address were remailed. However, approximately 800 surveys were returned with insufficient addresses to be delivered (usually no Apartment number).

Table 4. Summary of mailing procedures and returns, 1992 survey.

<u>Date of Mailing</u>	<u>Number Mailed</u>	<u>Number Returned and Completed</u>
April 30, 1993	7,982	2,169

Response Rate, 1992

If the response rate is defined to be the ratio of the number of questionnaires returned and completed to the number mailed, the response rate was 27%.

Data Entry procedures.

Returned questionnaires were keypunched by data entry clerks. Each questionnaire was verified by double key punching.

Questionnaire.

Questionnaires used in 1986, 1989 and 1992 are included in Appendix A. Questionnaires were similar, but several new questions were added to the 1992 survey in an attempt to assess angler attitudes and desires.

Nonresponse bias, 1986.

It is common in human surveys for nonrespondents to differ markedly from respondents (Filion 1974).

To adjust for nonresponse bias, three successive mailing waves were used in 1986. Chi square tests were performed between individual waves for a particular category (number who fished) to examine differences between respondents and nonrespondents. When significant differences existed, regression analysis was used to obtain the extrapolated complete response rate to be used. The term 'estimated complete response' refers to the estimated proportion of both respondents and nonrespondents with a certain characteristic.

To estimate and correct for nonresponse bias, a linear regression line was fitted to the data depicting an observed survey characteristic as a function of cumulative response rate after each wave of returns,  
i.e. fit

$$y = mx + b$$

Where Y = observed value of some characteristic per unit based on the respondents up to a given wave of returns (dependent variable)

x = Cumulative response up to a given wave  
 m,b = regression parameters.

Such a procedure was recommended by Scott (1961) and Fillion (1974).

The characteristics of the nonrespondents were also inferred from the estimated populations parameter using the value of Y in the regression line corresponding to x = 100%.

The equation estimating nonrespondents characteristics is:

$$Y_{nr} = \frac{(100 * Y) - (X_3 * Y_3)}{100 - X_3}$$

- Where
- $Y_{nr}$  = The value of some characteristic for the nonrespondents,
  - $Y$  = The estimated population parameter for complete response,
  - $Y_3$  = The observed value per unit for some characteristic from the third response wave,
  - $X_3$  = The cumulative response rate from the third response wave,
  - 100 = Complete response rate.

It was felt that if significant nonresponse error existed this relatively simple method of detection and correction could be easily and inexpensively applied to the Arizona Angler Survey. Nonresponse bias was evaluated in a two step procedure. Step one involved testing for significant differences between waves for a particular parameter using a Chi square test if the samples were normally distributed. If the parameter was not normally distributed Chi square tests were preformed to test for differences between individual waves for a particular category to see if there was any difference between respondents and nonrespondents.

If there was a significant difference then regression analysis was used to obtain the extrapolated complete response rate. We used the same estimate of nonresponse bias in 1992 as we did in 1986. As expected, there was a nonresponse bias in anglers who reported fishing. Based on the above procedure, we adjusted the percent of anglers who fished downward by 4% to account for a higher rate of return by anglers who did fish.

RESULTS

Results are presented by questions asked in the 1992 survey. Several questions were repeated in 1992 that were also asked in the 1986 and 1989 angler surveys.

QUESTION 1: "Did you fish anywhere in Arizona ?"

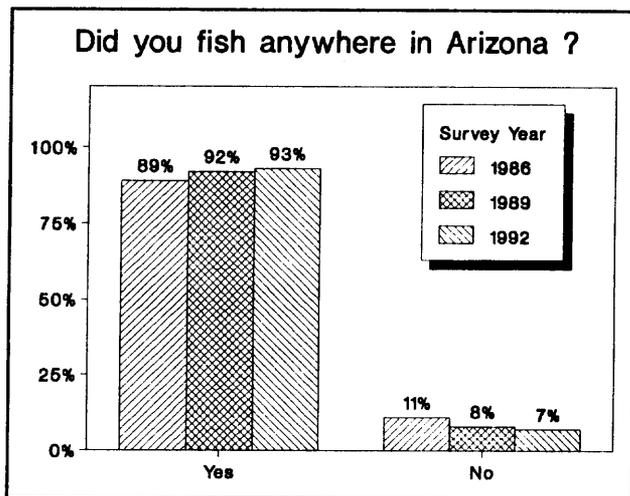


Figure 2.

In 1986 approximately 89% of licensed respondents fished in Arizona, and increased to approximately 93% in 1992. In the same respect we find that individual license holders not fishing declined from 11% in 1986 to 7% in 1992. This decrease in license buyers not fishing maybe tied to the drop in resident license sales from 1986. Arizona residents purchasing a fishing or combination license, now a days, may have a greater propensity to fish. As indicated in Figure 1 and Table 6, nonresident license sales and individuals fishing have remained constant at

roughly 51,000 and 94%, respectfully.

Table 5. Number (n) and percent of responses to question 1 in 1986, 1989 and 1992.

	1986		1989		1992	
	n	%	n	%	n	%
Yes	6,556	89%	1,866	92%	2,014	93%
No	820	11%	155	8%	144	7%
Total	7,376	100%	2,024	100%	2,158	100%

Table 6. Number (n) and percent of responses to question 1 in 1986, 1989 and 1992 by residency.

	1986				1989				1992			
	Resident		Nonres.		Resident		Nonres.		Resident		Nonres.	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	5814	89%	993	94%	1741	92%	126	93%	1845	93%	169	94%
No	724	11%	67	6%	146	8%	9	7%	134	7%	10	6%
Total	6538	100%	1060	100%	1887	100%	135	100%	1979	100%	179	100%

QUESTION 2: "Did you purchase a Arizona trout stamp ?"

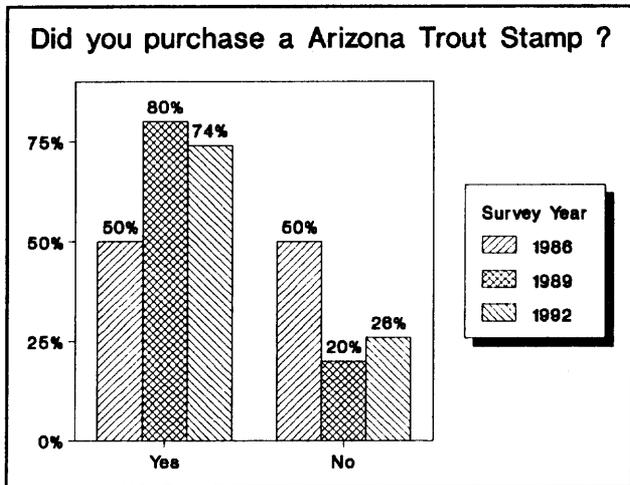


Figure 3.

During 1986 only 50% of respondents purchased a trout stamp for their Class A license. In 1989 and 1992 an average of 77% purchased a stamp. There is no definite factor that would account for this increase in trout stamps. In examining the random samples used for these surveys we find the percentage of Class A licenses have remained constant in 1986 and 1989 at 49%. However, in 1992 this percentage expanded to 61% of the sample population, which may have influenced that outcome. Another possible factor may simply be the increasing popularity of trout fishing.

Table 7. Number (n) and percent of responses to question 2 in 1986, 1989 and 1992.

	1986		1989		1992	
	n	%	n	%	n	%
Yes	3,705	50%	1,573	80%	1,591	74%
No	3,671	50%	406	20%	549	26%
Total	7,376	100%	1,978	100%	2,140	100%

QUESTION 3: "Did you, or will you purchase a (1990 or 1993) Arizona fishing license?"

License sales were down about 18% from 1986 to 1992. To better interpret declining license sales, we asked 1989 and 1992 anglers if they planned to purchase a license in the following year, and if not, why. Only 5% of licensed anglers in 1989 and 1992 responded that they did not plan to purchase a license next year. Fifteen percent of the sample population was undecided about the future purchase of a license.

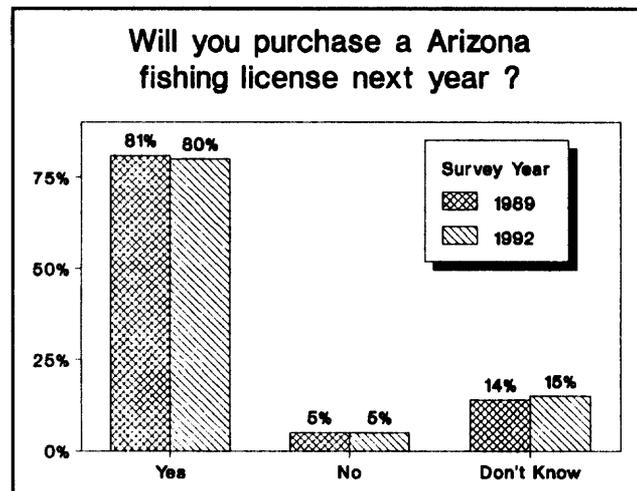


Figure 4.

Table 8. Number (n) and percent of responses to question 3 in 1989 and 1992.

	1989		1992	
	n	%	n	%
Yes	1,648	81%	1,721	80%
No	96	5%	111	5%
Don't Know	280	14%	317	15%
Total	2,024	100%	2,149	100%

QUESTION 4: "If you did not purchase a (1990 or 1993) Arizona fishing license, what factors influenced your decision to not fish this year?"

Table 9. Number (n) and percent of responses to question 4 in 1989 and 1992.

Response	1989		1992		Average
	n	%	n	%	%
No response	1,559	77%	1,617	75%	76%
Poor fishing	193	10%	202	9%	10%
Not enough spare time	170	8%	171	8%	8%
License too expensive	141	7%	218	10%	9%
Other	106	5%	129	6%	6%
Competition with other recreational water users	87	4%	92	4%	4%
Fishing trips too expensive	50	3%	89	4%	4%
Too many fishermen	44	2%	53	3%	3%
No place to fish	42	2%	45	2%	2%
Base (n) & Total %*	2,028	118%*	2,169	121%*	122%*

\* Total % exceed 100% due to multiple responses.

Overall, anglers cited poor fishing, license too expensive and not enough spare time as the three top reasons for not purchasing a 1990 or 1993 license. The 1989 anglers indicated, in order of importance, that poor fishing and not enough spare time were the two main factors. This changed in 1992 to license too expensive and poor fishing.

**QUESTION 5:** "Take a few moments to think about your fishing experiences from January through December (1986, 1989 or 1992). How many DAYS did YOU spend fishing for trout or other fish at each type of Arizona water? Count any portion of a day fished as a whole fishing day. Do not record the same fishing day in more than one blank."

User days were estimated from Question 5 which asked anglers to estimate the number of days they fished in each of 13 water types in the state. Details and intermediate calculations are shown in Appendix C, page 140. It is interesting to note that although license sales decreased from 1986 to 1992 user days showed a slight increase, 6.7 to 7.2 million. Most of the increase in user days from 1986 to 1992 are in City Waters (+255%) and Irrigation Canals (+223%). Although Urban Program Lakes were not dealt with in the 1986 and 1992 surveys, the expansion of this Department activity definitely influenced the increase in City Waters. Arizona anglers are fishing close to home! There has been a decline in user days for trout anglers on the Colorado River Reservoirs from 211,000 in 1986 to 77,000 in 1992, a net drop of -37%. The Streams and Rivers category has also experienced a decrease in both trout and warmwater fishing pressure. A deterioration of approximately twenty six percent has occurred since 1986 for this water type.

Table 10. Estimated user days (x1,000) for trout and warmwater fish, 1986, 1989 and 1992, by type of water from responses to Question 5.

Water Type Fished	1986			1989			1992		
	Trout	Warmwater	Total	Trout	Warmwater	Total	Trout	Warmwater	Total
Colorado River Reservoirs	211	658	869	132	610	742	77	784	861
Colorado River	155	387	542	272	220	492	203	322	525
Large Inland Reservoirs	211	1,830	2,041	164	1,806	1,970	274	1,749	2,023
Lakes	836	499	1,335	855	675	1,530	955	528	1,483
Ponds and Tanks	57	126	183	69	142	211	56	137	193
Urban Program Lakes	*	*	*	214	564	778	*	*	*
City Waters	79	199	278	23	218	241	255	454	709
Large Inland rivers	87	300	387	71	198	269	141	196	337
Streams and Rivers	322	112	434	318	69	387	245	75	320
Irrigation Canals	5	66	71	6	105	111	20	138	158
Indian Reservation Waters	215	202	417	210	222	432	202	178	380
Military Base Waters	24	21	45	60	34	94	39	22	61
Other	22	33	55	27	51	78	47	67	114
Don't Know Type Fished	8	13	21	3	10	13	15	31	46
<b>Total</b>	<b>2,232</b>	<b>4,446</b>	<b>6,678</b>	<b>2,424</b>	<b>4,924</b>	<b>7,348</b>	<b>2,529</b>	<b>4,681</b>	<b>7,210</b>

\* Urban Program Lakes were not addressed in the 1986 and 1992 angler surveys.

We calculated the mean and median number of days that anglers fished in 1986, 1989 and 1992, Table 11. Although there were fewer license buyers in 1992 than in 1986, anglers fished more days on the average in 1992. The mean days fished increased from 17.7, in 1986, to 22.7 in 1992. Also the same expansion in the median days fished occurred, 9 days to 12 days. A greater percentage of anglers fished more than 20 days in 1992 than in 1986. The percentage dropped for anglers fishing less than 6 days over the same period. The licensed angling public has decreased in size since 1986 but they are fishing a greater number of days per year. This indicates the lost of the occasional angler, individuals fishing less that 3 days per year. Using the LSD ANOVA to test mean days fished for the three survey years, we find a significant difference between 1986 and 1992 at  $p < 0.05$ .

Table 11. Number of valid responses (n), mean, median, and maximum number of days fished for individuals fishing based on question 5, 1986, 1989 and 1992.

	1986			1989			1992		
	Trout	Warmwater	Total	Trout	Warmwater	Total	Trout	Warmwater	Total
n	7560	7560	7560	1865	1865	1865	1927	1927	1927
Maximum	226	305	338	136	332	332	222	330	355
Mean	5.9	11.8	17.7	6.9	14.0	20.8	8.0	14.8	22.7
Median	2.0	4.0	9.0	2.0	5.0	11.0	2.0	5.0	12.0

Table 12. Frequency distribution of number of days fished based on question 5, 1986, 1989 and 1992.

Days Fished	1986		1989		1992	
	n	%	n	%	n	%
0	798	10.5%	157	8.4%	139	7.2%
1-2	825	10.9%	137	7.3%	160	8.3%
3-5	1260	16.7%	268	14.4%	273	14.2%
6-10	1381	18.3%	343	18.4%	342	17.8%
11-20	1388	18.4%	388	20.8%	359	18.6%
21-50	1347	17.8%	392	21.0%	448	23.2%
>50	561	7.4%	180	9.7%	206	10.7%
Total	7560	100.0%	1865	100.0%	1927	100.0%

QUESTION 6. "Please look at the map of Arizona (as seen in Appendix A) and estimate the number of YOUR (1986, 1989 or 1992) fishing days spent in each of the areas. Write your estimates in the blank next to the numbers of the areas listed below".

Responses to Question 6 were used to estimate angler use days in each of 30 fish management areas of the state. Details and intermediate calculations are shown in Appendix D, page 171. Note that totals were slightly different than user day estimates from Question 5 because some anglers answered Question 5 but not Question 6 and some answered Question 6 but not Question 5. The major areas that exhibited an increase in user days are 19 and 25, areas close to the two primary metropolitan zones. Area 25, the Phoenix metro area, experienced a 198% expansion since 1986, along with the Tucson area at 142%. Here, again, Arizona anglers are fishing closer to home. This is attributed to the population demographics of the state, over 50% of the states population reside in the Phoenix and Tucson metropolitan areas. The highest used area is fish management area 22 at approximately 1.3 million user days per year. In this area we have the major inland water developments of the Salt River Project and it is adjacent to the Phoenix metropolitan area.

Table 13. Estimated user days (x1,000) from Question 6, 1986, 1989 and 1992.

Area	1986	1989	1992	Area	1986	1989	1992	Area	1986	1989	1992
1	73	63	84	11	90	70	92	21	42	68	33
2	307	375	233	12	220	217	275	22	1,233	1,469	1,130
3	191	177	255	13	177	155	235	23	154	201	92
4	12	12	62	14	345	330	340	24	395	296	391
5	160	142	184	15	34	43	37	25	363	898	720
6	180	117	174	16	378	457	357	26	14	32	44
7	449	390	559	17	77	32	81	27	338	386	351
8	171	126	174	18	16	40	24	28	179	206	172
9	147	100	104	19	357	606	508	29	20	18	56
10	203	212	235	20	29	92	54	30	402	224	309

Table 14. Number of valid responses (n) and total estimated user days from Question 6, 1986, 1989 and 1992.

	1986	1989	1992
n	6,571	1,716	1,783
Total User Days	6,722,099	7,552,876	7,303,817

# Arizona Fish Management Areas and their Average Utilization by Anglers.

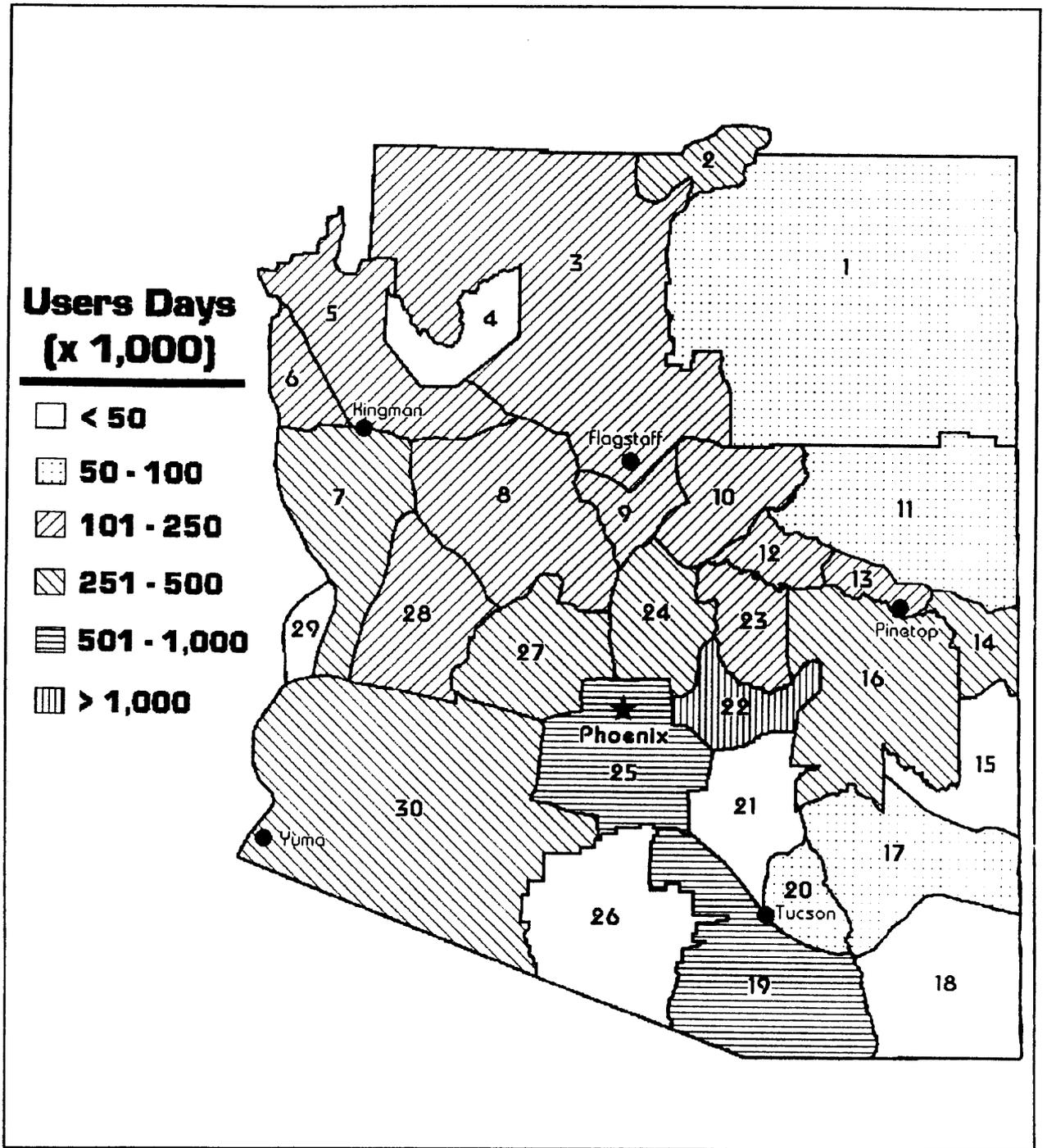


Figure 5.

We calculated the mean and median number of days that anglers fished in 1986, 1989 and 1992 from Question 6, Table 15. A similar expansion in both the mean and median days fished happened for Question 6 as did in Question 5. The mean days fished has increased from 17, in 1986, to 22 days in 1992. Also the same growth occurred in the median days fished, 8 days to 12 days. Here, again, we find the greatest increase in anglers fishing more than 20 days in 1992 than in 1986. This is followed by the decline for individuals fishing less than 6 days, indicating a potential loss of the occasional angler. There is a significant difference between 1986 and 1992 ( $p < 0.05$ ) in the mean days fished for Question 6 using LSD ANOVA analysis.

Table 15. Number of valid responses (n), mean, median, and maximum number of days fished based on Question 6, 1986, 1989 and 1992.

	1986	1989	1992
n	7641	1997	2144
Maximum	308	325	331
Mean	17.2	20.1	21.9
Median	8.0	10.0	12.0

Table 16. Frequency distribution of number of days fished based on question 6, 1986, 1989 and 1992.

Days Fished	1986		1989		1992	
	n	%	n	%	n	%
0	1070	14.0%	280	14.0%	260	12.1%
1-2	736	9.6%	141	7.1%	128	6.0%
3-5	1255	16.4%	265	13.3%	289	13.5%
6-10	1330	17.4%	337	16.9%	351	16.4%
11-20	1354	17.7%	388	19.4%	421	19.6%
21-50	1333	17.5%	400	20.0%	483	22.5%
>50	563	7.4%	186	9.3%	212	9.9%
Total	7641	100.0%	1997	100.0%	2144	100.0%

We also analyzed data from Question 6 to look at the number of areas that anglers fished. Most anglers fished more than one area, and approximately 38% fished only one area. There was no significant difference in the number of areas anglers fished from in 1986 and 1992. Slightly fewer anglers fished only one area in 1989 and 1992, perhaps reflecting the loss of 'occasional' anglers from 1986 to 1992. Over 60% of the States fishing public fish in one or two management areas.

Table 17. Frequency distribution of Arizona anglers by number of areas (1-30 from Question 6) that they fished. Number and percent of respondents, 1986, 1989 and 1992.

Number of Areas Fished	1986		1989		1992	
	n	%	n	%	n	%
1	2683	40.8%	631	36.8%	694	36.8%
2	1853	28.2%	506	29.5%	559	29.6%
3	1020	15.5%	296	17.2%	312	16.5%
4	504	7.7%	152	8.9%	164	8.7%
5	252	3.8%	64	3.7%	76	4.0%
6	102	1.6%	32	1.9%	42	2.2%
7	68	1.0%	8	0.5%	16	0.8%
8	27	0.4%	12	0.7%	6	0.3%
9	18	0.3%	6	0.3%	5	0.3%
10	11	0.2%	3	0.2%	5	0.3%
11	13	0.2%	1	0.1%	2	0.1%
12	7	0.1%	2	0.1%	2	0.1%
13	7	0.1%	2	0.1%	--	--
14	2	0.0%	1	0.1%	1	0.1%
15	1	0.0%	--	--	--	--
16	4	0.1%	--	--	--	--
17	1	0.0%	--	--	1	0.1%
18	--	--	--	--	1	0.1%
20	1	0.0%	--	--	--	--

QUESTION 7: "What PERCENTAGE of YOUR (1989 or 1992) Arizona fishing was done with ARTIFICIAL LURES OR FLIES?"

Anglers spent a greater percentage of their time fishing with a mixture of bait and artificial lures, approximately 60%. Since 1989 individuals fishing solely with lures or flies has remained constant at 18% of the angling public. A major shift in the all bait anglers occurred from 1989 to 1992. This 50% drop of bait only anglers, 31% to 15%, shows a migration of those individuals to the category of the mixed anglers with respect to artificial usage. This is exhibited in Tables 18 and 19.

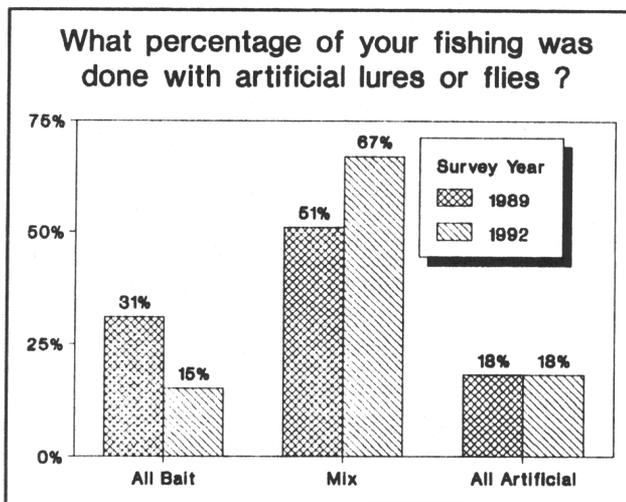


Figure 6.

Table 18. Number (n) and percent of responses to question 7 by type of angler in 1989 and 1992.

Type of Angler	1989		1992	
	n	%	n	%
Bait Only	628	31%	265	15%
Mostly Bait	416	21%	494	28%
Half & Half	220	11%	266	15%
Mostly Artificial	403	20%	424	24%
Artificial only	355	17%	322	18%
Total	2028	100%	2169	100%

Table 19. Number (n) and percent of responses to question 7 by a range of lures or flies used in 1989 and 1992.

% of Time Fishing with Artificials	1989		1992	
	n	%	n	%
0 - 24 %	922	45%	609	34%
25 - 49 %	122	6%	150	9%
50 - 74 %	298	15%	341	19%
75 - 100 %	680	34%	671	38%
Total	2028	100%	2169	100

QUESTION 8. "If given a choice would you rather catch?"  
(CHECK ONLY ONE)

- Six - 8.5 inch trout
- Four - 12 inch trout
- One - 24 inch trout
- Other
- No opinion

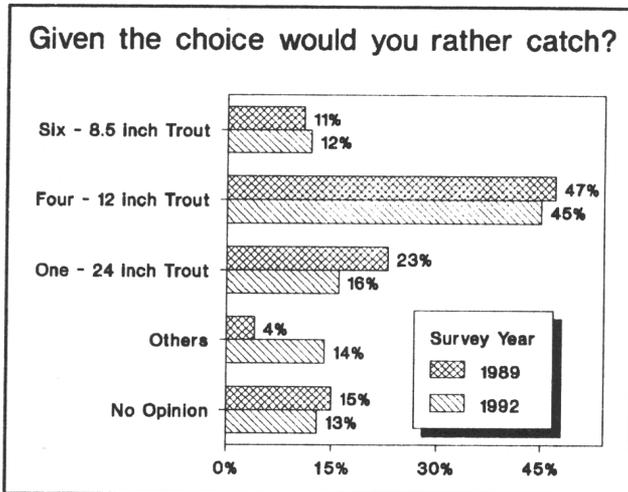


Figure 7.

For the two years this question was asked we find an overwhelmingly consensus to the option of keeping four twelve inch trout, approximately 46%. This option was the primary choice of Arizona anglers in 1989 and 1992. As demonstrated in Table 20, this preference for fewer larger trout is consistent across all angler types with respect to artificial lure usage. In the category of "Others", we find a marked increase from 1989, 4% to 14% in 1992. Respondents were given the option to write the size and number of trout they wish to keep. These individuals,

approximately 10% of the respondents, indicated they desire to catch, in order of importance, six twelve inch trout, two eighteen inch trout and ten twelve inch trout. Overall anglers feel that they would rather keep fewer trout if larger in size.

Table 20. Number (n) and percent of responses by preferred trout catch, by type of angler from question 7, 1989 and 1992.

Choice of Trout to Catch	1989						1992					
	All Bait		Mix		All Lures		All Bait		Mix		All Lures	
	n	%	n	%	n	%	n	%	n	%	n	%
Six - 8.5 inch	84	14%	114	11%	18	5%	49	19%	139	12%	24	7%
Four - 12 inch	289	49%	511	50%	124	37%	112	42%	597	50%	116	36%
One - 24 inch	88	15%	232	23%	121	36%	27	10%	200	17%	74	23%
Other	18	3%	42	4%	20	6%	35	13%	147	12%	70	22%
No Opinion	110	19%	116	12%	55	16%	42	16%	101	9%	38	12%
Total	628	100%	1039	100%	355	100%	265	100%	1184	100%	322	100%

QUESTION 9. "In order to have a successful fishing trip do you feel you must keep at least some of the fish you catch?"

Arizona anglers have changed since 1989 with respect to this question. One third of the 1989 anglers felt that they must keep some fish to have a successful fishing trip. In 1992 this increased to 54% of the angling public, Figure 8. This reverse in attitudes on keeping fish from 1989 to 1992 occurs primarily in the coldwater fishing community, Appendix B, Table B39, page 89. The majority of these anglers felt in 1989 that they did not need to keep fish in order to have a successful fishing trip. This changed in 1992 to a strong feeling of keeping the fish they caught determines the success of the trip.

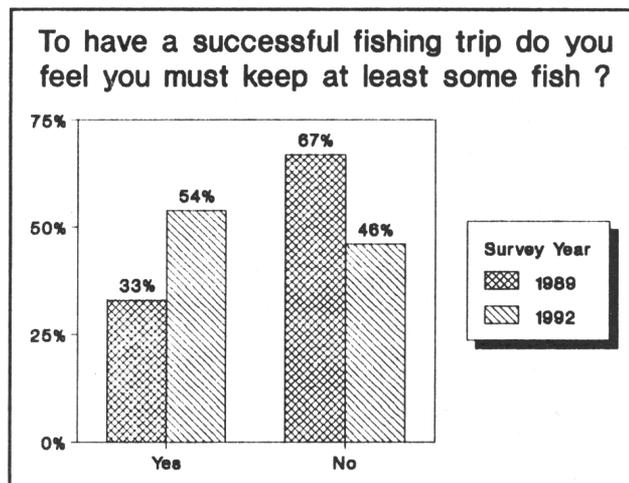


Figure 8.

Table 21. Number (n) and percent of responses for question 9 by type of angler from question 7, 1989 and 1992.

	1989						1992					
	All Bait		Mix		All Lures		All Bait		Mix		All Lures	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	234	12%	314	16%	86	5%	175	10%	615	36%	107	6%
No	345	18%	697	36%	256	13%	76	5%	538	31%	209	12%
Total	579	30%	1011	52%	342	18%	251	15%	1153	67%	316	18%

This change in angler attitudes towards keeping fish can also be seen in the amount of artificial lure usage, Table 21. For individuals using a combination of both bait and lures there has been a 20% increase, since 1989, in the conviction that keeping fish determines the success of the fishing trip. All bait anglers have declined from 18% in 1989 to 5% in 1992 in the perspective that retaining the fish caught does not govern the success of a trip. Anglers that exclusively use lures or flies have remained consistent with respect to this question.

QUESTION 10. "Estimate the PERCENTAGE of all your Arizona fishing days that were spent fishing for the fish listed below."

Table 22. Mean percent of fishing days that individuals spent fishing for question 10, 1986, 1989 and 1992.

Species Fished For:	1986	1989	1992	Mean
	%	%	%	%
Anything that bites	24.2%	27.6%	17.9%	23.5%
Trout	39.2%	32.2%	29.3%	33.8%
Largemouth bass	15.2%	16.4%	24.0%	18.2%
Smallmouth bass	1.4%	2.1%	3.9%	2.4%
Striped bass	9.0%	9.2%	9.5%	9.2%
White bass	0.3%	0.2%	0.5%	0.3%
Yellow bass	0.2%	0.1%	--	0.1%
Crappie	2.7%	4.4%	3.6%	3.6%
Sunfish	1.1%	1.5%	1.0%	1.2%
Channel catfish	4.1%	4.6%	6.8%	5.1%
Flathead catfish	1.1%	0.5%	3.0%	1.4%
Bullheads	0.2%	0.1%	0.2%	0.2%
Northern pike	0.6%	0.2%	0.1%	0.3%
Walleye pike	0.3%	0.6%	0.1%	0.4%
Yellow perch	0.1%	0.1%	--	0.1%
Tilapia	0.2%	--	--	0.1%
Carp	0.2%	0.1%	0.1%	0.1%
Other	0.1%	0.3%	--	0.1%
Total	100.0%	100.0%	100.0%	100.0%

There appeared to be a decrease in the amount of time anglers spend fishing for 'anything that bites' and Trout since 1986. Between 1986 and 1992 a slight increase occurred in the percentage of time anglers fished for both largemouth and smallmouth bass along with channel catfish. Anglers expend, in order of importance, 34% of their time fishing for trout, 24% of their fishing day for 'anything that bites' followed by largemouth and striped bass at 18% and 9%, respectively.

Table 23. Number (n) and percent of respondents fishing for only one species, 1986, 1989 and 1992.

Species Fished For:	1986		1989		1992	
	n	%	n	%	n	%
Trout	1053	20.5%	245	18.3%	239	16.3%
Largemouth bass	195	3.8%	51	3.8%	53	3.6%
Smallmouth bass	11	0.2%	4	0.3%	3	0.2%
Striped bass	91	1.8%	13	1.0%	15	1.0%
White bass	2	0.0%	--	--	1	0.1%
Yellow bass	4	0.1%	1	0.1%	--	--
Crappie	20	0.4%	3	0.2%	--	--
Sunfish	15	0.3%	4	0.3%	1	0.1%
Channel catfish	37	0.7%	7	0.5%	10	0.7%
Flathead catfish	15	0.3%	2	0.1%	3	0.2%
Bullheads	--	--	--	--	--	--
Northern pike	6	0.1%	--	--	--	--
Walleye pike	1	0.0%	--	--	1	0.1%
Yellow perch	1	0.0%	1	0.1%	--	--
Tilapia	1	0.0%	--	--	--	--
Carp	3	0.1%	--	--	--	--
Other	2	0.0%	3	0.2%	--	--
Many Species	3690	71.7%	1008	75.1%	1139	77.7%
Total	5147	100.0%	1342	100.0%	1465	100.0%

Most anglers fished for more than one species in 1986, 1989 and 1992, approximately 75%. There was a decline in the percentage of anglers who fished only for trout from 1986 at 20.5% to 16.3% in 1992. Largemouth and Smallmouth bass anglers have stayed relatively constant over the three survey years. This is also demonstrated in those individuals fishing solely for Channel catfish.

QUESTION 11. "Circle the one type of fish you most prefer to fish for in Arizona?"

Trout (36%) and largemouth bass (28%) were the preferred species of Arizona anglers in all three survey years. Overall, the third and fourth preferred fish species are channel catfish and striped bass. For an unknown reason, the selection in the fourth preference species category is different in 1989, 'anything that bites'. Nonresident anglers have exhibited a consistent difference in the third preferred species, striped bass, over resident anglers, channel catfish, Appendix B, Table B41, page 93.

Table 24. Number (n) and percent of responses to question 11 in 1986, 1989 and 1992.

Preferred Species	1986		1989		1992	
	n	%	n	%	n	%
Trout	3040	39.8%	700	34.6%	744	34.3%
Largemouth bass	2395	31.3%	506	25.0%	629	29.0%
No response	711	9.3%	323	16.0%	196	9.0%
Channel catfish	535	7.0%	104	5.1%	171	7.9%
Striped bass	308	4.0%	75	3.7%	102	4.7%
Crappie	231	3.0%	81	4.0%	86	4.0%
Anything that bites	134	1.8%	93	4.6%	65	3.0%
Smallmouth bass	49	0.6%	43	2.1%	67	3.1%
Sunfish	56	0.7%	24	1.2%	21	1.0%
Walleye pike	51	0.7%	20	1.0%	26	1.2%
Flathead catfish	51	0.7%	18	0.9%	34	1.6%
Northern pike	25	0.3%	16	0.8%	4	0.2%
Other	22	0.3%	9	0.4%	2	0.1%
Carp	10	0.1%	3	0.1%	4	0.2%
Yellow perch	8	0.1%	3	0.1%	3	0.1%
Yellow bass	7	0.1%	2	0.1%	4	0.2%
White bass	5	0.1%	3	0.1%	7	0.3%
Bullheads	5	0.1%	2	0.1%	4	0.2%
Total	7643	100.0%	2025	100.0%	2169	100.0%

QUESTION 12. "Which of the following statements comes closest to your point of view?"

A. Sport fish management should not be disrupted just to protect some rare native fish species such as desert pupfish.

B. Native fish in Arizona are becoming very rare. We should do everything we can to preserve them, even if it means restricting activities such as stocking sport fish like trout and bass.

C. Not sure.

Thirty seven percent of anglers favor the position that sport fish management should remain the same over the concerns of native fish. Anglers approving the native fish statement, 26%, are usually below the age of 40. Those endorsing sport fish are older, greater than 50 years of age, Appendix B, Table B42, page 94. Respondents that were undecided comprised 37% of the angling public. In 1992, the Department addressed this question to the general public in their Trend Survey. Their answers differed with 65% for native fish, 22% for sport fish and 13% not sure.

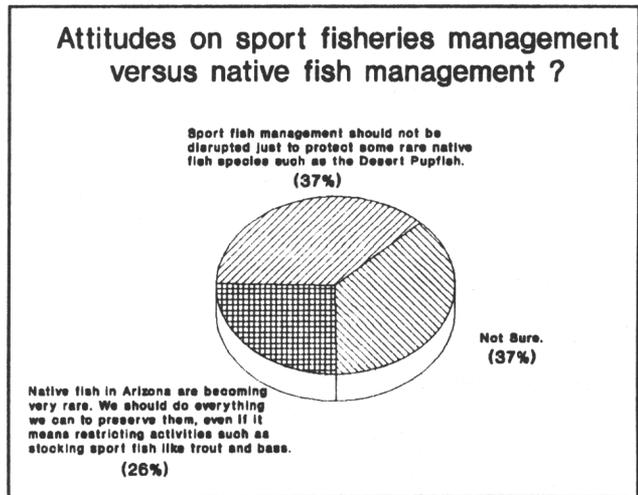


Figure 9.

QUESTION 13. "Should Arizona native fish, such as Colorado River squawfish, roundtail chub, and Apache trout, be managed as sportfish?"

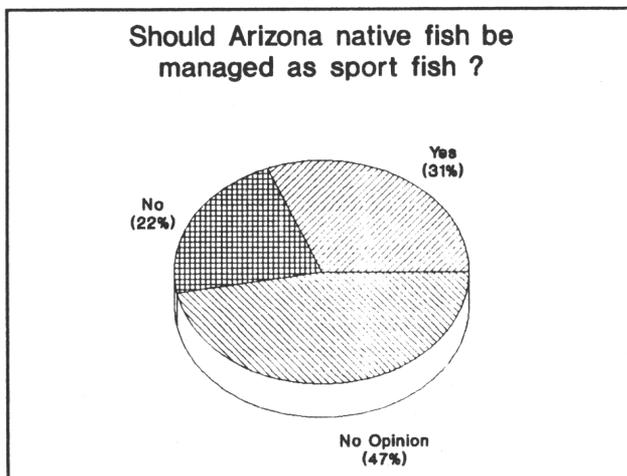


Figure 10.

Widespread response to this question was in the 'No Opinion' category, 47%, which are commonly individuals older than 50 years of age. The anglers that support this management concept, 31%, are generally below 50 years of age and live in the State's metropolitan areas. Also coldwater only anglers show support of this option, Appendix B, Table B43, page 98. There was no defined differences between anglers opposing this statement, which constitutes 22% of the anglers.

QUESTION 14. "Would you be willing to buy a 'special use stamp' to fish a specially managed fishery? (Lee's Ferry, Becker Lake, Alamo Lake)"

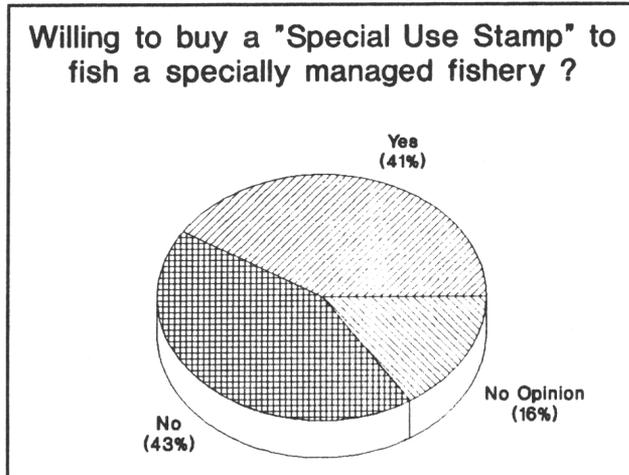


Figure 11.

When anglers were asked this question there responses were evenly divided, 41% for and 43% against. Anglers favoring the special use stamp option were between 20 and 39 years of age. Respondent older than 50 did not support this concept. Also anglers living in medium size cities and rural communities did not agree with this philosophy, Appendix B, Table B44, page 102. Sixteen percent of the survey respondents had no opinion.

QUESTION 15. "How much did you spend per day on an average fishing trip in 1992? (Consider costs for equipment, gas, food, lodging and licenses)"

Over one third of the State's anglers spend between \$26.00 to \$50.00 per day fishing. The median amount spent per day on an average fishing trip is \$50.00. As one would expect, nonresident anglers expended more per day fishing than resident anglers, \$75.00 versus \$50.00. Bait only anglers spend the least fishing, \$39.00 per day. Individuals fishing solely for largemouth and smallmouth bass spent the most per day angling, approximately \$68.75 dollars, Appendix B, Table B45, page 106.

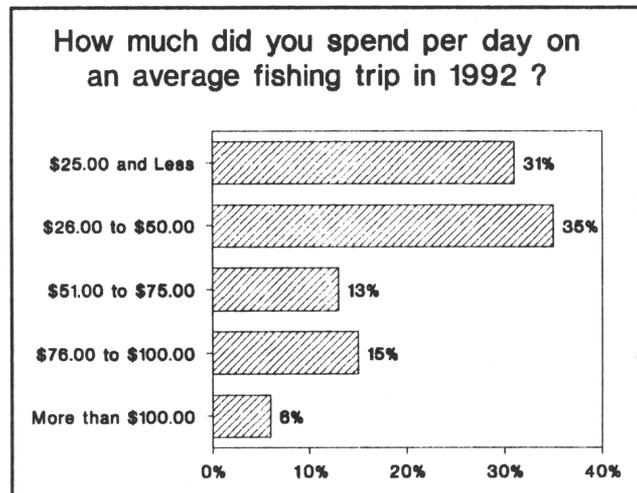


Figure 12.

Table 25. Mean, median and mode for question 15, "How much did you spend per day on an average fishing trip in 1992?".

Valid n	Mean	*Median*	Mode
1870	\$57.27	\$50.00	\$50.00

QUESTION 16. "How should Lee's Ferry be managed?"

The bulk of the fishing public have indicated that Lee's Ferry should be managed at its present state, 46%. This is followed by a special use stamp, 29%, others at 20% and no harvest at 5%. Support for the present management of Lees's Ferry, the 'As Is' option, is consistent across all angler demographics, Appendix B, Table B46, page 111. There is a slight tenancy for the 'Special Use Stamp' and 'No Harvest' options for lure only anglers. The others category was predominated with such comments as "no opinion" and "I don't know".

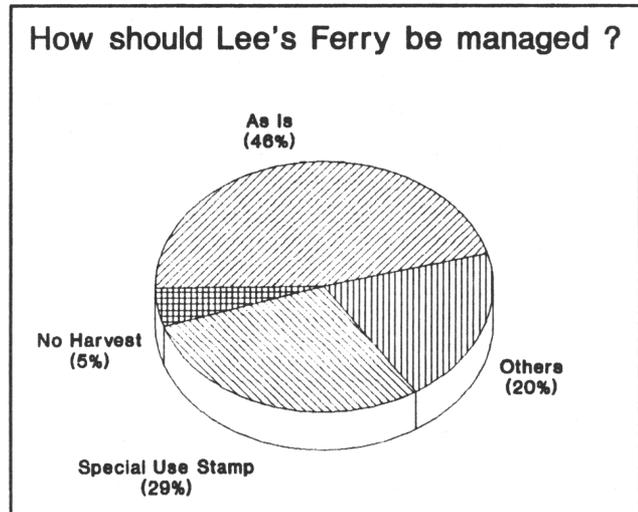


Figure 13.

QUESTION 17. "Should Becker Lake be managed as a quality fishery with special regulation?"

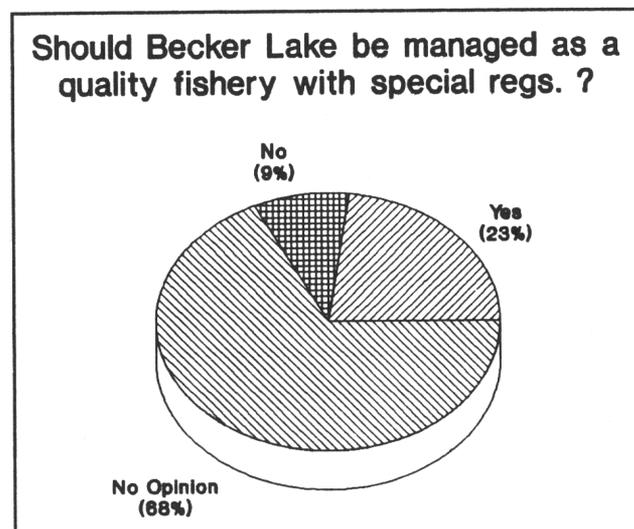


Figure 14.

Over two thirds (68%) of the respondents had no opinion regarding this Becker Lake management option. This maybe due to the majority of angler being unaware of Becker Lake and its fishery. Those anglers that support this concept (23%) are individuals that primarily fish with lures, only fish for trout and agree with question 14, "Would you be willing to buy a special use stamp?", Appendix B, Table B47, page 115. Nine percent of the anglers do not advocate this management tool.

QUESTION 18. "Did you have your fishing license checked by an Arizona Game and Fish officer during 1992?"

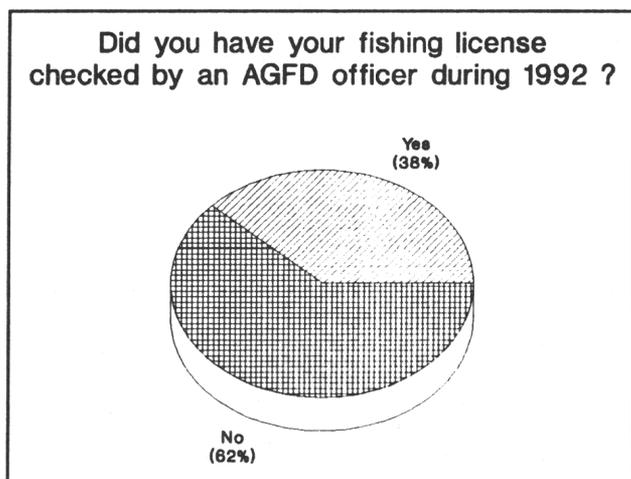


Figure 15.

Thirty eight percent of the 1992 anglers had their license check by an Arizona Game and Fish Department officer, approximately 126,000 anglers. As would be expected, individuals fishing more than 21 days a year had the greatest likelihood of having their fishing license checked by an officer, Appendix B, Table B48, page 119. This is consistent across all angler demographic such as gender, age and residency. Officers are not singling out any particular group of individuals.

QUESTION 19. "Did you see an Arizona Game and Fish officer during one of your trips during 1992?"

In this question we see a reversal of what occurred in question number 18. Sixty seven percent said they saw an Arizona Game and Fish Department officer during one of their fishing trips, nearly 221,000 anglers, 33% indicated they did not. Here again, anglers fishing more than six days had the greatest probability of seeing a Department officer, Appendix B, Table B49, page 122. This too, is uniform across all angler demographics.

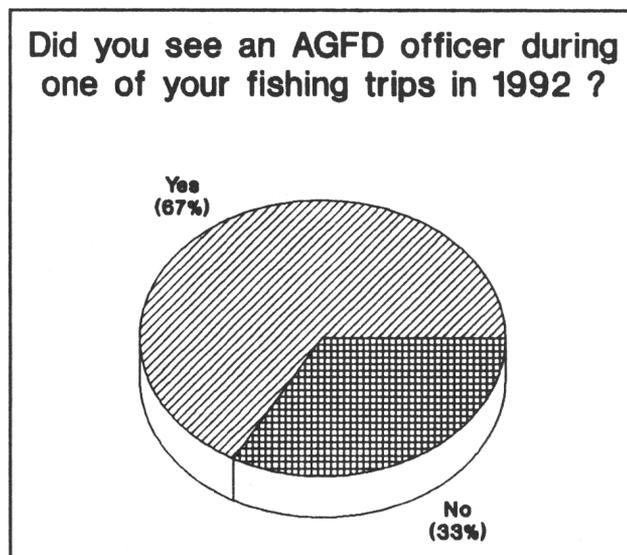


Figure 16.

QUESTION 20. "Do you belong to a fishing club or organization?"

Nine out of ten, or 89%, of the licensed angling public do not belong to a fishing club or organization. Of the 11% that exhibited a membership to such fishing groups, we find that they are predominately males between the ages of 20 to 59 years old, Appendix B, Table B50, page 125. Also these individuals that are associated with fishing clubs and organizations tend to mostly be dominated by artificial lure and fly anglers.

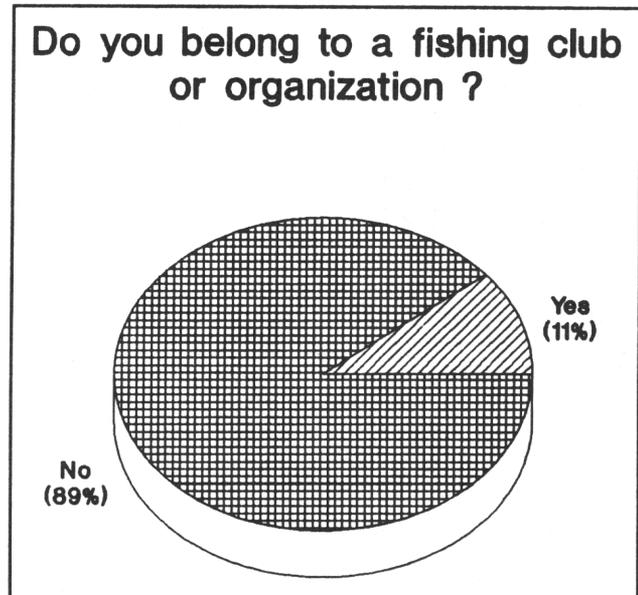


Figure 17.

QUESTION 21. "How often do you use the following sources of fishing information?"

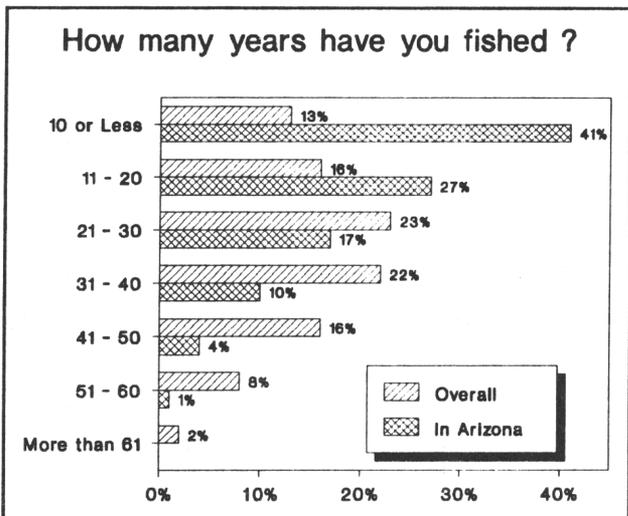
Table 26. Median value of usage for Question 21 by residency, (1 = A Lot, 2 = Some, 3 = Only a Little, 4 = Not at All and 5 = Didn't Know Existed)

	Weekly Newspaper Fishing Reports	Weekly Radio Fishing Reports	Wildlife Views	Game and Fish TV Show	Local Tackle Shops	Phone Game & Fish Offices
Nonresident	3	4	4	3	2	4
Resident	2	4	4	4	3	4
Overall	2	4	4	4	3	4

Of the six avenues for fishing information investigated in this question there is no singular area used a lot by the angling public. In general we find that weekly newspaper fishing reports are used some, local tackle shops only a little and the rest not at all. The States' resident anglers focus on the use of newspaper fishing reports. Whereas nonresident anglers tend to gather fishing information from the local tackle shops. There is no defined subgroup using a particular information area, Appendix B, Table B51, page 129.

QUESTION 22. "How many years have you fished?"

QUESTION 23. "How many years have you fished in Arizona?"



These two questions have been combined in Figure 18 to demonstrate the differences between years fished in Arizona and overall years fished. The average length of time people have fished is 32 years, Question 22. In Arizona the mean years fished is 17, with the bulk of these individuals, 41%, falling into the category of 10 or less. This indicates the States' anglers are new to Arizona, which is consistent with the general population dynamics of the state. In both questions, anglers living in rural communities display the highest number of years fished,

Figure 18.

Appendix B, Tables B52 and B53, pages 133 and 136.

QUESTION 24. "If you lived in and fished in another state or country which state or country did you live and fish in?"

Most of the surveyed anglers have lived and fished in California, 21%. This is followed by Colorado, 6%, and Illinois at 5%. Some people have lived and fished in countries as far away as Australia and Zimbabwe. A number of the respondent listed more than one state or country and this information is tabulated in Appendix B, Table B54, page 139.

Table 27. Number (n) and percent of the top five responses to Question 24.

State or Country	n	%
California	293	20.8%
Colorado	78	5.5%
Illinois	73	5.2%
Michigan	68	4.8%
Ohio	58	4.1%
All Others	842	59.6%
Total	1412	100.0%

QUESTION 25. "What is your date of birth?"

QUESTION 26. "What is your sex?"

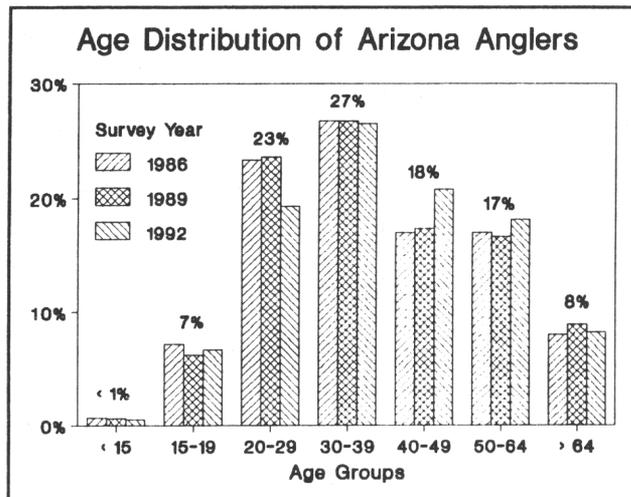


Figure 19.

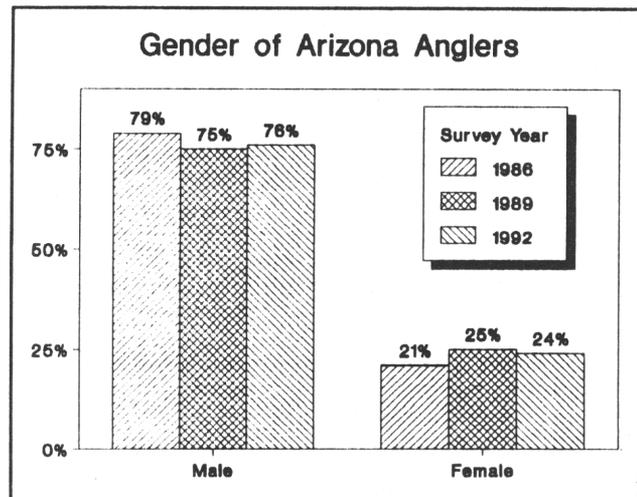


Figure 20.

We determined age and sex of the sampled population from our mailing list, which was generated from our random sample of license buyers, for each of the survey years. Questions 25 and 26 were used as a verification against the questionnaires returned by the anglers surveyed. The age distribution of anglers has remained somewhat stable since 1986. However, we see a decline (-4%) in anglers between the ages of 20 to 29 years old. This is followed by an increase of individuals fishing in the age groups of 40 to 49 and 50 to 64 years old, a +3% and +1% respectively. This would coincide with the general aging of the overall population. The ratio of male to female anglers has also stayed relatively constant over the three survey years. There has been a slight expansion (+3%) of female anglers since 1989.

Table 28. Age distribution, number (n) and percent, of license buyers by survey year and gender for 1986, 1989 and 1992.

Age Group	1986				1989				1992			
	Female		Male		Female		Male		Female		Male	
	n	%	n	%	n	%	n	%	n	%	n	%
< 15	9	0%	99	1%	10	0%	28	0%	6	0%	19	0%
15 - 19	158	1%	952	6%	50	1%	315	5%	60	1%	294	6%
20 - 29	795	5%	2782	18%	339	6%	1042	18%	246	5%	776	15%
30 - 39	832	5%	3256	21%	384	7%	1182	20%	350	7%	1054	20%
40 - 49	556	4%	2054	13%	275	5%	738	13%	289	5%	810	15%
50 - 64	587	4%	2019	13%	266	4%	708	12%	257	5%	700	13%
> 64	215	1%	1022	7%	119	2%	404	7%	70	1%	365	7%
Total	3152	21%	12184	79%	1443	25%	4417	75%	1278	24%	4018	76%

Table 29. Mean, median, and mode for the sample population by survey year and gender.

	1986		1989		1992	
	Female	Male	Female	Male	Female	Male
Mean	39	39	41	39	41	41
Median	36	36	38	36	40	39
Mode	26	27	31	32	30	36

The proportion of resident and nonresident anglers has stayed relatively stable since 1986 at 88% resident and 12% nonresident. Resident anglers have grown approximately 2% over the three survey years. Nonresident license buyers came primarily from California, Colorado, New Mexico, and Texas, Table 28. There has been a slight drop in nonresident anglers, (-2%), from 1986. Within this group the major decrease has occurred in anglers from Texas, 1.1% to 0.3%.

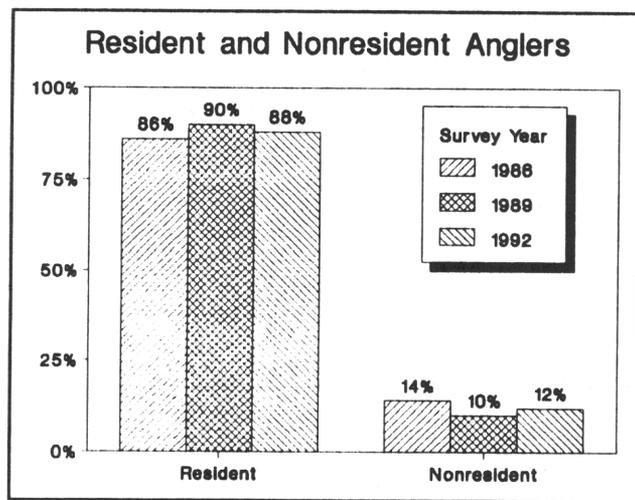


Figure 21.

Table 30. Number (n) and percent of the license buying population responding to the 1986, 1989 and 1992 surveys by residency.

State	1986		1989		1992	
	n	%	n	%	n	%
Arizona	6626	86.7%	1891	93.3%	1988	91.7%
California	520	6.8%	56	2.8%	101	4.7%
Colorado	58	0.8%	14	0.7%	12	0.6%
New Mexico	71	0.9%	10	0.5%	11	0.5%
Nevada	33	0.4%	4	0.2%	11	0.5%
Texas	81	1.1%	9	0.4%	6	0.3%
All Others	254	3.3%	42	2.1%	40	1.7%
Total	7643	100.0%	2026	100.0%	2169	100.0%

Survey respondents lived in the following Arizona cities and towns, ranked by percent of anglers for 1986, 1989 and 1992. Most of the 1992 anglers lived in the Phoenix and Tucson metropolitan area, followed by Flagstaff, Kingman, and Yuma. Cities not listed represented less than 1% of respondents.

Table 31. City of residence of survey respondents, 1986, 1989 and 1992.

City	1986		1989		1992	
	n	%	n	%	n	%
Phoenix	1,377	21.7%	423	20.9%	476	21.9%
Tucson	660	10.4%	299	14.7%	293	13.5%
Mesa	515	8.1%	149	7.4%	162	7.5%
Glendale	360	5.7%	109	5.4%	109	5.0%
Flagstaff	133	2.1%	59	2.9%	75	3.5%
Kingman	66	1.1%	26	1.3%	55	2.5%
Tempe	242	3.8%	79	3.9%	54	2.5%
Scottsdale	215	3.4%	81	4.0%	50	2.3%
Yuma	119	1.9%	33	1.6%	48	2.2%
Chandler	135	2.1%	48	2.4%	43	2.0%
Prescott	77	1.2%	27	1.3%	38	1.8%
Peoria	82	1.3%	33	1.6%	37	1.7%
Lake Havasu City	60	1.0%	32	1.6%	33	1.5%
Gilbert	42	0.7%	19	0.9%	24	1.1%
Apache Jct.	77	1.2%	30	1.4%	22	1.0%
Sierra Vista	61	1.0%	24	1.2%	13	0.6%
Payson	53	0.8%	18	0.9%	10	0.5%
All Others	2060	32.5%	539	26.6%	627	28.9%
Total	6,334	100.0%	2,028	100.0%	2,169	100.0%

Table 32. Distribution of resident license buyers surveyed by size of city (population), 1986, 1989 and 1992.

	1986		1989		1992	
	n	%	n	%	n	%
Phoenix Metro Area	3,234	58.0%	1,033	54.5%	1,038	52.1%
Tucson Metro Area	675	12.1%	311	16.4%	302	15.2%
Medium Size Cities	1,250	22.4%	410	21.6%	472	23.7%
Rural Communities	418	7.5%	142	7.5%	179	9.0%
Total	5,577	100.0%	1,896	100.0%	1,991	100.0%

## SUMMARY OF FINDINGS

The summary for the three angler surveys are outlined below in the form of a bullet list. This is followed by a general profile of the 1992 anglers, both resident and nonresident.

- Estimated angler user days averaged, over the three surveys, 7.1 million, with 2.4 million for trout and 4.7 million for warmwater species.
- The highest used areas of the State are area 22 at 1.3 million user days, area 25 at 0.7 million user days and area 19 at 0.5 million user days. This demonstrates that anglers are fishing closer to home.
- Over half of the anglers, approximately 60%, fish between 6 to 50 days per year. Thirty six percent fish 6 to 20 days per year followed by 23% in the 21 to 50 day category. Individuals fishing more than 50 days per year comprise 11% of the angling public.
- The mean days fished for anglers has increased from 17.5 days in 1986 to 22.8 days in 1992.
- Large inland reservoirs such as Roosevelt, Saguaro and Bartlett, and lakes like Woods Canyon are utilized the most by the angling public.
- The bulk of the anglers fish with a combination of bait and lures, 60%. The remaining group of anglers fished with bait at 22% and exclusively with lures or flies at 18%.
- Since 1989 anglers have favored the option of catching four 12 inch trout, 46%, when given a list of options to choose from.
- Anglers are somewhat evenly divided with respect to keeping some fish as to whether it determines the success of a fishing trip. On average, 43% of the anglers feel keeping some fish determines the success of trip and 57% do not.
- Trout and Largemouth bass are the two species anglers prefer the most. They also expend most of their fishing effort towards these two species.
- Anglers attitudes towards native fish management over sport fish management is consistent. Thirty seven percent feel that sport fish management should not be disrupted for native fish and 31% are in favor of the concept that native fish should be managed as sport fish.
- Most of the fishing public spent between \$26.00 to \$50.00 dollars per day angling in 1992, 35%. The most frequent amount spent per day fishing is \$50.00 dollars.

- Forty six percent of the 1992 anglers surveyed feel the Lee's Ferry fishery should be managed at its present state. Twenty nine percent favored the special use stamp option.
- Over one third, 38%, of the anglers had their fishing license checked by an Arizona Game and Fish officer. Two thirds of the angling public, 67%, indicated they saw a Game and Fish officer during one of their fishing trips.
- Eleven percent of the 1992 anglers belong to a fishing club or fishing organization.
- The fishing public obtains most of their fishing information from the weekly newspaper fishing reports and the use of local tackle shops.
- The States' anglers have fished an average 32 years overall with an average of 17 years in Arizona. This demonstrates that the majority of the angling public are new to the State.

1992 ANGLER PROFILE

- Resident:
- Are predominately male (76%), at a median age of 36 years old. Females constitute 24% of the fishing public and have a median age of 37 years old.
  - The majority of the resident anglers reside in the Phoenix and Tucson metropolitan areas.
  - They constitute 94% of all user day participation at approximately 6.8 million user days.
  - They mainly fish large inland reservoirs and mountain trout lakes.
- Nonresident:
- This group is also dominated by males, 84%, at a greater median age of 44 years old. Female anglers comprise 16% of the nonresident anglers and are at the same median age, 44.
  - These anglers mainly reside in adjacent states, predominately California.
  - They constitute 6% of all user day participation at roughly 430,000 user days per year.
  - These angler mainly fish the Colorado river and its reservoirs.