



2012 SHARP-TAILED GROUSE HARVEST SURVEY

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ABSTRACT

A survey was completed to determine the number of people hunting sharp-tailed grouse, the number of days hunting, and the number of sharp-tailed grouse harvested in Michigan. In 2012, 3,200 hunters obtained a free sharp-tailed grouse stamp allowing them to hunt sharp-tailed grouse, which was 37% greater than last year (2,344 stamp holders in 2011). About 12% of the people obtaining a stamp in 2012 hunted sharp-tailed grouse (394 hunters). The number of hunters increased 34% between 2011 and 2012 (294 versus 394). In 2012, sharp-tailed grouse hunters spent 1,115 days afield and harvested 156 sharp-tailed grouse ($\bar{x} = 0.4$ grouse/hunter). In comparison, grouse hunters spent 1,148 days afield and harvested 178 sharp-tailed grouse in 2011. Hunting effort and harvest were not significantly different between 2011 and 2012. About 19% of the hunters in 2012 harvested at least one sharp-tailed grouse. About 38% of hunters were either satisfied or somewhat satisfied with their hunting experience. Moreover, 82% of hunters reported that they were very likely or somewhat likely to continue hunting sharp-tailed grouse during the next two years.

INTRODUCTION

In 2012, hunters could hunt sharp-tailed grouse (*Tympanuchus phasianellus*) in portions of two counties in the Upper Peninsula of Michigan (Chippewa and Mackinac counties) during October 10-31 (Figure 1). About 17% of the area open to hunting was publicly owned land (i.e., land owned by federal, state, county, or township governmental agencies). In order to hunt sharp-tailed grouse, hunters were required to obtain a small game hunting license and a free sharp-tailed grouse hunting stamp. Hunters could harvest up to two birds per day with a seasonal limit of six birds.



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The Department of Natural Resources (DNR) and Natural Resources Commission have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. Harvest surveys are one of the management tools used by the DNR to accomplish its statutory responsibility. Estimating harvest, hunting effort, and hunter satisfaction are among the primary objectives of these surveys.

METHODS

Following the 2012 sharp-tailed grouse hunting season, a questionnaire (Appendix A) was sent to 3,200 people that had obtained a sharp-tailed grouse stamp. Hunters receiving the questionnaire were asked to report if they hunted sharp-tailed grouse, number of days spent afield, and number of sharp-tailed grouse they harvested. Hunters also were asked to indicate whether they normally hunted with the aid of a dog, satisfaction with the hunting season, and the likelihood of hunting sharp-tailed grouse during the next two years.

Estimates were calculated using a simple random sampling design (Cochran 1977) and were presented along with their 95% confidence limit (CL). This CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies that the true value would be within this interval 95 times out of 100. Estimates were not adjusted for possible response or nonresponse bias.

Statistical tests are used routinely to determine the likelihood that differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially during mid-December 2012, and one follow-up questionnaire was mailed to nonrespondents. Although 3,200 people were sent the questionnaire, 53 surveys were undeliverable resulting in an adjusted sample size of 3,147. Questionnaires were returned by 1,842 people, yielding a 59% adjusted response rate.

RESULTS

In 2012, 3,200 people obtained a stamp to hunt sharp-tailed grouse, which was 37% more than last year (2,344 stamp holders in 2011). Males obtained most of the stamps (3,063) in 2012. The average age of stamp buyers was 45 years (Figure 2), and nearly 6% (185) of the stamp holders were younger than 17 years old.

About $12 \pm 1\%$ of the people that obtained a stamp went afield to hunt sharp-tailed grouse (394 hunters, Table 1). The number of people hunting grouse increased significantly by 34% between 2011 and 2012; however, the number of hunters in 2012 was similar to the number of hunters in 2010 (Figure 3). Hunters spent 1,115 days hunting ($\bar{x} = 2.8 \pm 0.3$ days/hunter), and harvested 156 sharp-tailed grouse ($\bar{x} = 0.4$ birds/hunter). Hunting effort and harvest declined by 3% and 12%, respectively, between 2011 and 2012; however, these declines were not significantly different. (In 2011, grouse hunters spent 1,148 days afield and harvested 178 sharp-tailed grouse.) The estimated number of grouse seen per hunter was unchanged

between 2011 and 2012 (5.8 grouse per hunter in 2011 and 5.3 grouse per hunter in 2012). Hunters most frequently hunted during the weekend (Figures 5 and 6).

About 19% of hunters in 2012 successfully harvested at least one sharp-tailed grouse. About 10% of hunters took one grouse; 5% took two grouse, 1% took three grouse; 1% took four grouse; and about 2% took five or six grouse (Figure 7). Most grouse were taken from Chippewa County.

About $49 \pm 4\%$ of the hunters used a dog to locate sharp-tailed grouse (Table 2). The proportion of hunters harvesting a sharp-tailed grouse was similar among hunters using a dog and hunters not using a dog (23% versus 15%); however, hunters using dogs appeared more efficient because it required less hunting effort to see or harvest a grouse than for hunters without a dog.

Of the estimated 394 people hunting sharp-tailed grouse in 2012, 38% of these hunters were satisfied with their hunting experience (Table 3). Nearly 26% of the hunters rated their experience as neutral. About 25% of the hunters were dissatisfied with their experience. Overall hunter satisfaction was not significantly different between 2011 and 2012 (44% versus 38% of hunters satisfied). About 29% of hunters in 2012 were satisfied with the number of grouse seen, and 15% were satisfied with the number of grouse harvested. These estimates were not significantly different from 2011.

Among people that hunted sharp-tailed grouse in 2012, $82 \pm 3\%$ of the hunters were very likely or somewhat likely to hunt sharp-tailed grouse during the next two years. About $9 \pm 2\%$ of the hunters indicated that they were not very likely or not at all likely to hunt sharp-tailed grouse during the next two years. About 3% of the hunters were not sure whether they would hunt sharp-tailed grouse again during the next two years. Finally, 6% of the hunters failed to indicate whether they would hunt sharp-tailed grouse again. The proportion of hunters likely to hunt grouse during the next two years was similar to 2011 (82% versus 81% of hunters were likely to hunt in the future).

ACKNOWLEDGEMENTS

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LITERATURE CITED

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Payton, M. E., M. H. Greenstone, and N. Schenker. 2003. Overlapping confidence intervals or standard error intervals: what do they mean in terms of statistical significance? *Journal of Insect Science* 3:34.

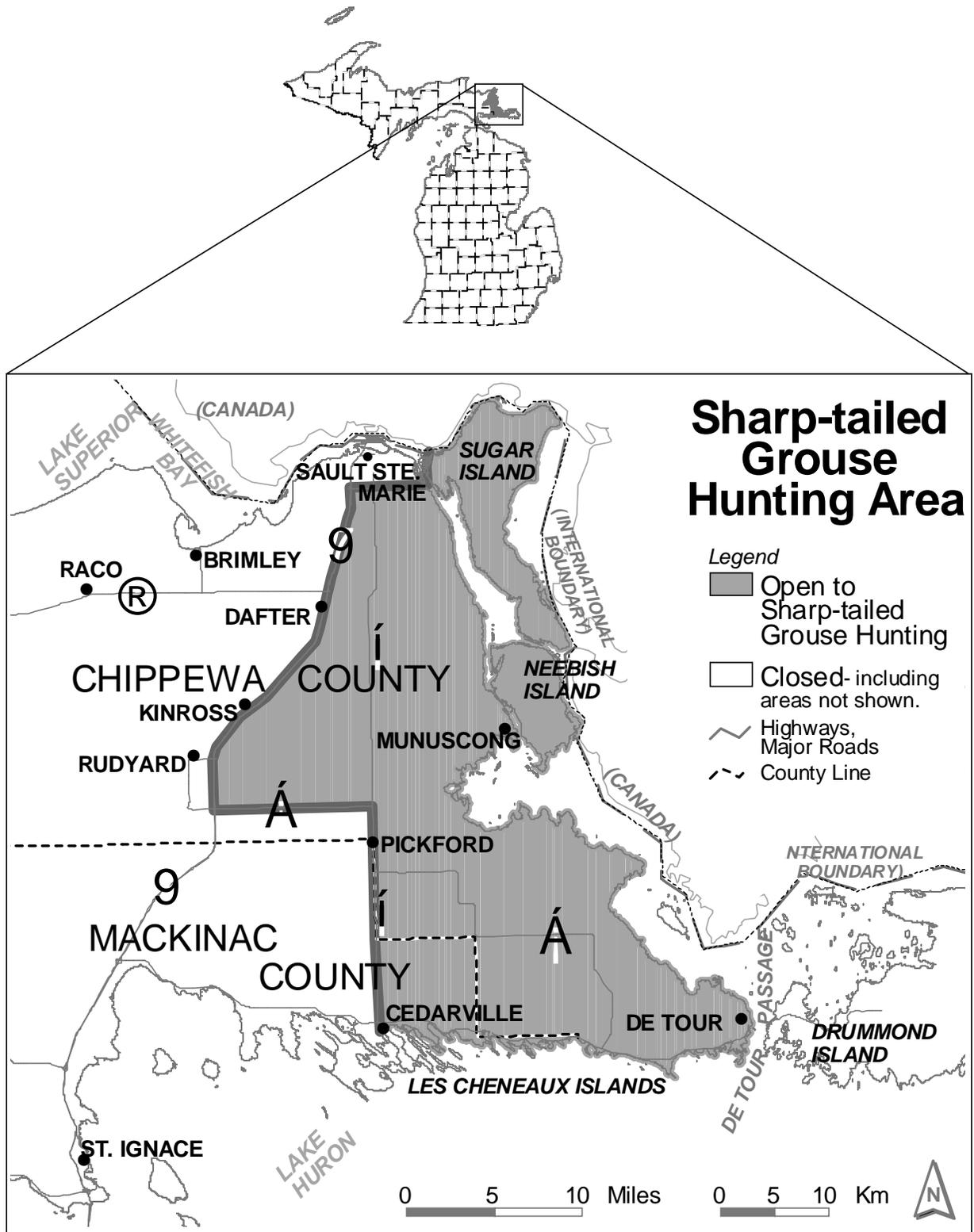


Figure 1. Area open for hunting sharp-tailed grouse in Michigan during 2012 hunting season.

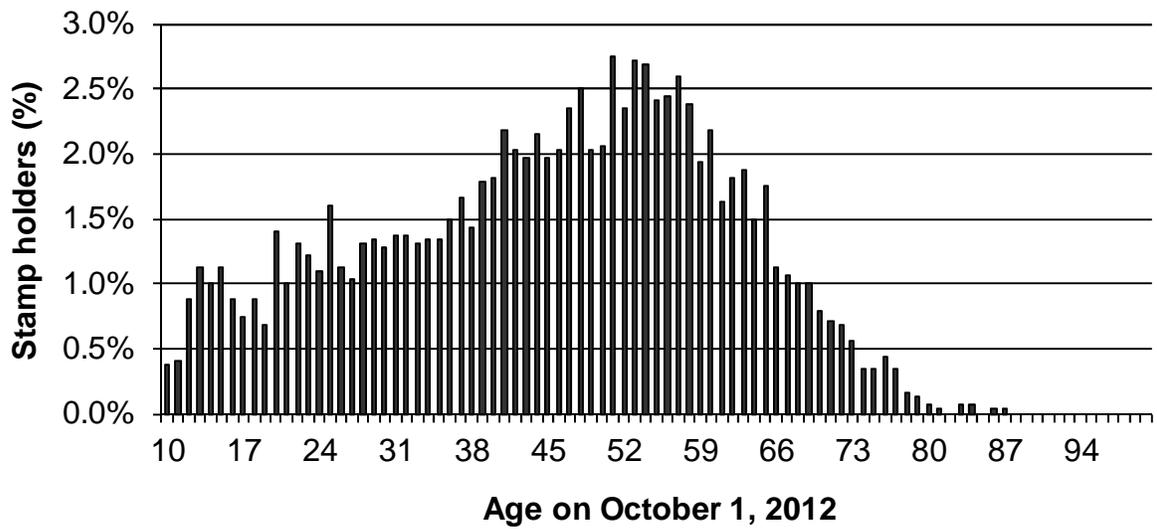


Figure 2. Age of people that obtained a sharp-tailed grouse hunting stamp in Michigan for the 2012 sharp-tailed grouse hunting season (\bar{x} = 45 years). Stamps were obtained by 3,200 people.

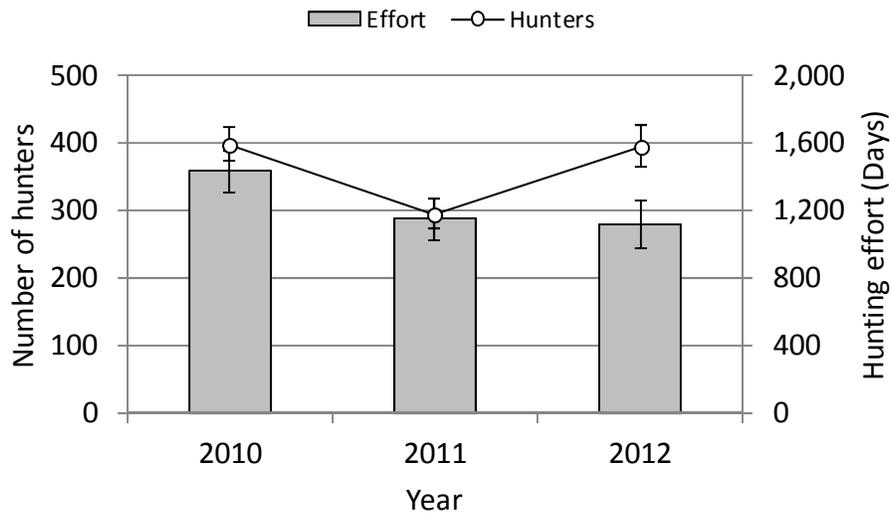


Figure 3. Estimated number of people hunting sharp-tailed grouse and the number of days of hunting effort during 2010-2012. Vertical bars represent the 95% confidence interval.

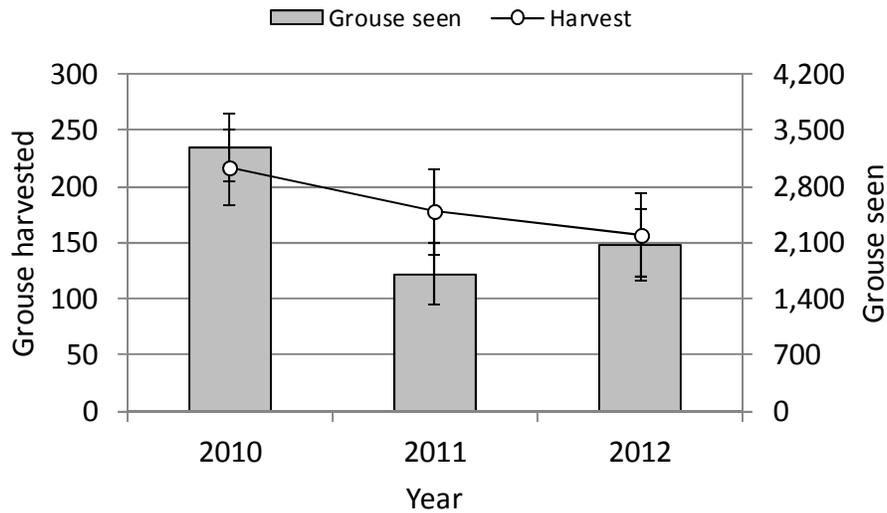


Figure 4. Estimated number of sharp-tailed grouse seen by hunters and the number of sharp-tailed grouse harvested during 2010-2012. Vertical bars represent the 95% confidence interval.

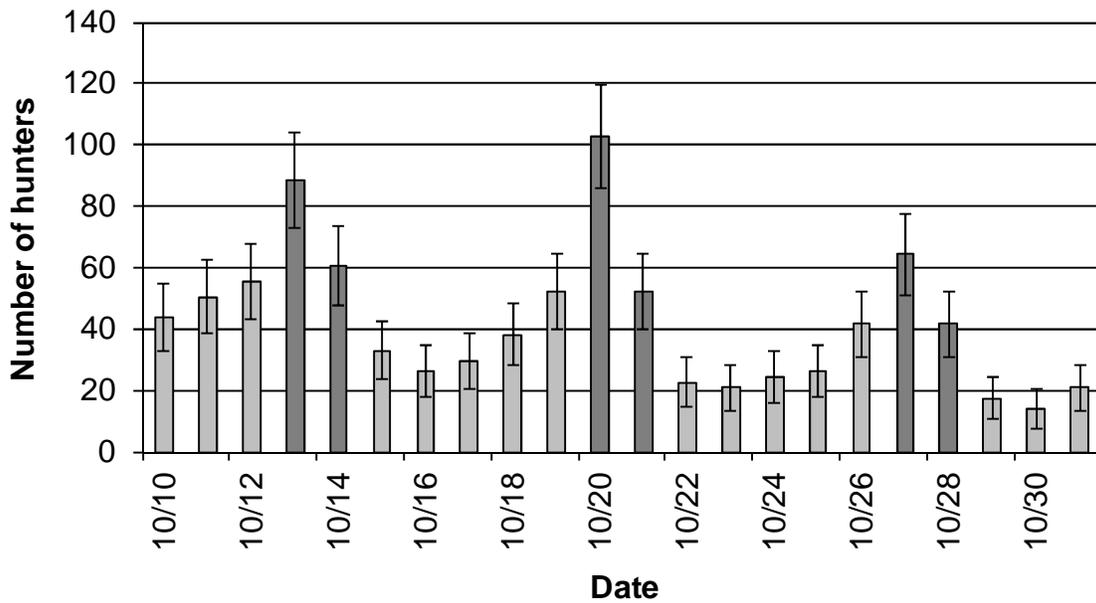


Figure 5. Estimated number of people hunting sharp-tailed grouse by date during the 2012 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

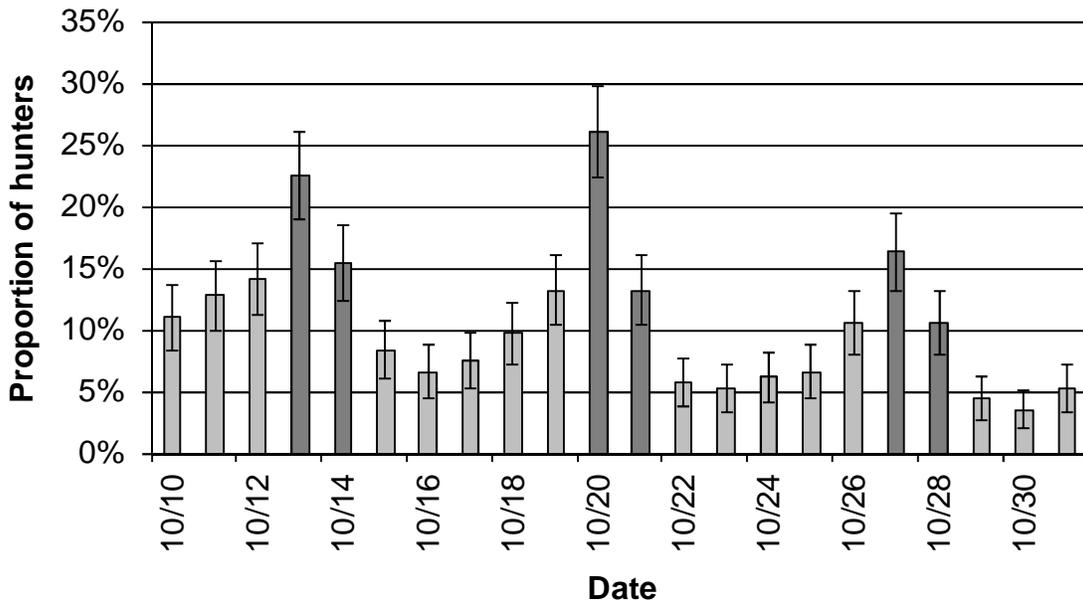


Figure 6. Estimated proportion of sharp-tailed grouse hunters afield by date during the 2012 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

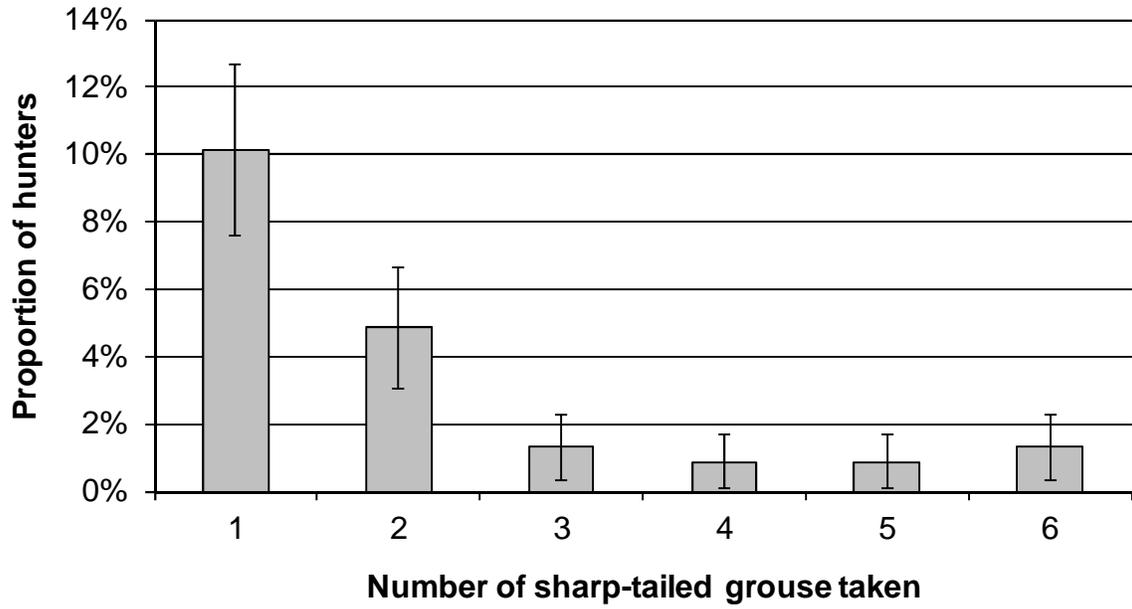


Figure 7. Estimated proportion of sharp-tailed grouse hunters that harvested one or more grouse during the 2012 hunting season, summarized by number of birds taken. Vertical bars represent the 95% confidence interval.

Table 1. Estimated number of hunters, hunting effort, sharp-tailed grouse seen, harvest, hunter success, grouse seen per hunter, and harvest per hunter during the 2012 sharp-tailed grouse hunting season in Michigan, summarized by county and land type where hunting occurred (private or public).

Area and land type	Hunters		Hunting effort (days)		Grouse seen		Harvest		Success ^a		Grouse seen per hunter		Harvest per hunter ^b	
	No.	95%	No.	95%	No.	95%	No.	95%	%	95%	No.	95%	No.	95%
		CL		CL		CL		CL		CL		CL		
Chippewa County														
Private lands	89	16	274	63	935	353	49	23	24	8	10.5	3.6	0.5	0.2
Public lands	106	17	273	57	280	131	31	12	21	7	2.6	1.2	0.3	0.1
Both lands	69	14	361	95	632	219	56	24	33	10	9.1	2.6	0.8	0.3
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	262	26	909	126	1,847	433	136	35	25	5	7.0	1.5	0.5	0.1
Mackinac County														
Private lands	14	6	17	8	132	95	9	9	25	21	9.5	5.7	0.6	0.6
Public lands	30	9	83	34	7	9	0	0	0	0	0.2	0.3	0.0	0.0
Both lands	19	7	83	48	82	52	12	7	45	20	4.3	2.2	0.6	0.3
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	63	13	184	59	221	108	21	12	19	9	3.5	1.6	0.3	0.2
Unknown County														
Subtotal	80	15	23	16	10	11	0	0	0	0	0.1	0.1	0.0	0.0
All areas														
Private lands	104	17	295	63	1,067	365	57	24	23	7	10.2	3.1	0.6	0.2
Public lands	134	19	374	71	297	132	31	12	17	5	2.2	0.9	0.2	0.1
Both lands	87	15	446	107	714	229	68	26	34	9	8.2	2.2	0.8	0.3
Unknown	71	14	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Grand total ^c	394	31	1,115	141	2,078	448	156	37	19	3	5.3	1.1	0.4	0.1

^aPercentage of hunters harvesting at least one sharp-tailed grouse.

^bThe season bag limit was six birds.

^cNumber of hunters does not add up to statewide total because hunters can hunt in more than one area.

Table 2. Estimated number of hunters, hunting effort, sharp-tailed grouse seen, harvest, hunter success, grouse seen per hunter, and harvest per hunter during the 2012 sharp-tailed grouse hunting season in Michigan, summarized by primary hunting method (used dogs or no dogs used).

Primary hunt method	Hunters		Hunting effort (days)		Grouse seen		Harvest		Success ^a		Grouse seen per hunter		Harvest per hunter ^b	
	No.	95% CL	No.	95% CL	No.	95% CL	No.	95% CL	%	95% CL	No.	95% CL	No.	95% CL
Used dog	195	23	502	93	1,032	327	96	31	23	5	5.3	1.6	0.5	0.1
Did not use dog	193	23	598	107	889	273	59	21	15	4	4.6	1.3	0.3	0.1
Unknown	7	4	16	12	156	145	2	2	25	32	22.5	17.4	0.3	0.3
Total	394	31	1,115	141	2,078	448	156	37	19	3	5.3	1.1	0.4	0.1

^aPercentage of hunters harvesting at least one sharp-tailed grouse.

^bThe season bag limit was six birds.

Table 3. Hunters' level of satisfaction with the number of sharp-tailed grouse seen, grouse harvested, and overall hunting experience during the 2012 sharp-tailed grouse hunting season.

Index	Satisfaction level						No answer or not applicable	
	Satisfied ^a		Neutral		Dissatisfied ^b		No answer or not applicable	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Grouse seen	29	4	24	4	38	4	9	2
Grouse harvested	15	3	28	4	41	4	16	3
Hunting experience	38	4	26	4	25	4	11	3

^aIncluded hunters who were "very satisfied" or "somewhat satisfied."

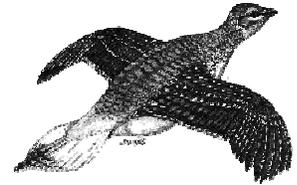
^bIncluded hunters who were "somewhat dissatisfied" or "strongly dissatisfied."

Appendix A. The questionnaire sent to a sample of sharp-tailed grouse hunters in this study.



2012 SHARP-TAILED GROUSE HARVEST REPORT

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.



It is important that you complete and return this questionnaire even if you did not hunt or harvest any sharp-tailed grouse in Michigan during 2012.

1. Did you attempt to hunt sharp-tailed grouse in Michigan during the 2012 season?

- ¹ Yes ² No, Skip to question number 6.

2. If you attempted to hunt sharp-tailed grouse during the 2012 season, please complete the following table. Sharp-tailed grouse could be hunted only in portions of Chippewa and Mackinac counties, and you could harvest a maximum of 6 grouse during the entire season.

COUNTY HUNTED <i>(List each county that you hunted)</i>	NUMBER OF DAYS HUNTED <i>(maximum= 22 days)</i>	TYPE OF LAND	NUMBER OF SHARP-TAILED GROUSE SEEN	NUMBER OF SHARP-TAILED GROUSE HARVESTED <i>(maximum= 6 grouse)</i>
		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both		
		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both		

3. Using the adjacent calendar, please circle [O] the days that you hunted. Circle only the days you actually went afield to hunt sharp-tailed grouse in Michigan.

October 2012						
S	M	T	W	T	F	S
			10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

4. Did you normally use a dog to hunt sharp-tailed grouse in Michigan during 2012?

- ¹ Yes ² No

Questions continued on next page.

5. Please indicate how satisfied or dissatisfied you were with the following for the 2012 sharp-tailed grouse hunting season in Michigan:

(Select one choice per item.)

Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Strongly Dissatisfied	Not Applicable
----------------	--------------------	---------	-----------------------	-----------------------	----------------

- | | | | | | | |
|---|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| a. Number of sharp-tailed grouse you saw. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> | 6 <input type="checkbox"/> |
| b. Number of sharp-tailed grouse you harvested. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> | 6 <input type="checkbox"/> |
| c. Your overall sharp-tailed grouse hunting experience. | 1 <input type="checkbox"/> | 2 <input type="checkbox"/> | 3 <input type="checkbox"/> | 4 <input type="checkbox"/> | 5 <input type="checkbox"/> | 6 <input type="checkbox"/> |

6. How likely is it that you will hunt sharp-tailed grouse in Michigan in the next 2 years?

- 1 Very likely
 2 Somewhat likely
 3 Not very likely
 4 Not at all likely
 5 Not sure

7. Do you have any comments or suggestions about sharp-tailed grouse management in Michigan?

*Please return questionnaire in the enclosed postage-paid envelope.
Thank you for your help.*