FINAL PERFORMANCE REPORT

Federal Aid Grant No. F17AF00601 (W-190-R-1)

Game Harvest Survey

Oklahoma Department of Wildlife Conservation

Grant Period: July 1, 2017 through June 30, 2019

FINAL PERFORMANCE REPORT

State: Oklahoma **Grant Number:** F17AF00601 (W-190-R-1)

Grant Program: Wildlife Restoration Program

Grant Title: Game Harvest Survey

Project Leader: Betsey York (2018)/Corey Jager (2017)

Grant Period: July 1, 2017 – June 30, 2019

Project Description:
This grant allows the Oklahoma Department of Wildlife Conservation to monitor upland game harvest and hunter opinion.

Objective 1 – Data Collection and Analysis – Research, Survey of Monitoring - Utilization: Complete a harvest survey of 2,000 hunting license holders annually from July 1, 2017 through June 30, 2019.

Accomplishments

Year 1: July 1, 2017 – June 30, 2018 (See interim report for full survey results)
A sample of 1,384 license holders was interviewed during February 2018. Five hundred twenty-nine individuals interviewed did not hunt during 2017. Eight hundred fifty-five interviewed did hunt. Deer season was most popular with hunters. Statewide harvest estimates increased from 2016 estimates for mourning dove, jackrabbit, swamp rabbit, fall turkey, woodcock, raccoon, bobcat, beaver, gray fox, and river otter. Harvest estimates decreased from 2016 estimates for crow, pheasant, quail, cottontail, fox squirrel, gray squirrel, spring turkey, coyote, and red fox. Prairie chicken season remained closed during 2017. Harvest estimates for most species were calculated statewide, by region of Oklahoma, and for all public lands open to hunting. The limitations of the harvest estimates were discussed in detail. Human dimensions questions pertained to a public land use on ODWC Wildlife Management Areas and Oklahoma Land Access Program lands, reasons for not hunting more often, and patterns in deer season participation (Jager 2018).

Year 2: July 1, 2018 – June 30, 2019

Abstract:
The Oklahoma Department of Wildlife Conservation (ODWC) has conducted telephone surveys since 1986 to estimate the number of hunters and game harvest statewide and regionally. A sample of hunting license holders (n = 2,114) was interviewed during February and March 2018. Sixty percent of individuals interviewed hunted during 2018. Hunter and game harvest estimates and statistics were calculated statewide. Deer (*Odocoileus virginianus* and *O. hemionus*) season was most popular with hunters. Statewide harvest estimates for 2018 increased from 2017 estimates for pheasant (*Phasianus colchicus*) and red fox (*Vulpes fulva*). Harvest estimates

decreased from 2017 estimates for quail (*Colinus virginianus* and *Callipepla s. quamata*), dove (*Zenaida macroura*), jackrabbit (*Lepus californicus*), swamp rabbit (*S. aquaticus*), fall turkey (*Meleagris gallopavo silvestris* and *M. g. intermedia*), woodcock (*Scolopax minor*), raccoon (*Procyon lotor*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), crow (*Corvus brachyrhynchos*), cottontail (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), gray squirrel (*S. carolinensis*), spring turkey, and coyote (*Canis latrans*). Prairie chicken (*Tympanuchus cupido* and *T. pallidicinctus*) season remained closed during 2018. A series of human dimensions questions were asked to learn about hunter familiarity and perception of Chronic Wasting Disease (CWD), opinions about hunter recruitment, satisfaction of hunted public land, and what ODWC is doing well and what could be improved upon in terms of wildlife management in the state.

Procedures:

The 2018-season Game Harvest Survey (hereafter referred to as the survey or the Game Harvest Survey) was administered using a mixed-mode methodology (mail and telephone). The methodology for this project was developed as a result of methodological research conducted during the 2014-season survey (Jager 2014), and is a hybrid version of past methodologies. Results are considered comparable from 1986 to present.

A random sample of license holders, stratified by license category, was drawn from the database of annual, lifetime, and senior citizen license holders (Table A1). Five-year license holders were sampled with annual license holders. Within each license category, the sample was further stratified by county of residence. The specific license types included in each general category included “hunting only” and “combination hunting and fishing.”

Based on the sampling scheme above, a sample of 5,870 license holders (1,525 annual/five-year, 2,449 lifetime, and 1,896 senior citizen) was selected for interviewing. A goal of more than 3,000 completed interviews was set for this project. License holders were over-sampled to compensate for declining response rates found in the past few seasons of the Game Harvest Survey

Contact to sampled hunting license holders was first established in the form of an invitation letter to participate in the survey signed by the ODWC director emphasizing the importance of the study (Appendix C). The survey (Appendix C) was then mailed on February 8, 2019. The mailed survey packet included a self-addressed, postage-paid envelope for respondents to use to send in their completed survey.

License holders who did not respond by mail and had telephone numbers listed on their license application were contacted by telephone beginning February 25, 2019, otherwise license holders without telephone numbers were mailed a second survey on March 13, 2019. The ODWC hired 8 contract laborers to collect telephone interview data and data enter mail surveys. The interviewers were trained to collect data. A computer assisted telephone interview (CATI) system was used. If participants completed the survey by both telephone and mail, telephone interview data were used.

Interviews were conducted Monday through Thursdays between 5:30 p.m. and 9:00 p.m. with some day shifts (between 9:00 a.m. to 4:00 p.m.) on various days each week to catch those respondents not available during evening hours or by appointment. Saturday shifts lasted from 9:00 a.m. to 1:00 p.m. Before a phone number was retired as "over quota," it was attempted at least 6 different times.

Survey participants answered questions regarding their hunting activities during 2018. Individuals that hunted were asked which species they hunted, the number of days they hunted each species, the number of each species harvested, the county which they hunted each species most, and whether they hunted each species on private or public land. Individuals that hunted on public land were asked the number of days they hunted on public land for each species and the number of each species harvested on public land. The harvest portion of the questionnaire was similar to previous years. Information regarding license holder opinion about current wildlife-related issues was also collected. The survey instrument was reviewed by wildlife division regional supervisors, the wildlife division research supervisor, the wildlife division assistant chief and chief, federal aid coordinator, and the assistant director. Modifications were incorporated as needed.

Statewide and regional (Figure A1) harvest estimates and public land use were calculated. Hunter and harvest estimates were determined by calculating the proportion of license holders hunting each species and their mean bag for that season. These estimates were extrapolated for all license holders. Differences between categorical variables were detected using the chi-square test. Multiple means were compared using a one-way ANOVA. All tests were considered significant at $P \leq 0.05$.

Results:
Interviews were completed for 36% (n = 2,114) of the 5,870 individuals we attempted to contact. The remaining license holders were not interviewed for a variety of reasons:

- Wrong, disconnected or no telephone number (n = 1,618)
- No phone number available (n=1,257)
- "Over quota" after six attempts (n = 472)
- Refused to complete the interview (n = 302)
- Health issues or deceased (n = 96)
- Language barrier or hearing impaired (n = 11)

The final adjusted response rate was calculated by dividing the number of completed interviews by the number of all eligible individuals. "Eligible individuals" were individuals that could potentially have resulted in completed interviews. After eliminating phone numbers that could not possibly have resulted in completed interviews (deceased license holders, fax numbers, and wrong or disconnected numbers; n = 1,618), the final, adjusted survey response rate was 50%.

Thirty-eight percent of the completed surveys were conducted by telephone and 62% by mail. To examine the impact of mixed methodology, survey responses were compared between mail and telephone respondents for seven variables. There were no statistically significant differences found between mail and telephone respondents for overall 2018-season category of license held, deer season participation and dove season participation ($P > 0.05$). Overall hunting participation,

public land use, participation in quail season, and spring turkey season were significantly different ($P<0.05$).

Because the survey methodology included multiple contacts, regardless of invitation method, response-mode and invitation-mode biases were not considered a significant problem in data validity; results were not weighted.

The average length of the telephone interviews was 11.9 minutes, with a median time of 8 minutes (for complete calls only). The proportions of license types in the completed survey sample differed by 0.9% or less from the distribution of license types found in the population (Table A1), therefore weighting was deemed unnecessary.

Harvest Estimates (Tables and Figures in Appendix A)

Number of hunters and game harvest estimates and statistics were calculated statewide (Table A2). Statewide harvest estimates for 2018 increased from 2017 estimates for pheasant (+15%) and red fox (harvest increased from 0 in 2017 to 212 in 2018). Harvest estimates decreased from 2017 estimates for dove (-47%), jackrabbit (-14%), swamp rabbit (-88%), fall turkey (-33%), woodcock (-90%), raccoon (-43%), bobcat (-63%), beaver (-93%), gray fox (-26%), river otter (-100%), crow (-25%), quail (-54%), cottontail (-50%), fox squirrel (-10%), gray squirrel (-37%), spring turkey (-20%), and coyote (-51%). Prairie chicken season remained closed during 2017. Statewide trends in estimated harvest and number of hunters by species from 1986 to 2018 are presented in Table A5 and Figures A2 – A20. Most hunters hunted within their region of residence (Table A2). The percentage of hunters that hunted within their home county ranged from 23% for pheasant to 59% for crow.

Regional harvest estimates were calculated, but small sample sizes reduced the reliability of some estimates, as evidenced by the large confidence intervals (Table A3). Small samples sizes have traditionally been a problem for less-popular game seasons. Increasing the sample from previous years improved sub-samples for several species, yet it was still not enough to improve the reliability for certain species. Some regional estimates indicated harvest outside the geographic range of a species. These estimates could be a result of animals harvested on commercial hunting preserves, or simply erred memory.

Game harvest estimates, statistics, and estimated number of hunters for each species were calculated for all public lands collectively (Table A4). The percentage of game harvested on public land ranged from 0% for woodcock to 58% for swamp rabbit. These estimates were limited by small sample sizes. A larger sample would be needed to obtain more reliable estimates of game harvest and hunter numbers on public hunting lands.

Deer hunter participation was assessed. On average, deer hunters spent 17.8 days in the field during the 2018 deer season (Std. Error = 0.60, Table A6). The average number of days spent hunting deer differed by license category ($P < 0.001$). Deer hunters with a lifetime license averaged 20.0 deer hunting days, annual/five-year license holders averaged 15.3 days and senior citizen license holders averaged 11.9 days.

The average number of days archery hunters spent in pursuit of deer in 2018 was 18.3 days. Muzzleloader hunters averaged 4.7 days. Youth season hunters averaged 2.2 days. Gun hunters averaged 5.8 days and special antlerless (holiday) season hunters averaged 2.7 days. There was a significant difference found in the number of days hunted by license category during the regular gun season ($P = 0.003$) with lifetime license holders hunting on average 6.1 days, annual license holders 5.8 days and senior license holders hunting 4.8 days. No differences were found by license type for days spent archery, muzzleloader or special antlerless (holiday) season hunting ($P \geq 0.05$).

Deer hunter success was also examined. On average, deer hunters harvested 0.46 bucks and 0.41 does during all of the 2018 deer seasons, for a total deer harvest of 0.87 per hunter (Table A7). Harvest did not differ by deer hunter license category ($P > 0.05$).

Human Dimensions Issues (Tables and Figures in Appendix B)

Human dimensions questions were designed to help ODWC become more familiar with hunting license holders and understand their hunting preferences. The rates of participation in different hunting seasons were analyzed for the various license holder categories (lifetime, annual/5-year and senior citizen license holders). Use of public land was examined. Several special management questions were also asked.

Hunting Activity

Overall, 60% of participants indicated that they hunted in 2018, but the rate of participation varied significantly according to license type ($P < 0.001$; Figure B1). Senior citizen license holders used their hunting privileges far less often than annual/five-year or lifetime license holders. To estimate the number of license holders that actually hunted, the total number of license holders in Table A1 (358,235) was multiplied by the ratio of active hunters interviewed (1,265/2,114). The estimated number of resident license holders who hunted in Oklahoma during 2018 was 214,365.

Rates of participation in the different hunting seasons, overall and by license type, are presented in Table B1. Combining all types of hunting license holders, the most popular season was deer (enjoyed by 51% of hunting license holders), followed by turkey and dove (15.8% and 14.6% respectively). Although the ODWC does not manage feral swine (Sus scrofa), the ODWC has begun to collect information about feral swine shooting and trapping participation. Feral swine are now tied with the second most pursued species by Oklahoma licensed hunters, with 15.8% having spent time shooting or trapping them in 2018.

Land Use

Participants used a variety of land types when hunting different game species. Excluding seasons with small sample sizes, the use of private land exclusively among active hunters was most common for pursuit of crow (90% of crow hunters used only private land), dove (87%) and jackrabbit (86%; Figure B2).

Twenty-four percent of survey participants used public land for some portion of their hunting during 2018. As can be seen from Figure B3, this statistic also reflects 43% of participants who did not hunt at all. Focusing only on *active* hunting license holders (those who hunted during

2018), 31% hunted on public land in 2018 and 69% did not. Use of public land by active hunters did not vary by license category ($P \geq .05$).

The problem with either of these approaches to measuring public land use is that they do not portray the *relative* importance of public land to Oklahoma's hunting license holders. A hunter who supplemented private land access with public land hunting once or twice during 2018 carried a weight equal to a hunter who relied on public land exclusively, although the relative importance of public land to those two hunters was probably much different. To more accurately capture the importance of public land, active hunters were asked to indicate how much of their hunting in 2018 occurred on public versus private land. Averaging across all active hunters, 15% of the hunting in 2018 occurred on public land (Figure B4). This measure of public land varied by license category ($P < 0.05$) with annual/5-year license holders spending the most amount of time on public land (18% of hunting in 2018).

Looking at the issue from another angle, the majority of active license holders used private land for at least some of their hunting during 2018. Only 7% relied exclusively on public land for hunting.

In general, more public land is available for hunting in the eastern half of Oklahoma than the western half. Similarly, a greater proportion of active hunters said they used public land located in the eastern half of the state than in the western (Figure B6). Active hunters who used public land were asked how satisfied they were with the public land they hunted. Seventy-three percent reported they were satisfied (Figure B7). Responses did not vary by license category ($P > 0.05$).

Deer Hunting

Deer season is the most popular hunting season in Oklahoma. Fifty-one percent of *all* survey participants and 86% of *active* hunters (those who hunted at all 2018) hunted deer during 2018. Participation in deer season by active hunters in 2018 varied according to license category ($P < 0.001$). Eighty-nine percent of active lifetime license holders hunted deer, while 84% of active annual/five-year license holders and 74% of active senior citizen license holders hunted deer during 2018.

The regular rifle season was the most popular among 2018 deer hunters (86% participating), followed by archery (56%), primitive firearms (43%), special antlerless (holiday) season (19%), and the youth rifle season (5% participating as a youth) (Figure B8). Deer hunter participation in the individual seasons was analyzed by license type. Archery season participation was most likely for lifetime license holders (62%), followed by annual/five-year license holders (53%) and senior citizen license holders (30%) ($P < 0.001$). Muzzleloader season participation was more likely for lifetime license holders (55%) than senior citizen license holders (30%) or annual/five-year license holders (24%) ($P < 0.001$). Rifle season participation was most likely for senior license holders (91%), followed by lifetime license holders (87%) and annual/five-year license holders (81%) ($P < 0.001$). Special antlerless (holiday) season participation was most likely for senior license holders (23%), followed by lifetime license holders (19%), and annual/five year license holders (17%) ($P < 0.001$). Youth season participation did not vary by license category ($P > 0.05$).

Patterns in deer season participation were also examined. Most deer hunters participated in more than one season (62%), and some hunted all four (7%; Figure B9). The most common patterns were participation in gun season only (24%) and the three regular seasons – archery, muzzleloader and gun (19%; Figure B10). Youth deer season participation was not included in this analysis because it only applied to a small portion of surveyed hunters. Examined separately, 95% of youth season participants also hunted deer during other seasons: 84% hunted during rifle season, 56% hunted during archery, 55% hunted during muzzleloader, and 16% hunted during the special antlerless (holiday) deer gun season (Figure B11).

Just under half (48%) of all deer hunters successfully harvested a deer during the 2018 season (Figure B12). More hunters shot a buck (61%) than a doe (39%). Less than 1% of hunters filled the annual bag limit of deer for 2018 (six total during archery, youth, muzzleloader and gun seasons, plus one bonus doe allowable during the special antlerless (holiday) season; seven maximum).

An increasing proportion of archery hunters are using crossbows for their hunting. In 2015, 33% of archery hunters used crossbows for all of their archery hunting. That number increased to 40% in 2016, 42% in 2017, and remained at 42% in 2018 (Figure B13).

Barriers to Participation

ODWC continues to assess barriers to hunting participation. Forty percent (n = 849) of hunting license holders did not hunt in 2018 and were asked to identify the main reason why they did not hunt. Thirty-three percent identified health issues, and another 28% indicated other priorities. Twelve percent were simply not interested in hunting (Figure B14). The finding of "health concerns" was unsurprising, given that nearly two-thirds of the inactive hunting license holders were senior citizen license holders. Similarly, the finding of "not interested" was expected, as over the years it has become apparent that many senior citizen license holders purchased the combination hunting and fishing license with no intent to hunt. Historically, the cost of a combination license was only slightly greater than the hunting-only or fishing-only license, leading many seniors to buy the combination "just in case" or in the interest of making a donation to ODWC. ODWC continues to face limitations in the things the agency can directly influence in order to remove barriers to hunting.

Special Management Issues

Chronic Wasting Disease

Chronic Wasting Disease (CWD) is a wildlife disease that affects cervid populations in the United States. During the 2018 big game seasons, there were no known cases of CWD in Oklahoma. As such, we asked our hunters, regardless of hunting activity in 2018, questions about CWD ahead of any known cases. We asked all respondents about familiarity, concern, trust in the Wildlife Department to manage the disease, and preference for receiving information about the disease in the future. Thirty-three percent of all respondents agreed that they were "very familiar with the effects of CWD on wildlife" (Figure B15). There was a significant difference between those that were active hunters and those that were not (P<0.001). Thirty-seven percent of active hunters agreed they were familiar compared to 26% of inactive hunters.

Our license holders are concerned with the impacts of CWD in Oklahoma. Thirty-nine percent agree and 35% completely agree that they are concerned (Figure B16). There was no significant difference between active and inactive license holders in their level of concern (P>0.05). Fifty percent of respondents completely agree that they trust ODWC to make informed management decisions (Figure B17). There was no significant difference between active and inactive license holders (P>0.05).

Oklahoma license holders would prefer to receive information about CWD in a variety of forms. The most often selected answer is on the Wildlife Department website (50% of respondents selecting) followed by emails and the *Outdoor Oklahoma* magazine (46% and 42% respectively). The least selected answer for receiving information about CWD was through an in-person public meeting (Figure B18).

We also asked active deer hunters what, if any, methods they used to attract deer during 2018. Deer hunters were most likely to use bait or feed (49%), followed by scents (28%) and mineral attractants (21%) but the majority of hunters do not use any methods to attract deer (Figure B19).

ODWC Strategic Plan Implementation Questions

In 2019, ODWC began its five year strategic plan mission. Bettering management for Oklahoma hunters and anglers is a key piece of this effort. We asked questions about hunter recruitment, which members of the public should be included in our decision-making processes, and if hunters feel included in management decision-making. The majority of hunters feel that recruitment of the next generation of hunters and anglers should be an equally shared responsibility between hunters and anglers and the Wildlife Department (65%, Figure B20). Hunters do not believe that the Wildlife Department should include people who do not hunt or fish in decision making (48% strongly disagree with inclusion), and leaned towards agreeing that the Wildlife Department provides adequate opportunities for public participation in fish and wildlife management decisions (57% agree there are adequate opportunities for public participation, (Figure B21). Finally, we asked open-ended questions about what the Wildlife Department is doing well and what it could do better. The responses to these open-ended questions can be found in the supplemental material that accompanies this report.

The last question of the survey invited the participants to share how they would demographically describe themselves. The goal of the Wildlife Department is to engage a diverse audience in all activities that we manage for. As such, it is beneficial to see what groups of people we can better target for marketing campaigns about outdoor opportunities in the state. Our hunting population in Oklahoma is not significantly different than the state of Oklahoma in terms of how people would describe themselves (Figure B22).

Discussion:

The Game Harvest Survey has been conducted for over 30 years and has provided valuable data for ODWC programs. However, the survey is not without its limitations. For years, ODWC managers and biologists have had reservations about the point estimates resulting from the Game Harvest Survey because the numbers of hunters and harvest estimates were inflated beyond what they felt was realistic. Over-estimation of hunter numbers and game harvest may have stemmed from several sources.

Recall Bias

Another significant source of estimation error was probably recall bias. Participants were asked questions about hunting seasons that may have begun 11 months prior to the interview (e.g., spring turkey). The majority of participants probably did not keep written records of the number of field days and harvest, and responded to questions based on memory. A 1998 mail survey found that participants in a one-day controlled quail hunt over-estimated their quail harvest almost a year after the event (Crews 1999). If hunters had trouble recalling an isolated one-day event, the problems of recall bias were surely magnified when hunters were asked to recall hunting activities for seasons spanning several months, as occurred during the Game Harvest Survey. Recall bias during the Game Harvest Survey might only be addressed by breaking the survey into smaller segments to be conducted throughout the year, immediately following the close of each season. At this time, such a change in methodology is cost prohibitive.

Social Desirability Bias

Yet another source of estimation error could have been social pressure, or the participant's desire to give socially acceptable answers. Participants may have felt uncomfortable admitting that they did not harvest any game, did not hunt very many days, harvested more game than legally allowed, harvested game without a tag, etc.

To minimize bias from social pressure, interviewers are trained to read the questions the same way during each interview, avoid discussion about the question items, and not reveal personal opinions. Although the desire to give socially acceptable answers may significantly impact the results of opinion questions, it is presumed that the effect on harvest data should be consistent from year to year and should not impact the trend data, except perhaps in scale.

It is assumed that respondents participating in the survey over the phone may be more likely to provide socially desirable answers than those participating by mail. This was examined on the 2014-season survey by comparing the percentage of respondents reporting unsuccessful hunts by their mode of response. The percentages of respondents who reported not harvesting, deer, spring turkey and dove were nearly identical for mail and phone responses, suggesting phone surveys may not be any more likely to introduce social desirability bias.

Rounding Bias (Digit Preference)

The exact number of game harvested for species with long seasons and/or large bag limits may have been difficult for participants to remember. For example, when successful hunters reported the number of animals harvested, they often respond with numbers ending in 0 or 5 (Crews 1999, 1998). Rounding bias, or digit preference, may have some unknown influence on harvest estimates. This bias was assessed and confirmed to exist on previous Game Harvest Surveys (Jager 2014). It is presumed that any bias introduced by the tendency toward rounded numbers is consistent from year to year and should not impact the trend data, except perhaps in scale.

Non-Response Bias

Non-response bias (resulting when the proportion of the sample interviewed does not represent the proportion which could not be interviewed) can be formally addressed by a follow-up study of non-respondents, comparative analysis, and subsequent weighting of the original data if differences are found. Another way to detect non-response bias is to compare the responses of

early and late respondents on a few key variables. The presumption is that the people who could not be interviewed (non-respondents) would be more similar to those that were difficult to interview (success after repeated attempts) than those that were successfully interviewed within the first few attempts. This second approach is typically used to assess non-response bias in the Game Harvest Survey; however data were unavailable for this analysis on the 2018-season survey. Past results of the assessment suggested that non-response bias was present on occasion, but not a significant problem.

Sample Size Limitations

The current number of completed surveys (n = 2,114) is more than adequate to analyze results of questions asked of all respondents (e.g., participation in hunting). A standard sample size of 400 is generally used for populations over 1,000, as the results from a random sample can be reported with 95% confidence at a level of precision of plus or minus 5% (Dillman 2000). Further increasing the sample size does not yield a significant return on investment in reduced sampling error.

However, during the Game Harvest Survey, estimates of hunter numbers and harvest are often calculated from a much smaller sub-sample (e.g., active hunters or participants in a particular season). The overall sample size for the 2018-seasons GHS was doubled from previous years. This helped increase certain sub-sample sizes, however, participant samples of less than 400 were still used for nearly all of the seasons listed in Table A2. Regional estimates and public land estimates are rarely based on data from more than 100 respondents (Tables A3 and A4). Variability in these small samples often yields wide confidence intervals.

The incidence of participation in some seasons is so low that an unrealistic number of completed surveys would be needed to yield a sub-sample size of 400 for estimating harvest. For example, based on 2017 season participation rates, over 10,000 completed surveys would be needed to identify 400 pheasant hunters (3.3% of completed 2017 surveys). For other seasons, almost an entire population census would be necessary (e.g., 1,048 woodcock hunters were estimated to exist statewide in 2017).

Methodological Variation

Two aspects of the methodology this year could contribute to the variance in harvest numbers from previous years. For the 2016 and 2017 Game Harvest Surveys, telephone data collection was contracted out to OU Poll- an on-campus polling service using students to contact hunters. The methodology was assumed to be the same, but IRB requirements from the university may have affected data collection. As such, data from 2015 may be more comparable to data collected in 2018 as those surveys were both conducted completely through the Wildlife Department. Also, due to scheduling conflicts of the P.I., the survey began a month later than usual for the 2018 Game Harvest Survey. The 2015 Game Harvest Survey was also conducted later in the year and no effect was noticed.

Recommendations:

The value of this project in collecting trend data on species harvest outweighs the cost, despite concerns about biases. Within the constraint of budget and time, ODWC should continue to

sample at the rate necessary to complete more than 3,000 completed surveys, in order to yield the greatest amount of data possible from active hunters.

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Objective 2 - Data Collection and Analysis – Database Development and Management:

Construct 1 database of historic hunter information from all existing Game Harvest Survey records and additional relevant data by June 30, 2019.

Accomplishments

Year 1: July 1, 2017 – June 30, 2018

Progress has been made toward designing a database that allows for quick queries and visualization of hunter trends. The database design is in progress. Tables in the database will likely include both raw and calculated information, which will provide an archive for the data and quick access to trend information that is not presented in reports. Year 2 of this grant will focus on standardizing tables and importing into a database, as well as determining appropriate software for sharing queries and visualizing data.

Year 2: July 1, 2018 – June 30, 2019

Progress has been made toward designing a database that allows for quick queries and visualization of hunter trends. The database design is in progress. Tables in the database will likely include both raw and calculated information, which will provide an archive for the data and quick access to trend information. We had anticipated the Game Harvest Survey database to be completed during this grant period, however, due to employment changes, we were unable to

attain resources to complete the project within the grant period. We will continue this work under the next grant.

Equipment:
None.

Significant Deviation:
None.

Date Prepared: July 2, 2019

Prepared by: Betsey York, Human Dimensions Specialist

Approved by: _____
Wildlife Division Administration
Oklahoma Department of Wildlife Conservation

_____
Andrea K. Crews, Federal Aid Coordinator
Oklahoma Department of Wildlife Conservation

APPENDIX A

Harvest Estimates – Tables and Graphs

Table A1. Distribution of license types for Game Harvest Survey population (Oklahoma resident hunting license holders), sample, and completed surveys, 2018.

	Population		Sampled		Completed	
LICENSE TYPE	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Lifetime						
Hunting	41,865	11.7	564	9.6	235	11.1
Combination	116,984	32.7	1,850	31.5	692	32.7
Hunting Over 60	611	0.2	8	0.1	3	0.1
Combination Over 60	1,942	0.5	27	0.5	17	0.8
Subtotal	*161,402*	45.1	*2,449*	41.7	*947*	45.0
Senior Citizen						
Hunting	2,330		41	0.7	19	0.9
Combination	115,299	32.2	1,855	31.6	656	31.0
Subtotal	*117,629*	32.8	*1,896*	32.3	*675*	32.1
Annual						
Hunting	32,834	9.2	749	12.8	210	9.9
Hunting Fiscal Year (FY)	8,037	2.2	183	3.1	57	2.7
Combination	13,505	3.8	179	3.0	68	3.2
Combination FY	3,534	1.0	51	0.9	23	1.1
Youth Hunting	2,410	0.7	56	1.0	19	0.9
Youth Hunting FY	1,020	0.3	27	0.5	10	0.5
Youth Combination	1,554	0.4	14	0.2	3	0.1
Youth Combination FY	612	0.2	9	0.2	1	0.0
Subtotal	*63,506*	17.7	*1,268*	21.6	*391*	18.6
Five-Year						
Hunting	4,659	1.3	112	1.9	42	2.0
Combination	11,039	3.1	145	2.5	59	2.8
Subtotal	*15,698*	4.4	*257*	4.4	*101*	4.8
Total	**358,235**		**5,870**		**2,114**	

Table A2. Statewide hunter and game harvest estimates and statistics by species/subspecies in Oklahoma, 2018.

SPECIES/SEASON	SAMPLE	MEAN BAG/ HUNTER	MEAN DAYS HUNTED	MEAN DAILY BAG	NUMBER OF HUNTERS	NUMBER OF DAYS HUNTED	TOTAL HARVEST	95% CONFIDENCE INTERVAL FOR TOTAL HARVEST	HUNTED IN OWN COUNTY (%)	HUNTED IN OWN REGION (%)
Crow	39	11.90	4.05	3.16	6,609	26,750	78,646	13,738 - 143,553	59.46	75.68
Dove	308	19.35	4.48	5.11	52,193	233,922	1,009,704	824,468 - 1,194,940	51.66	73.18
Furbearers	136	.	.	.	23,046[a]	.	133,550[b]	. - .	.	.
Coyote	109	4.04	22.76	0.49	18,471	420,434	74,574	54,695 - 94,454	.	.
Bobcat	35	1.77	19.79	0.20	5,931	117,400	10,506	2,718 - 18,295	.	.
Raccoon	41	6.58	23.08	0.68	6,948	160,320	45,682	32,232 - 59,132	.	.
Beaver	6	1.20	13.83	0.31	1,017	14,065	1,220	244 - 2,196	.	.
Gray Fox	4	2.00	15.75	0.13	678	10,676	1,356	0 - 2,890	.	.
Red Fox	5	0.25	10.80	0.02	847	9,151	212	0 - 627	.	.
Otter	1	.	42.00	.	169	7,117	.	. - .	.	.
Pheasant	62	4.29	4.26	1.12	10,506	44,737	45,076	23,812 - 66,340	22.95	49.18
Quail	126	9.56	6.18	1.58	21,352	131,930	204,108	147,507 - 260,710	38.02	52.89
Rabbits	83	.	.	.	14,065[a]	.	68,273[b]	. - .	.	.
Cottontail	81	4.44	6.25	0.97	13,726	85,744	60,986	41,210 - 80,761	51.32	81.58
Jackrabbit	7	3.43	2.67	1.68	1,186	3,163	4,067	1,249 - 6,885	40.00	80.00
Swamp Rabbit	10	1.90	3.80	0.45	1,695	6,439	3,220	0 - 6,630	33.33	77.78
Squirrels	215	.	.	.	36,434[a]		435,435[b]	. - .	.	.
Fox Squirrel	174	8.27	10.98	1.34	29,486	323,633	243,960	174,411 - 313,508	55.49	77.44
Gray Squirrel	153	7.39	10.91	1.12	25,927	282,841	191,475	139,676 - 243,275	50.70	76.06
Turkeys	333	.	.	.	56,430[a]	.	25,189[b]	. - .	.	.
Fall Turkey	105	0.21	6.60	0.12	17,793	117,366	3,764	2,361 - 5,167	51.02	67.35
Spring Turkey	293	0.43	4.99	0.13	49,651	247,557	21,425	17,595 - 25,255	43.88	64.26
Woodcock	3	0.33	3.67	0.17	508	1,864	169	0 - 502	33.33	33.33
Feral Swine	328				55,582[a]		755,332[b]		.	.
Shooting	297	8.91	23.86	0.77	50,329	1,200,659	448,653	310,107 - 587,199	45.67	65.74
Trapping	64	28.50	76.76	3.01	10,845	832,527	309,092	165,197 - 452,987	32.26	65.52

[a]Estimated number of hunters that hunted at least one species/subspecies within a given season.
[b]Estimated total harvest within a given season.

Table A3. Hunter and game harvest estimates and statistics by region and species/subspecies in Oklahoma, 2018.

REGION	SPECIES/SEASON	SAMPLE	MEAN BAG/ HUNTER	MEAN DAYS HUNTED	MEAN DAILY BAG	NUMBER OF HUNTERS	NUMBER OF DAYS HUNTED	TOTAL HARVEST	95% CONFIDENCE INTERVAL FOR TOTAL HARVEST	HUNTED IN OWN COUNTY (%)	HUNTED IN OWN REGION (%)
NW											
	Crow	1	10.00	5.00	2.00	169	847	1,695	. - .	100.00	100.00
	Dove	47	18.59	4.20	5.19	7,965	33,451	148,037	104,594 - 191,479	40.43	51.06
	Pheasant	18	2.44	3.17	0.88	3,050	9,659	7,456	3,674 - 11,238	11.11	16.67
	Quail	42	11.38	6.59	1.38	7,117	46,901	80,959	39,149 - 122,768	11.90	23.81
	Rabbits: Cottontail	4	2.50	3.67	1.58	678	2,485	1,695	0 - 3,687	50.00	75.00
	Jackrabbit	3	2.67	2.50	1.92	508	1,271	1,356	0 - 3,534	33.33	66.67
	Swamp Rabbit	0	.	.	.	.	.	.	. - .	.	.
	Squirrels: Fox	4	2.67	2.00	2.33	678	1,356	1,808	0 - 4,151	25.00	25.00
	Gray	0	.	.	.	.	.	.	. - .	.	.
	Turkey: Fall	7	0.00	2.43	0.00	1,186	2,881	0	0 - 0	14.29	14.29
	Spring	40	0.45	4.03	0.10	6,778	27,287	3,050	1,627 - 4,473	20.00	30.00
	Woodcock	0	.	.	.	.	.	.	. - .	.	.
SW											
	Crow	2	0.50	4.50	0.50	339	1,525	169	0 - 502	100.00	100.00
	Dove	52	27.02	6.13	6.26	8,812	54,057	238,096	113,039 - 363,153	59.62	67.31
	Pheasant	0	.	.	.	.	.	.	. - .	.	.
	Quail	20	10.72	7.26	1.66	3,389	24,616	36,339	15,465 - 57,214	60.00	65.00
	Rabbits: Cottontail	8	6.13	12.63	1.20	1,356	17,115	8,303	2,310 - 14,296	62.50	62.50
	Jackrabbit	0	.	.	.	.	.	.	. - .	.	.
	Swamp Rabbit	0	.	.	.	.	.	.	. - .	.	.
	Squirrels: Fox	8	27.50	5.13	3.79	1,356	6,948	37,281	0 - 95,413	75.00	87.50
	Gray	2	1.00	3.50	0.33	339	1,186	339	0 - 1,003	100.00	100.00
	Turkey: Fall	22	0.41	5.68	0.27	3,728	21,182	1,525	741 - 2,309	54.55	63.64
	Spring	29	0.90	5.47	0.24	4,914	26,865	4,423	2,673 - 6,172	58.62	68.97
	Woodcock	0	.	.	.	.	.	.	. - .	.	.
NC											
	Crow	7	3.57	4.00	1.24	1,186	4,745	4,236	2,033 - 6,440	71.43	85.71
	Dove	87	20.05	3.97	5.14	14,743	58,463	295,535	189,336 - 402,735	51.72	79.31
	Pheasant	38	4.00	4.95	0.95	6,439	31,858	25,758	11,839 - 39,677	31.58	60.53
	Quail	28	10.42	6.96	1.50	4,745	33,044	49,456	23,900 - 75,011	53.57	67.86
	Rabbits: Cottontail	15	1.67	2.80	0.56	2,542	7,117	4,236	35 - 8,438	33.33	93.33
	Jackrabbit	1	0.00	3.00	0.00	169	508	0	. - .	0.00	100.00
	Swamp Rabbit	1	0.00	3.00	0.00	169	508	0	. - .	0.00	100.00
	Squirrels: Fox	38	6.08	7.92	1.21	6,439	50,993	39,145	26,466 - 51,823	57.89	84.21
	Gray	27	5.56	7.23	0.98	4,575	33,083	25,419	12,590 - 38,248	51.85	77.78
	Turkey: Fall	21	0.14	5.00	0.10	3,559	17,793	508	0 - 1,054	61.90	95.24
	Spring	58	0.40	4.43	0.15	9,829	43,527	3,898	2,404 - 5,391	39.66	70.69
	Woodcock	1	1.00	2.00	0.50	169	339	169	. - .	0.00	00.00

Table A3. Continued.

REGION	SPECIES/SEASON	SAMPLE	MEAN BAG/ HUNTER	MEAN DAYS HUNTED	MEAN DAILY BAG	NUMBER OF HUNTERS	NUMBER OF DAYS HUNTED	TOTAL HARVEST	95% CONFIDENCE INTERVAL FOR TOTAL HARVEST	HUNTED IN OWN COUNTY (%)	HUNTED IN OWN REGION (%)
SC											
	Crow	7	5.88	3.38	2.25	1,186	4,003	6,969	3,639 - 10,299	71.43	85.71
	Dove	35	10.03	3.03	4.16	5,931	17,963	59,480	39,926 - 79,034	45.71	57.14
	Pheasant	1	2.00	1.00	2.00	169	169	339	. - .	00.00	00.00
	Quail	11	4.27	3.82	2.16	1,864	7,117	7,965	1,066 - 14,863	36.36	45.45
	Rabbits: Cottontail	11	3.40	6.40	0.73	1,864	11,930	6,338	2,758 - 9,917	36.36	54.55
	Jackrabbit	1	7.00	4.00	1.75	169	678	1,186	. - .	100.00	100.00
	Swamp Rabbit	0	.	.	.	.	.	.	. - .	.	.
	Squirrels: Fox	24	9.22	19.13	1.19	4,067	77,803	37,487	16,824 - 58,150	45.83	54.17
	Gray	11	7.18	30.90	1.00	1,864	57,599	13,387	2,927 - 23,847	27.27	36.36
	Turkey: Fall	14	0.14	4.07	0.06	2,372	9,659	339	0 - 790	35.71	35.71
	Spring	52	0.37	5.16	0.09	8,812	45,469	3,220	1,718 - 4,722	38.46	57.69
	Woodcock	1	0.00	5.00	0.00	169	847	0	. - .	100.00	100.00
NE											
	Crow	8	28.13	5.88	3.58	1,356	7,965	38,128	0 - 103,398	50.00	100.00
	Dove	61	19.98	4.72	4.99	10,337	48,756	206,564	142,945 - 270,183	50.82	93.44
	Pheasant	4	4.50	2.00	2.63	678	1,356	3,050	595 - 5,506	00.00	100.00
	Quail	16	8.80	6.13	2.12	2,711	16,630	23,860	7,295 - 40,425	62.50	100.00
	Rabbits: Cottontail	28	6.57	5.21	1.30	4,745	24,741	31,180	16,310 - 46,051	60.71	96.43
	Jackrabbit	0	.	.	.	.	.	.	. - .	.	.
	Swamp Rabbit	4	1.00	1.25	0.75	678	847	678	135 - 1,220	50.00	100.00
	Squirrel: Fox	56	7.63	9.45	1.18	9,490	89,643	72,359	52,269 - 92,448	58.93	96.43
	Gray	61	6.43	8.53	1.08	10,337	88,209	66,501	44,844 - 88,158	49.18	91.80
	Turkey: Fall	20	0.22	9.74	0.10	3,389	33,000	753	83 - 1,423	60.00	90.00
	Spring	50	0.32	5.92	0.10	8,473	50,146	2,711	1,507 - 3,915	54.00	88.00
	Woodcock	1	0.00	4.00	0.00	169	678	0	. - .	00.00	00.00
SE											
	Crow	12	12.46	2.92	5.19	2,034	5,944	25,341	10,923 - 39,758	41.67	41.67
	Dove	20	15.75	5.50	3.98	3,389	18,640	53,379	30,864 - 75,895	70.00	80.00
	Pheasant	0	.	.	.	.	.	.	. - .	.	.
	Quail	4	1.50	3.00	0.58	678	2,034	1,017	0 - 2,289	00.00	25.00
	Rabbits: Cottontail	10	4.90	11.10	0.85	1,695	18,810	8,303	658 - 15,949	60.00	70.00
	Jackrabbit	0	.	.	.	.	.	.	. - .	.	.
	Swamp Rabbit	4	3.75	5.75	0.39	678	3,898	2,542	0 - 5,722	25.00	50.00
	Squirrels: Fox	34	8.38	14.69	1.28	5,762	84,623	48,253	33,111 - 63,395	52.94	58.82
	Gray	39	11.92	13.08	1.35	6,609	86,437	78,771	35,475 - 122,066	53.85	58.97
	Turkey: Fall	13	0.15	11.85	0.08	2,203	26,097	339	0 - 789	46.15	53.85
	Spring	47	0.37	5.51	0.12	7,965	43,893	2,943	1,627 - 4,260	55.32	63.83
	Woodcock	0	.	.	.	.	.	.	. - .	.	.

Table A4. Hunter and game harvest estimates and statistics for all public hunting land in Oklahoma, 2018.

SPECIES/SEASON	SAMPLE	MEAN BAG/ HUNTER	MEAN DAYS HUNTED	MEAN DAILY BAG	NUMBER OF HUNTERS	NUMBER OF DAYS HUNTED	TOTAL HARVEST	% OF STATEWIDE HARVEST	95% CONFIDENCE INTERVAL FOR TOTAL HARVEST
Crow	4	2.25	5.50	1.25	678	3,728	1,525	1.9	52 - 2,998
Dove	38	11.84	4.61	3.47	6,439	29,655	76,256	7.6	36,244 - 116,269
Pheasant	13	0.75	3.08	0.34	2,203	6,778	1,652	3.7	337 - 2,968
Quail	38	5.89	4.39	1.33	6,439	28,300	37,959	18.6	23,350 - 52,567
Rabbits: Cottontail	23	4.27	5.59	0.96	3,898	21,791	16,653	27.3	7,274 - 26,032
Jackrabbit	1	1.00	1.00	1.00	169	169	169	4.2	. - .
Swamp Rabbit	4	2.75	4.25	0.46	678	2,881	1,864	57.9	0 - 5,090
Squirrels: Fox	36	3.82	8.83	0.61	6,101	53,888	23,325	9.6	13,583 - 33,068
Gray	45	4.10	7.75	0.90	7,626	59,099	31,229	16.3	18,425 - 44,032
Turkey: Fall	20	0.58	7.85	0.30	3,389	26,605	1,962	52.1	0 - 3,950
Spring	63	0.23	4.15	0.09	10,676	44,305	2,450	11.4	1,033 - 3,867
Woodcock	0	.	.	.	.	.	.	0.0	. - .

Table A5. Statewide trends in estimated harvest and estimated number of hunters in Oklahoma, 1986-2018.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Crow	1986	12,398	18.55	5.15	3.60	229,979	142,439 –	317,519
	1987	13,987	14.07	12.25	1.15	196,744	109,783 –	283,705
	1988	6,711	14.45	6.45	2.24	96,957	55,851 –	138,063
	1989	8,467	17.08	4.05	4.21	144,601	56,951 –	232,252
	1990	7,675	16.64	5.79	2.86	127,678	65,706 –	189,650
	1991	6,518	19.77	7.32	2.94	128,893	70,572 –	187,214
	1992	6,197	12.77	4.82	2.84	79,150	36,475 –	121,826
	1993	7,654	22.22	8.56	3.57	170,054	70,368 –	269,740
	1994	5,309	24.58	4.10	4.86	130,501	41,608 –	219,394
	1995	6,756	22.30	5.18	3.85	150,683	53,458 –	247,909
	1996	13,958	20.87	5.69	3.94	291,375	190,710 –	392,041
	1997	9,900	36.28	7.41	3.29	359,196	87,504 –	630,888
	1998	11,861	23.74	7.88	3.04	281,628	172,534 –	390,722
	1999	12,318	15.16	7.25	3.55	186,684	133,942 –	239,426
	2000	16,692	28.54	6.38	3.97	476,319	174,552 –	778,086
	2001	13,328	40.12	8.00	3.44	534,702	33,840 –	1,035,565
	2002	15,221	23.52	6.95	3.54	358,009	179,811 –	536,206
	2003	17,627	21.11	7.91	4.18	372,186	255,519 –	488,854
	2004	12,209	12.59	5.10	2.94	153,766	88,743 –	218,790
	2005	12,353	20.55	7.00	3.90	253,837	144,478 –	363,196
	2006	11,616	38.68	12.61	3.29	449,351	183,569 –	715,134
	2007	9,536	24.95	8.09	4.01	237,882	94,337 –	381,427
	2008	9,359	18.45	8.21	2.57	172,655	73,100 –	272,210
	2009	10,856	18.26	8.62	3.74	198,224	93,397 –	303,052
	2010	9,763	10.30	11.93	1.93	100,562	62,208 –	138,915
	2011	10,728	19.49	6.62	4.59	209,039	90,600 –	327,478
	2012	9,369	15.17	9.78	2.32	142,145	61,829 –	222,462
	2013	8,867	15.55	5.71	3.43	137,838	82,795 –	192,881
	2014	7,984	11.17	5.99	3.07	89,216	56,084 –	122,348
	2015	6,688	15.15	8.05	2.50	101,292	16,261 –	186,322
	2016	8,064	17.54	7.81	3.12	141,443	52,808 –	230,078
	2017	9,432	11.17	4.70	3.79	105,371	50,853 –	159,889
	2018	6,609	11.90	4.05	3.16	78,646	13,738 –	143,553

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest		
Dove	1986	73,973	28.00	6.25	4.48	2,071,048	1,771,207	–	2,370,889
	1987	78,325	25.13	5.91	4.25	1,968,139	1,668,916	–	2,267,362
	1988	71,966	23.74	5.96	3.98	1,708,665	1,475,536	–	1,941,794
	1989	59,044	20.66	4.99	4.14	1,219,640	1,049,482	–	1,389,799
	1990	65,583	26.72	5.66	4.86	1,752,372	1,464,888	–	2,039,856
	1991	60,142	24.43	5.53	4.69	1,469,351	1,276,161	–	1,662,541
	1992	61,828	23.26	5.18	4.80	1,437,806	1,249,094	–	1,626,519
	1993	48,706	19.64	5.33	4.33	956,451	825,859	–	1,087,044
	1994	61,483	22.66	5.50	4.37	1,393,209	1,157,469	–	1,628,949
	1995	59,598	17.52	4.54	4.14	1,044,286	900,397	–	1,188,176
	1996	64,959	18.05	4.71	4.56	1,172,345	1,016,774	–	1,327,916
	1997	60,666	18.78	4.70	4.58	1,139,192	1,016,289	–	1,262,095
	1998	62,562	23.97	5.12	5.98	1,499,400	1,307,724	–	1,691,076
	1999	69,527	20.32	5.04	4.68	1,413,132	1,254,042	–	1,572,222
	2000	75,116	26.04	6.01	4.71	1,956,043	1,672,467	–	2,239,619
	2001	69,507	20.25	5.11	4.65	1,407,192	1,240,641	–	1,573,742
	2002	73,379	24.60	5.48	4.96	1,804,942	1,570,543	–	2,039,340
	2003	69,844	25.31	5.89	4.83	1,767,431	1,432,089	–	2,102,773
	2004	65,621	23.34	5.36	5.00	1,531,717	1,314,727	–	1,748,707
	2005	53,430	23.30	5.88	5.07	1,244,858	1,067,456	–	1,422,260
	2006	61,700	25.72	5.50	5.36	1,586,916	1,323,873	–	1,849,959
	2007	53,470	21.47	5.78	4.67	1,147,814	944,320	–	1,351,307
	2008	49,537	21.95	5.03	5.14	1,087,404	925,280	–	1,249,528
	2009	57,945	23.31	5.59	4.75	1,350,721	1,160,476	–	1,540,966
	2010	48,976	23.58	4.91	5.08	1,154,651	803,429	–	1,505,873
	2011	49,670	21.04	4.67	5.12	1,044,986	888,392	–	1,201,580
	2012	50,505	24.37	5.21	5.02	1,230,761	898,432	–	1,563,089
	2013	57,392	25.77	4.97	4.90	1,479,101	1,075,013	–	1,883,189
	2014	59,297	22.39	4.98	5.18	1,327,749	1,184,961	–	1,469,966
	2015	45,330	23.49	5.10	4.97	1,064,832	918,750	–	1,210,915
	2016	58,569	23.49	4.83	5.68	1,375,710	898,531	–	1,852,889
	2017	62,619	30.24	6.43	7.43	1,893,421	1,241,116	–	2,545,727
	2018	52,193	19.35	4.48	5.11	1,009,704	824,468	–	1,194,940

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Pheasant	1986	20,043	4.12	4.16	0.99	82,652	60,345 –	104,959
	1987	19,348	3.01	3.83	0.79	58,277	46,072 –	70,482
	1988	16,429	3.27	3.35	0.98	53,769	40,807 –	66,731
	1989	15,819	3.00	3.56	0.84	47,458	37,129 –	57,787
	1990	16,280	2.89	3.21	1.07	46,978	33,790 –	60,166
	1991	13,775	2.95	4.01	0.94	40,586	30,920 –	50,253
	1992	16,478	4.00	4.71	1.05	65,912	47,535 –	84,288
	1993	18,787	3.55	5.19	0.97	66,658	54,001 –	79,315
	1994	16,441	2.96	3.71	0.94	48,638	36,766 –	60,510
	1995	17,131	3.13	4.37	0.90	53,566	38,927 –	68,205
	1996	13,690	2.84	3.80	0.98	38,922	27,664 –	50,179
	1997	15,195	3.89	4.36	1.17	59,170	47,167 –	71,173
	1998	13,946	3.86	4.24	1.02	53,830	39,450 –	68,210
	1999	18,203	4.06	5.20	1.15	73,907	59,268 –	88,546
	2000	22,592	5.32	7.14	0.91	120,203	86,005 –	154,401
	2001	16,194	4.52	4.42	0.94	73,233	37,037 –	109,429
	2002	14,740	3.89	4.55	1.41	57,358	35,876 –	78,840
	2003	20,621	4.76	4.77	1.26	98,114	77,301 –	118,927
	2004	21,823	3.79	3.38	1.36	82,713	65,053 –	100,373
	2005	19,348	5.02	3.87	1.56	97,037	72,896 –	121,178
	2006	17,047	4.17	3.65	1.30	71,053	52,350 –	89,756
	2007	18,391	4.39	3.54	1.37	80,783	63,519 –	98,046
	2008	18,072	4.25	4.61	1.18	76,807	60,512 –	93,102
	2009	18,924	6.06	3.81	1.63	114,725	83,682 –	145,769
	2010	19,366	4.57	3.82	1.39	88,440	65,260 –	111,621
	2011	12,344	3.86	3.48	1.20	47,613	34,745 –	60,481
	2012	11,711	2.29	3.14	0.91	26,789	18,965 –	34,614
	2013	10,640	3.26	3.45	1.08	34,661	25,063 –	44,259
	2014	10,887	2.64	2.95	1.09	28,741	20,824 –	36,658
	2015	10,616	3.20	2.95	1.27	33,950	26,496 –	41,404
	2016	13,157	3.67	3.62	1.39	48,241	32,215 –	61,268
	2017	11,790	3.36	3.31	1.19	39,039	18,774 –	60,351
	2018	10,506	4.29	4.26	1.12	45,076	23,812 –	66,340

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest		
Quail	1986	110,960	24.43	7.06	3.46	2,711,186	2,352,252	–	3,070,119
	1987	120,517	26.90	7.51	3.58	3,242,080	2,800,473	–	3,683,687
	1988	97,651	20.61	7.08	2.91	2,012,172	1,701,565	–	2,322,779
	1989	92,465	23.57	7.05	3.34	2,179,840	1,805,160	–	2,554,520
	1990	93,026	24.26	7.46	3.04	2,256,571	1,892,142	–	2,621,000
	1991	98,268	32.98	9.85	3.35	3,240,764	2,846,242	–	3,635,286
	1992	94,079	35.38	8.58	3.86	3,328,404	2,861,486	–	3,795,323
	1993	90,733	22.19	8.31	2.60	2,013,098	1,778,982	–	2,247,214
	1994	84,089	27.44	9.35	2.64	2,307,057	1,976,583	–	2,637,532
	1995	68,646	14.42	6.86	2.15	990,118	836,199	–	1,144,036
	1996	72,743	18.18	7.14	2.58	1,322,260	1,141,940	–	1,502,580
	1997	60,551	24.66	8.01	2.96	1,493,212	1,256,216	–	1,730,208
	1998	60,477	17.34	6.83	2.54	1,048,878	894,731	–	1,203,026
	1999	59,263	17.35	7.54	2.20	1,028,316	836,071	–	1,220,561
	2000	53,243	21.50	8.61	2.75	1,144,868	930,191	–	1,359,544
	2001	38,838	9.43	6.46	1.71	366,289	291,121	–	441,458
	2002	49,507	15.58	6.51	2.41	771,218	645,620	–	896,815
	2003	50,221	17.44	6.68	2.66	875,614	665,353	–	1,085,875
	2004	42,577	24.03	6.62	3.31	1,023,086	834,117	–	1,212,056
	2005	41,524	20.66	6.64	3.25	857,856	681,772	–	1,033,939
	2006	34,395	16.85	5.82	2.64	579,436	421,911	–	736,962
	2007	28,949	13.32	5.61	2.63	385,467	282,172	–	488,762
	2008	31,142	15.28	7.34	2.58	475,850	373,848	–	577,852
	2009	30,659	12.25	5.55	2.22	375,653	289,321	–	461,985
	2010	28,169	13.61	5.94	2.53	383,265	232,279	–	534,251
	2011	17,341	6.30	5.67	1.37	109,186	75,774	–	142,599
	2012	16,396	7.75	5.60	1.69	127,067	89,421	–	164,713
	2013	14,187	8.23	5.36	1.80	116,719	80,308	–	153,130
	2014	20,758	12.43	4.96	2.71	258,081	208,869	–	307,293
	2015	20,276	20.19	6.02	3.42	409,284	276,416	–	542,152
	2016	29,072	17.57	6.34	2.87	510,807	372,263	–	649,351
	2017	30,655	14.33	5.91	2.95	439,291	341,199	–	537,384
	2018	21,352	9.56	6.18	1.58	204,108	147,507	–	260,710

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Cottontail Rabbit	1986	73,560	10.70	7.07	1.51	787,052	658,305 –	915,798
	1987	78,558	14.37	7.39	1.94	1,128,714	678,501 –	1,578,926
	1988	66,181	9.38	8.45	1.11	621,080	512,259 –	729,902
	1989	49,686	9.24	7.23	1.28	459,203	370,984 –	547,423
	1990	57,909	9.24	7.17	1.57	534,898	431,376 –	638,420
	1991	53,746	12.00	7.6	1.77	645,201	488,080 –	802,322
	1992	44,786	8.49	5.84	1.81	280,260	320,761 –	439,759
	1993	35,903	8.99	7.15	1.47	322,714	256,101 –	389,326
	1994	39,219	7.89	6.94	1.45	309,469	249,874 –	369,063
	1995	37,761	7.01	5.95	1.38	264,812	222,666 –	306,957
	1996	43,351	8.56	6.37	1.58	370,963	305,406 –	436,520
	1997	31,772	10.37	7.88	1.62	329,463	264,429 –	396,497
	1998	36,625	9.95	7.92	1.53	364,426	293,158 –	435,695
	1999	35,311	7.42	6.04	1.46	261,880	195,480 –	328,280
	2000	45,616	9.25	7.24	1.80	422,095	356,135 –	488,055
	2001	31,959	13.45	7.25	1.78	429,797	221,176 –	638,417
	2002	31,403	8.39	7.35	1.51	263,397	194,256 –	332,538
	2003	30,598	8.85	10.62	1.46	270,869	221,939 –	319,800
	2004	21,975	10.01	8.55	1.40	219,907	146,217 –	293,596
	2005	23,962	12.09	6.61	1.71	289,772	111,813 –	467,730
	2006	21,572	14.81	8.58	1.59	319,483	169,745 –	469,222
	2007	18,391	7.76	8.81	1.39	142,700	94,777 –	190,624
	2008	19,202	6.78	8.59	1.39	130,217	92,611 –	167,824
	2009	25,672	7.47	7.01	1.53	191,643	149,663 –	233,623
	2010	20,167	6.90	7.29	1.50	139,247	101,532 –	176,961
	2011	18,957	7.81	8.67	1.30	147,982	113,594 –	182,371
	2012	16,981	6.89	6.45	1.26	116,966	86,617 –	147,315
	2013	17,089	7.43	6.21	1.27	126,944	75,628 –	178,261
	2014	19,596	8.04	6.21	1.53	157,648	120,011 –	195,284
	2015	16,667	6.49	5.73	1.72	108,119	83,309 –	132,929
	2016	19,098	7.16	8.27	1.66	136,762	107,591 –	165,933
	2017	17,030	7.10	5.67	1.72	120,887	83,517 –	158,257
	2018	13,726	4.44	6.25	0.97	60,986	41,210 –	80,761

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Jackrabbit	1986	6,612	7.06	6.97	1.01	46,698	5,716 –	87,681
	1987	7,926	4.62	6.35	0.73	36,598	8,927 –	64,269
	1988	2,314	4.00	3.50	1.14	9,256	1,850 –	16,662
	1989	2,005	0.78	7.44	0.10	1,560	128 –	2,991
	1990	2,326	3.00	3.67	0.67	6,977	1,541 –	12,413
	1991	2,583	7.71	5.71	0.88	19,924	0 –	41,977
	1992	1,268	4.89	8.89	0.41	6,197	0 –	17,124
	1993	2,227	4.12	5.75	0.95	9,185	2,580 –	15,790
	1994	1,199	1.14	1.86	0.67	1,370	0 –	3,318
	1995	603	2.20	1.60	1.20	1,327	0 –	3,644
	1996	805	0.50	21.67	0.33	403	0 –	942
	1997	1,151	2.60	3.20	1.01	2,993	1,481 –	4,505
	1998	912	6.29	12.29	0.54	5,735	666 –	10,804
	1999	1,506	2.00	3.82	0.83	3,011	432 –	5,590
	2000	1,151	3.38	7.13	0.54	3,885	0 –	9,411
	2001	1,433	2.10	7.10	0.40	3,010	856 –	5,163
	2002	1,762	1.09	3.55	0.47	1,923	490 –	3,355
	2003	998	1.50	5.17	0.41	1,497	3 –	2,990
	2004	1,679	4.55	3.91	1.41	7,630	3,779 –	11,482
	2005	1,191	4.13	7.25	0.94	4,911	1,056 –	8,767
	2006	1,961	7.08	8.08	1.19	13,879	0 –	28,118
	2007	1,533	6.44	2.78	3.00	9,877	2,315 –	17,438
	2008	1,291	5.00	12.13	1.64	6,454	1,673 –	11,236
	2009	2,054	29.00	15.57	1.29	59,559	0 –	127,281
	2010	1,601	3.30	4.70	0.66	5,282	443 –	10,120
	2011	882	27.33	26.67	1.75	24,100	0 –	66,544
	2012	1,025	0.43	3.86	0.29	439	0 –	1,036
	2013	1,773	1.55	6.18	0.46	2,741	427 –	5,054
	2014	1,524	0.89	3.72	0.28	1,364	0 –	2,945
	2015	849	5.56	4.11	0.92	4,718	0 –	10,113
	2016	1,061	3.20	6.60	0.94	3,395	0 –	6,961
	2017	1,310	3.60	9.20	0.77	4,716	0 –	10,016
	2018	1,186	3.43	2.67	1.68	4,067	1,249 –	6,885

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Swamp Rabbit	1986	8,885	7.53	7.37	1.02	66,948	36,672 –	97,224
	1987	12,122	3.85	7.62	0.51	46,622	30,227 –	63,016
	1988	10,876	4.23	9.02	0.47	46,049	32,353 –	59,744
	1989	12,032	4.13	10.22	0.40	49,686	31,287 –	68,084
	1990	9,535	5.68	8.80	0.70	54,187	23,908 –	84,466
	1991	10,454	7.45	10.60	0.96	77,852	41,742 –	113,962
	1992	8,028	9.75	10.21	1.28	78,305	35,583 –	121,027
	1993	9,045	7.31	9.32	0.83	66,101	43,944 –	88,259
	1994	7,535	6.11	7.57	0.96	46,069	28,701 –	63,438
	1995	7,721	5.95	8.22	0.78	45,965	27,923 –	64,007
	1996	10,737	3.66	6.21	0.69	39,324	23,196 –	55,452
	1997	5,641	6.33	8.53	0.81	35,686	19,760 –	51,612
	1998	7,560	5.76	10.19	0.90	43,533	29,328 –	57,738
	1999	6,980	5.80	10.24	0.93	40,512	27,075 –	53,950
	2000	5,036	3.94	8.29	0.69	19,858	12,309 –	27,407
	2001	7,309	4.36	9.24	0.83	31,867	21,768 –	41,966
	2002	4,486	3.57	9.39	0.78	16,022	8,368 –	23,676
	2003	5,820	9.91	19.11	0.68	57,690	23,946 –	91,433
	2004	3,357	6.36	5.33	0.65	21,365	775 –	41,955
	2005	2,977	3.70	6.51	0.62	11,013	4,333 –	17,694
	2006	3,319	6.05	21.00	0.50	20,064	10,216 –	29,912
	2007	2,725	2.88	24.25	0.34	7,833	3,060 –	12,607
	2008	2,420	5.73	9.40	0.69	13,877	7,081 –	20,673
	2009	2,347	4.19	10.47	0.52	9,829	4,021 –	15,636
	2010	3,041	2.74	11.05	0.59	8,323	3,250 –	13,395
	2011	2,645	5.50	12.28	0.51	14,548	6,908 –	22,188
	2012	2,489	3.24	9.00	0.69	8,051	4,072 –	12,031
	2013	2,418	8.20	8.27	0.92	19,829	3,520 –	36,138
	2014	2,250	5.35	6.30	0.91	12,048	5,338 –	18,758
	2015	1,592	2.14	4.69	0.61	3,412	945 –	5,879
	2016	2,334	2.40	7.64	0.67	5,602	966 –	10,238
	2017	2,358	11.86	13.50	1.13	27,960	4,020 –	51,899
	2018	1,695	1.90	3.80	0.45	3,220	0 –	6,630

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Fox Squirrel	1986	57,856	10.95	8.68	1.26	633,526	523,349 –	743,704
	1987	73,662	12.67	11.22	1.13	933,602	727,904 –	1,139,300
	1988	65,718	11.65	9.22	1.26	765,706	604,072 –	927,340
	1989	59,489	13.61	9.89	1.38	809,727	673,544 –	945,910
	1990	54,187	11.30	10.98	1.25	612,342	463,989 –	760,695
	1991	49,934	12.43	9.66	1.37	620,849	467,251 –	774,448
	1992	38,167	12.49	9.09	1.58	476,593	371,000 –	582,186
	1993	37,156	12.82	9.27	1.55	476,486	391,293 –	561,679
	1994	41,788	15.73	11.18	1.64	657,300	507,640 –	806,959
	1995	45,000	12.09	8.22	1.69	544,221	444,539 –	643,902
	1996	53,551	11.84	10.43	1.60	633,976	527,694 –	740,258
	1997	42,248	12.05	10.75	1.50	509,281	416,914 –	601,648
	1998	46,661	14.73	11.74	1.80	687,108	560,613 –	813,604
	1999	41,607	10.67	9.26	1.40	444,038	366,757 –	521,319
	2000	46,911	11.79	8.85	1.66	553,236	447,442 –	659,029
	2001	39,411	16.40	11.30	1.46	646,228	344,774 –	947,681
	2002	41,336	9.07	9.93	1.42	374,769	316,121 –	433,418
	2003	41,906	11.57	12.71	1.27	484,749	406,934 –	562,564
	2004	34,489	13.13	12.61	1.34	452,690	264,873 –	640,507
	2005	38,249	12.26	10.17	1.60	469,002	388,729 –	549,276
	2006	36,054	21.85	13.33	1.57	787,745	188,944 –	1,386,546
	2007	32,355	9.53	11.12	1.25	308,390	254,067 –	362,713
	2008	32,433	10.85	12.95	1.43	351,926	287,011 –	416,841
	2009	33,593	11.99	12.54	1.40	402,825	308,350 –	497,299
	2010	32,011	14.69	13.51	1.44	470,188	147,961 –	792,414
	2011	31,448	14.49	11.23	1.30	455,624	157,811 –	753,437
	2012	31,181	10.67	11.70	1.25	332,649	257,327 –	407,971
	2013	29,180	7.53	8.47	1.26	219,821	178,286 –	261,355
	2014	29,975	9.27	12.21	1.27	277,823	226,013 –	329,634
	2015	28,132	7.29	9.11	1.10	205,010	167,161 –	242,858
	2016	30,557	11.09	9.71	1.20	338,809	220,525 –	457,093
	2017	29,607	10.42	9.17	1.24	271,535	209,442 –	333,627
	2018	29,486	8.27	10.98	1.34	243,960	174,411 –	313,508

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest		
Gray Squirrel	1986	45,458	10.87	10.14	1.07	494,258	383,057	–	605,459
	1987	53,149	14.36	11.93	1.20	763,199	573,765	–	952,633
	1988	39,570	9.27	9.85	0.94	367,002	259,805	–	474,199
	1989	43,002	17.21	11.08	1.55	740,162	288,418	–	1,191,906
	1990	41,164	11.53	12.78	1.10	474,664	307,081	–	642,246
	1991	38,742	14.04	10.31	1.30	543,981	381,217	–	706,745
	1992	26,759	12.21	10.44	1.37	326,601	246,865	–	406,338
	1993	28,667	12.39	9.73	1.46	355,138	284,629	–	425,647
	1994	28,943	16.20	12.47	1.49	468,741	334,001	–	603,482
	1995	33,056	10.58	8.42	1.37	349,744	278,775	–	420,714
	1996	43,082	12.56	10.35	1.44	541,144	417,513	–	664,776
	1997	34,074	13.58	11.73	1.48	462,653	340,049	–	585,256
	1998	36,886	15.80	12.22	1.67	582,978	429,766	–	736,191
	1999	32,984	11.24	8.67	1.50	370,729	274,683	–	466,775
	2000	37,270	10.85	8.33	1.63	404,395	323,112	–	485,678
	2001	32,102	27.64	11.68	1.70	887,334	131,722	–	1,642,946
	2002	32,524	12.85	8.08	1.69	417,797	305,531	–	530,062
	2003	34,257	11.84	11.25	1.39	405,759	323,635	–	487,883
	2004	28,080	15.57	13.15	1.54	437,241	258,660	–	615,822
	2005	29,915	21.27	10.78	2.63	636,397	321,275	–	951,519
	2006	30,020	31.32	13.64	1.72	940,381	149,264	–	1,731,497
	2007	25,713	25.25	12.29	1.45	649,304	0	–	1,319,893
	2008	28,238	12.94	13.51	1.56	365,319	282,518	–	448,120
	2009	29,633	10.19	10.68	1.16	301,836	226,912	–	376,759
	2010	27,209	12.87	12.19	1.22	350,176	255,386	–	444,967
	2011	24,982	15.96	10.43	1.37	398,673	105,095	–	692,250
	2012	23,569	12.77	12.01	1.31	300,979	225,288	–	376,670
	2013	21,603	8.19	9.27	1.12	176,882	131,725	–	222,039
	2014	24,822	11.41	12.23	1.32	277,823	226,013	–	329,634
	2015	24,629	8.82	9.56	1.11	217,124	175,438	–	258,811
	2016	27,799	11.02	12.02	1.48	306,471	212,971	–	399,970
	2017	24,890	12.13	10.80	1.34	301,797	211,694	–	391,900
	2018	25,927	7.39	10.91	1.12	191,475	139,676	–	243,275

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Turkey: Fall[a]	1986	25,607	0.42	4.56	0.09	10,755	. –	.
	1987	24,568	0.39	3.99	0.10	9,589	. –	.
	1988	21,057	0.24	3.34	0.07	5,054	. –	.
	1989	18,199	0.30	4.08	0.07	5,460	. –	.
	1990	19,574	0.24	3.92	0.10	4,698	. –	.
	1991	20,049	0.34	3.68	0.19	6,817	. –	.
	1992	16,247	0.35	3.33	0.20	5,687	. –	.
	1993	12,664	1.10	4.11	0.27	13,930	. –	.
	1994	11,746	0.21	6.21	0.10	2,467	. –	.
	1995	13,150	0.19	9.28	0.08	2,557	1,571 –	3,543
	1996	19,863	0.22	6.81	0.10	4,429	3,092 –	5,766
	1997	17,267	0.26	6.78	0.14	4,434	3,214 –	5,653
	1998	17,596	0.27	5.13	0.15	4,763	3,429 –	6,096
	1999	21,625	0.25	4.59	0.15	5,406	3,392 –	6,880
	2000	20,434	0.26	4.49	0.13	5,217	3,741 –	6,693
	2001	21,354	0.22	5.99	0.11	4,617	3,196 –	6,038
	2002	27,557	0.35	5.27	0.16	9,669	7,692 –	11,646
	2003	27,605	0.26	6.79	0.14	7,151	5,305 –	8,996
	2004	28,690	0.34	5.06	0.18	9,614	7,673 –	11,555
	2005	22,920	0.37	4.40	0.20	8,483	6,730 –	10,237
	2006	22,628	0.28	6.99	0.13	6,336	4,705 –	7,967
	2007	16,688	0.21	8.88	0.12	3,576	2,213 –	4,939
	2008	20,977	0.20	8.28	0.07	4,195	2,747 –	5,643
	2009	22,444	0.32	7.11	0.14	7,188	5,523 –	8,853
	2010	20,967	0.26	8.67	0.12	5,442	3,862 –	7,022
	2011	16,753	0.32	9.31	0.15	5,290	3,855 –	6,726
	2012	17,860	0.25	9.77	0.08	4,538	3,153 –	5,924
	2013	16,927	0.20	6.46	0.08	3,385	2,084 –	4,687
	2014	20,467	0.27	7.12	0.12	5,600	4,336 –	6,865
	2015	12,421	0.19	9.27	0.10	2,421	1,529 –	3,313
	2016	20,372	0.22	8.83	0.12	4,429	2,703 –	6,155
	2017	21,484	0.26	10.71	0.16	5,640	3,555 –	7,724
	2018	17,793	0.21	6.60	0.12	3,764	2,361 –	5,167

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Turkey: Spring[a]	1986	31,632	0.56	5.35	0.10	17,714	. –	.
	1987	30,909	0.55	5.62	0.10	17,000	. –	.
	1988	30,082	0.40	5.18	0.08	12,033	. –	.
	1989	45,244	0.58	6.00	0.10	27,146	. –	.
	1990	32,391	0.45	6.02	0.12	14,576	. –	.
	1991	32,564	0.46	6.12	0.13	14,980	. –	.
	1992	34,226	0.58	5.40	0.18	19,851	. –	.
	1993	28,667	0.52	5.66	0.16	14,906	. –	.
	1994	29,102	0.43	5.60	0.15	12,514	. –	.
	1995	43,190	0.48	5.64	0.14	20,751	17,509 –	23,992
	1996	46,706	0.38	6.41	0.09	17,582	14,337 –	20,826
	1997	45,011	0.38	6.08	0.10	17,196	14,349 –	20,044
	1998	44,315	0.46	5.40	0.13	20,393	16,967 –	23,818
	1999	47,903	0.45	5.71	0.14	21,549	18,012 –	25,087
	2000	49,502	0.49	5.89	0.14	24,390	20,678 –	28,102
	2001	53,456	0.48	5.15	0.15	25,866	22,072 –	29,659
	2002	64,407	0.50	5.97	0.13	32,123	27,553 –	36,694
	2003	73,502	0.56	5.7	0.14	41,241	36,135 –	46,347
	2004	63,027	0.54	6.00	0.14	33,879	29,532 –	38,225
	2005	58,490	0.62	6.23	0.17	36,463	31,824 –	41,102
	2006	66,075	0.63	6.20	0.17	41,485	36,636 –	46,334
	2007	61,984	0.50	6.86	0.11	30,992	26,092 –	35,893
	2008	56,799	0.55	6.97	0.14	31,142	26,628 –	35,657
	2009	65,720	0.57	6.65	0.13	37,407	32,609 –	42,206
	2010	54,578	0.47	5.83	0.12	25,769	21,519 –	30,018
	2011	56,283	0.51	6.23	0.12	28,954	24,701 –	33,207
	2012	52,554	0.42	5.21	0.13	22,251	18,760 –	25,743
	2013	49,331	0.45	5.17	0.12	22,394	18,527 –	26,261
	2014	51,894	0.38	5.32	0.11	19,835	17,385 –	22,286
	2015	41,296	0.45	5.34	0.14	18,781	16,019 –	21,543
	2016	57,083	0.48	5.20	0.16	27,460	22,091 –	32,830
	2017	52,925	0.51	5.42	0.17	26,865	21,248 –	32,483
	2018	49,651	0.43	4.99	0.13	21,425	17,595 –	25,255

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Woodcock	1986	3,513	2.00	5.69	0.35	7,025	2,978 –	11,073
	1987	3,030	2.92	3.17	0.92	8,858	4,968 –	12,748
	1988	694	2.67	5.00	0.53	1,851	0 –	3,828
	1989	2,451	3.27	6.91	0.47	8,021	1,907 –	14,135
	1990	2,093	3.44	8.11	1.32	7,209	976 –	13,443
	1991	984	2.25	4.25	0.81	2,214	814 –	3,613
	1992	563	1.25	5.00	0.58	704	0 –	1,749
	1993	974	1.57	2.00	0.66	1,531	223 –	2,839
	1994	514	0.33	0.67	0.50	171	0 –	507
	1995	603	1.60	5.00	0.65	965	0 –	1,996
	1996	537	1.50	20.75	0.21	805	126 –	1,484
	1997	1,036	18.89	5.11	2.79	19,570	0 –	40,238
	1998	782	1.00	3.00	0.85	782	222 –	1,342
	1999	821	3.67	4.83	0.89	3,011	947 –	5,075
	2000	1,151	2.00	6.88	0.73	2,302	213 –	4,391
	2001	1,003	1.00	3.43	0.26	1,003	0 –	2,360
	2002	801	2.80	2.00	1.10	2,243	0 –	5,113
	2003	665	1.25	1.00	1.25	831	506 –	1,157
	2004	305	2.50	1.00	2.50	763	464 –	1,062
	2005	595	1.75	14.25	0.81	1,042	750 –	1,334
	2006	302	1.00	1.00	1.00	302	302 –	302
	2007	341	0.50	1.50	0.50	170	0 –	504
	2008	323	0.50	2.50	0.50	161	0 –	475
	2009	733	0.60	2.80	0.45	440	88 –	792
	2010	640	0	1.50	0	0	0 –	0
	2011	588	1.50	2.50	0.45	882	0 –	1,879
	2012	878	2.17	5.67	0.56	1,903	401 –	3,405
	2013	1,128	0.29	1.00	0.33	322	0 –	954
	2014	435	1.00	2.17	0.42	435	0 –	975
	2015	106	2.00	2.00	1.00	212	. –	.
	2016	1,273	1.00	4.40	0.40	1,273	254 –	2,292
	2017	1,048	3.33	1.67	1.67	1,747	0 –	10,340
	2018	508	0.33	3.67	0.17	169	0 –	502

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Coyote	2003	19,623	5.08	22.11	0.44	99,611	57,158 –	142,063
	2004	17,092	4.79	19.30	0.48	81,918	55,526 –	108,311
	2005	15,329	17.76	29.20	0.52	272,210	0 –	567,975
	2006	17,198	8.70	32.63	0.47	149,649	57,916 –	241,381
	2007	21,797	4.65	15.56	0.45	101,321	75,585 –	127,056
	2008	16,943	9.50	25.53	0.48	161,037	45,366 –	276,708
	2009	23,618	5.14	20.00	0.16	121,485	90,980 –	151,991
	2010	23,208	5.94	21.67	0.50	137,966	87,223 –	188,709
	2011	25,864	5.59	27.04	0.44	144,455	85,406 –	203,504
	2012	31,181	4.86	24.40	0.53	151,661	120,863 –	182,458
	2013	26,117	6.86	21.22	0.45	179,270	89,781 –	268,758
	2014	20,830	8.84	21.68	0.62	184,036	39,004 –	329,069
	2015	18,684	5.81	19.81	0.48	108,587	83,305 –	133,870
	2016	22,918	8.36	20.40	0.53	191,621	103,249 –	279,993
	2017	18,602	8.12	26.09	0.64	151,074	95,992 –	206,156
	2018	18,471	4.04	22.76	0.49	74,574	54,695 –	94,454
Bobcat	2003	7,650	1.93	16.00	0.22	14,800	6,817 –	22,783
	2004	7,173	1.06	12.96	0.16	7,630	3,702 –	11,559
	2005	8,781	1.90	15.14	0.16	16,669	8,636 –	24,701
	2006	9,051	2.50	23.95	0.20	22,628	14,734 –	30,523
	2007	9,706	1.51	17.16	0.18	14,645	9,647 –	19,642
	2008	8,229	1.76	15.80	0.25	14,522	7,258 –	21,786
	2009	10,415	1.44	14.17	0.21	14,963	8,225 –	21,701
	2010	12,164	1.57	14.01	0.25	19,138	12,287 –	25,990
	2011	10,581	1.15	16.06	0.13	12,220	7,650 –	16,789
	2012	10,101	1.52	17.93	0.13	15,371	7,449 –	23,293
	2013	9,673	0.93	20.49	0.14	9,028	5,751 –	12,305
	2014	7,621	1.44	19.83	0.13	10,950	7,075 –	14,826
	2015	6,263	0.97	16.53	0.09	6,047	3,297 –	8,798
	2016	10,186	1.63	22.48	0.13	16,552	6,665 –	26,439
	2017	8,122	3.52	18.73	0.30	28,559	14,809 –	42,308
	2018	5,931	1.77	19.79	0.20	10,506	2,718 –	18,295
Raccoon	2003	9,146	7.26	24.36	0.49	66,439	45,639 –	87,239
	2004	8,088	8.87	20.65	0.44	71,705	47,872 –	95,538
	2005	8,930	8.12	23.95	0.42	72,480	51,955 –	93,005
	2006	6,939	8.30	23.26	0.83	57,627	40,533 –	74,721
	2007	8,174	8.66	24.15	0.77	70,781	46,919 –	94,644
	2008	7,261	8.39	22.82	0.39	60,895	38,468 –	83,322
	2009	9,682	8.02	24.09	0.66	77,607	57,094 –	98,119
	2010	9,123	8.63	25.80	0.52	78,746	55,681 –	101,812
	2011	11,022	8.42	24.05	0.62	92,789	72,481 –	113,097
	2012	9,515	8.20	25.18	0.71	78,026	56,244 –	99,808
	2013	9,189	8.26	24.89	0.73	75,932	52,288 –	99,576
	2014	9,290	8.22	21.83	0.62	76,402	61,077 –	91,727
	2015	6,157	9.38	21.63	0.62	57,751	39,867 –	75,634
	2016	6,791	10.53	30.55	0.67	71,513	46,088 –	96,938
	2017	8,122	9.79	22.56	0.63	79,481	50,182 –	108,780
	2018	6,948	6.58	23.08	0.68	45,682	32,232 –	59,132

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
Beaver	2003	3,326	3.00	6.15	0.72	9,978	4,733 –	15,223
	2004	1,984	5.85	39.23	0.54	11,598	4,233 –	18,963
	2005	2,381	5.06	17.13	0.63	12,055	4,464 –	19,647
	2006	2,112	4.93	39.86	0.53	10,409	2,379 –	18,439
	2007	1,873	5.91	20.73	0.53	11,069	1,174 –	20,963
	2008	1,775	7.18	17.55	0.77	12,747	3,629 –	21,866
	2009	2,347	4.13	20.13	1.14	9,682	1,562 –	17,802
	2010	2,561	6.56	15.06	0.50	16,806	1,301 –	32,310
	2011	2,792	2.67	48.28	0.32	7,446	5,022 –	9,869
	2012	2,049	6.29	30.43	0.50	12,882	1,682 –	24,082
	2013	2,741	4.18	36.29	0.26	11,446	0 –	23,156
	2014	3,048	3.68	12.45	0.43	11,227	7,440 –	15,014
	2015	1,911	4.28	39.72	0.44	8,174	3,118 –	13,230
	2016	2,971	2.86	20.71	0.45	8,488	5,768 –	11,208
	2017	3,144	5.18	12.20	0.52	16,292	7,273 –	25,311
	2018	1,017	1.20	13.83	0.31	1,220	244 –	2,196
Gray Fox	2003	831	1.20	12.80	0.12	998	0 –	2,578
	2004	916	2.17	12.83	0.35	1,984	418 –	3,550
	2005	1,637	1.27	11.45	0.35	2,084	1,208 –	2,959
	2006	1,509	0.40	24.40	0.15	603	121 –	1,086
	2007	1,873	0.91	18.91	0.05	1,703	547 –	2,859
	2008	1,291	1.88	27.38	0.10	2,420	482 –	4,359
	2009	1,614	1.09	25.73	0.10	1,760	596 –	2,925
	2010	1,601	2.80	26.70	0.30	4,482	2,298 –	6,665
	2011	1,176	0.38	11.13	0.03	441	19 –	862
	2012	1,464	1.30	21.90	0.04	1,903	300 –	3,506
	2013	1,935	0.75	13.64	0.15	1,451	0 –	3,076
	2014	1,234	1.53	20.00	0.18	1,887	934 –	2,840
	2015	1,274	2.00	17.18	0.21	2,548	0 –	5,559
	2016	2,334	0.55	30.18	0.03	1,273	0 –	2,702
	2017	1,572	1.17	16.67	0.13	1,834	364 –	3,305
	2018	678	2.00	15.75	0.13	1,356	0 –	2,890
Red Fox	2007	851	0.40	21.40	0.04	341	0 –	1,008
	2008	484	1.00	12.67	0.43	484	0 –	1,032
	2009	1,027	0.67	31.86	0.20	685	14 –	1,355
	2010	320	0.50	36.00	0.01	160	0 –	474
	2011	735	0	10.20	0	0	0 –	0
	2012	1,610	0.64	20.64	0.23	1,025	255 –	1,795
	2013	1,290	0.13	14.88	0.01	161	0 –	477
	2014	653	0.44	15.44	0.04	290	0 –	600
	2015	743	0.43	24.29	0.03	319	24 –	613
	2016	1,061	0.60	12.60	0.06	637	0 –	1,468
	2017	1,048	0	23.00	0	0	0 –	–
	2018	847	0.25	10.80	0.02	212	0 –	627

Table A5. Continued.

	Year	Number Of Hunters	Mean Bag Per Hunter	Mean Days Hunted	Mean Daily Bag	Total Harvest	95% Confidence Interval for Total Harvest	
River Otter	2007	170	0	10.00	0	0	. –	.
	2008	645	1.50	8.75	1.02	968	336 –	1,601
	2009	293	1.00	50.00	0.10	293	0 –	868
	2010	320	0.50	3.00	0.10	160	0 –	474
	2011	588	0.75	14.75	0.03	441	0 –	992
	2012	0	0	0	0	0	. –	.
	2013	967	0.50	24.67	0.01	484	0 –	1,131
	2014	581	0.88	21.13	0.08	508	172 –	844
	2015	318	1.67	21.67	0.08	531	0 –	1,081
	2016	1,273	0.40	22.00	0.02	509	0 –	1,508
	2017	786	1.50	6.00	0.27	1,179	409 –	1,949
	2018	169	.	42.00	.	.	. –	.
Bear	2014	1,452	0.22	4.17	0.19	323	36 –	609
Elk	2014	1,814	0.33	4.77	0.21	605	255 –	954
Antelope	2014	581	0.67	6.20	0.27	387	147 –	627
Prairie Chicken	1986	5,992	2.07	2.45	0.85	12,398	3,714 –	21,081
	1987	5,595	1.33	1.96	0.68	7,459	3,302 –	11,617
	1988	3,934	1.53	1.65	0.93	6,016	2,388 –	9,645
	1989	3,342	2.29	2.57	0.89	7,639	2,811 –	12,467
	1990	4,186	1.56	2.72	0.51	6,512	2,411 –	10,613
	1991	3,936	2.12	2.25	0.81	8,363	4,921 –	11,805
	1992	3,239	1.65	2.57	0.72	5,352	1,097 –	9,606
	1993	974	1.14	2.43	0.64	1,113	464 –	1,763
	1994	1,713	0.75	1.22	0.59	1,284	101 –	2,468
	1995	1,448	0.56	1.56	0.45	812	169 –	1,455
	1996	671	0.80	3.80	0.53	537	45 –	1,029
	1997	576	1.00	1.80	0.68	576	71 –	1,080

[a]Confidence intervals for turkey harvest estimates were not available for 1986-1994. A correction factor was applied to the turkey estimates during those years, but it was evaluated in 1996 and deemed inappropriate. The harvest estimates for turkey prior to 1995 were recalculated without the correction factor but confidence intervals could not be calculated.

Table A6. Mean number of days deer hunters participated in each deer season in Oklahoma, 1997-2018.

Year	Total Mean Days[a]	Archery Mean Days	Muzzleloader Mean Days	Youth Mean Days	Rifle Mean Days	Holiday Mean Days[b]
1997	15.1	.	.	.	.	N/A
1998	14.5	.	.	.	.	N/A
1999	15.4	.	.	.	.	N/A
2000	16.0	.	.	.	.	N/A
2001	16.2	.	.	.	.	.
2002	16.8	.	.	.	.	.
2003	19.1	18.6	4.7	1.9	6.5	2.1
2004	16.8	16.4	4.6	1.9	6.1	2.1
2005	16.6	16.5	4.5	1.8	6.0	2.1
2006	18.3	18.3	4.6	2.0	6.1	2.0
2007	17.3	17.9	4.7	1.8	6.3	2.5
2008	17.4	17.8	4.7	2.1	6.1	2.3
2009	17.9	17.7	4.6	2.1	6.3	2.3
2010	18.3	18.2	4.6	2.1	6.1	2.8
2011	18.4	18.6	4.7	2.2	6.2	2.8
2012	17.8	18.0	4.7	2.1	6.3	2.8
2013	17.7	16.7	4.5	2.0	5.9	2.9
2014	17.8	17.8	4.6	2.2	5.9	2.8
2015	19.1	18.9	4.6	2.2	6.0	2.7
2016	16.4	17.9	4.3	2.2	5.6	2.6
2017	17.7	16.7	4.6	2.6	6.1	2.1
2018	17.8	18.3	4.7	2.2	5.8	2.7

[a]Number of days of deer hunting was collected as one aggregate variable in years 1997-2002. In years 2003-present, number of days of deer hunting was collected by season and summed to calculate total mean days.
[b]Holiday antlerless deer gun season began in 2001.

Table A7. Mean number of deer harvested by deer hunters in each deer season in Oklahoma, 2001-2018.

	Total: All-Seasons			Archery		Primitive		Youth		Rifle		Holiday
Year	Mean Number Deer	Mean Number Bucks	Mean Number Does	Mean Number Bucks	Mean Number Does	Mean Number Bucks	Mean Number Does	Mean Number Bucks	Mean Number Does	Mean Number Bucks	Mean Number Does	Mean Number Does
2001	0.91	0.46	0.46	0.13	0.21	0.22	0.16	N/A	N/A	0.27	0.20	0.21
2002	0.93	0.53	0.48	0.16	0.23	0.18	0.17	N/A	N/A	0.28	0.19	0.23
2003	0.98	0.49	0.49	0.19	0.19	0.20	0.17	N/A	0.32	0.29	0.22	0.22
2004	0.89	0.50	0.39	0.20	0.19	0.22	0.19	N/A	0.23	0.29	0.16	0.16
2005	0.84	0.45	0.39	0.13	0.18	0.20	0.15	N/A	0.42	0.29	0.18	0.17
2006	1.04	0.54	0.50	0.15	0.22	0.23	0.20	N/A	0.37	0.34	0.21	0.22
2007	0.86	0.47	0.39	0.14	0.19	0.20	0.13	0.18	0.30	0.28	0.18	0.22
2008	0.94	0.44	0.50	0.16	0.28	0.16	0.15	0.20	0.26	0.29	0.23	0.26
2009	0.92	0.45	0.47	0.17	0.28	0.20	0.13	0.23	0.15	0.27	0.22	0.24
2010	0.89	0.44	0.45	0.15	0.24	0.17	0.13	0.31	0.16	0.28	0.22	0.20
2011	0.95	0.47	0.48	0.20	0.26	0.17	0.17	0.17	0.23	0.31	0.23	0.19
2012	0.87	0.46	0.41	0.17	0.24	0.21	0.14	0.24	0.23	0.28	0.18	0.21
2013	0.72	0.36	0.35	0.16	0.18	0.17	0.13	0.12	0.08	0.20	0.17	0.16
2014	0.78	0.40	0.39	0.18	0.23	0.16	0.12	0.17	0.16	0.25	0.18	0.17
2015	0.74	0.39	0.35	0.16	0.22	0.19	0.12	0.10	0.22	0.24	0.15	0.14
2016	0.81	0.42	0.39	0.19	0.27	0.13	0.11	0.16	0.16	0.30	0.19	0.20
2017	0.92	0.51	0.41	0.18	0.23	0.22	0.11	0.44	0.23	0.32	0.21	0.19
2018	0.87	0.46	0.41	0.19	0.26	0.20	0.14	0.21	0.20	0.31	0.18	0.20

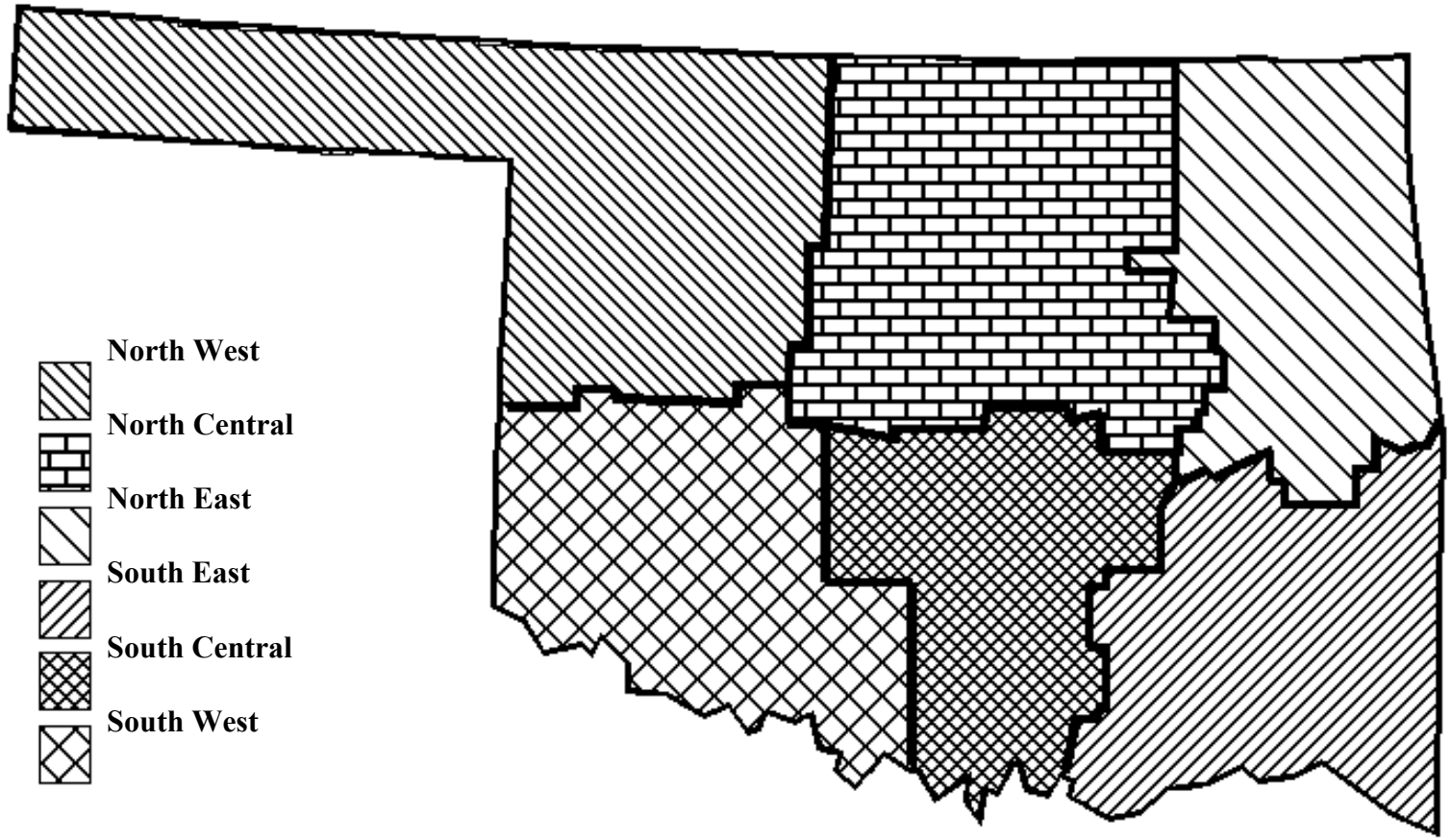


Figure A1. Regional boundaries for Oklahoma used in the Game Harvest Survey.

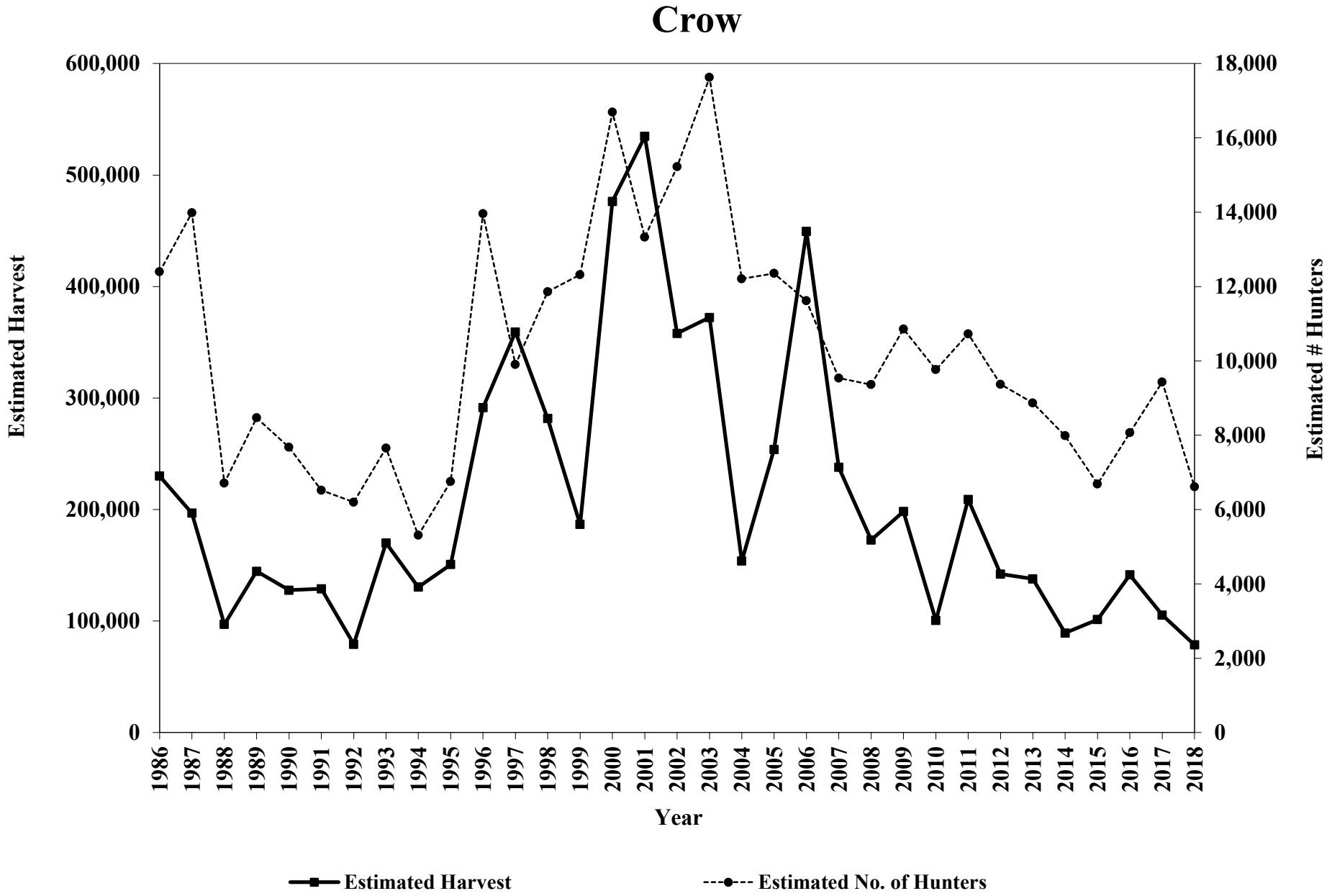


Figure A2. Statewide trends in estimated crow harvest and estimated number of crow hunters in Oklahoma, 1986-2018.

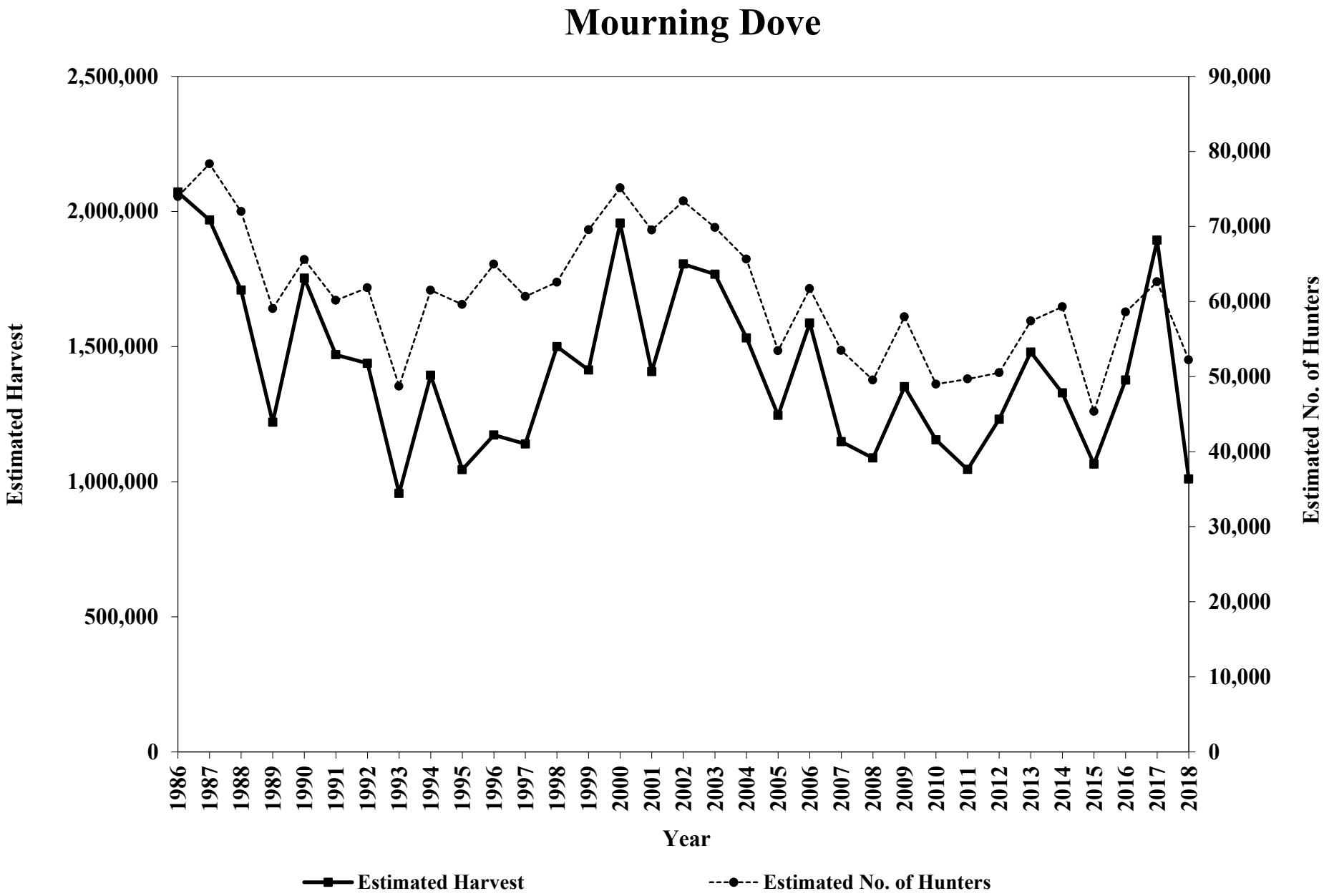


Figure A3. Statewide trends in estimated mourning dove harvest and estimated number of mourning dove hunters in Oklahoma, 1986-2018.

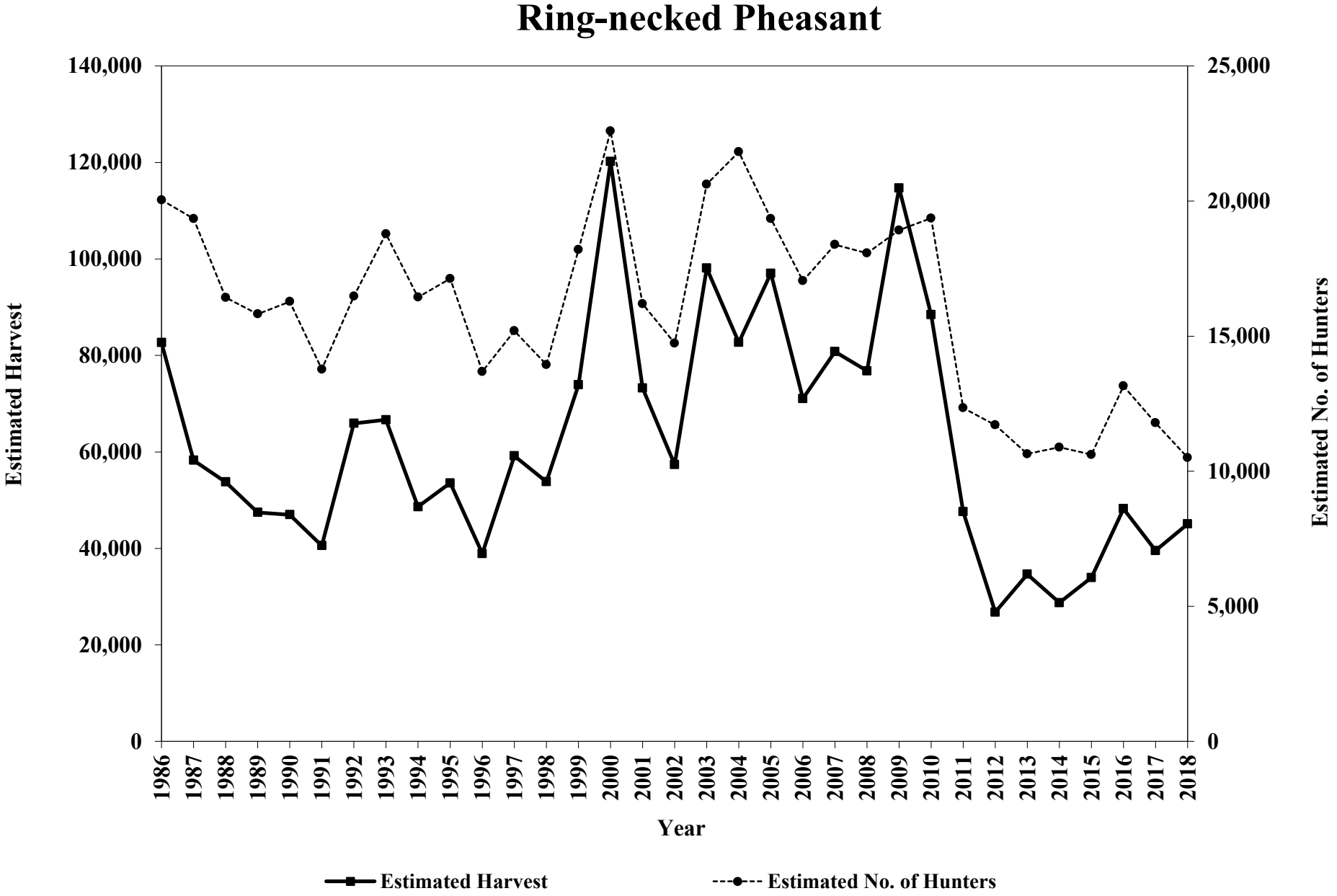


Figure A4. Statewide trends in estimated ring-necked pheasant harvest and estimated number of ring-necked pheasant hunters in Oklahoma, 1986-2018.

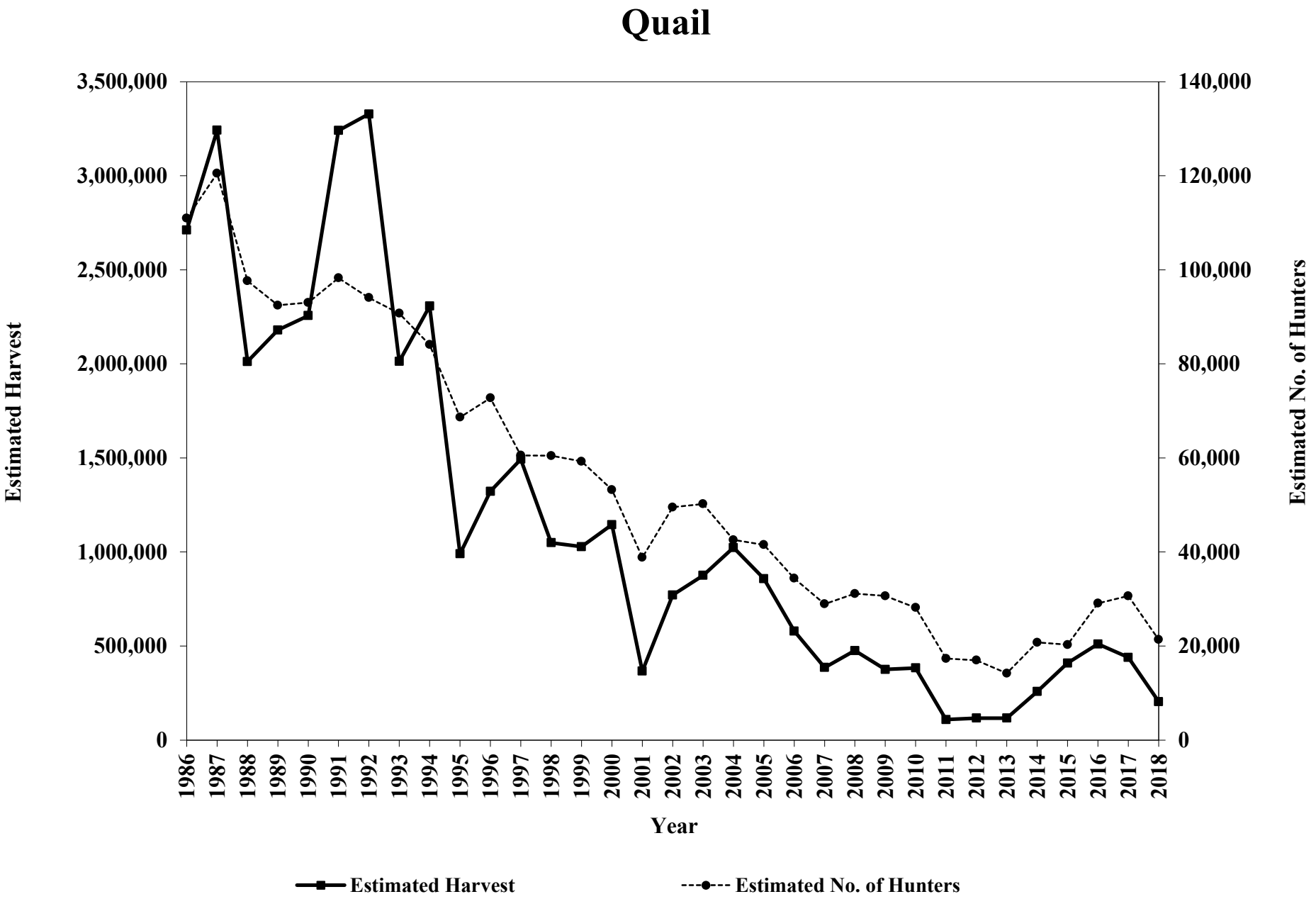


Figure A5. Statewide trends in estimated quail harvest and estimated number of quail hunters in Oklahoma, 1986-2018.

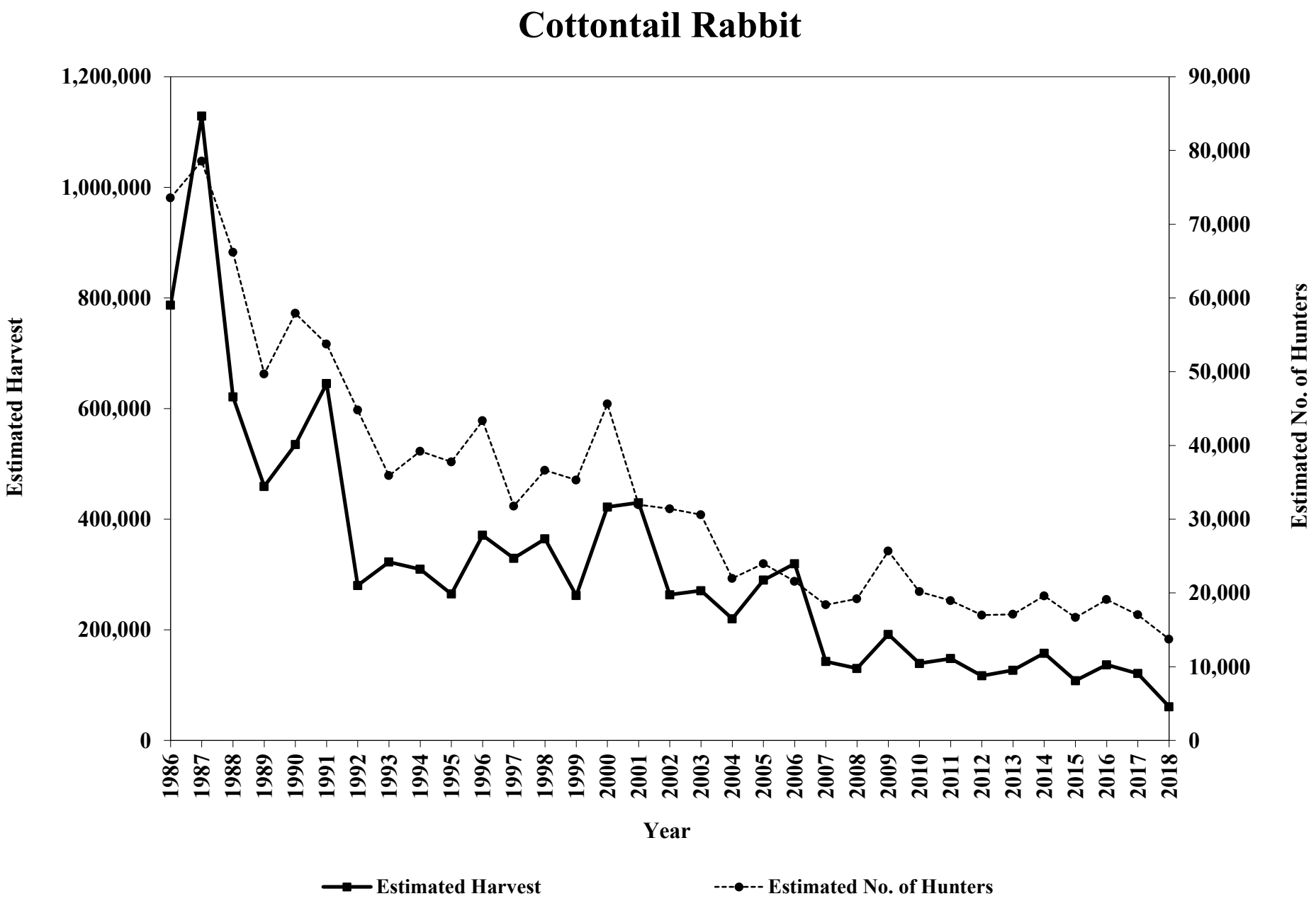


Figure A6. Statewide trends in estimated cottontail rabbit harvest and estimated number of cottontail rabbit hunters in Oklahoma, 1986-2018.

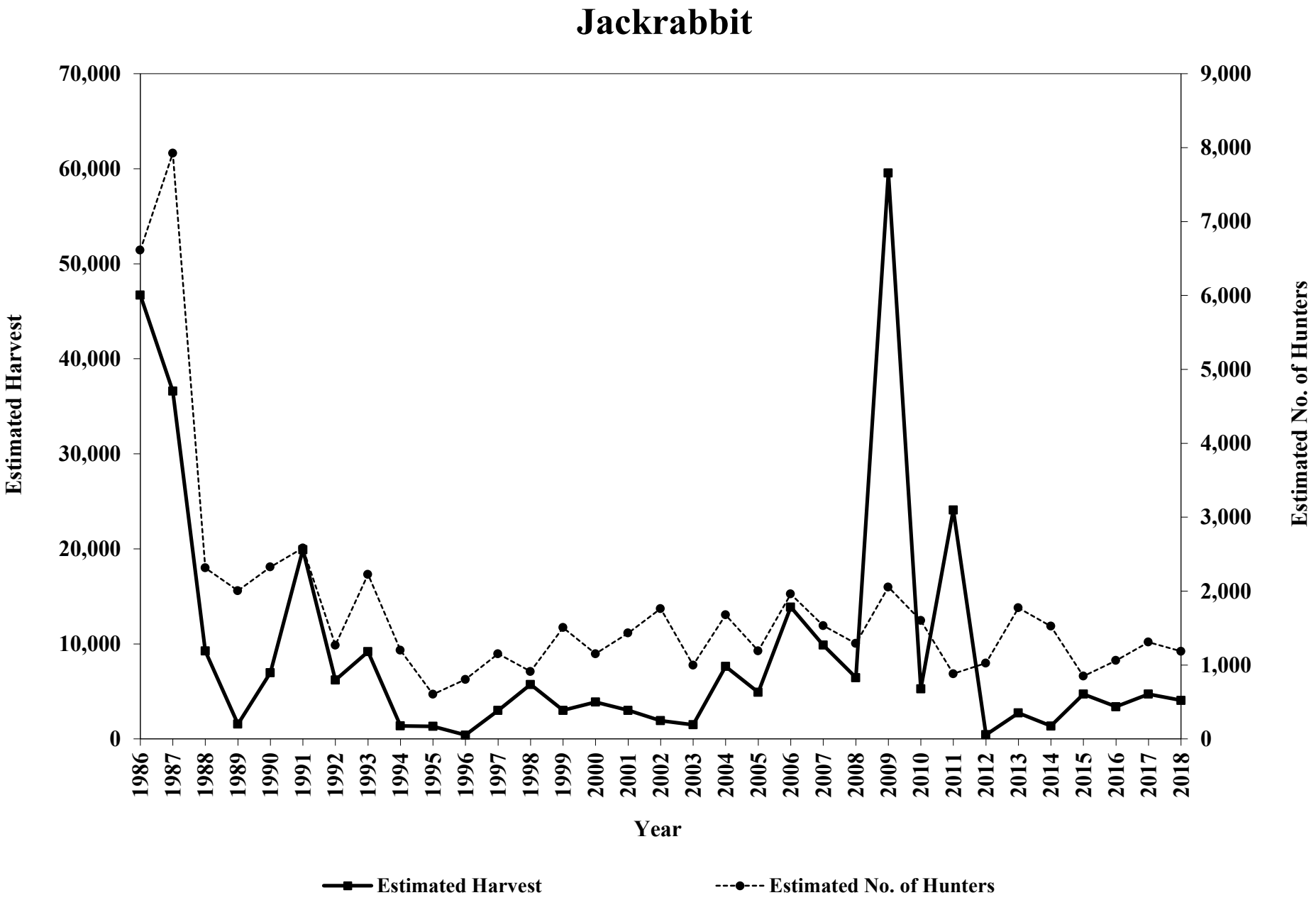


Figure A7. Statewide trends in estimated jackrabbit harvest and estimated number of jackrabbit hunters in Oklahoma, 1986-2018.

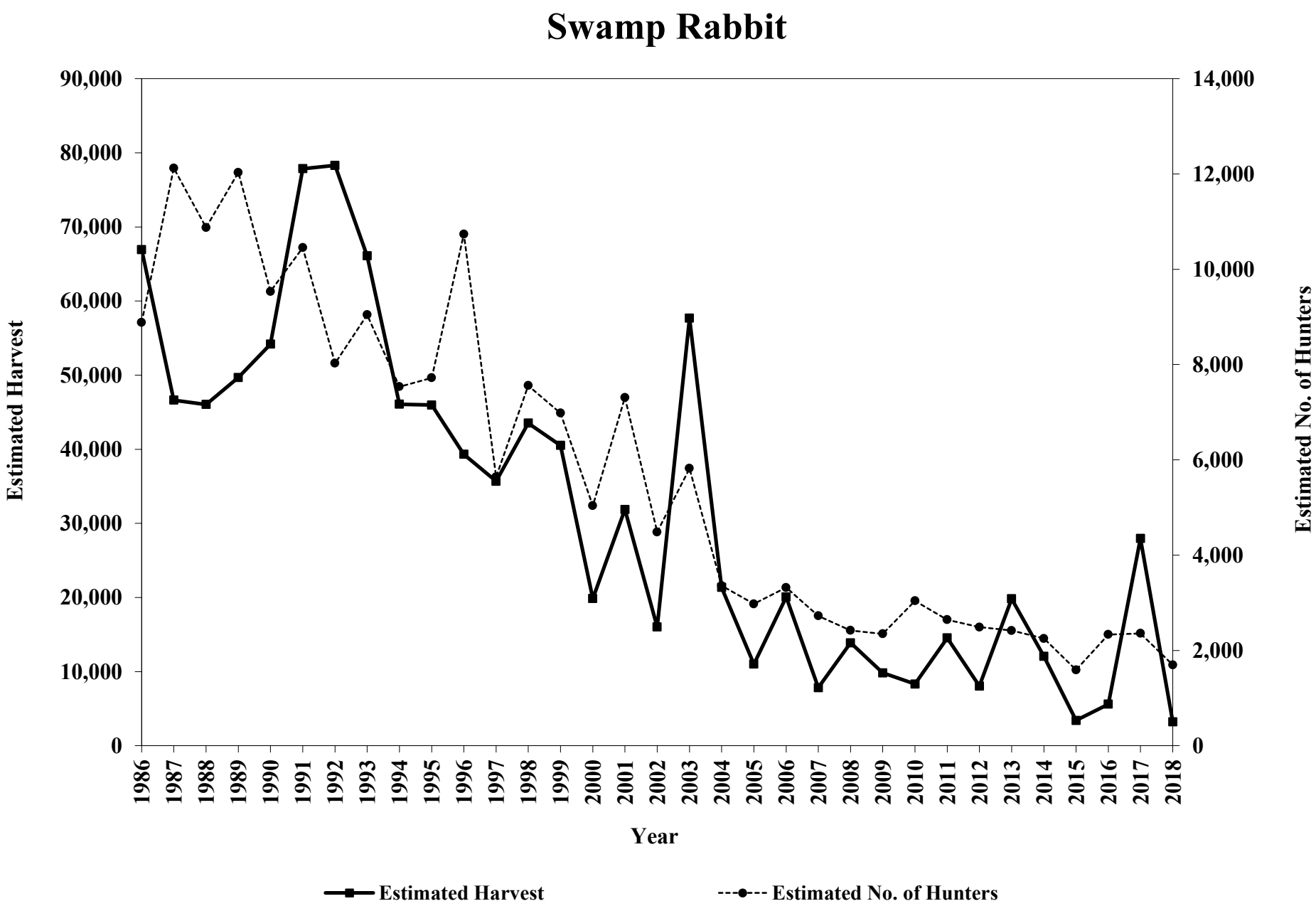


Figure A8. Statewide trends in estimated swamp rabbit harvest and estimated number of swamp rabbit hunters in Oklahoma, 1986-2018.

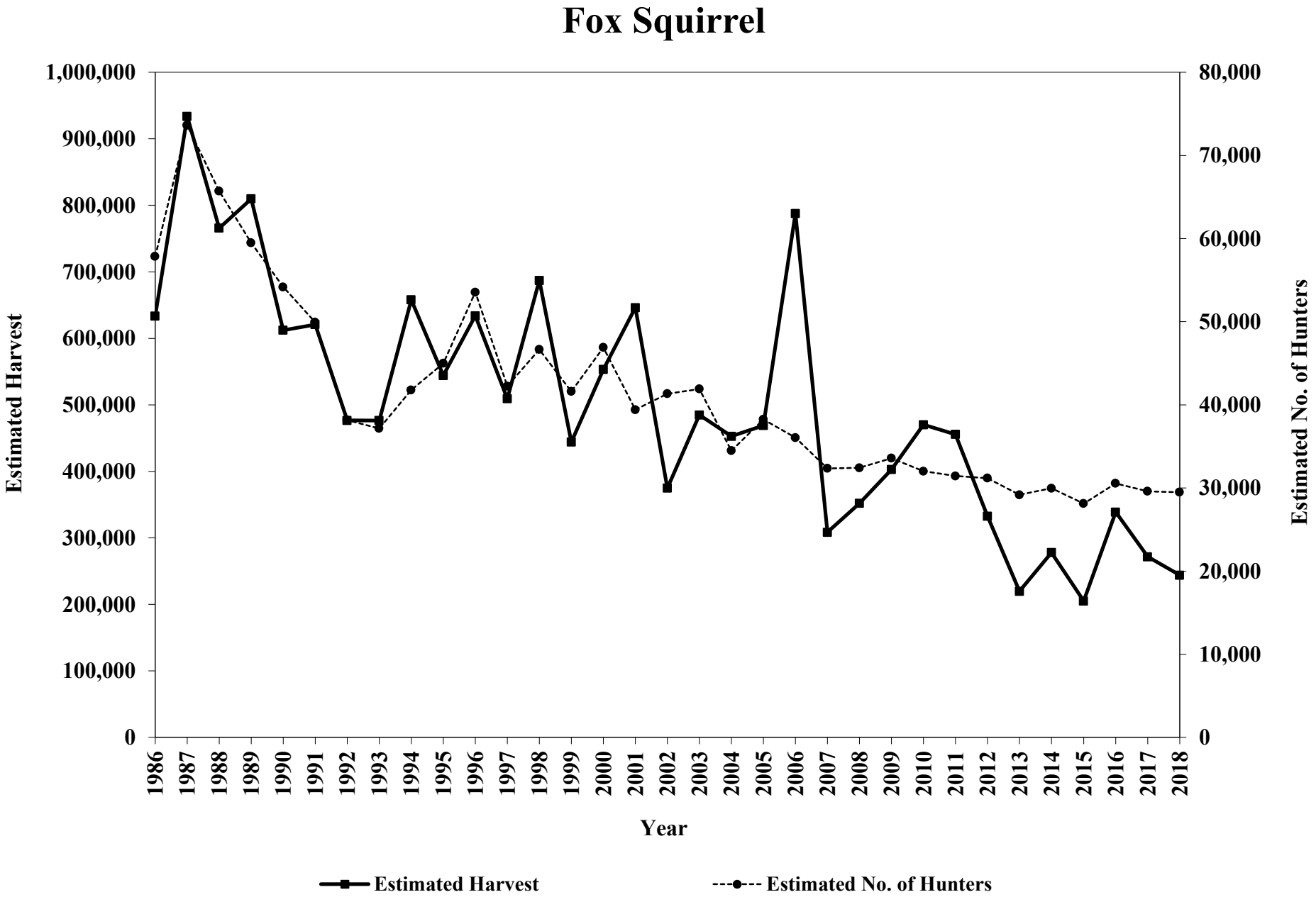


Figure A9. Statewide trends in estimated fox squirrel harvest and estimated number of fox squirrel hunters in Oklahoma, 1986-2018.

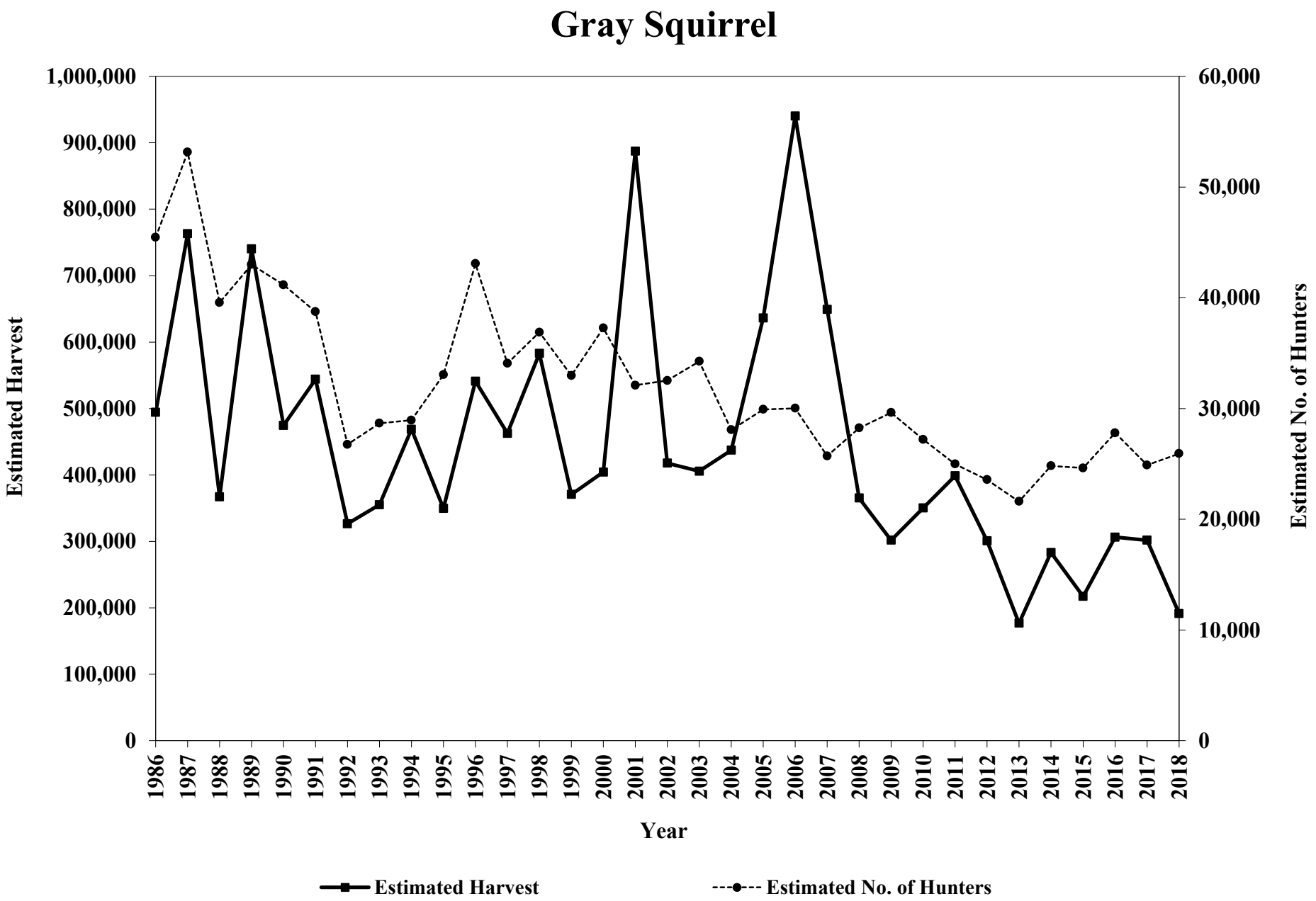


Figure A10. Statewide trends in estimated gray squirrel harvest and estimated number of gray squirrel hunters in Oklahoma, 1986-2018.

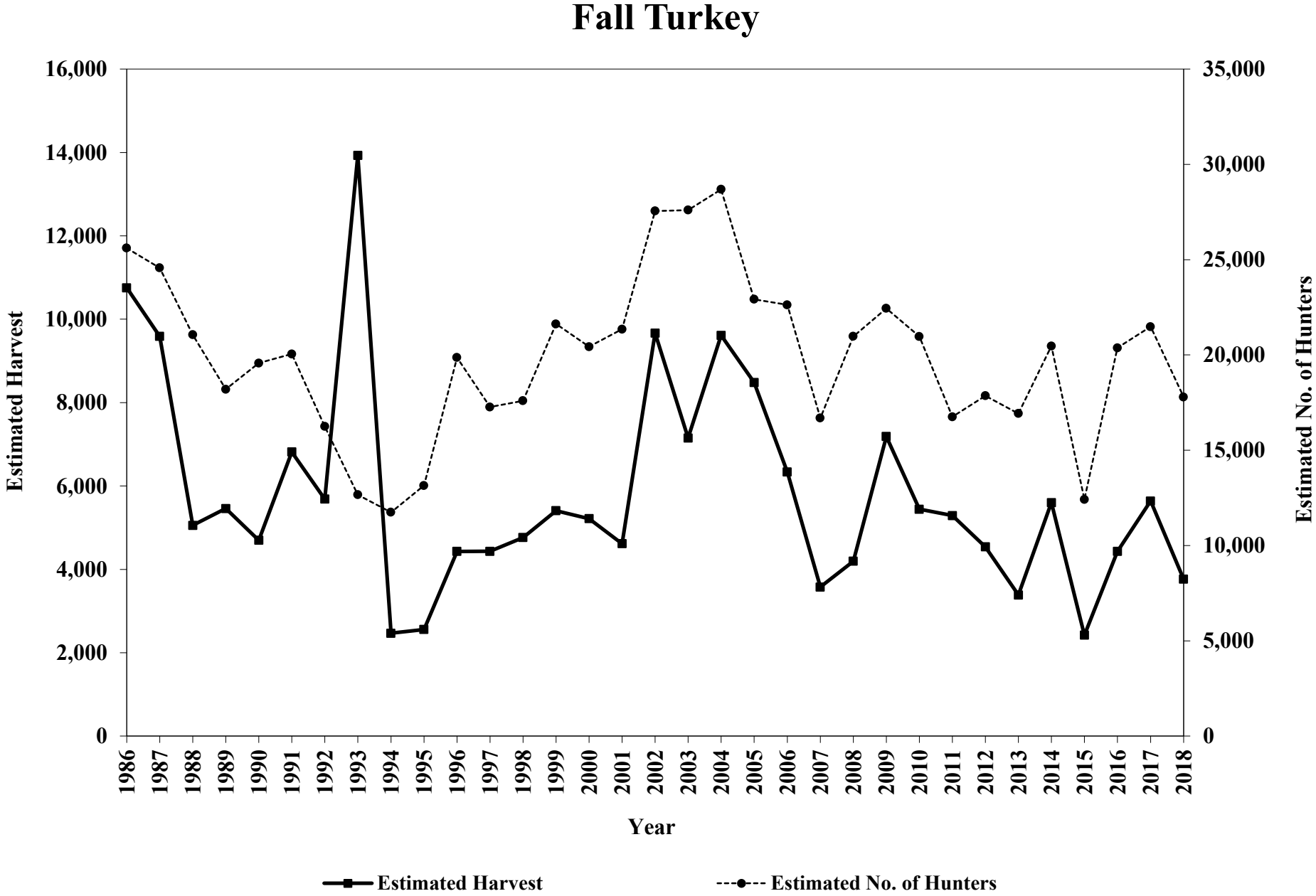


Figure A11. Statewide trends in estimated fall turkey harvest and estimated number of fall turkey hunters in Oklahoma, 1986-2018.

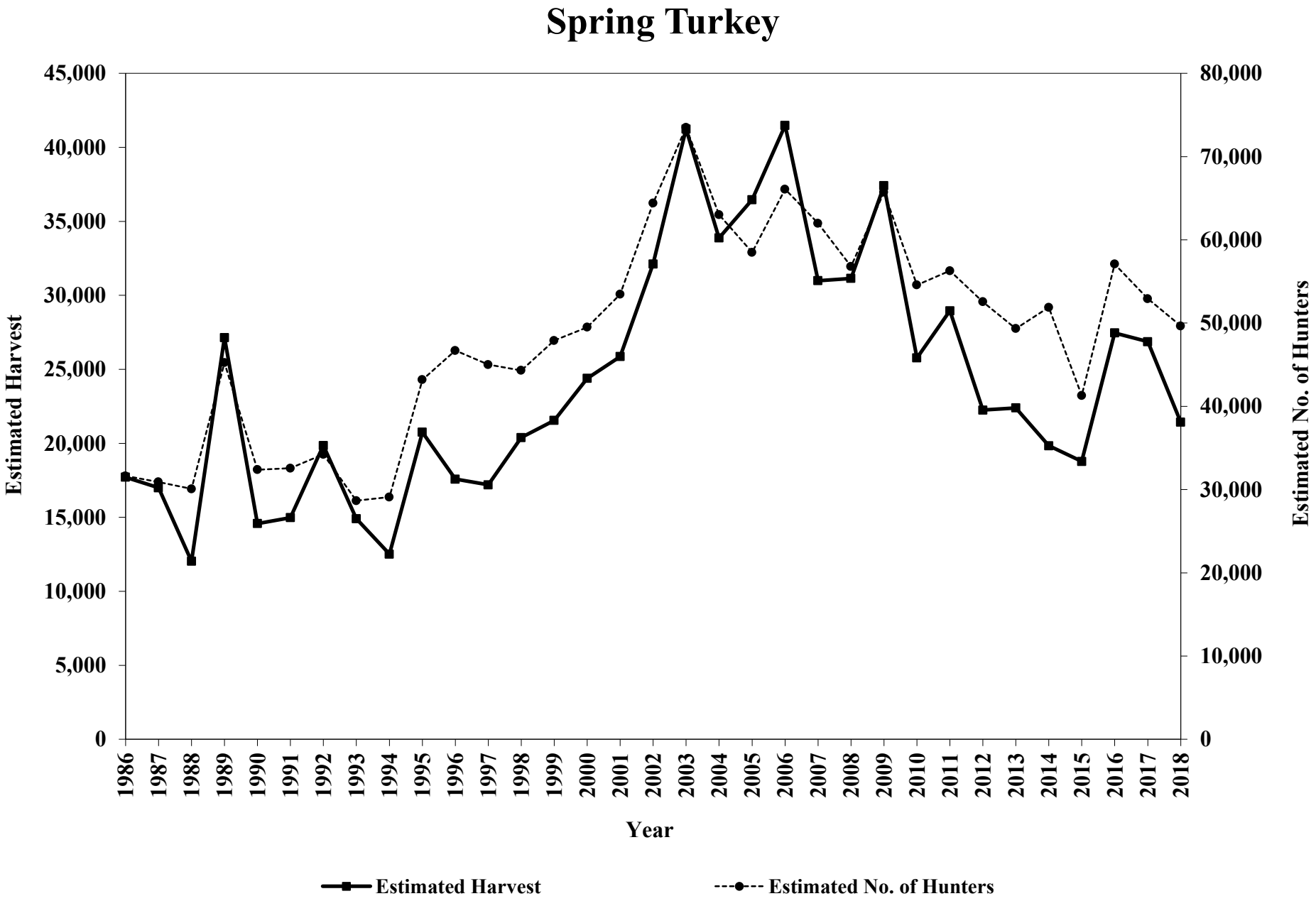


Figure A12. Statewide trends in estimated spring turkey harvest and estimated number of spring turkey hunters in Oklahoma, 1986-2018.

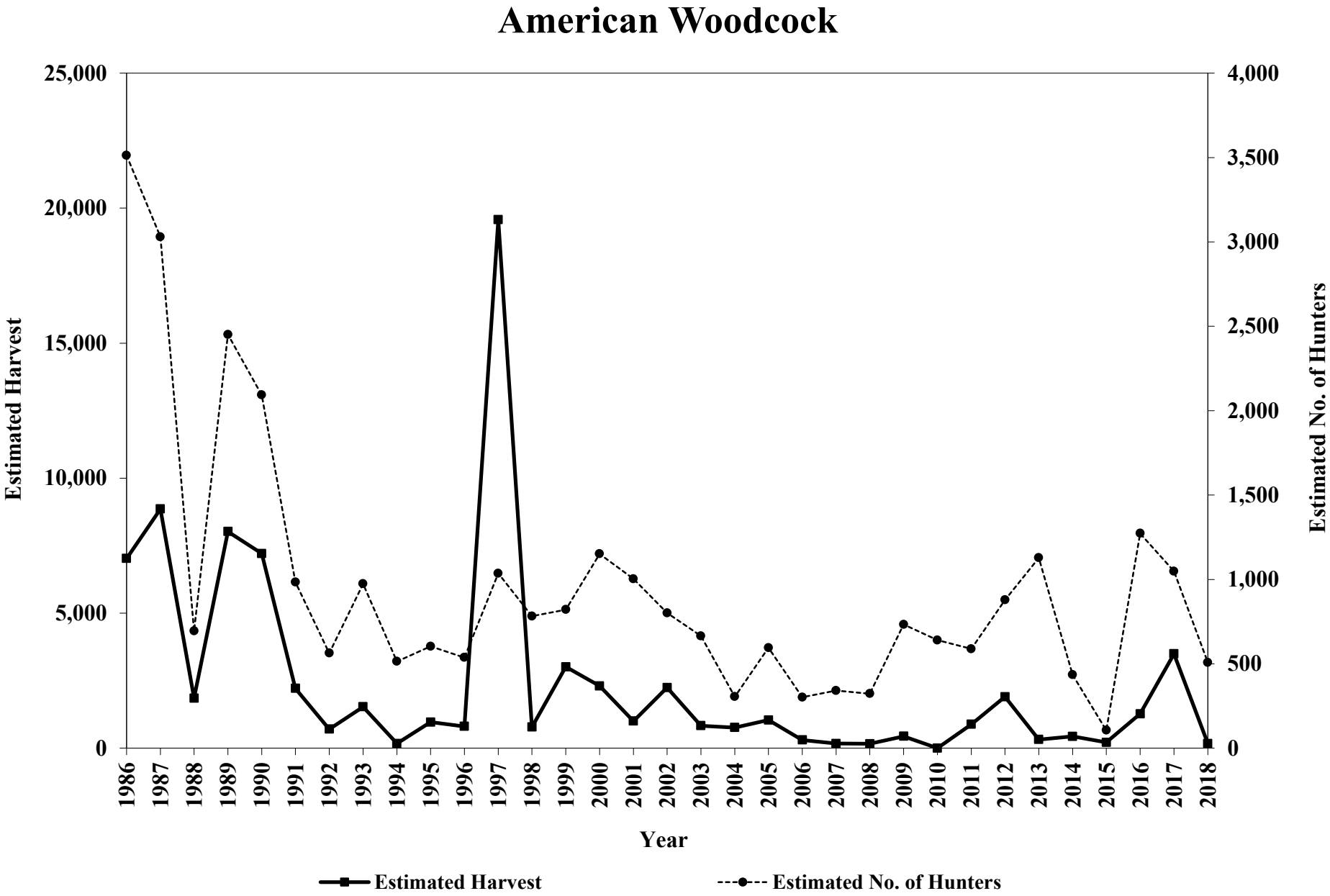


Figure A13. Statewide trends in estimated American woodcock harvest and estimated number of American woodcock hunters in Oklahoma, 1986-2018.

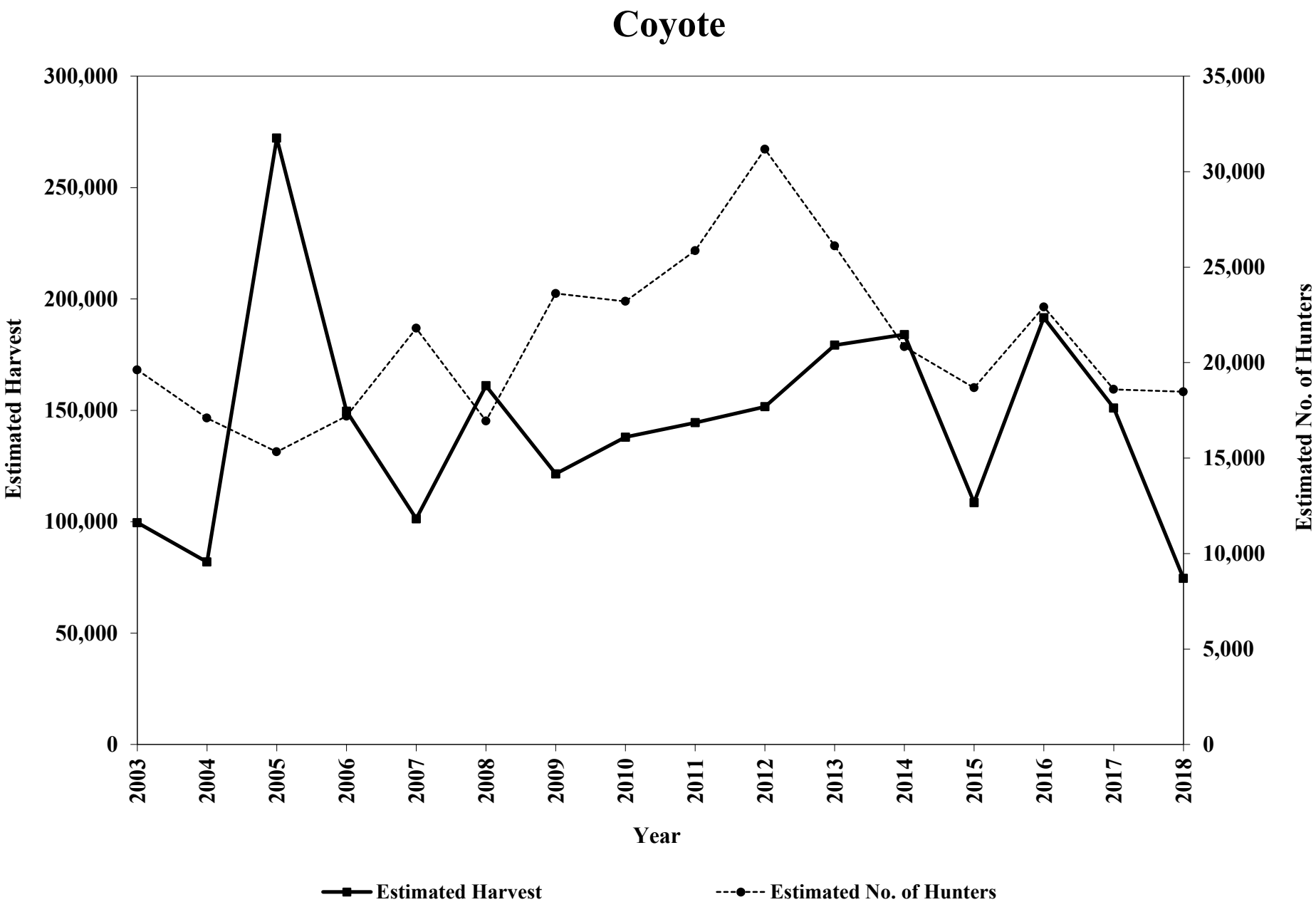


Figure A14. Statewide trends in estimated coyote harvest and estimated number of coyote hunters in Oklahoma, 2003-2018.

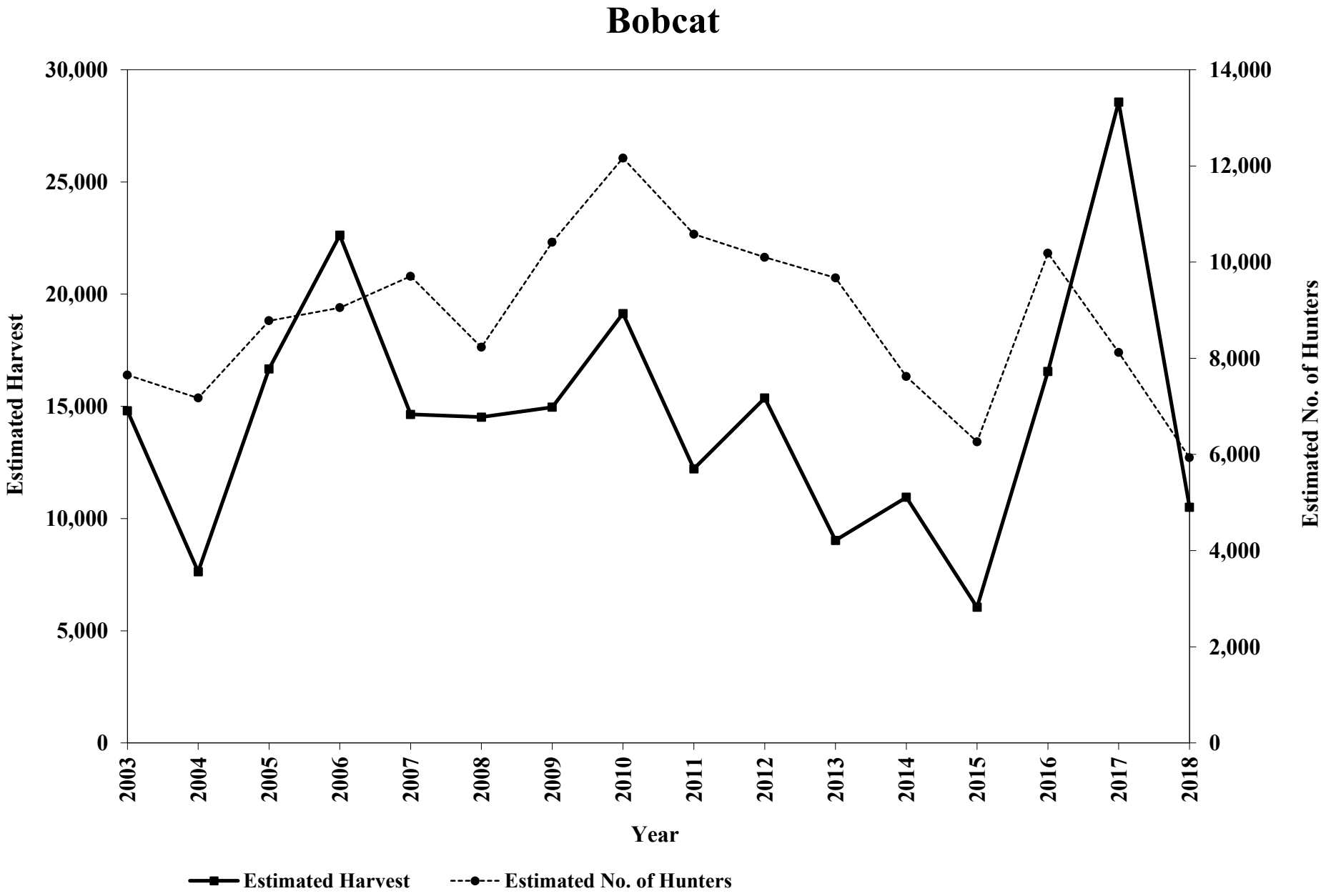


Figure A15. Statewide trends in estimated bobcat harvest and estimated number of bobcat hunters in Oklahoma, 2003-2018.

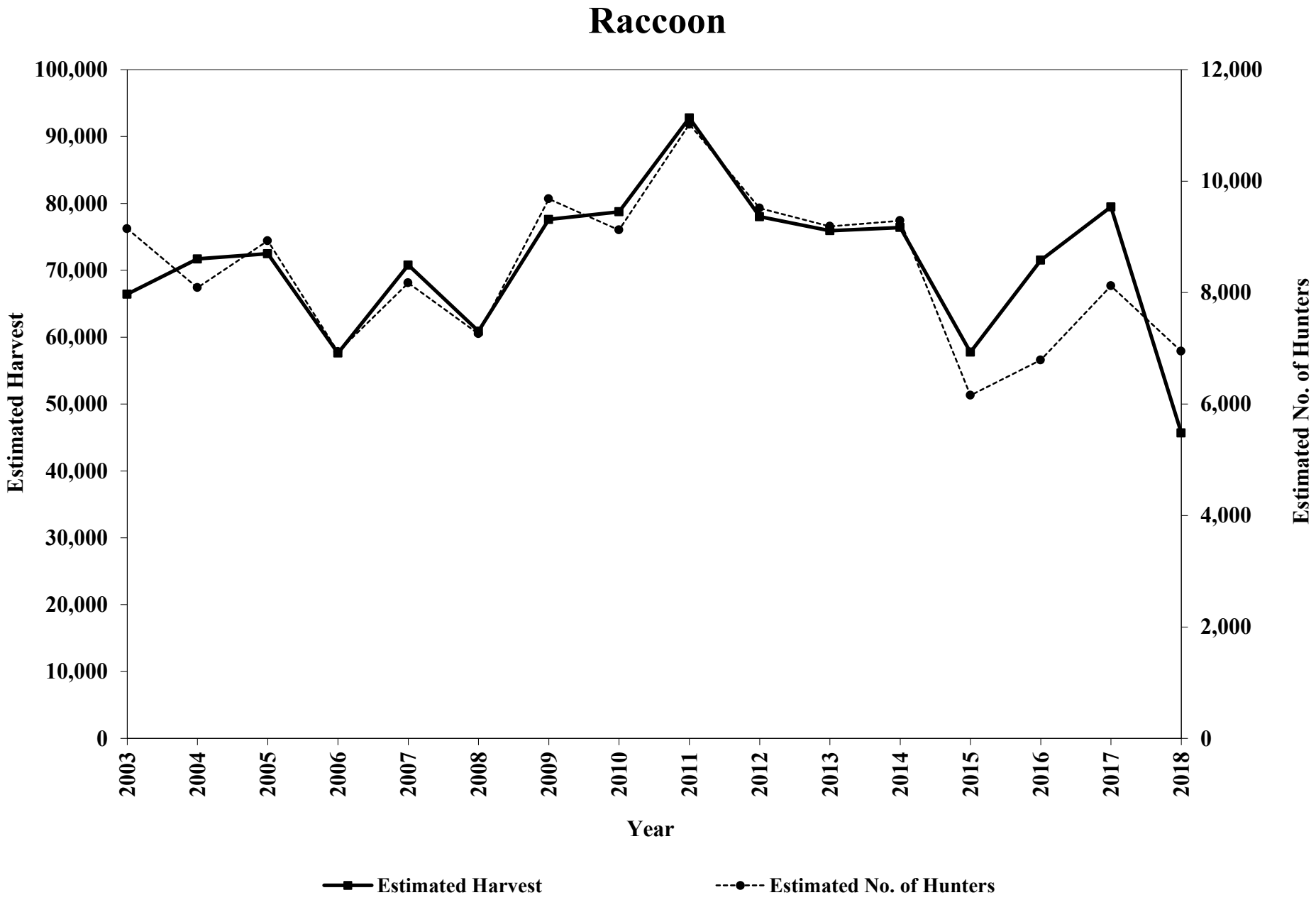


Figure A16. Statewide trends in estimated raccoon harvest and estimated number of raccoon hunters in Oklahoma, 2003-2018.

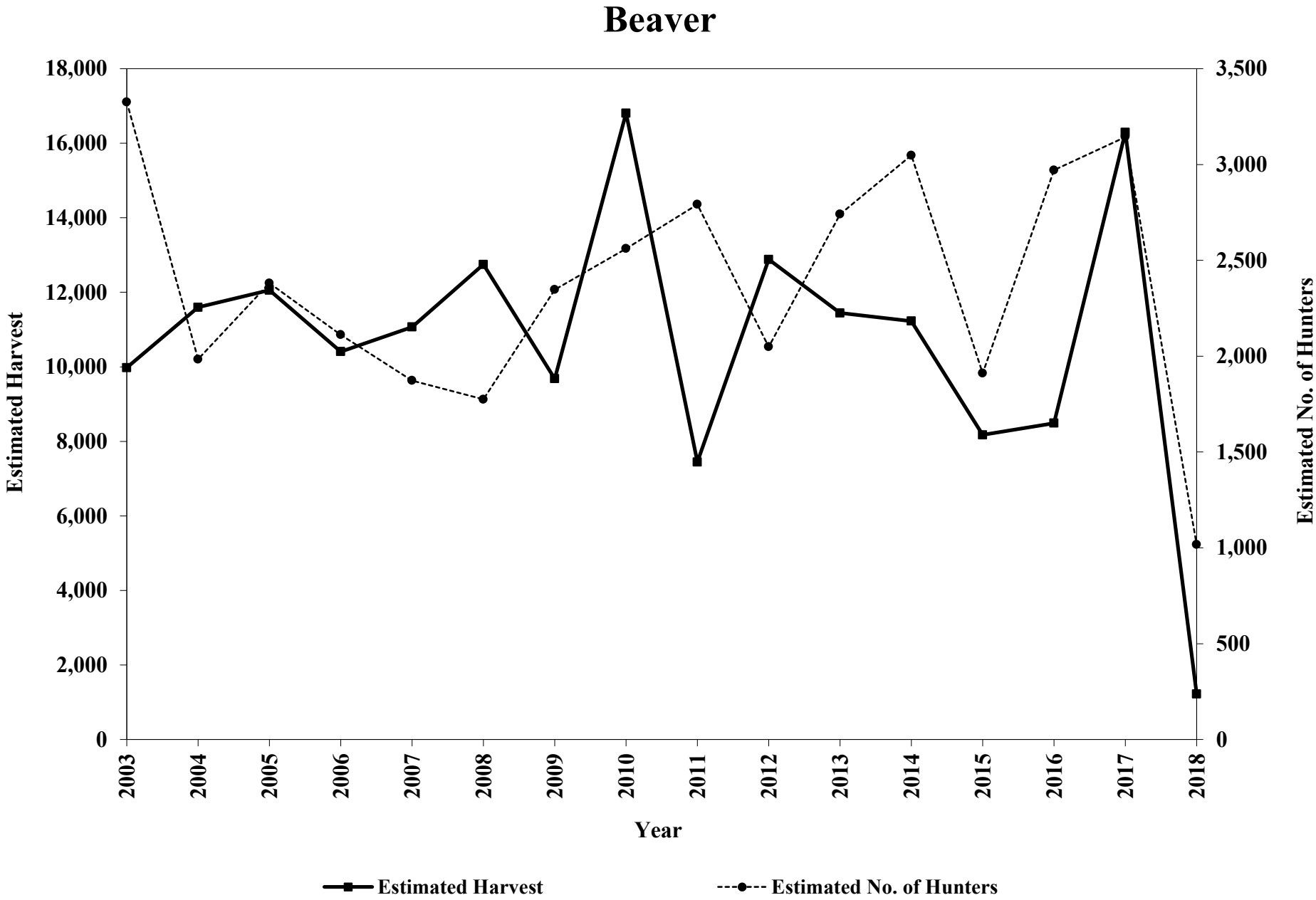


Figure A17. Statewide trends in estimated beaver harvest and estimated number of beaver hunters in Oklahoma, 2003-2018.

Figure A18. Statewide trends in estimated gray fox harvest and estimated number of gray fox hunters in Oklahoma, 2003-2018.

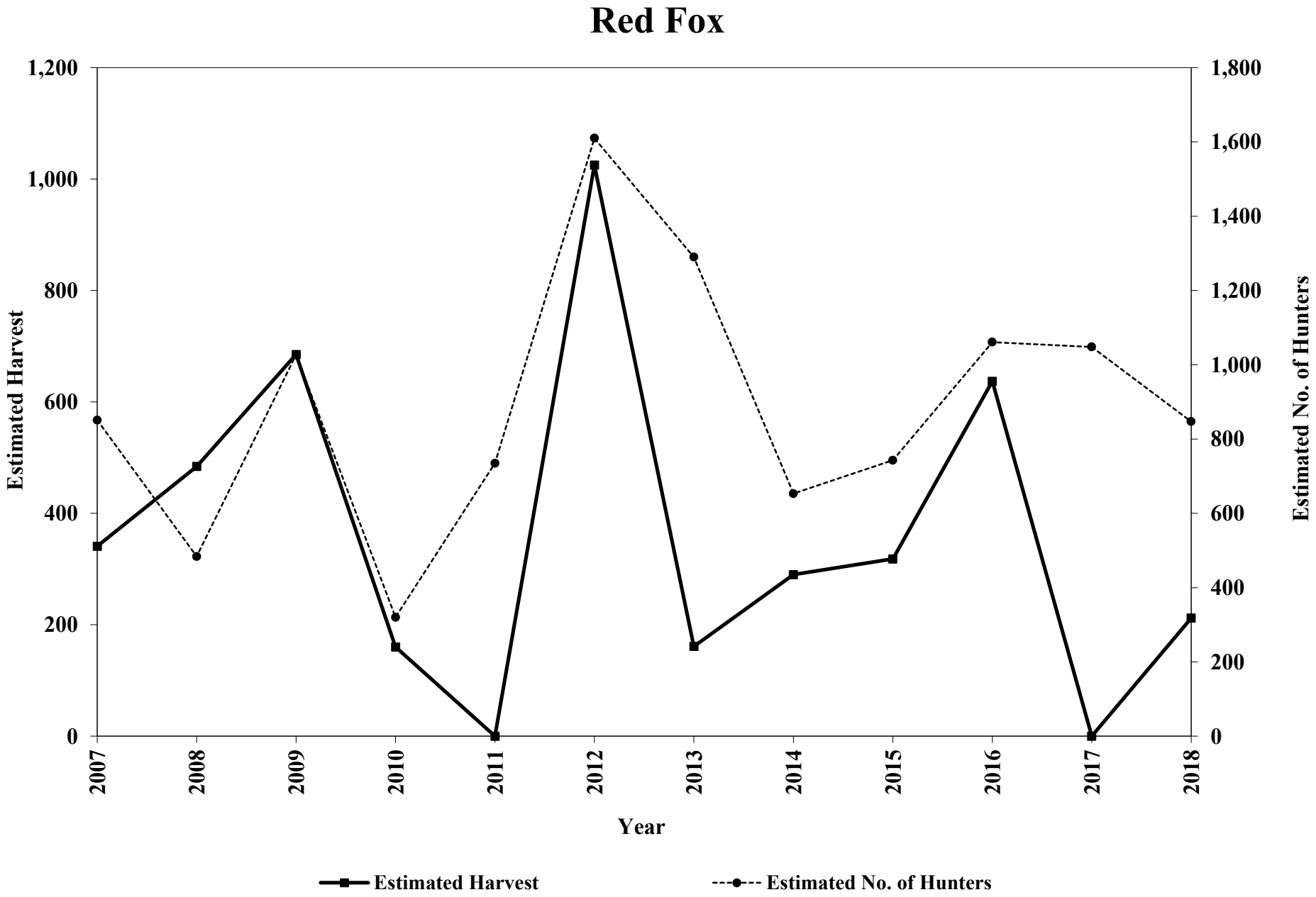


Figure A19. Statewide trends in estimated red fox harvest and estimated number of red fox hunters in Oklahoma, 2007-2018.

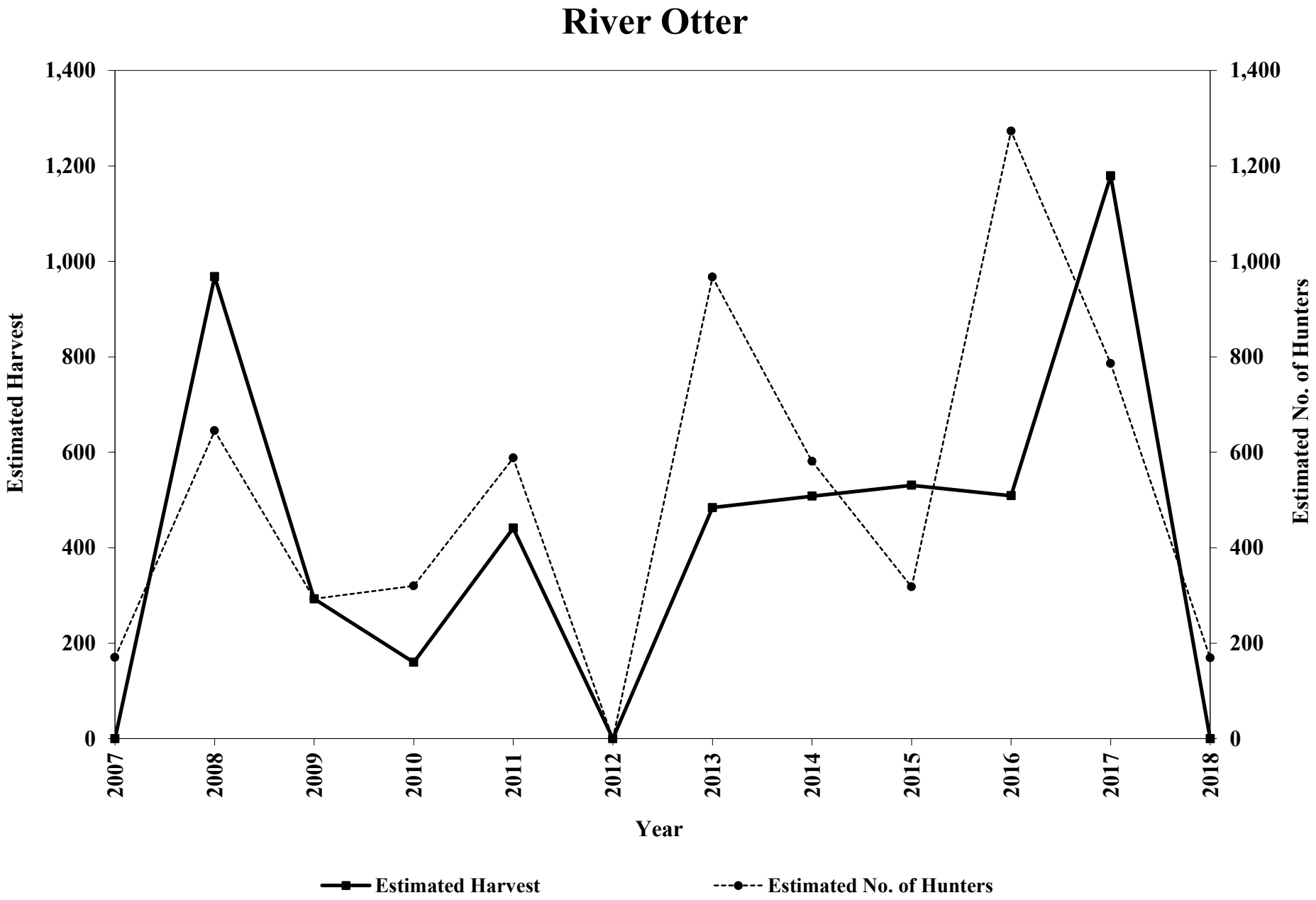


Figure A20. Statewide trends in estimated river otter harvest and estimated number of river otter hunters in Oklahoma, 2007-2018.

APPENDIX B

Human Dimensions Issues – Tables and Graphs

Table B1. Rate of participation in specific 2018 hunting seasons by all license holders, and by license type. (*Small sample size.)

Hunting Season	Total Sample Participation (n = 2,114)		Participation by License Type: Lifetime (n = 947)		Annual/Five-Year (n = 492)		Senior (n = 675)	
	Season *n*	Percent	Season *n*	Percent	Season *n*	Percent	Season *n*	Percent
Any Hunting	1,265	59.8	714	75.4	410	83.3	141	20.9
Deer (Overall)	1,086	51.4	637	67.3	344	69.9	105	15.6
Gun	939	44.4	565	59.7	278	56.5	96	14.2
Primitive Firearms	464	21.9	348	36.7	84	17.1	32	4.7
Archery	608	28.8	395	41.7	181	36.8	32	4.7
Special Antlerless	203	9.6	120	12.7	59	12.0	24	3.6
Youth Season	59	2.8	42	4.4	13	2.6	0	0.0
Turkey (Overall)	333	15.8	245	25.9	56	11.4	30	4.4
Spring Turkey	291	13.8	224	23.7	41	8.3	26	3.9
Fall Turkey	104	4.9	72	7.6	22	4.5	10	1.5
Dove	308	14.6	202	21.3	82	16.7	24	3.6
Feral Swine	328	15.5	225	23.8	77	15.7	26	3.9
Ducks	203	9.6	121	12.8	74	15.0	8	1.2
Geese	123	5.8	76	8.0	39	7.9	8	1.2
Squirrel (Overall)	213	10.1	124	13.1	49	10.0	40	5.9
Fox Squirrel	174	8.2	110	11.6	35	7.1	29	4.3
Gray Squirrel	151	7.1	88	9.3	36	7.3	27	4.0
Quail	125	5.9	74	7.8	29	5.9	22	3.3
Furbearers (Overall)	135	6.4	86	9.1	29	5.9	20	3.0
Coyote	108	5.1	75	7.9	21	4.3	12	1.8
Raccoon	41	1.9	25	2.6	8	1.6	8	1.2
Bobcat	34	1.6	26	2.7	6	1.2	2	0.3
Beaver*	6	0.3	4	0.4	2	0.4	0	0.0
Gray Fox*	4	0.2	4	0.4	0	0.0	0	0.0
Red Fox*	5	0.2	3	0.3	1	0.2	1	0.1
Otter*	1	0.0	1	0.1	0	0.0	0	0.0
Rabbit (Overall)	82	3.9	41	4.3	23	4.7	18	2.7
Cottontail Rabbit	80	3.8	40	4.2	22	4.5	18	2.7
Swamp Rabbit*	10	0.5	6	0.6	3	0.6	1	0.1
Jackrabbit*	7	0.3	3	0.3	2	0.4	2	0.3
Pheasant	61	2.9	38	4.0	16	3.3	7	1.0
Crow	39	1.8	26	2.7	8	1.6	5	0.7
Woodcock*	3	0.1	0	0.0	3	0.6	0	0.0

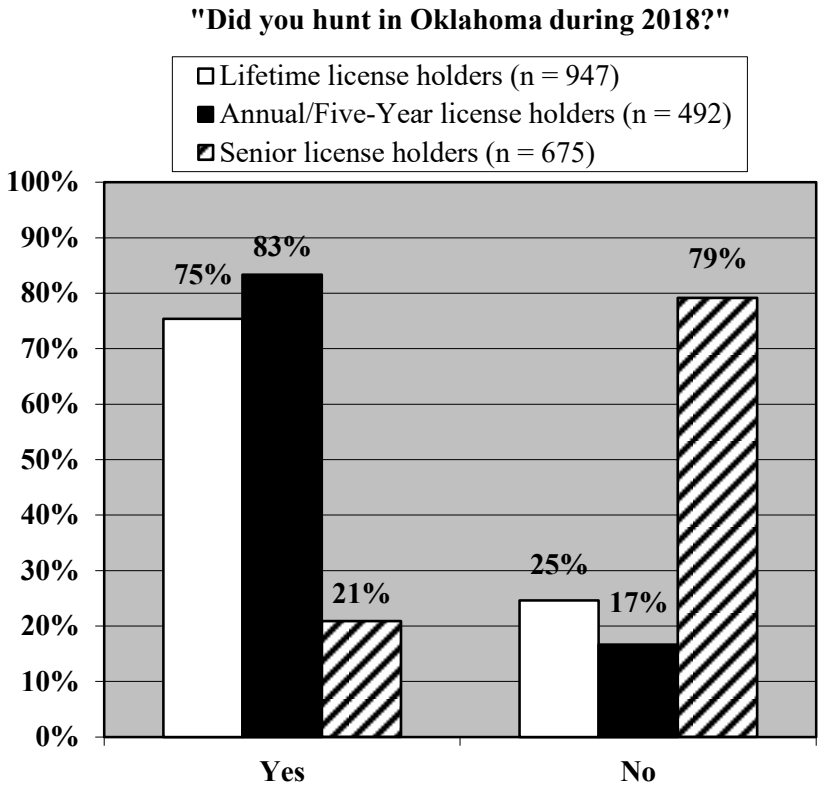


Figure B1. Distribution of hunting license holder participation in hunting activities during 2018, by license category. Both hunting and combination-hunting-and-fishing licenses were included in all license categories (*n* = 2,114).

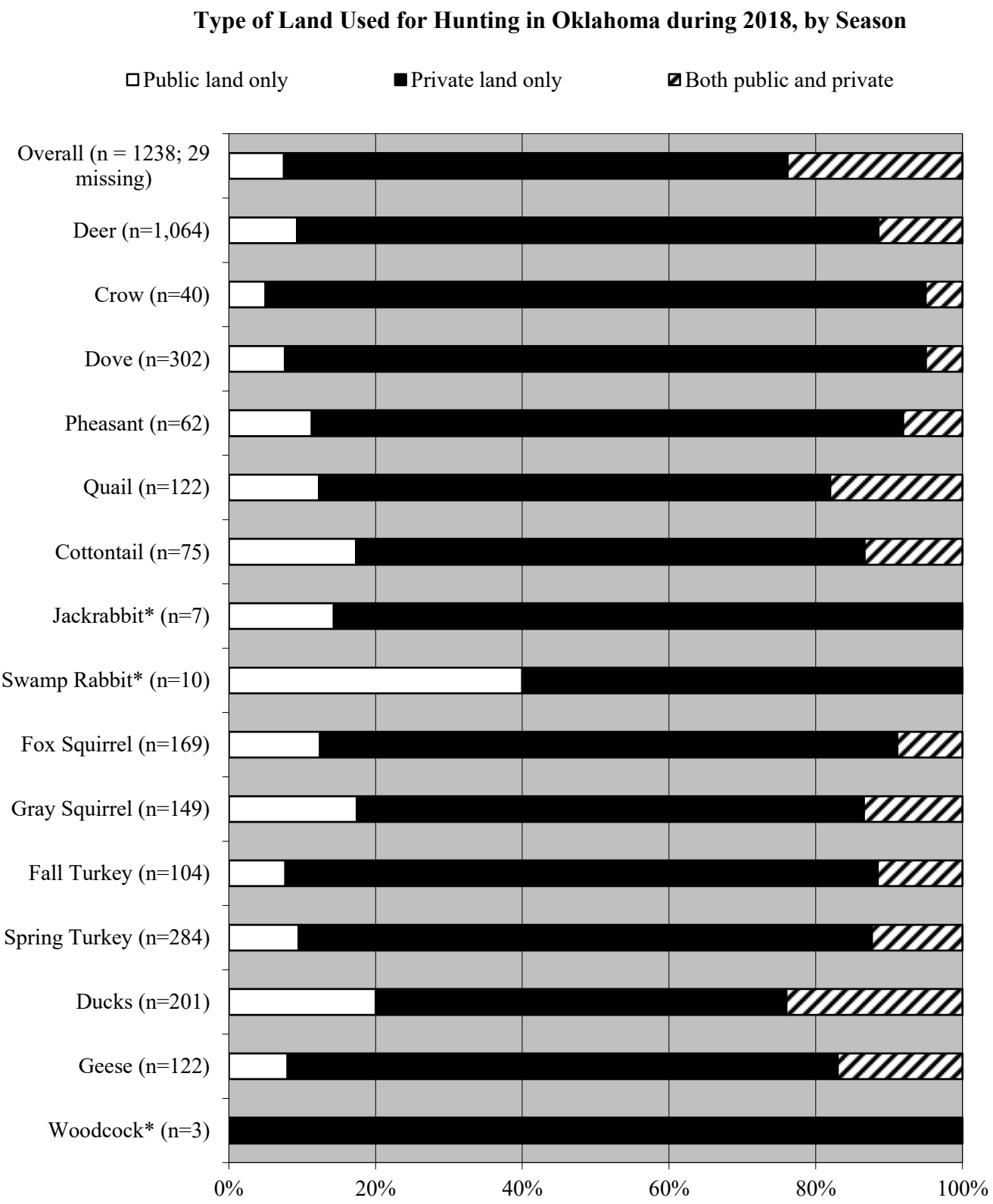


Figure B2. Distribution of land use for specific hunting seasons during 2018. Sample sizes and missing data vary for each species. *Small sample size.

"Did you use public land for any portion of your hunting in Oklahoma during 2018?"

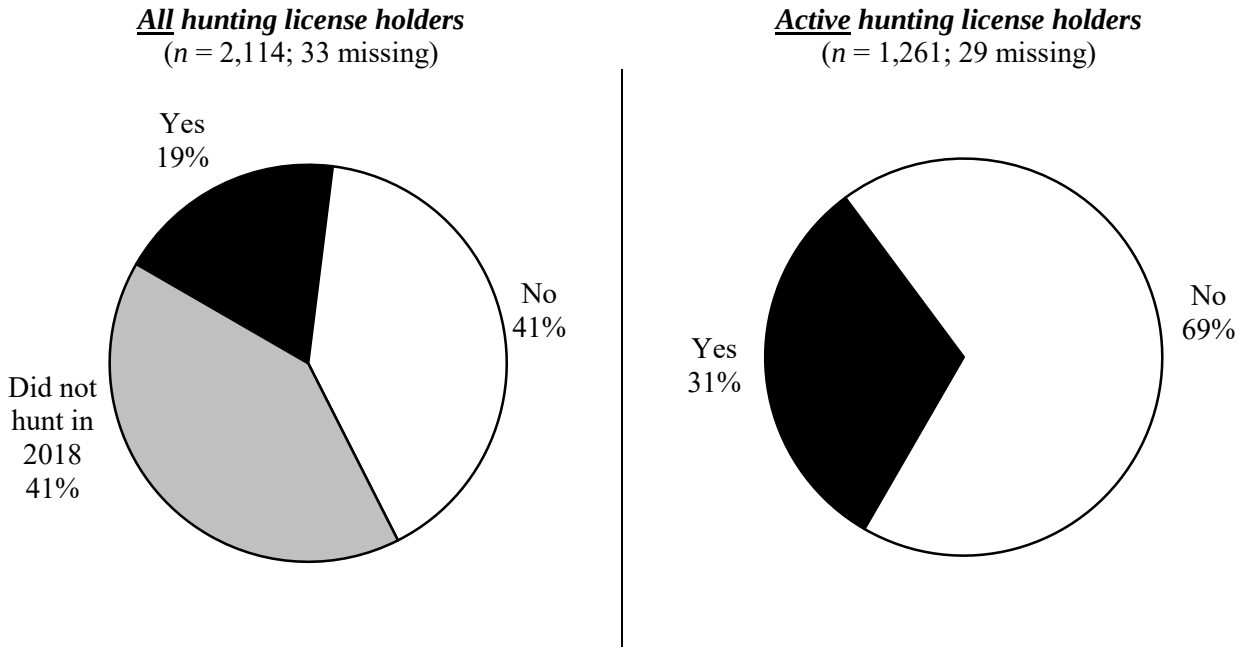


Figure B3. Distribution of hunting license holder use of public land during the 2018 hunting season.

"Considering all Oklahoma hunting seasons in 2018, how much of your hunting occurred on public vs. private land?"

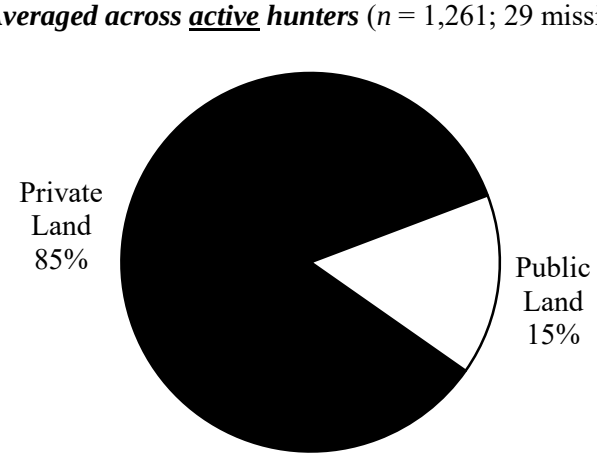


Figure B4. Average proportion of 2018-season hunting that occurred on public or private land, by license holders who hunted during 2018.

"Please check the box for each part of Oklahoma where you hunted on public land during 2018, based on the major highways:"

Active hunters 2018 (*n* = 1,265)

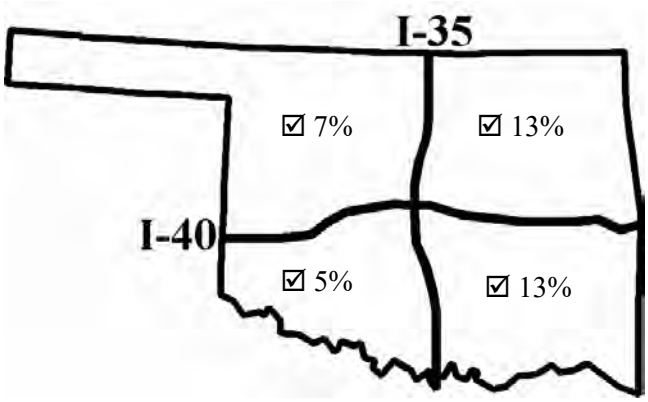


Figure B6. Use of public land located in each region, by active hunting license holders in 2018.

[Asked of hunters who used public land:]

"Overall, how would you rate your satisfaction with the public land you hunted on?"

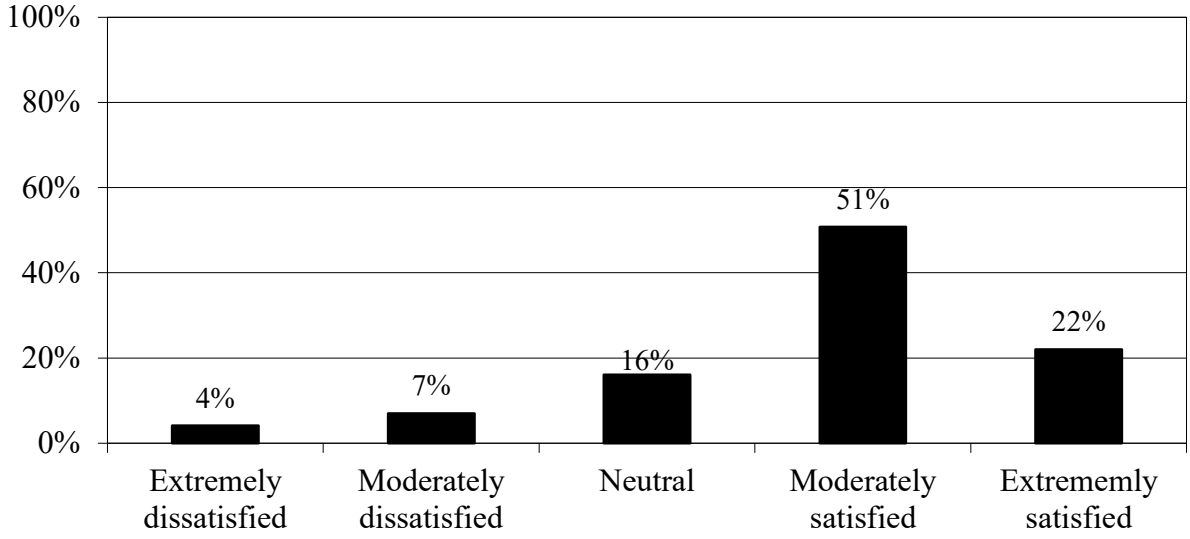


Figure B7. Satisfaction with public land hunting, by 2018 public land hunters (*n* = 386, missing 2)

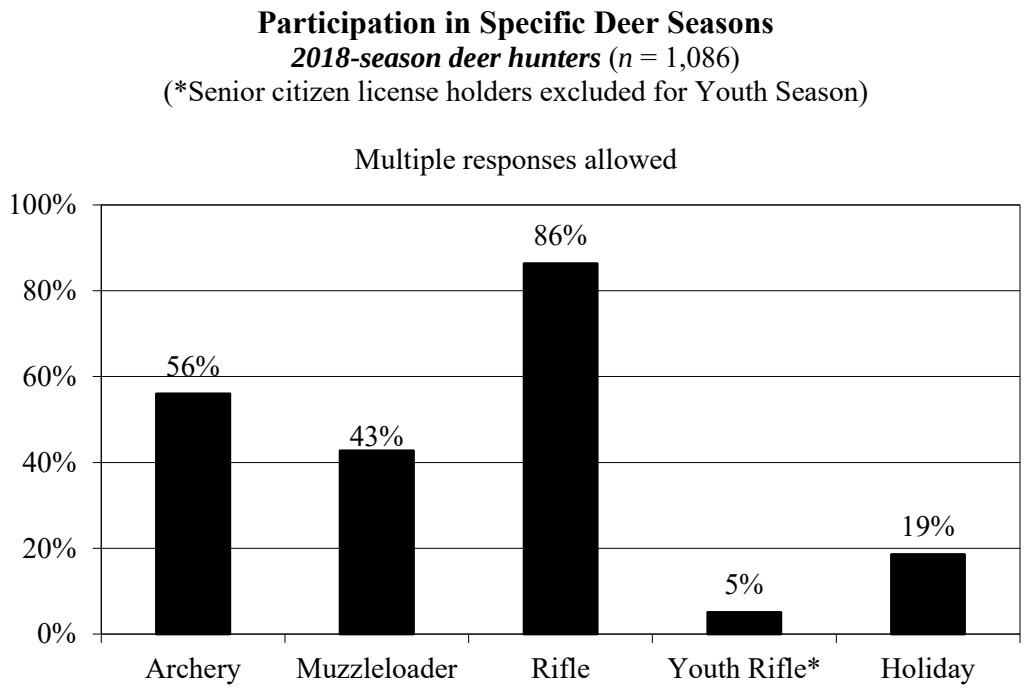


Figure B8. Participation in individual deer seasons, by 2018-season deer hunters.

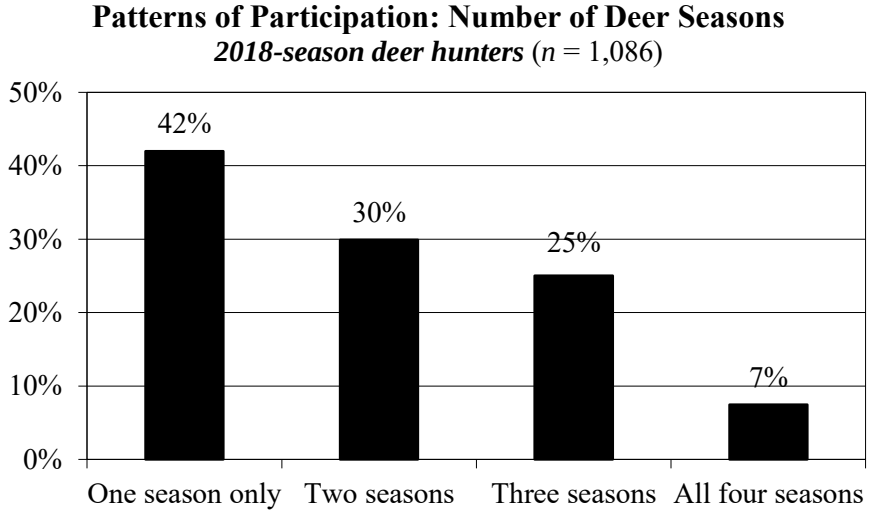


Figure B9. Number of deer seasons (archery, primitive, gun and holiday season; youth season excluded) participated in by 2018-season deer hunters.

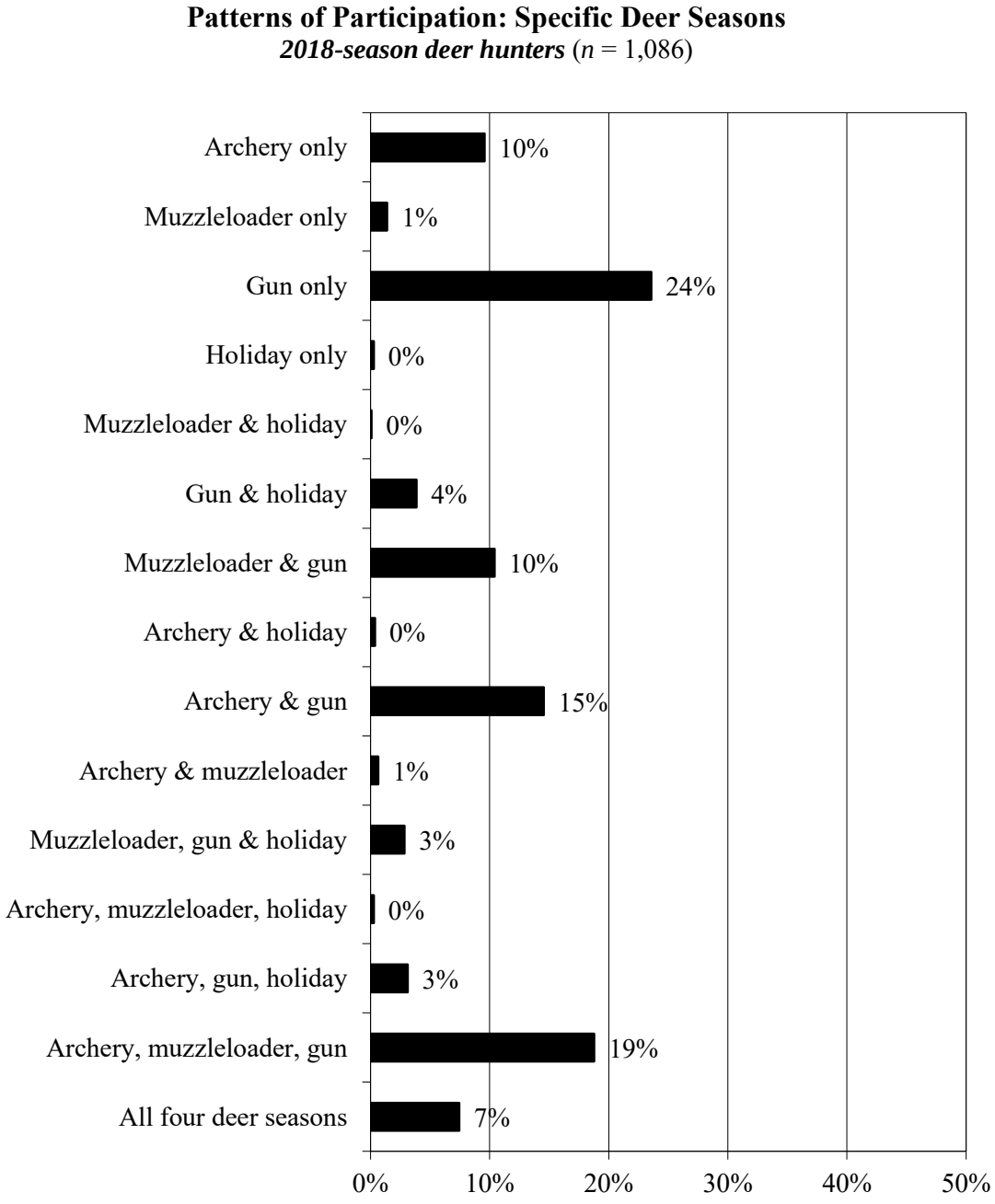


Figure B10. Specific deer seasons (archery, primitive, gun and holiday antlerless season; youth season excluded) participated in by 2018-season deer hunters.

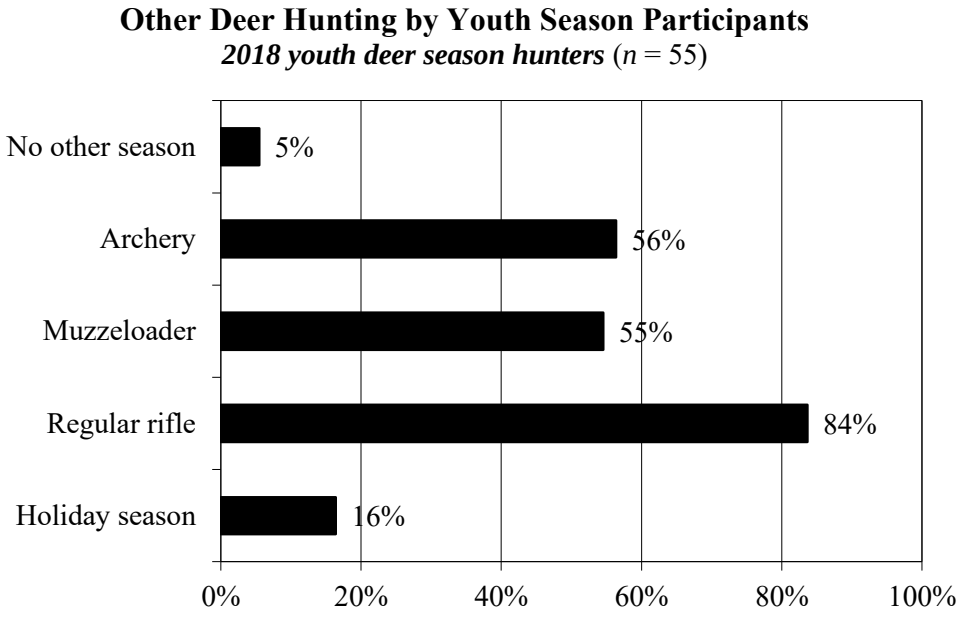


Figure B11. Participation in other deer seasons by 2018 youth deer season hunters.

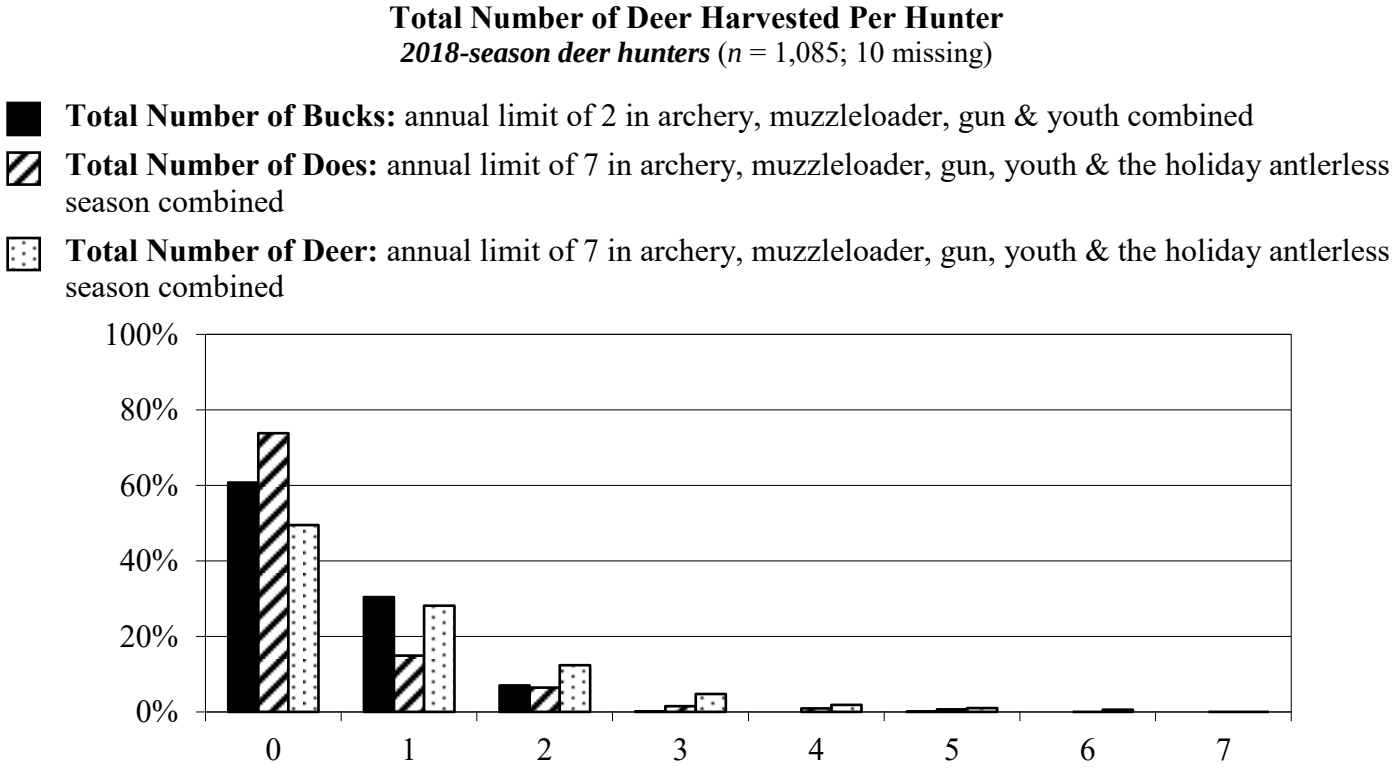


Figure B12. Total number of deer harvested per hunter across all 2018 seasons: archery, muzzleloader, gun, youth, and the holiday antlerless season.

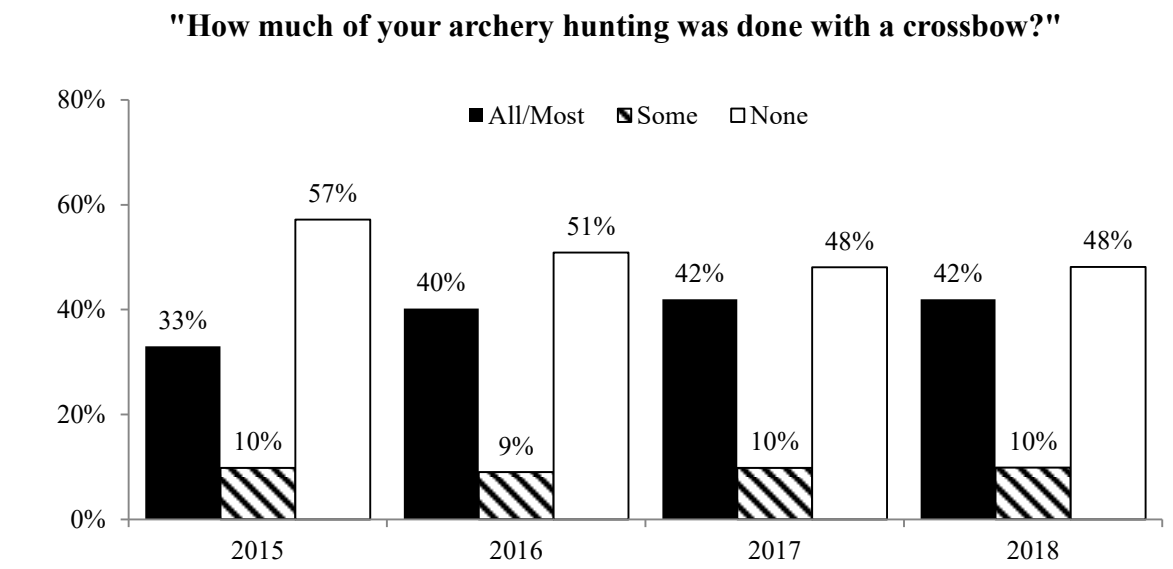


Figure B13. Crossbow use by 2015 archery deer hunters (*n* = 780); 2016 (*n* = 470); 2017 (*n* = 376); 2018 (*n* = 600).

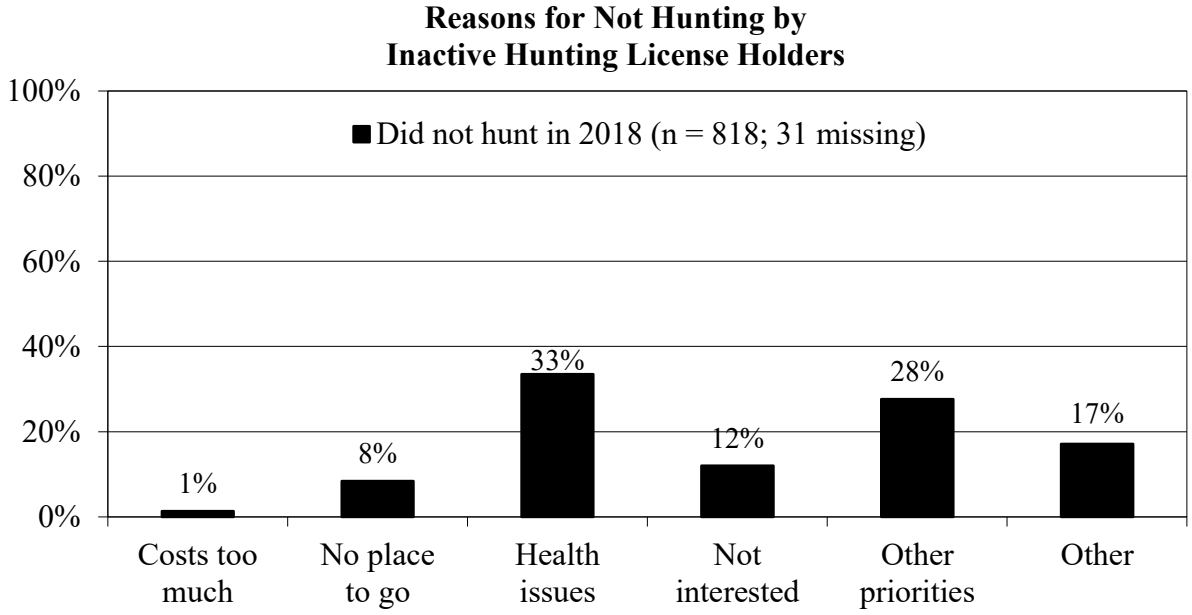


Figure B14. Barriers to hunting participation, by hunting license holders who were inactive in 2018.

[Asked of all license holders surveyed:]
"Please indicate your agreement to the following statement: I am very familiar with the effects of CWD on wildlife."

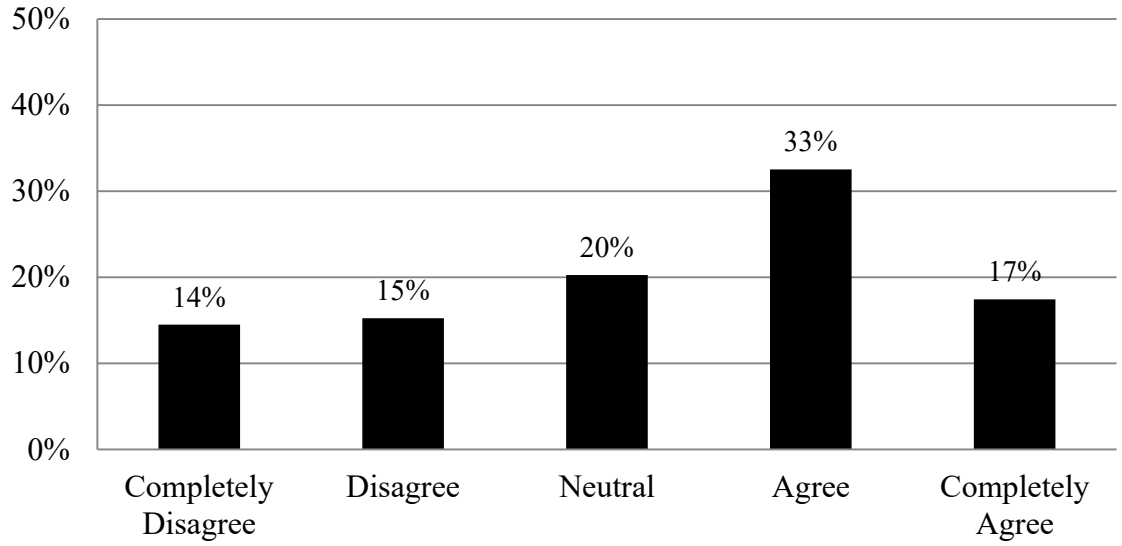


Figure B15. Familiarity with the effects of CWD on wildlife, by 2018 hunting license holders (n=1,994)

[Asked of all license holders surveyed:]
"Please indicate your agreement to the following statement: I am concerned about the impacts of CWD in Oklahoma."

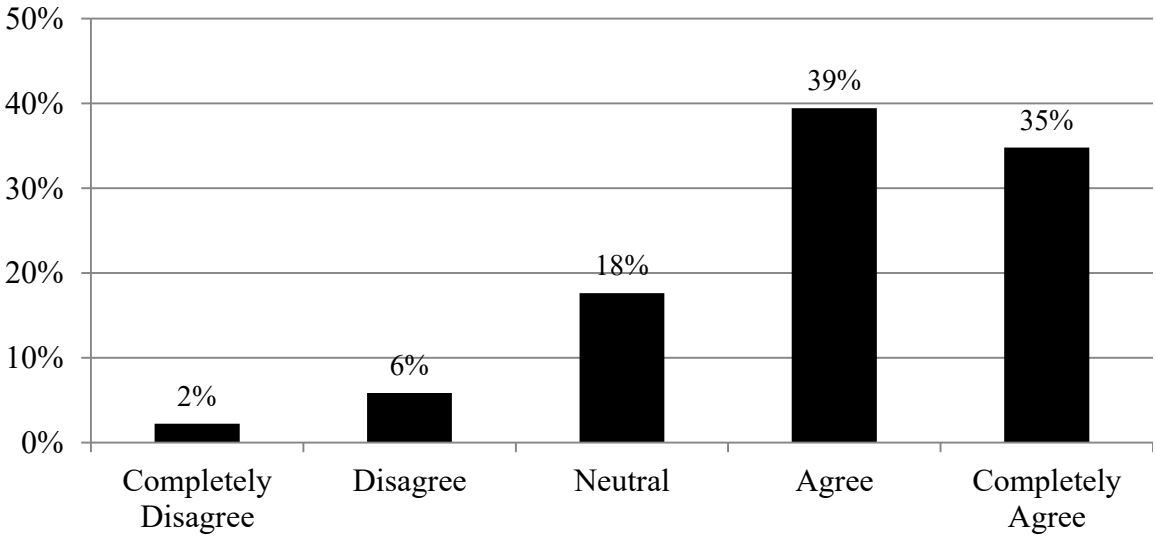


Figure B16. Level of concern of the impacts of CWD in Oklahoma, by 2018 hunting license holders (n=2,002)

[Asked of all license holders surveyed:]

"Please indicate your agreement to the following statement: I trust the Wildlife Dept to make informed decisions concerning CWD."

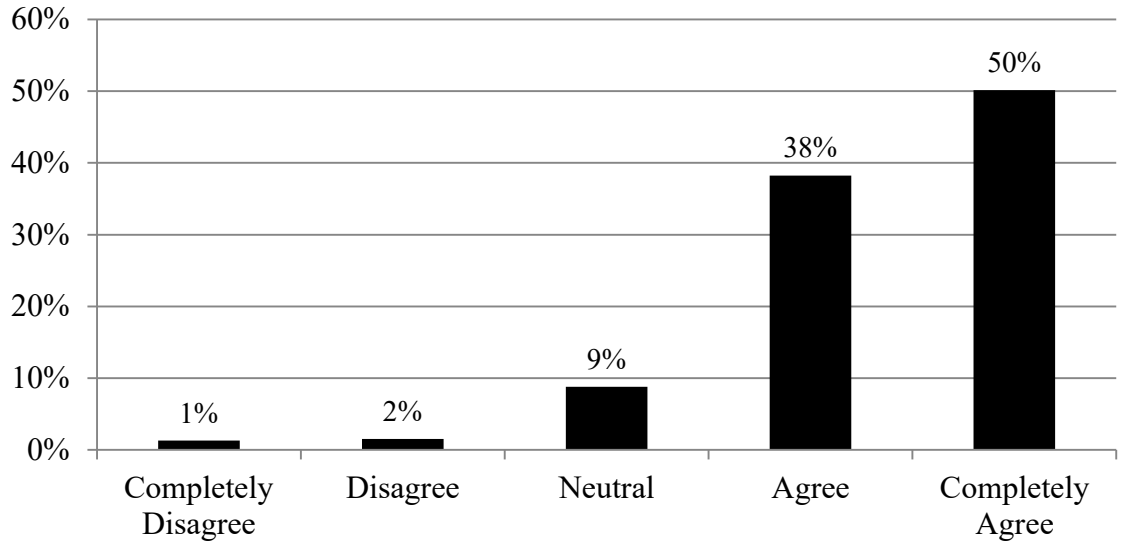


Figure B17. Trust in the Wildlife Dept to make informed decisions concerning CWD, by 2018 hunting license holders (n=2,014)

[Asked of respondents that stated they would be interested in learning more about CWD from the Wildlife Department:]

"What is your preferred method for receiving information on CWD? Check all that apply."

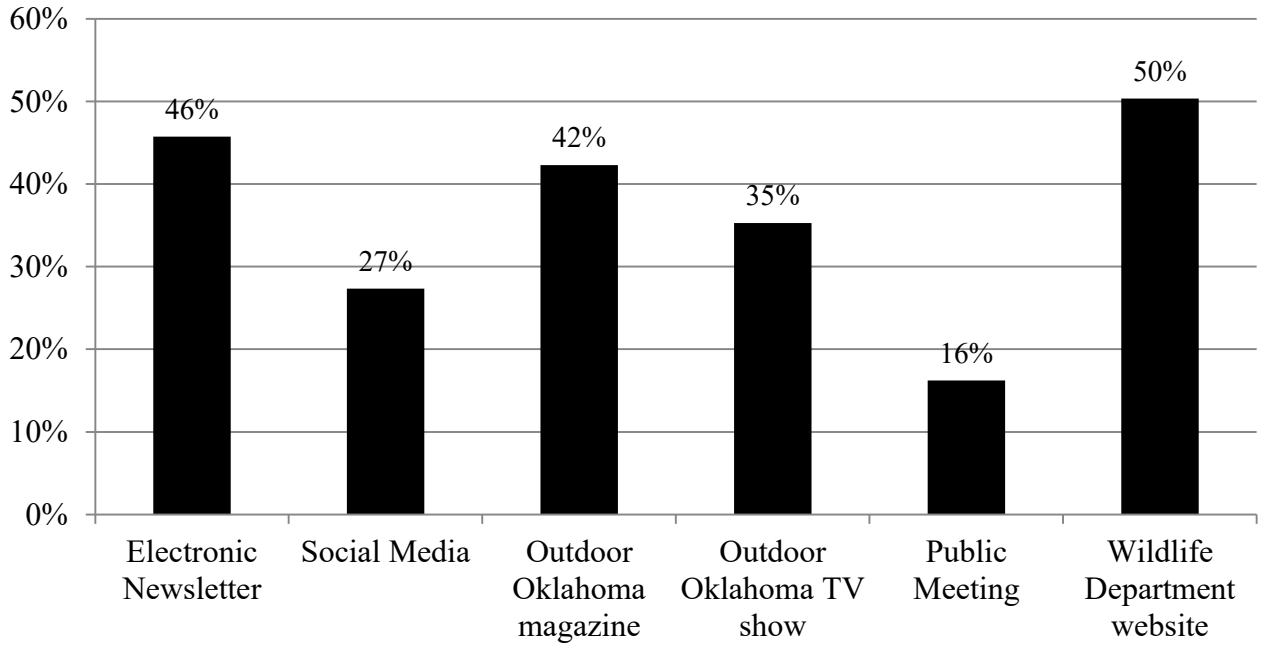


Figure B18. Preferred method for receiving information about CWD, by 2018 hunting license holders (n=1,281)

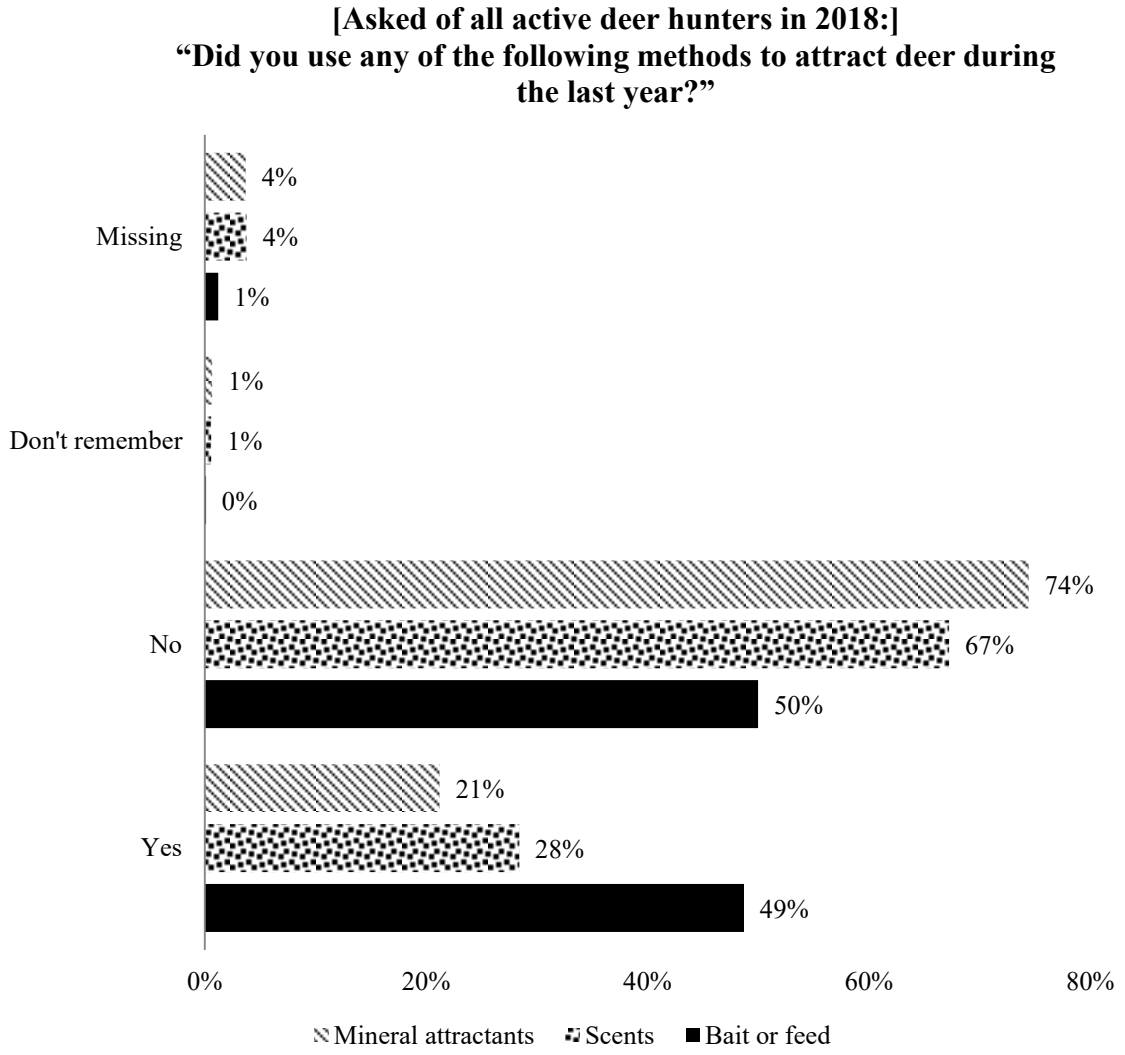


Figure B19. Percent of active deer hunters that used methods to attract deer during 2018 (n=1,084)

Who is responsible for recruiting the next generation of hunters and anglers in Oklahoma?"

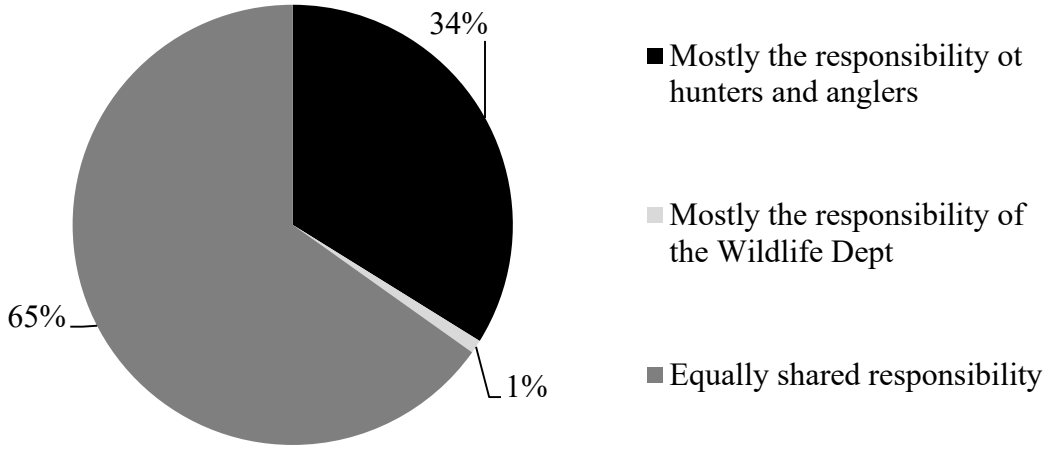


Figure B20. Responsible party for recruiting the next generation (n=2,021)

"Please indicate to the extent you agree or disagree with the following:…"

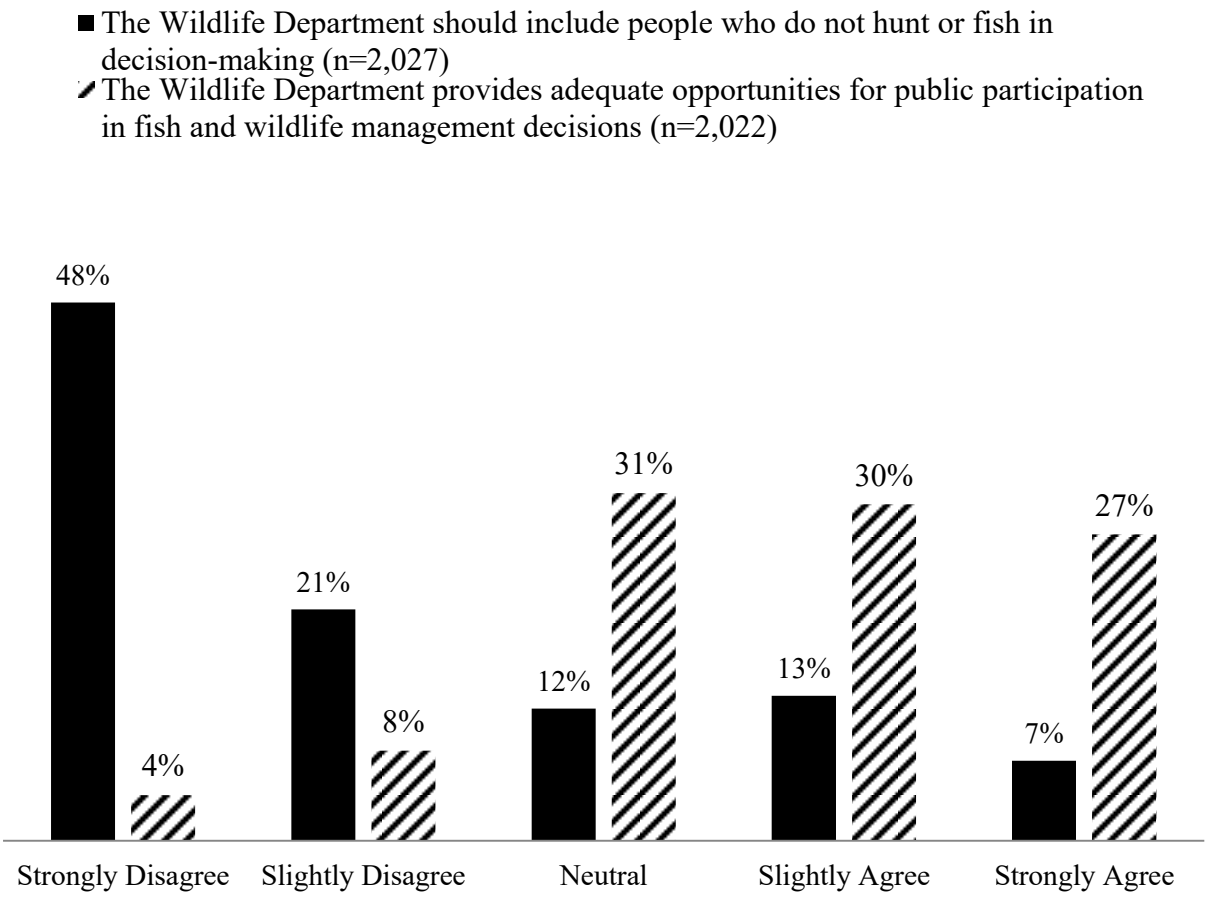


Figure B21. Wildlife Department inclusion in management activities.

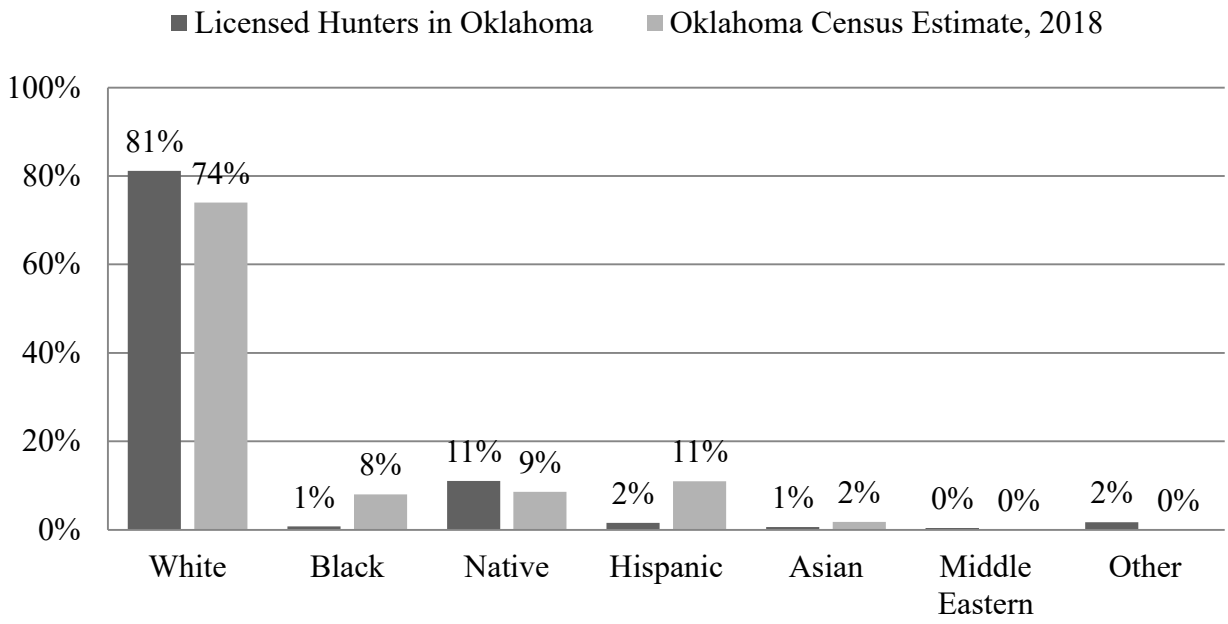


Figure B22. Demographic makeup of licensed hunters in Oklahoma compared to state census estimates (n= 2,055)

APPENDIX C
Invitation Letter and Survey Instrument

DEPARTMENT OF WILDLIFE CONSERVATION
P.O. Box 53465 Oklahoma City, OK 73152 PH. (405) 521-3851

Dear Oklahoma Hunter,

Do you have ideas or concerns regarding how we manage wildlife in Oklahoma? Now is your chance to have a voice. We at the Oklahoma Department of Wildlife Conservation recognize how important hunters and anglers are to conservation of the natural resources that make our state great. As a licensed hunter, you have been randomly selected to take part in an exclusive, statewide survey administered by ODWC. The goal of this survey is to gather hunter input on management actions and issues, as well as understand game harvest rates in the state. This information will help us immensely in our mission to provide better hunting, fishing and outdoor opportunities.

In the next few weeks, you will receive a survey in the mail. Because your views are important to us, I hope that you fill it out at your earliest convenience and mail it back to ODWC in the pre-paid envelope that will be provided. The more hunters that fill out the survey, the better feedback we will receive to direct the future of wildlife management in Oklahoma. As a token of our appreciation, every 20th hunter to complete this survey will be given a recently updated Wildlife Management Area atlas.

Your responses are voluntary and will be kept confidential. If you have any questions about this survey, please contact the ODWC Human Dimensions Specialist, Betsey York, by telephone (405) 401-7532 or by email at betsey.york@odwc.ok.gov. The survey should take no more than fifteen minutes and will greatly help the Department. Thank you for all you do to support wildlife conservation in Oklahoma, and keep your eye out for that survey within the new few weeks!

Gratefully,

J. D. Strong
Director

2018-Season Game Harvest Survey

Please help the Wildlife Department by participating in this study, **even if you did not hunt last year!**

Congratulations, you are one of a few hunting license holders that The Oklahoma Department of Wildlife Conservation (ODWC) has selected for a very important survey. We are interested in learning about the seasons you hunted in 2018 (if any) and the game you harvested. We need your help with this survey even if you didn't hunt. Your answers will help us improve wildlife conservation in Oklahoma.

As a token of our appreciation, every 20th hunter to return their completed survey will receive a recently updated Wildlife Management Area atlas. The survey should take no more than 15 minutes of your time.

If you have any questions or would like a report of this study's findings, please call Betsey York at (405) 521-4605. Your help in this project is greatly appreciated, and we look forward to learning about your 2018 hunting experiences!

Sincerely,

Betsey York
Human Dimensions Specialist

1. Did you hunt in Oklahoma during 2018?

☐ Yes → If yes, please continue with survey on the next page →

☐ No → 1a. What was the main reason you did not hunt last year?

☐ Costs too much ☐ No place to go ☐ Health issues
☐ Not interested ☐ Other priorities ☐ Other

If you did not hunt in 2018, please skip to page 12.

Public Land

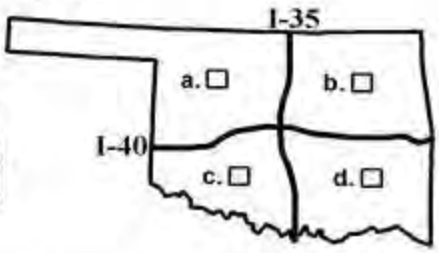
2. Did you use public land for any portion of your hunting in Oklahoma during 2018?
   (Public land might include wildlife management areas, wildlife refuges, U.S. Army Corps of Engineers land, state parks, city-owned land, etc. NOT privately owned land.)
   - ☐ No → If no, go to question 6.
   - ☐ Yes

3. Considering all Oklahoma hunting seasons in 2018, how much of your hunting occurred on public vs. private land?

_____	% Public land
_____	% Private land
Total should equal:	100%

4. Please check (☑) the box for each part of Oklahoma where you hunted on public land during 2018, based on the major highways:

Example:



5. Overall, how would you rate your satisfaction with the public land you hunted on in 2018?

Very unsatisfied	Unsatisfied	Neutral	Satisfied	Very satisfied
☐	☐	☐	☐	☐

Hunting in Oklahoma During 2018

Please complete the box for each season <u>you</u> hunted in Oklahoma during 2018 (not others in your household or hunting party). If you are unsure about exact numbers, please estimate.

6. Quail

a. Did you hunt **quail** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt quail? _____

c. How many quail did you harvest? _____ Scaled quail
_____ Bobwhite
_____ Unsure of species
☐ None

d. County you hunted quail most often? _____
(If unsure, what town is closest?)

e. Land used for quail hunting? ☐ Public ☐ Private ☐ Both

If you hunted quail on <u>public</u> land at all during 2018:

f. How many days did you hunt quail on public land? ____

g. How many quail did you harvest on public land? ____

7. Pheasant

a. Did you hunt **pheasant** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt pheasant? _____

c. How many pheasant did you harvest? _____ ☐ None

d. County you hunted pheasant most often? _____
(If unsure, what town is closest?)

e. Land used for pheasant hunting? ☐ Public ☐ Private ☐ Both

If you hunted pheasant on <u>public</u> land at all during 2018:

f. How many days did you hunt pheasant on public land? _____

g. How many pheasant did you harvest on public land? _____

8. Dove

a. Did you hunt **dove** in Oklahoma during 2018? ☐ Yes ☐ No
(if not, skip to next box.)
b. How many days did you hunt dove? _____
c. How many dove did you harvest? _____ ☐ None
d. County you hunted dove most often? _____
(if unsure, what town is closest?)
e. Land used for dove hunting? ☐ Public ☐ Private ☐ Both

If you hunted dove on <u>public</u> land at all during 2018:
f. How many days did you hunt dove on public land? _____
g. How many dove did you harvest on public land? _____

9. Woodcock

a. Did you hunt **woodcocks** in Oklahoma during 2018? ☐ Yes ☐ No
(if not, skip to next box.)
b. How many days did you hunt woodcocks? _____
c. How many woodcocks did you harvest? _____ ☐ None
d. County you hunted woodcocks most often? _____
(if unsure, what town is closest?)
e. Land used for woodcock hunting? ☐ Public ☐ Private ☐ Both

If you hunted woodcocks on <u>public</u> land at all during 2018:
f. How many days did you hunt woodcocks on public land? _____
g. How many woodcocks did you harvest on public land? _____

10. Spring Turkey

a. Did you hunt the **spring turkey season** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt spring turkey? _____

c. How many spring turkey did you harvest? _____ ☐ None

d. County you hunted spring turkey most often? _____
(If unsure, what town is closest?)

e. Land used for spring turkey hunting? ☐ Public ☐ Private ☐ Both

If you hunted turkey on <u>public</u> land at all during spring 2018:

f. How many days did you hunt spring turkey on public land? _____

g. How many spring turkeys did you harvest on public land? _____

11. Fall Turkey

a. Did you hunt the **fall turkey season** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt fall turkey? _____

c. What did you harvest? ☐ Hen ☐ Tom ☐ No fall turkey harvested

d. County you hunted fall turkey most often? _____
(If unsure, what town is closest?)

e. Land used for fall turkey hunting? ☐ Public ☐ Private ☐ Both

If you hunted turkey on <u>public</u> land at all during fall 2018:

f. How many days did you hunt fall turkey on public land? _____

g. How many fall turkeys did you harvest on public land? _____

12. Gray Squirrel

a. Did you hunt **gray squirrels** in Oklahoma during 2018? ☐ Yes ☐ No
(if not, skip to next box.)
b. How many days did you hunt gray squirrels? _____
c. How many gray squirrels did you harvest? _____ ☐ None
d. County you hunted gray squirrels most often? _____
(if unsure, what town is closest?)
e. Land used for gray squirrel hunting? ☐ Public ☐ Private ☐ Both

If you hunted gray squirrels on <u>public</u> land at all during 2018:
f. How many days did you hunt gray squirrels on public land? _____
g. How many gray squirrels did you harvest on public land? _____

13. Fox Squirrel

a. Did you hunt **fox squirrels** in Oklahoma during 2018? ☐ Yes ☐ No
(if not, skip to next box.)
b. How many days did you hunt fox squirrels? _____
c. How many fox squirrels did you harvest? _____ ☐ None
d. County you hunted fox squirrels most often? _____
(if unsure, what town is closest?)
e. Land used for fox squirrel hunting? ☐ Public ☐ Private ☐ Both

If you hunted fox squirrels on <u>public</u> land at all during 2018:
f. How many days did you hunt fox squirrels on public land? _____
g. How many fox squirrels did you harvest on public land? _____

14. Cottontail Rabbit

a. Did you hunt **cottontail rabbits** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt cottontail rabbits? _____

c. How many cottontail rabbits did you harvest? _____ ☐ None

d. County you hunted cottontail rabbits most often? _____
(If unsure, what town is closest?)

e. Land used for cottontail rabbit hunting? Public ☐ Private ☐ Both

If you hunted cottontail rabbits on <u>public</u> land at all during 2018:

f. How many days did you hunt cottontail rabbits on public land? _____

g. How many cottontail rabbits did you harvest on public land? _____

15. Jackrabbit

a. Did you hunt **jackrabbits** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt jackrabbits? _____

c. How many jackrabbits did you harvest? _____ ☐ None

d. County you hunted jackrabbits most often? _____
(If unsure, what town is closest?)

e. Land used for jackrabbit hunting? ☐ Public ☐ Private ☐ Both

If you hunted jackrabbits on <u>public</u> land at all during 2018:

f. How many days did you hunt jackrabbits on public land? _____

g. How many jackrabbits did you harvest on public land? _____

16. Swamp Rabbit

a. Did you hunt **swamp rabbits** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)
b. How many days did you hunt swamp rabbits? _____
c. How many swamp rabbits did you harvest? _____ ☐ None
d. County you hunted swamp rabbits most often? _____
(If unsure, what town is closest?)
e. Land used for swamp rabbit hunting? ☐ Public ☐ Private ☐ Both

If you hunted swamp rabbits on public land at all during 2018:
f. How many days did you hunt swamp rabbits on public land? _____
g. How many swamp rabbits did you harvest on public land? _____

17. Ducks

a. Did you hunt **ducks** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)
b. Land used for duck hunting? ☐ Public ☐ Private ☐ Both

If you hunted ducks on public land at all during 2018:
c. How many days did you hunt ducks on public land? _____
d. How many ducks did you harvest on public land? _____

18. Geese

a. Did you hunt **geese** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)
b. Land used for goose hunting? ☐ Public ☐ Private ☐ Both

If you hunted geese on public land at all during 2018:
c. How many days did you hunt geese on public land? _____
d. How many geese did you harvest on public land? _____

19. Crow

a. Did you hunt **crows** in Oklahoma during 2018? ☐ Yes ☐ No
(If not, skip to next box.)

b. How many days did you hunt crows? _____

c. How many crows did you harvest? _____ ☐ None

d. County you hunted crows most often? _____
(If unsure, what town is closest?)

e. Land used for crow hunting? ☐ Public ☐ Private ☐ Both

If you hunted crows on public land at all during 2018:

f. How many days did you hunt crows on public land? _____

g. How many crows did you harvest on public land? _____

20. Furbearers

a. Did you hunt or trap **furbearers** in Oklahoma during 2018?
☐ Yes ☐ No *(If not, skip to next box.)*

b. Which did you hunt or trap?		c. How many days?		d. How many did you harvest?
☐ Coyote	→	_____	→	_____
☐ Bobcat	→	_____	→	_____
☐ Raccoon	→	_____	→	_____
☐ Beaver	→	_____	→	_____
☐ Otter	→	_____	→	_____
☐ Gray fox	→	_____	→	_____
☐ Red fox	→	_____	→	_____

21. Feral Swine (feral hogs, feral pigs, etc.)

a. Did you hunt or trap free-ranging feral swine in Oklahoma during 2018? *(If not, skip to question 22.)* ☐ Yes ☐ No

b. Land used to hunt or trap feral swine? ☐ Public ☐ Private ☐ Both

Did you hunt, trap or do both? ☐ Hunt ☐ Trap
Check all that apply and fill in columns below.

c. How many days?	_____	_____
d. How many did you harvest?	_____	_____
e. County you hunted/trapped most often?	_____	_____

Deer Hunting in 2018

22. Deer

a. Did you hunt **deer** in Oklahoma during 2018?

☐ Yes ☐ No → *(If you did not hunt deer during 2018, please skip to question 31.)*

b. County you hunted deer most often? _____

(If unsure, what town is closest?)

c. Land used for deer hunting? ☐ Public ☐ Private ☐ Both

23. Deer: Archery Season

a. Did you hunt **deer** during **archery** season? (Oct. 1 - Jan. 15)
☐ Yes ☐ No *(If not, skip to next box.)*

b. How much of your archery hunting was done with a crossbow?
☐ All or most ☐ Some ☐ None

c. How many **days** did you hunt during archery? _____
d. Number of **bucks** harvested during archery? _____ ☐ None
e. Number of **does** harvested during archery? _____ ☐ None

24. Deer: Muzzleloader Season

a. Did you hunt **deer** during **muzzleloader** season? (Oct. 27 – Nov. 4)
☐ Yes ☐ No *(If not, skip to next box.)*

b. How many **days** did you hunt during muzzleloader? _____
c. Number of **bucks** harvested during muzzleloader? _____ ☐ None
d. Number of **does** harvested during muzzleloader? _____ ☐ None

25. Deer: Youth Gun Season

a. Did you participate in the **youth deer gun** season in October as a youth hunter? (Oct. 19 – 21) *(If not, skip to next box.)*
☐ Yes ☐ No

b. How many **days** did you hunt during youth season? _____
c. Number of **bucks** harvested during youth season? _____ ☐ None
d. Number of **does** harvest during youth season? _____ ☐ None

26. Deer: Regular Gun Season

a. Did you hunt **deer** during the **regular gun** season? (Nov. 17 – Dec. 2)
☐ Yes ☐ No *(If not, skip to next box.)*

b. How many **days** did you hunt during gun season? _____
c. Number of **bucks** harvested during gun season? _____ ☐ None
d. Number of **does** harvest during gun season? _____ ☐ None

27. Deer: Holiday Antlerless Gun Season

a. Did you hunt **deer** during the **holiday antlerless deer gun** season? (Dec. 21 - 30)
☐ Yes ☐ No

b. How many **days** did you hunt during holiday season? _____
c. Did you harvest your bonus doe? ☐ Yes ☐ No

Did you use any of the following methods to attract deer during the last year?

28. Bait or feed	Yes	No	Don't remember
29. Scents	Yes	No	Don't remember
30. Mineral attractants	Yes	No	Don't remember

Chronic Wasting Disease (CWD) is a wildlife disease found in surrounding states which affects elk and deer herds. *ODWC has been testing for CWD in deer and elk for twenty years with no positive detection in free-ranging herds.* The Wildlife Department is creating a response plan to CWD should it be detected in Oklahoma in the future. For more information please visit the Wildlife Department website (www.wildlifedepartment.com).

Please circle your response to each of the following statements:

		Completely Disagree	Disagree	Neutral	Agree	Completely Agree
31.	I am very familiar with the effects of CWD on wildlife.	1	2	3	4	5
32.	I am concerned about the impacts of CWD in Oklahoma.	1	2	3	4	5
33.	I trust the Wildlife Dept to make informed decisions concerning CWD.	1	2	3	4	5

34. Would you be interested in learning more about CWD from the Wildlife Department?

☐ Yes →
☐ No

34a. What is your preferred method for receiving information on Chronic Wasting Disease? **Check all that apply.**

☐ Electronic Newsletter
☐ Social Media
☐ Outdoor Oklahoma magazine
☐ Outdoor Oklahoma TV show
☐ Public Meeting
☐ Wildlife Department website

Please share your opinions

The Wildlife Department is in the process of outlining our goals and priorities for the next five years. We would like your input as part of this process.

35. Who is responsible for recruiting the next generation of hunters and anglers in Oklahoma? **Check only one**.

- ☐ Mostly the responsibility of hunters and anglers
- ☐ Mostly the responsibility of the Wildlife Department
- ☐ Equally shared responsibility between hunters, anglers, and the Wildlife Department

Please indicate to the extent you agree or disagree with the following statements.

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Strongly Agree
36. The Wildlife Department should include people who do not hunt or fish in decision-making.	1	2	3	4	5
37. The Wildlife Department provides adequate opportunities for public participation in fish and wildlife management decisions.	1	2	3	4	5

For the next two questions, please think broadly about the work that Wildlife Department accomplishes in Oklahoma. Please share your thoughts in the following boxes.

38. What is something that the Wildlife Department does well?

39. What is something that the Wildlife Department could do better?

40. How would you describe yourself? (Check all that apply)

- ☐ White
- ☐ Black or African-American
- ☐ Native American or American Indian
- ☐ Other: _____
- ☐ Hispanic or Latino
- ☐ Asian/Pacific Islander
- ☐ Middle Eastern/ North African

Thank you for your time in completing this survey. Upon returning this survey you will be entered in a drawing to receive a Wildlife Management Area atlas. If you would like to be notified via email of the drawing results, please indicate your preferred email address:

_____@_____