

# Evaluation of North Carolina Trout Anglers' Opinions, Participation and Socioeconomic Impact



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## Executive Summary

Mountain trout fishing is an important recreational activity in North Carolina, with over 350,000 anglers fishing for trout in 2022. As with any intensively managed fishery, it is important to periodically assess public perceptions towards management of the resources as well as public expenditures surrounding trout fishing. This project aimed to replicate the most recent survey of North Carolina trout anglers, completed in 2015.

An emailed survey was sent to 22,650 resident and 2,500 non-resident license holders that held fishing privileges at any point during 2022. The questionnaire was developed by the Social Science Team, with input from the Inland Fisheries Division on goals and intended outcomes. The questionnaire was based on the 2015 study of trout anglers (Responsive Management & NCWRC) and was open for four weeks in February and March of 2023. Data were analyzed using IMPLAN (IMPLAN Group, LLC), Stata (Statacorp) and NVivo (QSR International).

Results suggested that approximately 369,968 individuals fished for trout in North Carolina in 2022. These anglers spent a collective 4.6 million days fishing for trout with the average angler taking 9 trout fishing trips. On average, North Carolina trout anglers spent \$240 per trout fishing trip, which totaled \$587,553,393 million on trip-related expenditures in North Carolina. The overall economic impact of these trout fishing expenditures in North Carolina in 2022 was \$1.38 billion. Direct spending by trout anglers in the state totaled \$1.34 billion between trip and equipment expenditures. Trout fishing also directly and indirectly supported 11,808 full- and part-time jobs across the state. The Social Accounting Matrix (SAM) multiplier indicated that for every dollar spent on trout fishing in North Carolina, there was a \$1.93 return to the state economy.

Most respondents reported trout fishing in at least one other year, and that their level of trout fishing has not changed over time. Anglers reported fishing the most in Ashe, Watauga, Avery, Jackson and Haywood counties, and fishing mostly on public lands. Over half of respondents reported using all types of tackle, including artificial flies, artificial lures, and natural bait, but if they could only pick one, artificial flies were the most popular amongst all anglers. However, primarily Hatchery-Supported anglers selected artificial lures and natural bait more often than Delayed Harvest and wild trout anglers.

When comparing results of the 2023 survey to the 2015 survey, most were very similar. The primary motivations of fishing for sport and fishing for relaxation continue to be the top choices from 2015 to now. Respondents also continue to report that finding a location where they will catch fish on public land is important, but finding a location with regulations posted on site is not as important as finding a secluded location now. However, the biggest difference between 2015 and 2023 results is the primary water fished. More than 50% of respondents in this project reported fishing mostly in Hatchery Supported waters, which is a large increase from 2015.

Results from this project show that access remains the primary problem, and in the future, it will be important to not only retain but increase access. Further, a potential expansion of Hatchery Supported waters may be considered for the winter months, and concerns about crowding may need to be explored further. Future research may address the impending Setzer Fish Hatchery closure and programmatic impacts and aim to collect more data from younger anglers.

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## Introduction

Mountain trout fishing is an important recreational activity in North Carolina, with over 350,000 anglers fishing for trout in 2022. As with any intensively managed fishery, it is important to periodically assess public perceptions towards management of the resources as well as public expenditures surrounding trout angling. To this end, surveys of trout anglers were conducted in 2008 (Responsive Management, Responsive Management & Southwick Associates) and 2015 (Responsive Management, Responsive Management, Responsive Management & Southwick Associates) to assess public perceptions and economic impact. As nine years have passed since the last iteration, a new study was conducted in 2023 to assess trends in participation, economic impacts, angler preferences, motivations, specializations, satisfaction, and issues with access. Updated numbers will allow for exploration of trends and will inform future management decisions. Specific objectives for this project include:

- Determine economic impacts of trout fishing on North Carolina's economy;
- Assess current trends in trout fishing habits (participation, usage patterns, preferences for locations, equipment specialization, etc.);
- Identify trout angler motivations;
- Understand current issues with angler access and explore tradeoffs;
- Determine overall satisfaction levels with trout fishing in North Carolina;
- Identify preferred communication channels for information regarding trout fishing; and
- Compare results to 2015 report.

## Methods

### *Questionnaire Design and Survey Sample*

The study was conducted in early 2023 with questionnaire design taking place in January and survey implementation in February and March. A survey was emailed to 22,650 residents and 2,500 nonresident license holders with fishing privileges at any point in 2022 and were over the age of 18. The survey was offered entirely online, using the Qualtrics survey platform. A modified version of the Tailored Design Method was utilized to implement the survey, with an initial email invitation taking place on February 14<sup>th</sup>, 2023, and 3 more rounds of emails being sent to nonrespondents on February 21<sup>st</sup>, 27<sup>th</sup>, and March 8<sup>th</sup> (Dillman et al., 2014). The questionnaire was open for a total of four weeks and closed at 11:55PM on March 14<sup>th</sup>. The questionnaire was based on the 2015 projects (Responsive Management, Responsive Management & Southwick Associates) with updates from the Social Science Team and Inland Fisheries Division.

### *Quantitative and Qualitative Data Analysis*

Data were analyzed using Stata 17 for quantitative analysis and NVivo for qualitative analysis. Quantitative analysis including descriptive statistics, frequencies and count data were compiled along with qualitative analysis using thematic analysis techniques. Qualitative data were grouped by theme and only themes with more than 10% agreement were developed. Economic data were analyzed using IMPLAN and 2022 statistics.

### *Economic Impact Assessment*

The economic impact of trout fishing to North Carolina's economy was estimated using survey-sourced data for an Input-Output model using IMPLAN software. This method has been widely used for economic impact assessments of hunting and other outdoor recreation activities (Grado et al., 2011; Munn et al., 2010; Poudyal et al., 2020). It uses data collected from visitors or users on participation rates, trip expenditures, and equipment expenditures along with data on the North Carolina economy to generate multiplier effects (direct, indirect, and induced) from that activity.

### *Trout fishing participation*

As North Carolina does not offer a license specifically for trout fishing, the number of trout anglers was estimated via the data collection methodology of the survey. To do this, the survey was emailed to 25,150 licensed individuals with fishing privileges in North Carolina. The subject of the email did not mention trout fishing specifically to get a random sample of anglers to begin the survey. However, the first question on the survey asked participants if they fished for freshwater trout in North Carolina in 2022. If participants selected that they had not fished for trout, they were directed to the end of the survey. Seven hundred and five individuals out of the 2,230 who responded to that screener question selected that they fished for trout in North Carolina in 2022. Based on this, 31.6% of license holders fished for trout in 2022. This is a significant increase from the 18.5% estimated in 2014, but relatively close to the 29.3% of licensed anglers found in 2008. Results suggest that the 2014 survey could have been an anomaly due to the license sampling method chosen that year.

Data on the total number of freshwater anglers from the NCWRC license-holder database, ALVIN (Automated License and Vessel Information Network), was then used to estimate the total number of trout anglers. This resulted in a total of 369,968 individuals who fished for trout in 2022. The 2022 estimation of the proportion of North Carolina resident anglers (87%) was used to estimate the total number of resident trout anglers at 321,872.

The sampling error describes the deviation in the sample from the population being measured. Maximum sampling error is calculated by dividing the standard deviation of the population by the square root of the size of the sample and multiplying by the Z-score value, which is based off the confidence interval of 95% (calculation shown below; Dillman et al., 2014). With a sample size of 705 and a population of 369,968 trout anglers, the sampling error for the entire sample of trout anglers was calculated to be, at most, 3.68%.

$$B = \left( \sqrt{\frac{\frac{N_p(.25)}{N_s} - .25}{N_p - 1}} \right) (1.96)$$

### *Trip Expenditures*

The survey was used to collect itemized expenditures for a typical trout fishing trip. The questionnaire included items such as food and beverages, gasoline and other transportation costs, lodging, activity expenses such as fishing gear, bait, charter fees, and other trip expenses such as souvenirs and entertainment. Survey participants

were also asked to estimate the percentage of their total spending that took place in the North Carolina County where they fished most often. On average, 72% of trout angler spending occurred near their fishing site. Trip expenditure profiles were then estimated using the itemized expenditures, the average number of trips per person, the average number of people paid for on a typical trip, and the proportion of their spending which took place near their fishing site. This was then extrapolated to the entire trout angler population.

### *Equipment Expenditures*

The survey also collected trout angler expenditures on equipment related to trout fishing that may be used over the course of multiple trips like rods, reels, fishing tackle, electronic fishing equipment, life jackets, boats, taxidermy, etc. Respondents were specifically asked to estimate the cost of items purchased for trout fishing, so that items purchased for other types of fishing would not be considered in the calculations. As equipment purchases are typically made close to where anglers live, purchases made outside of North Carolina by non-residents would not have an impact on the state's economy. To account for this, only equipment purchases made by North Carolina resident trout anglers were counted.

### *Multiplier Effects*

Trip and equipment expenditures were then organized into industry-specific sectors to determine the secondary impacts resulting from those expenditures. The IMPLAN input-output model then uses those industry-specific expenditures to provide several economic indicators to determine overall impact. It generates direct impacts, which are impacts to a local industry directly attributed to the activity being analyzed, indirect impacts, or those stemming from regional business purchases in the supply chain, and induced impacts, which stem from household spending of income generated by the activity being analyzed. These three types of impacts are comprised of three economic indicators: employment, labor income, and value added. Employment is an industry-specific measure of the number of full-, part-time, and seasonal employment supported by an activity, while labor income describes the income from that employment. The value-added indicator is comprised of the labor income in addition to taxes on production and imports (TOPI) and other property income (OPI). When combined, these indicators provide the total economic impact of a particular activity.

## Results

### *Socioeconomic Impact*

An estimated 369,968 individuals fished for trout in North Carolina in 2022. Of those, 87% were North Carolina residents, meaning that approximately 48,000 anglers traveled from out-of-state to fish for trout in North Carolina. All NC trout anglers spent a collective 4.6 million days fishing for trout with the average angler spending 12.5 days trout fishing. The average angler also took 9 trout fishing trips, which could be one or multiple days long, and paid trip-related expenses for two people per trip. Additionally, 72% of all trout fishing trip-related expenditures were spent in the county of their typical North Carolina fishing site.

On average, trout anglers spent \$240 per person per trout fishing trip in North Carolina. When averaged to all North Carolina trout anglers, this totaled \$587,553,393 million on trip-related expenditures (**Table 1**). The trip-

related expenditure categories with the highest average expenditures per angler were hotels/motels and gasoline. In terms of equipment-related expenditures, North Carolina trout anglers spent \$770,570,566 (Table 2). The equipment categories with the highest average expenditures per angler were vehicles and motorized boats. The cost per trip differed between local anglers (those that drove <20 miles, n = 133) and non-local anglers (those that drove >20 miles, n = 437). Local anglers spent \$112 on average per trip, while non-local anglers spent \$276 per trip. The biggest differences in cost between the two groups were on hotels (\$16 for locals and \$81 for non-locals), other lodging (\$14 for locals and \$74 for non-locals), and gasoline (\$33 for locals and \$75 for non-locals).

**Table 1:** Total angler trip expenditures

Expenditure Item	Total Expenditures
Restaurants	\$75,707,639
Convenience Stores	\$28,414,818
Groceries	\$44,541,817
Vehicle and Boat Fuel	\$84,034,013
Vehicle Repair	\$13,400,448
Vehicle Rental	\$11,700,938
Other Transportation	\$6,088,890
Bait	\$17,520,841
Equipment Rentals	\$14,329,676
Special Licenses	\$17,997,682
Access & Launching Fees	\$2,078,537
Guide/Charter Fees	\$50,447,306
Camping Supplies	\$44,223,923
Hotels & Motels	\$84,156,279
Other Lodging	\$73,763,596
Souvenirs & gifts	\$4,010,353
Other entertainment expenses	\$15,136,637
<b>Total</b>	<b>\$587,553,393</b>

**Table 2:** Total angler equipment expenditures

Expenditure Item	Total Spent (\$)
Rods & reels	\$41,061,176
Fishing tackle	\$30,555,283
Fishing gear	\$17,558,103
Fly tying equipment	\$9,392,217
Electronic fishing equipment	\$34,459,587
Clothing	\$26,860,196
Life jackets, PFDs	\$4,203,645
Books & magazines	\$3,144,687
Cameras & binoculars	\$10,258,052
Camping equipment	\$11,265,510
Adaptive fishing gear	\$1,651,202
Other fishing purchases	\$6,019,001
Motorized boat	\$79,283,443
Non-motorized boat	\$19,341,272
Boat accessories	\$24,095,317
Boat storage	\$12,459,655
Camper, RV, ATV, truck	\$406,266,491
Dues/contributions to organizations & clubs	\$7,473,862
Taxidermy	\$9,376,123
Coolers	\$10,744,078
Bug spray, sunscreen	\$5,101,667
<b>Total</b>	<b>\$770,570,566</b>

The overall economic impact of trout fishing in North Carolina in 2022 was \$1.38 billion (**Table 3**). Direct spending by trout anglers in the state totaled \$1.34 billion between trip and equipment expenditures. Trout fishing also directly and indirectly supported 11,808 full- and part- time jobs across the state. The Social Accounting Matrix (SAM) multiplier was 1.93, indicating that for every dollar spent on trout fishing in North Carolina, there was a \$1.93 return to the state economy. Trout fishing had the biggest impact on the “retail – sporting goods” sector, with a direct impact of \$115 million.

**Table 3:** Economic summary for trout fishing in North Carolina

NC Trout Angler purchases	
Trip Expenditures	\$587 million
Equipment Expenditures	\$770 million
<b>Total Expenditures</b>	<b>\$1.34 billion</b>
NC Trout Angler Economic Impact	
Trip Impact	\$886 million
Equipment Impact	\$528 million
<b>Total Economic Impact</b>	<b>\$1.38 billion</b>
Economic Indicators	
Labor Income	\$535,804,313
Value Added	\$801,030,943
Jobs Supported	11,808
Tax Revenue from all Spending	
State	\$48,150,717
Federal	\$101,345,570

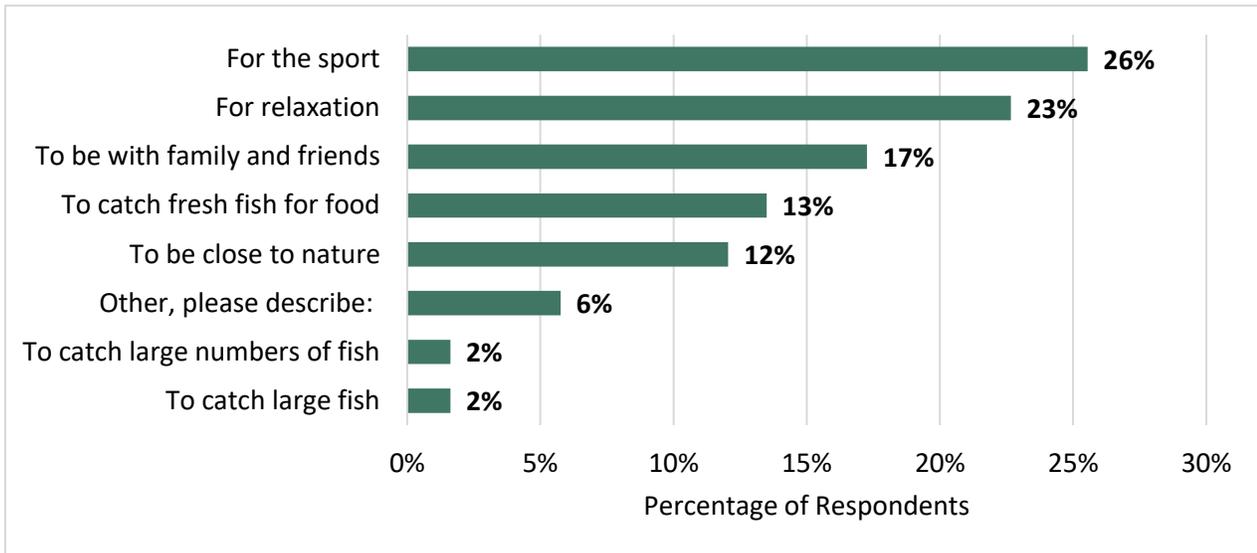
### Fishing Participation

Respondents were asked a series of questions pertaining to their trout fishing participation. First, respondents were asked to share in what other years, since 2017, did they go trout fishing (**Appendix A.1**). The majority of respondents (>83%) have trout fished in at least one other year since 2017. Respondents reported that over time, their level of trout fishing activity has not changed (50%, **Appendix A.2**). Of those that did report a change, 31% selected their level of fishing activity decreased. There were no relationships between the changes in trout fishing activity and age, trout fishing expertise, or primary water fished.

### Motivations for Trout Fishing

Respondents were asked to select their single main reason for trout fishing (**Figure 1**). None of the reasons garnered a large proportion of responses, but the reasons most respondents selected were fishing for the sport, and fishing for relaxation. Other reasons that respondents suggested included an inability to choose just one reason and wanting to fish to teach their grandchildren.

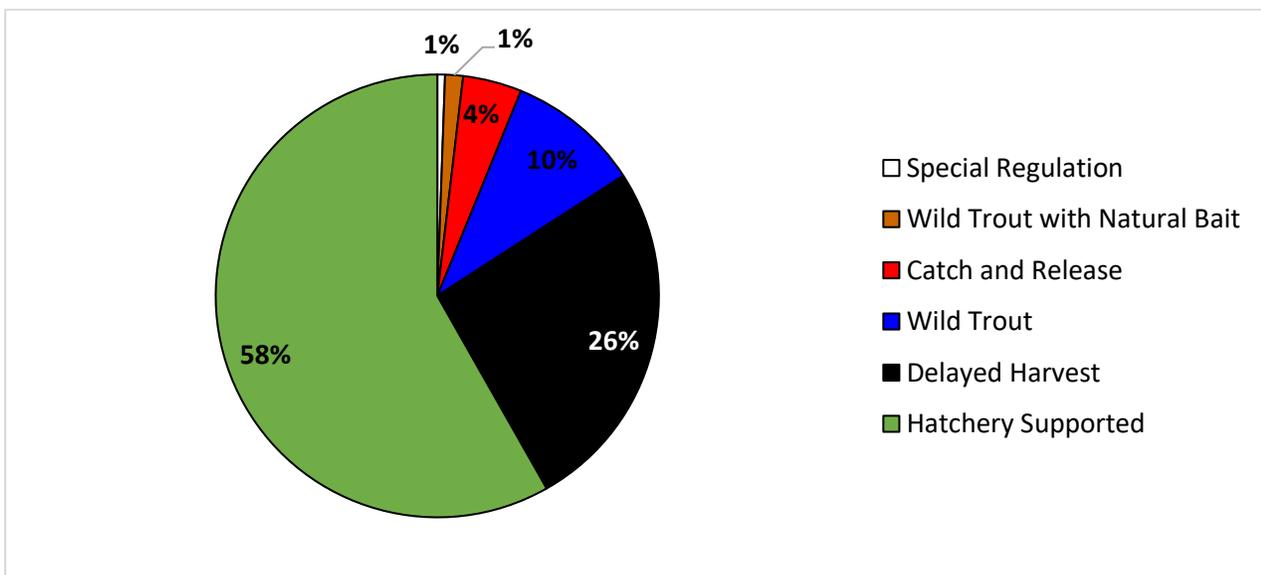
When comparing main motivations to age, most anglers who selected spending time with family and friends were over the age of 45 (83%). Further, when comparing family and friends as a primary motivation, there are no distinct trends in skill level. However, more advanced anglers reported fishing for the sport as their primary motivation. Proportionally, more primarily Delayed Harvest anglers (35%) reported fishing for the sport as a primary motivation than primarily Hatchery Supported anglers (19%). Hatchery Supported anglers selected fishing for relaxation, to be with friends and family, to catch fresh fish for food and for the sport as their primary motivations.



**Figure 1:** Respondents selection of the single main reason they choose to trout fish (n = 556)

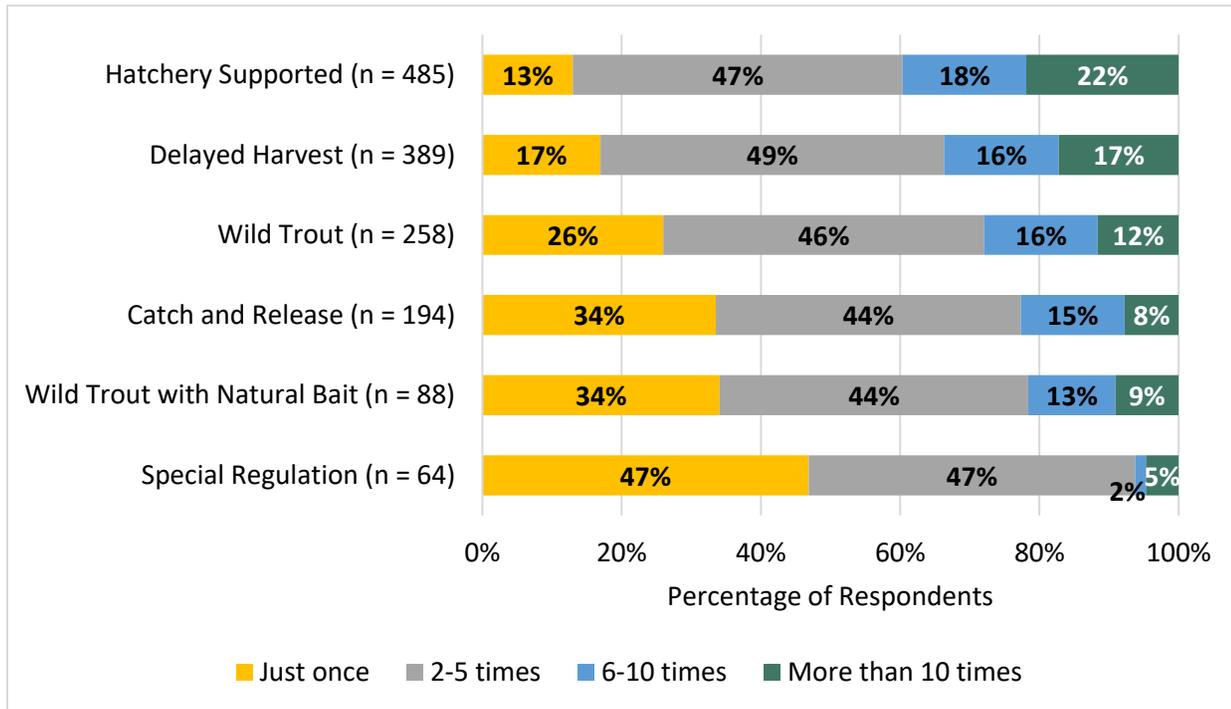
### Fishing Locations

Respondents shared the different types of Public Mountain Trout Waters (PMTW) that they fished during 2022 (**Appendix A.3**). Most respondents reported fishing in Hatchery Supported Waters, followed by Delayed Harvest Waters. Respondents were also asked what type of Public Mountain Trout Waters they fished the most in 2022 (**Figure 2**). Over half of respondents reported fishing in Hatchery Supported Waters the most, followed by 26% of respondents fishing Delayed Harvest Waters the most. There were no significant relationships between type of water fished the most and age or expertise.



**Figure 2:** Which PMTW respondents fish the most (n = 536)

For each type of PMTW fished, respondents were asked to share how often they fished that type (**Figure 3**). Overall, most respondents reported fishing each type of water between two and five times. With the exception of Special Regulation Waters, more experienced anglers are reporting fishing in each stream type more frequently ( $\chi^2 > 28.5, p < 0.01$ ).



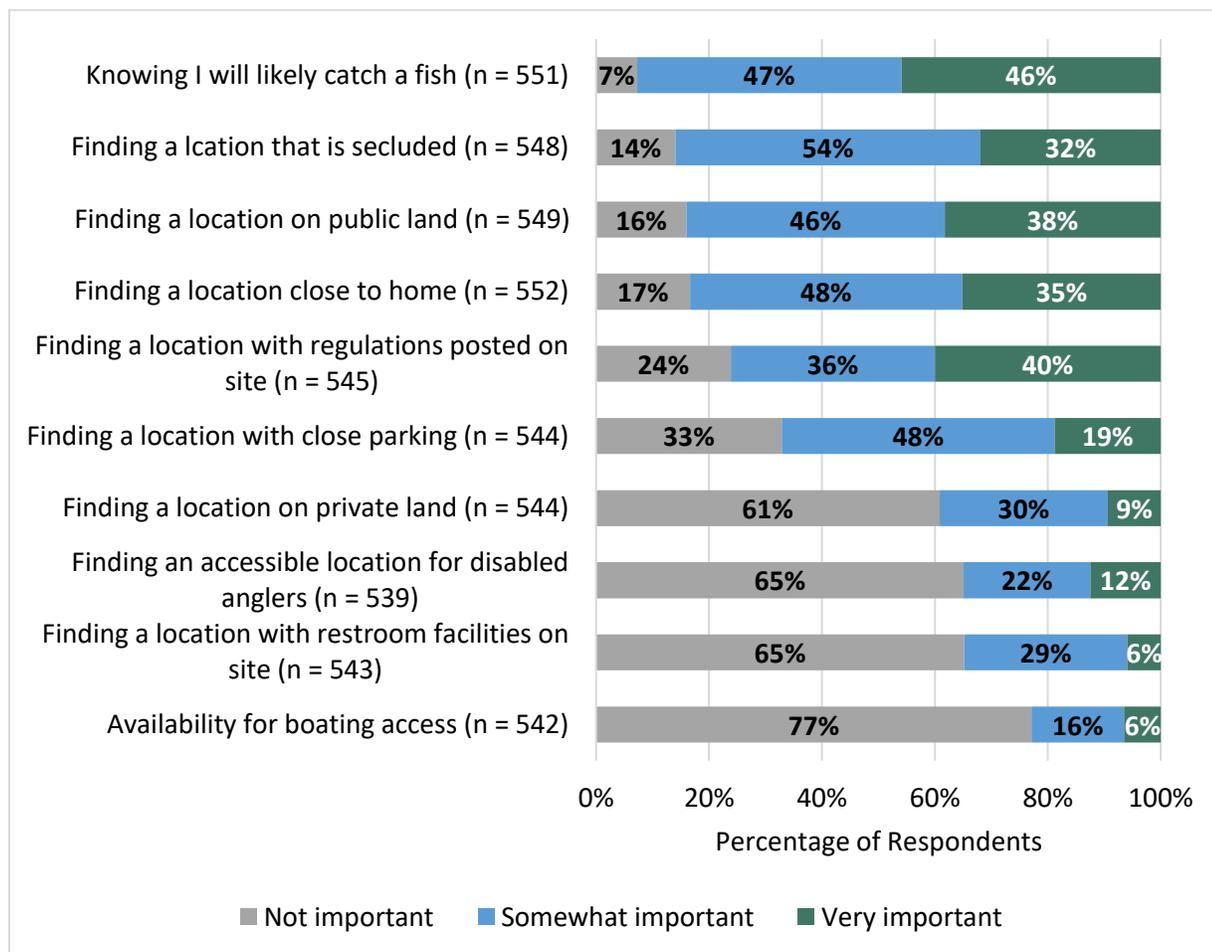
**Figure 3:** How often respondents fished the different waters in 2022

Respondents shared in which counties they trout fished the most during the last five years. Those counties included Ashe, Watauga, Avery, Jackson and Haywood counties. If respondents fished in more than one county, they named a second county. The most common second-most fished counties are Watauga, Ashe, Transylvania, Alleghany, and Cherokee. As previously, if the respondent fished in more than two counties, respondents were asked to share the county they trout fished in the third most, and the most common were Avery, Swain, Watauga, Ashe and Cherokee.

Respondents were asked if they mostly fish on public lands, private lands, or both about equally, and most respondents primarily trout fish on public lands (67%, **Appendix A.4**). When asked if respondents owned property with access to PMTW, only 5% reported that they did. To gauge the level of importance of different aspects of finding a fishing spot, respondents were asked about their ratings of importance (**Figure 4**). The most important factor respondents consider when deciding where to go trout fishing is knowing they will likely catch a fish, followed by finding locations with regulations posted on site and a location on public land. The least important factors were finding a location with restrooms on site, and locations with boating access areas.

Comparing these statements to age, experience, and primary water fished produced some statistically significant differences. Anglers that primarily fished Wild Trout Waters more often reported finding a secluded location as

very important than the other water types ( $\chi^2 = 54.50, p < 0.001$ ). Respondents that are over 55 are more likely to report finding a location on public land as more important ( $\chi^2 = 23.39, p = 0.05$ ). Anglers that primarily fished Delayed Harvest Waters were more likely to report finding a location with boating access ( $\chi^2 = 18.38, p = 0.05$ ), and finding a location on private land ( $\chi^2 = 18.12, p = 0.05$ ) as not very important. Anglers that primarily fished Wild Trout and Catch and Release Waters were more likely to report finding a location with close parking as not very important ( $\chi^2 = 25.35, p < 0.01$ ). More advanced anglers reported finding a location with close parking as not important ( $\chi^2 = 29.38, p < 0.001$ ). Anglers over the age of 55 were more likely to rate finding a location where regulations are posted on site as more important than younger anglers ( $\chi^2 = 24.13, p = 0.04$ ). Advanced and expert anglers are more likely to rate locations with restrooms on site as less important than more beginner anglers ( $\chi^2 = 24.88, p < 0.01$ ).



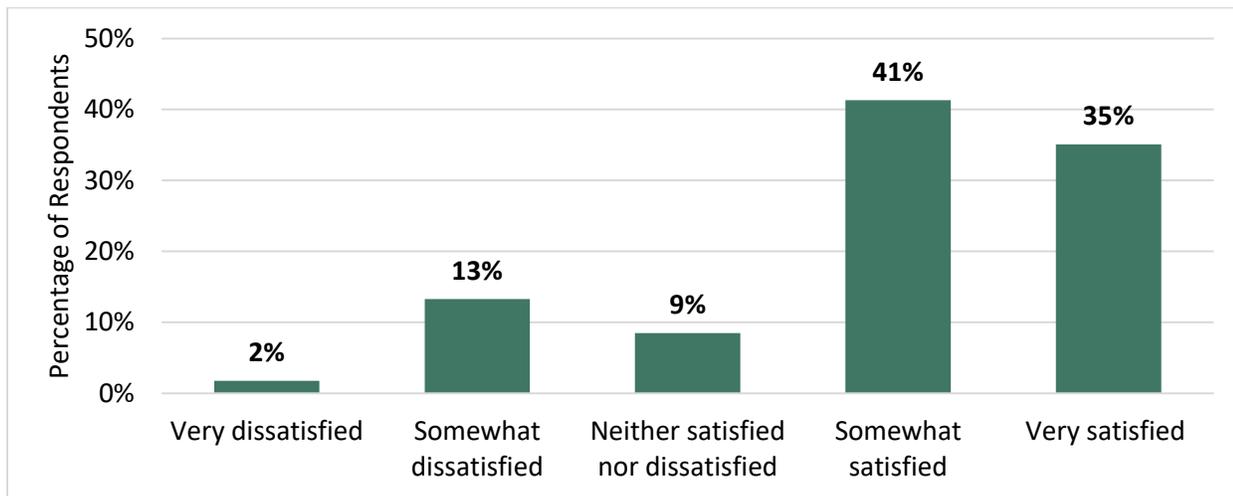
**Figure 4:** Importance of things to consider when deciding where to go trout fishing

### Types of Fishing Equipment and Bait Used

Respondents shared what kind of tackle they use when they go trout fishing (**Appendix A.5**). Over half of respondents reported using all three types identified, artificial flies (69%), artificial lures (66%), and natural bait (55%). Respondents were then asked, if they could only use one of the kinds that they use, which kind would they most prefer (**Appendix A.6**). Most respondents reported preferring to use artificial flies (44%), followed by natural bait (29%) and artificial lures (27%). When comparing these results to type of water respondents primarily fished, anglers who primarily fish in Hatchery Supported Waters prefer to fish with artificial lures and natural bait, but Delayed Harvest and Wild Trout anglers selected artificial flies more often ( $\chi^2 = 164.53$ ,  $p < 0.001$ ). Anglers over the age of 55 chose to fish with artificial flies more than younger anglers ( $\chi^2 = 23.29$ ,  $p = 0.05$ ). Anglers under the age of 55 reported preferring to fish with each of the different kinds of tackle equally.

### Satisfaction or Dissatisfaction with Trout Fishing in North Carolina

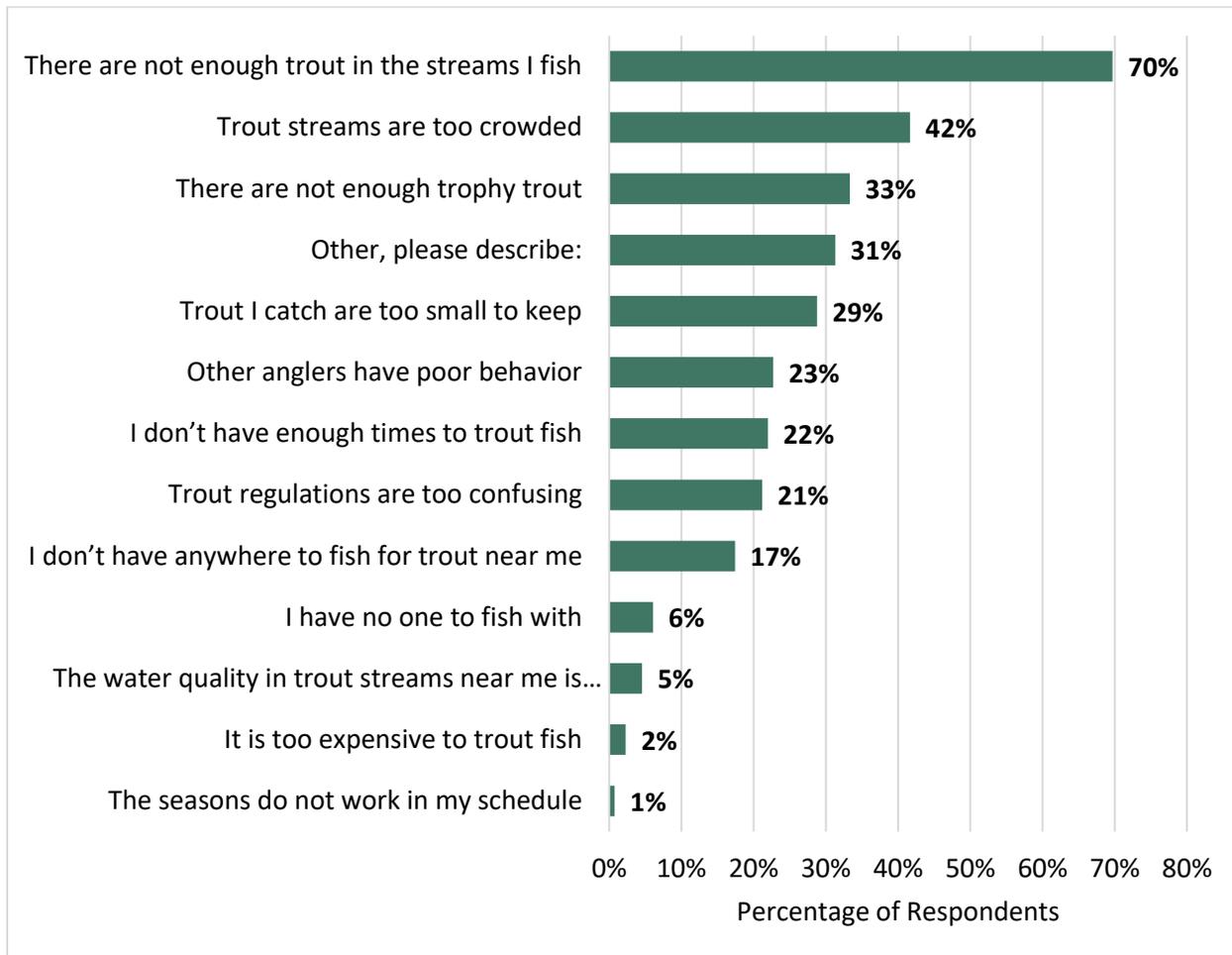
Anglers were asked to share their overall level of satisfaction with their trout fishing experience in 2022 (**Figure 5**). Most respondents reported being at least somewhat satisfied with their experience (76%). That number is consistent with values reported in the 2015 survey (76%; Responsive Management). There are no significant relationships between satisfaction and primary water type fished, age, or expertise.



**Figure 5:** Respondents satisfaction with their overall trout fishing experience (n = 564)

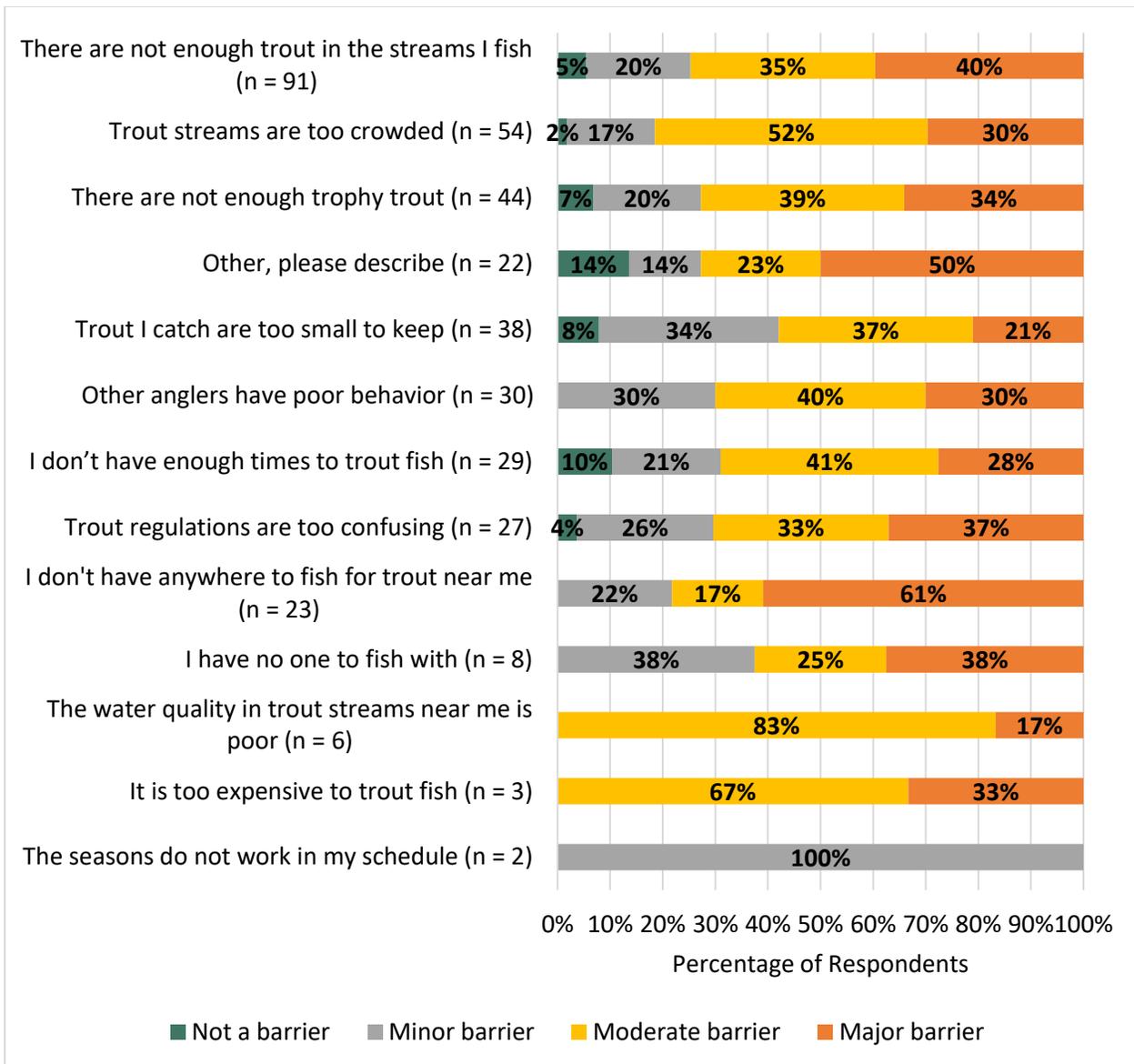
If respondents were not somewhat or very satisfied with their trout fishing experience, they were asked why (**Figure 6**). The most common reasons they were not satisfied were not having enough trout in the streams they fish, and the trout streams being too crowded. Respondents were given the opportunity to describe other reasons they were not satisfied with their experience, and they described decreased access, crowding on the streams and not enough enforcement (**Appendix A.7**).

When comparing these reasons to primary water fished, age, and experience, there are a two statistically significant differences. No beginner anglers reported trout streams being too crowded as an issue, while competent and more experienced anglers reported crowding at similar rates ( $\chi^2 = 9.54, p = 0.05$ ). Similarly, beginner and competent anglers did not select there not being enough trophy trout as often as anglers with a higher expertise did ( $\chi^2 = 11.81, p = 0.02$ ).



**Figure 6:** Reasons respondents were not satisfied with their trout fishing experience (n = 132)

Respondents were then asked to rate how much of a barrier each of their selected reasons for dissatisfaction were (**Figure 7**). The statement with the highest percentage of respondents reporting it as a major barrier was not having anywhere to fish near them. When comparing these barriers to primary water fished, age and experience, there are again two statistically significant differences. Anglers who primarily fish Hatchery Supported Waters were more likely to report trout they catch being too small as a barrier to fishing ( $\chi^2 = 30.67, p < 0.01$ ), and curiously, competent anglers were more likely to report not having trout streams near them than the other expertise levels ( $\chi^2 = 15.35 p = 0.05$ ).



**Figure 7:** Respondents rating of barriers to their trout fishing related to their dissatisfaction

Respondents were asked to share their thoughts on how well the NCWRC does in providing trout fishing opportunities for North Carolina (**Appendix A.8**). The majority of anglers rated the performance as good (45%) or excellent (34%). Anglers who primarily fish in Delayed Harvest Waters are more likely to rate the performance as excellent than other water types ( $\chi^2 = 25.14, p = 0.05$ ). If respondents did not rate performance as “Excellent,” they were given the opportunity to share if there was anything the NCWRC could do to improve trout fishing opportunities (**Appendix A.9**). The three most common ideas respondents mentioned were to increase stocking, increase access, and increase enforcement.

Respondents shared their satisfaction with the current public access to trout fishing in North Carolina (**Appendix A.10**). The majority of respondents reported they were somewhat (47%) or very satisfied (33%) with the current

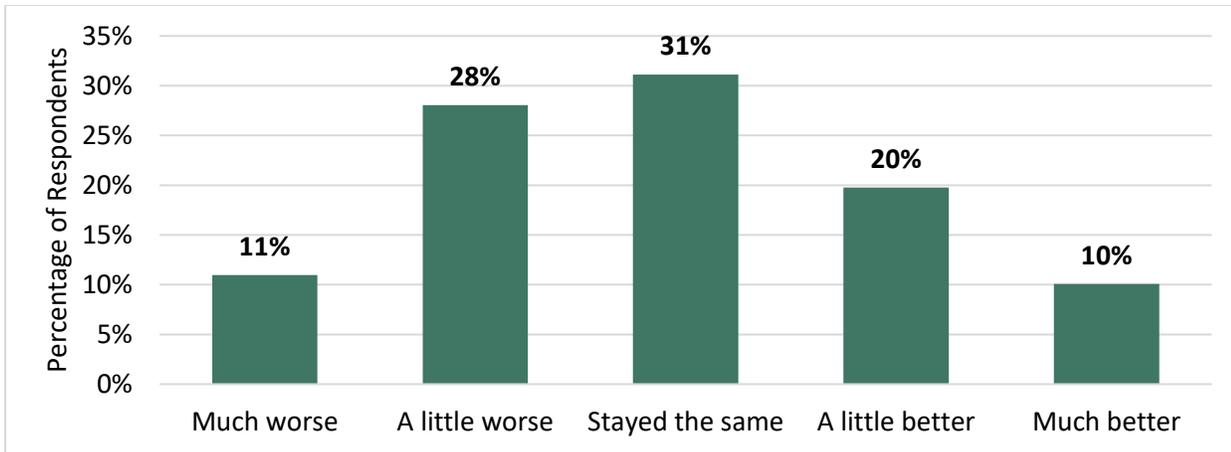
access provided. Anglers who primarily fish Hatchery Supported Waters were more likely to be dissatisfied with the current access provided than anglers who primarily fished other water types ( $\chi^2 = 31.33$ ,  $p = 0.05$ ). If respondents were not very satisfied with current public trout fishing access, they were asked what would make them more satisfied (**Table 4**). Most respondents described simply increasing the amount of access available, followed by working with private landowners to reopen streams that used to be a part of the PMTW that are now posted. Ideas on improving the access that is already available include improving the parking situation at access points and increasing the stocking rates.

**Table 4:** Respondents ideas on what would make them more satisfied with trout fishing access in North Carolina (n = 259)

Theme	Description	Count
Increase access	Respondents suggested opening more access	53
Work with private landowners	Respondents suggested working with private landowners to reopen access from private land.	39
Increase parking	Respondents suggested expanding or creating parking areas at access points.	34
More stocking	Respondents suggested increasing the stocking rates at current access points.	30

Respondents were asked to share their satisfaction with current trout fishing regulations (**Appendix A.11**). The majority of respondents are very satisfied (47%) or somewhat satisfied (37%) with the current regulations, and only 5% of respondents reported any level of dissatisfaction. There are no statistically significant relationships between the level of satisfaction with trout fishing regulations and primary water fished, age or expertise. Once again, if respondents were not very satisfied with current regulations, respondents were given the opportunity to share what would make them more satisfied (**Appendix A.12**). The top two themes including continuing to simplify regulations and increase enforcement of the current regulations.

Respondents were asked to share if they thought their trout fishing experience has changed since they began trout fishing, and to rate it (**Figure 8**). Most respondents reported trout fishing staying the same, but considering better vs. worse, more respondents reported their experience getting worse than getting better. There are no statistically significant relationships between primary water fished or age and how their trout fishing experience has changed. There appears to be a relationship between fishing expertise and how their trout fishing experience has changed ( $\chi^2 = 44.58$ ,  $p < 0.001$ ), but a subsequent linear regression reports that only 3% of the variance in how angler's trout fishing experience has changed can be explained by their expertise level.



**Figure 8:** Respondents description of how their trout fishing experience quality has changed since they started trout fishing (n = 556)

Respondents were then asked to describe how they felt their trout fishing experience has changed (**Table 5**). The most common changes described were seeing more anglers, experiencing less trout, experiencing more crowding, and struggling with less access.

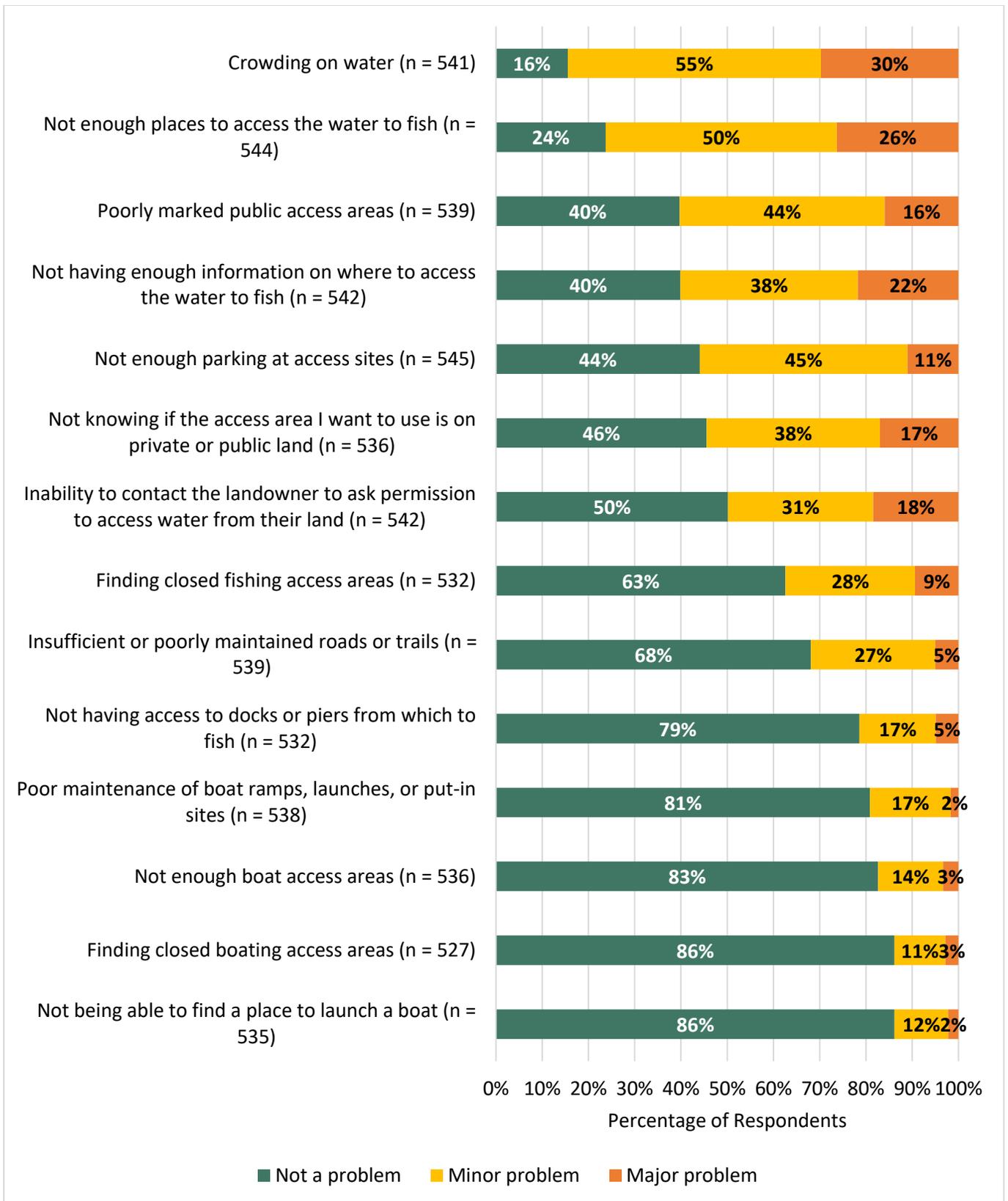
**Table 5:** Descriptions of how respondents’ trout fishing has changed over time (n = 349)

Theme	Description	Count
More anglers	Respondents described seeing more anglers trout fishing	76
Less trout	Respondents described seeing less fish, less stocked fish, less native brook trout, or smaller trout overall	74
More crowding	Respondents described feeling more crowded on the water, as well as more pressure on the resource.	51
Less access	Respondents described dealing with decreased access.	37

### Problems Encountered and Possible Solutions with Trout Fishing Access

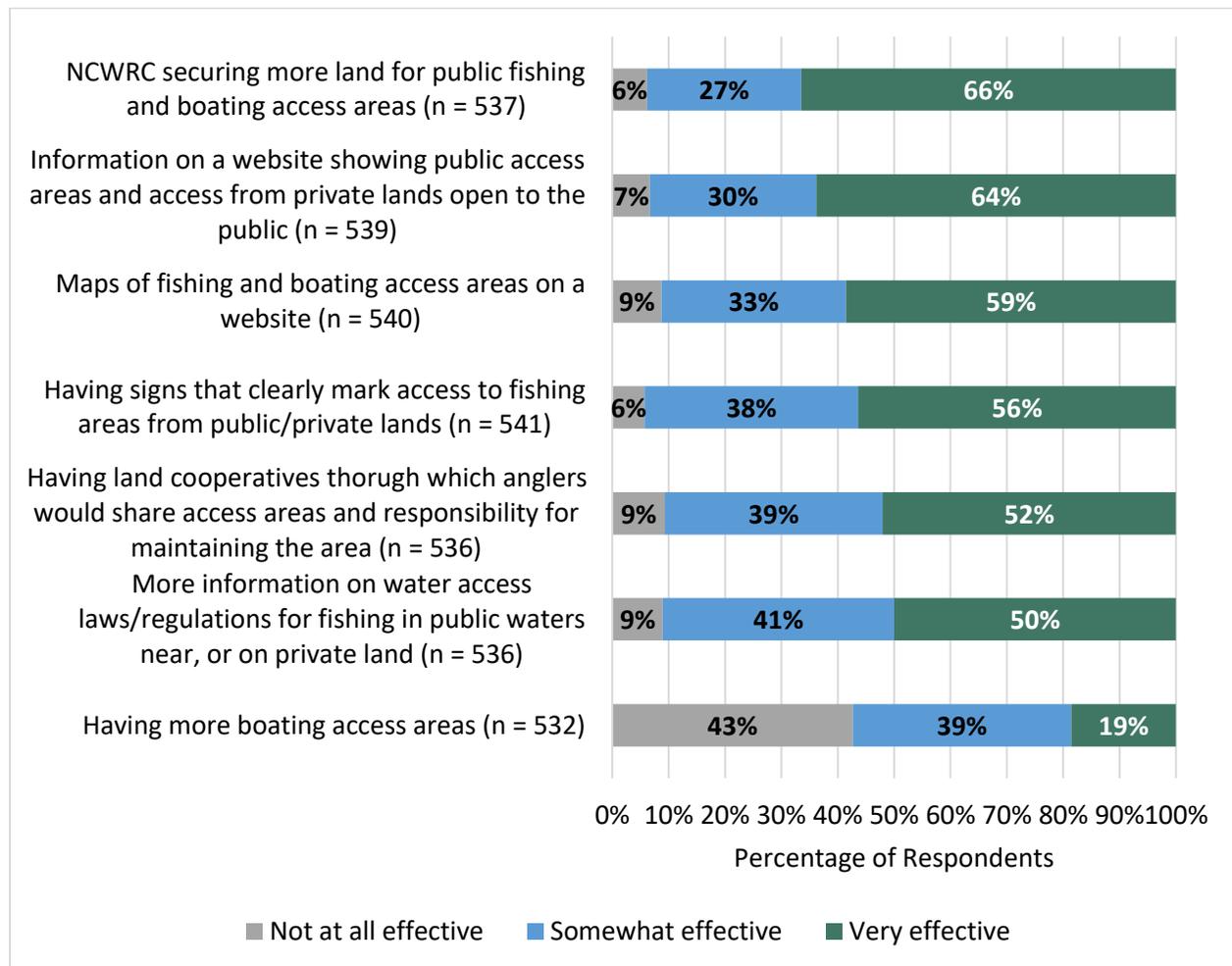
Respondents shared if common issues were problems that they experienced finding a location to trout fish (**Figure 9**). The most common issue reported was crowding on the water, followed by not having enough access points.

When comparing the problems encountered to experience level, age, and primary water fished, there are a few statistically significant differences. More experienced anglers (proficient, advanced, expert) rated finding a location closer to home as a major problem than less experienced anglers ( $\chi^2 = 39.06, p < 0.001$ ). Respondents who fish primarily hatchery supported waters more often rated being unable to contact the landowner to get permission to fish on their land as a major problem than Delayed Harvest or Wild Trout waters ( $\chi^2 = 19.71, p = 0.03$ ). Hatchery Supported anglers are also more likely to rate poorly marked access areas as a major problem than Delayed Harvest or Wild Trout with Natural Bait anglers ( $\chi^2 = 20.02, p = 0.03$ ). Hatchery Supported anglers are more likely to report not having access to docks or piers to fish from than Delayed Harvest anglers ( $\chi^2 = 22.78, p = 0.01$ ).



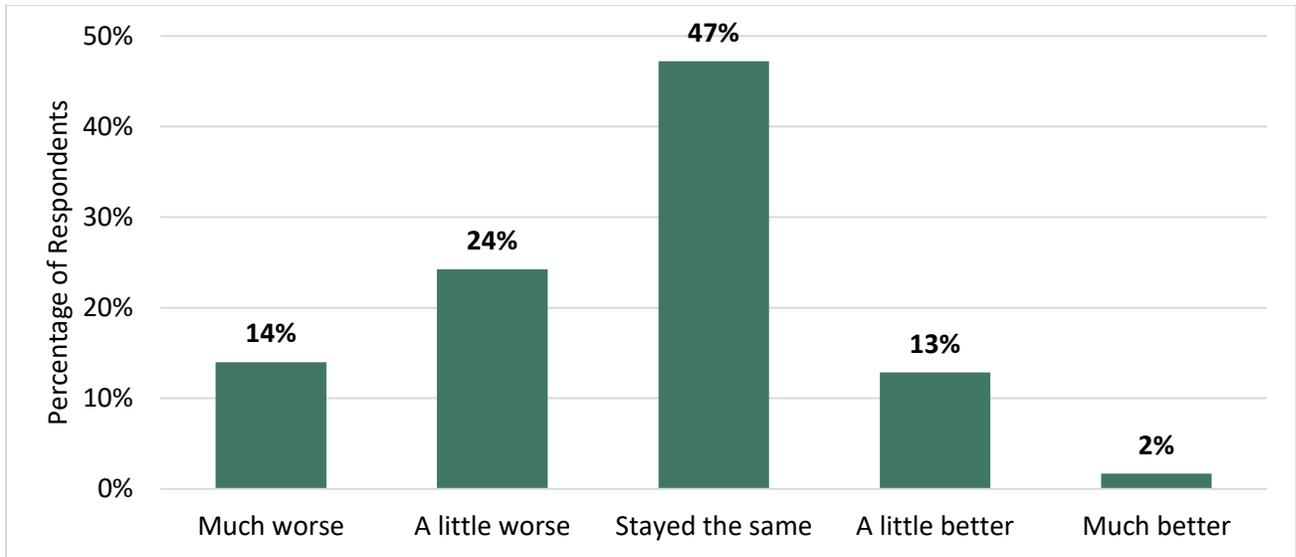
**Figure 9:** Common issues respondents encounter finding a location to trout fish

Next, respondents were asked to share their perception of effectiveness of different actions the NCWRC could take to better anglers' experiences (**Figure 10**). Most of the statements had similar levels of reported effectiveness (>90%). When comparing these statements to respondents age, experience and primary water fished, there are a few statistically significant differences. Older respondents are more likely to select having information on a website that shows public access areas and access from private land that are open to the public ( $\chi^2 = 30.54, p < 0.01$ ). Having more boating access areas would be more effective for Hatchery Supported anglers than Delayed Harvest or Wild Trout anglers ( $\chi^2 = 25.29, p < 0.01$ ).



**Figure 10:** Reported effectiveness of things NCWRC could do to improve trout fishing access

Respondents also shared if they had noticed a change in public fishing access (**Figure 11**). Most respondents said that it has stayed the same, but more respondents indicated that it has gotten worse compared to those who said it has gotten better. Respondents that reported being an advanced or expert angler were more likely to report their perception of fishing access getting worse over beginner anglers ( $\chi^2 = 37.40, p = 0.002$ ).



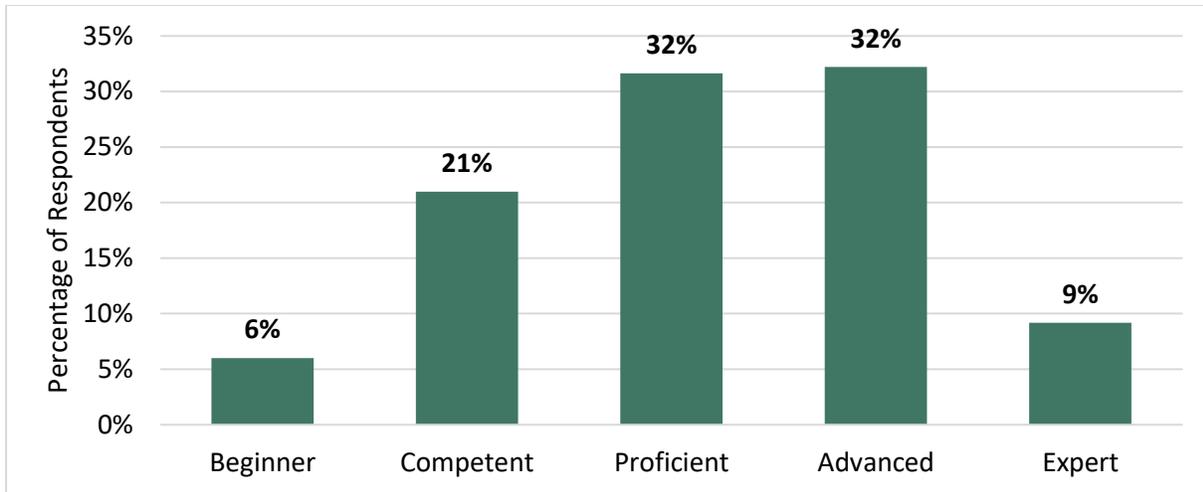
**Figure 11:** Respondents rating of how public fishing access has changed (n = 536)

### Guided Fishing Trips

Respondents were asked to share if they have participated in and paid for any guided fishing trips in the last five years (**Appendix A.13**). Most respondents (75%) reported not paying for any guided fishing trips. However, if they did purchase a trip, they only went on one. Delayed Harvest anglers were more likely to have purchased a guiding fishing experience than Hatchery Supported anglers ( $\chi^2 = 130.50, p < 0.001$ ).

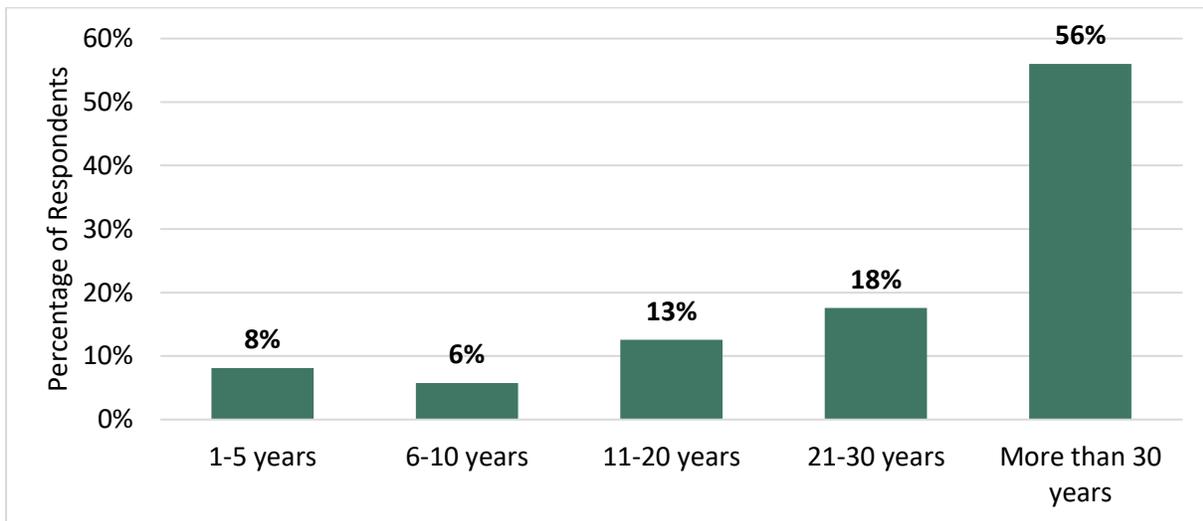
### Self-Rating of Skills

Respondents reported self-ratings of their trout fishing expertise (**Figure 12**). Most anglers rated themselves as advanced (32%) or proficient (32%) anglers. More respondents rated themselves as experts than beginners. There is no statistically significant relationship between expertise and primary water fished or age, but there is a relationship between expertise and how long respondents have been trout fishing. Unsurprisingly, anglers that have been trout fishing longer are more likely to report access getting worse ( $\chi^2 = 261.54, p < 0.001, r = 0.52, p < 0.001$ ). A subsequent linear regression confirms the initial chi-square test and shows that 28% of the variance found expertise can be explained by how long trout anglers have been fishing.



**Figure 12:** Respondents personal rating of their personal trout angling expertise (n = 534)

Respondents also reported how long they have been trout fishing (**Figure 13**). Just over half of respondents reported trout fishing for more than 30 years (56%). Also unsurprisingly, older respondents reported trout fishing for longer than younger respondents ( $\chi^2 = 86.49$ ,  $p < 0.001$ ).



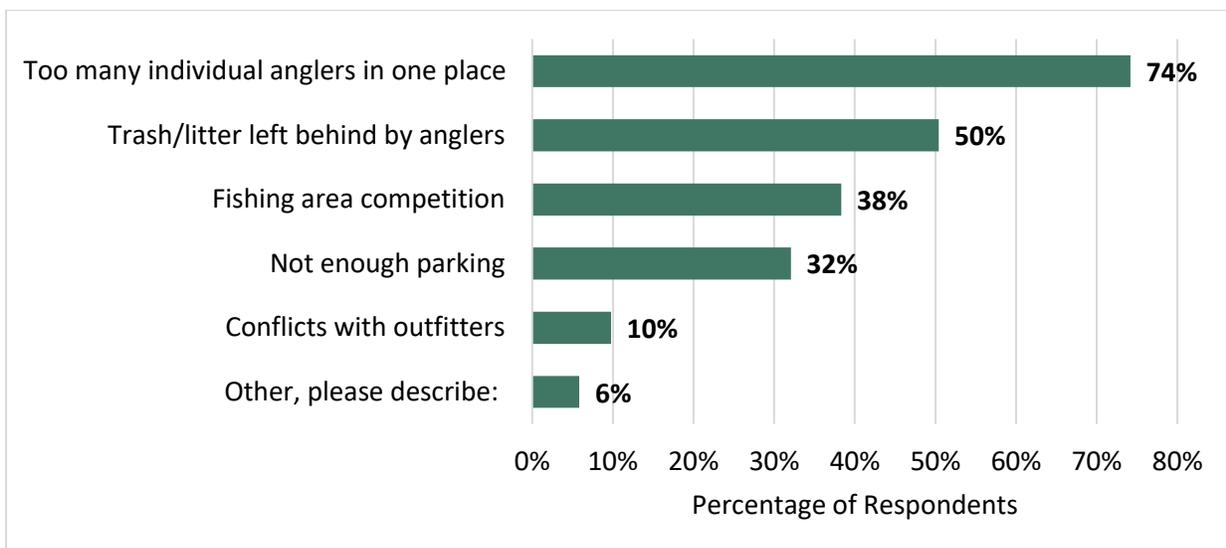
**Figure 13:** How long respondents have been trout fishing (n = 541)

### Experiences with Crowding on Public Mountain Trout Waters

Crowding on PMTW is anecdotally a significant issue to trout anglers. Thus, we asked questions to attempt to quantify any crowding that may be occurring on PMTW. First, respondents were asked to share how often they experience crowding on PMTW (**Appendix A.14**). Most respondents reported that they sometimes experience crowding while trout fishing on PMTW (49%). There were no statistically

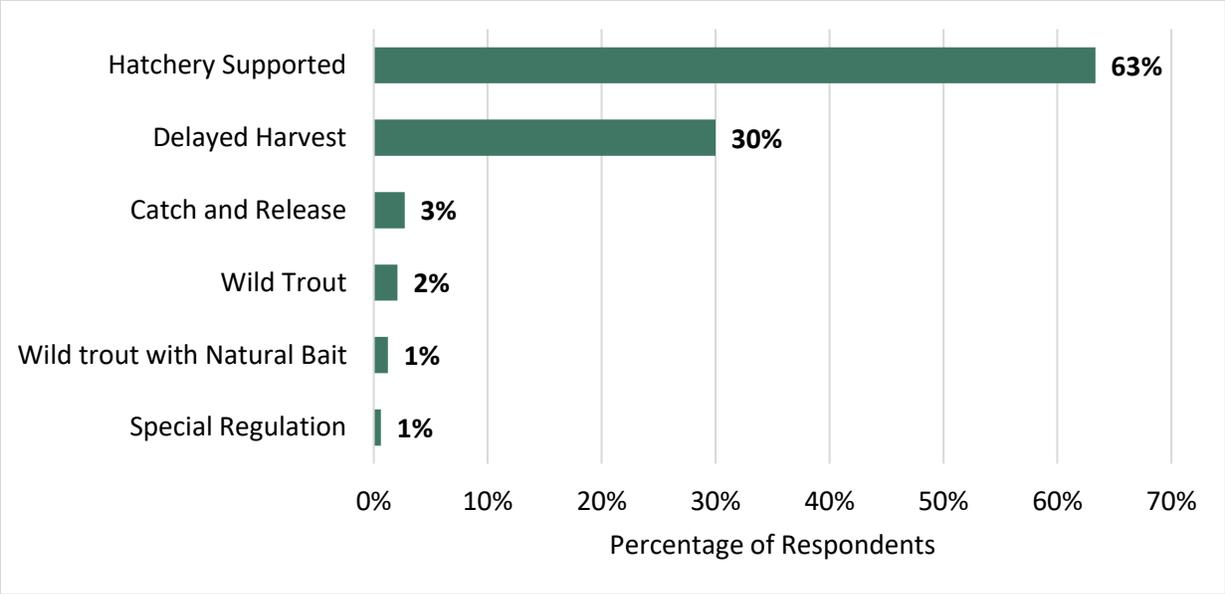
significant relationships between age or primary water fished, but more advanced anglers were more likely to report higher instances of crowding ( $\chi^2 = 47.79$ ,  $p < 0.001$ ). If respondents reported experiencing crowding often or always, they were asked to share if it has gotten better or worse over time (**Appendix A.15**). The majority of those respondents reported crowding has gotten much worse (59%), followed by crowding has gotten a little worse (33%). Only 3% of respondents reported crowding getting a little or much better over time. Proficient, advanced, and expert anglers were more likely to report crowding getting worse than less experienced anglers ( $\chi^2 = 42.60$ ,  $p < 0.001$ ).

Respondents reported different impacts of crowding that they experience on PMTW (**Figure 14**). The two most common kinds of crowding respondents experience are too many people in one place, and seeing trash or litter left behind by other anglers. Other kinds of crowding anglers experience are interference with other recreationists that are kayaking, swimming or rafting. Delayed Harvest anglers were more likely to report experiencing too many people fishing than Hatchery Supported anglers ( $\chi^2 = 13.09$ ,  $p = 0.02$ ). Wild trout anglers were more likely to experience trash and litter left behind than the other water types ( $\chi^2 = 12.46$ ,  $p = 0.03$ ). Expert anglers were also more likely to experience trash and litter left behind than less experienced anglers ( $\chi^2 = 16.86$ ,  $p = 0.002$ ).



**Figure 14:** Respondents report of different impacts of crowding they experience (n = 480)

Respondents were asked to share how they have adjusted their fishing behavior due to the crowding they experience (**Appendix A.16**). Most respondents said by avoiding weekends and holidays (72%) and avoiding certain times (60%) and streams (58%). Respondents were asked to share if there was a particular classification that they experience crowding on more than others (**Figure 15**). Over half of respondents reported experiencing crowding the most on Hatchery Supported streams.



**Figure 15:** Which classification respondents experience crowding on the most (n = 480)

Respondents were asked if there was a specific stream or area that they experienced crowding on more than others. Answers to this question were varied, and respondents listed over 50 different streams and areas, most only getting one or two respondents answering. The two water bodies with the highest numbers of respondents are Wilson Creek (n = 38) and Davidson River (n = 26). These trout anglers were also asked to share if there was a particular month or season that they experience crowding in more than others. Most respondents reported experiencing crowding in the months of April (n = 84), May (n = 41), and June (n = 36). Further, some respondents reported the Summer (n = 34) and Spring (n = 33) seasons as more crowded as well as opening week (n = 40).

**Information Sources About Fishing in North Carolina**

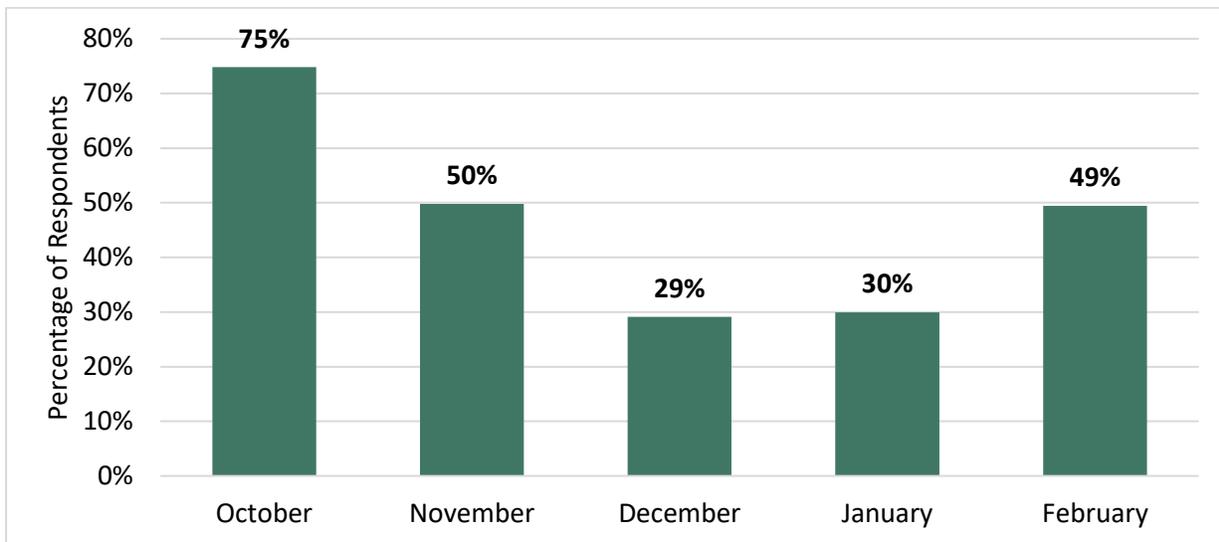
Respondents were asked two questions on their communication preferences. First, they were asked to share how they would like to receive trout fishing information (**Appendix A.17**). Most respondents would like to receive information from the NCWRC website (73%), an email from the NCWRC (57%), or the regulations digest or brochures (53%). Respondents also shared what topics they would like to receive information on (**Table 6**). Most respondents wanted to know stocking schedules and rules and regulation changes.

**Table 6:** Topics respondents would like to receive information on from the NCWRC (n = 197)

Theme	Description	Count
Stocking schedule	Respondents would like to know when and where trout has been stocked, as well as how much.	60
Rules and regulation changes	Respondents would like information on any potential changes to rules and regulations regarding trout fishing, including when stream classifications change.	60
Access changes	Respondents would like to know when access has changed, trout streams have been removed from PMTW, or when more access has opened up.	43

### Trout Stocking Programs

State fish hatcheries support numerous streams throughout the year. Respondents were asked to share their thoughts on expanding the Hatchery Supported program, and what months of the fall and winter they would be interested in fishing (**Figure 16**). Three-quarters of respondents reported interest in fishing during October, with half of respondents expressing interest in November and February. December and January showed lower levels of interest, at about a third of respondents expressing interest.



**Figure 16:** Respondents' preferences on months being able to fish an expanded hatchery-supported program (n = 508)

Respondents were asked questions about their trout fishing habits. The first question asked respondents to share if they mostly fish for stocked trout, wild trout, or both about equally (**Appendix A.18**). Just over half of respondents (56%) reported they mostly fish for stocked trout, but only 12% of respondents

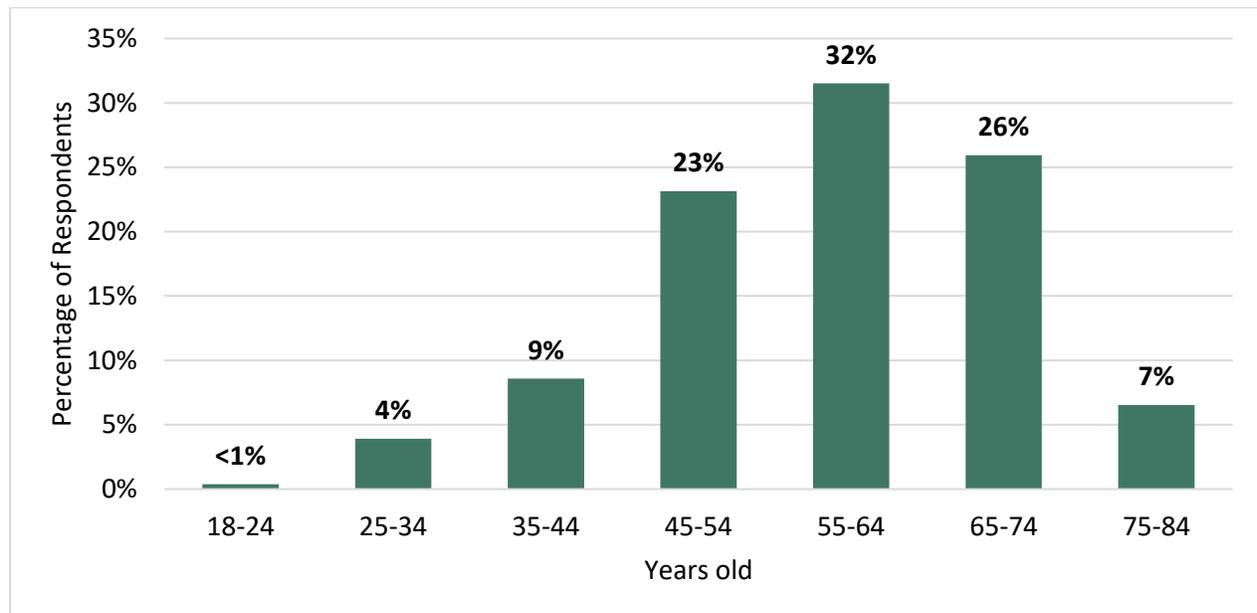
mostly fish for wild trout. When comparing the catching stocked to wild trout gradient to primary water fished, there are statistically significant differences ( $\chi^2 = 251.65$ ,  $p < 0.001$ ). Anglers who primarily fish in Wild Trout Waters report catching mostly wild trout. Alternatively, Hatchery Supported anglers and Delayed Harvest anglers primarily catch stocked trout.

Similarly, just over half of respondents usually release the trout that they catch (54%), and 19% of respondents mostly keep the trout they catch (**Appendix A.19**). When comparing the catch or release gradient to primary water fished, there are statistically significant differences ( $\chi^2 = 113.71$ ,  $p < 0.001$ ). With anglers that primarily fish Hatchery Supported waters, there were relatively even levels of those that selected mostly catch, mostly release, or both equally. Delayed Harvest anglers, Wild Trout anglers, and Catch and Release anglers all primarily released the trout they caught.

### Demographics

The survey was completed by 764 trout anglers for a response rate of 3.04%. Respondents were primarily male (98%), white (98%) and not of Hispanic, Latino/a or Spanish origin (100%, **Appendix A.20**). Respondents also either completed some college or an Associates degree (33%), or a Bachelors or four-year degree (33%), and had a combined household income of \$120,000 or more (33%).

The majority of respondents held primarily residences in North Carolina (87%). Those respondents most often had their primary residence in Wake (n = 32), Buncombe (n = 28), Burke (n = 20) or Catawba (n = 20). Of those respondents that held their primary residence out of state, the most common states were South Carolina (n = 25), Georgia (n = 15), Tennessee (n = 12) and Florida (n = 10). Most respondents were between 55 and 64 years of age (**Figure 17**), but the majority of respondents were over the age of 45.



**Figure 17:** Percentage of respondents in different age categories (n = 536)

## Discussion

### *Socioeconomic Impact*

Results from the economic impact analysis show a large increase in the economic impact of trout fishing from \$383 million in 2015 to \$1.38 billion in 2022. This increase is mainly due to the increase in the estimation of trout anglers and increases in cost of living. In 2015, it was estimated that 18.5% of North Carolina freshwater fishing license holders fished for trout. This percentage increased to 32% in 2022. Additionally, the number of North Carolina freshwater fishing license holders increased from 805,357 in 2014 to 1,233,225 in 2023. This led to a larger multiplier effect when extrapolating survey responses across the population of trout anglers. While the number of trout anglers increased, the cost of living has also increased 29% since 2014 (CPI-U, March 2023). These factors combined may account for the large increase in economic impact.

Additionally, the proportion of resident to nonresident North Carolina trout anglers also differed between the 2015 report and the recent findings. The 2015 study estimated that 82% of North Carolina trout anglers were residents and 18% were nonresidents, while this study found the proportion to be 87% residents and 13% nonresidents. This reduction in the proportion of nonresident trout anglers may also contribute to the increase in overall economic impact as equipment expenditures for nonresidents are not reported as having any economic impact in the state of North Carolina. As a larger proportion of anglers were North Carolina residents, a greater proportion of expenditures were attributed to North Carolina, increasing the overall economic impact to the state.

### *Fishing Participation*

Fishing participation has not changed much since 2015. About half of anglers are still reporting that their fishing participation has stayed the same over the last five years, but the percentage of anglers saying their trout fishing participation has decreased over the last five years has increased from 24% to 31%. This jump may be explained by the increase in recreational fishing due to the COVID-19 pandemic within the last five years (Cooke et al., 2021). As the world shifts back to pre-pandemic activities, it is possible anglers are returning to their pre-2020 fishing activity, which may explain the anglers reporting their trout fishing decreasing.

### *Motivations for Trout Fishing*

The primary motivations for trout fishing for all respondents are the same when compared to the 2015 report. Fishing for sport and fishing for relaxation continue to be the top choices for anglers from 2015 to now, in 2023. In both 2015 and 2023, more advanced anglers selected fishing for the sport as a primary motivation over less experienced anglers. Fishing to spend time with family and friends was also the third most selected reason across both projects. However, in 2014, fishing with family and friends was more important to younger anglers, but in 2023, most anglers who selected family and friends were over the age of 45.

### *Fishing Locations*

In North Carolina, there are six different types of PMTW. In 2015, there were seven. This project shows a marked difference in the most frequently fished type of water. While Hatchery Supported was the most fished in 2015 and 2023, the percentage jumped from 38% (2015) to 58% (2023). The percentage of Delayed Harvest anglers also increased from 21% to 26%. Although anecdotal, the NCWRC continues to hear from increased number of anglers seeking self-sustaining trout opportunities (J. Rash, NCWRC, personal communication). However, these and the remaining classification types (Wild Trout, Catch and Release, Wild Trout Natural Bait and Special Regulation) all decreased.

Anglers reported if they fished for trout mostly public lands, mostly private lands or both about equally, and the results from 2023 are nearly identical to 2015. Both projects also addressed decision making on where to go fishing in North Carolina. Two of the top three statements with the highest level of any kind of importance (somewhat important and very important) are the same in 2023 as they were in 2015, but one was different. Finding a location where fish will be caught and finding a location on public land continue to be an important consideration, but finding a location that is secluded is more important in 2023. In addition, the third top statement in 2015 was finding a location with regulations posted onsite. In this project, anglers over the age of 55 were more likely to report finding a location on public land and finding a location with regulations posted on site as more important than younger anglers, which is different than 2015 in which neither of those statements had age differences. In direct comparison to the 2015 results, more advanced anglers do not rate locations with close parking and locations with restrooms as important as more beginner anglers did, while in 2015, the relationship was the opposite.

### *Types of Fishing Equipment and Bait Used*

When comparing preference of fishing equipment, the percentage of anglers that prefer artificial flies, natural bait and artificial lures are the same from 2015 to 2023. In 2015, 46% of anglers reported preferring artificial flies, and 44% reported the same in 2023. In 2015, 22% of anglers reported preferring artificial lures, while 27% reported the same in 2023. In 2015, 23% of anglers reported preferring natural bait, and 29% reported the same in 2023.

### *Satisfaction or Dissatisfaction with Trout Fishing in North Carolina*

Satisfaction of trout fishing is an area of exploration for both 2015 and 2023. In both reports, 76% of respondents reported being somewhat or extremely satisfied with their trout fishing experience. However, unlike in 2015, there are no statistically significant differences between satisfaction of total experience and primary water fished, age or experience. Also contrary to 2015, in 2023, respondents rated not having enough trout in the streams fished as the most common reason for their dissatisfaction, followed by trout streams being too crowded. In 2015, respondents reported a lack of time to go trout fishing as the most common reason for dissatisfaction.

Respondents who rated how well the NCWRC does at providing trout fishing opportunities as excellent or good has also stayed the same from 2015 (80%) to 2023 (79%). However, there are no trends across ages or experience. But anglers who primarily fish in Delayed Harvest waters were more likely to rate the

provided fishing opportunities higher. Respondents also rated trout fishing access in North Carolina as excellent or good similarly from 2015 (78%) to 2023 (80%), except there are more people who reported being somewhat satisfied in 2023 than in 2015. Again, in 2023 there were not any statistically significant differences between access satisfaction and age or experience, but primarily Hatchery Supported anglers reported being more dissatisfied with access than other waters. There are similar sentiments in satisfaction of regulations with 84% being somewhat or very satisfied in 2023, and 82% in 2015, but there were no statistically significant differences in 2023 across age, experience or primary water fished.

There are slightly different results on how respondents' rate how their fishing quality has changed since they started trout fishing. In 2015, 42% of anglers reported their trout fishing experience has not changed since they began trout fishing. This number has declined to 31% in 2023. The question did change between 2015 and 2023, with the shift to much better, a little better, a little worse, and much worse instead of improved, declined, have not been fishing more than five years, and unsure. When comparing those that reported their trout fishing experience has improved in 2015 to those that reported their trout fishing has gotten a little better or much better in 2023, the percentage increased from 19% to 30%. However, similarly, the percentage of respondents who reported their trout fishing experience has declined or gotten a little or much worse also increased from 17% to 39%. Since the question comparison is not identical, the notable result is that while the percentage of respondents that thought their trout fishing experience improved and declined in 2015 was relatively similar (19% to 17%), the percentage of respondents that reported their trout fishing experience has gotten worse is 9% higher than the percentage of respondents that reported their trout fishing experience has gotten better. However, the percentage of anglers that are satisfied with their experience (76%) is consistent over time.

### *Problems Encountered & Possible Solutions with Trout Fishing Access*

Some of the top problems encountered in 2015 are similar to the problems anglers are experiencing in 2023. The top six issues in 2015 were crowding, lack of access, not knowing if the access areas are on public or private land, not knowing where to go fishing, poorly marked access areas, and having to travel far to access the water to fish. In 2023, the statements with more than 50% of respondents indicating they were minor or major problems were crowding, lack of access, poorly marked access areas, not knowing where to go fishing, not enough parking at access sites, not knowing if the access areas are on public or private land and an inability to contact the landowner to ask permission to access water from their land. The top two problems encountered are the same now as they were in 2015, but parking and not being able to talk to landowners are new issues in 2023.

Similar to 2015, respondents generally thought the solutions to potential issues would be effective in 2023. The only potential solution that received more than 10% of respondents reporting it would be not at all effective is having more boating access areas.

### *Guided Fishing Trips*

While most respondents in both 2015 and 2023 reported not purchasing a guided fishing trip for trout, 25% of respondents in 2023 reported purchasing a guided fishing trip while that percentage was lower (20%) in 2015.

### *Self-Rating of Skills*

Both the 2015 and 2023 projects asked respondents questions about how anglers would rate their expertise in trout fishing. However, there were three options in 2015 (beginner, intermediate, and advanced), and there are five options in the 2023 report (beginner, competent, proficient, advanced and expert). When combining beginner and competent into one “Beginner” category for 2023, 27% of anglers reported they had low levels of expertise, compared to the 17% from 2015. Advanced (Advanced and expert) anglers also increased from 36% in 2015 to 41% in 2023. This means that the middle category, intermediate (proficient in 2023), decreased from 46% to 32%. Roughly, the beginner, proficient, advanced categories are more evenly distributed in 2023 than they were in 2015.

### *Information Sources About Fishing in North Carolina*

Communication sources were surprisingly similar from 2015 to 2023. While the questions were slightly different, the general results can be compared. Respondents in 2015 reported looking for trout fishing information on the internet, and in 2023, anglers want to receive communication through the NCWRC website or through an email from the NCWRC, which are both on the internet. Respondents in 2015 reported getting information about trout fishing from the NCWRC, and with respondents wanting information from the NCWRC through the website or an email. In 2015, only 18% of respondents reported getting information from social media, and in 2023, the number of respondents who would prefer to receive trout fishing information through social media platforms dropped slightly to 15%.

## Conclusion

In conclusion, most respondents are satisfied with their trout fishing experience. Crowding and lack of access continue to be barriers to satisfaction. Based on these barriers and other results, this project can reinforce the ideals that the NCWRC has a positive-majority sentiment, and management actions should be weighed against this. Further, results of this study show that trout fishing had a total economic impact of \$1.38 billion in 2022, which means for every dollar trout anglers spend, \$1.93 is returned to the state economy.

Issues relating to access remain and are getting worse. Approximately 85% of Hatchery Supported Trout Waters exist on private lands, while very few Wild Trout Waters exist outside of United States Forest Service land. Waters on private land remain within the program at the prerogative of the landowner. Unfortunately, this has meant that angling opportunities are routinely lost, access is often fragmented, and efforts to provide high-quality angling opportunities are challenging. Anglers across all surveys and through direct interaction with staff, continue to highlight the importance of angling access. Falling alongside the access issues is the emerging issue surrounding crowding. As access decreases, crowding will continue to grow as a barrier to a satisfactory trout fishing experience.

Survey results indicate support for expanded opportunities in Hatchery Supported Trout Waters, with fall stockings being the favored alternatives. Given the finite number of hatchery trout, the NCWRC must be judicious with how those fish are allocated, so these data will help staff consider management

alternatives. Furthermore, survey results demonstrate an increased usage in Hatchery Supported Trout Waters, and within that usage, there appears to be greater usage by a diversity of trout anglers (i.e., catch-and-release anglers). This change in usage likely mirrors staff observations of more traditional Delayed Harvest Trout Waters anglers exploring Hatchery Supported Trout Waters via catch-and-release practices with artificial flies. Adding October and November stocking dates to selected Hatchery Supported Trout Waters will help support this emerging user group, and potentially, help lessen crowding effects on Delayed Harvest Trout Waters.

Future surveys may focus on the impact of the Setzer Hatchery renovation and subsequent closure and programmatic impacts as well as focus on the 18–40-year-old trout angling demographic.

## Acknowledgements

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## Literature Cited

Cooke, S. J., Twardek, W. M., Lynch, A. J., Cowx, I. G., Olden, J. D., Funge-Smith, S., ... & Britton, J.

R. (2021). A Global Perspective on the Influence of the COVID-19 Pandemic on Freshwater Fish Biodiversity. *Biological Conservation*, 253, 108932.

Dillman, D. A., Smyth J.D., & Christian, L. M. (2014). *Internet, Phone, Mail and Mixed- Mode Surveys: The Tailored Design Method*, 4<sup>th</sup> ed. Hoboken, NJ: John Wiley & Sons

Responsive Management. (2008). *North Carolina Trout Anglers' Participation in and Satisfaction with Trout Fishing and Their Opinions on Specific Regulations*.

Responsive Management & Southwick Associates. (2008). *The Economic Impact of Mountain Trout Fishing in North Carolina*.

Responsive Management. (2015). *North Carolina Landowners' Attitudes Toward Trout Fishing Access*.

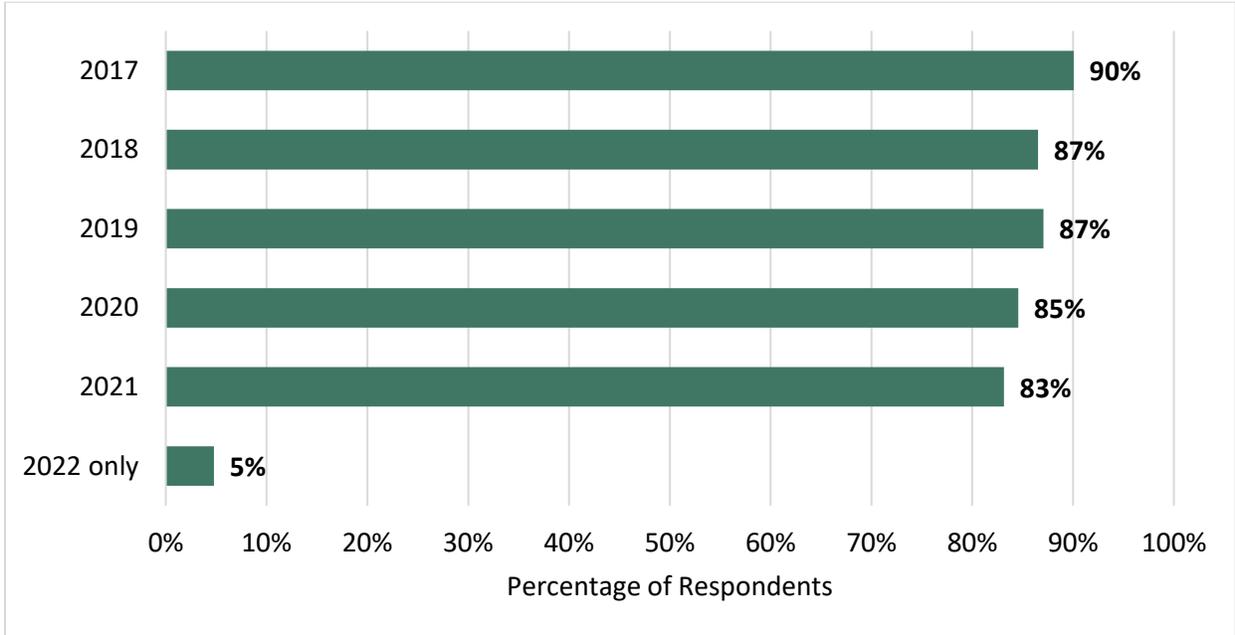
Responsive Management. (2015). *Trout Anglers' Participation in and Opinions of Trout Fishing in North Carolina*.

Responsive Management & Southwick Associates. (2015). *Mountain Trout Fishing: Economic Impacts on and Contributions to North Carolina's Economy*.

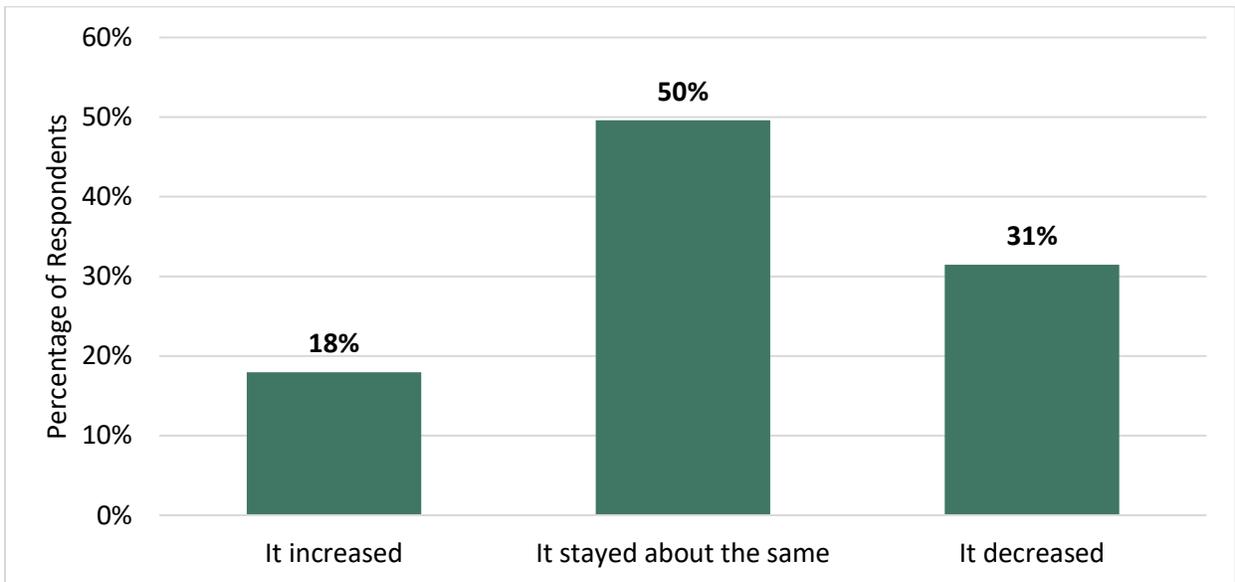
# Appendices

## Appendix A: Tables and Figures

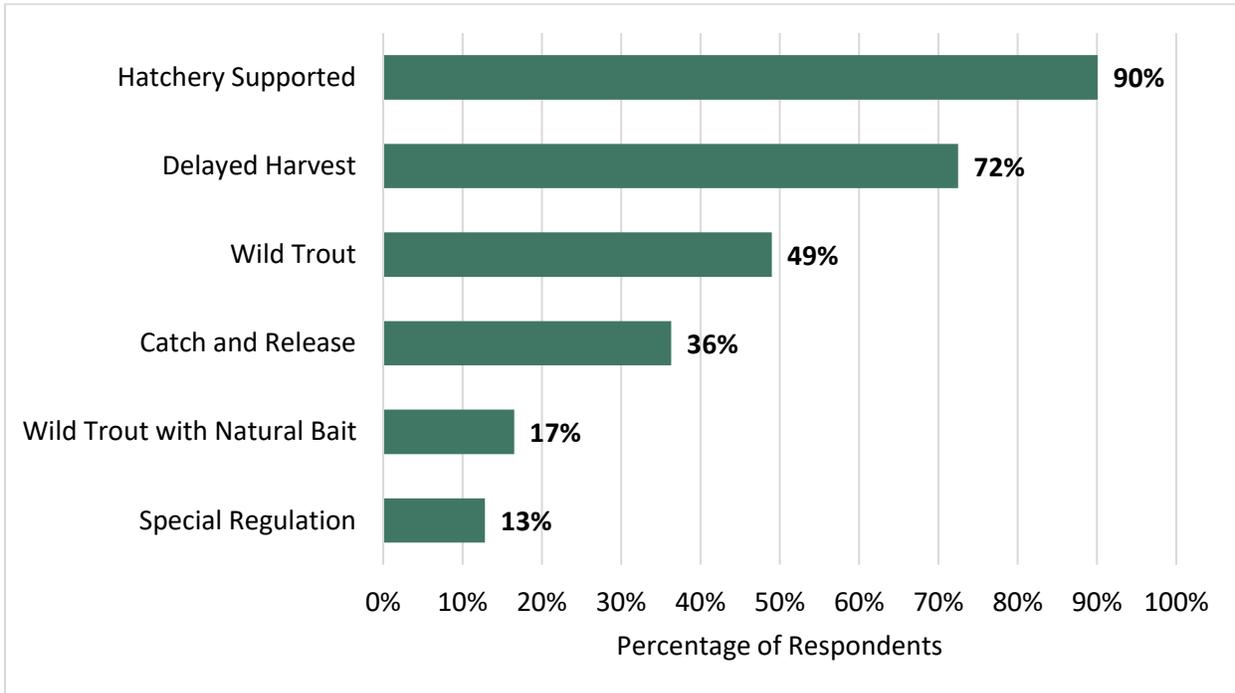
**Appendix A.1:** Respondents trout fishing participation before 2022 (n = 564)



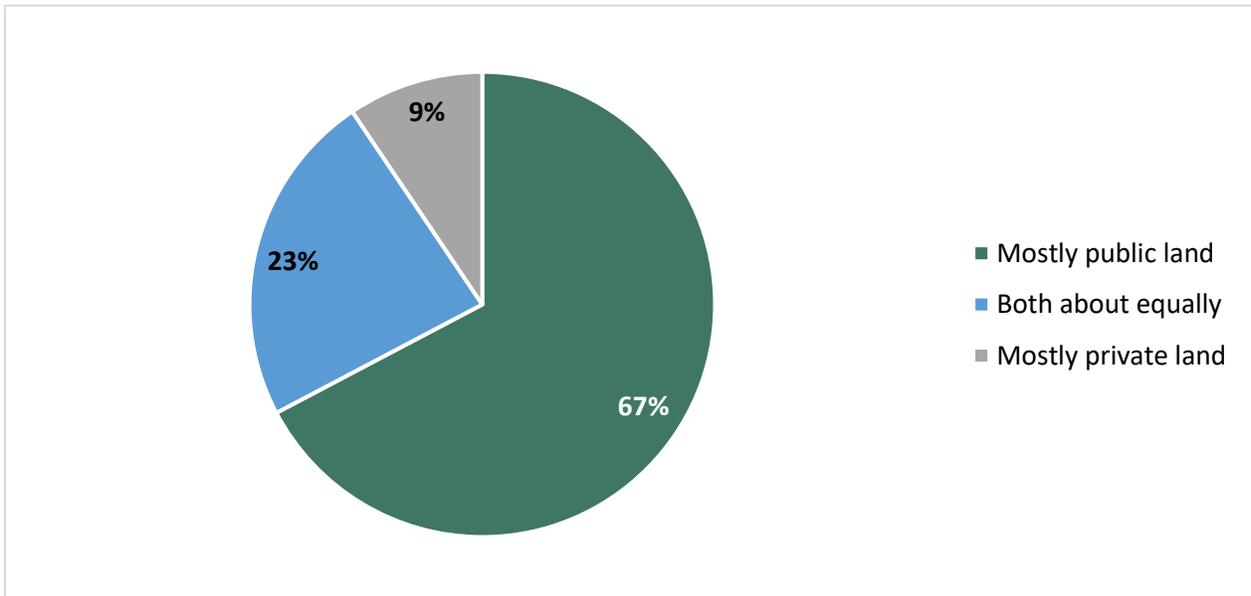
**Appendix A.2:** How respondents' level of trout fishing activity has changed over time (n = 513)



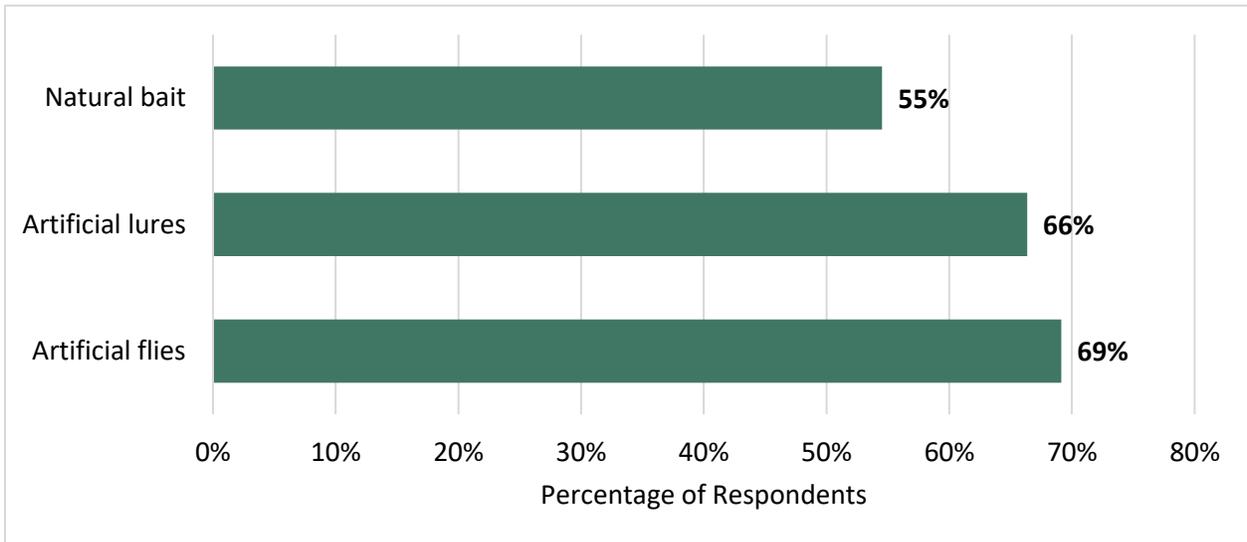
**Appendix A.3:** Respondents fishing participation at each of Public Mountain Trout Waters classifications (n = 545)



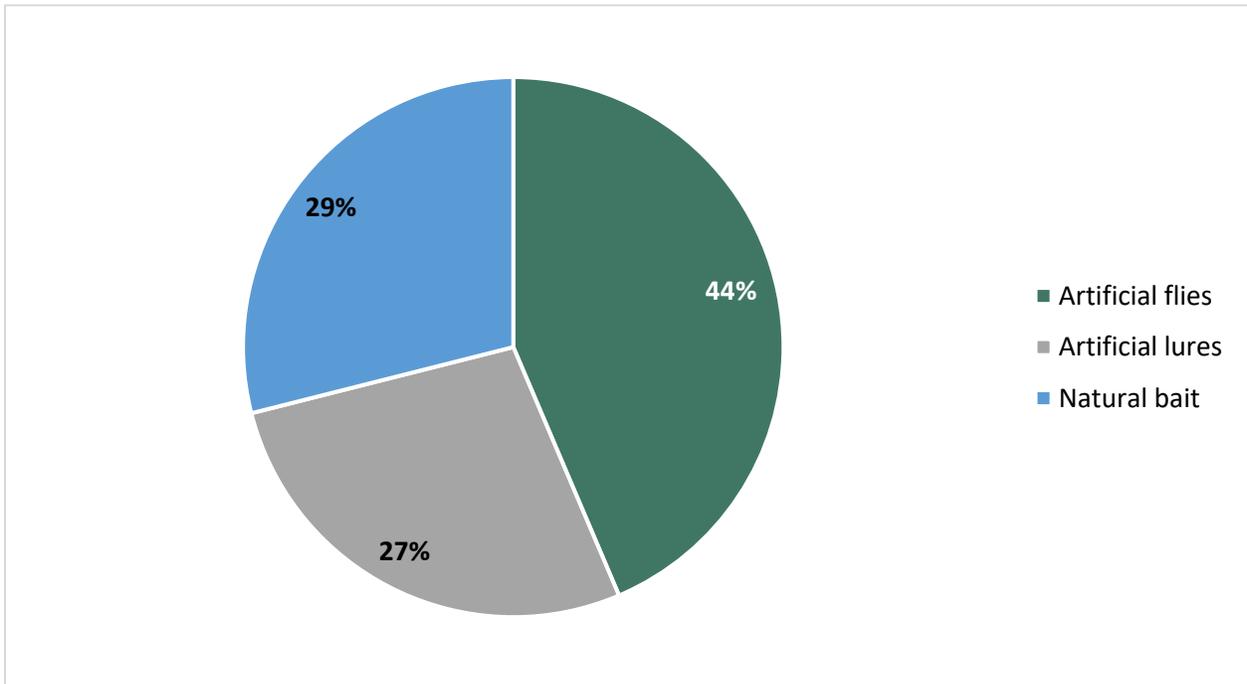
**Appendix A.4:** Breakdown of respondents trout fishing on private or public land (n = 541)



**Appendix A.5:** The types of tackle respondents use during trout fishing (n = 541)



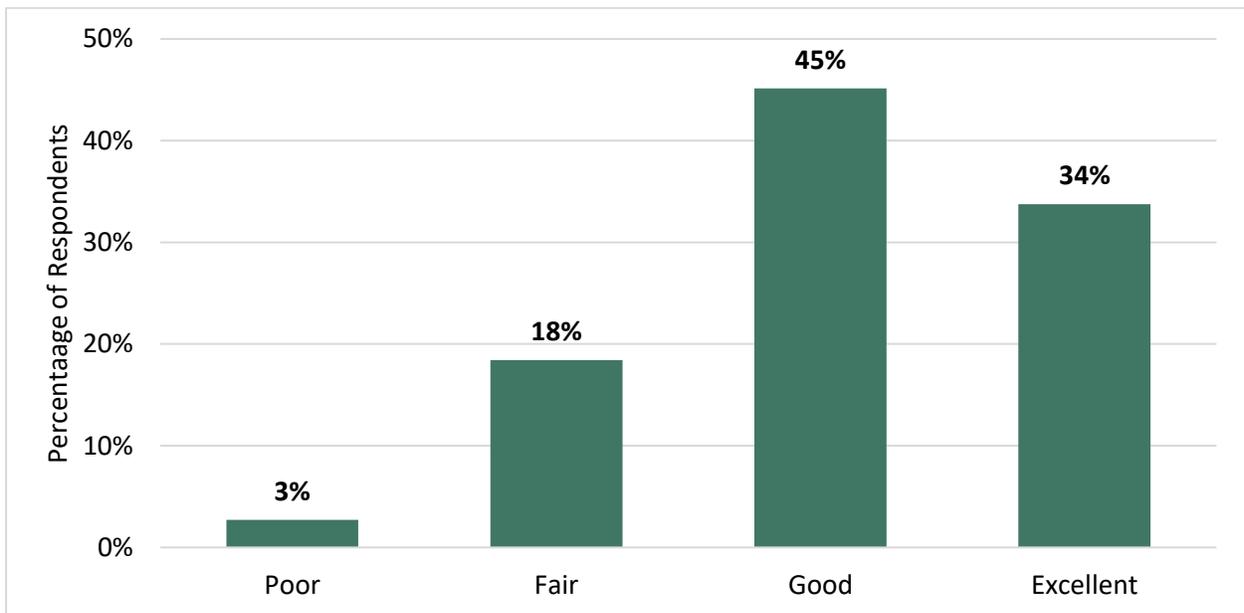
**Appendix A.6:** If respondents used more than one type, what their top preference was for what kind of tackle they would use (n = 539)



**Appendix A.7:** Other reasons why respondents were not satisfied with their trout fishing experience (n = 41)

Theme	Description	Count
Decreased access	Dissatisfaction stemming from increasing posted land, closed access roads, etc.	14
Crowding	Dissatisfaction stemming from overcrowding from anglers.	5
Not enough enforcement	Dissatisfaction stemming from witnessing illegal activities and wishing there was more enforcement on the streams.	5

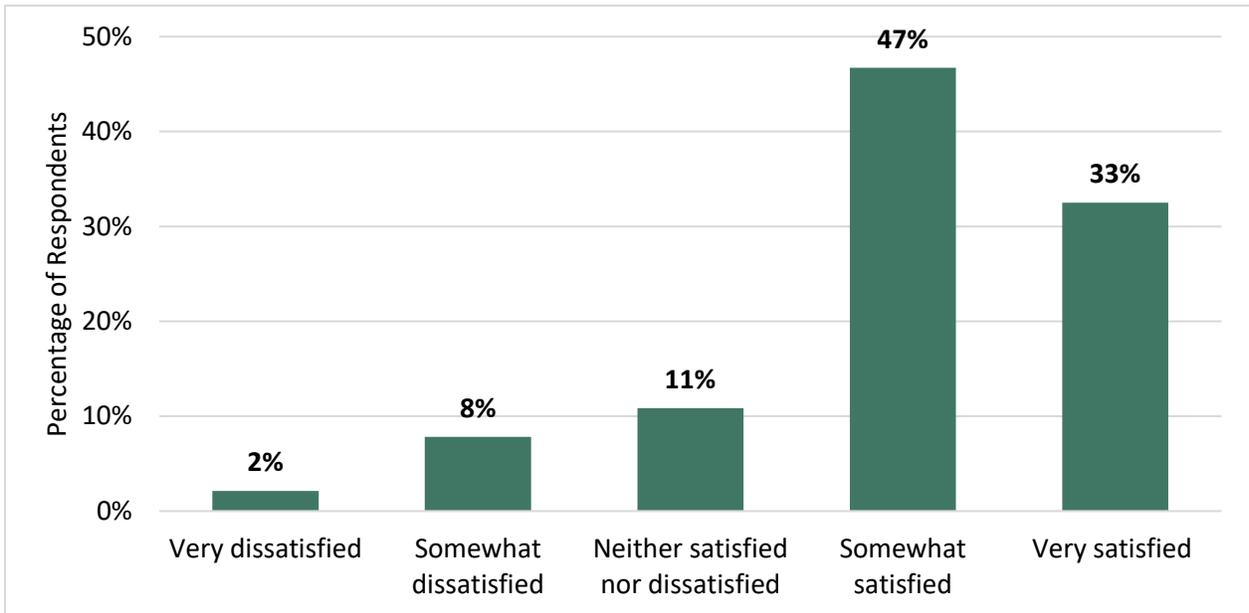
**Appendix A.8:** Respondents rating of the NCWRC performance in providing trout fishing opportunities (n = 554)



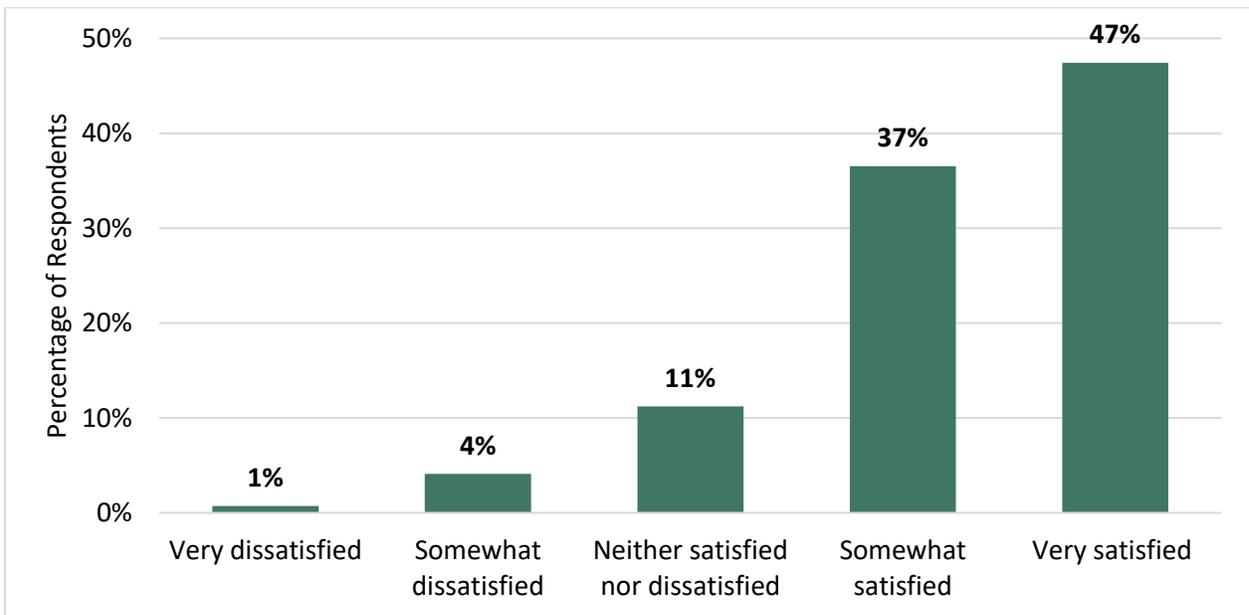
**Appendix A.9:** Respondents recommendations for ways we could improve trout fishing opportunities (n = 246)

Theme	Description	Count
Increase stocking	Respondents suggested more stocking, including stocking larger fish, stocking in rural areas, and spreading out the density of stocked fish.	76
Increase access	Respondents suggested providing more access to trout streams, as well as protecting the current access points.	29
Increase enforcement	Respondents suggested increasing the enforcement presence on trout streams, especially during opening day.	28

**Appendix A.10:** Respondents satisfaction with current public trout fishing access (n = 563)



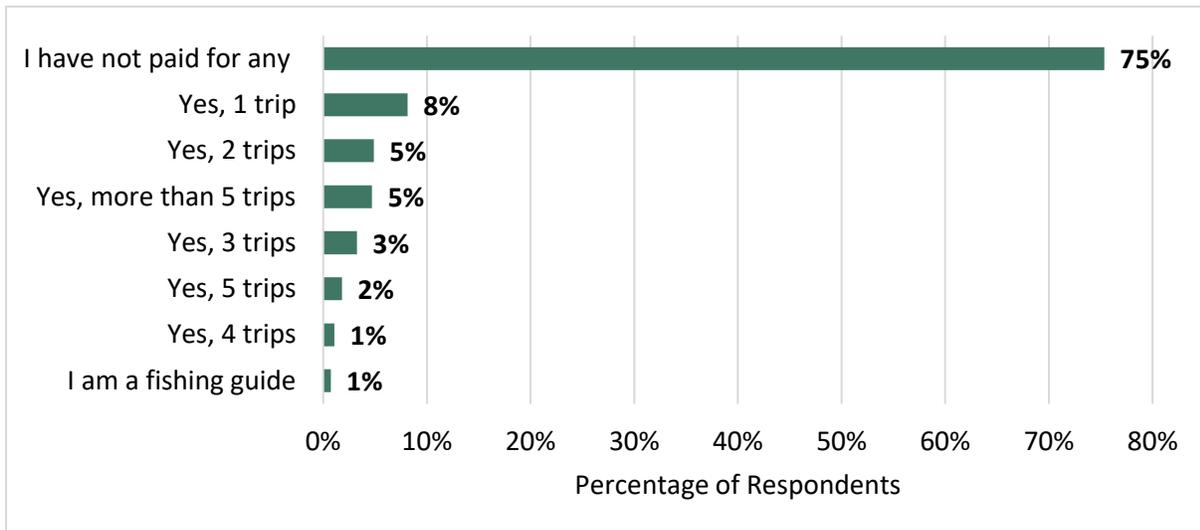
**Appendix A.11:** Respondents satisfaction with trout fishing regulations (n = 561)



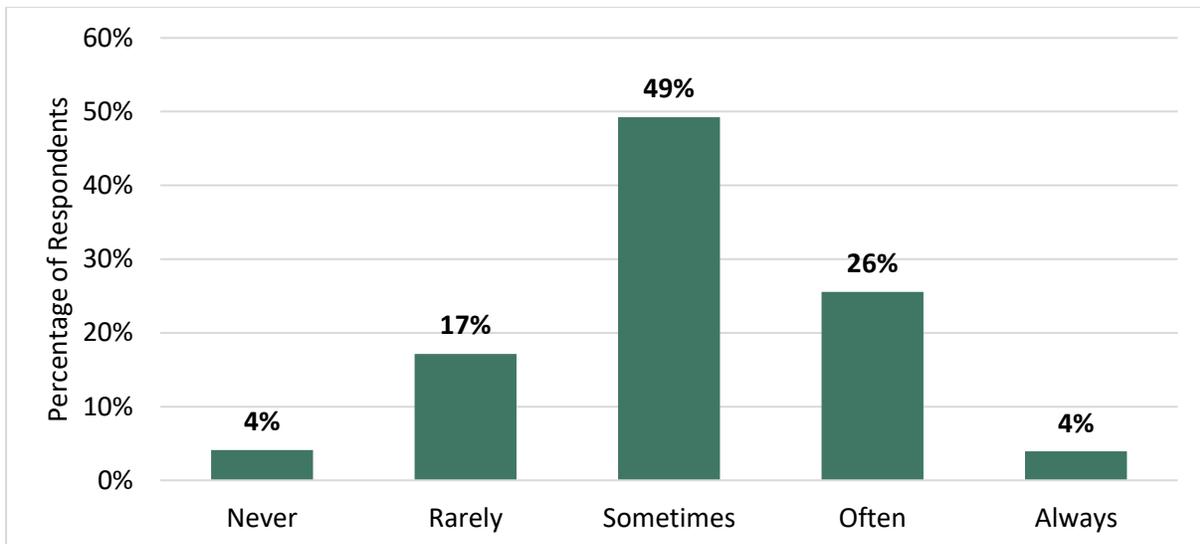
**Appendix A.12:** Respondents ideas on improving trout regulations to make them more satisfied (n = 157)

Theme	Description	Count
Simplify regulations	Respondents described continuing to simplify trout regulations to improve their satisfaction with regulations	27
Increase enforcement	Respondents suggested increasing the enforcement of the current rules and regulations	18

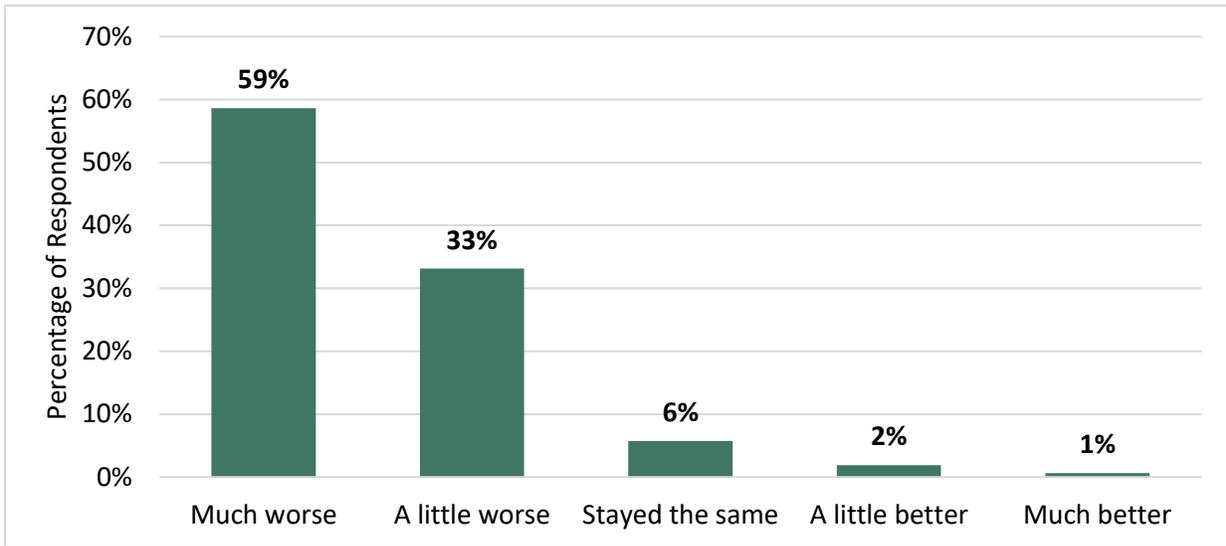
**Appendix A.13:** How many guided fishing trips respondents have purchased in the last five years (n = 552)



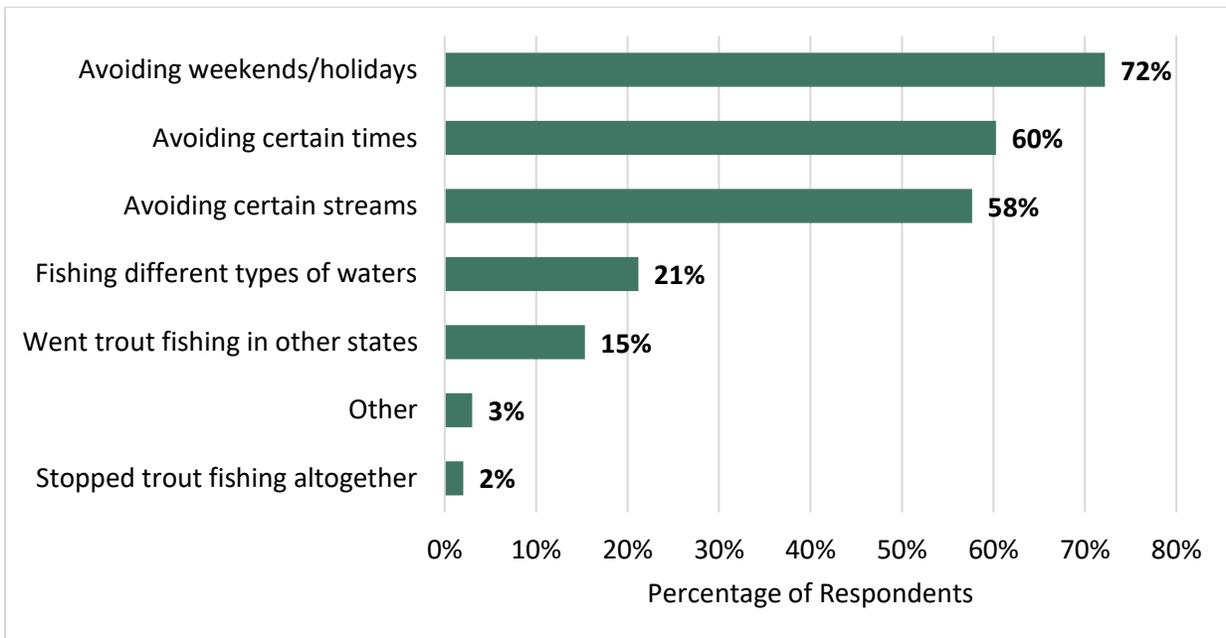
**Appendix A.14:** How often respondents experience crowding on PMTW (n = 536)



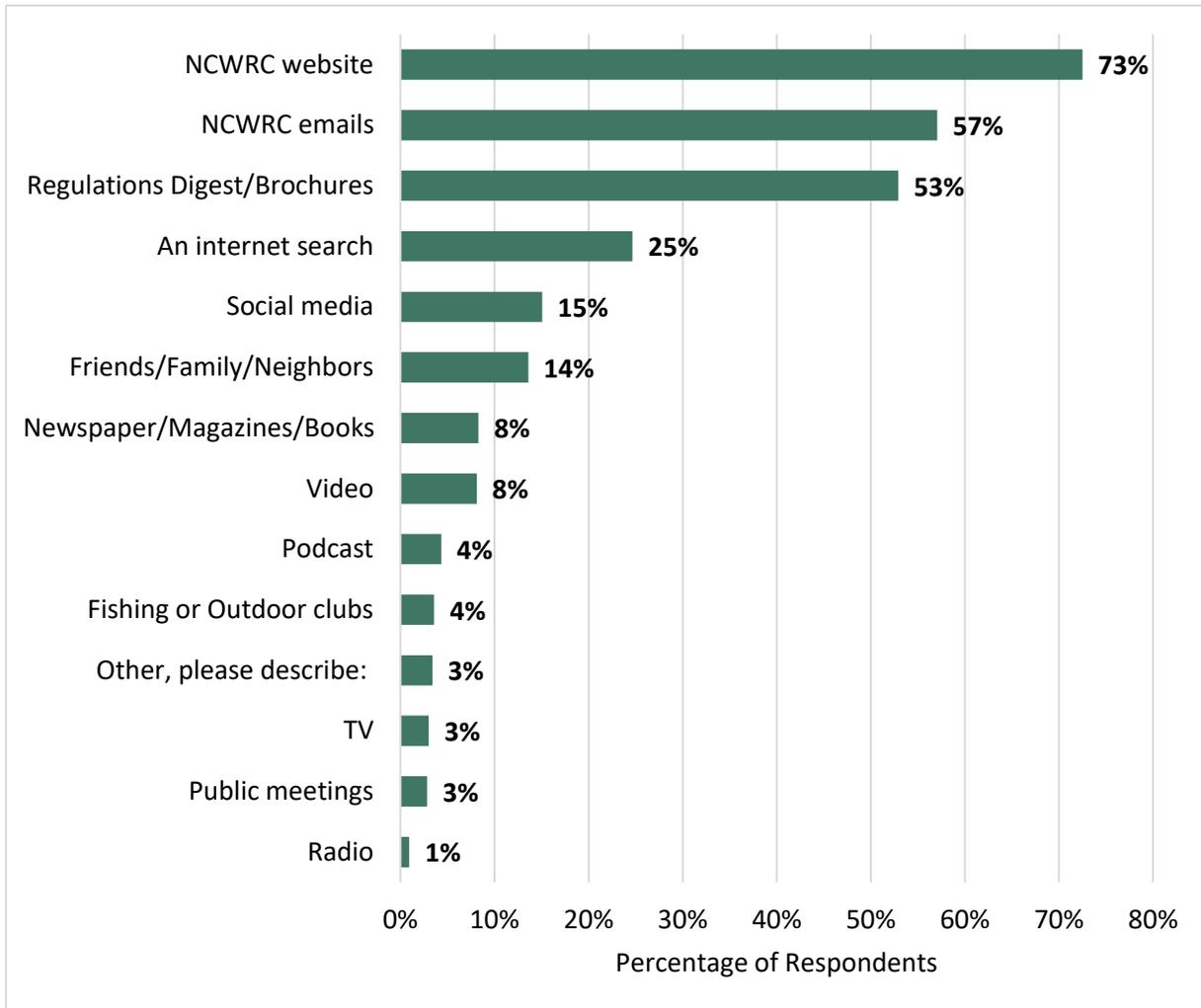
**Appendix A.15:** How crowding on PMTW has changed over time (n = 157)



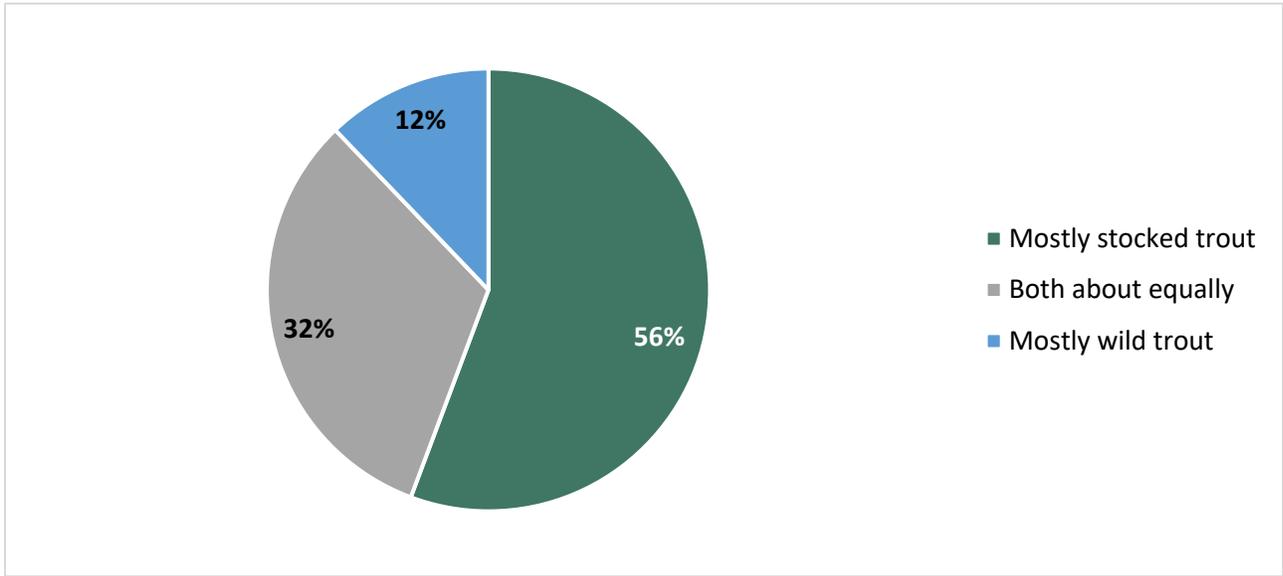
**Appendix A.16:** How respondents have adjusted their fishing behavior to account for crowding (n = 496)



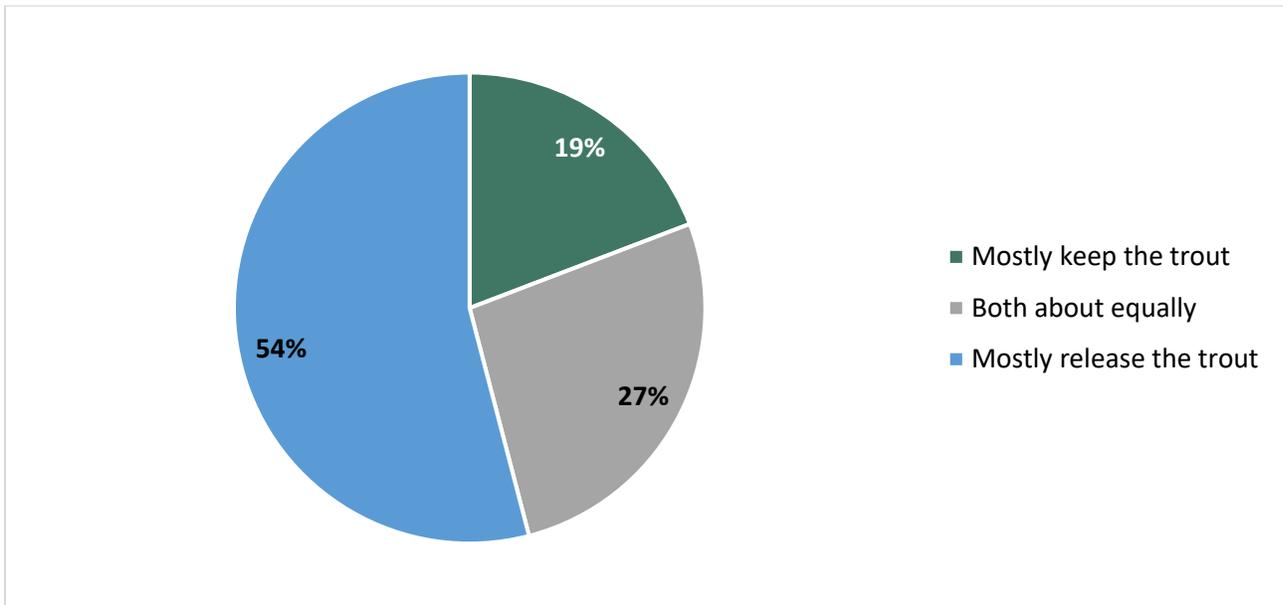
**Appendix A.17:** Respondents preferences of where they receive trout fishing information from (n = 531)



**Appendix A.18:** Breakdown of respondents that fish for stocked or wild trout (n = 535)



**Appendix A.19:** Breakdown of respondents that keep or release the trout they catch (n = 542)



**Appendix A.20:** Demographic characteristics of survey respondents

	n	%
<b>Gender</b>		
Male	526	98%
Female	13	2%
<b>Race</b>		
White	515	98%
American Indian or Alaskan Native	8	2%
Other	5	1%
Black or African American	2	<1%
Asian	2	<1%
Native Hawaiian or Pacific Islander	2	<1%
<b>Ethnicity</b>		
Not Hispanic, Latino/a, or Spanish	505	100%
Hispanic, Latino/a, or Spanish	0	0%
<b>Education</b>		
Less than high school	2	<1%
High school diploma	75	14%
Some college or Associates degree	176	33%
Bachelors or 4-year degree	173	33%
Graduate or professional degree	101	19%
<b>Household income</b>		
Less than \$20,000	7	2%
\$20,000-\$39,999	31	7%
\$40,000-\$59,999	53	12%
\$60,000-\$79,999	92	21%
\$80,000-\$99,999	64	14%
\$100,000-\$119,999	52	12%

## Appendix B: Survey Instrument

### Block A: Consent, Screening and Hybrid Striped Bass Reservoirs

1. The N.C. Wildlife Resources Commission (NCWRC) is conducting a study of licensed anglers to learn more about fishing participation in North Carolina. This survey will take approximately 12-15 minutes to complete. Any information you provide during the survey will be kept confidential and no personal details will be shared. You may opt out of any questions that you feel uncomfortable answering by skipping them. By agreeing to participate in the survey, you acknowledge that you have read and understood the voluntary nature of your participation, that you are at least 18 years of age, and that you may choose to enter a prize drawing for full completion of the survey.

Do you agree to participate?

- Yes
- No *skip to end of survey*

2. Did you fish for either of the following species in 2022? *Select all that apply.*

- ❖ Freshwater Trout (Brook, Brown or Rainbow)
- ❖ Striped Bas or Hybrid Striped Bass in reservoirs
- ❖ No *skip to end of survey*

3. *If only striped bass or hybrid striped bass is selected in question #2* Thank you for your time. The purpose of this survey is to assess opinions from Trout anglers. Later this year, we will be sending out a survey to Striped Bass anglers. Would you be interested in taking a survey on Striped Bass and Hybrid Striped Bass in reservoirs in the future?

- Yes
- No

4. What email can we send that survey to? It will be sent during the summer.

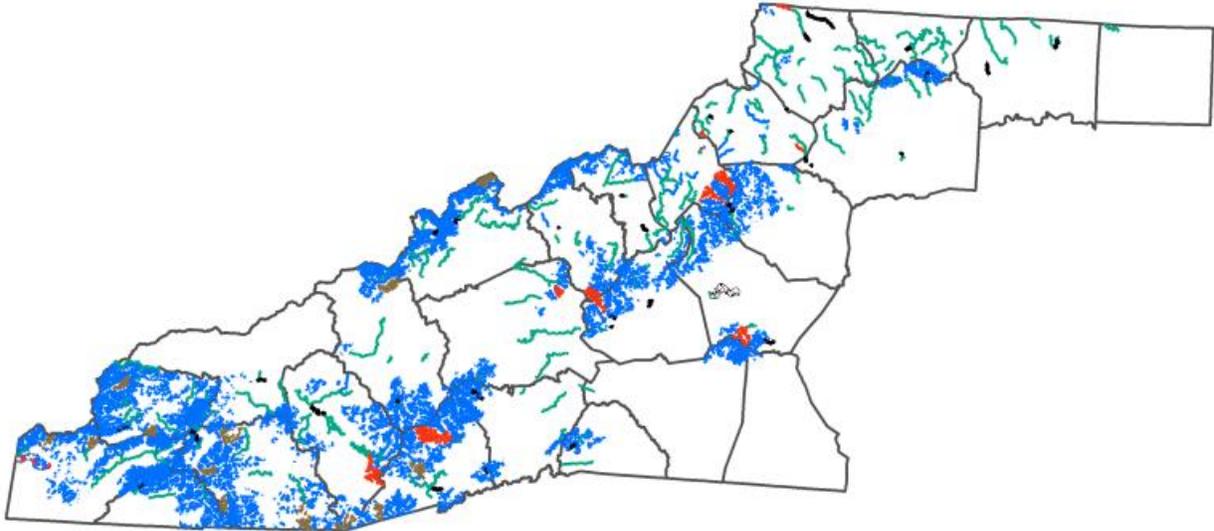
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*If Trout or Striped Bass or selected in question #2*

The N.C. Wildlife Resources Commission (NCWRC) wants to know more about your:

- Trout fishing habits and motivations
- Satisfaction with trout fishing in NC

As a valued North Carolina angler, your participation in this survey will help us better understand your preferences as a trout angler.



5. Did you fish for trout in waters managed by the NCWRC (Public Mountain Trout Waters) in 2022?

- Yes
- No
- I'm unsure

**Block B: Economic Impact Questions**

6. In 2022, how many days did you spend fishing? \_\_\_\_\_

7. In 2022, how many days did you spend fishing for **trout**? \_\_\_\_\_

8. In 2022, how many trips did you take **trout** fishing (A trip can be a single day or several days)? \_\_\_\_\_

9. Approximately how many **miles** did you travel, one-way, on a typical trip from your residence to go trout fishing **most often**? \_\_\_\_\_

10. How many people did you usually pay for on a typical trout fishing trip including yourself? (i.e. you and a friend, you and your family, etc.) \_\_\_\_\_

11. About what percentage of your spending took place in the North Carolina county where you fished most often? \_\_\_\_\_

12. On a typical **freshwater trout fishing** trip in the last 12 months in North Carolina, how much did you spend for the following? *(Include the amount that you spent for all persons you covered the costs for or shared the costs with (i.e. children, spouse)*

**Food & Beverages**

- Meals (Food & drinks) at restaurants (including tips) \_\_\_\_\_
- Food & drinks purchased at convenience/special food stores \_\_\_\_\_
- Food purchased at a Grocery Store or Supermarket \_\_\_\_\_

**Transportation to and from where you fish:**

- Gasoline & oil for car and boat \_\_\_\_\_
- Repair/Service for Automobile, Truck, SUV, or Trailer \_\_\_\_\_
- Vehicle (car, RV, ATV, etc.) or boat rental \_\_\_\_\_
- Airfare, train, and other public transportation \_\_\_\_\_
- Other transportation costs, please specify: \_\_\_\_\_

**Activity Expenses**

- Fishing gear (Clothes, rods, lures, etc.) \_\_\_\_\_
- Bait (live, cut, prepared) \_\_\_\_\_
- Equipment rentals (boats, camping, etc.) \_\_\_\_\_
- Special licenses or permits (trip-specific) \_\_\_\_\_
- Access & launching fees \_\_\_\_\_
- Guide/outfitter or charter fees \_\_\_\_\_
- Camping & outdoor sporting goods supplies \_\_\_\_\_
- Other, please specify: \_\_\_\_\_

**Lodging**

- Hotel or Motel \_\_\_\_\_
- Other lodging (Bed & breakfast, cabin, campground) \_\_\_\_\_

**Other trip expenses**

- Souvenirs and gifts \_\_\_\_\_
- Other entertainment expenses during trip (visiting museums, movies, etc.) \_\_\_\_\_
- Other expenses, please specify: \_\_\_\_\_

13. Did you purchase any of the following items in 2022? *Select all that apply.*

- ❖ Rods & reels
- ❖ Fishing tackle (line, artificial baits, hooks, weights, etc.)
- ❖ Fishing gear (tackle and fly boxes, landing nets, downriggers, rod holder, wading staff, etc.)
- ❖ Fly tying equipment
- ❖ Electronic fishing equipment (depth finders, fish finders, etc.)
- ❖ Clothing (fishing vests, waders, rain gear, etc.)
- ❖ Life jackets, PFDs
- ❖ Books and magazines
- ❖ Cameras, binoculars
- ❖ Camping equipment (sleeping bags, packs, tents, etc.)
- ❖ Adaptive fishing gear (pole holder, easy-grip gloves, etc.)
- ❖ Other fishing purchases (scales, knives, scuba equipment, etc.)
- ❖ Motorized boat
- ❖ Non-motorized boat (canoe, kayak, raft, drift boat, float tube, etc.)
- ❖ Boat accessories (motor, trailer/hitch, etc.)
- ❖ Boat storage
- ❖ Vehicle (car, truck, camper, RV, ATV, 4-wheeler, etc.)
- ❖ Dues or contributions to state or local organizations or clubs
- ❖ Taxidermy
- ❖ Coolers
- ❖ Bug spray, sunscreen

14. What was the total cost for the following items you purchased in 2022? *Carry forward choices selected in question #13*

- Rods & reels \_\_\_\_\_
- Fishing tackle (line, artificial baits, hooks, weights, etc.) \_\_\_\_\_
- Fishing gear (tackle and fly boxes, landing nets, downriggers, rod holder, wading staff, etc.) \_\_\_\_\_
- Fly tying equipment \_\_\_\_\_
- Electronic fishing equipment (depth finders, fish finders, etc.) \_\_\_\_\_
- Clothing (fishing vests, waders, rain gear, etc.) \_\_\_\_\_
- Life jackets, PFDs \_\_\_\_\_
- Books and magazines \_\_\_\_\_
- Cameras, binoculars \_\_\_\_\_
- Camping equipment (sleeping bags, packs, tents, etc.) \_\_\_\_\_
- Adaptive fishing gear (pole holder, easy-grip gloves, etc.) \_\_\_\_\_
- Other fishing purchases (scales, knives, scuba equipment, etc.) \_\_\_\_\_
- Motorized boat \_\_\_\_\_
- Non-motorized boat (canoe, kayak, rift, drift boat, float tube, etc.) \_\_\_\_\_
- Boat accessories (motor, trailer/hitch, etc.) \_\_\_\_\_
- Boat storage \_\_\_\_\_
- Vehicle (car, truck, camper, RV, ATV, 4-wheeler, etc.) \_\_\_\_\_
- Dues or contributions to state or local organizations or clubs \_\_\_\_\_
- Taxidermy \_\_\_\_\_
- Coolers \_\_\_\_\_
- Bug spray, sunscreen \_\_\_\_\_

15. Have you leased land for trout fishing access within the past five years?

- Yes
- No
- Unsure

16. Did you go fly fishing for trout in 2022?

- Yes
- No

**Block C: Trout Fishing Participation**

17. In which of the previous years did you trout fish? *Select all that apply.*

- ❖ 2021
- ❖ 2020
- ❖ 2019
- ❖ 2018
- ❖ 2017
- ❖ I only fished for trout in 2022

18. Has your level of trout fishing activity changed over time?

- It increased
- It stayed the same
- It decreased
- Unsure

19. Overall, how satisfied were you with your trout fishing experience in North Carolina in 2022?

- Very satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

20. *If not very satisfied, Why were you not satisfied with your trout fishing experience? Select all that apply.*

- ❖ I don't have enough time to trout fish
- ❖ Trout streams are too crowded
- ❖ Other anglers have poor behavior
- ❖ Trout I catch are too small to keep
- ❖ I have no one to fish with
- ❖ There are not enough trout in the streams I fish
- ❖ There are not enough trophy trout
- ❖ I don't have anywhere to fish for trout near me
- ❖ The water quality in trout streams near me is poor
- ❖ It is too expensive to trout fish
- ❖ The seasons do not work in my schedule
- ❖ Trout regulations are too confusing
- ❖ Other, please describe: \_\_\_\_\_

21. To what extent were the following barriers to your trout fishing experience? *Carry forward selected choices from question #20*

	Not a barrier	Minor barrier	Moderate barrier	Major barrier
I don't have enough time to trout fish				
Trout streams are too crowded				
Other anglers have poor behavior				
Trout I catch are too small to keep				
I have no one to fish with				
There are not enough trout in the streams I fish				
There are not enough trophy trout				
I don't have anywhere to fish for trout near me				
The water quality in trout streams near me is poor				
It is too expensive to trout fish				
The seasons do not work in my schedule				
Trout regulations are too confusing				
Other, please describe: _____				

22. Overall, how well does the NCWRC do in providing Trout fishing opportunities in the state?

- Excellent
- Good
- Fair
- Poor
- I don't know

23. *If excellent is not selected* Is there anything the NCWRC could do to improve trout fishing opportunities? \_\_\_\_\_

24. How satisfied or dissatisfied are you with **public access** to places to go trout fishing in North Carolina?

- Very satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

25. *If not very satisfied* What would make you more satisfied with Trout fishing access in North Carolina?

\_\_\_\_\_

26. Overall, are you satisfied or dissatisfied with the current Trout fishing **regulations** in North Carolina?

- Very satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Very dissatisfied

27. *If not very satisfied*, What would make you more satisfied with trout fishing regulations in North Carolina? \_\_\_\_\_

28. How has the quality of your experience changed since you began trout fishing?

- Yes, it has gotten ***much worse***
- Yes, it has gotten ***a little worse***
- No, it has ***stayed the same***
- Yes, it has gotten ***a little better***
- Yes, it has gotten ***much better***

29. How has trout fishing changed since you began trout fishing? \_\_\_\_\_

30. What was your single MAIN reason for trout fishing in North Carolina in 2022?

- To catch fresh fish for food
- To be with family and friends
- For the sport
- To catch large fish
- To catch large numbers of fish
- To be close to nature
- For relaxation
- Other, please describe: \_\_\_\_\_
- Unsure

31. Have you paid for guided fishing trips at any time during the last 5 years?

- Yes, 1 trip
- Yes, 2 trips
- Yes, 3 trips
- Yes, 4 trips
- Yes, 5 trips
- Yes, more than 5 trips
- I am a fishing guide
- I have not paid for any guided trips in the past 5 years
- Unsure

32. Please share the importance of each of the following when deciding where to go trout fishing in North Carolina.

	Not important	Somewhat important	Very important
Finding a location close to home			
Knowing I will likely catch a fish			
Finding a location that is secluded			
Finding a location on public land			
Availability for boating access			
Finding a location on private land			
Finding a location with close parking			
Finding an accessible location for disabled anglers			
Finding a location with regulations posted on site			
Finding a location with restroom facilities on site			

33. Are any of these problems you have encountered when accessing locations for trout fishing?

	Not a problem	Minor problem	Major problem
Crowding on water			
Not enough places to access the water to fish			
Poor maintenance of boat ramps, launches, or put-in sites			
Inability to contact the landowner to ask permission to access water from their land			
Not enough parking at access sites			
Poorly marked public access areas			
Not having enough information on where to access the water to fish			
Not enough boat access areas			
Not having access to docks or piers from which to fish			
Insufficient or poorly maintained roads or trails			
Not being able to find a place to launch a boat			
Not knowing if the access area I want to use is on private or public land			
Finding closed fishing access areas			
Finding closed boating access areas			

34. Do you think these would be very, somewhat, or not at all effective in making it easier for you to access the water for trout fishing in North Carolina?

	Not at all effective	Somewhat effective	Very effective
Having signs that clearly mark access to fishing areas from public/private lands			
More information on water access laws/regulations for fishing in public waters near, or on private land			
Information on a website showing public access areas and access from private lands open to the public			
Maps of fishing and boating access areas on a website			
Having more boating access areas			
NCWRC securing more land for public fishing and boating access areas			
Having land cooperatives through which anglers would share access areas and responsibility for maintaining the area			

35. Currently, trout waters in North Carolina are categorized by six different classifications. Which of the following Public Mountain Trout Waters classifications did you fish in 2022? *Select all that apply.*

- ❖ Hatchery supported waters
- ❖ Delayed harvest waters
- ❖ Wild trout waters
- ❖ Wild trout with natural bait
- ❖ Catch and release waters
- ❖ Special regulation trout waters

36. *Carry forward selections from question #35* How often did you fish the different waters in 2022?

	Just once	2-5 times	6-10 times	More than 10 times
Hatchery supported waters				
Delayed harvest waters				
Wild trout waters				
Wild trout with natural bait				
Catch and release waters				
Special regulation trout waters				

37. *Carry forward selections from question #35* Which type of Public Mountain Trout Waters did you fish the most in 2022?

- Hatchery supported waters
- Delayed harvest waters

- Wild trout waters
- Wild trout with natural bait
- Catch and release waters
- Special regulation trout waters

38. In which North Carolina county did you trout fish **the most days** during the last 5 years? *Drop down of counties with PMTW*

39. In which North Carolina county did you trout fish **the second most days** during the last 5 years? *Drop down of counties with PMTW*

40. In which North Carolina county did you trout fish **the third most days** during the 5 years? *Drop down of counties with PMTW*

41. Did you primarily access trout fishing through public or private land?

- Mostly public land
- Both land types equally
- Mostly private land

42. Have you noticed a change in public trout fishing access?

- Yes, it has gotten ***much worse***
- Yes, it has gotten ***a little worse***
- No, it has ***stayed the same***
- Yes, it has gotten ***a little better***
- Yes, it has gotten ***much better***

**Block D: Trout fishing on private lands**

43. Do you own property with access to Public Mountain Trout Waters?

- Yes
- No
- I don't know

44. If you would like to share more about your experiences about owning land on Public Mountain Trout Waters, please share your email address: \_\_\_\_\_

**Block E: Trout fishing habits**

45. Would you say that you fish mostly for stocked trout, mostly for wild trout, or both about equally?

- Mostly stocked trout
- Both about equally
- Mostly wild trout
- Unsure

46. When trout fishing in North Carolina, do you mostly **keep** the legal trout you catch, mostly **release** them, or do you do both about equally?

- Mostly keep the trout
- Both about equally
- Mostly release the trout
- Unsure

47. How would you rate your expertise as a trout angler?

- Beginner
- Competent
- Proficient
- Advanced
- Expert

48. How many years have you been trout fishing?

- 1-5 years
- 6-10 years
- 11-20 years
- 21-30 years
- More than 30 years

49. When you go trout fishing in North Carolina, do you fish with any of the following?

- ❖ **Artificial flies:** One single hook dressed with feathers, hair, thread, tinsel, rubber or any similar material to which no additional hook, spinner, spoon or similar
- ❖ **Artificial lure:** A fishing lure that neither contains nor has been treated with any substance that attracts fish by the sense of smell or taste
- ❖ **Natural bait:** Any living or dead organism (plant or animal), or parts thereof, or prepared substances designed to attract fish by the sense of taste or smell

50. *If respondents selected more than one option in question #49, and those selections are carried forward* If you had to choose, which of these would you prefer to fish for trout with?

- **Artificial flies:** One single hook dressed with feathers, hair, thread, tinsel, rubber or any similar material to which no additional hook, spinner, spoon or similar
- **Artificial lure:** A fishing lure that neither contains nor has been treated with any substance that attracts fish by the sense of smell or taste
- **Natural bait:** Any living or dead organism (plant or animal), or parts thereof, or prepared substances designed to attract fish by the sense of taste or smell

51. If the WRC could expand opportunities within Hatchery Supported Trout Waters beyond the current months, which months of the year would you be interested in fishing these waters? *Select all that apply.*

- ❖ October
- ❖ November
- ❖ December
- ❖ January
- ❖ February

**Block F: Crowding concerns**

52. How often do you experience over-crowding on Public Mountain Trout Waters?

- Never
- Rarely
- Sometimes
- Often
- Always

53. If so, has it gotten better or worse over time?

- Yes, it has gotten ***much worse***
- Yes, it has gotten ***a little worse***
- No, it has ***stayed the same***
- Yes, it has gotten ***a little better***
- Yes, it has gotten ***much better***

54. Which of the following kinds of over-crowding do you experience? *Select all that apply.*

- ❖ Not enough parking
- ❖ Too many individual anglers in one place
- ❖ Conflicts with outfitters
- ❖ Fishing area competition
- ❖ Trash/litter left behind by anglers
- ❖ Other, please describe: \_\_\_\_\_

55. Have you made any of the following changes to your fishing behavior due to crowding? *Select all that apply.*

- ❖ Avoiding certain streams
- ❖ Avoiding certain times
- ❖ Avoiding weekends/holidays
- ❖ Stopped trout fishing altogether
- ❖ Went trout fishing in other states
- ❖ Fishing different types of water
- ❖ Other

56. Is there a specific **stream classification** you experience over-crowding on more than others?

- Hatchery supported waters
- Delayed harvest waters
- Wild trout waters
- Wild trout with natural bait
- Catch and release waters
- Special regulation trout waters

57. Is there a specific **stream or area** you experience over-crowding on more than others? \_\_\_\_\_

58. Is there a specific **time or month** of the year you experience over-crowding in more than others?  
\_\_\_\_\_

### **Block G: Communication and demographics**

59. How would you prefer to receive information about trout fishing in North Carolina? *Select all that apply.*

- ❖ Friends/Family/Neighbors
- ❖ TV
- ❖ Radio
- ❖ Regulations Digest/Brochures
- ❖ Newspaper/Magazines/Books
- ❖ An internet search
- ❖ NCWRC website
- ❖ Social Media (i.e. Facebook, Twitter, Instagram)
- ❖ Public meetings
- ❖ Fishing or outdoor clubs
- ❖ NCWRC emails
- ❖ Podcast
- ❖ Video (YouTube)
- ❖ Other, please specify:

60. What information would you like to receive from the NCWRC? \_\_\_\_\_

**This last set of questions will help us get to know the people we have the privilege of representing. This information will only be used for internal research purposes and will not be shared with anyone. All responses are voluntary and confidential.**

61. Is your primary residence in North Carolina?

- Yes
- No

62. *If not in North Carolina*, What state is your primary residence in? \_\_\_\_\_

63. *If in North Carolina*, What zip code is your primary residence in? \_\_\_\_\_

64. Please select the gender with which you most identify.

- Male
- Female
- Other
- Prefer not to say

65. What is the highest level of formal education you have completed?

- Less than high school
- High school diploma
- Some college or associates degree
- Bachelors or 4-year degree
- Graduate or professional degree
- Prefer not to say

66. What is your age?

- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65-74 years old
- 75-84 years old
- 85 years or older
- Prefer not to say

67. Please select the race(s) with which you most identify. *Select all that apply.*

- ❖ White
- ❖ Black or African American
- ❖ American Indian or Alaska Native
- ❖ Asian
- ❖ Native Hawaiian or Pacific Islander
- ❖ Other, please describe: \_\_\_\_\_
- ❖ Prefer not to say

68. Are you of Hispanic, Latino/a, or Spanish origin?

- Yes
- No
- Prefer not to say

69. Which of the following best represents your gross household income before taxes last year?

- Less than \$20,000
- \$20,000-\$39,999
- \$40,000-\$59,999
- \$60,000-\$79,999
- \$80,000-\$99,999
- \$100,000-\$120,000
- \$120,000 or more
- Prefer not to say

70. Would you be interested in the WRC contacting you again in the future regarding your trout fishing experiences and observations?

- Yes
- No

71. Would you like to be entered into a prize drawing for one of 6 \$50 Bass Pro Shops gift cards?

- Yes
- No

72. Please enter a valid email address so that we may contact you: \_\_\_\_\_