OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION 2019 OKLAHOMA ANGLER SURVEY





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INTRODUCTION

One of the most popular forms of outdoor recreation in Oklahoma is sportfishing. Successful Oklahoma fisheries management depends on an understanding of both the biological and social aspects of a fishery. Because the fishing public bear the majority of the cost of maintaining and enhancing fishing through their license and equipment purchases, it is especially critical to understand the fishing public's experiences and preferences, as well as their attitudes toward Oklahoma fisheries management.

Recently, many states have observed stagnation, and in many cases a decline in fishing participation. Although the amount of leisure time has increased for many Americans, the amount of demand on this leisure time has apparently increased as well. The number of Oklahomans who purchase fishing license and their attitudes have changed over the decades. State license holders increased from 245,429 in 1969 to over 720,000 in 1999. There was also a significant increase in the last few years with the addition of two tribal compact licenses, the Cherokee Nation Compact and the Choctaw Nation Compact. Angler attitudes toward the ODWC's direction of management activity have also changed (Summers2009). Additionally, unpublished reports by the ODWC suggest that annual renewal rates of anglers buying license is less than 60%. Marketing strategies that deal not only with recruitment of new anglers but retention of these participants is needed. Assessing motivation as well as opinions and needs becomes the first logical step in developing such a marketing plan.

It is imperative that resource management agencies, primarily funded by user groups such as anglers, investigate fishing participation, reasons for fishing, opinions about fisheries management, and reasons why fishing participation is waning. Since the late 1960's, angler opinion surveys have been a useful tool for fishery resource managers to learn about their angling constituents. This survey was once again employed during 2019 to learn about and monitor trends related to the fishing public in Oklahoma.

METHODS

Previous Oklahoma surveys consisted of both mail questionnaires (Moser 1975, Mense 1977 and Summers 1986) and telephone interviews (Summers 1990, 1996 and 2002; Summers and Crews 2002). Although the advantages of conducting mail surveys include range and economy, it has been suggested that telephone interviews obtain more complete and accurate information. However, transitions to mobile phones and public displeasure with the amount of telemarketing seen in recent years, suggests that web-based surveys may provide a better way to access public opinion. After consultation with survey literature, Division personnel, ODWC administration and human dimensions colleagues, a mixed-mode mail and online angler questionnaire was developed.

The sample for the 2019 Angler Survey consisted of resident non-tribal license holders, resident tribal license holders and nonresident license holders. The terminology in this report refers to license category, not the racial identity of the license holders. Non-tribal licenses are any resident licenses not administered through either the Cherokee Nation or the Choctaw Nation. Previous surveys have focused only on resident non-tribal license holders. The popularity of fishing in Oklahoma with nonresidents was the impetus for including nonresident license holders in this year's survey. Also, in 2016 and 2017 the two tribal licenses were created (Cherokee Nation Compact and Choctaw Tribal Compact). This is the first survey completed which includes these new license types. The resident non-tribal license sample

consisted of 4,000 users and followed the 2014 Angler Survey protocol. This sample included 75% annual license holders, 20% lifetime license holders and 5% senior license holders. 2,000 nonresident license holders were randomly selected and 2,000 tribal license holders were randomly selected (1,000 Cherokee, 1,000 Choctaw) to receive the questionnaire. This sample was randomly pulled from the year 2018 license file in the relative percentages described above.

All anglers selected for the survey were mailed a pre-survey invitation letter (Appendix A) on April 12, 2019, which informed them of their selection to participate. All anglers were then mailed a copy of the survey instrument (Appendix A) on April 25, 2019 with instructions to fill out and return the survey in the pre-paid envelope provided. An incentive to participate was offered in the form of a oneyear subscription to the Wildlife Department's bi-monthly magazine, *Outdoor Oklahoma*.

License holders who did not respond to the initial mail query were mailed a reminder postcard on May 20, 2019. This postcard reminded them of the mail survey and also offered the option of filling out the survey online. Issues with mailing funds created this large gap in timing between the initial survey and the reminder postcard. A final full survey mailing with a reminder of the online option was mailed on June 10, 2019. The lengthiness of the survey mailing process may have contributed to lower than desired response rates as selected participants may have forgotten about the survey between mailings.

Non-response bias (resulting when the proportion of the sample from which survey data was received does not represent the proportion from whom no data was received) is sometimes formally addressed by a follow-up study of non-respondents, comparative analysis, and subsequent weighting of the original data if differences are found. Alternatively, responses of early and late respondents can be compared for a few key variables. The presumption is that people who do not complete the survey (non-respondents) are likely more similar to those that responded slowly than those who responded quickly. This second approach (comparison of early vs. late respondents) was used to assess non-response bias. Differences between categorical variables were detected using chi-square (Pearson, Fisher's Exact Test, or Linear-by-Linear Association as appropriate). Multiple means were compared using a one-way ANOVA. All tests were considered significant at P < 0.05. Analysis was performed on the entire dataset along with stratification by license type when differences were significant. Trend comparisons were made to previous Oklahoma Angler Surveys when appropriate. Surveys from previous years often asked the same questions, but in some years the response items differed. Trend data from previous years were pulled from reports, not raw data, due to accessibility and usability. Due to rounding, some sample percentages may not add to 100%.

SAMPLE DISPOSITION AND RESPONSE RATE

A total of 1,705 usable survey responses were received. Discarded from analysis were 14 responses as they had incomplete license holder data. The effective response rate after removing 26 people we couldn't possibly have contacted (wrong address, deceased, etc.), our effective response rate was 21.4%. Of the valid responses, 211 responded online (12%) and 1,494 responded via mail (88%). Subsequent surveys will likely receive higher response rates with up to date contact information from the angler license population due to the agency transitioning to the new GoOutdoors system.

The respondent group was comprised of 51% resident non-tribal license holders, 25% resident tribal license holders and 24% non-resident license holders, which nearly matched our sampling distribution (Table 1). Further details of the full, sampled, and respondent populations are displayed in Appendix B.

The average age of respondents was 52.3 years and a median age of 55.1 years. Also, out of the respondents, 21% identify as female, 63% male and 15% did not provide this information (Figure 1).



FIGURE 1: RESPONDENT AGE DISTRIBUTION, N=1,704

Annual/Five Year 205,980 2,906 559	
Resident Lifetime 161,403 811 231 Non-Tribal	
Senior 190,858 282 78	
Resident Tribal 128,406 1,999 423	
Non-resident 70,822 1,992 415	
757,469 7,990 1,706	

Table 1: Distribution of license types for Angler Opinion Survey population, sample, and completed surveys, 2019. For a complete list of license codes refer to Appendix B.

NON-RESPONSE BIAS

To assess non-response bias, answers from survey participants for whom surveys were received after multiple contacts were compared to the responses for those that sent in their surveys after our first full survey mailing. Out of the 1,705 respondents, 1,102 (65%) responded after the initial invitation to complete the survey. After a reminder survey was sent with an additional reminder that the survey was available online, 603 people responded (35%). There was a significant difference in activity level between respondents (p<0.001). This follows previous surveys accomplished by ODWC as early respondents are more likely to be active. No weighting was used as the percentage of active anglers was the vast majority in both early and late responders. Also, we know anglers are a typically active group of recreationists based on previous angler surveys. There was no significant difference for the variables of years fishing (p=0.07), importance of fishing as a recreational activity (p=0.36), gender (p=0.27), and age (p=0.70). There was a significant difference in license type responding (p=0.02). This variable was also not weighted as the respondent population overall varied by one percentage point (Table 1).

RESPONSE MODE BIAS

A mixed-mode methodology was used for the Angler Survey to improve coverage and response rates. Question formatting and wording was identical across modes, however, different response modes may introduce different biases. To examine the impact of mixed methodology, survey responses were compared between mail and internet respondents. The mail methodology yielded 1,494 responses while the internet methodology yielded 211. There was no significant difference between activity level (p=0.08), years fishing (p=0.19), importance of fishing as a recreational activity (p=0.25), license type (p=0.41), and gender (p=0.62). The average age of internet respondents was 45 years of age while the average age of mail respondents was 53 which was significantly different (p<0.001). The average age of the population of fishing license holders is 52.54.

GEOGRAPHIC DISTRIBUTION

Per a suggestion on the 2014 Angler Survey and with input from fisheries biologists, we expanded the sample for the 2019 Angler Survey to include nonresident license holders and the newly created tribal license holders. With this survey, we reached a wide distribution of nonresidents across the United States (Map 1). Also, when looking at residents, the geographic location reflects the population distribution in Oklahoma (Map 2).



MAP 1: DISTRIBUTION OF RESPONDENTS ACROSS THE UNITED STATES.



MAP 2: DISTRIBUTION OF RESPONDENTS WITHIN OKLAHOMA.

USE OF FISHING PRIVILEGES

Overall, activity trends have been consistent across all angler surveys conducted by ODWC. Past angler surveys have only sampled resident non-tribal license holders. Around 80% of license holders consistently actively fished. Resident tribal license holders were significantly less likely to have been active in the last 12 months compared to other license categories (Fig 2; p<0.05). Those who did not fish in the last 12 months did not answer any further questions related to fishing activity. They were directed to skip to opinion questions on Wildlife Department activities reported on later in this document.



FIGURE 2: PERCENT OF RESPONDENTS WHO FISHED IN THE LAST YEAR BY LICENSE CATEGORY (NON-RESIDENT N=446; RESIDENT NON-TRIBAL N=739; RESIDENT TRIBAL N=485)

Of those who were active in the last year, we asked them the number of days they went fishing (Fig 3). Resident tribal license holders went fishing most (37.74 days), followed closely by resident non-tribal holders (35.4 days). Nonresidents were predictably the least active in terms of average days fishing in Oklahoma (19.73 days).



FIGURE 3: NUMBER OF FISHING DAYS IN THE LAST YEAR BY LICENSE CATEGORY (NON-RESIDENT N=323; RESIDENT NON-TRIBAL N=687; RESIDENT TRIBAL N=272) Combining all license types, fishing is one of the most important recreational activities to active anglers (Fig 4).



FIGURE 4: IMPORTANCE OF FISHING IN COMPARISON TO OTHER OUTDOOR RECREATIONAL ACTIVITIES (N=1,364)

We also asked active anglers which types of water they were active on and how many days they were active on each. Public lakes were the most widely used type of water, followed by public rivers. This means that the most amount of people said that they fished at least one day on these waters. Public lakes were also the waterbodies charting the most amount of days by individuals. Anglers on average spent 20 days in the last year fishing on public lakes. Farm ponds were the second most visited by individual anglers with 18 days in the last year (Fig 5). The estimated days on public waters in Oklahoma was in the millions (Table 2). The estimated total amount of days fished by all fishing license holders in Oklahoma was over 20 million days.



	TABLE 2: AMOUNT	OF USERS AND	DAYS OF USE IN	I PUBLIC VERSUS	PRIVATE WATERS
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For those that did not fish, we asked why they did not make it out. They selected all reasons that were applicable to their situation. Other priorities, health issues and lack of someone to go with far outweighed the other options (Table 3). The first two are out of ODWC's control, but lack of someone to go with could be addressed by activities put on by the Wildlife Department or in partnership with non-profit partners across the state.

Resident anglers are traveling further to pursue fish as the average one-way distance traveled has increase to 44.87 (tribal compact licenses and nonresident licenses were removed from this analysis to offer comparisons to previous survey data). This number continues to increase over the years with anglers travelling 35 miles in 1996 and 39 miles in 2014 (Fig 6). Urbanization could be contributing to this trend. This year, we also surveyed non-residents who are on average TABLE 3: SELECTED REASONS FOR NOT FISHING IN THE LAST 12 MONTHS

Reason for Not Fishing in last 12 months	Percent of Sample	Rank
Other priorities	41.6%	1
Health issues	29.5%	2
Lack of someone to go fishing with	14.4%	3
Lack of a place to go fishing	6.5%	4
Poor quality of fishing	2.8%	5
Regulations too confusing	1.7%	6

traveling 135.6 miles one-way to fish in Oklahoma. We also looked at the average amount of days per angler on all waterbodies over time. The average amount of days per angler in all water bodies combined was 35.4 (tribal compact licenses and non-resident licenses were also removed from this analysis to offer comparisons to previous survey data). This has increased from an average of 31 days in 2014 (Fig 6). Possible reasoning for this could be attributed to flooding across the state in spring/summer 2019 while this survey was being administered.



FIGURE 6: AVERAGE NUMBER OF DAYS FISHED AND DISTANCE TRAVELED WITHIN THE LAST YEAR FROM 1977-2019.

We looked at angling pressure in each region of the state. Anglers reported how many days they spent in different regions. Residents, predictably, spent on average more days on the water in all Oklahoma regions than non-residents (Fig 7).



FIGURE 7: AVERAGE NUMBER OF DAYS PER ANGLER SPENT FISHING IN ONE OF FIVE REGIONS OF OKLAHOMA BY LICENSE CATEGORY (AVERAGE WAS TAKEN OF THOSE ANGLERS WHO RESPONDED THEY FISHED AT LEAST ONE DAY IN THE GIVEN REGION)

We looked at the percent of anglers in each residency category that fished each region. Out of 370 non-resident active anglers, 46% reported fishing in northeast Oklahoma. Resident anglers most highly reported fishing in the southeast (Fig 8).



FIGURE 8: PERCENT OF ANGLERS THAT FISHED IN EACH REGION OF OKLAHOMA BY RESIDENCY TYPE

RECRUITMENT AND COMPANIONSHIP

Out of the 1,374 anglers that fished in Oklahoma in the last 12 months, only 212 stated that they did not take anyone fishing. All others (85%) took someone fishing in the last year. This included a new angler under the age of 16 or over the age of 16, someone who had not fished in a few years (reactivated) or they took someone but they weren't sure if it was their first time.

Fishing in Oklahoma continues to be a family affair. We asked anglers who they typically fish with allowing them to designate any that applied. The three most common answers were family, friends and children. Fishing guides were less likely to be selected (Fig 9).



FIGURE 9: RESPONSE TO WHO ANGLERS FISHED WITH IN THE LAST 12 MONTHS (MULTIPLE RESPONSES PERMITTED) N=1,372

PREFERRED METHOD

The most preferred method for anglers in Oklahoma was rod and reel with more than 90% of anglers using this method most often (Fig 10).



FIGURE 10: MOST OFTEN USED METHOD IN THE LAST 12 MONTHS FOR FISHING N=1,361

We also asked methods that anglers attempted in the last year, even if those methods were not what they utilized most often. Ninety-seven percent of anglers attempted rod and reel, 4% attempted bowfishing, 22% participated in juglining/trotlining, 5% tried their hand at noodling and 4% used other methods such as gigging, yoyo fishing, etc.

SPECIES PREFERENCE

Anglers were asked what species they target in different water bodies in Oklahoma in the past 12 months. If they did not fish that waterbody in the last year, they were instructed to skip that section. This is in contrast to previously collected data, where anglers were asked to rank their most sought after species and scores were assigned based on rank. The methodology for this survey was developed to fulfill the current needs of the fisheries division. Figure 11 displays the species that we inquired about as well as the relative percent of selection compared to other species. Crappie was most often selected in lakes, largemouth bass was exceedingly popular in ponds and channel catfish are most popular in rivers.



FIGURE 11: MOST POPULAR SPECIES BASED ON THOSE THAT WERE SELECTED BEING TARGETED IN THREE DIFFERENT WATER BODY TYPES IN OKLAHOMA.

In terms of how species have changed over the years related to angler preference, largemouth bass once again became the top targeted species across water bodies, followed by crappie and channel catfish. Ranking data were not collected in the exact methodology as previous surveys, but results are comparable and are being shown as such (Table 4).

Species	2019 Rank	Rank Change 2014- 2019	2014	2006	2000	1996	1990	1985
Largemouth bass	1	+1	2	2	1	1	1	1
Crappie	2	-1	1	1	2	2	2	2
Channel catfish	3	0	3	3	3	3	3	3
Blue catfish	4	0	4	4	4	5	5	9
Smallmouth bass	5	+2	7	7	9	9	6	10
Sunfish, bluegill, perch, brim, etc.	6	+4	10	8	7	7	10	12
White/sand bass	7	-2	5	5	5	4	4	4
Flathead catfish	8	-2	6	6	6	6	7	5
Striped bass	9	-1	8	9	10	8	8	6
Hybrid striped bass	10	+2	12	11	13	12	12	11
Spotted/Kentucky bass	11	+4	15	13	12	16	13	13
Brown trout	12	+1	13	15	14	13	n/a	n/a
Walleye	13	-2	11	12	11	10	10	7
Paddlefish/spoonbill	14	0	14	16	17	15	18	17
Carp	15	+3	18	17	16	14	18	15
Saugeye	16	+1	17	14	15	18	14	n/a
Gar	17	-1	16	18	18	17	20	18
Sauger	18	n/a	n/a	n/a	n/a	n/a	n/a	n/a

TABLE 4: SPECIES MOST OFTEN SELECTED IN BEING TARGETED FOR FISHING, METHODOLOGY OF QUESTION CHANGED IN 2019.

TROUT FISHING IN OKLAHOMA

Oklahoma's trout fisheries are a popular destination for both residents and non-residents. Fisheries biologists wanted to assess the current trout bag limit to see if a reduction would significantly impact the popularity of the fisheries. The current trout bag limit in Oklahoma is 6 fish per day. We asked about a reduction in trout to either 3 or 4. One half of the sample was proposed a reduction to 3 the other a reduction to 4. Overall, we only received surveys from 225 trout anglers. This puts our calculations at +/-5% sampling error. When asked how a reduction in bag limit would affect their fishing, there was no statistically significant difference between those who were posed a 4 trout limit compared to those who were posed a 3 trout limit per day (Fig 12; p=0.25). Overall, anglers largely reported that a reduction to 3 or 4 fish would not affect their trout fishing experience.



How would the proposed reduction affect your trout fishing?

FIGURE 12: COMPARISON OF RESPONDENT FEELINGS WHO WERE PRESENTED WITH A REDUCTION TO THREE TROUT COMPARED TO REDUCTION TO FOUR TROUT BAG LIMIT (N=225, P>0.05)

Finally, we looked at the breakdown of what percentage of anglers are trout anglers by license type. Thirteen percent of non-resident anglers fish for trout, 17% of resident non-tribal license holders fish for trout and 18% of resident tribal license holders fish for trout. We also wanted to know what trout fisheries are receiving the most pressure (Fig 13).



BLACK BASS

Black bass (largemouth bass, smallmouth bass, etc.) are a popular sport fish in Oklahoma. Out of all anglers who fished in Oklahoma in the last 12 months, 60% targeted these species (Fig 14).



FIGURE 14: ANGLER RESPONSE TO IF THEY TARGETED BLACK BASS IN THE LAST 12 MONTHS (N=1,367)

We also explored black bass patterns of catch. The majority of respondents had never fished in a bass tournament before (84%). We also asked the likelihood, whether in a tournament or now, that they would keep what they catch. Of all black bass anglers, <u>69% return all or nearly all that they catch to the</u> <u>water</u> followed by 17% that do not return any to the water.

Anglers were also asked what they think the lengths of keeper versus trophy black bass are, if there were no length limits in place. The average length of keepers was 13.24 inches while the average of trophy black bass was 19.67 inches (Fig 15). The average difference between the two responses from each angler was 6.6 inches.

Finally, we asked the preference of anglers overall if they like to catch one large trophy fish or lots of smaller keeper fish. The majority (66%) would rather catch lots of smaller keeper fish than one large trophy fish.



FIGURE 15: ANGLER RESPONSE TO LENGTH LIMIT OF KEEPER BLACK BASS VERSUS TROPHY BLACK BASS, AVERAGE DISPLAYED FOR EACH TYPE OF BLACK BASS (KEEPER N=633; TROPHY N=589)

BOATING

Over half of all licensed anglers in Oklahoma used a boat for some portion of their fishing in the past 12 months (Fig 16). This includes all active anglers.



FIGURE 16: RESPONSE OF ANGLERS TO IF THEY USED A BOAT FOR FISHING IN THE LAST 12 MONTHS N=1,370

Across the three different license categories there are significant differences in utilization of a boat for fishing. Non-residents are more likely to use a boat than resident non-tribal license holders and both nonresidents and non-tribal residents are more likely to use a boat then resident tribal license holders (Fig 17, p<0.001).



FIGURE 17: RESPONSE OF ANGLERS TO IF THEY USED A BOAT FOR FISHING IN THE LAST 12 MONTHS BY LICENSE CATEGORY (NON-RESIDENT N=378; RESIDENT NON-TRIBAL N=615; RESIDENT TRIBAL N=355)

Boating access is a focus for our agency. With such a large proportion of anglers in Oklahoma using a boat to fish, we need to focus on keeping access points numerous and well taken care of. As such, we asked anglers if there are enough boat access locations at their favorite fishing spots and if they are well taken care. The spread of responses is relatively even across all responses (Fig 18). This means that we should have a stronger focus on creating more access points as well as taking care of the access points that exist or are established in the future to achieve a more strongly satisfied response in the future.



FIGURE 18: ANGLER SATISFACTION WITH TWO ASPECTS OF BOATING ACCESS (GREEN N=800; ORANGE N=804)

If anglers said they used a boat to fish, we asked about their actions related to aquatic nuisance species (ANS) prevention. We listed seven actions both positive and negative and asked how often they complete the activities (Table 5). Boaters were generally taking actions to prevent the spread of ANS.

Positive Precautions Never Rarely **Sometimes** Always 8% 25% Conduct visual inspection 10% 56% Remove aquatic plants and animals 22% 10% 13% 55% Flush cooling system with tap water 45% 18% 22% 15% Rinse boat with high pressure or hot water 25% 16% 40% 19% Never Rarely **Sometimes Negative Actions** Always Move boat to another waterbody without drying 78% 14% 4% 3% 77% 4% 11% 8% Leave water in boats 56% 11% 18% 15% Release unwanted live bait into water

TABLE 5: RESPONSE TO ANS RELATED ACTIONS AND THE FREQUECY OF ACCOMPLISHING THEM FOR ANGLERS THAT USED A BOAT FOR FISHING IN THE LAST 12 MONTHS

We also asked all active anglers (whether they used a boat or not), from what sources they had heard about ANS. Anglers had most commonly heard of aquatic nuisance species through the OK fishing regulations guide (43%). Second most common was boat ramp signs (39%) followed in third by the selection of, "I have not heard of ANS before now" (33%).

AVIDITY

Anglers in Oklahoma are highly avid based on years of fishing experience. Seventy-eight percent of anglers surveyed have been fishing for ten years or more (Fig 19). Resident anglers have been fishing in Oklahoma for more years than non-resident anglers, and tribal license holders have been fishing longer than resident non-tribal license holders (Fig 20).



FIGURE 19: NUMBER OF YEARS FISHING IN OKLAHOMA OF ANGLERS ACTIVE IN THE LAST 12 MONTHS N=1,364



FIGURE 20: YEARS FISHING IN OKLAHOMA BY LICENSE CATEGORY (NON-RESIDENT N=342; RESIDENT NON-TRIBAL N=733; RESIDENT TRIBAL N=295)

Of the 79 anglers that reported this was their first year fishing in Oklahoma, the most popular response for what made them try fishing in the past 12 months was that a family or friend suggested to them to try it (47%). This suggests that mentorship is a key factor in recruiting new anglers into the activity. This response was followed by 'wanting to try new activities (17%) and just having moved to Oklahoma (22%)

FISHING ATTRACTORS

A higher percentage of overall anglers do not target fish attractors when fishing (Fig 21). If we subset the population by those that fished from a boat in the last 12 months, we get a more equivalent comparison between those that do target fish attractors and those that do not (Fig 21)





CLOSE TO HOME FISHERIES

The Oklahoma Department of Wildlife Conservation's Close to Home fishing program strives to provide quality fishing experiences within a close distance to urban areas. The goal is to remove the constraint of travel time from the reasons that people do not fish. We asked respondents both their familiarity with the program, and if familiar, if they used a Close to Home pond. Of all respondents, both resident and non-resident, familiarity was not very high, with only 14.8% having previously heard of the program (Fig 23). When analyze by only resident license holders the familiarity increases to 19% and with anglers in urban areas the familiarity increases to 35%.



This shows that the Close to Home initiative is not a nationally recognized program, but that it is connecting with a good portion of metro anglers in Oklahoma- the population that it is targeted to benefit. Figure 24 displays only those anglers surveyed that said they had heard of Close to Home ponds and asks if they used Close to Home ponds. Of metro anglers, a majority (57%) of the 35% who had heard of the ponds use them.



FIGURE 24: USE OF ODWC'S CLOSE TO HOME FISHING PROGRAM PONDS BY THOSE THAT SAID THEY ARE FAMILIAR (STATEWIDE N=193; METRO N=95)

ATTITUDES TOWARD ODWC

The Wildlife Department is in the process of prioritizing our goals and priorities for the coming years. Public input will help in aligning these priorities to achieve higher angler satisfaction. We asked about public land acquisition looking at the difference between support for purchasing land compared to leasing land (Fig 25). We only analyzed this item by resident anglers. There was no significant difference when looking at resident non-tribal license holders and resident tribal license holders . There was significantly higher support for purchasing new areas over leasing private land (p<0.001). This question was asked of all resident licensed anglers, regardless of their active participation within the last 12 months.





We also wanted to know how anglers feel about the complexity of fishing regulations in Oklahoma and the ease with which they were able to buy a fishing license. We looked at this by license type (resident non-tribal, resident tribal, and nonresident) to see if any groups felt more complexity existed than other groups (Fig 26). There was no significant difference between license groups in terms of ease of understanding Oklahoma fishing regulations (p=0.97), satisfaction with the number of Oklahoma fishing regulations (p=0.60), and ease of purchasing an Oklahoma fishing license (p=0.27). License holders lean toward being satisfied with their understanding of fishing regulations, are neutral on the number of regulations, and are satisfied with the ease of purchasing a license.



FIGURE 26: SATISFACTION IN TERMS OF-<u>TOP</u>: EASE OF UNDERSTANDING OKLAHOMA FISHING REGULATIONS, <u>MIDDLE</u>: <u>NUMBER OF OKLAHOMA FISHING</u> <u>REGULATIONS</u>, <u>BOTTOM</u>: EASE OF <u>PURCHASING AN OKLAHOMA FISHING LICENSE</u>- BY LICENSE CATEGORY OF ALL LICENSE HOLDERS REGARDLESS OF ACTIVITY IN THE LAST 12 MONTHS (NON-RESIDENT N=414; RESIDENT NON-TRIBAL N=862; RESIDENT TRIBAL N=416) The Wildlife Department is focusing on how to engage the next generation of hunters and anglers. We asked licensed anglers who should be responsible for that recruitment. Overall, people felt that it is a shared responsibility between the Wildlife Department and current hunters and anglers (Fig 27).



FIGURE 27: BELIEF IN WHO IS RESPONSIBLE FOR RECRUITING THE NEXT GENERATION OF HUNTERS AND ANGLERS IN OKLAHOMA N=1,692

We also asked who anglers believe should be included in management decisions made by the wildlife department. Anglers largely felt that opinions from those that do not hunt and fish should not be included in decision-making (Fig 28).



FIGURE 28: AGREEMENT LEVEL WITH INCLUDING THOSE WHO DO NOT HUNT OR FISH IN ODWC DECISION MAKING N=1,690

Finally, anglers were asked if the Wildlife Department provides enough opportunities for their participation in management decisions. Overall, they were neutral about this aspect of the public engagement process, but leaned towards agreeing that they have sufficient opportunities (Fig 29). Answering this question while being surveyed and asked for their opinion could have influenced responses.



FIGURE 29: AGREEMENT LEVEL WITH HAVING ADEQUATE OPPORTUNITY FOR PUBLIC PARTICIPATION IN WILDLIFE MANAGEMENT DECISIONS N=1,688

CONCLUSION

The quinquennial survey of Oklahoma anglers has provided valuable updates and trend information for resource managers since the mid 1970's. These surveys have provided an understanding of angler participation, experiences, preferences and attitudes toward various aspects of Oklahoma's fisheries. Interestingly, very little change can be seen for the majority of angling preferences and experiences since the inception of the survey. Fishing in Oklahoma remains a predominantly familyoriented activity. The majority of anglers use fishing as a means to get outside, relax and be with family and friends. However, trend data suggest anglers are spending fewer days on the water, and driving longer distances to get to their fishing destinations. A slight, but notable increase can be seen in the amount of anglers utilizing boats for their fishing. Lastly, anglers fished most often in lakes or reservoirs, and continued to prefer crappie, largemouth bass, and channel catfish over other species. Based on survey results, there are several recommendations that could be made for fisheries management across Oklahoma.

- 1. Reduce the daily bag limit of trout statewide. The majority of respondents would continue to fish for trout if the bag limit were reduced to 3 or 4 fish. This could allow the possibility of minimized stocking needs.
- 2. Continue work on creating boating access locations and taking care of boat ramps currently managed by the Wildlife Department. An increasing number of anglers utilize boats for their fishing.
- 3. Future angler surveys should continue to survey non-resident license holders. They contribute significant license revenue to Oklahoma and fish in different regions of the state.
- Future surveys could also pull resident tribal license holders as part of the resident license sample. Baseline data was beneficial for these new licenses, and few differences exist between license categories.
- 5. A top barrier for going fishing is not having someone to go with. The Wildlife Department could focus its outreach efforts on connecting anglers with other anglers to decrease this barrier.
- 6. Thirty-three percent of anglers had never heard of ANS before this survey. This illuminates the fact that anglers need further education on this threat to aquatic ecosystems in Oklahoma.
- 7. The Close to Home Fishing Program appears to be a successful program for its intended audience. Also, the number of miles traveled to fishing spots is increasing which may eventually become a barrier to fishing for metro anglers. The Close to Home program may help minimize this barrier.
- 8. ODWC should further engage anglers in the management decision-making process, and more frequent angler surveys may help to achieve this objective.

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APPENDIX A: SURVEY MAILINGS- INVITATION LETTER, SURVEY AND REMINDER POSTCARD

WILDLIFE CONSERVATION COMMISSION John D.Groendyke Rember Bill Brewster Bill Brewster VICE CHAIRMAN Leigh Gaddis SECRETARY James Barwick MEMBER MEMBER J. KEVIN STITT, GOVERNOR J.D. STRONG, DIRECTOR wildlifedepartment.com

P.O. Box 53465 Oklahoma City, OK 73152 PH. (405) 521-3851

DEPARTMENT OF WILDLIFE CONSERVATION

Dear Angler,

As a fishing license holder in Oklahoma, you have been randomly selected to give your feedback on your fishing experiences and fisheries management in the state through the Wildlife Department's angler opinion survey. We at the Oklahoma Department of Wildlife Conservation (ODWC) recognize how critical anglers are to conserving Oklahoma's unique aquatic resources. Your input will help us greatly in our mission to provide abundant angling opportunities for present and future generations of citizens and visitors to Oklahoma.

We are writing to ask for your help in completing this survey. In the next few weeks, you will receive the survey in the mail. We ask that you fill it out at your earliest convenience and mail it back to the Wildlife Department in the pre-paid envelope that will be provided. The more people that fill out the survey, the better feedback we will receive to direct the future of fisheries management in Oklahoma. As a token of appreciation, every 30th angler to complete this survey will be given an annual subscription to the Wildlife Department's magazine, *Outdoor Oklahoma*.

Your responses are voluntary and will be kept confidential. If you have any questions about this survey please contact the ODWC Human Dimensions Specialist, Betsey York, by telephone (405) 401-7532 or by email at betsey.york@odwc.ok.gov. The survey should take no more than fifteen minutes and will greatly help the Wildlife Department. We appreciate your ongoing support and look forward to hearing from you. Keep your eye on the mail over the new few weeks!

Sincerely,

NOVES NOT

Barry Bolton Chief, Fisheries Division

THIC

Ken Cunningham Asst. Chief, Fisheries Division

york

Betsey York Human Dimensions Specialist

The Oklahoma Department of Wildlife Conservation is the state agency responsible for managing fish and wildlife. The Wildlife Department receives no general tax appropriations and is supported by hunting and fishing license fees and federal excise taxes on hunting and fishing equipment.

Angler	Opinion Sur	vey			
The Oklahoma Department of Wild fishing license holders. We are inter and preferences, even if you have us improve fisheries management a	life Conservation is erested in learning e not fished recen t and conservation ir	s conducting a survey of about your fishing activities tly . Your answers will help n Oklahoma.			
You are one of a few fishing license help- even if you haven't fished rec taking the time to fill out this survey angler to return a completed survey Wildlife Department's <i>Outdoor Okla</i>	e holders we have <u>ently</u> . Please help . As a token of our / will be given a on ahoma magazine.	contacted, and we need your the Wildlife Department by appreciation, every 30 th e-year subscription to the			
If you have any questions or would contact Betsey York at (405) 521-4 this project is greatly appreciated, a Oklahoma fishing experiences!	like a copy of the r 605 or betsey.york and we look forward Sincerely, Betsey York Betsey York Human Dimensio	eport for this study, please @odwc.ok.gov. Your help in d to learning about your			
 Did you fish in Oklahoma during the previous 12 months? 					
\Box Yes \rightarrow Continue with survey on next page.					
$\Box \text{ No } \rightarrow \text{ What was the reasons} $ Check all that appendix on the second s	on you did not fish oply.	in the previous 12 months?			
Poor quality of fis	shing	Regulations too confusing			

- □ Lack of someone to go fishing with □ Other priorities
- □ Lack of a place to go fishing □ Health issues
- Other

If you did not fish in Oklahoma in the past 12 months, please continue to page 12.

For the following questions, please think about your fishing activity within the previous 12 months.

2. Please estimate the number of days (single day or any portion of a day) that you fished in the following water types in Oklahoma during the previous 12 months.

Number of Days

Public	lake:	
Private	lake:	
Creek, river or stream on <i>public</i> I	and:	
Creek, river or stream on <i>private</i> I	and:	
Farm p	ond:	
Public access below a reservoir o	dam:	

3. On average, how many miles did you travel (one-way) for a typical fishing trip in Oklahoma during the previous 12 months?

Miles

4. How many years have you fished in Oklahoma?

	This was my first year →	4a. If this was your first year, what caused you
	2-5 years	to try fishing in Oklahoma?
	6-9 years	Check all that apply.
	10+ years	Family or friend suggested
	1 C	Wanting to try new outdoor activities
		Moved to Oklahoma
		□ Other:
2		3.200 0123.000

- 5. Did you take any of the following people fishing during the previous 12 months? *Check all that apply.*
 - \Box New angler under the age of 16
 - \Box New angler over the age of 16
 - □ Someone who had not fished in a few years
 - □ I took someone fishing, but I'm not sure if it was their first time.
 - □ I did not take anyone fishing
- 6. Who do you typically fish with? *Check all that apply.*

	l fish	al	lone
<u>1</u>	1 11 31 1	a	OLIC

□ Friends

Children

□ Family

Guides

7. When fishing, do you specifically visit locations with fish attractors (brush piles, rock mounds, etc.)?



8. Which of the following fishing methods did you use during the previous 12 months? <i>Check all that apply.</i>	8a. Of the methods you used to fish, which one did you use MOST often during the previous 12 months? Check <u>only one</u> .
Rod and Reel / Flyfishing	Rod and Reel / Flyfishing
Bowfishing	Bowfishing
Juglining / Trotlining	Juglining / Trotlining
Noodling	
 Other methods (gigging, yoyo fishing, etc.) 	 Other methods (gigging, yoyo fishing, etc.)

- **9.** The Wildlife Department's "Close to Home" program offers fishing opportunities through partnerships with cities in Oklahoma. Are you familiar with this program?
 - Yes →
 No
 9a. If yes, did you fish at a "Close to Home" lake or pond during the previous 12 months?
 Yes
 Yes
 No
 Unsure
- **10.** How important is fishing to you compared to your other *outdoor recreational activities*?

Check only one.

	One of the			
Most	most	Equally	Less	Not at all
important	important	important	important	important



For the next question, please reference the map below splitting Oklahoma into five regions:

11. Please estimate the <u>number of days</u> (single day or any portion of a day) that you fished in the following regions of Oklahoma during the past 12 months:

Number of Days

Northwest OK :

Southwest OK :- _____

Oklahoma City Area : _____

Northeast OK : _____

Southeast OK : _____

Fishing Preference in Oklahoma Waterbodies —

For the next questions, consider the types of waterbodies you fished in Oklahoma during the previous 12 months. Please indicate which species you fished for in each of the below waterbodies.

12. If you fished in a <u>lake</u>, what species did you target in the past 12 months? *Check all that apply.* (If you did not fish in a lake, skip to next box.)





13. If you fished in a <u>**river/stream**</u>, what species did you target in the previous 12 months?

Check all that apply. (If you did not fish in a river/stream, skip to next box.)

Ĩ	☐ Channel catfish	🗆 Carp	
]	☐ Flathead catfish	□ Sunfish, bluegill, perch, brim, etc.	
]	☐ Blue catfish	□ Paddlefish/spoonbill	E AL
I	□ Crappie	□ Largemouth bass	s f
Į	⊐ Walleye	□ Smallmouth bass	
Ĩ	∃ Saugeye	□ Spotted/Kentucky bass	
Į	∃ Sauger	□ White/sand bass	
]]	☐ Brown trout	□ Striped bass	
]	∃ Gar	Hybrid striped bass	

14. If you fished in a **<u>pond</u>**, what species did you target in the last 12 months? *Check all that apply.* (If you did not fish in a pond, skip to next page.)

	Channel catfish	🗆 Carp
	Flathead catfish	☐ Sunfish, bluegill, perch, brim, etc.
	Blue catfish	□ Paddlefish/spoonbill
-	🛛 Crappie	□ Largemouth bass
	Walleye	□ Smallmouth bass
and the second	🗆 Saugeye	□ Spotted/Kentucky bass
	□ Sauger	□ White/sand bass
	□ Brown trout	□ Striped bass
	🗆 Gar	Hybrid striped bass

Aquatic Nuisance Species

For the next questions, please think about Aquatic Nuisance Species (ANS) in the state of Oklahoma. ANS are aquatic species (zebra mussel, white perch, bighead carp, silver carp, etc.) not native to Oklahoma, which pose significant ecological and economic threats to aquatic ecosystems.

15 . From what sources have you heard about ANS? <i>Check all that apply.</i>	15a . From what source would you prefer to receive information on ANS? <i>Check <u>only one</u>.</i>
I have not heard of ANS before now	I have not heard of ANS before now
OK Fishing Regulations Guide	OK Fishing Regulations Guide
Wildlife Department website, pamphlet, news release	 Wildlife Department website, pamphlet, news release
Outdoor Oklahoma Magazine	Outdoor Oklahoma Magazine
Boat ramp signs	Boat ramp signs
Social media	Social media
ODWC educational program	ODWC educational program
□ Wildlife Expo	Wildlife Expo
□ Other	□ Other

a. When using a boat for fishing, how often do you complete the following activities? Please read the options carefully.		Never	Rarelv		Sometimes		Always
Conduct visual inspection of boats and equipmen for aquatic plants and animals.	t		L]			
Leave water in boats, including live wells, bilge, and bait buckets.			E]			
Release unwanted live bait into the water.]			
Remove aquatic plants and animals from boats and equipment.]			
Flush motor's cooling system with tap water.			E]			
Rinse boat with high pressure and/or hot water.			C	ו			
Move boat to new waterbody next day without drying.			Ē]			
 b. Please select to what extent you agree or disagree with the following statements. 	Completely	nisagiee	Slightly Disagree	Neutral	Slightly	Agree	Completely
There are enough boat access locations for the places I like to fish.					C]	
The boat ramps at my favorite fishing spots are well taken care of		1					

		1	
17.	Iro	ut fis	shing



a. Did you fish for trout in Oklahoma during the past 12 months? □ Yes □ No (If not, skip to next page.)									
b . Where did you fish for trout? Check all that apply.									
Lower Mountain Fork River Blue River									
Robber's Cave Lake Carl Etling									
🗆 Lower Illinoi	s River	Perry CCC / La	ake Perry Park						
Lake Waton	ga	Medicine Cree	k						
Veterans Pa	irk Pond	Dolese Youth F	Pond						
□ Other									
c. How much would a reduction in trout daily bag limit to three trout per day affect your overall fishing experience? (The current bag limit for trout in Oklahoma is six fish per day.)									
Highly affect, I would stop fishing for trout.	Somewhat affect, I would fish for trout less often.	This would not affect my fishing experience. My experience fishing for trou would improve							
		·							

18. Black bass fishing



aun	ing the past i	(If not, skip to ne)	xt page.)	
o. How E	roften did you ⊐ Never	u fish bass tournam □ Occasionally	ents in Oklahoma □ Regularly	during the past 12 mo □ Exclusively
c. Hov the	w many legal- water?	-sized (14-inch mini	mum) black bass	did you release back i
	None	Less than half	More than half	All or nearly all
		П	—	
. 16.4-	. <u> </u>			
d. If ta wou wou	Irgeting black uld you consid uld keep to ea Keeper" blac	t bass, and there w der to be the length at) and trophy-sized	vere no ODWC len s of "keeper" (the i l fish? inches	gth limits in place, wha ninimum-sized fish yo
d. If ta wou wou "	Irgeting black ald you considuld keep to ea Keeper" black Trophy" black	k bass, and there w der to be the length at) and trophy-sized k bass:	/ere no ODWC len s of "keeper" (the r I fish? inches inches	gth limits in place, wha ninimum-sized fish yo
d. If ta wou wou " " "	urgeting blacl uld you consid uld keep to ea Keeper" blac Trophy" black en fishing for ohy fish?	bass, and there w der to be the length at) and trophy-sized k bass: bass: black bass, would	vere no ODWC len s of "keeper" (the r l fish? inches inches you rather catch l	gth limits in place, what minimum-sized fish you

Please share your opinions =

19. To what extent do you support or oppose the Wildlife Department doing each of the following:

	Strongly oppose	Moderately oppose	Neutral	Moderately support	Strongly support
a. Purchasing land to create new public fishing areas					
b. Leasing private land for public fishing access					

20. Please rate your satisfaction with each of the following:

	Very dissatisfied	Moderately dissatisfied	Neutral	Moderately satisfied	Very satisfied
a. Ease of understanding Oklahoma fishing regulations					
b. Number of Oklahoma fishing regulations					
c. Ease of purchasing an Oklahoma fishing license					

The Wildlife Department is in the process of outlining goals and priorities for the next five years. We would like your input as part of this process.

- **21.** Who is responsible for recruiting the next generation of hunters and anglers in Oklahoma? <u>Check only one</u>.
- Mostly the responsibility of hunters and anglers
- Mostly the responsibility of the Wildlife Department
- Equally shared responsibility between hunters and anglers and the Wildlife Department
- 22. Please indicate to the extent you agree or disagree with the following statements.

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
a. The Wildlife Department should include opinions from people who do not hunt or fish in decision-making					
b. The Wildlife Department provides adequate opportunities for public participation in fish and wildlife management decisions					

For the next two questions, please think broadly about the work that the Wildlife Department accomplishes in Oklahoma. Please share your thoughts in the following boxes.

23. What is something that the Wildlife Department does well?

24. What is something that the Wildlife Department could do better?



25. How would you describe yourself? (Check all that apply)

Thank you for your time in completing this survey. Upon returning this survey you will be entered in a drawing to receive a one-year subscription to *Outdoor Oklahoma* magazine. If you would like to be notified via email if you were selected, please indicate your preferred email address:

@_

Dear Fellow Angler,

In the past few weeks you received a mailed survey from the Oklahoma Dept. of Wildlife Conservation. You are part of a small pool of anglers with a chance to shape how we manage Oklahoma's fisheries. Every 30th angler to return a completed survey will receive an annual subscription to the Wildlife Department's magazine, *Outdoor Oklahoma*! The survey should take no more than 15 mins and is also available online.

You may submit your responses in one of three ways:

- 1. Return the previously mailed survey in the pre-paid envelope provided.
- 2. Enter the following address in your web browser: https://tinyurl.com/odwcfish
- 3. Scan this QR Code with your smartphone QR reader to find the survey online:

Online, you will be asked for your survey ID number, this is found on the front of this card above your name and address.

We look forward to receiving your completed survey.

BARE TOTAL Barry Bolton Chief, Fisheries Division

TTC Ken Cunningham Asst. Chief, Fisheries Division

John Doe 123 Main Street Your City, OK 73111-0000



Questions? Contact Betsey York 405-401-7532, betsey.york@odwc.ok.gov

APPENDIX B: LICENSE CODES OF ANGLER POPULATION AND TABLE OF POPULATION BREAKDOWN

CNC	Cherokee Nation Compact	СТС	Choctaw Tribal Compact
CHF	Combination Hunting Fishing Annual	LNC	Lifetime Non-resident Combination
LTF	Lake Texoma Fishing	LNF	Lifetime Non-resident Fishing
R2F	Resident 2-Day Fishing	N1F	Non-resident 1-Day Fishing
RC5	Resident 5 Year Combination	N6F	Non-resident 6-Day Fishing
RCF	Resident Combination Fiscal Year	NAF	Non-resident Annual Fishing
RF	Resident Fishing Annual	LRF	Lifetime Resident Fishing
RF5	Resident Fishing 5-Year	LC6	Lifetime Combination Over 60
YC	Youth Combination	LF6	Lifetime Fishing Over 60
YCF	Youth Combination Fiscal Year	D60	Disability over 60
YF	Youth Fishing	SRC	Senior Resident Combination
LRC	Lifetime Resident Combination	SRF	Senior Resident Fishing

			Population		Sampled		Completed	
		License	Number	Percent	Number	Percent	Number	Percent
		<u>Type</u>						
Resident	Annual/	CHF	11980	2%	171	4%	41	5%
Non-Tribal	Five Year	LTF	22857	4%	316	8%	59	7%
		R2F	4135	1%	48	1%	7	1%
		RC5	10707	2%	135	3%	40	5%
		RCF	1966	0%	23	1%	4	0%
		RF	124397	22%	1825	46%	320	37%
		RF5	22122	4%	269	7%	73	8%
		YC	1460	0%	18	0%	3	0%
		YCF	307	0%	8	0%	0	0%
		YF	6049	1%	93	2%	12	1%
	Lifetime							
		LRC	114051	20%	580	15%	153	18%
		LRF	39709	7%	220	6%	73	8%
		LC6	1904	0%	2	0%	0	0%
		LF6	5739	1%	9	0%	5	1%
	Senior							
		D60	8383	2%	93	2%	23	3%
		SRC	114310	20%	128	3%	35	4%
		SRF	68165	12%	61	2%	20	2%
	<u>TOTAL</u>		558241		3999		868	51%
Resident	Tribal							
		CNC	107649	84%	1000	50%	190	45%
		СТС	20757	16%	999	50%	233	55%
	<u>TOTAL</u>		128406		1999		423	25%
Non-resi	dent							
		LNC	293	0%	39	2%	22	5%
		LNF	3401	5%	458	23%	157	38%
		N1F	25895	37%	585	29%	57	14%
		N6F	17077	24%	360	18%	59	14%
		NAF	24156	34%	550	28%	120	29%
	TOTAL		70822		1992		415	24%
			757469		7990		1706	21%