2018 South Carolina
TURKEY HARVEST REPORT

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES
TURKEY RESEARCH & MANAGEMENT PROJECT

Submitted by
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Introduction

Ranking only behind the white - tailed deer in popularity among hunters, the Eastern wild turkey is an important natural resource in South Carolina. The 2018 Turkey Hunter Survey represents the South Carolina Department of Natural Resources (SCDNR), Wildlife Section's ongoing commitment to conduct pertinent research related to the state's wild turkey population. The primary objectives of this survey research were to obtain valid estimates of; (1) the statewide spring gobbler harvest in 2018, (2) the harvest of gobblers in the constituent counties of the state, and (3) hunting effort related to turkeys. Information on hunter's opinions of the turkey resource and other aspects of turkey hunting are also presented.

Due to the importance of turkeys as a state resource, SCDNR believes that accurately assessing the harvest of turkeys, as well as hunter participation in turkey hunting, is key to the management of this species. Proposed changes in turkey-related laws and regulations should have foundations in biology, therefore, the population dynamics associated with annual hunting mortality cannot be ignored. Similarly, when issues arise that do not involve biological parameters, it is important to have information related to turkey hunter activities afield because they too form an important basis for managing wild turkeys.

Since the inception of the Statewide Turkey Restoration and Research Project (Turkey Project) the methods used to document the turkey harvest have changed. Historically, turkey harvest figures were developed using a system of mandatory turkey check stations across the state. This system yielded an actual count of harvested turkey and was, therefore, an absolute minimum harvest figure. Shortcomings in this system included deterioration of check station compliance, complaints from hunters regarding the inconvenience of check stations, and costs associated with the check station system. The requirement to check harvested turkeys in South Carolina was eliminated following the 2005 season. Prior to eliminating the check-in requirement, SCDNR conducted surveys in order to document the rate of noncompliance, as well as, to determine the relationship between harvest figures obtained from check stations and those obtained from surveys. As would be expected, harvest figures obtained from surveys are higher than those from check stations due to lack of compliance with the check - in requirement.

Survey Methodology

The 2018 Turkey Hunter Survey represented a random mail survey that involved a single mail-out. The questionnaire for the 2018 Turkey Hunter Survey was developed by Wildlife Section personnel (Figure 1). The mailing list database was constructed by randomly selecting 30,000 individuals who received a set of 2018 Turkey Transportation Tags which are required in order to hunt turkeys in South Carolina. Data entry was completed by Priority Data, Inc., Omaha, Nebraska.

Results from the mail survey were corrected for nonresponse bias using data collected during 2007 - 2013 by Responsive Management of Harrisonburg, Virginia using a Computer Assisted Telephone Interview program (CATI).

Statistical analysis was conducted using Statistix 7 (Analytical Software, Tallahassee, FL).

Results and Discussion

Turkey Harvest

During the 2018 spring season it is estimated that a total of 16,145 adult gobblers and 1,794 jakes were harvested for a statewide total of 17,939 turkeys (Table 1). This figure represents a 6.4 percent decrease in harvest from 2017 (19,171). Keep in mind that legislative changes that went into effect in 2016 provided an earlier starting date and increased number of days in the turkey season in 34 of 46 South Carolina counties. The effect of this season change was a 50 percent increase in opportunity (days) for the majority of the state. Although the harvest was down slightly from 2017 to 2018, the harvest under the new season framework has consistently been higher (18 percent) than the year prior to the new season (Figure 2).

This increase in harvest can be explained in 2 ways. First, perhaps turkey numbers have increased since the new season went into place leading to an increase in harvest because more birds are available for harvest on the landscape. Alternatively, more hunter effort can clearly increase the harvest, to a point, regardless of the number of turkeys on the landscape.

Digging deeper into this issue we find that turkey production, as measured during the Summer Turkey Survey which has been conducted annually since 1982, has been poor since the new season began (Figure 3). In fact, recruitment during the last 5 years has been the lowest of any 5 year period since the survey began. Typically, low recruitment is followed by decreasing harvest and good recruitment is followed by increasing harvest. Based on this analysis the recent trend of higher harvest under the new season does not fit with the notion of a recent increase in the turkey population.

On the other hand, hunter effort (days/hunted) has increased an average of 23 percent under the new season framework compared to 2015 which was the last season prior to the new framework. Again, the new season increased opportunity (days) for hunters in 34 of 46 counties by 50 percent and this data clearly indicates that hunters have taken advantage of the additional opportunity. With turkey production being low recently, it appears that increased effort rather than increased turkey numbers is more influential in the increase in harvest that has accompanied the new season.

Finally, another measure of this harvest versus effort issue is catch per unit effort (CPUE) which is the amount of effort (days) it takes to harvest a turkey. Statewide CPUE prior to the new season was 12.7 days per turkey harvested. It was virtually the same for the 34 counties (12.4 days/turkey) that received more days under the new season framework as the 12 counties (13.4 days/turkey) that received no more days. Under the new season framework the CPUE in the 34 counties receiving more days increased 36 percent to 16.9 days/turkey, whereas, it remained the same in the 12 counties (12.6 days/turkey) that received no more days. This may be indicative of hunters in the 34 counties that received more days under the new framework using the additional days to kill more gobblers from a population that had no more birds than it previously did.

Harvest Per Unit Area County Rankings

Comparisons can be made between turkey harvests from the various counties in South Carolina if a harvest per unit area is established. Harvest per unit area standardizes the harvest among counties regardless of the size of individual counties. One measure of harvest rate is the number of turkeys taken per square mile (640ac. = 1 mile^2). When considering the estimated turkey habitat that is available in South Carolina, the turkey harvest rate in 2018 was 0.8 gobblers per square mile statewide (Table 2). Although this harvest rate is not as high as it once was, it should be considered good and is similar to other Southeastern states. The top 5 counties for harvest per unit area were Union (1.7 turkeys/mile^2), Spartanburg (1.4 turkeys/mile^2), Cherokee (1.3 turkeys/mile^2), Anderson (1.3 turkeys/mile^2), and Fairfield (1.2 turkeys/mile^2) (Table 2).

Turkey Harvest Rankings by County

Total turkey harvest is not comparable among counties because there is no standard unit of comparison, i.e. counties vary in size and are, therefore, not directly comparable. However, some readers may be interested in this type of ranking. The top 5 counties during 2018 were Williamsburg, Berkeley, Orangeburg, Fairfield, and Colleton (Table 3).

Number of Turkey Hunters

Even though all individuals receiving a set of Turkey Transportation Tags were licensed to hunt turkeys, only 60 percent indicated that they actually hunted turkeys. Based on this figure, approximately 50,772 hunters participated in the 2018 spring turkey season, a 3.2 percent decrease from 2017 (52,429). Counties with the highest estimates for individual hunters include, Fairfield, Union, Newberry, Orangeburg, and Berkeley, and (Table 4) and these were the same counties that made up the top 5 in 2017.

Hunter Effort

For the purposes of this survey hunter effort was measured in days with one day being defined as any portion of the day spent afield. Turkey hunters averaged approximately 5.7 days afield during the 2018 season (Table 4). Successful hunters averaged significantly more days afield (7.1 days) than unsuccessful hunters (4.7 days). Extrapolating to the entire population of turkey hunters yields a figure of 258,786 total days of spring gobbler hunting, down 6.7 percent from 2017 (277,300 days).

The number of days devoted to turkey hunting in South Carolina is significant and points not only to the availability and popularity of turkeys as a game species, but to the obvious economic benefits related to this important natural resource. Figures generated by a 2003 Survey by the National Wild Turkey Federation estimate that approximately 35 million dollars are added to South Carolina's economy annually from turkey hunting. The top 5 South Carolina counties for overall days of turkey hunting during 2018 were Fairfield, Union, Berkeley, Newberry, and Orangeburg counties (Table 4).

Turkey Harvest by Week of Season

South Carolina historically had two spring turkey season frameworks. Throughout most of the state (Game Zones 1, 2, and 4) the season was April 1 - May 1. This season was based on a recommendation from SCDNR following gobbling and nesting studies that were conducted in the 1970's. The other season framework was March 15 - May 1 and was only in effect in 12 counties in Game Zone 3 which comprised the lower coastal plain. This early opening season

was socio - politically based.

Due to legislation passed in 2015, the spring 2016 season was the first with a single statewide season on private land of March 20 - May 5. In past years it was customary to compare the harvest trends between the two season frameworks. With the single statewide season now in place, this comparison is no longer available. Nonetheless, Figure 4 depicts the harvest trends over the course of the season.

Hunting Success

For determination of hunting success only those individuals that actually hunted turkeys were included in the analysis and similarly, success was defined as harvesting at least one turkey. Overall hunting success in 2018 was 23 percent (Figure 5). Unlike deer hunting which typically has high success, turkey hunting can be an inherently unsuccessful endeavor, relatively speaking. Curiously though, the proportion of hunters who take two gobblers was slightly greater than those who take one indicating that successful hunters had essentially the same chance of taking two birds as they did one bird (Figure 5).

The statewide bag limit in South Carolina is 3 gobblers. Obviously, most successful hunters harvest only one or two birds. However, it is interesting to note the relative contribution to the total harvest of turkeys by the few hunters that harvest 3 birds. Ironically, the percentage of hunters taking 3 birds was only 2.3 percent, however, this small percentage of hunters harvested an estimated 28 percent of the total birds taken in the state (Figure 6).

Hunter Opinion Regarding Turkey Numbers

The 2018 Turkey Hunter Survey asked participants to compare the number of turkeys in the area they hunt most often with the number of turkeys in past years. Participants were given 3 choices; increasing, about the same, or decreasing. Approximately 46 percent of hunters indicated that the number of turkeys in the area they hunted most often was about the same as in past years. A higher percentage of hunters (37 percent) believed that the turkey population was decreasing than increasing (17 percent). On a scale of 1 to 3 with 1 being increasing, 2 being the same, and 3 being decreasing, the overall mean rating of 2.2 suggests that hunters viewed the turkey

population as decreasing. The opinion among hunters that the turkey population is decreasing has been consistent the last few years.

Turkeys Shot but not Recovered

Harvesting game signals the end of a successful hunt and although most hunters do a good job of preparing their equipment and mental state, it goes without saying that a certain percentage of game is shot or shot at and not killed or recovered. This point is no different when turkey hunting.

In order to estimate the prevalence of errant shots at turkeys, the 2018 Turkey Hunter Survey asked hunters to indicate the number of turkeys that they "shot but did not kill or recover during the 2018 season in South Carolina." Approximately 9.6 percent of hunters indicated that they shot but did not kill or recover at least one turkey in 2018 (10.8 percent in 2017). There were approximately 50,772 turkey hunters in 2018 meaning that approximately 4,870 turkeys were shot or shot at and not killed or recovered. Therefore, approximately 21 percent of the total number of turkeys shot at were not killed or recovered. These results have been consistent since this type of data has been available.

This data is certainly not indicative of "dead and unrecovered turkeys," however, it is clear that some percentage of the 4,870 turkeys that were shot at did eventually die. Although shot shells for turkeys have become increasingly sophisticated, accurate, and lethal it is a fact that the pattern of a shotgun is relatively broad and contains between 200 and 400 pellets. Therefore, a "clean miss" is not as clear-cut for turkeys compared to other big game like deer where there is typically a single projectile. Additional research is needed on this topic.

Turkey Harvest in the Morning vs. Afternoon

The typical spring turkey hunt is characterized by attempting to locate a gobbling bird prior to or just after sunrise. Once a gobbler is located most hunters position themselves as close as they can to the gobbler without scaring it away. Various types of callers that mimic the sounds of wild turkeys are then used to attempt to call the gobbler into gun range. This technique of locating a gobbling bird, setting up, and calling is repeated as necessary.

Traditionally, spring turkey hunting was primarily carried out during the first few hours of the day. As the popularity of turkey hunting has increased, many hunters now hunt in the afternoon as well. Gobblers are generally not as vocal in the afternoon but they can be stimulated to gobble using the various turkey calls, particularly late in the afternoon near areas where turkeys frequently roost.

In order to gain a better understanding of the distribution of harvest with respect to time of day, the 2018 Turkey Hunter Survey asked hunters to identify the number of birds harvested in the morning compared to the afternoon. Results indicate that approximately 77 percent of gobblers were harvested in the morning compared to 23 percent in the afternoon. This data may be useful if discussions arise concerning the relative importance of morning compared to afternoon harvest of gobblers in the spring. These results have been consistent since this type of data has been available.

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Table 1. Estimated statewide turkey harvest in South Carolina in 2018.

County	Acres*	Square Miles	Gobbler Harvest	Jake Harvest	Total Harvest	Percent Jakes	Harvest Rates	
							Ac/Turkey	Turkey/Mi.^{2}
Abbeville	223,113	349	210	20	230	8.7	970	0.7
Aiken	500,546	782	275	27	302	8.9	1,657	0.4
Allendale	216,455	338	283	30	313	9.6	692	0.9
Anderson	219,068	342	397	41	438	9.4	500	1.3
Bamberg	196,573	307	292	13	305	4.3	645	1.0
Barnwell	281,764	440	251	13	264	4.9	1,067	0.6
Beaufort	147,441	230	105	15	120	12.5	1,229	0.5
Berkeley	567,530	887	778	54	832	6.5	682	0.9
Calhoun	190,584	298	259	13	272	4.8	701	0.9
Charleston	288,732	451	413	27	440	6.1	656	1.0
Cherokee	156,664	245	275	48	323	14.9	485	1.3
Chester	300,589	470	348	41	389	10.5	773	0.8
Chesterfield	372,478	582	283	27	310	8.7	1,202	0.5
Clarendon	298,087	466	429	20	449	4.5	664	1.0
Colleton	502,666	785	705	13	718	1.8	700	0.9
Darlington	286,228	447	210	20	230	8.7	1,244	0.5
Dillon	214,069	334	105	41	146	28.1	1,466	0.4
Dorchester	302,717	473	365	6	371	1.6	816	0.8
Edgefield	246,543	385	227	41	268	15.3	920	0.7
Fairfield	384,607	601	649	82	731	11.2	526	1.2
Florence	397,888	622	454	116	570	20.4	698	0.9
Georgetown	399,638	624	421	27	448	6.0	892	0.7
Greenville	294,257	460	503	55	558	9.9	527	1.2
Greenwood	204,400	319	186	13	199	6.5	1,027	0.6
Hampton	324,840	508	535	45	580	7.8	560	1.1
Horry	533,336	833	365	110	475	23.2	1,123	0.6
Jasper	309,889	484	235	6	241	2.5	1,286	0.5
Kershaw	360,485	563	381	27	408	6.6	884	0.7
Lancaster	266,382	416	389	75	464	16.2	574	1.1
Laurens	317,916	497	519	68	587	11.6	542	1.2
Lee	220,106	344	227	20	247	8.1	891	0.7
Lexington	280,742	439	64	20	84	23.8	3,342	0.2
McCormick	212,021	331	170	48	218	22.0	973	0.7
Marion	216,907	339	170	13	183	7.1	1,185	0.5
Marlboro	281,271	439	121	20	141	14.2	1,995	0.3
Newberry	317,761	497	421	48	469	10.2	678	0.9
Oconee	284,348	444	146	20	166	12.0	1,713	0.4
Orangeburg	504,516	788	705	41	746	5.5	676	0.9
Pickens	219,926	344	316	48	364	13.2	604	1.1
Richland	340,121	531	227	20	247	8.1	1,377	0.5
Saluda	192,173	300	202	27	229	11.8	839	0.8
Spartanburg	265,939	416	462	103	565	18.2	471	1.4
Sumter	338,968	530	373	6	379	1.6	894	0.7
Union	258,111	403	551	144	695	20.7	371	1.7
Williamsburg	513,851	803	908	27	935	2.9	550	1.2
York	276,650	432	235	55	290	19.0	954	0.7
Total	**14,028,896**	**21,920**	**16,145**	**1,794**	**17,939**	**10.0**	**782**	**0.8**
95% Conf. Interval for harvest			**(+-) 1,025**	**(+-) 385**	**(+-) 1,132**			

* Acreage shown represents the acreage of forested land and acreage of row crops considered to be significant turkey habitat within each county.

Table 2. County rankings based on turkey harvest per unit area in South Carolina in 2018.

County	Acres*	Square Miles	Gobbler Harvest	Jake Harvest	Total Harvest	Percent Jakes	Harvest Rates	
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Union	258,111	403	551	144	695	20.7	371	1.7
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Total	**14,028,896**	**21,920**	**16,145**	**1,794**	**17,939**	**10.0**	**782**	**0.8**
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Table 3. County rankings based on total turkeys harvested in South Carolina in 2018.

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Table 4. Estimated number of turkey hunters, average days hunted, and total hunting effort in South Carolina in 2018.

County	Total Harvest	Number Hunters	Success Rate	Avg. Days Hunted	Total Man/Days
Abbeville	230	1,206	37.0	4.8	5,777
Aiken	302	1,116	37.1	5.2	5,827
Allendale	313	891	38.4	5.2	4,636
Anderson	438	1,714	29.6	4.3	7,299
Bamberg	305	879	43.8	5.7	5,026
Barnwell	264	620	35.3	5.9	3,635
Beaufort	120	440	36.4	3.1	1,352
Berkeley	832	1,736	30.0	6.0	10,363
Calhoun	272	609	32.7	4.6	2,783
Charleston	440	1,184	32.6	3.9	4,576
Cherokee	323	688	28.5	6.7	4,606
Chester	389	1,635	33.7	5.2	8,501
Chesterfield	310	868	44.1	4.9	4,265
Clarendon	449	834	50.0	5.2	4,305
Colleton	718	1,545	51.8	5.7	8,841
Darlington	230	586	27.6	4.4	2,573
Dillon	146	304	29.4	5.3	1,622
Dorchester	371	812	34.0	5.6	4,576
Edgefield	268	1,184	26.7	5.0	5,947
Fairfield	731	2,075	28.8	5.8	12,055
Florence	570	1,139	32.9	4.9	5,577
Georgetown	448	868	40.9	4.2	3,615
Greenville	558	1,252	23.7	5.4	6,759
Greenwood	199	970	22.8	4.0	3,925
Hampton	580	1,342	33.8	5.2	6,979
Horry	475	1,274	47.6	5.7	7,239
Jasper	241	631	49.4	5.3	3,344
Kershaw	408	1,308	32.5	4.5	5,927
Lancaster	464	1,049	34.9	6.3	6,598
Laurens	587	1,725	32.0	4.5	7,680
Lee	247	710	30.0	5.3	3,785
Lexington	84	474	20.0	3.1	1,482
McCormick	218	947	26.5	5.2	4,916
Marion	183	598	36.2	4.5	2,713
Marlboro	141	440	32.1	5.8	2,563
Newberry	469	1,860	24.1	5.2	9,642
Oconee	166	981	20.0	6.4	6,238
Orangeburg	746	1,781	30.6	5.1	9,011
Pickens	364	1,206	35.4	6.3	7,610
Richland	247	1,026	23.9	4.4	4,486
Saluda	229	902	25.4	4.6	4,185
Spartanburg	565	1,488	27.9	4.8	7,089
Sumter	379	947	33.9	4.8	4,516
Union	695	2,030	32.5	5.2	10,453
Williamsburg	935	1,612	43.8	4.3	7,009
York	290	1,285	27.9	5.4	6,879
Total	**17,939**	**50,772**	**38.0**	**5.1**	**258,786**

Figure 1. South Carolina Department of Natural Resources 2018 Turkey Hunter Survey.

2018 South Carolina Turkey Hunter Survey

1. Did you turkey hunt in SC this past season (2018)? **1. Yes 2. No**
   If you answered **No** to this question please **go to question # 8**.

2. Did you harvest any turkeys in SC this past season? **1. Yes 2. No**

3. Even if you did not harvest a turkey, please record the SC counties you turkey hunted and the number of days hunted in each county this past season (2018). If you harvested turkeys please record the number of adult gobblers and jakes taken in each county. A day of hunting is defined as any portion of the day spent afield. Please do not give ranges (i.e. 5-10), rather provide absolute numbers (i.e. 5). Provide information only for yourself - not friends, relatives, or other people you may have called or guided for. See the diagram below if you are unsure how to determine an adult gobbler or "longbeard" from a juvenile gobbler or "jake".

SC Counties You Turkey Hunted	# Days Hunted	Number Turkeys Harvested
1		Adult gobblers_____ Jakes_____
2		Adult gobblers_____ Jakes_____
3		Adult gobblers_____ Jakes_____
4		Adult gobblers_____ Jakes_____
5		Adult gobblers_____ Jakes_____

If you did not harvest any turkeys in SC this past season please go to question 6.

4. If you harvested turkeys in SC this past season, please indicate as best you can the number of turkeys killed by week of season.

Date of Season	# Turkeys Harvested	Date of Season	# Turkeys Harvested
1 March 20-31		4 April 15-21	
2 April 1-7		5 April 22-30	
3 April 8-14		6 May 1-5	

5. How many turkeys did you kill in the morning_____ after 12:00 noon _____?

6. How many turkeys did you shoot but not kill or recover in SC this past season?_____

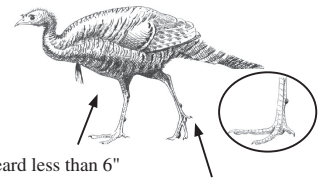
7. Compared to past years, how would you describe the number of turkeys in the area that you hunted most often this spring? **Circle one**
   1. Increasing 2. About the same 3. Decreasing

8. Are you a resident of SC? **1. Yes 2. No**

9. If yes, which county _____

Separate and return this portion of the survey. Postage is prepaid. Please do not staple this form.

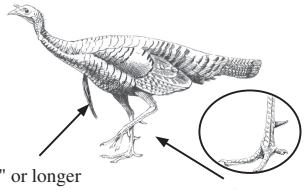
Juvenile "Jake"



beard less than 6"

spur less than ½"

Adult "Gobbler"



beard 6" or longer

spur ½" or longer

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Figure 1. continued

May, 2018

Dear Sportsman:

Eastern wild turkeys are one of the most important game species in South Carolina. Therefore, it is important that this species be monitored for population status and harvesting activities. Wildlife resource managers require current and accurate information about wild turkey harvests to aid in successfully managing this important natural resource and to optimize future hunting potential. To obtain this needed data, the South Carolina Department of Natural Resources (SCDNR) is conducting a survey of hunters who received a set of turkey tags during spring 2018.

You are one of a group of randomly selected hunters asked to participate in this survey. To draw accurate conclusions it is very important that you complete the survey and return it. Please take time to read each question. Even if you did not hunt wild turkeys this spring please indicate this by answering the appropriate questions and moving on to the next set of questions.

Please note that complete confidentiality will be given to you. There is no number on your survey form, therefore, there is no way to link your responses to you.
Keep in mind that the purpose of the survey is to determine the wild turkey harvest in South Carolina and not to determine whether game laws are observed. By accurately answering the survey questions you will enable SCDNR biologists to better manage the Eastern wild turkey resource for you and other citizens of the state. Therefore, it is very important that you take a few minutes to complete this survey and mail it. Return postage is prepaid.

Results of this survey will be posted on the SCDNR web site once completed. The results from the 2017 survey can be found at:
www.dnr.sc.gov/wildlife/turkey/2017TurkeyHarvest.html

Thank you for your assistance.

Charles Ruth
Wildlife Biologist
Big Game Program Coordinator

PLEASE MAIL YOUR SURVEY AFTER SEPARATING THIS HALF FROM THE SIDE ON WHICH YOUR ANSWERS HAVE BEEN ENTERED. NO POSTAGE IS NECESSARY.

If you have questions regarding this survey, please call 803-734-3886 or write 2018 Turkey Hunter Survey, SCDNR, P.O. Box 167, Columbia, SC 29202.

The South Carolina Department of Natural Resources prohibits discrimination on the basis of race, color, sex, national origin, disability, religion or age. Direct all inquiries to the Office of Human Resources, P.O. Box 167, Columbia, SC 29202

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Figure 2. Spring wild turkey harvest in South Carolina 1982-2018. Harvest increased (R^2 = 0.92) between 1982 and 2002 as a result of increasing turkey population during restoration efforts. Since 2002 harvest has generally decreased, although harvest has been up an average of 18 percent during the 3 years of the new season framework.

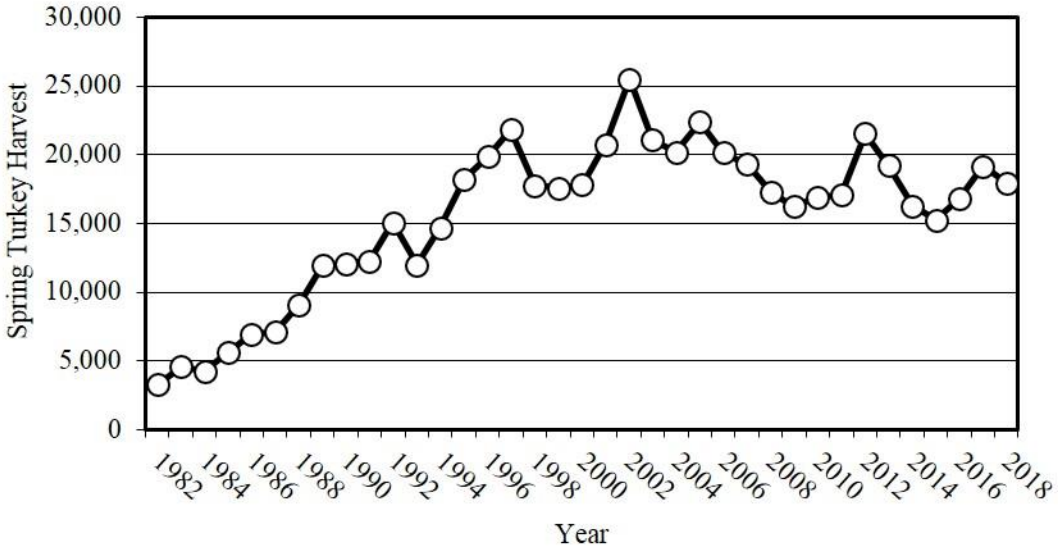

Figure 3. Summer wild turkey recruitment ratio in South Carolina 1982-2017. Note declining trend since 1988. Average recruitment prior to 1988 = 3.5. Average recruitment since 1988 = 2.1. This represents a 40 percent decrease in average recruitment.

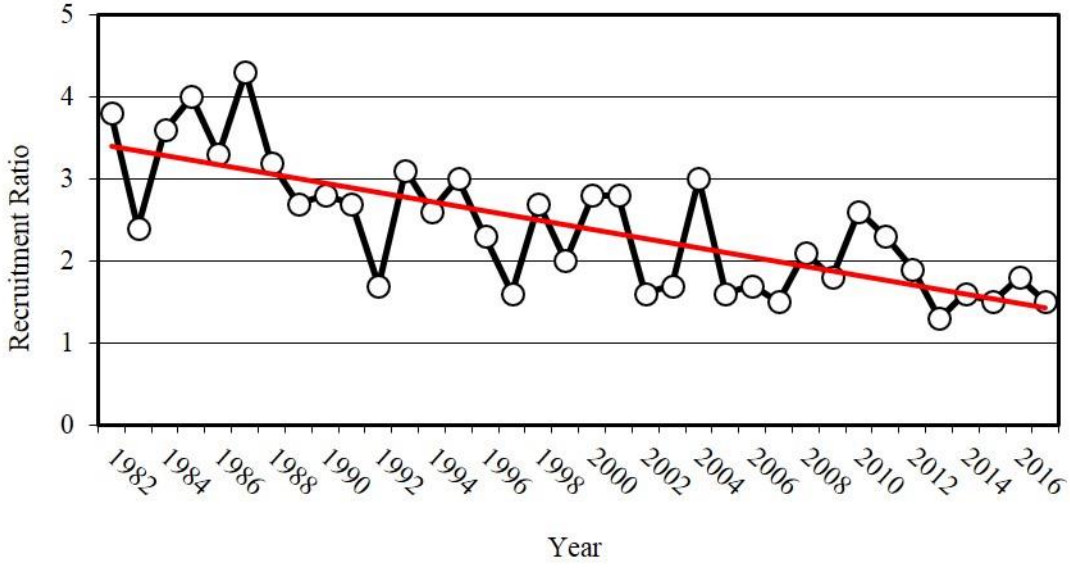

Figure 4. Percentage of gobblers harvested by period of season in South Carolina in 2018.

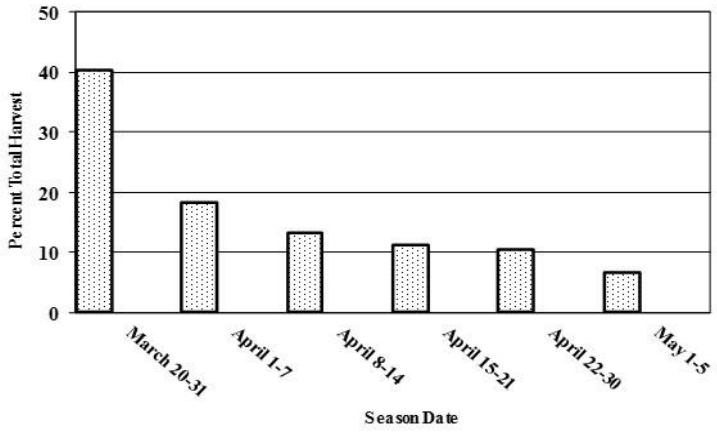

Figure 5. Hunter success during the spring turkey season in South Carolina in 2018. Overall success was 26 percent at harvesting at least one gobbler.

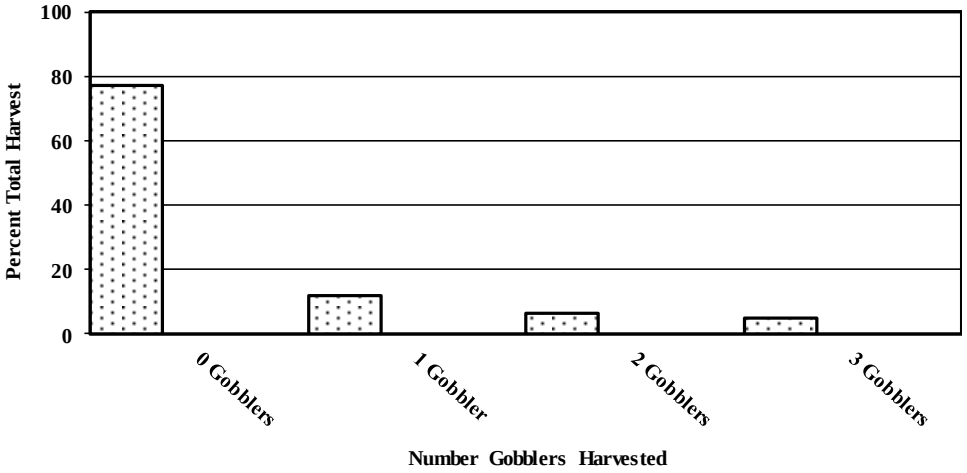
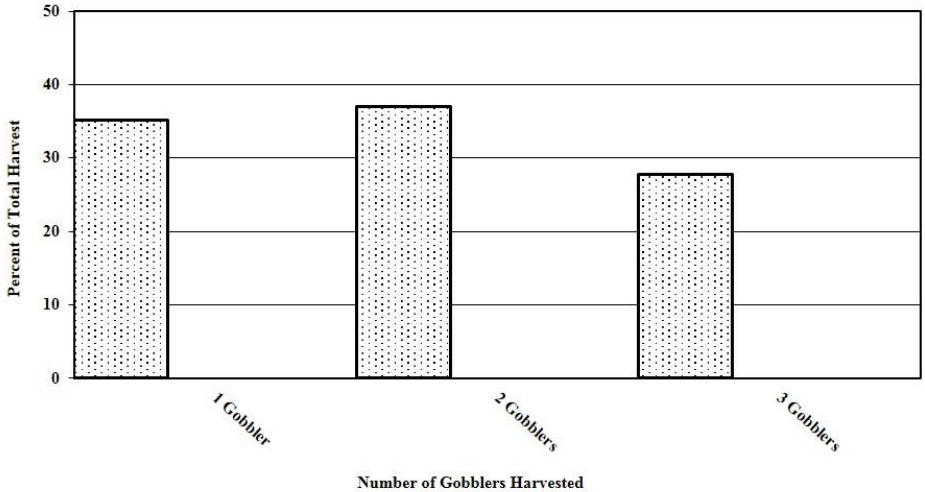
Figure 6. Relative contribution to the total turkey harvest by hunters taking between 1 and 3 gobblers in South Carolina in 2018.