



## 2007-2008 South Carolina Bobwhite Quail Hunter Survey



The South Carolina Department of Natural Resources Small Game Project conducts an annual survey of the state's bobwhite quail (*Colinus virginianus*) hunters. This survey was initiated during the 1987-88 hunting season and was conducted for the 21th consecutive year during the 2007-08 season. The purpose of the Quail Hunter Survey is to collect quantitative information on hunting success, which aids biologists in tracking quail population trends.

### **METHODS**

A mailing list was generated from individuals who had participated in the Quail Hunter Survey in previous years, applicants from the DNR Public Drawing quail hunts and individuals who responded to news releases or otherwise heard about the survey.

Immediately prior to the opening of the 2007-08 quail hunting season, a total of 210 potential cooperators were provided with materials necessary to participate in the survey. The materials included a pocket-size hunting diary, a data sheet, a postage-paid return envelope, and instructions for the survey. Potential cooperators were also provided with a larger return envelope with tags and asked to collect 10 wings from harvested quail. The wings were used to estimate sex and age ratios for the state's quail population. Funds for printing of the hunting diary booklets were generously provided by the South Carolina State Committee of Quail Unlimited.

Cooperators were instructed to keep accurate records while quail hunting by recording the following information for each hunt: date, county of hunt, number of quail coveys flushed, number of quail bagged, an estimate of average covey size, number of woodcock (*Scolopax minor*) flushed, number of woodcock bagged, time expended on each hunt, and number of rabbits (*Sylvilagus* spp.) seen while quail hunting. Information and comments concerning the overall quality of the season, dog performance, quail food habits, weather, habitat conditions and other observations were also requested. Cooperators were asked to collect 1 wing from each quail harvested (up to 10 per cooperator) and affix a tag with the date, county and sex of the bird to each wing. Survey participants were urged to record information for wild, native bobwhite quail hunts only.

Near the close of the quail season, a reminder postcard was mailed to each potential cooperator encouraging prompt return of the survey forms and wings. Data received were entered on a computer file, proofed and summarized. Data were then analyzed statistically to determine differences by year, county, region, month, or a combination of these variables.

## **RESULTS AND DISCUSSION**

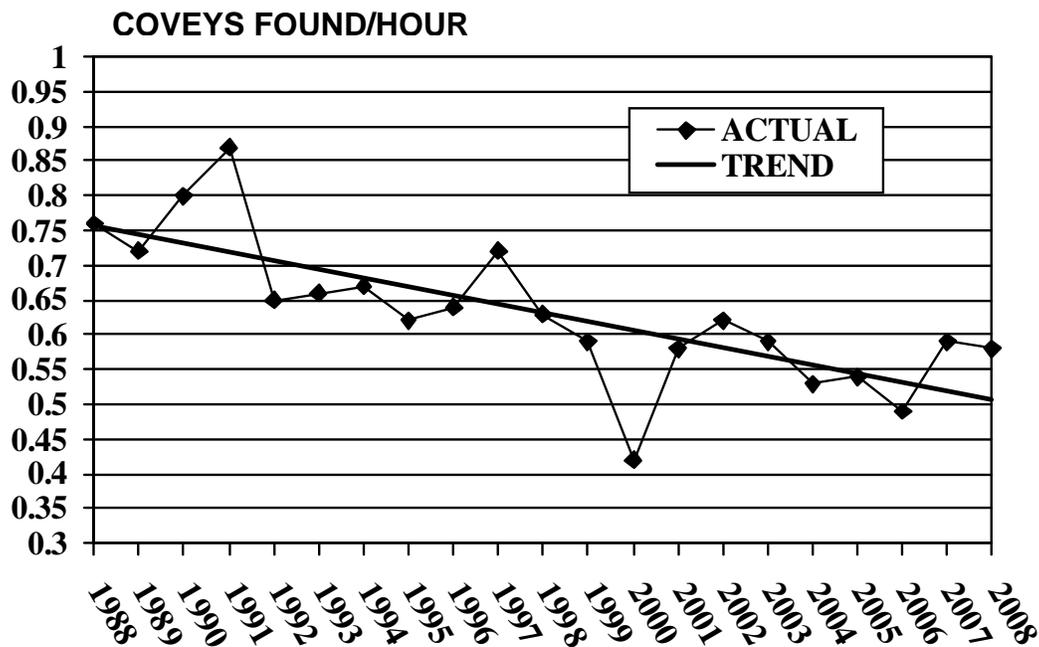
### **Statewide**

Responses were received from 46 individuals, with 39 hunters providing usable data. The total response rate was 19%. Information was obtained from 474 hunts, totaling 1412.5 quail hunting hours. The highest frequency of survey quail hunting activity occurred during the month of January, closely followed by February (Table 1).

**Table 1. Quail hunting activity by month, 2007-08 South Carolina Quail Hunter Survey**

Month	Number of Hunts	Percentage of Total
November	49	10.3
December	118	24.9
January	150	31.6
February	143	30.2
March	14	3.0
TOTAL	474	100.0

Survey cooperators flushed an average of 0.58 coveys per hour during the 2007-08 season, which was not significantly from the flush rate in the previous season (Table 2). Quail bagged per hour decreased significantly from the previous season, and rabbits jumped per hour increased slightly from last year. The reported average covey size was significantly higher than the previous year. The trend in the coveys per hour index over the 21 years of the survey is illustrated in Figure 1. Quail hunters responding to the survey reported flushing 35 woodcock while quail hunting, for a flush rate of 0.02 woodcock per hour, significantly lower than the 0.14 woodcock flushed per hour in 2006-07. The number of woodcock harvested was 4 during the 2007-08 season, down from 53 woodcock harvested during the 2006-07 season.



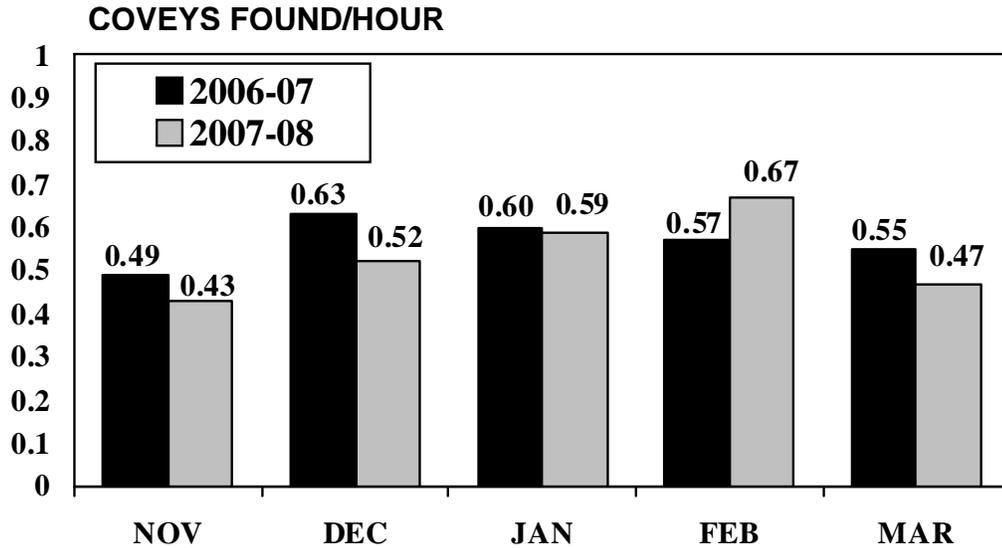
**Figure 1. Coveys per hour index and trend, South Carolina Quail Hunter Survey, 1988-2008.**

**Table 2. Statewide South Carolina Quail Hunter Survey results, 1988-2008.**

Year of Survey	Coveys Found Per Hour	Quail Bagged Per Hour	Average Covey Size	Rabbits Jumped Per Hour
1987-88	0.76	0.99	12.5	0.21
1988-89	0.72	0.94	12.2	0.19
1989-90	0.80*	1.04	12.9	0.16
1990-91	0.87*	1.07	12.5	0.19*
1991-92	0.65*	0.75*	12.2	0.15*
1992-93	0.66	0.73	12.2	0.15
1993-94	0.67	0.73	11.9	0.22*
1994-95	0.62	0.72	11.8	0.17*
1995-96	0.64	0.76	11.7	0.16
1996-97	0.72*	0.79	12.3	0.18
1997-98	0.63*	0.66*	11.9	0.14
1998-99	0.59	0.62	11.3*	0.16
1999-00	0.42*	0.38*	10.7*	0.14
2000-01	0.58*	0.55*	11.4*	0.13
2001-02	0.62	0.56	11.8	0.17*
2002-03	0.59	0.56	11.2	0.16
2003-04	0.53*	0.49	11.6*	0.13
2004-05	0.54	0.55	11.1*	0.14
2005-06	0.49	0.42*	10.5	0.13
2006-07	0.59*	0.43	11.2*	0.14
2007-08	0.58	0.33*	12.1*	0.15

\*Significantly different from the previous year (P<0.05)

The Quail Hunter Survey also provides information on hunting success by month, region, and county. Hunting success rates as measured by coveys per hour were higher in February and the lower in all other months when compared with the previous season (Fig. 2).

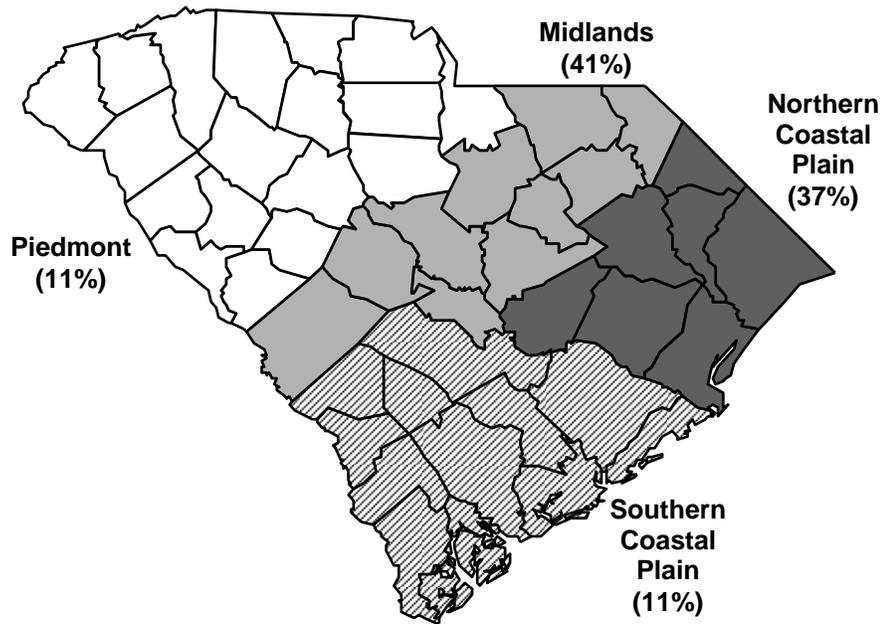


**Figure 2. Coveys per hour index by month for the 2006-07 and 2007-08 seasons, South Carolina Quail Hunter Survey.**

**Regional Comparisons**

South Carolina can be divided into 4 broad geographical regions based on habitat type similarities. The Piedmont, which includes the mountain and foothills areas, encompasses about 1/3 of the state. The Midlands extends in a broad band of mostly sandhills habitat on a northeast - southwest axis across the middle of South Carolina. The Northern Coastal Plain or "Pee Dee" and the Southern Coastal Plain or "Low Country" are the other 2 regions.

Hunting effort expended in the 2007-08 Quail Hunter Survey was greatest in the Midlands, accounting for 41% of all hunts (Fig. 3). The coveys per hour index was highest in the Northern Coastal Plain, followed by the Midlands, the Southern Coastal Plain and the Piedmont (Table 3). Quail harvest rate was higher in the Northern Coastal Plain than in the other three regions. The reported average size of quail coveys ranged from 10.4 birds per covey in the Southern Coastal Plain and Piedmont, to 13.3 birds per covey in the Northern Coastal Plain. The rabbit jumping rate by quail hunters was highest in the Northern Coastal Plain and lowest in the Southern Coastal Plain.



**Figure 3. Percentage of total hunts occurring in each region, South Carolina Quail Hunter Survey, 2007-08.**

**Table 3. Results by region, South Carolina Quail Hunter Survey, 2007-08.**

Region	Coveys Found Per Hour*	Quail Bagged Per Hour*	Average Covey Size*	Rabbits Jumped Per Hour*
N. Coastal Plain	0.87A	0.49A	13.3A	0.23A
Midlands	0.51B	0.29B	10.9B	0.12AB
S. Coastal Plain	0.22C	0.13C	10.4B	0.03B
Piedmont	0.16C	0.12BC	10.4B	0.10AB

\*Numbers followed by the same letter within the same column are not significantly different (P > 0.05).

## County Results

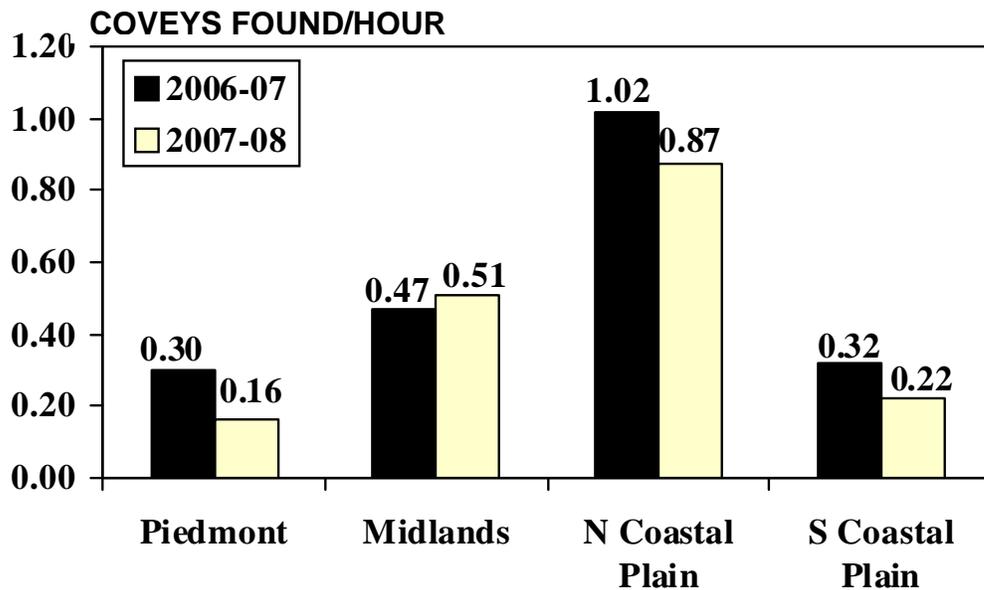
The top 5 counties for each of 4 indices are listed in Table 4. A minimum of 15 sample hunts had to occur in a particular county to be included in this ranking. Georgetown County retained the top spot in the coveys per hour index at 1.79, followed by Clarendon (1.26) and Calhoun (1.25) counties. Georgetown County also led the state in quail harvested per hour at 0.68, followed by Richland (0.58) and Calhoun (0.57) counties.

The top five counties for quail hunting lie in the Northern Coastal Plain Region or Midlands Region. However, county results should be interpreted cautiously due to the relatively low number of hunts upon which they are based. Nevertheless, Northern Coastal Plain and Midlands counties have proven to be the better areas for South Carolina quail hunting (Fig. 4).

**Table 4. Ranking of the top counties for indices measured in the South Carolina Quail Hunter Survey, 2007-08.**

Rank*	Coveys Found Per Hour	Quail Harvested Per Hour	Average Covey Size	Rabbits Jumped Per Hour
1	Georgetown (1.79)	Georgetown (0.68)	Georgetown (14.39)	Horry (0.47)
2	Clarendon (1.26)	Richland (0.58)	Lee (12.00)	Richland (0.27)
3	Calhoun (1.25)	Calhoun (0.57)	Charleston (11.47)	Williamsburg (0.17)
4	Lee (0.77)	Clarendon (0.56)	Horry (9.95)	Marlboro (0.14)
5	Richland (0.71)	Florence (0.46)	Richland (9.38)	Lee (0.13)

\*Counties with a sample size of less than 15 hunts not included.



**Figure 4. Coveys per hour index by region for the 2006-07 and 2007-08 seasons, South Carolina Quail Hunter Survey.**

### **Quail Wing Data**

All potential Quail Hunter Survey cooperators were asked to provide wings from harvested birds. Twenty-one survey participants provided usable wings, for a response rate of 54% of those providing hunting data. Age information was obtained from 135 wings collected during the 2007-08 season, and cooperators provided the sex of the birds from which 122 wings were taken.

A higher percentage of males is believed to be normal for fall quail populations because of the hen's greater susceptibility to predation and physical stress due to egg laying and incubation during the nesting season. The sex ratio obtained from quail wing samples during the 2007-08 season was 61% males to 39% females (Fig. 5). Overall, the percentage of juveniles in the harvest was 71%, versus 29% adults (Fig. 5). The age ratio of 2.46 juveniles per adult was lower than the age ratio of 3.17 juveniles per adult recorded in the 2006-07 survey. This decreased age ratio is likely a reflection of extended drought resulting in decreased nesting success and brood survival during the 2007 nesting season. Age ratios in quail of 5-6 juveniles per adult are considered good and 7-8 juveniles per adult excellent.

Age Ratio = 2.46 Juveniles per Adult

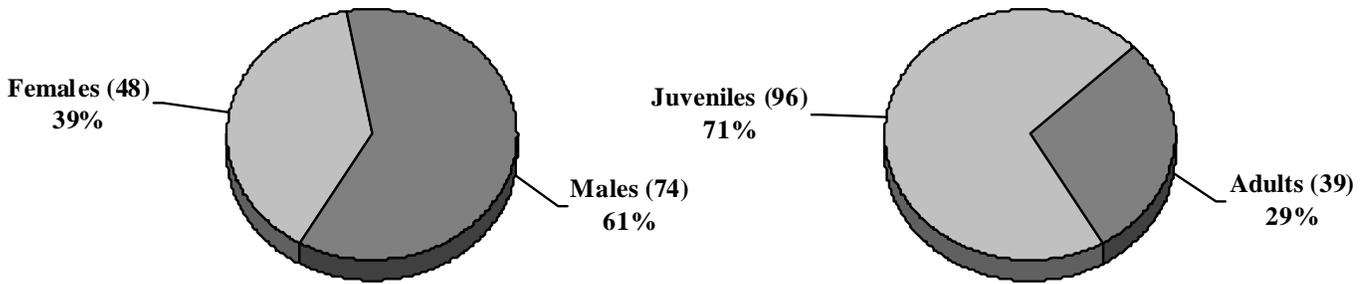


Figure 5. Quail sex and age distribution from sample wings, South Carolina Quail Hunter Survey, 2007-08.

Comments From Cooperators

Only 8% (down from 26%) of those responding rated the 2007-08 season as good, while 8% gave the season a fair rating, and 84% a poor rating (Fig. 6). Dog performance was rated good by 84% and fair by 13% of cooperators (Fig. 6).

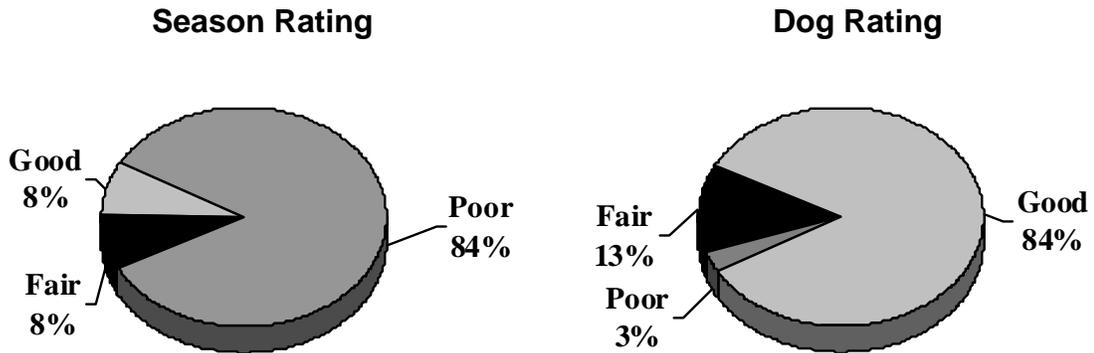


Figure 6. Ratings of season quality and dog performance by cooperators in the South Carolina Quail Hunter Survey, 2007-08.

Cooperator comments provide insight into general habitat and hunting conditions and predominant food items utilized by quail during fall and winter. Commonly submitted comments on the 2007-08 quail season are listed below. Number of comments received is noted in parentheses.



Season was poor/worse than last year (8).



Warm weather negatively impacted hunting success (6).



Drought had a negative impact on habitat conditions and the hatch (4).



Habitat appears good (2).



Predators seem to be a problem (2).

Typically, a basic food habits analysis is provided as part of this report. However, for the 2007-08 season, cooperators did not provide enough information regarding quail food habits to allow a summary.

Plans are underway to continue the Quail Hunter Survey for the 2008-09 season. Efforts are ongoing to increase the number of cooperators and all avid quail hunters are encouraged to participate. Contact the SCDNR Small Game Project, P.O. Box 167, Columbia, SC 29202 (telephone 803-734-3609) to be included in the survey.