Chowan River Angler Creek Survey, 2024

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Abstract. A stratified, non-uniform probability access-point creel survey was conducted along the Chowan River from January 1 to December 31, 2024. Creel clerks completed 392 sessions, resulting in 590 total interviews. Overall, an estimated 52,928 (SE = 3,086) angler hours were expended by 8,230 anglers. Anglers reported catching an estimated 147,203 (SE = 21,247) fish and harvesting 40,063 (SE = 10,544). Largemouth Bass *Micropterus salmoides* was the most frequently targeted species, while White Perch *Morone americana* accounted for the highest proportion of catch and harvest. On average, vehicle fuel represented the greatest expense per trip ($22.00; SE = $2.80), followed by boat fuel ($19.00; SE = $1.24), with total direct fishing-related expenditures estimated at USD $239,653 (SE = $33,535). The majority of all anglers used artificial lures (71%; n = 310), and 68% (n = 220) identified as catch-and-release anglers. Among crappie anglers, 66% (n = 172) considered the current minimum size limit “just right,” and nearly half (n = 128) voluntarily avoided harvest of fish under 254 mm (10 inches). Overall satisfaction with inland fishing opportunities was high (83%; n = 483), and nearly all respondents (95%; n = 558) preferred in-person interviews.

The Chowan River is a blackwater river that flows approximately 80 km (50 miles) from its origin at the confluence of the Blackwater and Nottoway rivers near the Virginia–North Carolina border into the Albemarle Sound near Edenton, NC (NCDEQ 2021). The river drains a basin of nearly 12,432 square kilometers across Virginia and North Carolina, with major tributaries including Potecasi and Ahoskie creeks and the Wiccacon and Meherrin rivers (NCDEQ 2021). The Chowan River widens to nearly two miles at its mouth, providing diverse aquatic habitats that support both resident and migratory fish species.

Recent surveys of the Chowan River have primarily focused on biological characteristics of the fishery (Smith 2024; Smith & Kerr 2024). Biological sampling has documented a diverse assemblage of recreationally important species, including Largemouth Bass *Micropterus salmoides*, White Perch *Morone americana*, Black Crappie *Pomoxis nigromaculatus*, and expanding populations of invasive Blue Catfish *Ictalurus furcatus*. These species contribute to both local subsistence harvest and regional recreational angling, with seasonal migrations of anadromous fishes such as Striped Bass *Morone saxatilis* and American Shad *Alosa sapidissima* further enhancing the system's importance.

Angler creel surveys provide critical estimates of effort, catch, and harvest, complementing biological monitoring by capturing the human dimensions of the fishery. The last comprehensive creel survey of the Chowan River was conducted in 2001–2002 (Dockendorf et al. 2004), documenting angler activity, harvest, and expenditures. Since then, shifts in angler participation, technology, evolving harvest regulations, and the emergence of new ecological dynamics have underscored the need for an updated assessment.

The purpose of the 2024 creel survey was to document angler activity and preferences on the Chowan River by (1) characterizing angler demographics, catch, effort, and harvest, (2) estimating the economic impact of recreational fishing, and (3) assessing angler opinions about current fisheries management issues. Results from this survey will be used to inform management strategies for the Chowan River, ensuring that future decisions remain responsive to ecological realities while reflecting the values and behaviors of the angling community.

Methods

Sampling. A non-uniform probability access-point survey design (Pollock et al. 1994; Jones & Pollock 2012) was used from January 1 through December 31, 2024. Twenty-nine potential access sites, including sites used during the previous creel survey, were assessed for inclusion. Access sites no longer in existence or not accessible without landowner permission were excluded. Ten access sites were selected and stratified into two zones via river morphometry: Upper (n = 6) and Lower (n = 4) with Arrowhead Beach being the cut off for the Lower Zone (Table 1; Figure 1). The survey was stratified by zone (Upper/Lower), a primary sampling unit (weekday/weekend), and a secondary sampling unit (morning/afternoon; demarcation occurred at 1330 hours). Two random weekdays (Monday–Thursday) and two random weekend days (Friday–Sunday) were sampled each week for a goal of approximately 16 sampling days each month. Fridays were considered weekend days to allow flexibility in weekend scheduling. Holidays designated by the North Carolina Office of State Human Resources were considered weekend days but were not sampled. During each assigned sampling day, a creel clerk conducted a 3-hour creel session at one randomly selected access site beginning 1–3 hours

after sunrise. Following the completion of the 3-hour morning session, a 3-hour afternoon session was conducted at another randomly selected access site within the alternate zone that was not sampled in the morning creel session. The fishing day was considered the period from sunrise to sunset with sunrise and sunset times were based on data for Harrellsville, NC. Given that each zone received one creel session each sampling day, the time-of-day probability was 0.25 for both morning and afternoon creel sessions. Initial access site selection probabilities were based on input from NCWRC fisheries biologists and wildlife enforcement officers and a reconnaissance conducted November–December 2023. Site probabilities were greater for sites identified as receiving greater angling usage relative to low probability sites. A low-probability wheel was included for selected sites in the upper zone that were considered very low probability. Boat trailer and vehicle counts from trail cameras at NCWRC owned ramps and from prior month sessions were reviewed to assess relative angling pressure and, if needed, access site probabilities were modified (Table 1).

Interviews. During each creel session, the creel clerk recorded session start and end times on a standardized creel session cover sheet (Appendix A). Each angler party was interviewed using a standardized survey instrument (Appendix B) when they completed their trip during a creel session. The assigned creel clerk for the survey was instructed to interview boat, bank, and pier-based angling parties. A fishing trip was considered complete when anglers were observed ending their fishing trip and the party provided the time they began their trip. Bank and pier angling parties still fishing at the end of the creel session were interviewed using the same survey instrument but were considered incomplete trips. All non-angling parties were excluded from fishing-trip specific questions but were asked questions regarding Black Crappie regulations. The survey instrument collected information on angler effort, target species, catch, harvest, opinions regarding management of Black Crappie, angler demographics, satisfaction, and expenditures. Angling parties that declined to be interviewed or drove off without being intercepted were recorded as refusals. The creel clerk identified and counted harvested fish and recorded lengths of up to five fish per species if permitted by the angler but did not measure weight. Following creel session completion, all session and survey instrument data were digitized and archived in QualtricsXM database management software (Qualtrics, Seattle, Washington).

Data analysis. All interviews were used to summarize opinion data but completed trips that lasted less than 15 minutes and non-fishing trips were censored from effort, catch, and harvest estimates. Catch and harvest analyses focused on four focal species commonly targeted or encountered in the Chowan River fishery: Largemouth Bass, White Perch, Black Crappie, and Blue Catfish. Catch was estimated for all four species, whereas harvest estimates were generated only for White Perch, Black Crappie, and Blue Catfish due to the predominance of catch-and-release behavior among Largemouth Bass anglers. These species were selected based on their recreational importance, management relevance, and, in the case of Blue Catfish, their ecological significance within the system. Angling effort for incomplete trips was incorporated by assigning to those trips the median of the angling hours observed from the seven incomplete trips (6.1 hours). Catch and harvest of incomplete trips was incorporated by assuming the catch and harvest rates for each species observed at the time of the interview remained constant for the entire 6.1 angler hour trip. Estimates of angler effort (anglers; angler-hours), catch (number of fish), and harvest (number of fish) for each sample day were

calculated by standardizing the data to one quarter fishing day before expanding the interview data by the sample unit probability (product of the access site probability and the time-of-day probability). Daily estimates were averaged by month and zone, with weekday and weekend days combined because sample sizes within each stratum were insufficient to support separate day-type estimates. Averages were expanded to the total number of days of each primary sampling unit in each month. Approximate standard errors (SE) of the expanded estimates (E) within strata were computed as:

$$\widehat{SE}(\hat{x}) = \sqrt{N^2\left(\frac{S^2}{n}\right)}$$

where S^2 is the variance of the effort observations, *n* is the number of days sampled, and N is the number of days of that type available for sampling.

Economic impacts were investigated using direct fishing-related expenditures. Total direct angling expenditure was calculated as the product of the mean total expenditures per angling hour for completed trips and the estimate of angling hours. Individual responses were censored for nonsensical responses, and all data were included in the estimates. Angler-hour expenditures included the five primary expenditure categories consistently reported by anglers: food, ice, bait, boat fuel, and vehicle fuel. Lodging expenditures were also collected; however, because only a small number of anglers reported lodging costs, this category was not included in the expanded angler-hour expenditure estimates and is presented descriptively only.

Survey limitations. All angler interviews were conducted during daylight hours and estimates were standardized assuming a variable fishing day duration equal to the time elapsed between sunrise and sunset (fishing day length ranged 9.5–14.5 hours). Therefore, overall estimates in this survey are biased due to the exclusion of any night angling. Additionally, the sum of the access site probabilities was 1.00; therefore, angling activity that occurred outside of the sampling frame of the selected access sites would not be represented in this survey. Several known access sites were not sampled due to construction, maintenance or intermittent accessibility issues, and there are likely unknown access sites on privately-owned land. Anglers boating into the Chowan River from another river system were not sampled in the survey. Some questions, such as those dealing with harvest, were not applicable to every angler.

Additionally, although the survey instrument included questions regarding fishing tournaments and the sale of nongame fish, both components produced insufficient data for meaningful analysis. As a result, tournament activity and nongame-fish sales could not be reliably summarized and are not presented in this report.

Results

Sampling and Fishery Metrics. Creel clerks conducted 392 creel sessions during the study period, resulting in 590 completed interviews and 439 fishing trips across the survey period. Seven interviews remained incomplete and 58 refusals to participate or drive-offs were recorded (Table 2). Pembroke Creek was eliminated from the survey after May by request of new landowners. Estimated total angling effort reached 110,543 hours (SE = 11,605); effort was generally higher in the upper zone and was highest in March–May (Figure 2). Anglers reported

catching an estimated 220,373 fish (SE = 43,176) with the majority of fish caught being White Perch during the spring and in the upper zone (Table 3 and Figure 3). Largemouth Bass was the dominant species caught by anglers in the lower zone with 33,745 fish (SE = 6,939) total and the peak catch during May (Figure 4). Total harvest of all fish was estimated at 71,006 fish (SE = 24,636; Table 4) with the majority of harvest contribution being White Perch in the upper zone (Figure 5). White Perch represented the most frequently caught species overall (42%; 94,430; Table 5) and accounted for the highest proportion of the estimated overall harvest (77%; 55,207).

Black Crappie catch and harvest was highest in the upper zone and peaked during late summer and fall (Aug–Oct). No harvest was recorded for Black Crappie during the summer months in either zone. Blue Catfish contributed a small portion of the observed fishery, with an estimated catch of 11,942 (16%) fish (SE = 2,652) and an estimated harvest of 4,897 (6%) fish (SE = 1,364), the lowest value among the four focal species except for Largemouth Bass. Peak catch and harvest for Blue Catfish occurred during the spring months (March–May) in the upper zone. Harvest in the lower zone during the spring months for this species was 0 and peaked during summer months (Jun–Aug; Figure 6). Anglers reported other fish species caught although not in sufficient numbers to warrant additional analysis (Table 6).

Economic Impact. Of the 439 completed fishing-trip interviews, angler compliance in reporting at least one type of expenditure was approximately 85% (n = 375). All trips were classified as private, as no guided trips were encountered during the survey period. Only 29 anglers reported paying for lodging, and this sample size was too small for reliable expansion; therefore, lodging was excluded from the angler-hour expenditure estimates. The raw lodging total ($6,418) is reported for context, as some anglers did incur these costs. Vehicle fuel represented the greatest average expense per trip at $27.50 (SE = $2.80), followed by boat fuel at $19.70 (SE = $1.24; Figure 7). Total estimated direct expenditures associated with fishing on the Chowan River equaled $286,867.05 (SE = $14,913.35). Because only the five consistently reported expenditure categories were expanded, these values represent conservative estimates of total angler spending.

Angler Characteristics. Most anglers interviewed reported using a boat (93%; n = 407) and traditional rod-and-reel gear (93%; n = 413) during their fishing trip (Figures 8 and 9). Most anglers (71%; n = 310) used artificial lures, while 28% (n = 121) relied on live bait (Figure 10). Additionally, 54% (235) of anglers targeted Largemouth Bass (Figure 11). Of those releasing fish, 95.7% (n = 232) identified as “catch-and-release only” anglers (Figure 12). Among anglers who harvested fish, 70% (n = 61) preferred to clean and consume their catch themselves (Figure 13). Most anglers interviewed (49%; n = 332) resided within Chowan River local counties (Bertie, Chowan, Gates, and Hertford counties), while 5% (n = 32) were non-residents from outside the state (Figure 14). Older males comprised 49% (n = 325) of interview participants, and males overall represented 90% (n = 298) of all anglers interviewed (Figure 15).

Angler Opinions. Among anglers that targeted Black Crappie, 66% (n = 172) considered the current minimum size limit (203 mm; 8 in) appropriate, while 49% (n = 128) reported voluntarily avoiding harvest of fish smaller than 254 mm (10 in; Figures 16 and 17). The majority of crappie anglers (78%; 204) felt that the existing daily creel limit of 20 fish per day is appropriate (Figure 18). In terms of targeting frequency, 78% (n = 204) reported targeting crappie on “some trips,” and 39% (n = 171) of all anglers indicated that they “never” target the species (Figure 19).

Nearly all anglers (95%; n = 558) preferred in-person interviews, while fewer than 1% (n = 6) favored an online interview format (Figure 20). Overall, satisfaction with inland fishing opportunities was high, with 83% (n = 483) of anglers reporting “yes” to satisfaction with inland fisheries (Figure 21).

Discussion

The 2024 Chowan River creel survey provides an updated assessment and valuable insight into the current recreational fishery, angler demographics, and the economic contributions of angling to the region more than two decades after the 2001–2002 survey (Dockendorf et al. 2004). Interview compliance was high (91%), but the total number of recorded interviews (590 trip interviews) was notably less than the 2001–2002 survey (1,194 trip interviews). Total direct expenditures for fishing in 2024 were less than the 2001–2002 survey, which reported an estimated $885,334 (unadjusted for inflation) spent on bait, gas, food, lodging and other expenses combined when angling on the Chowan River during the previous creel survey.

Angler effort demonstrated pronounced temporal structure, with effort peaking during spring, consistent with patterns commonly documented in warmwater river systems (Quinn 1993). The upper zone accounted for a large share of total observed fishing pressure, mirroring its greater number of access points and tributaries and aligning with historical expectations from both local fishery biologists and observations from the 2001–2002 survey. Seasonal patterns indicate that overall effort peaked during the spring. This springtime increase in effort is consistent with the seasonal migrations of anadromous species such as White Perch which ascend the Chowan River during this period, drawing substantial recreational fishing activity (Hewitt 2003).

Total catch and harvest estimates were both notably lower than what was recorded in 2001–2002. The catch estimates in this survey are likely reflecting a decline in fishing since the previous survey. This interpretation is consistent with national trends, as recent studies have documented decreases in fishing participation and license sales across many states including North Carolina (USFWS 2022). Moreover, regulation changes over the past two decades may have facilitated a shift in fishing culture and behavior among anglers, a dynamic noted in other recreational fisheries (Beard et al. 2003; Johnston et al. 2010). A common anecdote recorded during this survey, when anglers were asked “satisfied with inland fishing?”, was often met with the response “yes”, but followed by a desire for closed fisheries such as Striped Bass and river herring to be open again. Additionally, it is possible that anglers who are extremely dissatisfied have stopped fishing and were not represented in the survey.

Catch and harvest estimates demonstrated meaningful variation among focal species. For example, the majority of anglers that targeted Largemouth Bass identified as “catch-and-release only,” resulting in relatively low harvest despite the species being both the most frequently caught and the predominant target of directed effort. In contrast, species such as White Perch exhibited higher proportions of harvest relative to catch, reflecting differences in angler behavior, cultural preferences, and regulatory frameworks. White Perch accounted for the highest recorded catch and harvest during spring in the upper zone of the survey, which is consistent with their migration patterns and accessibility to a broad range of angler types (Hewitt 2003; Kerr & Secor 2012).

Blue Catfish are highlighted here not only for their harvest representation but also because of their broader ecological significance as an invasive species in the Albemarle drainage (Miller & Morley 2024). While creel surveys primarily document public use and harvest activity, opportunities to assess this population outside of fishery independent surveys are taken when feasible. Periodic attention to Blue Catfish is warranted to evaluate changing trends, assess impacts on native fish assemblages, and inform future management considerations. Blue Catfish had the lowest harvest estimates of the three focal species (White Perch, Black Crappie, Blue Catfish). The notable low harvest could be due to the region-wide fish consumption advisory east of I-95 (NCDHHS 2022) as well as an increase in catch-and-release behavior among catfish angler groups (Hutt et al. 2013). This species was present in the early 2000's survey but with no specific harvest numbers reported. Blue Catfish representation in 2024 likely reflects continued population expansion within the Chowan system experiencing year-round harvest. Despite low recreational harvest estimates, commercial landings highlight the substantial presence of Blue Catfish in the system. In 2023, catfishes were the top commercial group harvested from the Chowan River at 994,295 pounds, far exceeding White Perch landings (40,185 pounds; NCDMF 2024). Moreover, in a recent study on the Roanoke River, Blue Catfish were characterized as relatively young cohorts and more abundant than other catfish species (Kerr & Smith 2024). A comparable pattern may be occurring in the Chowan River, where Blue Catfish currently represent the predominant catfish species observed. Currently, fisheries biologists are managing the Blue Catfish population with no implemented catch and harvest restrictions.

Black Crappie contributed notably to both catch and harvest during the fall–spring period especially in the upper zone, reflecting increased angler targeting during these seasonal peaks (Allen & Miranda 1998). Black Crappie population data collected during the 2025 Chowan River trap net survey provides the biological context that was previously unavailable during the creel analysis. The assessment revealed a balanced size and age structure, with fish ranging from ages 1 to 10 and a strong age-1 cohort representing the most abundant group (Kerr & Smith 2026). This pattern contrasts with the Roanoke River complex, where younger age classes were underrepresented, and supports the interpretation that recruitment in the Chowan River has been generally stable over the past several years (Kerr & Smith 2025). The bimodal length distribution observed in the trap net sample further indicates that at least two strong cohorts are contributing substantially to the fishery, aligning with angler reports of consistent catch opportunities during fall and spring periods. The average total length of harvested Black Crappie measured in this survey exceeded 10 inches, and no measured fish were recorded below the current minimum length limit. This pattern is consistent with the trap-net length distribution, which also showed strong representation of larger, older cohorts, indicating that harvested fish fall within the dominant size classes observed in the population.

Growth and mortality estimates also reinforce the conclusion that harvest is not a primary driver of population structure. The biological survey reported Black Crappie populations in the Chowan River exhibited moderate growth, low mortality, and expanded age distribution (Kerr & Smith 2025). These indicators are consistent with a population experiencing limited fishing pressure, a finding that mirrors the creel survey results showing relatively low harvest and strong voluntary selectivity among anglers. Most crappie anglers reported that the current 8-inch minimum length limit is "just right," and nearly half stated they do not retain fish under 10

inches, effectively imposing a more conservative harvest threshold than required. The persistence of older individuals in the biological sample supports this behavioral pattern and suggests that current regulations are allowing fish to survive to older ages.

Taken together, the creel and biological datasets present a coherent picture. Angler behavior, low mortality, and stable recruitment collectively indicate that the existing 8-inch minimum length limit and 20 fish daily creel limit remain appropriate for the Chowan River. While adjustments to creel limits may be a more flexible management lever in systems where harvest pressure is high, the Chowan River does not exhibit signs of harvest driven constraint. Instead, both angler selectivity and population dynamics point toward a fishery that is functioning within sustainable bounds. Integrating stakeholder perspectives with empirical biological data strengthens confidence in maintaining current regulations and highlights the value of continued monitoring to detect future shifts in recruitment or angler behavior (Beard et al. 2003; Johnston et al. 2010).

Angler demographics highlight the dual character of the Chowan River fishery as both a locally valued resource and an increasingly visible regional destination. Most anglers interviewed (49%) resided within counties adjacent to the river, underscoring the importance of the fishery to local communities. At the same time, 46% of use originated from outside local counties, and 5% of respondents were non-residents from outside North Carolina, reflecting steady regional and national interest despite the lack of fishing trips compared to the 2004 survey. This trend is reinforced by the river's recent emergence on the competitive bass fishing circuit, with the Chowan hosting its first Major League Fishing tournament in 2024 and the Albemarle Sound and its tributaries hosting a Bassmaster's Elite series event in 2025. Such tournaments elevate the profile of the system, attract non-local anglers and stimulate localized tournament efforts that contribute to economic activity while also increasing fishing pressure. The Chowan River had 60 documented local bass tournaments occurring during the survey period at NCWRC boating access areas alone, underscoring the system's high level of organized angling activity and the strong engagement of existing user groups. This level of participation highlights both the vitality of the current angling community and the opportunity to broaden involvement by recruiting younger and more diverse anglers to ensure long-term sustainability of the fishery.

Demographically, older males comprised nearly half of participants, and males overall represented 90% of anglers interviewed, consistent with broader patterns in inland recreational fisheries (The Outdoor Foundation & Recreational Boating and Fishing Foundation, 2025). Such demographic skew has been documented in other inland fisheries and is associated with long-term declines in overall participation if recruitment of new anglers does not keep pace. These patterns highlight the need for targeted outreach and structured recruitment efforts to broaden engagement and sustain future use of the fishery.

Management Recommendations

1. Retain the current minimum size limit for Black Crappie (203 mm; 8 in) while continuing to monitor recruitment trends in the Chowan River through trap net surveys.
2. Maintain current regulations for White Perch but emphasize seasonal education campaigns to ensure sustainable harvest during peak migration periods.

3. Collaborate with local Largemouth Bass and Black Crappie tournament anglers to collect supplemental data on catch, release, and angler demographics.
4. Develop recruitment programs targeting younger and more diverse angler groups and promote family-friendly fishing events to counter the skewed demographic.
5. Continue integrating creel survey results with independent biological monitoring. Use angler opinion data to guide adaptive management strategies that balance ecological realities with stakeholder expectations.

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TABLE 1. Monthly access site probabilities for each zone (upper and lower). Low probability sites (Gatesville PFA, Shoups PFA, and Murfreesboro PFA) in upper zone were grouped and subject to a secondary random draw, or "wheel", for access area worked.

Access Area by Zone	Access Probability											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Upper Zone												
Harrellsville BAA	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Tunis BAA	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Shoups BAA/PFA	0.20	0.20	0.20	0.20	0.20	0.35	0.35	0.35	0.30	0.30	0.30	0.30
Gatlington BAA	0.15	0.15	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Murfreesboro BAA	0.20	0.20	0.25	0.25	0.25	0.10	0.10	0.10	0.15	0.15	0.15	0.15
Gatesville BAA	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Low Probability	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Lower Zone												
Cannon Ferry BAA	0.40	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Edenhouse BAA/PFA	0.40	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Arrowhead BAA/PFA	0.05	0.05	0.05	0.05	0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Pembroke Creek BAA/PFA	0.15	0.15	0.15	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 2. Interview characteristics by interview type.

Trip status	Trips	Anglers	Mean party size	Mean trip duration (h)	Mean angler-hours (h)	Median angler-hours (h)
Completed	430	779	1.8	5.0	8.3	7.3
Incomplete	7	9	1.2	4.4	6.2	6.1
Refused	58	-	-	-	-	-

TABLE 3. Estimated monthly total of all species combined catch by zone (number of fish).

Month	Lower Zone Catch (SE)	Upper Zone Catch (SE)
Jan	362 (273)	1,489(1,103)
Feb	2,058 (1,240)	945 (436)
Mar	7,216 (3,619)	6,098 (2,402)
Apr	1,625 (954)	81,585 (39,734)
May	16,285(4,724)	26,435 (9,491)
Jun	9,833 (3,501)	9,941 (4,724)
Jul	5,275 (4,353)	7,272 (2,882)
Aug	6,704 (2,355)	15,303 (8,545)
Sep	4,810(2,851)	5,876 (2,025)
Oct	1,097 (2,052)	4,579 (2,052)
Nov	1,044 (510)	3,208 (1,810)
Dec	434 (434)	887 (642)
Total	56,749 (9,138)	163,623 (42,197)

TABLE 4. Estimated monthly harvest of all species combined by zone (number of fish).

Month	Lower Zone Harvest (SE)	Upper Zone Harvest (SE)
Jan	0 (0)	528 (385)
Feb	131 (131)	247 (247)
Mar	296 (278)	3,158 (1,513)
Apr	0 (0)	47,350 (24,133)
May	1,097 (831)	5,758 (3,031)
Jun	2,041 (815)	247 (247)
Jul	2,693 (451)	451 (451)
Aug	1,229 (652)	2,469 (1,588)
Sep	0 (0)	1,293 (1,293)
Oct	238 (208)	315 (240)
Nov	251 (129)	605 (439)
Dec	0 (0)	601 (601)
Total	7,979 (2,778)	63,027 (24,479)

TABLE 5. Estimated catch and harvest for focal species (number of fish).

Species	Catch	SE	Harvest	SE	Proportion harvested
Largemouth Bass	69,830	11,040	-	-	-
White Perch	94,430	38,655	55,207	23,993	58%
Black Crappie	17,625	8,374	5,495	2,028	31%
Blue Catfish	11,942	2,652	4,897	1,364	41%

TABLE 6. Fish reported by common name or local name during the Chowan River Creel Survey.

Scientific name	Common Name	Local Names
Amia calva	Bowfin	mud fish
Ictalurus punctatus	Channel Catfish	catfish; blue catfish
Ameiurus natalis	Yellow Bullhead	mud cat
Esox niger	Chain Pickerel	pike
Micropogonias undulatus	Atlantic Croaker	croaker
Paralichthys lethostigma	Southern Flounder	flounder
Lepisosteus osseus	Longnose Gar	gar; alligator gar
Lepomis auritus	Redbreast Sunfish	brim
Morone saxatilis	Striped Bass	rock(fish)
Lepomis gulosus	Warmouth	brim
Lepomis microlophus	Redear Sunfish	brim; shell cracker
Lepomis macrochirus	Bluegill	brim
Perca flavescens	Yellow Perch	raccoon perch

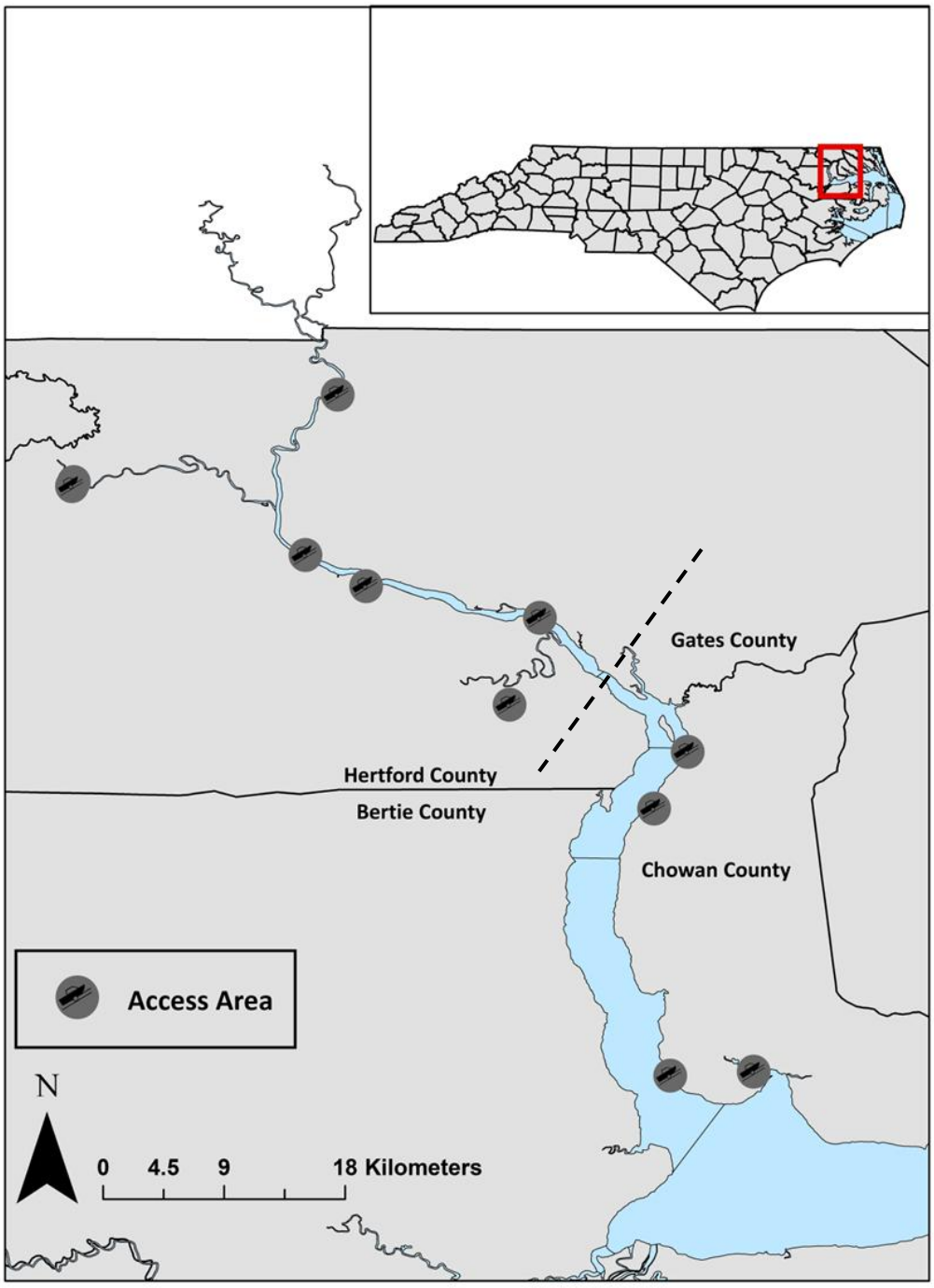

FIGURE 1. Chowan River creel survey access sites. Dashed line differentiates between the Upper and Lower zones.

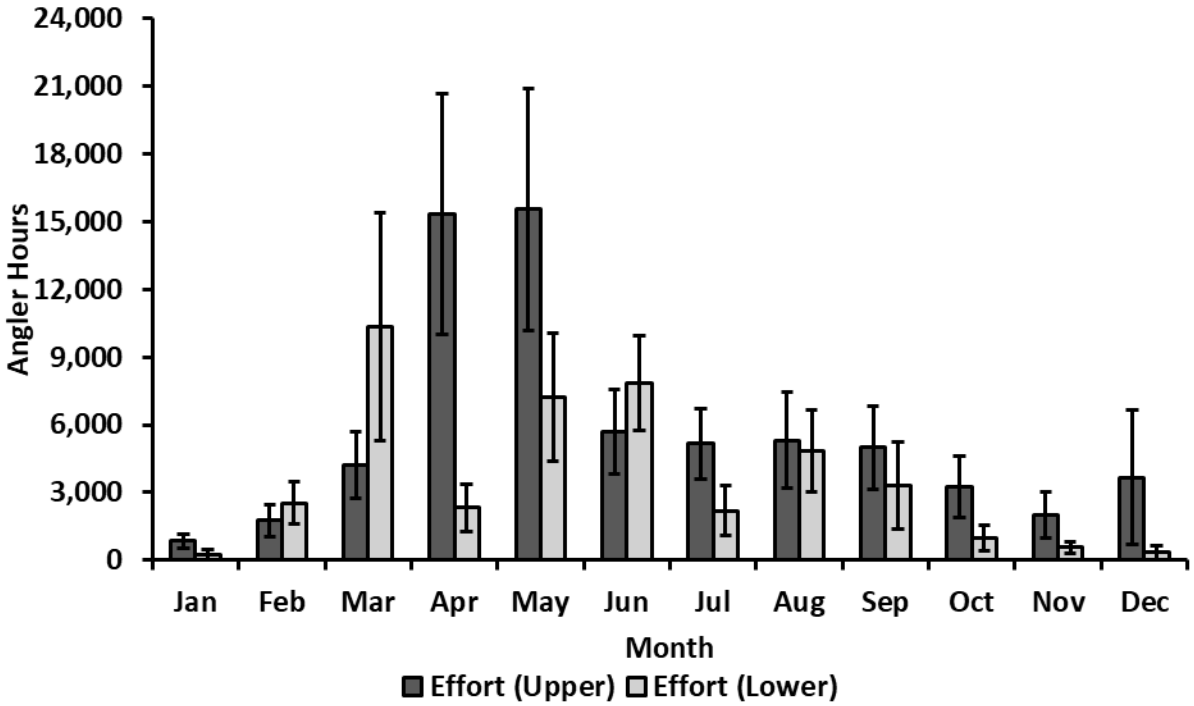

FIGURE 2. Total effort (angler-hours) expended by month stratified by zone. Error bars denote standard error.

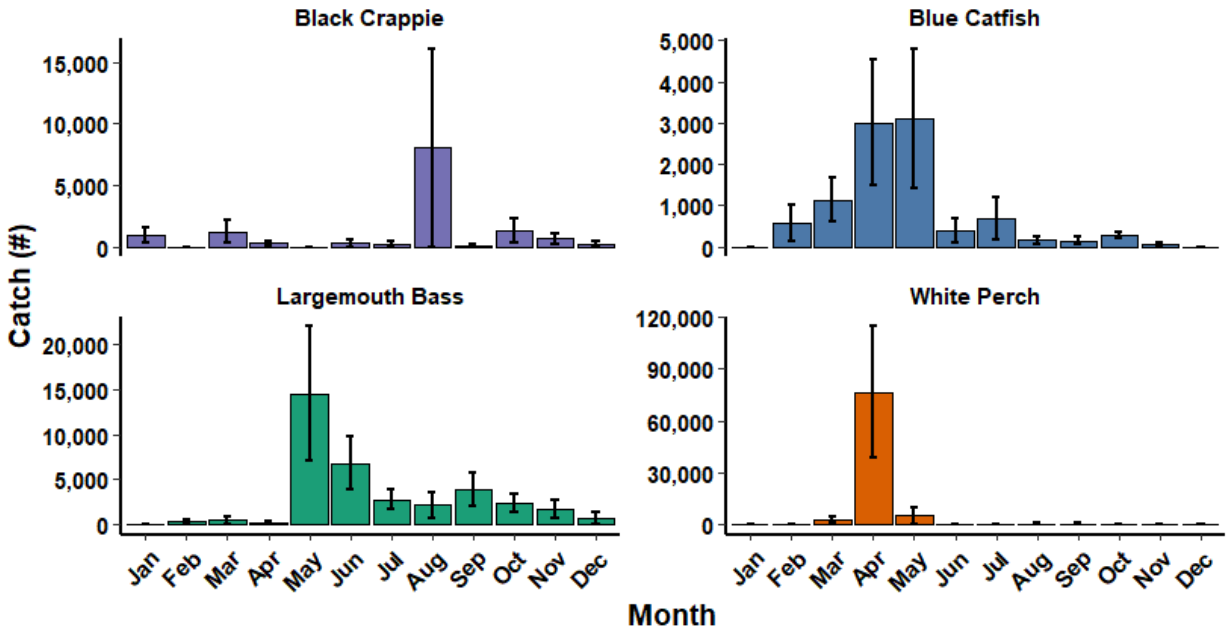

FIGURE 3. Monthly expanded catch for the four focal species in the upper zone. Bars denote standard error.

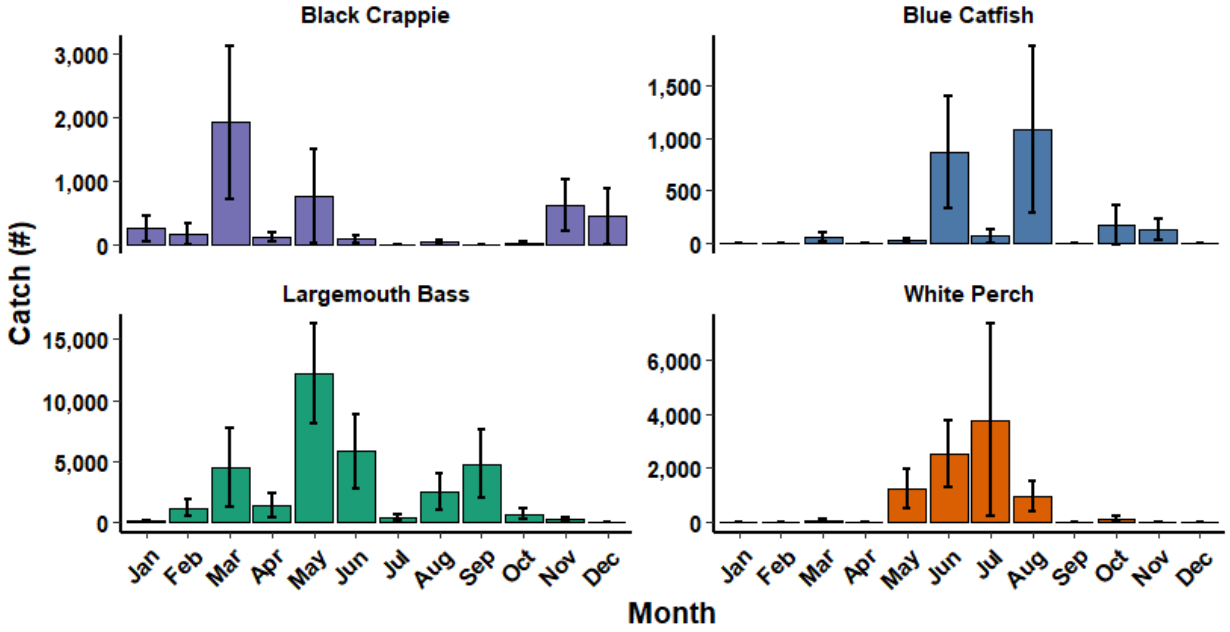

FIGURE 4. Monthly expanded catch for the four focal species in the lower zone. Bars denote standard error.

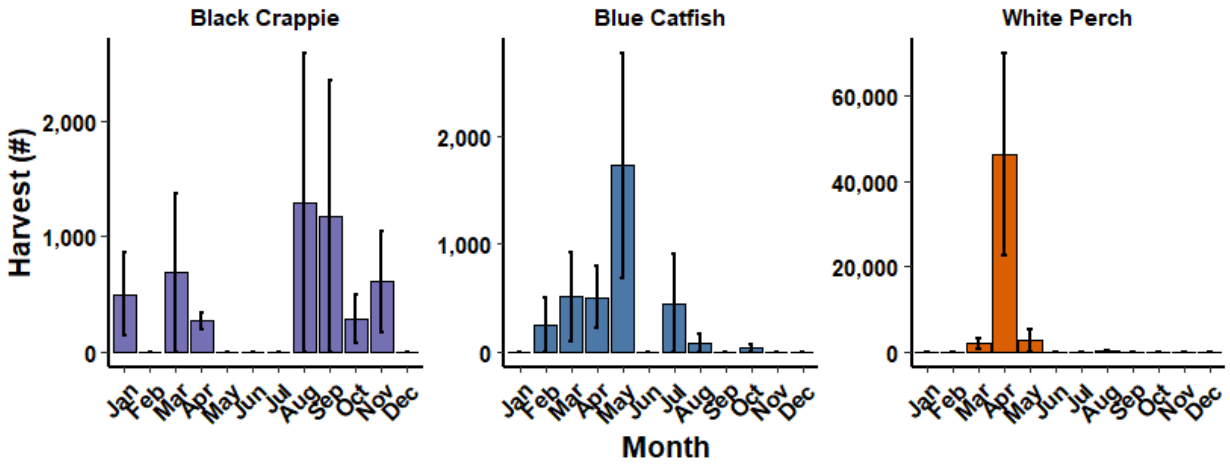

FIGURE 5. Monthly expanded harvest for three focal species in the upper zone. Bars denote standard error.

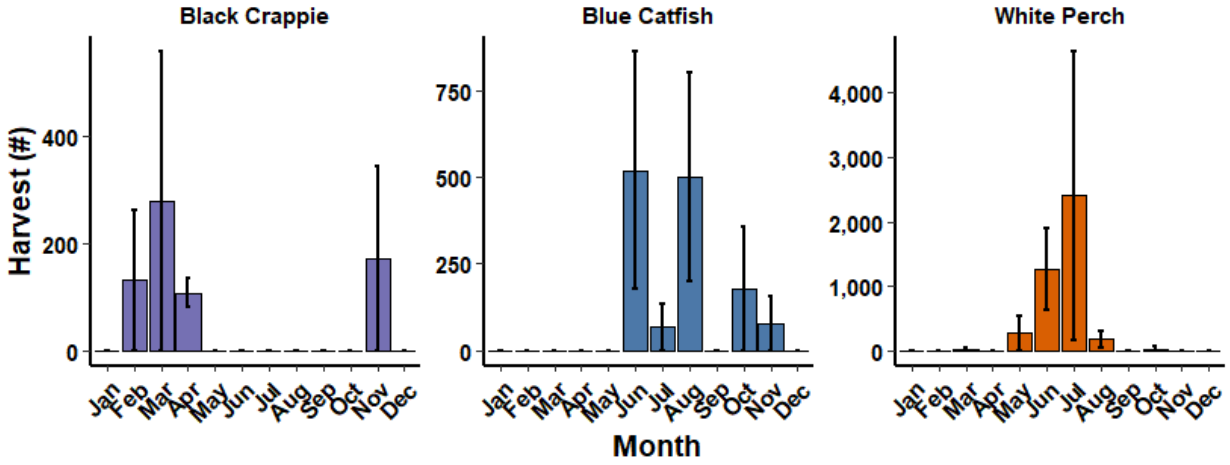

FIGURE 6. Monthly expanded harvest for three focal species in the lower zone. Bars denote standard error.

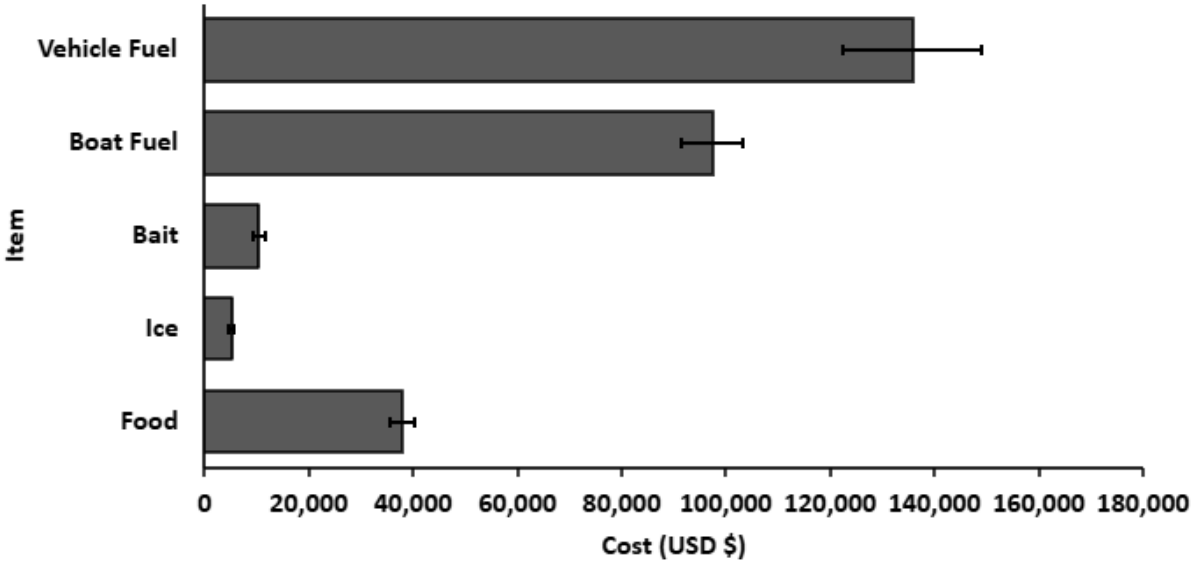

FIGURE 7. Direct expenditures by item type reported by interviewed parties.

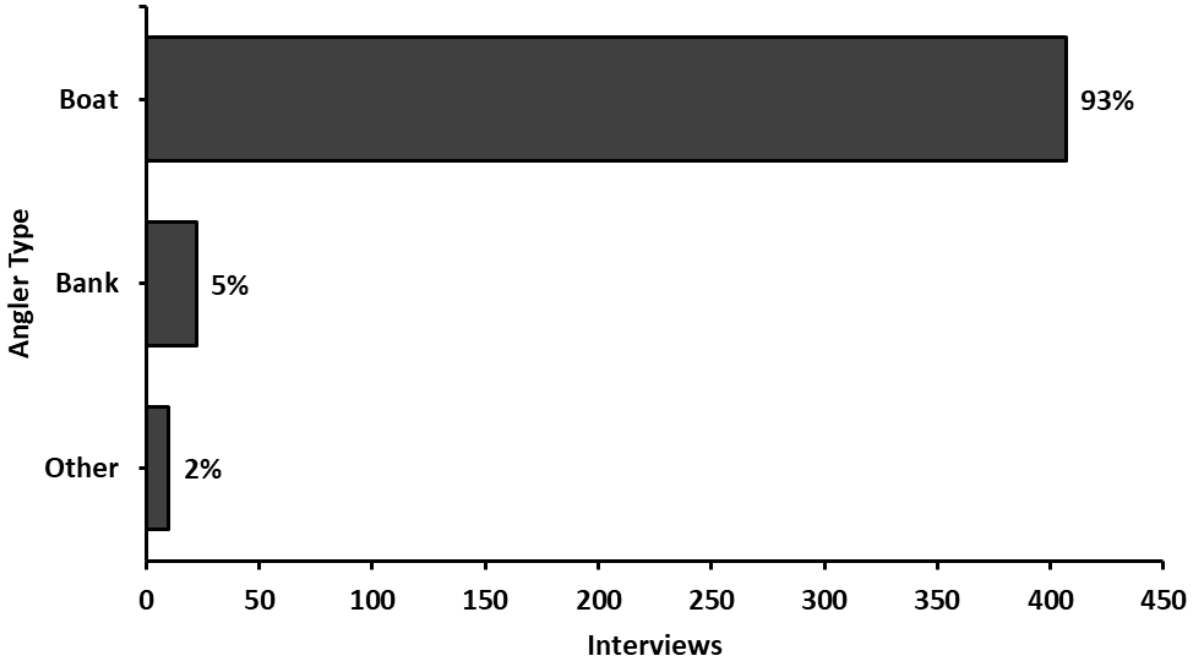

FIGURE 8. Interviewed parties by angler type. Boat includes any interview in which a motorized or non-motorized vessel was used (n = 439).

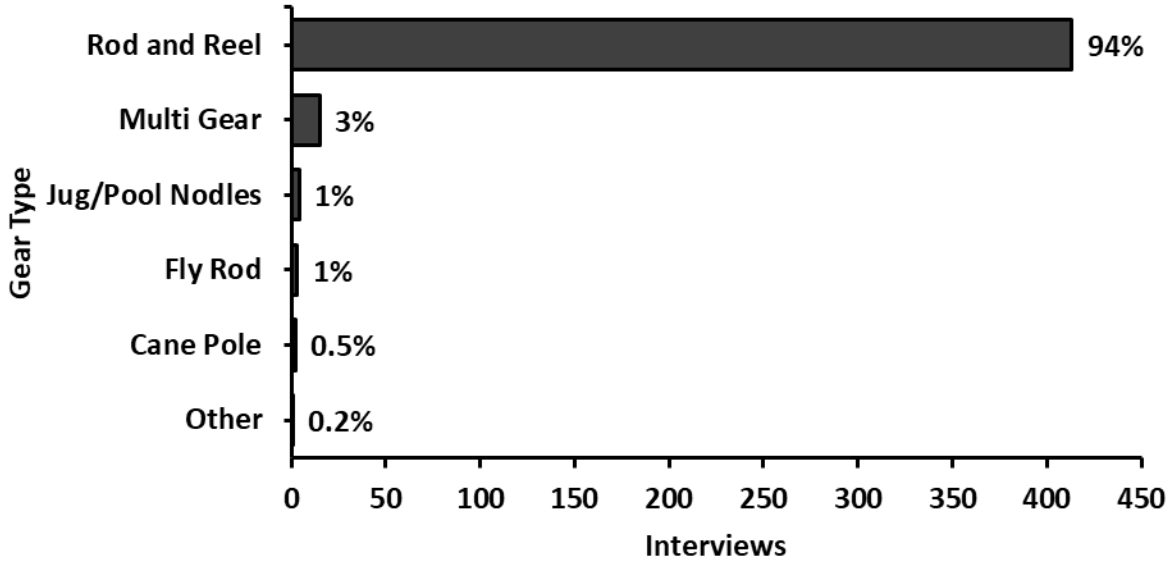

FIGURE 9. Count of interviews by angler-indicated type of gear used during fishing trip (n = 438).

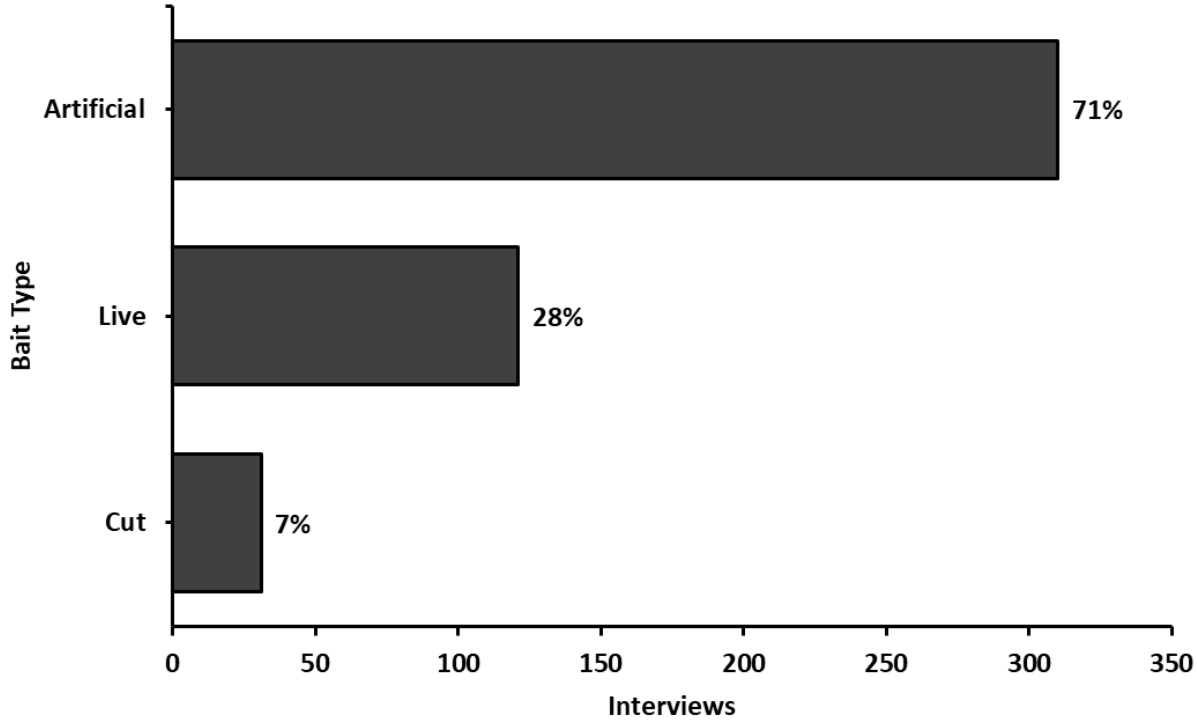

FIGURE 10. Count of interviews by angler-indicated bait type. More than one bait could be used in an interview (n = 439).

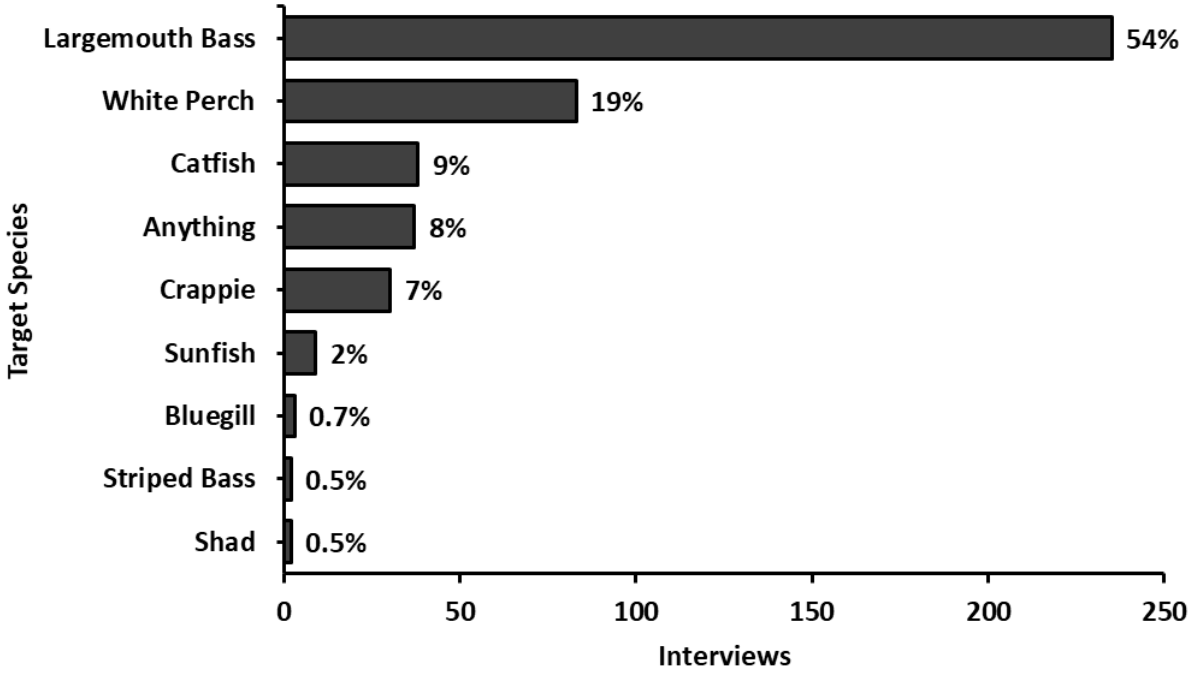

FIGURE 11. Count of interviews by angler-indicated target species. More than one species could be targeted in an interview (n = 439).

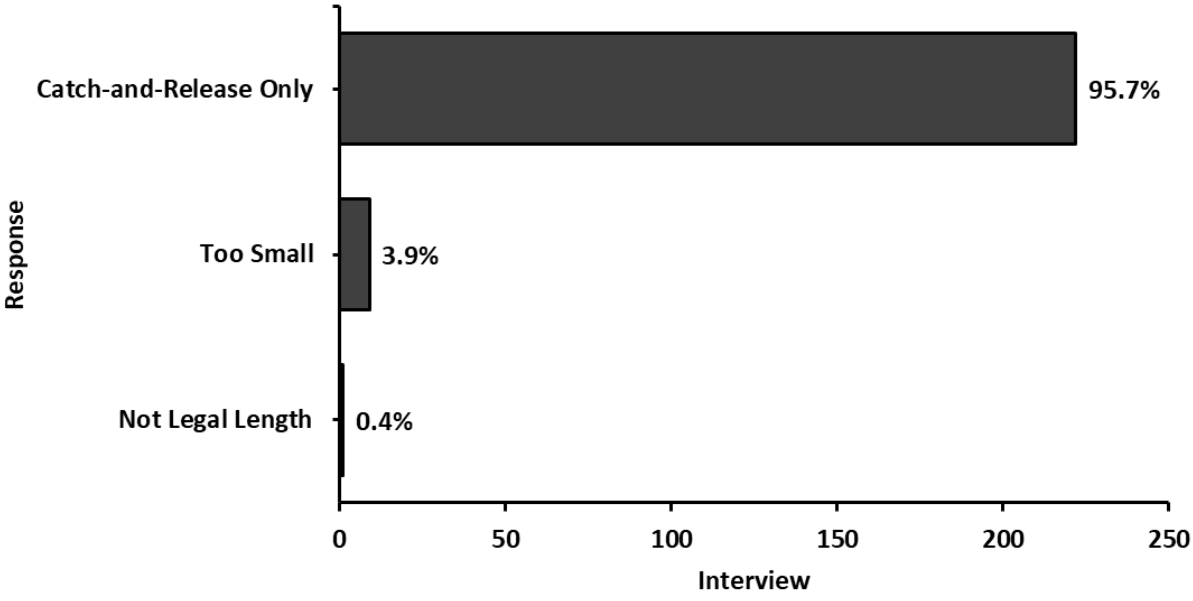

FIGURE 12. Angler response to “Reason for release?”. Interviewed anglers could give more than one response (n = 232). Response type “other” was included in the survey instrument but was excluded from the analysis due to lack of useable data.

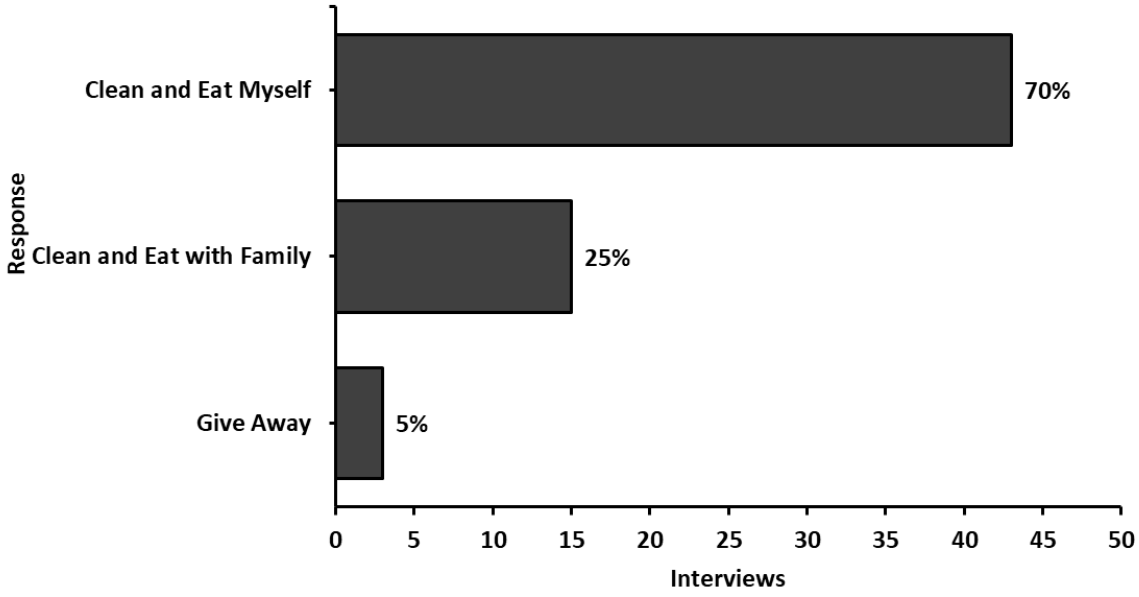

FIGURE 13. Angler response to "what will you do with your harvest?" (n = 61). Response type "other" was included in the survey instrument but was excluded from the analysis due to lack of useable data.

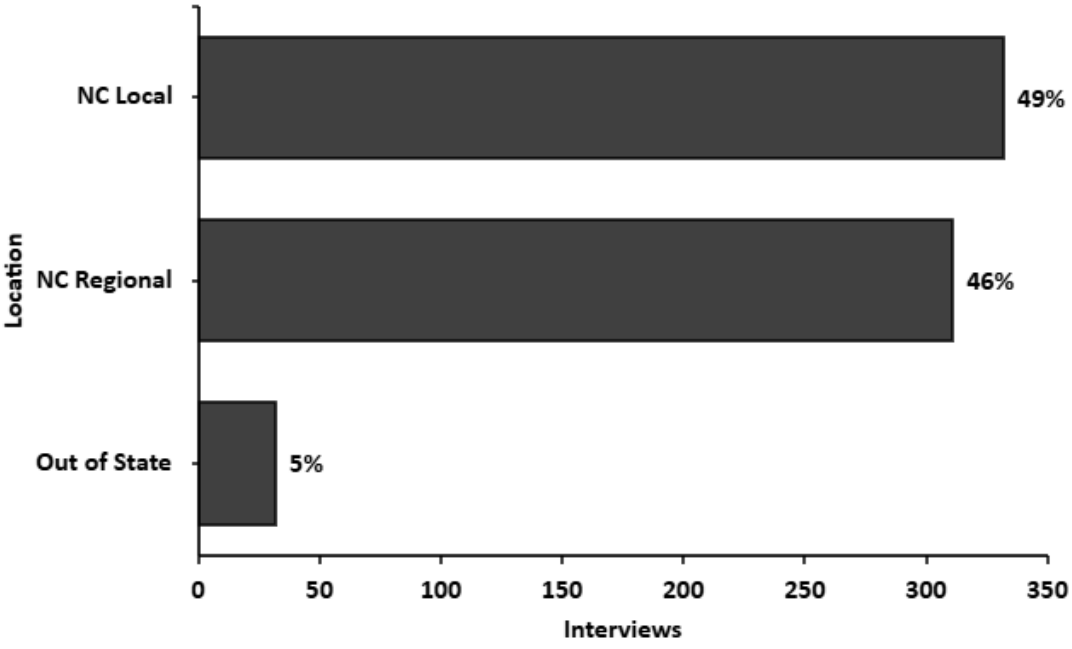

FIGURE 14. Number of anglers by county of residence (n = 675). North Carolina local (NC Local) represents the four NC counties adjacent to the Chowan River. North Carolina regional (NC regional) represents all other counties within the state.

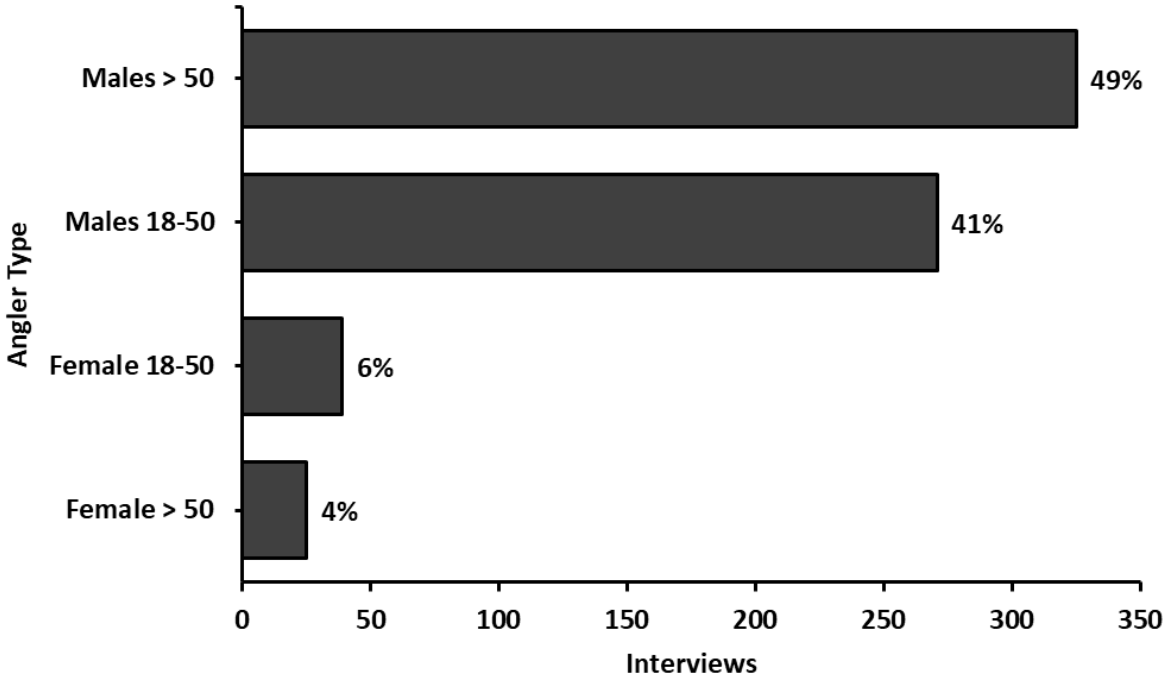

FIGURE 15. Count of anglers by sex and age (n = 660).

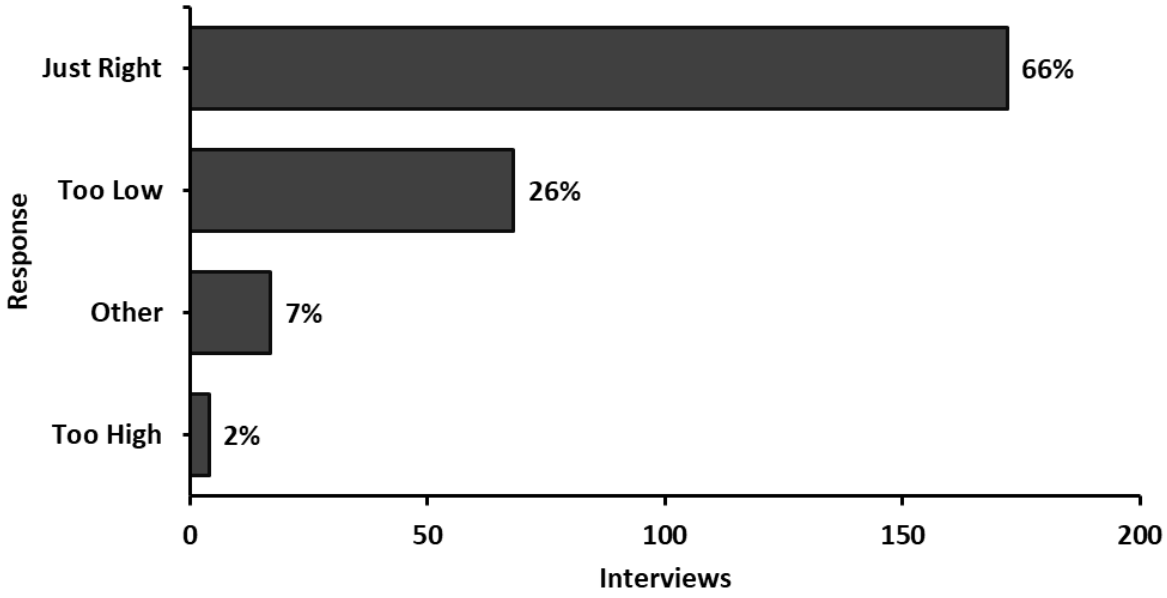

FIGURE 16. Black Crappie angler response to the question “are you satisfied with the minimum length limit?” (n = 261).

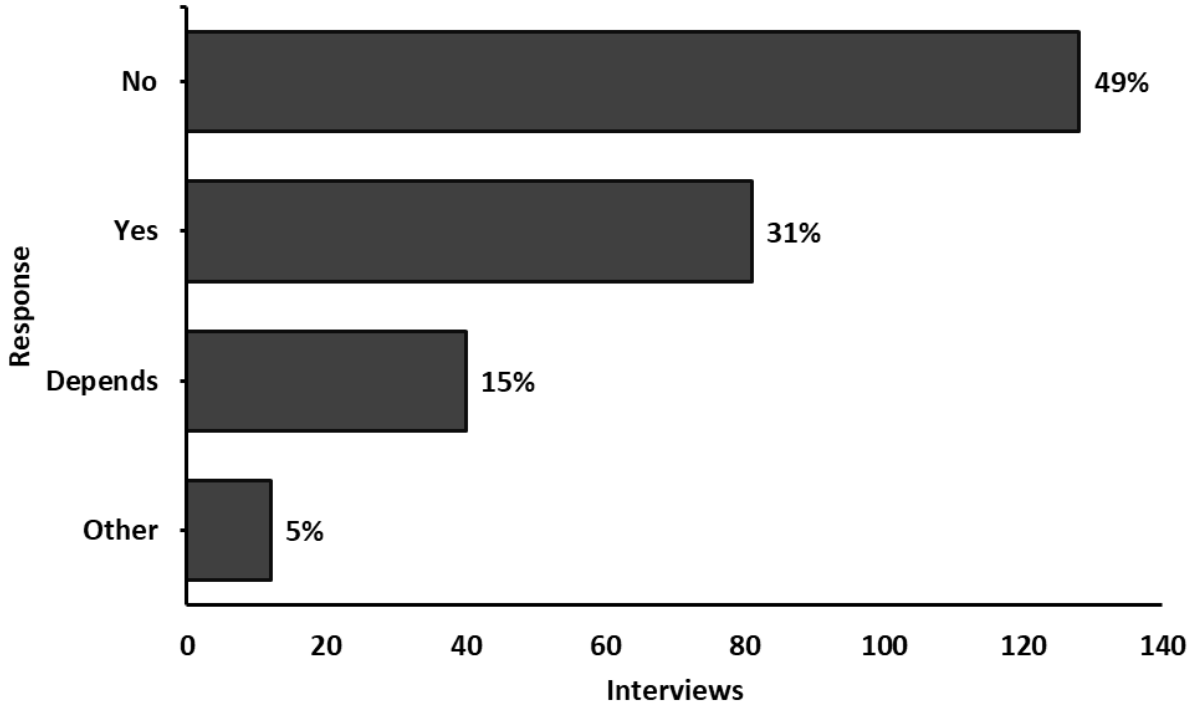

FIGURE 17. Black Crappie angler response to the question “Do you harvest crappie less than 10 inches?” (n = 261). Responses are only those that indicated that they fish for crappie.

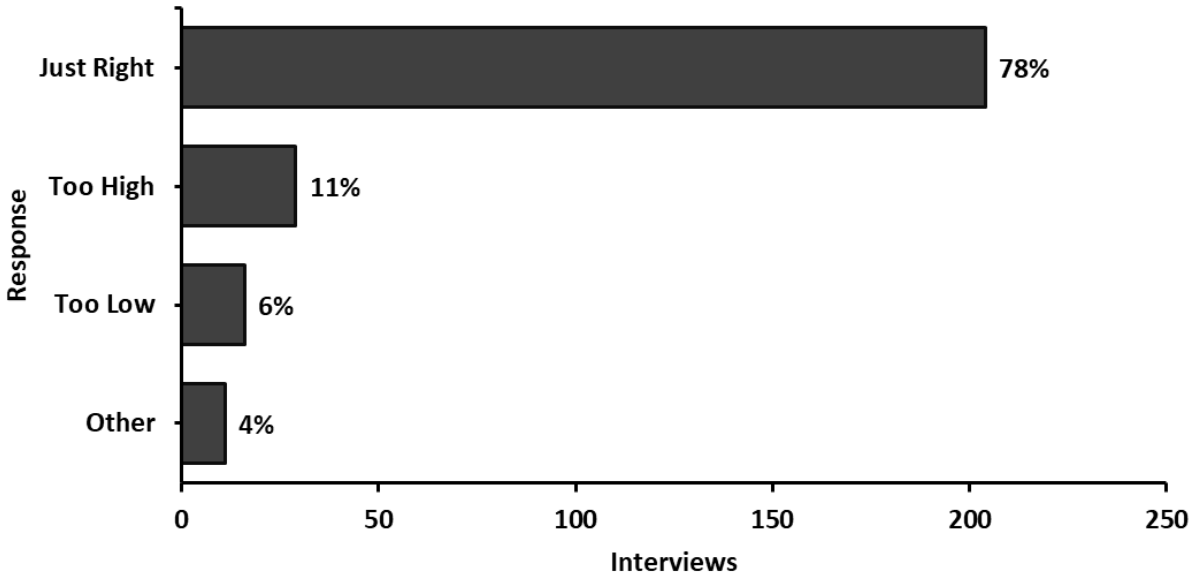

FIGURE 18. Black Crappie angler response to the question “how do you feel about the daily creel limit?” (n = 260).

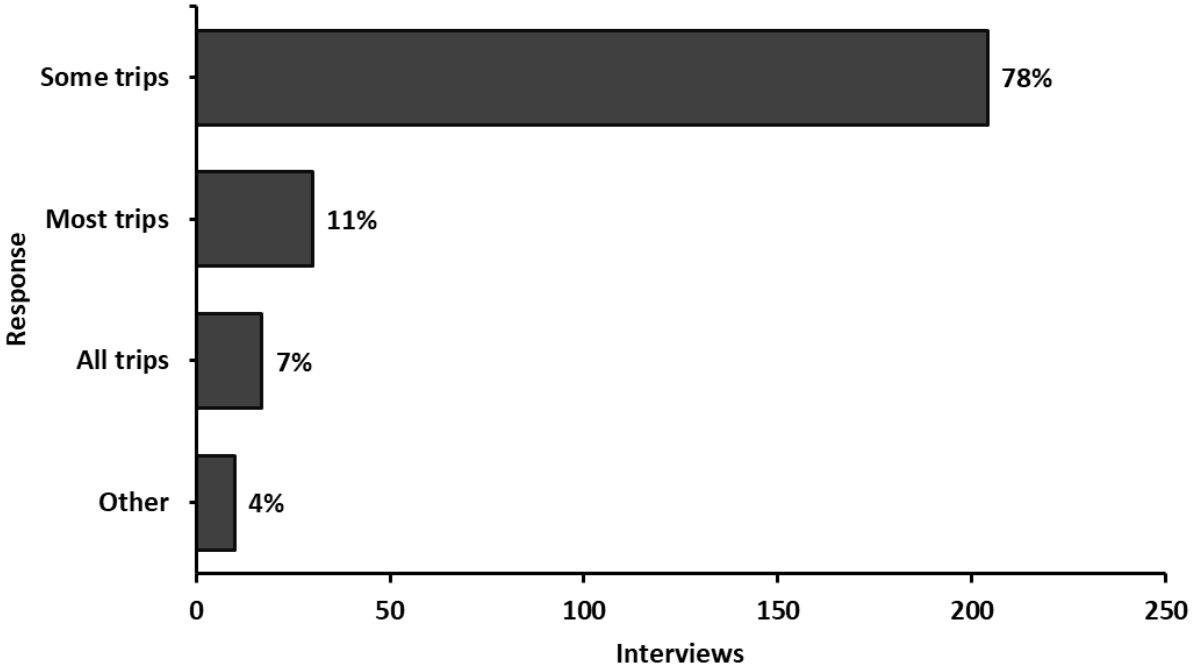

FIGURE 19. Black Crappie angler response to the question “How frequent do you fish for crappie?” (n = 261).

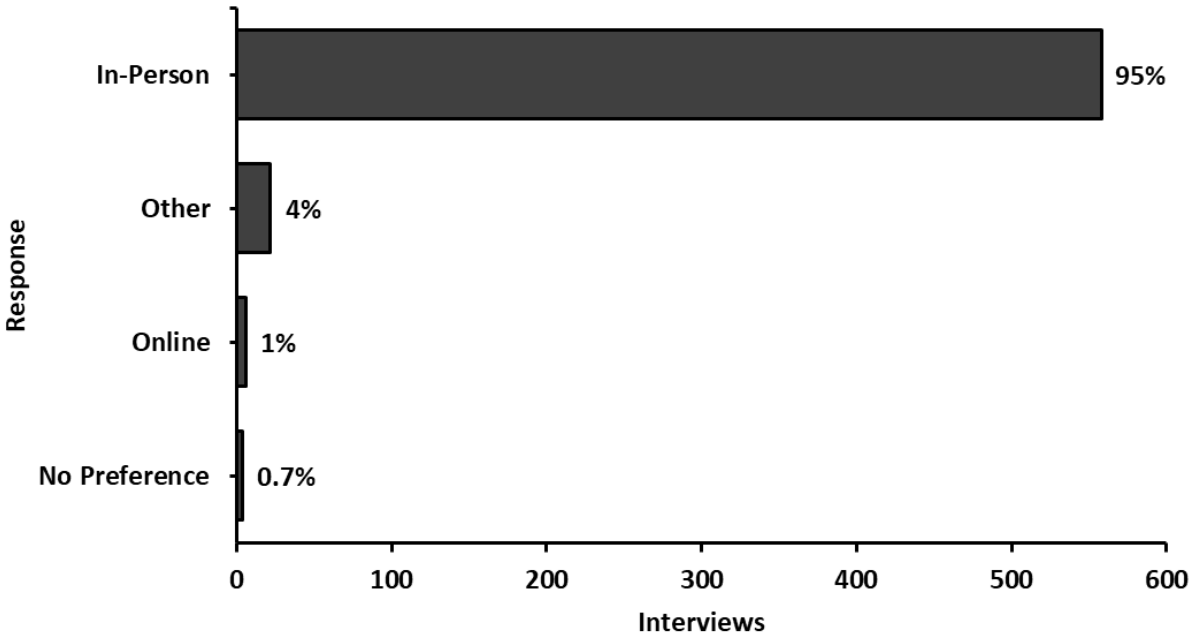

FIGURE 20. Angler response to “Do you prefer online or in-person type of interviews?” (n = 439).

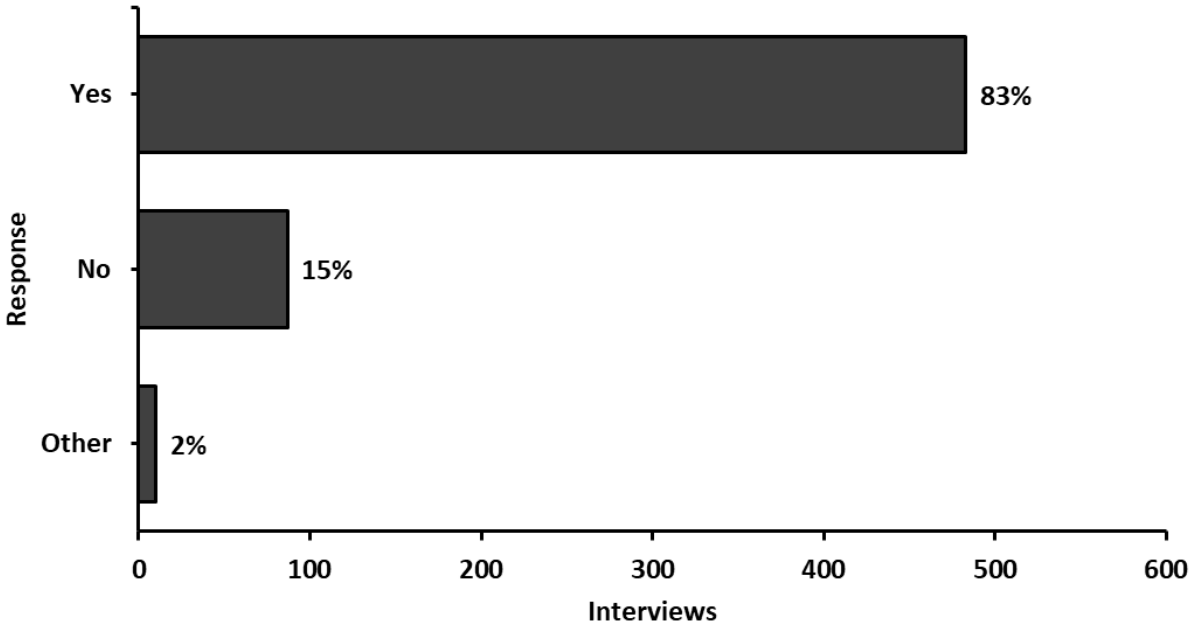

FIGURE 21. Interviewer response to “are you satisfied with inland fishing?” (n = 580).

Appendix A. Session Instrument

CHOWAN RIVER CREEL SURVEY
Cover Sheet

DATE: _____

ACCESS LOCATION_____ SESSION (circle): AM PM

Counts For:	Start Time_____	Midway Time_____	End Time_____
Boat Trailers	_____	_____	_____
Single Vehicles	_____	_____	_____
Anglers on Site	_____	_____	_____
Other_____	_____	_____	_____

Number of Angling Party Drive-offs, angling parties that leave and ignore the survey:_____

Number of Angling Parties Not Able to be Interviewed, including Refusals: _____

Total Interview Sheets: _____

Angling Interview Sheets:_____

Non-Angling Interview Sheets:_____

Weather Observations:
_____
_____

Access Area Notes:
_____
_____

Other Session Notes:
_____
_____

Any Angling or Non-Angling Parties Described on Back of Sheet? Circle YES or NO

Appendix B. Survey Instrument

Chowan River Creel Survey Interview Form **Angler Interview Sheet #:**_____

Interview Date __ __/__ __/ 2 0 2 4 (Month / Day) Circle AM or PM Access Name_____

What Interview Type? Boat Kayak Fishing Pier Bank Other _____

Any Gears Observed? Fly Rod "Jug Hooks/Pool Noodles" Spider-Rigging Forward Sonar "Set Hooks/Limb Lines"

Any Notes or Information on the Back of this form? Yes No

Are you finished with your fishing trip today? YES NO Reason Not Finished_____

If Not a Fishing Trip, what activity? Hunting Leisure Commercial Maintenance Refused

Fishing Trip continues for next section and to end of document; Non-Fishing Trips skip to Black Crappie section to end of document

Fishing Effort: *As you approach the party,* Record Time of Interview: __ __ __ __

What TIME did you start fishing today? Record Time Started Fishing: __ __ __ __

How many anglers fishing in your party today? Record the Number of Anglers in Party: __ __

What were you fishing for today? (Circle first fish mentioned, write-in for Other)

Anything Sunfish Crappie Largemouth Bass Catfish White Perch Striped Bass Other _____

Where did you fish? (Circle All that Apply) Main Creeks Sound Roanoke River Meherrin River Other_____

What baits or lures used? Artificial Worms Minnows Crickets Cut Bait Fly Rod Flies Other _____

	Catch Any?	**Keep Any?**	**Release Any?**	***Measure Total Length - up to 5 fish of each species***				
Species	Total # Caught	Total # Kept	Total # Released	TL-mm	TL-mm	TL-mm	TL-mm	TL-mm
Bluegill	_____	_____	_____	_____	_____	_____	_____	_____
Redear Sunfish	_____	_____	_____	_____	_____	_____	_____	_____
Largemouth Bass	_____	_____	_____	_____	_____	_____	_____	_____
Black Crappie	_____	_____	_____	_____	_____	_____	_____	_____
Striped Bass	_____	_____	_____	_____	_____	_____	_____	_____
White Perch	_____	_____	_____	_____	_____	_____	_____	_____
Blue Catfish	_____	_____	_____	_____	_____	_____	_____	_____
Channel Catfish	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

For fish harvested today, will you: Eat Them Alone Eat them with Group Give Them Away Other_____

For released fish, were they: Not legal size Beyond your limit Catch-and-release only Other_____

Minimum Length Limit for Black Crappie	***Daily Limit for Black Crappie***	***Harvest crappie less than 10 inches***	***Black Crappie Trip Frequency***	***Fishing in a Tournament?*** *Anglers may prefer not to respond until after Weigh-In*	***Does this fishing trip include sale of nongame fish?***
☐ Too Low	☐ Too Low	☐ Yes	☐ Never	Species_____	☐ No
☐ Just right	☐ Just right	☐ No	☐ Some trips	Total Weight _____	☐ Yes, catfish
☐ Too High	☐ Too High	☐ Depends	☐ Most trips	Total Fish _____	☐ Yes, perch
☐ Other_____	☐ Other_____	☐ Other_____	☐ All trips	Number Released_____	☐ Other
			☐ Other_____	Number Dead_____	

Have WRC interviewed you before today?	***What NC county do you live? If not NC, what state do you live?*** *(Enter # anglers; e.g. 3 Wake , 2 SC)*	***May I ask your Age?***	***Satisfied with Inland Fishing?***
☐ No	___ Bertie ___ Chowan ___ Gates	__ Child <18	☐ Yes
☐ Yes, WRC	___ Hertford ___ Northampton	__ Female 18-50	☐ No
☐ Yes, DMF	___ NC County _____	__ Female >50	Why or Why Not?
☐ Other_____	___ NC County _____	__ Male 18-50	_____
	___ NC County _____	__ Male >50	_____
	___ Out of State_____	__ Other_____	

For your fishing trip today, how much money do you expect to spend on:

Food/Beverage $____ Ice $____ Bait $____ Boat Fuel/Oil $____ Vehicle Fuel $____

Other Expenses? Lodging per night? $_____/_____ Guided Trip? $_____

How much more would you be willing to spend on today's trip? $_____ (in round numbers)

Prefer online or in-person interviews

☐ In-Person

☐ Online or "Self-Checkout"