

ODS Output of Proc SurveyMeans for a Bobcat Hunter Survey

Rebecca Frederick & E. Barry Moser, Louisiana State University Agricultural Center
Greg Linscombe & Mike Olinde, Louisiana Department of Wildlife and Fisheries

Abstract

The Louisiana Department of Wildlife and Fisheries (LDWF) conducted a Bobcat, Fox, and Coyote Hunter Survey of randomly selected Louisiana resident hunters licensed to hunt big game during the 2003-04 deer season. LDWF wanted harvest and attitude information concerning a new bobcat season which ran concurrent with the 2003-04 deer season. There is little information on the numbers of bobcats within the state of Louisiana, and so, harvest data will be used to best manage the season and monitor trends through time. Questions pertaining to whether shots were fired at a bobcat, whether bobcat were hit and whether bobcat retrieval efforts were successful were included in the questionnaire. If a bobcat was bagged, the hunter was asked whether another bobcat would be taken during the 2004-05 season, if the opportunity arose. Additional questions pertaining to coyote and fox were also included in the survey instrument but will not be discussed. The bobcat data were analyzed by PROC SURVEYMEANS with PDF output in an ODS statement. Proper graphical display of the weightings from PROC SURVEYMEANS made this investigation quite intriguing.

Introduction

The Louisiana Department of Wildlife and Fisheries (LDWF) conducted a Bobcat, Fox, and Coyote Hunter Survey of randomly selected Louisiana resident hunters licensed to hunt big game during the 2003-04 deer season. LDWF wanted harvest and attitude information concerning a new bobcat season which ran concurrent with the 2003-04 deer season. Based upon precision requirements, cost constraints, and the Department of Experimental Statistics (DES) estimated that a target sample size of 10,000 licensed deer was needed. To achieve this sample size, 1 random 6 % sample of licensed deer hunters stratified by parish was required. Actual 1st mailing size was 10,378. Second and third mailings were sent to non-respondents. In all, the LDWF received 2,217 surveys from the 1st mailing, 992 surveys from the 2nd mailing, and 1316 surveys from the 3rd mailing, making 4,525 surveys returned in total, for a 43.60% total return rate. Data was entered into in a Microsoft Access database and then processed primarily with PROC SURVEYMEANS (SAS System[®]) to provide harvest estimates. Though the sample was stratified by Parish (or County), the DES decided to use a proportional allocation by Parish and so the sample was treated as a simple random sample. The survey instrument (questionnaire) is included in the appendix.

Response Bias Analysis

Each of the hunters in the sample was given a period of time to complete and return the survey questionnaire. At the end of that period, hunters who had not returned the survey were mailed a 2nd copy of the questionnaire. Finally, hunters who had not responded to either one of the survey mailings were then sent a 3rd mailing of the questionnaire. To investigate the potential for response bias, several of the questions were studied as a function of the mailing for which the survey was returned.

One factor that LDWF wanted to determine from the survey was whether there was a difference among the 3 mailings as to the type of license purchased. Based upon a contingency table analysis, differences among the proportions of the license types by mailing were evident (Table 1, chi-square=46.0, df=8, $p<0.0001$). Analysis of whether respondents' reported having hunted deer in the 2003-04 season suggested that the proportion of respondents that did not hunt deer during the 2003-04 season was larger for the later mailings than for those who hunted (Table 2, chi-square=41.6, df=2, $p<0.0001$). The distributions of those who answered that they would shoot a bobcat (Question 5) were similar among the mailings (Table 3, chi-square=2.73, df=2, $p=0.2552$). Deer hunters reporting having seen a bobcat while hunting (Question 6a) were more likely to return the survey earlier than those who did not see a bobcat while hunting (Table 4, chi-square=20.5, df=2, $p<0.0001$). Deer hunters reporting having killed a bobcat in the 2003-04 season (Question 7a) were more likely to return the survey earlier than those who did not kill a bobcat in the 2003-04 season (Table 5, chi-square=6.33, df=2, $p=0.0422$). When the Holm (Holm, S. 1979. A simple sequentially rejective Bonferroni test procedure. *Scandinavian Journal of Statistics* 6, 65-70) adjustment to control the error rate for multiplicity in testing was applied to these tests, only license type, having hunted deer during the 2003-04 season, and having seen a bobcat while deer hunting had proportions that differed with respect to the mailings ($P<0.05$).

These results suggested that non-respondents may have been less likely to have gone deer hunting and to have sighted a bobcat during the 2003-04 season. Thus, the number of bobcats sighted and possibly the numbers harvested by the population of hunters may be overestimated. Future surveys should continue to stress the importance of returning the survey instrument regardless of whether or not the hunter hunted, or whether or not he saw a bobcat or shot at a bobcat.

Table of License Type by Mailing				
License Type	Mailing			Total
Frequency Row Pct Col Pct	1	2	3	
Basic/Big Game	1671 47.74 75.37	767 21.91 77.32	1062 30.34 80.70	3500
Lifetime	469 55.50 21.15	193 22.84 19.46	183 21.66 13.91	845
None Purchased	15 36.59 0.68	4 9.76 0.40	22 53.66 1.67	41
Sportsman's Paradise	48 48.48 2.17	21 21.21 2.12	30 30.30 2.28	99
Unknown	14 35.00 0.63	7 17.50 0.71	19 47.50 1.44	40
Total	2217	992	1316	4525

Table 1. Distribution of the respondents' license types by mailing.

Table 2. Distribution of those respondents reported having hunted deer in the 2003-04 season by mailing.

Table of Question2 by Mailing				
Question 2 (Hunted Deer 03/04)	Mailing			Total
Frequency Row Pct Col Pct	1	2	3	
0	196 39.68 8.84	93 18.83 9.38	205 41.50 15.58	494
1	2021 50.14 91.16	899 22.30 90.63	1111 27.56 84.42	4031
Total	2217	992	1316	4525

Table 3. Distribution of those respondents having hunted in 2003-04 that reported that they would shoot a bobcat by mailing.

Table of Question5 by Mailing				
Question5(Would Shoot Bobcat)	Mailing			
Frequency Row Pct Col Pct				
	1	2	3	Total
0	665 48.72 32.90	324 23.74 36.04	376 27.55 33.84	1365
1	1356 50.86 67.10	575 21.57 63.96	735 27.57 66.16	2666
Total	2021	899	1111	4031

Table 4. Distribution of those respondents having hunted in 2003-04 that reported that they saw a bobcat by mailing.

Table of Question6a by Mailing				
Question6a (Hunters Sighted Bobcat)	Mailing			
Frequency Row Pct Col Pct				
	1	2	3	Total
0	1064 47.58 52.65	494 22.09 54.95	678 30.32 61.03	2236
1	957 53.31 47.35	405 22.56 45.05	433 24.12 38.97	1795
Total	2021	899	1111	4031

Table 5. Distribution of those respondents having hunted in 2003-04 that reported that they killed a bobcat by mailing.

Table of Question7a by Mailing				
Question7a (Hunters Killed Bobcat Past Season)	Mailing			
Frequency Row Pct Col Pct				
	1	2	3	Total
0	1879 49.87 92.97	833 22.11 92.66	1056 28.03 95.05	3768
1	142 53.99 7.03	66 25.10 7.34	55 20.91 4.95	263
Total	2021	899	1111	4031

Survey Analysis

The Hunter Survey resulted in 4525 surveys returned. Prior LDWF harvest survey estimated the number of licensed resident deer hunters in Louisiana to be 170,000. DES treated the 170,000 as a known constant. Extrapolation to the 170,000 hunters, standard errors, 95% confidence interval estimates, and domain analyses were computed using SURVEYMEANS and SURVEYFREQ (<http://support.sas.com/onlinedoc/913/docMainpage.jsp>)(SAS). The methods employed are for simple random sampling of a finite population (see Lohr, S.L. 1999. *Sampling: Design and Analysis*. Duxbury Press, Pacific Grove, CA, 494pp). Confidence interval estimates are reported within parentheses as lower and upper limits of a 95% interval.

Analysis on Deer Hunting & Providing a Map

In order to illustrate the data, the GMAP procedure coded in a SAS Macro was used to produce a map of the 7 regions within Louisiana for various sample and estimated values. The GMAP is performed on the two question variables:

1.Question 6a- Did you see a bobcat while deer hunting during the 2003-04 hunting Season?

2.Question 7a- Did you shoot and kill a bobcat this past season?

In GMAP, a Cartesian coordinates projection is performed on the Louisiana Map Projection, for Questions 6a and 7a.

```
Macro RegionMap(VarName);
Data ForMap;
  Set RegionReport;
  Where (VarName="&Varname");
Run;

Proc GMap Data=ForMap(Where=(Region NE "UNKNOWN"))
          Map=LAMapProj;
Id Region;
Choro Sum / Levels=7;
Format Sum 5.0;
Run;
Quit;
%Mend RegionMap;
Title3 "Given Hunted Deer -- Bobcat Sightings (Q6a)";
%RegionMap(Question6a);
Title3 "Given Hunted Deer -- Bobcats Killed (Q7a)";
%RegionMap(Question7a);
```

The name of the Macro is *RegionMap* and has one variable, named, (*VarName*), which will store the answers to a particular question. The data procedure *ForMap* sets an existing data step named *RegionReport* which is a SAS Summary table where each observation, generally is:

Region	Question	Mean	Sum	Standard Error
--------	----------	------	-----	----------------

For instance,

CENTRAL	Question 6a	0.166405	3982.32	0.014561
---------	-------------	----------	---------	----------

Specifically, Data step *ForMap* will focus in on one particular question except for the UNKNOWN questions, which is given in the GMap option. GMap does a projection of the state of Louisiana and stores all of those particular questions by *Region*. The CHORO statement specifies the variable that contain the data represented on the map by patterns that fill the map areas. This statement automatically determines the 7 Region midpoints and assigns patterns to the Louisiana map areas. DES specifically wanted the *Sum* values of the questions for the *Regions*. A Quit statement ended that procedure. %Mend is the end statement of the Macro *RegionMap*. %*RegionMap* macro is called with Question 6a which is the number of Hunters that Sighted A Bobcat by Region of the LA State. Again, %*RegionMap* macro is called with Question7a which is the numbers Hunters that Killed A Bobcat the Past Season by Region of the LA State. This is the general pattern of any of the survey questions asked to the respondents

Figure 1. Deer hunters in the survey aggregated by the Region in which they reported deer hunting the most (Question3b).

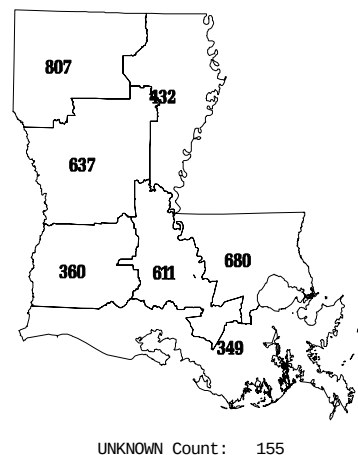


Figure 1 shows the distribution of respondents aggregated by region. Using this data estimates for the population of licensed deer hunters were done by using PROC SURVEYMEANS. Sampling weights for this report were:

$$\text{Weight}_i = 170,000 / 4,525 = 37.569$$

and assume equal probability sampling with respect to respondents. Remember, DWLF, reports 170,000 LA deer hunters as an estimate of population of all hunters in Louisiana. The LA deer hunters responded with 4,525 surveys randomly this year.

Question 1 characterized the population of licensed 2003-04 hunters according to the type of license held:

- 131492 (77%) of the hunters were estimated to have a Basic and Big Game License,
- 31746 (19%) of the hunters were estimated to have a Lifetime License,
- 3719 (2%) of the hunters were estimated to have a LA Sportsman License,
- 1540 (1%) of the hunters were estimated not to have a 2003/2004 License, and
- (1%) of those returning the survey did not respond to the question.

DES also analyzed the Survey as a sub-population or domain analysis on the 7 regions of the state who did hunt during the 2003-2004 season(Question2). Also, remember the 170,00 hunters is an estimate of the population size so the domain, Region becomes an estimate or a random variable. The PROC SURVEYMEANS follows:

```
ODS RTF File="C:\WildLifeFisheries\BobcatSurveyDomainQ2Region.rtf";
Title2 "Domain Analysis on Hunted Deer (Q2) by Region";
Proc SurveyMeans Data=BobcatSurveyData N=170000
                Mean Sum Clm CLSum CV;
  Domain Question2*Region;
  Var &VarList;
  Weight Weight;
  ODS Output Domain=Q2RegionResults;
Run;
ODS RTF Close;
```

The ODS RTF statements generate the RTF (Rich Text Format) file, *BobcatSurveyDomainQ2Region.rtf* in the directory *C:\WildLifeFisheries*. The *N=* option specifies the population size so that the finite population correction factor is applied. Then various descriptive statistics, mean, total, confidence interval estimates, and coefficient of variation estimates are selected. The *Domain* will take the subpopulations of *REGIONS* over the entire state of Louisiana and will only take a survey of the proportion of respondents that did hunt deer during the 2003-04 season (Question 2). *Var* statement takes, in general, all 20 questions from the Deer Hunter Survey. The same *Weight* as discussed earlier are used here. Finally, temporary dataset, *Q2RegionResults*, contained the Domain Statistics from the *ODS Output*.

Table 6. Estimated population totals based upon all returned surveys.

Question	Description	Total	Lower CL	Upper CL	Standard Error	CV(%)
	Deer Hunters	170000	170000	170000	0.00	0.0
1a	License: Basic and Big Game	131492	129445	133538	1043.77	0.8
1b	License: Lifetime License	31746	29841	33651	971.77	3.1
1c	License: Sportsmans Paradise	3719	3004	4434	364.78	9.8
1d	License: No License Purchased	1540	1077	2004	236.28	15.3
2	Hunted Deer 2003-04	151441	149916	152965	777.64	0.5

Table 7. Estimated population percentages based upon all returned surveys.

Question	Description	Percentage(%)	Lower CL	Upper CL	Standard Error	CV(%)
2	Hunted Deer 03-04	89.1	88.2	90.0	0.457	0.5

Table 8. Estimated population totals based upon respondents that indicated that they hunted deer during the 2003-04 season.

Question	Description	Total	Lower CL	Upper CL	Standard Error	CV(%)
	Deer Hunters	151441	149916	152965	777.64	0.0
1a	License: Basic and Big Game	121874	119672	124076	1123.38	0.8
1b	License: Lifetime License	25660	23910	27410	892.69	3.4
1c	License: Sportsmans Paradise	3193	2530	3857	338.54	10.6
1d	License: No License Purchased	225	48	403	90.74	40.3
2	Hunted Deer 2003-04	151441	149916	152965	777.64	0.0
5	Would Shoot Bobcat	100159	97754	102564	1226.82	1.1
6a	Hunters Sighted Bobcat	67436	65045	69828	1219.90	1.7
6b	Number of Bobcat Sightings	232402	218471	246333	7105.74	3.0
7a	Hunters Killed Bobcat Past Season	9881	8737	11024	583.44	5.9

Table 9. Estimated population means based upon respondents that indicated that they hunted deer during the 2003-04 season.

Question	Description	Mean	Lower CL	Upper CL	Standard Error	CV(%)
3a	Number of Times Hunted Deer	15.412	14.965	15.859	0.2282	1.5
6b	Number of Bobcat Sightings	1.535	1.444	1.625	0.0463	3.0

Table 10. Estimated population percentages based upon respondents that indicated that they hunted deer during the 2003-04 season.

Question	Description	Percentage (%)	Lower CL	Upper CL	Standard Error	CV (%)
2	Hunted Deer 2003-04	100.0	100.0	100.0	0.000	0.0
5	Would Shoot Bobcat	66.1	64.7	67.6	0.735	1.1
6a	Hunters Sighted Bobcat	44.5	43.0	46.0	0.772	1.7
7a	Hunters Killed bobcat Past Season	6.5	5.8	7.3	0.384	5.9

Table 11. Region reported by deer hunters as the one that they hunted the most (Question 3b). Frequency is the number of hunters observed in the sample, while the weighted frequency is the estimated number in the population.

Region	Frequency	Weighted Frequency	Standard Deviation of Wgt Freq	Percent of Total
NORTH WEST	807	30318	1042.3	20.0198
SOUTH EAST	680	25547	957.83	16.8693
CENTRAL	637	23931	926.73	15.8025
SOUTH CENTRAL	611	22955	906.65	15.1575
NORTH EAST	432	16230	765.86	10.7169
SOUTH WEST	360	13525	697.50	8.9308
COASTAL	349	13112	688.88	8.6579
UNKNOWN	155	5823	453.54	3.8452
	4031	151441		100.000

Bobcats

The analysis of the bobcat data focused upon the 89.1% of the respondents that reported hunting deer in the 2003-04 season. The results of this analysis are reported in Table 8 through Table 10.

It is estimated that 67,436 (65045, 69828) hunters saw a bobcat during the 2003-04 season with a total of 232,402 (218471, 246333) bobcat sightings (Table 8). This converts to an average sighting rate of 1.535 (1.444, 1.625) bobcats per hunter (see Figure 2, Table 9). It is important to note as well that 44.5% (43.0%, 46.0%) of the hunters reported seeing at least 1 bobcat (Table 10).

It is estimated that 66.1% (64.7%, 67.6%) of hunters would shoot a bobcat if given the opportunity, and for the 2003-04 season, it is estimated that 9881 (8737, 11024) hunters harvested a bobcat corresponding with 6.5% (5.8%, 7.3%) of those hunting (Table 8, Table 10). It is interesting that of those hunters reported killing a bobcat in 2003-04 only 96.2% (93.9%, 98.5%) stated that they would shoot a bobcat if given the opportunity, and only 95.1% (92.5%, 97.6%) stated that they had seen a bobcat while deer hunting (Table 14). This might imply some confusion about the questions, or that some bobcats were taken while not actually deer hunting. Of those hunters killing a bobcat 87.1% (83.1%, 91.1%) indicated that they would kill another one during the 2004-05 season (Table 14). Further, the most frequently reported purpose for harvesting a bobcat of those killing one in 2003-04 was to control predators on the land on which they hunt 81.0% (76.3%, 85.7%) (Table 14). The average number of bobcat sightings for those reporting that they killed a bobcat was 4.544 (4.029, 5.059) (Table 13).

Figure 2. Distribution of bobcat sightings by deer hunters for those respondents that indicated that they went deer hunting during the 2003-04 season.

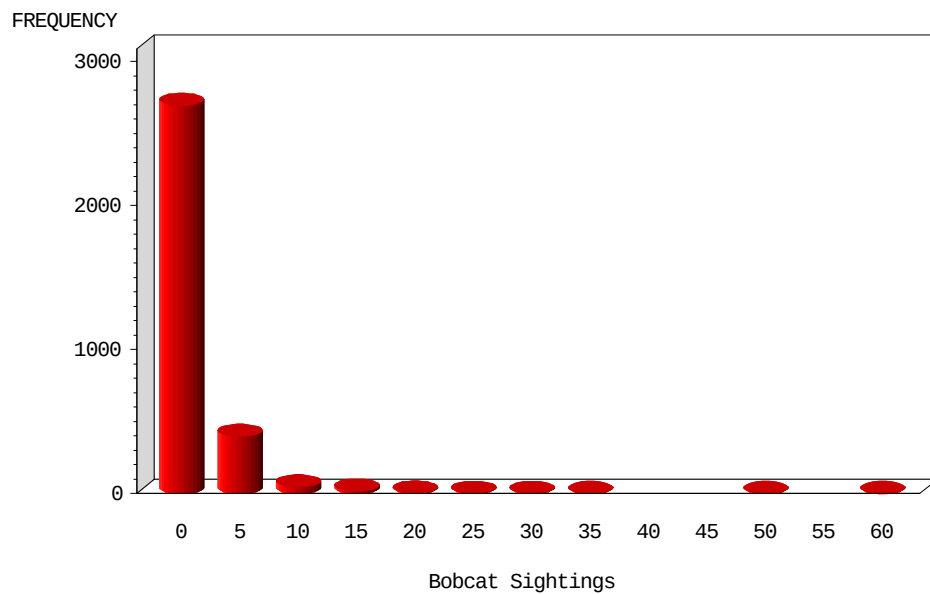


Figure 3. Bobcat sightings of those that hunted deer in 2003-04 grouped according to whether or not the hunter also killed a bobcat during that season.

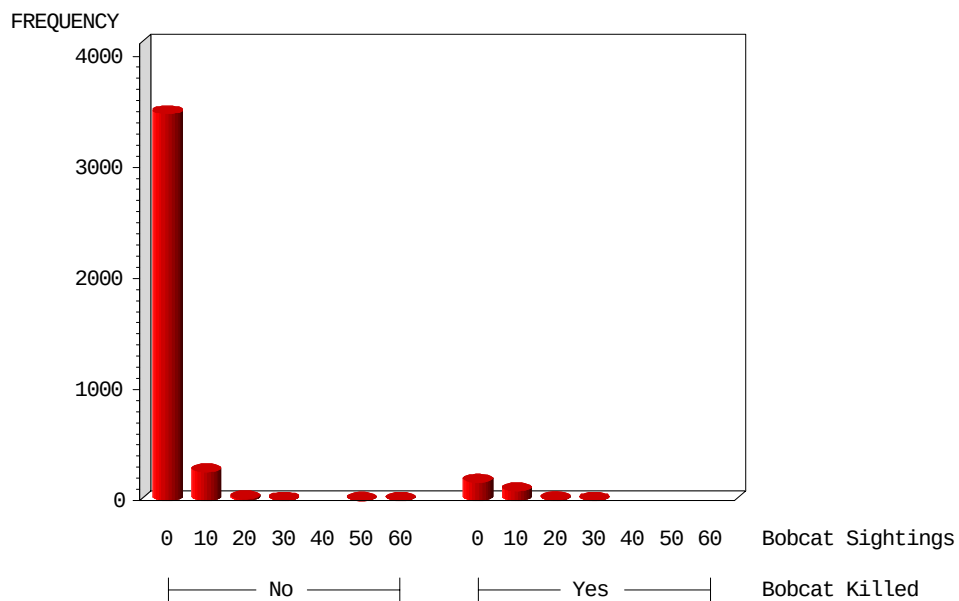
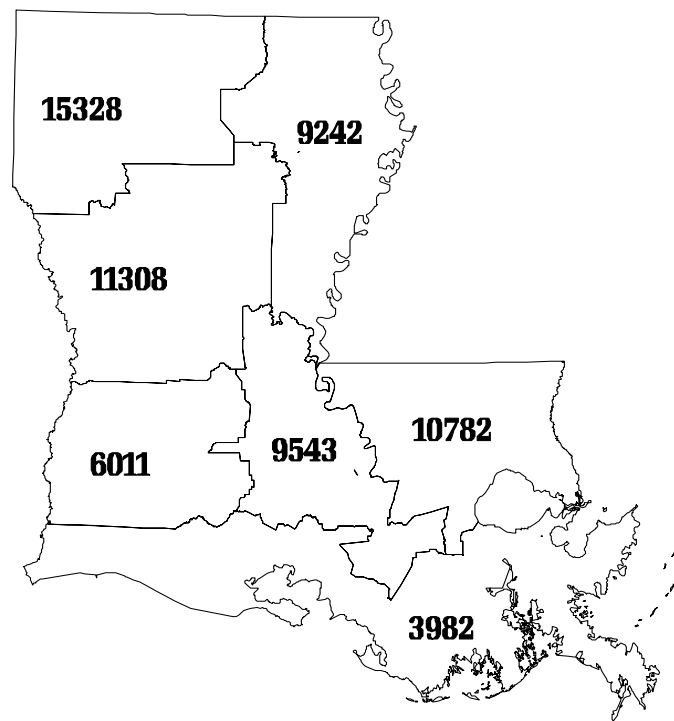
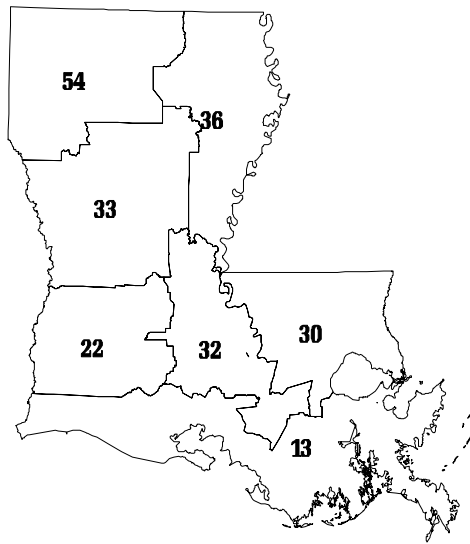


Figure 4. Estimated Bobcat sightings of those that hunted deer in 2003-04 aggregated according to the region in which the questionnaire hunted the most deer.



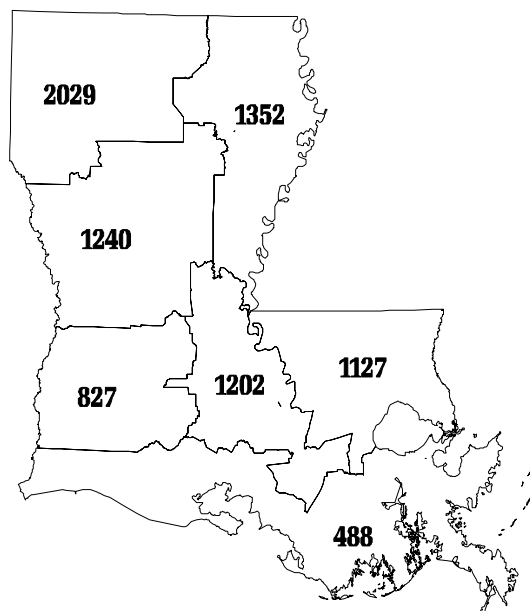
Region	Frequency	Weighted Frequency	Standard Deviation of Wgt Freq	Percent of Total
NORTH WEST	408	15328	744.93	22.7298
CENTRAL	301	11308	640.15	16.7688
SOUTH EAST	287	10782	625.34	15.9889
SOUTH CENTRAL	254	9543	588.01	14.1504
NORTH EAST	246	9242	579.45	13.7047
SOUTH WEST	160	6011	467.07	8.9136
COASTAL	106	3982	380.97	5.9053
UNKNOWN	33	1240	212.17	1.8384
	1795	67436		100.000

Figure 5. Number of hunters in the survey that reported killing a bobcat aggregated according to the Region in which the bobcat was reported to have been killed.



UNKNOWN Count: 43
 Total Frequency = 263
 Total Weighted Frequency = 9,881

Figure 6. Estimated bobcat sightings for those reporting that they hunted deer during the 2003-04 season.



UNKNOWN Count: 1615

Region	Frequency	Weighted Frequency	Standard Deviation of Wgt Freq	Percent of Total
NORTH WEST	54	2029	272.18	20.5323
UNKNOWN	43	1615	241.93	16.3498
NORTH EAST	36	1352	222.31	13.6882
CENTRAL	33	1240	212.83	12.5475
SOUTH CENTRAL	32	1202	209.57	12.1673
SOUTH EAST	30	1127	202.95	11.4068
SOUTH WEST	22	827	173.78	8.3650
COASTAL	13	488	133.61	4.9430
	263	9881		100.000

Table 12. Estimated population totals based upon respondents that indicated that they hunted deer and also killed a bobcat during the 2003-04 season.

Question	Description	Total	Lower CL	Upper CL	Standard Error	CV(%)
	Deer Hunters	9881	8737	11024	583.44	0.0
1a	License: Basic and Big Game	7589	6579	8599	514.97	3.3
1b	License: Lifetime License	2029	1498	2560	270.78	12.0
1c	License: Sportsmans Paradise	188	25	350	82.84	43.7
1d	License: No License Purchased	38	-35	110	37.07	98.5
2	Hunted Deer 2003-04	9881	8737	11024	583.44	0.0
5	Would Shoot Bobcat	9505	8382	10628	572.91	1.2
6a	Hunters Sighted Bobcat	9392	8275	10509	569.70	1.4
6b	Number of Bobcat Sightings	44895	37622	52168	3709.83	5.8
7a	Hunters Killed Bobcat Past Season	9881	8737	11024	583.44	0.0

Table 13. Estimated population means based upon respondents that indicated that they hunted deer and also killed a bobcat during the 2003-04 season.

Question	Description	Mean	Lower CL	Upper CL	Standard Error	CV(%)
3a	Number of Times Hunted Deer	24.027	21.731	26.323	1.1711	4.9
6b	Number of Bobcat Sightings	4.544	4.029	5.059	0.2627	5.8

Table 14. Estimated population percentages based upon respondents that indicated that they hunted deer and also killed a bobcat during the 2003-04 season.

Question	Description	Percentage (%)	Lower CL	Upper CL	Standard Error	CV (%)
2	Hunted Deer 2003-04	100.0	100.0	100.0	0.000	0.0
5	Would Shoot Bobcat	96.2	93.9	98.5	1.164	1.2
6a	Hunters Sighted Bobcat	95.1	92.5	97.6	1.319	1.4
7a	Hunters Killed Bobcat Past Season	100.0	100.0	100.0	0.000	0.0
10	Bobcat Would Kill Again	87.1	83.1	91.1	2.041	2.3
11c	Bobcat: Predator Control	81.0	76.3	85.7	2.387	2.9

Associations among Responses

The associations among several pairs of responses were studied with responses cross-classified. The percentage of 2003-04 hunters who did not kill a bobcat that reported that they would kill one if given the opportunity was about 64% (Table 15). One question that was asked by LDWF concerned the independence of “seeing a bobcat while hunting in 2003-04” (Question 6a) with “given the opportunity, would you shoot a bobcat” (Question 5). Approximately 62% of those deer hunters that did not see a bobcat in the 2003-04 season said that they would shoot a bobcat, while 71.% of those that did see a bobcat during the 2003-04 season said that they would shoot one. These two factors were found to be dependent (Table 16, chi-square=40.33, df=1, $p<0.0001$) suggesting that the attitude toward shooting a bobcat and having seen a bobcat while hunting are related.

Additional tests for independence of factors and results are:

- A test of independence of factors suggests that those killing a bobcat are more likely to also kill a coyote than those that did not kill a bobcat
- A test of independence of factors suggests that those killing a bobcat are more likely to believe that predators are a problem for deer and turkey populations than those that did not kill a bobcat
- A test of independence of factors suggests that those killing a bobcat are more likely to believe that predators are a problem for rabbit and quail populations than those that did not kill a bobcat .
- A test of independence of factors suggests that those sighting a bobcat while hunting are more likely to be willing to kill a bobcat than those that did not sight one (Table 16, chi-square=40.3, df=1, $p<0.0001$).

Table 15. Given whether the hunter killed a bobcat in the 2003-04 season, would he shoot a bobcat if given the opportunity? There are 10 hunters that killed a bobcat in 2003-04, but stated that they would not kill one if given the opportunity.

Table of Question7a by Question5			
Question7a (Hunters Killed Bobcat Past Season)	Question5 (Would Shoot Bobcat)		Total
Frequency Row Pct	0	1	
0	1355 35.96	2413 64.04	3768
1	10 3.80	253 96.20	263
Total	1365	2666	4031

Table 16. Association between sighting a bobcat and willingness to shoot a bobcat if given the opportunity.

Table of Question6a by Question5			
Question6a (Hunters Sighted Bobcat)	Question5 (Would Shoot Bobcat)		Total
Frequency Row Pct	0	1	
0	852 38.10	1384 61.90	2236
1	513 28.58	1282 71.42	1795
Total	1365	2666	4031

Statistics for Table of Question6a by Question5

Statistic	DF	Value	Prob
Chi-Square	1	40.3300	<.0001

Acknowledgements

We want to give appreciation to Donna Navare Of the Louisiana Department of Wildlife and Fisheries for her dedication with the 4,525 Deer Hunting surveys. Also, we would like to thank LSU Experimental Statistics Graduate Student Rebecca Christofferson for transferring all paper surveys in to the Microsoft Access Database program. Their work allowed the DES to analyze the data and will permit LDWF to make valuable management plans for the future of Louisiana.

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CONTACT INFORMATION

Your comments and questions are valued & encouraged. Contact the author at:

Rebecca Frederick

Louisiana State University Agricultural Center

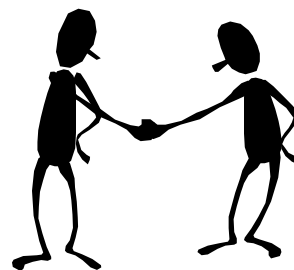
Dept. of Experimental Statistics

Baton Rouge, LA 70803-5606

Work Phone: 225-578-8303

Fax Phone: 225-578-8344

Email: rfrederi@lsu.edu



APPENDIX

- Survey questionnaire

Bobcat, Fox, and Coyote Hunter Survey

1. Which type of license did you purchase/have to hunt Big Game for the 2003/2004 hunting season?

Basic and Big Game	☐	LA Sportsmen Paradise	☐
Lifetime	☐	Did not have a 2003/2004 license	☐

2. Did you hunt deer during the 2003-04 season? Yes ☐ No ☐

If you answered no, you do not have to answer any more questions. However, your answers are still important to us. Please return survey in pre-paid envelope. Thank you.

If you answered yes, please continue with the survey.

3. How many times did you deer hunt during the 2003/2004 deer season? _____
In which parish did you deer hunt the most? _____

4. What answers best describes the habitat type for the land on which you are deer hunting?
Please check all that apply.

Mixed Pine/Hardwood	☐	Clearcut (3 years or less)	☐	Old Pine Plantation (15 + years old)	☐
Bottomland Hardwood	☐	Pine Plantation (3-10 years old)	☐	Woodlots with Pasture or Agriculture	☐
Swamp	☐	Thinned Pine Plantation (10-15 years old)	☐		

It was legal for a licensed deer hunter to harvest one bobcat during the 2003-2004 deer season. We want to determine how deer hunters used this option and their opinions.

5. If given the opportunity, would you shoot a bobcat? Yes ☐ No ☐
6. Did you see a bobcat while deer hunting during the 2003-04 hunting Season? Yes ☐ No ☐
How many bobcats did you see this past season? _____

What answers best describes the habitat type in which you saw bobcats? Please check all that apply.

Mixed Pine/Hardwood	☐	Clearcut (3 years or less)	☐	Old Pine Plantation (15 + years old)	☐
Bottomland Hardwood	☐	Pine Plantation (3-10 years old)	☐	Woodlots with Pasture or Agriculture	☐
Swamp	☐	Thinned Pine Plantation (10-15 years old)	☐		

7. Did you shoot and kill a bobcat this past season? Yes ☐ No ☐
 If you killed a bobcat, in which parish did you kill the bobcat? _____
 Did you hunt near food plots and/or feeders? Yes ☐ No ☐
8. Did you shoot at and miss a bobcat this past season? Yes ☐ No ☐
 How many times did this happen this past season? _____
9. Did you shoot at and hit a bobcat, but did not find the bobcat? Yes ☐ No ☐
 What parish did this occur in? _____
 How many times did this happen this past season? _____
10. If you killed and recovered a bobcat this past season, would you kill another one during the 2004-05 season if given the opportunity again? Yes ☐ No ☐
11. If you killed a bobcat during the 2003-04 season, which of the following **best** describes your purpose for harvesting the bobcat?
- Never had the opportunity to legally shoot one before ☐
 Wanted one to have it mounted ☐
 To control predators on the land that I hunt ☐
 Other ☐

The next several questions deal with the harvest of coyotes while deer hunting.

12. It is legal for a licensed deer hunter to shoot coyotes during the open deer season. Would you shoot a coyote if you saw one while deer hunting? Yes ☐ No ☐
13. Did you see a coyote while hunting deer this past season? Yes ☐ No ☐
 How many coyotes did you see this past season? _____
14. Did you shoot at and kill a coyote while deer hunting this past season? Yes ☐ No ☐
 How many coyotes did you kill while deer hunting this past season? _____
 In which parish(es) did you kill the coyote(s)? _____
15. Did you shoot at and miss a coyote this past season? Yes ☐ No ☐
 How many times did this happen this past season? _____
16. Did you shoot at and hit, but did not find the coyote this past season? Yes ☐ No ☐
 How many times did this happen this past season? _____
 In which parish did this happen? _____

*We also are interested in getting information concerning the distribution of fox in the state
The next question specifically addresses sighting of fox. (Fox can only be taken by trapping.)*

17. Did you see a fox while deer hunting this past season? Yes ☐ No ☐
 What kind of fox was it? Red___ Gray___
 What parish did you see the fox in? _____

The remaining questions address your observations on the relative abundance of several species of wildlife.

18. Check the box that in your opinion best describes the population status for the following animals on the land where you deer hunt.

	<u>Stable</u>	<u>Increasing</u>	<u>Decreasing</u>	<u>Don't Know</u>
<u>Bobcat</u>	☐	☐	☐	☐
<u>Coyote</u>	☐	☐	☐	☐
<u>Fox</u>	☐	☐	☐	☐
<u>Turkey</u>	☐	☐	☐	☐
<u>Bobwhite</u>	☐	☐	☐	☐
<u>Quail</u>	☐	☐	☐	☐

19. In your opinion, do you think that bobcat, coyote, or fox are a major problem for the deer and turkey populations on the land that you hunt on? Yes ☐ No ☐

20. In your opinion, do you think bobcat, coyote, or fox are a major problem for the rabbit and quail populations on the land that you hunt on? Yes ☐ No ☐

Comments: _____

