

# Responsive Management



## **SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES HUNTING AND FISHING LICENSE DUPLICATION STUDY**

**LICENSE YEAR 2004-2005**

**Conducted for the South Carolina Department of Natural Resources  
by Responsive Management**

**2005**

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**Responsive Management National Office**

Mark Damian Duda, Executive Director  
Peter E. De Michele, Ph.D., Director of Research  
Martin Jones, Research Associate  
Andrea Criscione, Research Associate  
Chad Craun, Research Associate  
Tim Winegord, Survey Center Manager  
Alison Lanier, Business Manager  
Steven J. Bissell, Ph.D., Qualitative Research Associate  
James B. Herrick, Ph.D., Research Associate

130 Franklin Street  
Harrisonburg, VA 22801  
Phone: 540/432-1888 Fax: 540/432-1892  
E-mail: [mark@responsivemanagement.com](mailto:mark@responsivemanagement.com)  
[www.responsivemanagement.com](http://www.responsivemanagement.com)

## **Acknowledgements**

Responsive Management would like to thank Ross Self of the South Carolina Department of Natural Resources for his input, support, and guidance on this project.

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## **INTRODUCTION AND METHODOLOGY**

Responsive Management conducted this study for the South Carolina Department of Natural Resources (SCDNR) to estimate the total numbers of hunters and anglers in the state (both resident and non-resident) based on the numbers of licenses sold. Specifically, the study estimated how many hunting and fishing licenses sold in the state were sold to hunters and anglers who already held other valid hunting and/or fishing licenses. The study entailed a telephone survey of specific hunting and fishing license holders—those licenses that a hunter or angler might purchase while simultaneously having another type of license: Resident County Hunting License, 3-Day Non-Resident Hunting License, 10-Day Non-Resident Hunting License, Shooting Preserve License, 14-Day Resident Freshwater Fishing License, Resident Lakes-Reservoirs Permit, 7-Day Non-Resident Freshwater Fishing License, Annual Resident Saltwater Fishing License, 14-Day Resident Saltwater Fishing License, Annual Non-Resident Saltwater Fishing License, 14-Day Non-Resident Saltwater Fishing License. This information is necessary to allow South Carolina to calculate the state's appropriation of Federal Sport Fish and Wildlife Restoration funds, which is based on the numbers of hunters and anglers in the state. Specific aspects of the research methodology are discussed below.

For the survey, telephones were selected as the preferred sampling medium because of the universality of telephone ownership. In addition, a central polling site at the Responsive Management office allowed for rigorous quality control over the interviews and data collection. Responsive Management maintains its own in-house telephone interviewing facilities. These facilities are staffed by interviewers with experience conducting computer-assisted telephone interviews on the subjects of natural resources and outdoor recreation. The telephone survey questionnaire was developed cooperatively by Responsive Management and the SCDNR. Responsive Management conducted a pre-test of the questionnaire, and revisions were made to the questionnaire based on the pre-test.

To ensure the integrity of the telephone survey data, Responsive Management has interviewers who have been trained according to the standards established by the Council of American Survey Research Organizations. Methods of instruction included lecture and role-playing. The Survey Center Managers and other professional staff conducted project briefings with the interviewers

prior to the administration of this survey. Interviewers were instructed on type of study, study goals and objectives, handling of survey questions, interview length, termination points and qualifiers for participation, interviewer instructions within the survey instrument, reading of the survey instrument, skip patterns, and probing and clarifying techniques necessary for specific questions on the survey instrument. The Survey Center Managers and statisticians monitored the data collection, including monitoring of the actual telephone interviews without the interviewers' knowledge, to evaluate the performance of each interviewer and ensure the integrity of the data. After the surveys were obtained by the interviewers, the Survey Center Managers and/or statisticians edited each completed survey to ensure clarity and completeness.

Interviews were conducted Monday through Friday from 9:00 a.m. to 9:00 p.m., Saturday noon to 5:00 p.m., and Sunday from 5:00 p.m. to 9:00 p.m., local time. A five-callback design was used to maintain the representativeness of the sample, to avoid bias toward people easy to reach by telephone, and to provide an equal opportunity for all to participate. When a respondent could not be reached on the first call, subsequent calls were placed on different days of the week and at different times of the day. The survey was conducted in November 2005. Responsive Management obtained a total of 2,692 completed interviews.

The software used for data collection was Questionnaire Programming Language 4.1 (QPL). The survey data were entered into the computer as each interview was being conducted, eliminating manual data entry after the completion of the survey and the concomitant data entry errors that may occur with manual data entry. The analysis of data was performed using Statistical Package for the Social Sciences software as well as proprietary software developed by Responsive Management.

As alluded to previously, the likelihood for license duplication exists primarily in the following eleven license types: Resident County Hunting License, 3-Day Non-Resident Hunting License, 10-Day Non-Resident Hunting License, Shooting Preserve License, 14-Day Resident Freshwater Fishing License, Resident Lakes-Reservoirs Permit, 7-Day Non-Resident Freshwater Fishing License, Annual Resident Saltwater Fishing License, 14-Day Resident Saltwater Fishing License, Annual Non-Resident Saltwater Fishing License, 14-Day Non-Resident Saltwater

Fishing License. These types of licenses are likely to be purchased regardless of other licenses held in that “class” of license. There are four “classes” of licenses: Resident Hunting, Resident Fishing, Non-Resident Hunting, and Non-Resident Fishing.

In each of the four classes of licenses, there are unduplicated licenses and potentially duplicated licenses, as shown in the tabulation that follows.

<b>License Class</b>	<b>License Types</b>
<b>Class 1: Resident Hunting Licenses</b>	<b>Unduplicated Licenses</b>
	Combination Hunting and Freshwater Fishing and Big Game License
	Sportsman’s License
	Junior Sportsman’s
	Lifetime Combination
	State Hunting
	Lifetime Hunting
	<b>Potentially Duplicated Licenses</b>
County Hunting	
<b>Class 2: Nonresident Hunting Licenses</b>	<b>Unduplicated Licenses</b>
	Annual Hunting Licenses
	<b>Potentially Duplicated Licenses</b>
	10-Day Hunting License
	3-Day Hunting License
Shooting Preserve Permit	
<b>Class 3: Resident Fishing Licenses</b>	<b>Unduplicated Licenses</b>
	Resident Freshwater Fishing
	Lifetime Freshwater Fishing
	<b>Potentially Duplicated Licenses</b>
	14-Day Freshwater Fishing
	Lakes and Reservoirs Permit
	Annual Resident Saltwater Fishing
14-Day Resident Saltwater Fishing	
<b>Class 4: Nonresident Fishing License</b>	<b>Unduplicated Licenses</b>
	Annual Non-Resident Freshwater Fishing License
	<b>Potentially Duplicated Licenses</b>
	7-Day Nonresident freshwater fishing license
	Annual Non-Resident Saltwater Fishing License
14-day Non-Resident Saltwater Fishing License	

The following tabulation shows possible overlap of license types. Shaded cells are those upon which the study focused.

Resident Licenses								
License Types in Sample	Licenses Types for Final Counts							
	Combination Hunting and Freshwater Fishing and Big Game	Sportsman's	Junior Sportsman's	Lifetime Combination	Resident Freshwater Fishing	Lifetime Freshwater Fishing	State Hunting	Lifetime Hunting
14-Day Resident Freshwater Fishing	X	X	X	X	X	X		
Lakes and Reservoirs Permit	X	X	X	X	X	X		
Annual Resident Saltwater Fishing	X	X	X	X	X	X		
14-Day Resident Saltwater Fishing (Internal Overlap with Annual Saltwater)	X	X	X	X	X	X		
County Hunting	X	X	X	X			X	X

Non-Resident Licenses		
License Types in Sample	Licenses Types for Final Counts	
	Annual Non-Resident Freshwater Fishing	Annual Hunting
7-Day Non-Resident Freshwater Fishing	X	
Annual Non-Resident Saltwater Fishing	X	
14-Day Non-Resident Saltwater Fishing (Internal Overlap With Annual Saltwater)	X	
3-Day Non-Resident Hunting		X
10-Day Non-Resident Hunting		X
Shooting Preserve Permit		X

Using the schema defined above and a coding methodology described herein, duplication values were created for each potentially duplicated license type for use in removing the effect of multiple purchases of licenses by single individuals.

The sampling methodology was as follows. The SCDNR tracks license purchases through pencil-and-paper transaction slips and through an electronic point-of-sale database. These two data sources encompass all license sales; however, the distribution of license types within those two sources was uncertain. To minimize sampling error and create the most accurate sampling strategy, sampling of the eleven potentially duplicated license types from the two data sources was split in two. The sampling strategy entailed sampling each of the eleven license types from the electronic database independently of the sampling of the eleven license types represented in the paper transaction slips. This ensured that any geographic or vendor-based confounds that differentiated the distributions of the licenses in the two data sources would be controlled through treating the samples as if they were completely independent.

The population of license holders was sampled in such a way to maintain an even and low sampling error across all subgroups within the population of license holders. The sampling plan was based on the population data of licenses sold, the total number of completed surveys desired, and the sampling error formula (described below) for each of the 22 groups (11 electronic and 11 pencil-and-paper). The SCDNR hand-sampled its pencil-and-paper transactions and provided records to Responsive Management. Those data were entered at Responsive Management in Questionnaire Programming Language to provide the call sample for 11 of the 22 groups. The electronic database was randomly sampled via computer for the sample of the other 11 groups.

At the conclusion of the calling, these data were weighted to make the results match known population figures for license sales, as shown in the tabulation on the following page. The sampling methodology used in this study differs from the methodology of the study performed by Responsive Management in 1994, but it results in a higher level of accuracy.

**Weighting Factors**

LICENSE TYPE	TOTAL POPULATION	ELECTRONIC POPULATION	HARDCOPY POPULATION	ELECTRONIC SAMPLE	HARDCOPY SAMPLE	TOTAL SAMPLE	ELECTRONIC ERROR	HARDCOPY ERROR	TOTAL ERROR	ELECTRONIC WEIGHT	HARDCOPY WEIGHT
RESIDENT COUNTY HUNTING LICENSE	1,545	983	562	130	88	218	8.01	9.60	6.15	0.10	0.08
3-DAY NON-RESIDENT HUNTING LICENSE	11,065	7,564	3,501	61	174	235	12.50	7.24	6.32	1.57	0.25
10-DAY NON-RESIDENT HUNTING LICENSE	2,301	1,418	883	103	154	257	9.30	7.18	5.76	0.17	0.07
SHOOTING PRESERVE LICENSE	3,253	471	2,782	104	76	180	8.49	11.09	7.10	0.06	0.46
14-DAY RESIDENT FRESHWATER FISH LICENSE	35,209	9,654	25,555	35	249	284	16.54	6.18	5.79	3.49	1.30
RESIDENT LAKES-RESERVOIRS PERMIT	1,650	219	1,431	22	197	219	19.86	6.49	6.17	0.13	0.09
7-DAY NON-RESIDENT FRESHWATER FISH	53,728	10,805	42,923	78	281	359	11.06	5.83	5.15	1.75	1.93
ANNUAL RESIDENT SALTWATER FISH LICENSE	78,545	72,912	5,633	91	149	240	10.27	7.92	6.32	10.15	0.48
14-DAY RESIDENT SALTWATER FISH LICENSE	5,225	3,884	1,341	50	188	238	13.77	6.63	6.21	0.98	0.09
ANNUAL NON-RESIDENT SALTWATER FISH	6,662	6,016	646	115	126	241	9.05	7.84	6.20	0.66	0.06
14-DAY NON-RESIDENT SALTWATER FISH	13,352	13,352	0	214	7	221	6.65	NA*	6.54	0.79	0.00
TOTAL	212,535	127,278	85,257	1,003	1,689	2,692	3.08	2.36	1.88		

\*Sampling error does not apply because hardcopy population was 0.

The analysis examined the eleven potentially duplicated licenses held by respondents and assigned them a meaningful value to indicate how much they overlap with other license types. License holders gained license “scores” for each license type they had purchased. These scores represented the percent of a potentially duplicated license that could be assigned to that one license holder. If one license holder holds a single license, he/she is assigned a score of 100 to indicate that there was a 1-to-1 match of holder-to-license.

Zero percent of any quantity of potentially duplicated licenses can be counted if the owner also holds an unduplicated license. Unduplicated licenses are considered to have already been counted, so having any number of unduplicated licenses and having a potentially duplicated

license is assigned a score of 0% for the potentially duplicated license(s). That prevents that particular respondent from being counted a second time.

If a respondent holds only potentially duplicated license(s), then the respondent is assigned a score of 100% divided by the number of potentially duplicated licenses he/she holds. This allows the licenses to be counted as a percent of a person they represent. For instance, four potentially duplicated licenses held by a single person would mean that each of the four licenses represent 25% of a person.

## DUPLICATION TABULATIONS

### County Hunting License Duplication

Unduplicated License Types	Percent of County Hunting Licenses That Are Counted Under the Given Unduplicated License Type
Combination Hunting and Freshwater Fishing and Big Game License	19.30
Sportsman's License	5.00
Junior Sportsman's License	0.41
Lifetime Combination License	0.00
State Hunting License	8.77
Lifetime Hunting License	0.41
Overlap with All Unduplicated Licenses (not a sum of above)	27.16
Percent of County Hunting Licenses That Are Not Duplicated	72.84

### Duplication of 10-Day and 3-Day Non-Resident Hunting Licenses and Non-Resident Shooting Preserve Permits

Unduplicated License Type	License Types That May Be Duplicated with Annual Hunting License			
	Percent of 10-Day Non-Resident Hunting Licenses That Are Duplicated with Annual Hunting Licenses	Percent of 3-Day Non-Resident Hunting Licenses That Are Duplicated with Annual Hunting Licenses	Percent of Non-Resident Shooting Preserve Permits That Are Duplicated with Annual Hunting Licenses	Percent of All Three License Types That Are Duplicated with Annual Non-Resident Hunting Licenses
Annual Non-Resident Hunting License	14.43	9.57	10.95	10.52

**Duplication of 14-Day Resident Freshwater and Saltwater Fishing Licenses, Annual Resident Saltwater Fishing Licenses, and Lakes and Reservoirs Permits**

	License Types That May Be Duplicated with Resident Freshwater Fishing & Lifetime Freshwater Fishing Licenses				
Unduplicated License Type	Percent of 14-Day Resident Freshwater Fishing Licenses That Are Duplicated with Resident Freshwater Fishing & Lifetime Freshwater Fishing Licenses	Percent of 14-Day Resident Saltwater Fishing Licenses That Are Duplicated with Resident Freshwater Fishing & Lifetime Freshwater Fishing Licenses	Percent of Annual Resident Saltwater Fishing Licenses That Are Duplicated with Resident Freshwater Fishing & Lifetime Freshwater Fishing Licenses	Percent of Lakes and Reservoirs Permits That Are Duplicated with Resident Freshwater Fishing & Lifetime Freshwater Fishing Licenses	Percent of All Four License Types That Are Duplicated with Resident Freshwater Fishing & Lifetime Freshwater Fishing Licenses
Resident Freshwater Fishing & Lifetime Freshwater Fishing	20.57	13.12	23.43	2.72	21.86

**Duplication of 14-Day Non-Resident Saltwater Fishing Licenses, 7-Day Non-Resident Freshwater Fishing Licenses, and Annual Non-Resident Saltwater Fishing Licenses**

	License Types That May Be Duplicated with Annual Non-Resident Freshwater Fishing License			
Unduplicated License Type	Percent of 14-Day Non-Resident Saltwater Fishing Licenses That Are Duplicated with Annual Non-Resident Freshwater Fishing Licenses	Percent of 7-Day Non-Resident Freshwater Fishing Licenses That Are Duplicated with Annual Non-Resident Freshwater Fishing Licenses	Percent of Annual Non-Resident Saltwater Fishing Licenses That Are Duplicated with Annual Non-Resident Freshwater Fishing Licenses	Percent of All Three License Types That Are Duplicated with Annual Non-Resident Freshwater Fishing Licenses
Annual Non-Resident Freshwater Fishing License	8.76	12.80	9.63	11.78

## **ABOUT RESPONSIVE MANAGEMENT**

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

Utilizing its in-house, full-service, computer-assisted telephone and mail survey center with 65 professional interviewers, Responsive Management has conducted more than 1,000 telephone surveys, mail surveys, personal interviews, and focus groups, as well as numerous marketing and communications plans, need assessments, and program evaluations on natural resource and outdoor recreation issues.

Clients include most of the federal and state natural resource, outdoor recreation, and environmental agencies, and most of the top conservation organizations. Responsive Management also collects attitude and opinion data for many of the nation's top universities, including the University of Southern California, Virginia Tech, Colorado State University, Auburn, Texas Tech, the University of California—Davis, Michigan State University, the University of Florida, North Carolina State University, Penn State, West Virginia University, and others.

Among the wide range of work Responsive Management has completed during the past 15 years are studies on how the general population values natural resources and outdoor recreation, and their opinions on and attitudes toward an array of natural resource-related issues. Responsive Management has conducted dozens of studies of selected groups of outdoor recreationists, including anglers, boaters, hunters, wildlife watchers, birdwatchers, park visitors, historic site visitors, hikers, and campers, as well as selected groups within the general population, such as landowners, farmers, urban and rural residents, women, senior citizens, children, Hispanics, Asians, and African-Americans. Responsive Management has conducted studies on environmental education, endangered species, waterfowl, wetlands, water quality, and the reintroduction of numerous species such as wolves, grizzly bears, the California condor, and the Florida panther.

Responsive Management has conducted research on numerous natural resource ballot initiatives and referenda and helped agencies and organizations find alternative funding and increase their memberships and donations. Responsive Management has conducted major agency and organizational program needs assessments and helped develop more effective programs based upon a solid foundation of fact. Responsive Management has developed Web sites for natural resource organizations, conducted training workshops on the human dimensions of natural resources, and presented numerous studies each year in presentations and as keynote speakers at major natural resource, outdoor recreation, conservation, and environmental conferences and meetings.

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 routinely conducts surveys in Spanish and has also conducted surveys and focus groups in Chinese, Korean, Japanese, and Vietnamese.

Responsive Management's research has been featured in most of the nation's major media, including CNN's *Crossfire*, ESPN, *The Washington Post*, *The Washington Times*, *The New York Times*, *Newsweek*, *The Wall Street Journal*, and on the front page of *USA Today*.

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