

# Responsive Management™



## **MOUNTAIN TROUT FISHING: ECONOMIC IMPACTS ON AND CONTRIBUTIONS TO NORTH CAROLINA'S ECONOMY**

**Conducted for the North Carolina Wildlife Resources Commission**

**by Responsive Management and Southwick Associates**

**2015**

# **MOUNTAIN TROUT FISHING: ECONOMIC IMPACTS ON AND CONTRIBUTIONS TO NORTH CAROLINA'S ECONOMY**

**2015**

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## **EXECUTIVE SUMMARY**

### **INTRODUCTION AND METHODOLOGY**

This study was conducted for the North Carolina Wildlife Resources Commission (the Commission) to determine mountain trout anglers' contribution to North Carolina's economy. The study entailed a multi-modal survey of North Carolina licensed anglers and an economic analysis of their spending on mountain trout fishing activities.

A multi-modal survey was chosen to allow trout anglers the most convenience in completing the survey and to increase response rates. The survey questionnaire was developed cooperatively by Responsive Management (in consultation with Southwick Associates) and the Commission and included questions based on previous surveys of trout anglers in North Carolina. Responsive Management conducted pre-tests of the questionnaire to ensure proper wording, flow, and logic in the survey.

The database of licensed resident and nonresident North Carolina freshwater anglers from which the sample was obtained was provided by the Commission. A probability-based random sample of anglers was taken from the database.

Anglers were initially contacted using one of three modes—a telephone call, a postcard, or an email—to introduce the survey to the anglers and encourage them to complete the survey. Postcard and email recipients were encouraged to complete the survey online using a URL address. Postcard recipients could also access the survey online using a Quick Response (QR) code. A toll-free number was made available to postcard recipients and an email address was made available to email recipients so that both postcard and email recipients who needed assistance with the online survey or who preferred to complete it by telephone could contact Responsive Management directly. Finally, an incentive was offered (a chance to win a free lifetime fishing license) to encourage participation in the survey.

The survey was conducted until the target goal of at least 2,000 completed questionnaires by trout anglers was reached (approximately half of which, randomly selected, would get the economic portion of the survey); ultimately, 2,113 trout anglers completed the questionnaire. The survey was

administered from early April to mid-May 2015. The analysis of data was performed using Statistical Package for the Social Sciences as well as proprietary software developed by Responsive Management and Southwick Associates.

Southwick Associates provided the analysis of economic contributions to the North Carolina economy by anglers who fished for trout. This analysis consisted of two components:

- calculation of expenditures made by trout anglers in North Carolina by residency, region, and trout fishery management regime; and
- estimation of the multiplier effects that result from the spending by trout anglers.

The estimation of spending by trout anglers is based on the multi-modal survey of resident and nonresident anglers who fished for trout in 2014. The results of that survey were coupled with counts of licensed anglers and estimates of fishing activity (number of trips) to estimate the total amount of fishing-related spending by anglers, the specific goods and services purchased, and the regional locations of the spending. An input-output model of the North Carolina economy was then used to estimate the economic multiplier effects of the anglers' spending.

The expenditures portion of the survey was divided into two sections: a) trip expenditures associated with the anglers' first trip of the season/most recent trip, and b) equipment expenditures during 2014 for items used for trout fishing. (Note that half of respondents who received this question and who fished for more than one day were asked about their first trip, and the second half were asked about their most recent trip. This was done to remove possible bias if people's first trip of the season was more expensive than their most recent trip. Those anglers who fished only one day and, therefore, were assumed to have made only one trip were simply asked about that one trip.) For the expenditure questions, 935 resident and nonresident trout anglers reported trip expenditures, and 485 resident trout anglers reported equipment expenditures. In total, 935 trout anglers reported any expenditures.

Trip expenditures refer to the purchases of those goods and services that are consumed almost entirely during the fishing trip and are allocated to the regions where the anglers did most of their trout fishing. All trip expenditures were allocated to trips that occurred because fishing was either

the main purpose or one of the purposes of the trip. No expenditures were allocated to trips that would have taken place regardless of the opportunity to go fishing. Other gradations of the response categories allocated 25%, 50%, and 75% of trip expenditures.

Equipment costs are associated with durable goods that are used over the course of multiple trips. Equipment purchases are typically made in the same region where anglers reside, therefore the equipment purchases are allocated to the region where anglers live and purchases made outside of the state by nonresidents do not have an economic impact on the North Carolina economy.

The expenditures made by anglers for trout fishing activities generated additional economic benefits throughout the North Carolina economy beyond the initial angler spending. These additional economic benefits were estimated with an IMPLAN input-output model that relates changes in specific industries to impacts in other industries within the statewide economy. The *direct effect* of angler spending refers to the dollars that are captured by North Carolina businesses that provide the goods and services purchased by anglers. *Indirect effect* refers to the economic activity (e.g., output, employment, income) that occurs in the industries that supply those businesses that are stimulated by the direct effect. The *induced effect* measures the economic activity that results from the household spending of salaries and wages by employees whose jobs are supported by the direct and indirect effects.

## **FISHING PARTICIPATION**

- In 2014, 18.5% of North Carolina freshwater fishing license holders fished for trout. This percentage was determined through screener questions that asked licensed anglers if they had fished for mountain trout; only those who had done so were given the full angler survey, including the expenditure questions.
- A little more than half of trout anglers (58%) fished all 5 of the past 5 years.
- The percentage of trout anglers (only those who have been fishing for at least 5 years) who say that their fishing has increased in the past 5 years is about the same as the percentage who say it

has decreased: 26% say it increased, and 24% say it decreased. Most commonly, trout anglers say it has stayed about the same (49%).

- The mean number of days of trout fishing is 14.16 days; the median is 8 days. The mean number of trips that anglers took to go trout fishing in North Carolina is 10.92 trips; the median is 5 trips.
- Trout anglers were asked to name their most-fished type of water. The top response was Hatchery Supported Trout Waters (38% stated this), followed by Delayed Harvest Trout Waters (21%) and Wild Trout Waters (16%).

### **TROUT FISHING'S EFFECT ON NORTH CAROLINA'S ECONOMY**

- All (resident and nonresident) trout anglers spent \$239.8 million in North Carolina in 2014. The total economic effect of trout fishing is estimated at \$383.3 million, supporting nearly 3,600 jobs.
- In the Mountain Region, all (resident and nonresident) trout anglers spent \$210.7 million in 2014. The total economic effect of trout fishing is estimated at \$334.3 million, supporting nearly 3,200 jobs.
- Hatchery Supported Trout Waters were the most popular destination for trout anglers among the trout fishery management regimes in 2014. All (resident and nonresident) trout anglers spent \$89.7 million fishing these waters. The total economic effect of trout fishing is estimated at \$141.3 million, supporting nearly 1,300 jobs.
- All (resident and nonresident) trout anglers spent \$66.3 million in Delayed Harvest Trout Waters. The total economic effect of trout fishing is estimated at \$108.4 million, supporting over 1,000 jobs.



- Resident trout anglers spent \$38.7 million in Wild Trout Waters. (Note that the nonresident sample was too small in Wild Trout Waters for analysis.) The total economic effect of resident trout fishing is estimated at \$60.8 million, supporting approximately 550 jobs.

## TABLE OF CONTENTS

Introduction and Methodology .....	1
Questionnaire Design .....	1
Survey Sample .....	2
Contact Procedures .....	4
Initial Contact .....	4
Follow-Up Contacts and Reminders .....	9
Survey Administration .....	9
Surveying Dates and Times .....	10
Estimation Procedures: The Economic Contributions of North Carolina Trout Fishing .....	11
Trout Angler Expenditures .....	12
Trip Expenditures .....	14
Equipment Expenditures .....	14
Multiplier Effects and Economic Contributions .....	15
Sampling Error .....	16
Fishing Participation .....	17
Trout Fishing's Effect on North Carolina's Economy .....	23
About Responsive Management .....	46

## LIST OF FIGURES

Figure 1.1. Postcard, Side 1 .....	6
Figure 1.2. Postcard, Side 2 .....	7
Figure 1.3. Template for Email Invitation .....	8
Figure 1.4. North Carolina Regions Used in Study .....	11
Figure 1.5. Conceptual Framework for Estimation of the Economic Contributions of Trout Angler Spending in North Carolina .....	12
Figure 1.6. Sampling Error Equation .....	16
Figure 2.1. Number of Years Trout Fishing in the Past 5 Years .....	18
Figure 2.2. Self-Assessed Participation Trend .....	19
Figure 2.3. Days Fished for Trout .....	20
Figure 2.4. Trips Taken to Fish for Trout .....	21
Figure 2.5. Types of Trout Waters Fished by Trout Anglers .....	22

## LIST OF TABLES

Table 1.1. Contact Effort .....	9
Table 1.2. Response Rates .....	10
Table 1.3. Summary of Survey Respondents .....	13
Table 3.1 Economic Summary for All Trout Fishing .....	24
Table 3.2 Total Trip Expenditures .....	25
Table 3.3 Total Equipment Expenditures .....	26

## **TABLE OF CONTENTS (cont.)**

### **LIST OF TABLES (cont.)**

Table 3.4. Economic Summary for All Trout Fishing (Coastal Region).....	27
Table 3.5. Total Equipment Expenditures (Coastal Region) .....	28
Table 3.6. Economic Summary for All Trout Fishing (Piedmont Region) .....	29
Table 3.7. Total Trip Expenditures (Piedmont Region) .....	30
Table 3.8. Total Equipment Expenditures (Piedmont Region).....	31
Table 3.9. Economic Summary for Trout Fishing in the Mountain Region .....	32
Table 3.10. Total Trip Expenditures (Mountain Region) .....	33
Table 3.11. Total Equipment Expenditures (Mountain Region).....	34
Table 3.12. Economic Summary for All Trout Fishing (Unknown Region) .....	35
Table 3.13. Total Trip Expenditures (Unknown Region) .....	36
Table 3.14. Economic Summary for Statewide Hatchery Supported Trout Fishing .....	37
Table 3.15. Total Trip Expenditures (Hatchery Supported Trout Waters) .....	38
Table 3.16. Total Equipment Expenditures (Hatchery Supported Trout Waters) .....	39
Table 3.17. Economic Summary for Statewide Delayed Harvest Trout Fishing.....	40
Table 3.18. Total Trip Expenditures (Delayed Harvest Trout Waters) .....	41
Table 3.19. Total Equipment Expenditures (Delayed Harvest Trout Waters).....	42
Table 3.20. Economic Summary for Statewide Wild Trout Fishing .....	43
Table 3.21. Total Trip Expenditures (Wild Trout Waters) .....	44
Table 3.22. Total Equipment Expenditures (Wild Trout Waters) .....	45



## **INTRODUCTION AND METHODOLOGY**

This study was conducted for the North Carolina Wildlife Resources Commission (the Commission) to determine mountain trout anglers' contribution to the North Carolina economy. (Mountain trout fishing is confined to 26 western North Carolina counties. Hereinafter all references to trout fishing refer to mountain trout fishing and do not include sea trout, even when "mountain" is omitted from the phrase.) The study entailed a multi-modal survey of North Carolina licensed anglers by Responsive Management and an economic analysis of their expenditures on trout fishing activities by Southwick Associates. This report details the economic portion of the study.

The results of this study are built upon a probability-based random sample of North Carolina anglers. A multi-modal data collection method was used to allow anglers to complete the survey in the way most convenient to them. Contacts were made by mail, telephone, and email. In this manner, nearly complete coverage was achieved because all licensed anglers in the database had either a postal address, a telephone number, or an email address. Specific aspects of the research methodology are discussed below.

### **QUESTIONNAIRE DESIGN**

The survey questionnaire was developed cooperatively by Responsive Management (in consultation with Southwick Associates) and the Commission, based on the research team's familiarity with fishing, as well as natural resources in general. Many of the questions were based on previous surveys of trout anglers in North Carolina.

The survey was coded in Questionnaire Programming Language (QPL) for approval from the Commission and for use in the telephone surveys. An online version of the survey was coded in HyperText Markup Language (HTML) based on the QPL version. Both versions produced data that could be exported directly into the data analyses programs.

The survey instruments were programmed to automatically skip questions that did not apply and to substitute phrases in the survey based upon previous responses, as necessary, for the logic and

flow of the interview. Responsive Management conducted pre-tests of the questionnaire to ensure proper wording, flow, and logic in the survey.

## **SURVEY SAMPLE**

The database of licensed resident and nonresident North Carolina freshwater anglers from which the sample was obtained was provided by the Commission. A Probability-based random sample of anglers was taken from the database. Each potential respondent was assigned a unique identifying code to track progress in the survey and to ensure that each angler took the survey only once, as explained further on.

The goal of this study was to obtain at least 2,000 completed interviews with North Carolina trout anglers (approximately half of which, randomly selected, would get the economic portion of the survey), although the sample had to be selected from the entire database of licensed anglers with trout fishing privileges. In North Carolina there is not a single license that identifies trout anglers, rather there are 41 licenses that grant trout fishing privileges. Therefore, all anglers with these license types had to be included in the initial sample and then screened for trout fishing participation. To meet the objectives of the study, Responsive Management determined that approximately 70,000 individuals would need to be selected for the initial sample to ultimately achieve 2,000 completed interviews with trout anglers.

When determining that 70,000 individuals would need to be selected, Responsive Management considered the following factors: anticipated response rate, anticipated trout participation rate, and bad contact information. The anticipated response rate was approximately 20%, given recent response rates for similar studies. In addition, Responsive Management anticipated an approximately 20% trout fishing participation rates measured in the *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. Finally, bad contact information (i.e., failed mail addresses, bad telephone numbers, and bounced emails addresses) was also assumed for approximately 10% to 20% of the database given typical industry results.

Note that to ensure as complete coverage as possible, Responsive Management had the database checked and corrected for accuracy through a license National Change of Address (NCOA)

vendor; this is a process required by the U.S. Postal Service for any bulk mailing but was performed on the entire database prior to sample selection for this study. Following the NCOA corrections, the entire database was also sent to a professional phone match vendor so that new and corrected telephone numbers could be obtained based on the address information. These two processes ensured that the database would be as accurate as possible. Nonetheless, as predicted, we still experienced a 19.8% rate of failed contacts across mail, email, and telephone.

Based on the assumptions that the database would yield the 20% response rate, 20% trout fishing participation rate, and 10% to 20% bad contact information, Responsive Management pulled a probability-based random sample of 70,000 individuals from the database in an effort to acquire at least 2,000 completed interviews with active North Carolina trout anglers. Please see the assumed calculations below (please note that the calculations below are based on assumptions when designing the sample, they do not represent the actual final results):

$$70,000 * .80 = 56,000$$

(20% bad contacts, resulting in 80%, or 56,000, with valid contact information)

$$56,000 * .20 = 11,200$$

(20% response rate, resulting in 11,200 who respond to the survey)

$$11,200 * .20 = 2,240$$

(20% trout fishing participation rate, resulting in 2,240 trout anglers who respond to the survey)

The initial sample of 70,000 was selected in proportion to the 41 licenses, and a multi-modal data collection method was employed to allow anglers to complete the survey in the way most convenient to them. Complete coverage was achieved because all anglers in the database had either a postal address, a telephone number, or an email address.

Because all anglers who hold a license with trout fishing privileges do not necessarily fish for trout, a screener question was developed to identify those who fished for mountain trout in North Carolina in 2014. Because there is also a sea trout, intentional and specific wording was

developed to ensure that respondents understood the question. The screener question wording and logic are shown as follows:

Did you fish for FRESHWATER TROUT in North Carolina in 2014?

MOUNTAIN TROUT IS ALSO FRESHWATER TROUT; DO NOT INCLUDE SALTWATER OR SEA TROUT

*(INELIGIBLE IF DID NOT FISH FOR FRESHWATER TROUT)*

Based on the above screener question, 18.5% of license holders with trout privileges actually fished for mountain trout in 2014, and this was the figure used for the results of this study to calculate the number of mountain trout anglers in North Carolina.

## **CONTACT PROCEDURES**

A multi-modal data collection method was used for this study. Contacts were made by mail (via postcard), telephone, and email. Note that only after a probability-based random sample was selected were attempts made at contacting those who had been selected. The sample was designed to ensure a 95% confidence level and a low sampling error for the total population of license anglers. For this study, Responsive Management offered an incentive (a free lifetime fishing license) to respondents to encourage survey participation. We believe providing this incentive helped boost response rates.

The survey could be completed online or over the telephone, as most convenient or preferred by the respondent. Note that the online survey was available only to those who were selected in the sample. Appropriately designed surveys with an Internet component require that a *closed* group of potential respondents is invited to participate in the survey. Internet surveys are an excellent survey method to use *when the sample consists of a closed population* of respondents (i.e., a person surfing the Internet could not stumble upon the survey and take it), as was the case in this study.

### **Initial Contact**

Postcards were sent to those in the selected random sample who only had a postal address and no telephone number or email address. All those in the sample with an email address were initially



sent an email with the link to the online survey. Those with telephone numbers but not email addresses were initially contacted by telephone.

Postcards and emails both provided a link to the survey (Figures 1.1 through 1.3). The postcards also provided a unique identification number to access the survey; the emails did not need to provide a unique identification number as the number was embedded in the unique link that each email recipient received. All respondents could be accounted for so that no respondent could complete the survey more than once. Postcard recipients could also access the survey online using a Quick Response code (referred to in the industry as a QR code). A toll-free number was made available to postcard recipients and an email address was made available to email recipients for those who needed assistance. The toll-free number and the email address allowed those to contact Responsive Management to take the survey by telephone, schedule another time for the interview, request a link for the online survey, or request a paper copy of the survey (note that no requests were received for a paper copy of the survey). Postcard, telephone, and email recipients were all eligible for the lifetime license incentive.

Specifically, the postcard and emails explained the purpose of the study, included a link to the online survey, provided a deadline for completion, and emphasized the incentive. The templates for the postcards and outgoing emails are shown on the following pages.

Figure 1.1. Postcard, Side 1



**NORTH CAROLINA WILDLIFE  
RESOURCES COMMISSION**  
*Fishing in North Carolina*  
[ncwildlife.org](http://ncwildlife.org)


Tell us about your North Carolina fishing experiences and be entered to win a  
**Lifetime Fishing License!**

The easiest way to enter is to take the survey now at:




**<http://sgiz.mobi/s3/NCFish>**  
by April 30  
(see reverse side for details)

Figure 1.2. Postcard, Side 2



Dear Licensed Angler,  
The NC Wildlife Resources Commission (WRC) wants your feedback on fishing in the state. If you complete the survey by **April 30**, you are automatically entered to win a Lifetime Inland Fishing License. There are several ways you can take the survey:

- online at <http://sgiz.mobi/s3/NCFish>
- by telephone at 1-800-432-6135
- by scanning this QR code:



Responsive Management, a research firm, is conducting this study for the North Carolina Wildlife Resources Commission. For more information, please contact Kerry Linehan at [kerry.linehan@ncwildlife.org](mailto:kerry.linehan@ncwildlife.org).

NC Wildlife Resources Commission  
c/o Responsive Management  
130 Franklin Street  
Harrisonburg, VA 22801

**Recipient Information:**  
**Unique Identification Number**  
**Name**  
**Address**

**Figure 1.3. Template for Email Invitation**

Dear [contact("first name")],

The [North Carolina Wildlife Resources Commission](#) (Commission) is conducting a study of licensed anglers to learn more about fishing participation in North Carolina. You have been randomly selected to provide valuable information for our fisheries management efforts. Once you have completed and submitted your survey, **you will be entered into a drawing to win a FREE Lifetime Inland Fishing license.**

**You can access the survey by clicking [here](#), or by visiting: ["[unique survey link](#)"].**

**Please submit your completed survey by April 30.**

You can read more about the study on the Commission's website [here](#) (click on "2015 Angler and Landowner Surveys" on the right side of the page).

The Commission has contracted [Responsive Management](#), an independent research firm that specializes in natural resource and outdoor recreation issues, to conduct this study. We need your input to help represent anglers from your area of the state. Please provide the best information your memory allows for your fishing activities, specifically in North Carolina in 2014 only. Your answers will be kept completely confidential and will not be associated with your name or license in any way.

\*Throughout this survey, an asterisk (\*) indicates a required question that must be answered before proceeding or submitting the completed survey.

Please note that you can only complete the survey once, but at any time during the survey you may click on "Save and continue survey later" at the top center of the survey screen to return and finish completing the survey at a later time on the same device.

If you need technical assistance with the survey, please contact Responsive Management via email at [research@responsivemanagement.com](mailto:research@responsivemanagement.com).

Thank you for your time and participation. Your responses will help the Commission maintain fishing opportunities across the state.

## Follow-Up Contacts and Reminders

Responsive Management carefully tracked participation in the survey through the identification numbers. Approximately 1 to 3 weeks after sending the first contacts, Responsive Management began making follow-up contact with those who had not yet responded. Multiple follow-up contacts were made to encourage participation and obtain completed interviews using the most convenient method for respondents. Responsive Management continued with a total of two to five follow-up contacts. The reminders again provided a link to the online survey, a toll-free number, and information about the incentive.

Table 1.1 summarizes the contact effort for this study:

**Table 1.1. Contact Effort**

Contact Round	Approximate Date(s)	Data Collection Tasks
1	March to Early April 2015	Pretest and initial contact: postcards mailed, phone calls made, email invitations sent with link, instructions, and incentive
2	Early to Mid-April 2015	First follow-up (second contact) made; interviewers complete survey at time of call if at all possible; requests from the toll-free number and help email address fulfilled for links and scheduled calls
3	Mid- to Late April 2015	Second follow-up contact made; requests fulfilled
4+	Late April to Mid-May 2015	Third-plus follow-up contacts made; interviewers call back those who agreed to complete the survey online but have not done so, remaining surveys completed by telephone; requests fulfilled

## SURVEY ADMINISTRATION

As indicated above, the unique identification number that was assigned to each angler in the sample was for tracking progress in the survey and ensured that no anglers completed the survey more than once (in case they thought that doing so would increase their chances of winning the free lifetime license).

To ensure that the data collected were of the highest quality, Responsive Management used interviewers who were trained through lectures, role-playing, and video training, according to the standards established by the Council of American Survey Research Organizations (CASRO).

The Survey Center Managers conducted in-depth project briefings with the interviewing staff prior to their work on this study. Interviewers were instructed on survey goals and objectives, the type of study, handling of survey questions, interview length, termination points and qualifiers for participation, reading of interviewer instructions, reading of the survey, reviewing of skip patterns, and probing and clarifying techniques necessary for specific questions on the survey.

Survey administration efforts resulted in 2,113 completed surveys with trout anglers (1,727 residents and 386 nonresidents). The percentage of licensed freshwater anglers who did *not* fish for trout was tracked for determining the rate of fishing for trout among all licensed freshwater anglers.

Response rates are calculated by dividing the number of completed interview by the number of all eligible contacts (Table 1.2). An eligible contact is a person in a residence whom we can reach or speak to and who is a licensed angler. Further criteria was then applied after to determine if the respondent was a trout angler. The rate of bad contact information, response rate, and trout fishing participation rate were monitored throughout the data collection phase of the study. The following are the final rates (rounded) from the study, which closely resembled our initial assumptions:

**Table 1.2. Response Rates**

Bad contact information	19.8%
Response rate	20.4%
Trout fishing participation rate	18.5%

Note that percentages are rounded.

## **SURVEYING DATES AND TIMES**

For surveys completed over the web, questionnaires could have been completed at any time—at the convenience of the respondent. For telephone surveys, Responsive Management’s surveying times are Monday through Friday from 9:00 a.m. to 9:00 p.m., Saturday from noon to 5:00 p.m., and Sunday from 5:00 p.m. to 9:00 p.m., local time. The survey was administered from March to May 2015.

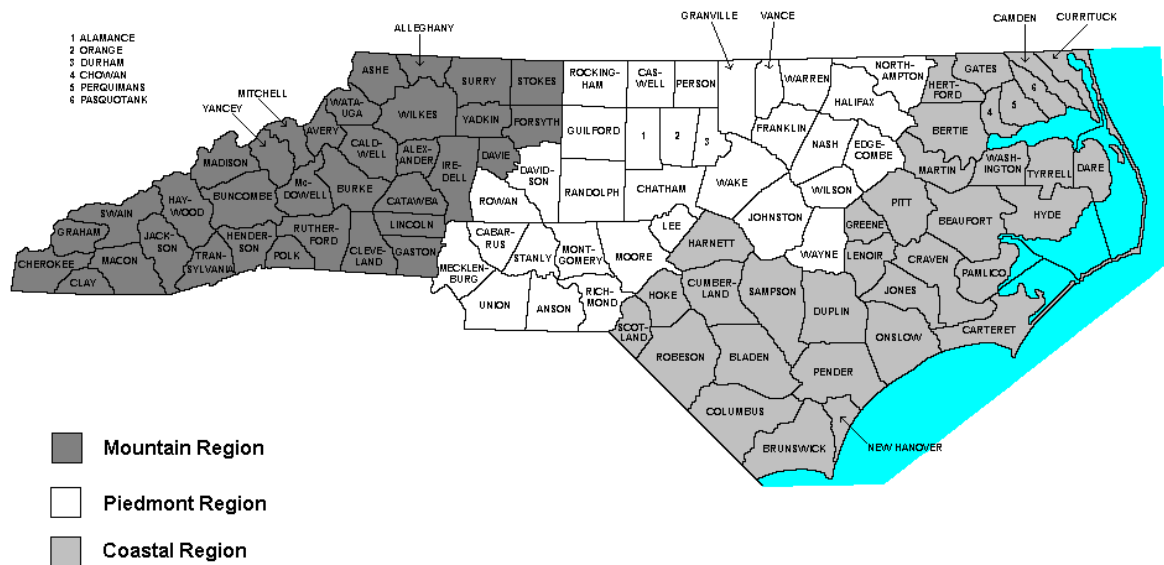
## ESTIMATION PROCEDURES: THE ECONOMIC CONTRIBUTIONS OF NORTH CAROLINA TROUT FISHING

The estimation of economic contributions to the North Carolina economy by anglers who fish for trout consists of two components:

- Calculation of expenditures made by trout anglers in North Carolina by residency, region, and trout fishery management regime.
- Estimation of the multiplier effects that result from the spending by trout anglers.

The regions used in the study are shown in Figure 1.4.

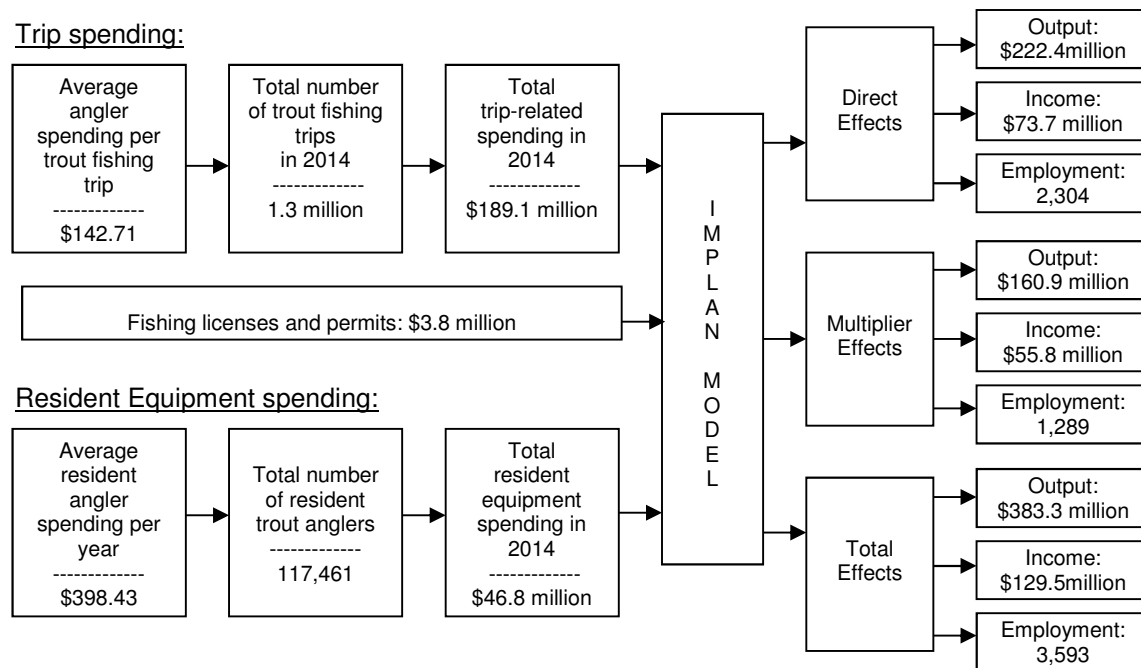
**Figure 1.4. North Carolina Regions Used in Study**



## Trout Angler Expenditures

The estimation of spending by trout anglers is based on the multi-modal survey of resident and nonresident anglers who fished for trout in 2014. The results of that survey were coupled with counts of licensed anglers and estimates of fishing activity (number of trips) to estimate the total amount of fishing-related spending by anglers, the specific goods and services purchased, and the regional locations of the spending. An input-output model of the North Carolina economy was then used to estimate the economic multiplier effects of the anglers' spending (Figure 1.5).

**Figure 1.5. Conceptual Framework for Estimation of the Economic Contributions of Trout Angler Spending in North Carolina**



The survey asked anglers to report: a) their residency status in 2014, b) the region in which they did most of their trout fishing, and c) whether they mostly targeted hatchery supported trout, delayed harvest trout, or wild trout. For the expenditure questions, 935 respondents reported trip expenditures, and 633 respondents reported equipment expenditures (the latter which includes 485 *residents* who reported equipment expenditures—only resident equipment expenditures have an effect on North Carolina). In total, 935 trout anglers reported any expenditures. The number



of respondents, by state residency, region fished, region of residence, and type of trout targeted (i.e. trout management regime) are shown in Table 1.3.

**Table 1.3. Summary of Survey Respondents**

	<b>Trip</b>	<b>Equipment</b>
<b>North Carolina Residency</b>		
Resident	771	485
Nonresident	164	148
<b>Total</b>	<b>935</b>	<b>633</b>
<b>Region of Residence</b>		
Region 1 - Coastal	N/A	71
Region 2 - Piedmont	N/A	147
Region 3 - Mountain	N/A	265
Out of state	N/A	148
Unknown	N/A	2
<b>Total</b>	<b>N/A</b>	<b>633</b>
<b>Region Fished</b>		
Region 1 - Coastal	0	N/A
Region 2 - Piedmont	13	N/A
Region 3 - Mountain	849	N/A
Unknown	73	N/A
<b>Total</b>	<b>935</b>	<b>N/A</b>
<b>Trout Targeted</b>		
Hatchery supported	378	219 (179 residents)
Delayed harvest	194	142 (100 residents)
Wild trout	153	90 (75 residents)
Other/unknown	210	182 (131 residents)
<b>Total</b>	<b>935</b>	<b>633</b> <b>(485 residents)</b>

The number of trout anglers, statewide, was determined on the basis of total freshwater licenses sold by the North Carolina Wildlife Resources Commission that were valid during the 2014 calendar year.

## **Trip Expenditures**

The expenditures portion of the survey was divided into two sections: a) trip expenditures associated with the anglers' first trip of the season/most recent trip, and b) equipment expenditures during 2014 for items used for trout fishing. (Note that half of respondents who received this question and who fished for more than one day were asked about their first trip, and the second half were asked about their most recent trip. This was done to remove possible bias if people's first trip of the season was more expensive than their most recent trip. Those anglers who fished only one day and, therefore, were assumed to have made only one trip were simply asked about that one trip.) Trip expenditures refer to the purchases of those goods and services that are consumed almost entirely during the fishing trip and are allocated to regions based on the respondents' indication of where they did most of their trout fishing. Examples of these expenditures include travel costs, food, lodging, bait, and guide services.

Because fishing can occur during a trip with that includes other non-fishing activities, respondents were asked how likely they would have taken the trip if they were unable to go fishing. The response to this question was used to properly allocate trip expenditures to fishing activity. All trip expenditures were allocated to trips that occurred because fishing was either the main purpose or one of the purposes of the trip. No expenditures were allocated to trips that would have taken place regardless of the opportunity to go fishing. Other gradations of the response categories allocated 25%, 50%, and 75% of trip expenditures.

## **Equipment Expenditures**

Equipment costs are associated with durable goods that are used over the course of multiple trips. Examples include fishing equipment (rods, reels, lures, etc.) and other items that survey respondents reported were used for trout fishing (boats, trailers, coolers, clothing, etc.). Equipment purchases are typically made in the same region where anglers reside, therefore the equipment purchases are allocated to the region where anglers live and purchases made outside of the state by nonresidents do not have an economic impact on the North Carolina economy. Most fishing equipment can be used for multiple types of fishing. Therefore, to properly allocate the equipment expenditures to trout fishing, the equipment expenditures were multiplied by the ratio of days that the respondent fished for trout in 2014 to the number of days of all types of

fishing (i.e., if a respondent fished for trout 25% of the time then 25% of fishing equipment expenditures were allocated to trout fishing). Vehicles are a special case of equipment because they are unlikely to be used solely for fishing and are typically used year-round for multiple non-fishing purposes. Expenditures for vehicles were allocated to trout fishing on the basis of the total number of days fished for trout in 2014 divided by 365 days.

### **Multiplier Effects and Economic Contributions**

The expenditures made by anglers for trout fishing activities generated additional economic benefits throughout the North Carolina economy beyond the initial angler spending. These additional economic benefits were estimated with an IMPLAN input-output model that relates changes in specific industries to impacts in other industries within the statewide economy. For this study, a single statewide model was used to estimate the multiplier effects on the state economy of spending attributed to each region and management regime. The model produced estimates of the total economic multiplier effects (indirect and induced) from the spending by trout anglers. The *direct effect* of angler spending refers to the dollars that are captured by North Carolina business that provide the goods and services purchased by anglers. Much of the equipment purchased by anglers is manufactured outside of the state and did not have a direct effect on the North Carolina economy. In that case, the direct effect consists primarily of retail trade margins and typically is less than the total amount spent by anglers. *Indirect effect* refers to the economic activity (e.g., output, employment, income) that occurs in the industries that supply those businesses that are stimulated by the direct effect. The *induced effect* measures the economic activity that results from the household spending of salaries and wages by employees whose jobs are supported by the direct and indirect effects.

Interpretation of the model results depends on the spending under consideration. The term “economic impact” is normally reserved to describe some level of economic activity that would not occur but for the economic stimulus. In the case of recreational activities like trout fishing, it is generally agreed that economic impact comes from spending by visitors to the region. If not for their presence, their spending would never occur in North Carolina. If quality trout fishing was no longer available in North Carolina, for example, nonresident anglers might choose to fish and spend their money elsewhere and thus not generate economic activity in the North Carolina

economy. Most resident anglers, on the other hand, choose fishing as an activity on which to spend their recreational dollars locally. If quality trout fishing was no longer available, an unknown portion of residents would likely choose some other local recreational activity on which to spend their money in place of fishing and their spending would still remain in the state's economy. This study focused on the total economic contribution from spending by residents and nonresidents. However, the analysis presents the results of angler spending separately for resident and nonresidents to distinguish the total economic impact of trout fishing from its total economic contribution. Additional breakdowns by region and management regime are also provided.

### SAMPLING ERROR

Throughout this report, findings of the telephone survey are reported at a 95% confidence interval. For the entire sample of trout anglers, the sampling error is at most plus or minus 2.12 percentage points. This means that if the survey were conducted 100 times on different samples that were selected in the same way, the findings of 95 out of the 100 surveys would fall within plus or minus 2.12 percentage points of each other. Sampling error was calculated using the formula described in Figure 1.6, with a sample size of 2,113 and an estimated population size of 148,991 trout anglers (the population estimate was calculated as the percent of the residents in the sample who fished for mountain trout plus the percentage of nonresidents in the sample who fished for mountain trout). Note that some questions have a lower sample size than 2,113 because some questions did not apply to everyone and because some respondents on the online survey did not respond to all questions in which they should have responded.

**Figure 1.6. Sampling Error Equation**

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

Where: B = maximum sampling error (as decimal)  
 $N_p$  = population size (i.e., total number who could be surveyed)  
 $N_s$  = sample size (i.e., total number of respondents surveyed)

Derived from formula: p. 206 in Dillman, D. A. 2000. *Mail and Internet Surveys*. John Wiley & Sons, NY.

**Note:** This is a simplified version of the formula that calculates the maximum sampling error using a 50:50 split (the most conservative calculation because a 50:50 split would give maximum variation).

## **FISHING PARTICIPATION**

This chapter presents a brief summary of trout fishing participation in North Carolina in 2014. (For detailed information on the multi-modal survey results, refer to the Responsive Management report, *Trout Anglers' Participation in and Opinions on Trout Fishing in North Carolina*, 2015.)

- In 2014, 18.5% of North Carolina freshwater fishing license holders fished for trout. This percentage was determined through screener questions that asked licensed anglers if they had fished for mountain trout; only those who had done so were given the full angler survey, including the expenditure questions.
- A little more than half of trout anglers (58%) fished all 5 of the past 5 years (Figure 2.1).
- The percentage of trout anglers (only those who have been fishing for at least 5 years) who say that their fishing has increased in the past 5 years is about the same as the percentage who say it has decreased: 26% say it increased, and 24% say it decreased. Most commonly, trout anglers say it has stayed about the same (49%) (Figure 2.2).
- Days of fishing in 2014 are shown: the mean is 14.16 days; the median is 8 days (Figure 2.3). A graph also shows the number of trips that trout anglers took to go trout fishing in North Carolina: the mean is 10.92 trips; the median is 5 trips (Figure 2.4).
- Trout anglers were asked to name their most-fished type of water. The top response was Hatchery Supported Trout Waters (38% stated this), followed by Delayed Harvest Trout Waters (21%) and Wild Trout Waters (16%) (Figure 2.5).

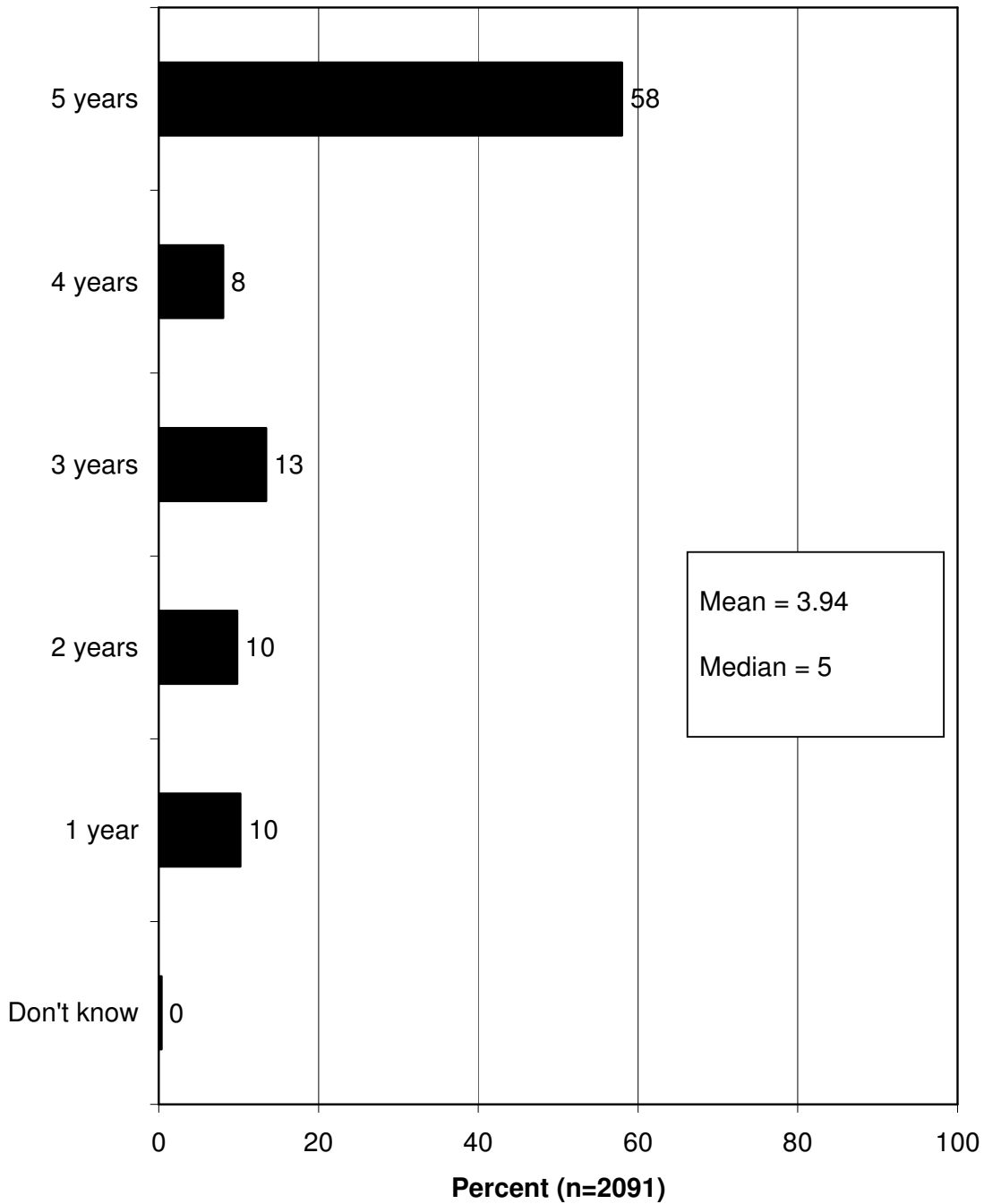
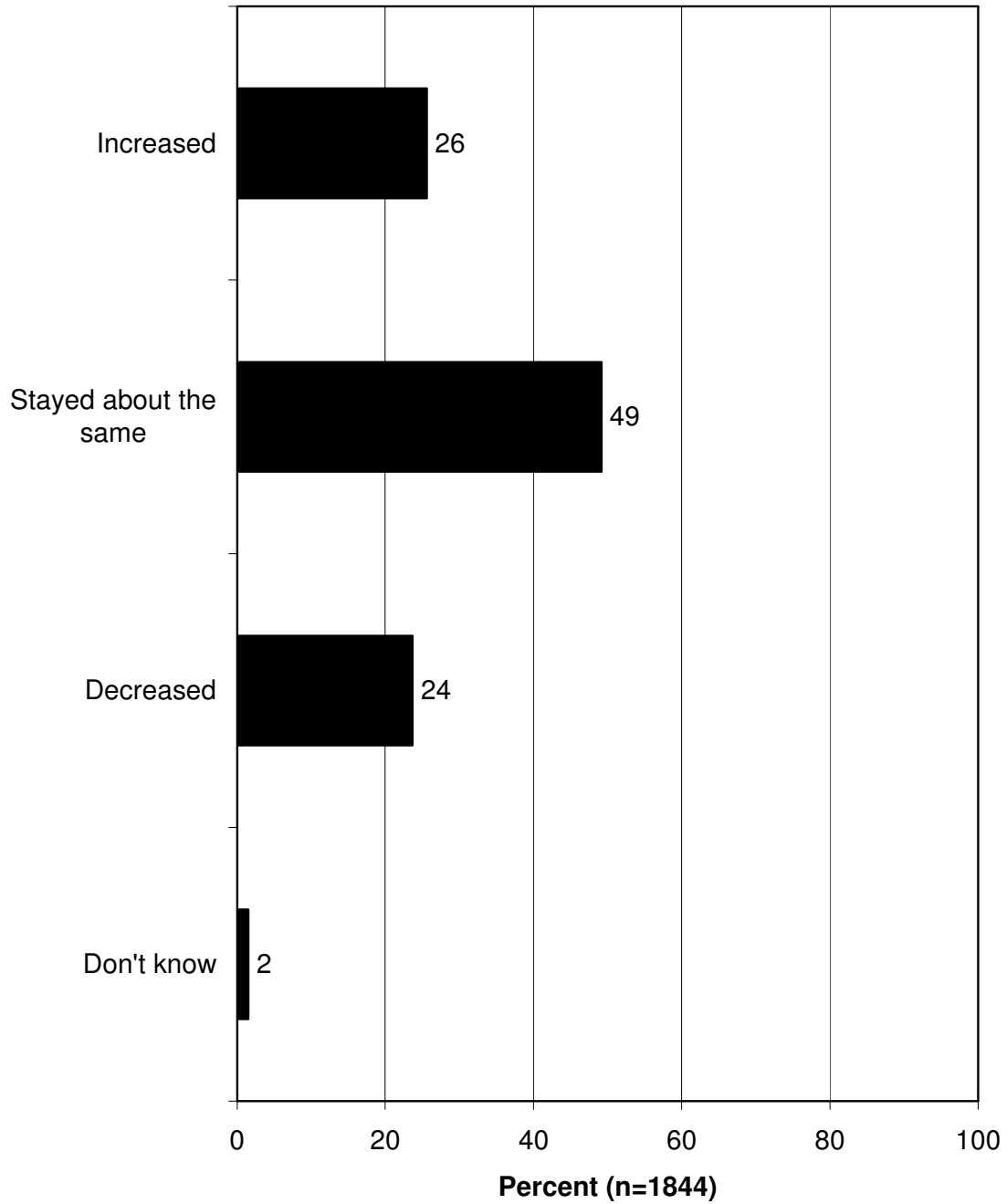
**Figure 2.1. Number of Years Trout Fishing in the Past 5 Years****Q36. How many of the past 5 years did you go trout fishing in North Carolina?**

Figure 2.2. Self-Assessed Participation Trend

**Q37. Would you say your level of trout fishing activity in North Carolina over the past 5 years has increased, stayed about the same, or decreased?**



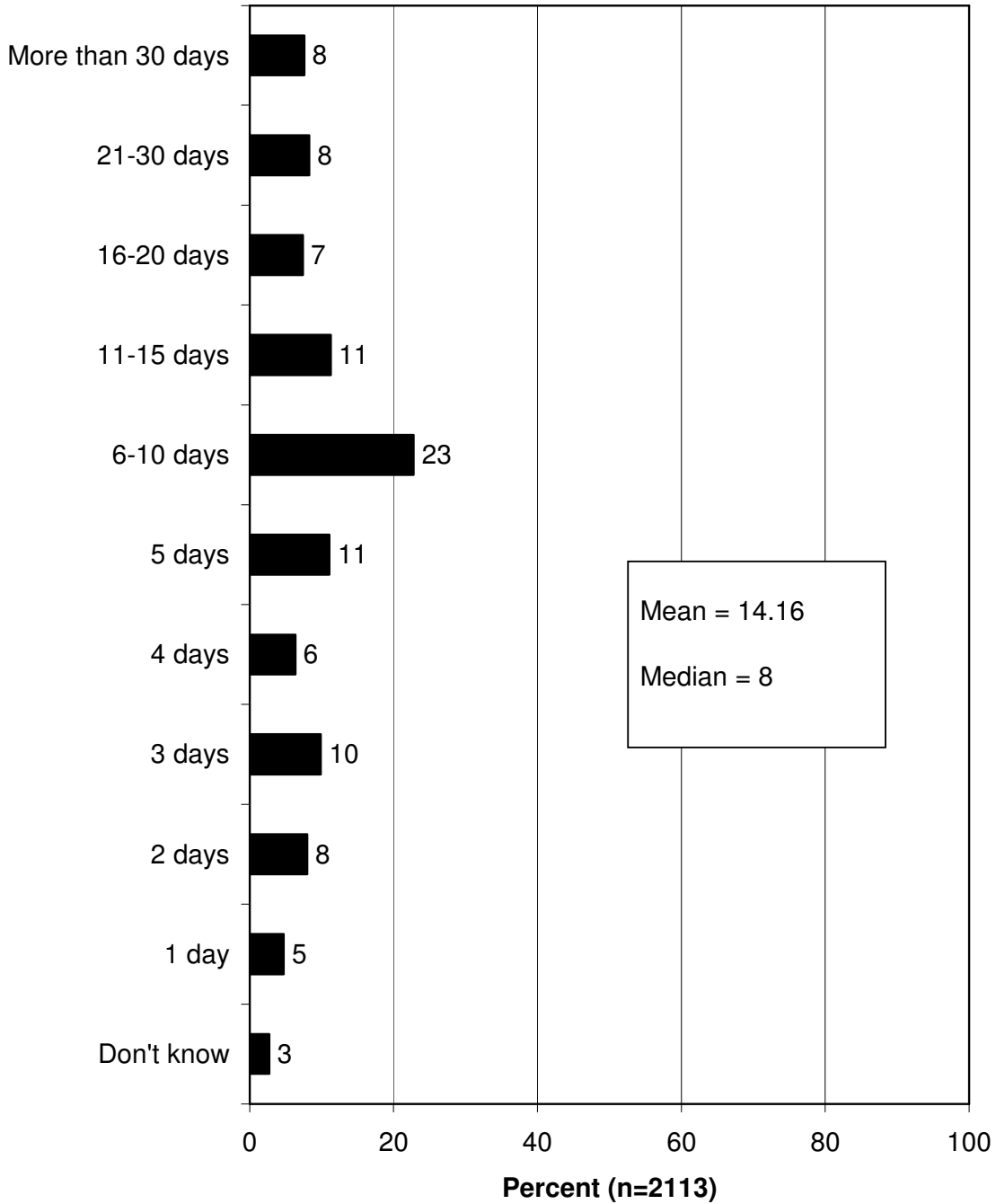
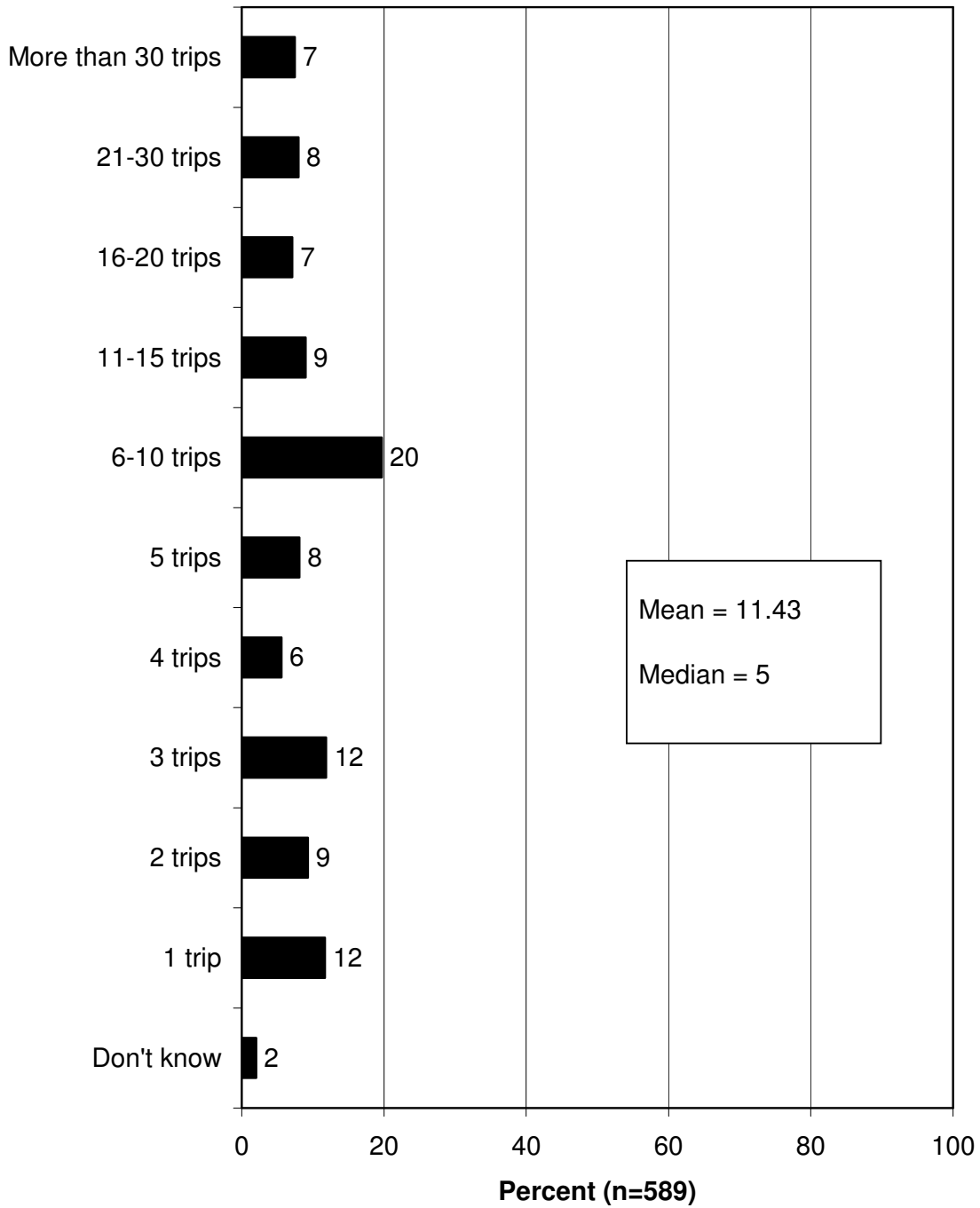
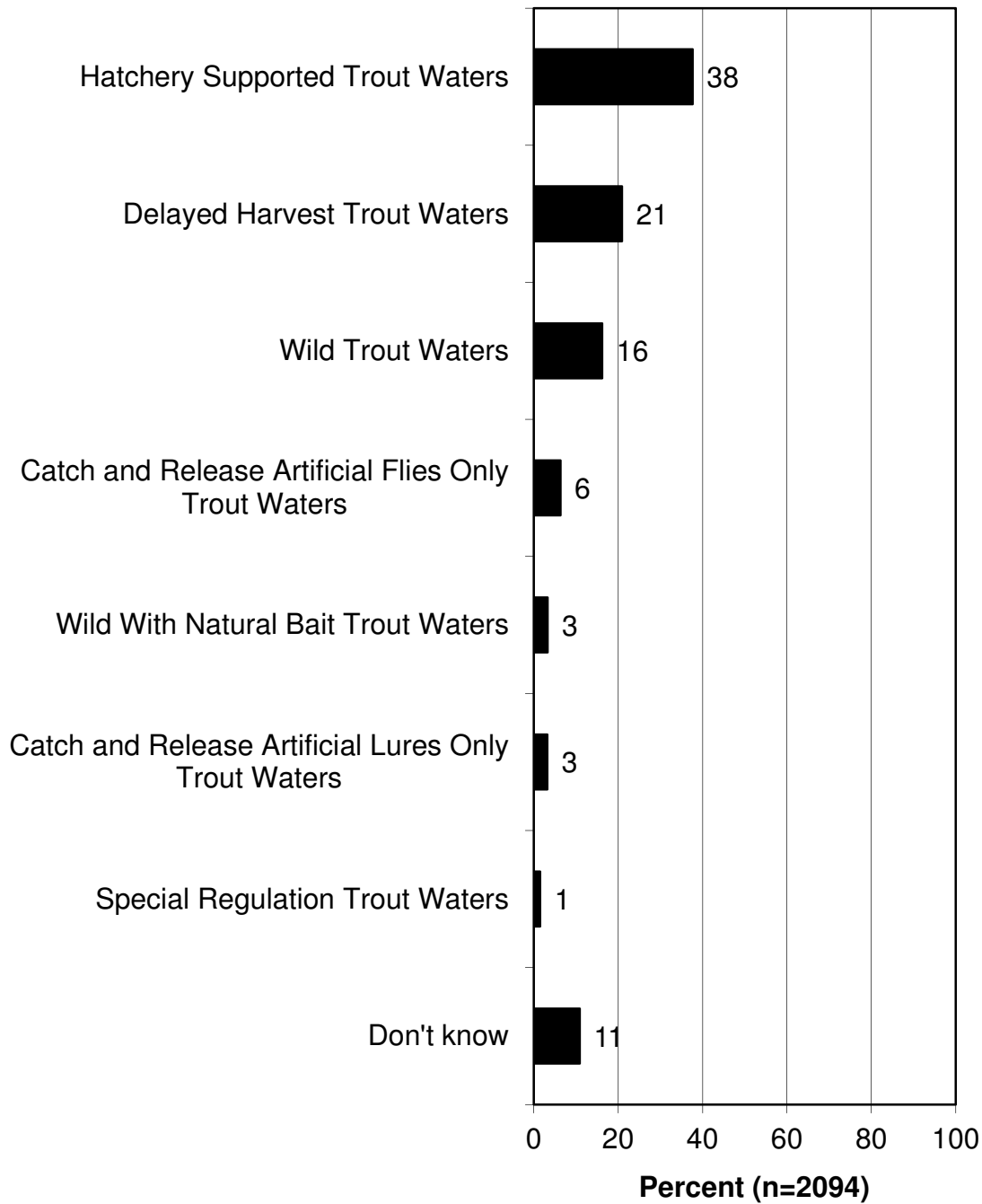
**Figure 2.3. Days Fished for Trout****Q38. How many days did you fish for trout in North Carolina in 2014?**



Figure 2.4. Trips Taken to Fish for Trout

**Q40. How many trips or outings did you take to fish for trout in North Carolina in 2014?**



**Figure 2.5. Types of Trout Waters Fished by Trout Anglers****Q121. Which one of those classification types of trout waters did you fish in most, or do you not know?**

## **TROUT FISHING'S EFFECT ON NORTH CAROLINA'S ECONOMY**

- The tabulations that follow show the results of the economic analysis by Southwick Associates.
- Tables 3.1–3.3 show statewide results.
    - All (resident and nonresident) trout anglers spent \$239.8 million in North Carolina in 2014.
    - The total economic effect of trout fishing is estimated at \$383.3 million, supporting nearly 3,600 jobs.
  - Tables 3.4–3.13 show summaries and expenditures for the Regions. Note that some spending still occurs in other regions, including by residents of the other regions who purchase equipment at home.
    - In particular, Mountain Region resident and nonresident trout anglers spent \$210.7 million in the Mountain Region.
    - The total economic effect of trout fishing is estimated at \$334.3 million in the Mountain Region, supporting nearly 3,200 jobs.
  - Tables 3.4–3.16 show summaries and expenditures for statewide Hatchery Supported Trout Waters. This was the most popular destination for trout anglers among the trout fishing management regimes in 2014.
    - All (resident and nonresident) trout anglers spent \$89.7 million in Hatchery Supported Trout Waters.
    - The total economic effect of trout fishing is estimated at \$141.3 million, supporting nearly 1,300 jobs.
  - Tables 3.17–3.19 show summaries and expenditures for statewide Delayed Harvest Trout Waters.
    - All (resident and nonresident) trout anglers spent \$66.3 million in Delayed Harvest Trout Waters.
    - The total economic effect of trout fishing is estimated at \$108.4 million, supporting over 1,000 jobs.
  - Tables 3.20–3.22 show summaries and expenditures for statewide Wild Trout Waters. (Note that the nonresident sample was too small in Wild Trout Waters for analysis.)
    - Resident trout anglers spent \$38.7 million in Wild Trout Waters.
    - The total economic effect of resident trout fishing is estimated at \$60.8 million, supporting approximately 550 jobs.

**Table 3.1. Economic Summary for All Trout Fishing**

	<b>Resident Anglers</b>	<b>Nonresident Anglers</b>	<b>All Anglers</b>
<b>Trout Anglers</b>	117,461	31,530	148,991
<b>Days Fished for Trout</b>	1,383,967	254,390	1,638,357
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	\$3,198,304	\$644,941	\$3,843,245
<i>Trip Expenditures</i>	\$130,816,172	\$58,320,654	\$189,136,825
<i>Equipment Expenditures</i>	\$46,800,561	*	\$46,800,561
<b>Total Dollars Spent</b>	\$180,815,037	\$58,965,594	\$239,780,631
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$205,251,927	\$88,800,892	\$294,052,819
<i>Income Provided</i>	\$69,510,537	\$30,191,055	\$99,701,592
<i>Jobs Supported</i>	1,953	925	2,878
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$89,223,773	*	\$89,223,773
<i>Income Provided</i>	\$29,813,625	*	\$29,813,625
<i>Jobs Supported</i>	715	*	715
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$294,475,700	\$88,800,892	\$383,276,592
<i>Income Provided</i>	\$99,324,162	\$30,191,055	\$129,515,217
<i>Jobs Supported</i>	2,668	925	3,593
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$20,232,056	\$5,943,059	\$26,175,114
<i>Federal</i>	\$22,501,217	\$6,958,830	\$29,460,047

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.2. Total Trip Expenditures**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
Groceries	\$24,662,130	\$8,055,872
Restaurants	\$15,428,860	\$6,310,138
Lodging	\$23,265,110	\$17,989,883
Vehicle fuel	\$36,909,928	\$8,249,359
Public transportation	\$1,070,267	\$104,209
Car rentals	\$439,786	\$70,078
Guide fees	\$8,547,205	\$12,110,505
Boat launch/docks	\$702,407	-
Cooking / heating fuel	\$3,197,008	\$436,711
Equipment rental	\$2,690,950	\$1,610,928
Bait	\$7,011,445	\$1,348,248
Souvenirs	\$3,536,879	\$853,368
Entertainment	\$3,354,198	\$1,181,354
<b>Total Trip Expenditures</b>	<b>\$130,816,172</b>	<b>\$58,320,654</b>

**Table 3.3. Total Equipment Expenditures**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$3,198,304</b>	<b>\$644,941</b>
Rods and reels	\$6,379,360	*
Line and leaders	\$1,760,061	*
Lures	\$2,582,904	*
Tackle boxes	\$569,479	*
Hooks, sinkers, swivels	\$652,471	*
Depth finders; electronics	\$360,752	*
Creels, stringers, nets	\$402,147	*
Other fishing equipment	\$861,461	*
Fly tying equipment	\$984,984	*
Clothing	\$1,870,054	*
Waders, boots, shoes	\$2,882,261	*
Life jackets, PFDs	\$275,260	*
Taxidermy	\$194,777	*
Books & magazines	\$758,801	*
Coolers	\$720,836	*
Boats, canoes, kayaks	\$3,337,778	*
Boat motors	\$577,532	*
Trailers, hitches, accessories	\$624,832	*
Boat parts, accessories	\$748,780	*
Bug spray, sunscreen	\$698,837	*
Cameras, binoculars	\$2,078,178	*
Tents, tarps, packs	\$863,103	*
Camping trailer	\$7,526,975	*
Other camping equipment	\$740,336	*
Trucks, SUVs, RVs	\$8,348,603	*
<b>Total Equipment Expenditures</b>	<b>\$46,800,561</b>	*

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.4. Economic Summary for All Trout Fishing (Coastal Region)**

	Resident Anglers	Nonresident Anglers	All Anglers
<b>Trout Anglers</b>	0	0	0
<b>Days Fished for Trout</b>	0	0	0
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	\$186,776	\$0	\$186,776
<i>Trip Expenditures</i>	\$0	\$0	\$0
<i>Equipment Expenditures</i>	\$3,406,686	\$0	\$3,406,686
<b>Total Dollars Spent</b>	<b>\$3,593,462</b>	<b>\$0</b>	<b>\$3,611,758</b>
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$0	\$0	\$0
<i>Income Provided</i>	\$0	\$0	\$0
<i>Jobs Supported</i>	-	-	-
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$5,890,413	\$0	\$5,890,413
<i>Income Provided</i>	\$2,088,628	\$0	\$2,088,628
<i>Jobs Supported</i>	54	-	54
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$5,890,413	\$0	\$5,890,413
<i>Income Provided</i>	\$2,088,628	\$0	\$2,088,628
<i>Jobs Supported</i>	54	-	54
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$419,200	\$0	\$419,200
<i>Federal</i>	\$460,698	\$0	\$460,698

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.5. Total Equipment Expenditures (Coastal Region)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$186,776</b>	<b>18,296</b>
Rods and reels	\$759,902	-
Line and leaders	\$219,299	-
Lures	\$315,071	-
Tackle boxes	\$65,149	-
Hooks, sinkers, swivels	\$89,304	-
Depth finders; electronics	\$18,876	-
Creels, stringers, nets	\$24,175	-
Other fishing equipment	\$94,332	-
Fly tying equipment	\$30,184	-
Clothing	\$117,451	-
Waders, boots, shoes	\$181,668	-
Life jackets, PFDs	\$82,801	-
Taxidermy	\$0	-
Books & magazines	\$83,898	-
Coolers	\$175,289	-
Boats, canoes, kayaks	\$340,100	-
Boat motors	\$123,776	-
Trailers, hitches, accessories	\$188,361	-
Boat parts, accessories	\$162,226	-
Bug spray, sunscreen	\$134,307	-
Cameras, binoculars	\$132,320	-
Tents, tarps, packs	\$29,615	-
Camping trailer	\$22,200	-
Other camping equipment	\$6,383	-
Trucks, SUVs, RVs	\$10,000	-
<b>Total Equipment Expenditures</b>	<b>\$3,406,686</b>	<b>-</b>

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.



**Table 3.6. Economic Summary for All Trout Fishing (Piedmont Region)**

	Resident Anglers	Nonresident Anglers	All Anglers
<b>Trout Anglers</b>	1,443	581	2,024
<b>Days Fished for Trout</b>	**	**	**
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	**	**	**
<i>Trip Expenditures</i>	**	**	**
<i>Equipment Expenditures</i>	\$13,184,514	**	\$13,184,514
<b>Total Dollars Spent</b>	**	**	**
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	**	**	**
<i>Income Provided</i>	**	**	**
<i>Jobs Supported</i>	**	**	**
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$22,225,691	\$0	\$22,225,691
<i>Income Provided</i>	\$7,379,026	\$0	\$7,379,026
<i>Jobs Supported</i>	185	-	185
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	**	**	**
<i>Income Provided</i>	**	**	**
<i>Jobs Supported</i>	**	**	**
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	**	**	**
<i>Federal</i>	**	**	**

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

\*\* Sample size too small to report reliable results.

**Table 3.7. Total Trip Expenditures (Piedmont Region)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
Groceries	\$342,320	\$41,201
Restaurants	\$543,100	\$58,420
Lodging	\$650,046	\$368,968
Vehicle fuel	\$732,348	\$54,115
Public transportation	\$0	\$15,374
Car rentals	\$0	\$12,299
Guide fees	\$238,071	\$112,447
Boat launch/docks	\$2,790	\$0
Cooking / heating fuel	\$11,160	\$6,149
Equipment rental	\$41,383	\$0
Bait	\$237,014	\$0
Souvenirs	\$134,042	\$0
Entertainment	\$14,414	\$9,224
<b>Total Trip Expenditures</b>	<b>\$2,946,689</b>	<b>\$678,198</b>

**Table 3.8. Total Equipment Expenditures (Piedmont Region)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$59,969</b>	<b>\$27,444</b>
Rods and reels	\$2,005,870	
Line and leaders	\$582,705	
Lures	\$791,991	
Tackle boxes	\$149,227	
Hooks, sinkers, swivels	\$162,225	
Depth finders; electronics	\$250,011	
Creels, stringers, nets	\$111,428	
Other fishing equipment	\$215,536	
Fly tying equipment	\$413,569	
Clothing	\$568,678	
Waders, boots, shoes	\$775,142	
Life jackets, PFDs	\$60,884	
Taxidermy	\$0	
Books & magazines	\$299,907	
Coolers	\$231,599	
Boats, canoes, kayaks	\$533,861	
Boat motors	\$314,815	
Trailers, hitches, accessories	\$52,270	
Boat parts, accessories	\$140,541	
Bug spray, sunscreen	\$214,686	
Cameras, binoculars	\$863,018	
Tents, tarps, packs	\$348,958	
Camping trailer	\$994,870	
Other camping equipment	\$193,188	
Trucks, SUVs, RVs	\$2,909,535	
<b>Total Equipment Expenditures</b>	<b>\$13,184,514</b>	<b>\$0</b>

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.9. Economic Summary for Trout Fishing in the Mountain Region**

	<b>Resident Anglers</b>	<b>Nonresident Anglers</b>	<b>All Anglers</b>
<b>Trout Anglers</b>	107,316	29,294	136,610
<b>Days Fished for Trout</b>	1,297,574	258,260	1,555,834
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	\$2,951,558	\$599,200	\$3,550,759
<i>Trip Expenditures</i>	\$120,398,283	\$56,553,041	\$176,951,324
<i>Equipment Expenditures</i>	\$30,209,361	*	\$30,209,361
<b>Total Dollars Spent</b>	\$153,559,203	\$57,152,241	\$210,711,444
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$189,921,557	\$93,436,568	\$283,358,126
<i>Income Provided</i>	\$64,318,318	\$31,761,698	\$96,080,016
<i>Jobs Supported</i>	1,804	975	2,779
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$50,941,511	*	\$50,941,511
<i>Income Provided</i>	\$16,995,943	*	\$16,995,943
<i>Jobs Supported</i>	406	*	406
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$240,863,068	\$93,436,568	\$334,299,637
<i>Income Provided</i>	\$81,314,261	\$31,761,698	\$113,075,959
<i>Jobs Supported</i>	2,211	975	3,185
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$16,771,131	\$6,256,667	\$23,027,799
<i>Federal</i>	\$18,512,726	\$7,322,592	\$25,835,318

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.10. Total Trip Expenditures (Mountain Region)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
Groceries	\$23,064,316	\$7,784,387
Restaurants	\$13,679,541	\$6,062,972
Lodging	\$20,940,953	\$17,356,487
Vehicle fuel	\$34,012,405	\$7,969,278
Public transportation	\$1,063,328	\$78,004
Car rentals	\$439,786	\$49,114
Guide fees	\$8,134,463	\$11,918,834
Boat launch/docks	\$573,799	-
Cooking/heating fuel	\$3,135,267	\$383,741
Equipment rental	\$2,620,410	\$1,610,928
Bait	\$6,156,035	\$1,320,296
Souvenirs	\$3,299,016	\$853,368
Entertainment	\$3,278,964	\$1,165,631
<b>Total Trip Expenditures</b>	<b>\$120,398,283</b>	<b>\$56,553,041</b>

**Table 3.11. Total Equipment Expenditures (Mountain Region)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$2,951,558</b>	<b>\$599,200</b>
Rods and reels	\$3,613,589	*
Line and leaders	\$958,057	*
Lures	\$1,475,843	*
Tackle boxes	\$355,102	*
Hooks, sinkers, swivels	\$400,943	*
Depth finders; electronics	\$91,865	*
Creels, stringers, nets	\$266,543	*
Other fishing equipment	\$551,593	*
Fly tying equipment	\$541,231	*
Clothing	\$1,183,925	*
Waders, boots, shoes	\$1,925,452	*
Life jackets, PFDs	\$131,575	*
Taxidermy	\$194,777	*
Books & magazines	\$374,997	*
Coolers	\$313,948	*
Boats, canoes, kayaks	\$2,463,817	*
Boat motors	\$138,940	*
Trailers, hitches, accessories	\$384,200	*
Boat parts, accessories	\$446,013	*
Bug spray, sunscreen	\$349,844	*
Cameras, binoculars	\$1,082,840	*
Tents, tarps, packs	\$484,530	*
Camping trailer	\$6,509,905	*
Other camping equipment	\$540,765	*
Trucks, SUVs, RVs	\$5,429,067	*
<b>Total Equipment Expenditures</b>	<b>\$30,209,361</b>	*

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.12. Economic Summary for All Trout Fishing (Unknown Region)**

	Resident Anglers	Nonresident Anglers	All Anglers
<b>Trout Anglers</b>	8,703	1,655	10,357
<b>Days Fished for Trout</b>	**	**	**
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>			
<i>Trip Expenditures</i>	\$7,471,200	\$1,089,414	\$8,560,614
<i>Equipment Expenditures</i>	\$0	\$0	\$0
<b>Total Dollars Spent</b>	\$7,471,200	\$1,089,414	\$8,560,614
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$11,722,390	\$1,658,777	\$13,381,167
<i>Income Provided</i>	\$11,096,600	\$0	\$11,096,600
<i>Jobs Supported</i>	81	17	98
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$0	\$0	\$0
<i>Income Provided</i>	\$0	\$0	\$0
<i>Jobs Supported</i>	-	-	-
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$11,722,390	\$1,658,777	\$13,381,167
<i>Income Provided</i>	\$11,096,600	\$0	\$11,096,600
<i>Jobs Supported</i>	81	17	98
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$1,455,240	\$64,019	\$1,519,259
<i>Federal</i>	\$1,610,408	\$67,817	\$1,678,225

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

\*\* Sample size too small to report reliable results.

Unknown Region consists of those respondents who named a county well outside of the mountain trout fishing waters; the rule of thumb was any county more than two counties away from mountain trout waters was considered well outside of mountain trout waters. Some leeway was granted (i.e., respondents naming an adjacent county were coded as having fished in that county because they either did so hoping to catch trout—perhaps not knowing that they were not within mountain trout waters—or because they accessed mountain trout waters through that county—it was the last county they remembered or stopped in before they entered the actual mountain trout water county).

Those who named a county well away from mountain trout waters (i.e., more than two counties away) are assumed for this analysis to have named an incorrect county; they are coded as County and Region Unknown. However, it is useful to have the data from these respondents. They were included in statewide totals.

**Table 3.13. Total Trip Expenditures (Unknown Region)**

Items	Residents	Nonresidents
Groceries	\$1,255,493	\$230,284
Restaurants	\$1,206,219	\$188,747
Lodging	\$1,674,111	\$264,427
Vehicle fuel	\$2,165,176	\$225,965
Public transportation	\$6,939	\$10,831
Car rentals	\$0	\$8,665
Guide fees	\$174,671	\$79,224
Boat launch/docks	\$125,818	\$0
Cooking / heating fuel	\$50,582	\$46,820
Equipment rental	\$29,157	\$0
Bait	\$618,395	\$27,952
Souvenirs	\$103,821	\$0
Entertainment	\$60,819	\$6,499
<b>Total Trip Expenditures</b>	<b>\$7,471,200</b>	<b>\$1,089,414</b>

Unknown Region consists of those respondents who named a county well outside of the mountain trout fishing waters; the rule of thumb was any county more than two counties away from mountain trout waters was considered well outside of mountain trout waters. Some leeway was granted (i.e., respondents naming an adjacent county were coded as having fished in that county because they either did so hoping to catch trout—perhaps not knowing that they were not within mountain trout waters—or because they accessed mountain trout waters through that county—it was the last county they remembered or stopped in before they entered the actual mountain trout water county).

Those who named a county well away from mountain trout waters (i.e., more than two counties away) are assumed for this analysis to have named an incorrect county; they are coded as County and Region Unknown. However, it is useful to have the data from these respondents. They were included in statewide totals.



**Table 3.14. Economic Summary for Statewide Hatchery Supported Trout Fishing**

	<b>Resident Anglers</b>	<b>Nonresident Anglers</b>	<b>All Anglers</b>
<b>Trout Anglers</b>	53,737	6,485	60,222
<b>Days Fished for Trout</b>	642,679	67,987	710,665
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	\$1,361,363	\$114,836	\$1,476,199
<i>Trip Expenditures</i>	\$50,786,163	\$13,277,657	\$64,063,820
<i>Equipment Expenditures</i>	\$24,182,725	*	\$24,182,725
<b>Total Dollars Spent</b>	\$76,330,250	\$13,392,493	\$89,722,743
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$78,878,974	\$21,201,915	\$100,080,889
<i>Income Provided</i>	\$26,745,568	\$7,160,085	\$33,905,653
<i>Jobs Supported</i>	751	218	969
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$41,192,636	*	\$41,192,636
<i>Income Provided</i>	\$13,696,242	*	\$13,696,242
<i>Jobs Supported</i>	317	*	317
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$120,071,610	\$21,201,915	\$141,273,525
<i>Income Provided</i>	\$40,441,810	\$7,160,085	\$47,601,895
<i>Jobs Supported</i>	1,067	218	1,286
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$8,160,348	\$1,427,108	\$9,587,456
<i>Federal</i>	\$9,104,857	\$1,647,961	\$10,752,817

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.15. Total Trip Expenditures (Hatchery Supported Trout Waters)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
Groceries	\$10,230,842	\$3,067,233
Restaurants	\$6,103,254	\$1,757,609
Lodging	\$7,271,342	\$3,685,153
Vehicle fuel	\$14,951,528	\$1,618,344
Public transportation	\$2,149	\$34,320
Car rentals	\$2,149	-
Guide fees	\$2,710,645	\$1,964,720
Boat launch/docks	\$516,774	-
Cooking/heating fuel	\$1,394,054	\$154,304
Equipment rental	\$1,079,208	\$42,557
Bait	\$3,826,577	\$527,845
Souvenirs	\$1,559,664	\$128,358
Entertainment	\$1,137,977	\$297,213
<b>Total Trip Expenditures</b>	<b>\$50,786,163</b>	<b>\$13,277,657</b>

**Table 3.16. Total Equipment Expenditures (Hatchery Supported Trout Waters)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$1,361,363</b>	<b>\$114,836</b>
Rods and reels	\$2,208,535	*
Line and leaders	\$647,934	*
Lures	\$1,014,639	*
Tackle boxes	\$266,179	*
Hooks, sinkers, swivels	\$329,378	*
Depth finders; electronics	\$223,137	*
Creels, stringers, nets	\$185,715	*
Other fishing equipment	\$360,395	*
Fly tying equipment	\$155,264	*
Clothing	\$620,599	*
Waders, boots, shoes	\$1,277,206	*
Life jackets, PFDs	\$142,149	*
Taxidermy	\$132,091	*
Books & magazines	\$280,985	*
Coolers	\$340,377	*
Boats, canoes, kayaks	\$1,112,294	*
Boat motors	\$391,672	*
Trailers, hitches, accessories	\$115,768	*
Boat parts, accessories	\$373,043	*
Bug spray, sunscreen	\$305,765	*
Cameras, binoculars	\$778,490	*
Tents, tarps, packs	\$306,729	*
Camping trailer	\$8,513,794	*
Other camping equipment	\$319,111	*
Trucks, SUVs, RVs	\$3,781,472	*
<b>Total Equipment Expenditures</b>	<b>\$24,182,725</b>	<b>*</b>

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.17. Economic Summary for Statewide Delayed Harvest Trout Fishing**

	<b>Resident Anglers</b>	<b>Nonresident Anglers</b>	<b>All Anglers</b>
<b>Trout Anglers</b>	21,717	11,181	32,898
<b>Days Fished for Trout</b>	283,551	106,535	390,085
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	\$482,043	\$256,500	\$738,543
<i>Trip Expenditures</i>	\$33,258,813	\$23,613,828	\$56,872,641
<i>Equipment Expenditures</i>	\$8,649,716	*	\$8,649,716
<b>Total Dollars Spent</b>	\$42,390,571	\$23,870,329	\$66,260,900
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$54,008,625	\$39,430,282	\$93,438,907
<i>Income Provided</i>	\$18,198,424	\$13,478,227	\$31,676,651
<i>Jobs Supported</i>	517	404	922
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$14,916,254	*	\$14,916,254
<i>Income Provided</i>	\$5,190,055	*	\$5,190,055
<i>Jobs Supported</i>	139	*	139
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$68,924,879	\$39,430,282	\$108,355,161
<i>Income Provided</i>	\$23,388,479	\$13,478,227	\$36,866,706
<i>Jobs Supported</i>	657	404	1,061
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$4,885,250	\$2,665,171	\$7,550,420
<i>Federal</i>	\$5,383,495	\$3,090,793	\$8,474,288

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.18. Total Trip Expenditures (Delayed Harvest Trout Waters)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
Groceries	\$4,825,983	\$2,701,864
Restaurants	\$3,318,891	\$3,092,100
Lodging	\$6,531,533	\$7,488,791
Vehicle fuel	\$9,271,231	\$4,066,563
Public transportation	\$1,176,229	\$41,420
Car rentals	\$307,077	-
Guide fees	\$4,781,193	\$3,779,306
Boat launch/docks	\$31,546	-
Cooking/heating fuel	\$341,470	\$123,360
Equipment rental	\$904,035	\$1,141,754
Bait	\$750,128	\$394,391
Souvenirs	\$520,189	\$478,132
Entertainment	\$499,308	\$306,148
<b>Total Trip Expenditures</b>	<b>\$33,258,813</b>	<b>\$23,613,828</b>

**Table 3.19. Total Equipment Expenditures (Delayed Harvest Trout Waters)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$482,043</b>	<b>\$256,500</b>
Rods and reels	\$2,015,023	*
Line and leaders	\$489,387	*
Lures	\$692,590	*
Tackle boxes	\$159,427	*
Hooks, sinkers, swivels	\$112,094	*
Depth finders; electronics	\$7,384	*
Creels, stringers, nets	\$122,407	*
Other fishing equipment	\$233,393	*
Fly tying equipment	\$430,169	*
Clothing	\$697,230	*
Waders, boots, shoes	\$760,715	*
Life jackets, PFDs	\$26,780	*
Taxidermy	-	*
Books & magazines	\$189,262	*
Coolers	\$113,318	*
Boats, canoes, kayaks	\$199,522	*
Boat motors	-	*
Trailers, hitches, accessories	\$124,944	*
Boat parts, accessories	\$106,917	*
Bug spray, sunscreen	\$165,825	*
Cameras, binoculars	\$712,527	*
Tents, tarps, packs	\$158,677	*
Camping trailer	-	*
Other camping equipment	\$123,288	*
Trucks, SUVs, RVs	\$1,008,835	*
<b>Total Equipment Expenditures</b>	<b>\$8,649,716</b>	*

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

**Table 3.20. Economic Summary for Statewide Wild Trout Fishing**

	<b>Resident Anglers</b>	<b>Nonresident Anglers</b>	<b>All Anglers</b>
<b>Trout Anglers</b>	19,656	4,696	24,352
<b>Days Fished for Trout</b>	244,340	**	276,804
<b>Angler Purchases:</b>			
<i>Licenses and Fees</i>	\$547,074	**	\$662,350
<i>Trip Expenditures</i>	\$24,610,338	**	\$28,918,658
<i>Equipment Expenditures</i>	\$9,119,822	*	\$9,119,822
<b>Total Dollars Spent</b>	\$34,277,234	**	\$38,700,830
<b>Effects from Trip Spending</b>			
<i>Total Economic Output</i>	\$38,538,492	**	\$45,633,258
<i>Income Provided</i>	\$13,017,586	**	\$15,439,660
<i>Jobs Supported</i>	358	**	430
<b>Effects from Equipment Spending</b>			
<i>Total Economic Output</i>	\$15,132,304	*	\$15,132,304
<i>Income Provided</i>	\$5,130,893	*	\$5,130,893
<i>Jobs Supported</i>	126	*	126
<b>Effects from All Spending</b>			
<i>Total Economic Output</i>	\$53,670,796	**	\$60,765,562
<i>Income Provided</i>	\$18,148,479	**	\$20,570,553
<i>Jobs Supported</i>	484	**	555
<b>Tax Revenues from All Spending</b>			
<i>State and local</i>	\$3,771,528	**	\$4,254,207
<i>Federal</i>	\$4,123,133	**	\$4,679,858

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

\*\* Sample size too small to report reliable results.

**Table 3.21. Total Trip Expenditures (Wild Trout Waters)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
Groceries	\$5,576,275	\$675,578
Restaurants	\$2,900,555	\$477,067
Lodging	\$3,861,299	\$1,315,935
Vehicle fuel	\$7,103,837	\$840,678
Public transportation	\$83,901	\$6,125
Car rentals	\$100,346	-
Guide fees	\$971,778	\$624,349
Boat launch/docks	\$196,615	-
Cooking/heating fuel	\$973,557	\$65,080
Equipment rental	\$541,750	\$13,782
Bait	\$1,305,765	\$55,892
Souvenirs	\$479,687	\$130,473
Entertainment	\$514,975	\$103,362
<b>Total Trip Expenditures</b>	<b>\$24,610,338</b>	<b>\$4,308,321</b>



**Table 3.22. Total Equipment Expenditures (Wild Trout Waters)**

<b>Items</b>	<b>Residents</b>	<b>Nonresidents</b>
<b>Licenses</b>	<b>\$547,074</b>	<b>\$115,275</b>
Rods and reels	\$1,137,902	*
Line and leaders	\$384,803	*
Lures	\$460,808	*
Tackle boxes	\$74,855	*
Hooks, sinkers, swivels	\$95,797	*
Depth finders; electronics	\$70,332	*
Creels, stringers, nets	\$45,907	*
Other fishing equipment	\$178,610	*
Fly tying equipment	\$237,084	*
Clothing	\$421,060	*
Waders, boots, shoes	\$520,805	*
Life jackets, PFDs	\$81,359	*
Taxidermy	\$95,870	*
Books & magazines	\$208,405	*
Coolers	\$125,066	*
Boats, canoes, kayaks	\$1,423,281	*
Boat motors	\$132,811	*
Trailers, hitches, accessories	\$168,903	*
Boat parts, accessories	\$199,943	*
Bug spray, sunscreen	\$127,359	*
Cameras, binoculars	\$316,331	*
Tents, tarps, packs	\$346,417	*
Camping trailer	\$664,057	*
Other camping equipment	\$240,789	*
Trucks, SUVs, RVs	\$1,361,267	*
<b>Total Equipment Expenditures</b>	<b>\$9,119,822</b>	*

\*Most equipment spending takes place where people live; nonresidents generally spend little on equipment in NC.

## **ABOUT RESPONSIVE MANAGEMENT**

Responsive Management is an internationally recognized public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. Our mission is to help natural resource and outdoor recreation agencies and organizations better understand and work with their constituents, customers, and the public.

Utilizing our in-house, full-service telephone, mail, and web-based survey center with 50 professional interviewers, we have conducted more than 1,000 telephone surveys, mail surveys, personal interviews, and focus groups, as well as numerous marketing and communication plans, needs assessments, and program evaluations.

Clients include the federal natural resource and land management agencies, most state fish and wildlife agencies, state departments of natural resources, environmental protection agencies, state park agencies, tourism boards, most of the major conservation and sportsmen's organizations, and numerous private businesses. Responsive Management also collects attitude and opinion data for many of the nation's top universities.

Specializing in research on public attitudes toward natural resource and outdoor recreation issues, Responsive Management has completed a wide range of projects during the past 22 years, including dozens of studies of hunters, anglers, wildlife viewers, boaters, park visitors, historic site visitors, hikers, birdwatchers, campers, and rock climbers. Responsive Management has conducted studies on endangered species; waterfowl and wetlands; and the reintroduction of large predators such as wolves, grizzly bears, and the Florida panther.

Responsive Management has assisted with research on numerous natural resource ballot initiatives and referenda and has helped agencies and organizations find alternative funding and increase their membership and donations. Additionally, Responsive Management has conducted major organizational and programmatic needs assessments to assist natural resource agencies and organizations in developing more effective programs based on a solid foundation of fact.

Responsive Management has conducted research on public attitudes toward natural resources and outdoor recreation in almost every state in the United States, as well as in Canada, Australia, the United Kingdom, France, Germany, and Japan. Responsive Management has also conducted focus groups and personal interviews with residents of the African countries of Algeria, Cameroon, Mauritius, Namibia, South Africa, Tanzania, Zambia, and Zimbabwe.

Responsive Management routinely conducts surveys in Spanish and has conducted surveys in Chinese, Korean, Japanese and Vietnamese and has completed numerous studies with specific target audiences, including Hispanics; African-Americans; Asians; women; children; senior citizens; urban, suburban, and rural residents; large landowners; and farmers.

Responsive Management's research has been upheld in U.S. District Courts; used in peer-reviewed journals; and presented at major natural resource, fish and wildlife, and outdoor recreation conferences across the world. Company research has been featured in most of the nation's major media, including CNN, *The New York Times*, *The Wall Street Journal*, and on the front pages of *USA Today* and *The Washington Post*. Responsive Management's research has also been highlighted in *Newsweek* magazine.

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