



2013 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 2013, 3,867 hunters obtained a free sharp-tailed grouse stamp allowing them to hunt sharp-tailed grouse, which was 21% greater than last year (3,200 stamp holders in 2012). About 9% of the people obtaining a stamp in 2013 hunted sharp-tailed grouse (348 hunters). The number of hunters was not statistically different between 2012 and 2013 (394 versus 348). In 2013, sharp-tailed grouse hunters spent 1,427 days afield and harvested 146 sharp-tailed grouse ($\bar{x} = 0.4$ grouse/hunter). In comparison, grouse hunters spent 1,115 days afield and harvested 156 sharp-tailed grouse in 2012. Hunting effort and harvest were not significantly different between 2012 and 2013. About 19% of the hunters in 2013 harvested at least one sharp-tailed grouse. Hunters spent an average of \$203 per year hunting sharp-tailed grouse. Collectively, hunters spent \$70,700 hunting sharp-tailed grouse in 2013. About 40% of hunters were either satisfied or somewhat satisfied with their hunting experience. Moreover, 85% of hunters reported that they were very likely or somewhat likely to continue hunting sharp-tailed grouse during the next two years.

INTRODUCTION

In 2013, 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



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free sharp-tailed grouse hunting stamp. Hunters could harvest up to two birds per day with a seasonal limit of six birds.

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 2013 sharp-tailed grouse hunting season, a questionnaire (Appendix A) was sent to 3,867 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, hunting expenditures, 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 early December 2013, and two follow-up questionnaires were mailed to nonrespondents. Although 3,867 people were sent the questionnaire, 137 surveys were undeliverable resulting in an adjusted sample size of 3,730. Questionnaires were returned by 2,277 people, yielding a 61% response rate excluding undeliverables.

RESULTS

In 2013, 3,867 people obtained a stamp to hunt sharp-tailed grouse, which was 21% more than last year (3,200 stamp holders in 2012). Males obtained most of the stamps (3,660) in 2013. The average age of stamp buyers was 45 years (Figure 2), and 6.5% (250) of the stamp holders were younger than 17 years old.

About $9 \pm 1\%$ of the people that obtained a stamp went afield to hunt sharp-tailed grouse (348 hunters, Table 1). The number of hunters in 2013 was similar to the number of hunters in 2012 (Figure 3). Hunters spent 1,427 days hunting ($\bar{x} = 4.1 \pm 0.4$ days/hunter), and

harvested 146 sharp-tailed grouse ($\bar{x} = 0.4$ birds/hunter). Hunting effort and harvest were not significantly different between 2012 and 2013. (In 2012, grouse hunters spent 1,115 days afield and harvested 156 sharp-tailed grouse.) The estimated number of grouse seen per hunter was unchanged between 2012 and 2013 (5.3 grouse per hunter in 2012 and 5.4 grouse per hunter in 2013). Hunters most frequently hunted during the weekend (Figures 5 and 6).

About 19% of hunters in 2013 successfully harvested at least one sharp-tailed grouse. About 8% of hunters took one grouse; 5% took two grouse, 3% 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 $41 \pm 4\%$ 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 (25% 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 348 people hunting sharp-tailed grouse in 2013, 40% of these hunters were satisfied with their hunting experience (Table 3). Nearly 25% of the hunters rated their experience as neutral. About 27% of the hunters were dissatisfied with their experience. Overall hunter satisfaction was not significantly different between 2012 and 2013 (38% versus 40% of hunters satisfied). Approximately 25% of hunters in 2013 were satisfied with the number of grouse seen, and 16% were satisfied with the number of grouse harvested. These estimates were not significantly different from 2012.

Beginning in 2013, hunters were asked whether they were satisfied with their opportunities to access land to hunt sharp-tailed grouse, the area open to hunting, length of the hunting season, and the timing of the hunting season (Table 3). About 46% of hunters were satisfied with the opportunities they had to access land. Nearly one-third of hunters were satisfied with the amount of area open to hunting and the length of the hunting season. In addition, 44% of hunters were satisfied with the timing of the season.

Hunters spent an average of $\$203 \pm \27 per year hunting sharp-tailed grouse. Expenditures included the costs of ammunition, food, travel, and lodging. Collectively, hunters spent about $\$70,700 (\pm \$9,500)$ hunting sharp-tailed grouse in 2013.

Among people that hunted sharp-tailed grouse in 2013, $85 \pm 3\%$ of the hunters were very likely or somewhat likely to hunt sharp-tailed grouse during the next two years. About $10 \pm 3\%$ 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, 2% 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 2012 (85% versus 82% of hunters were likely to hunt in the future).

ACKNOWLEDGEMENTS

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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.

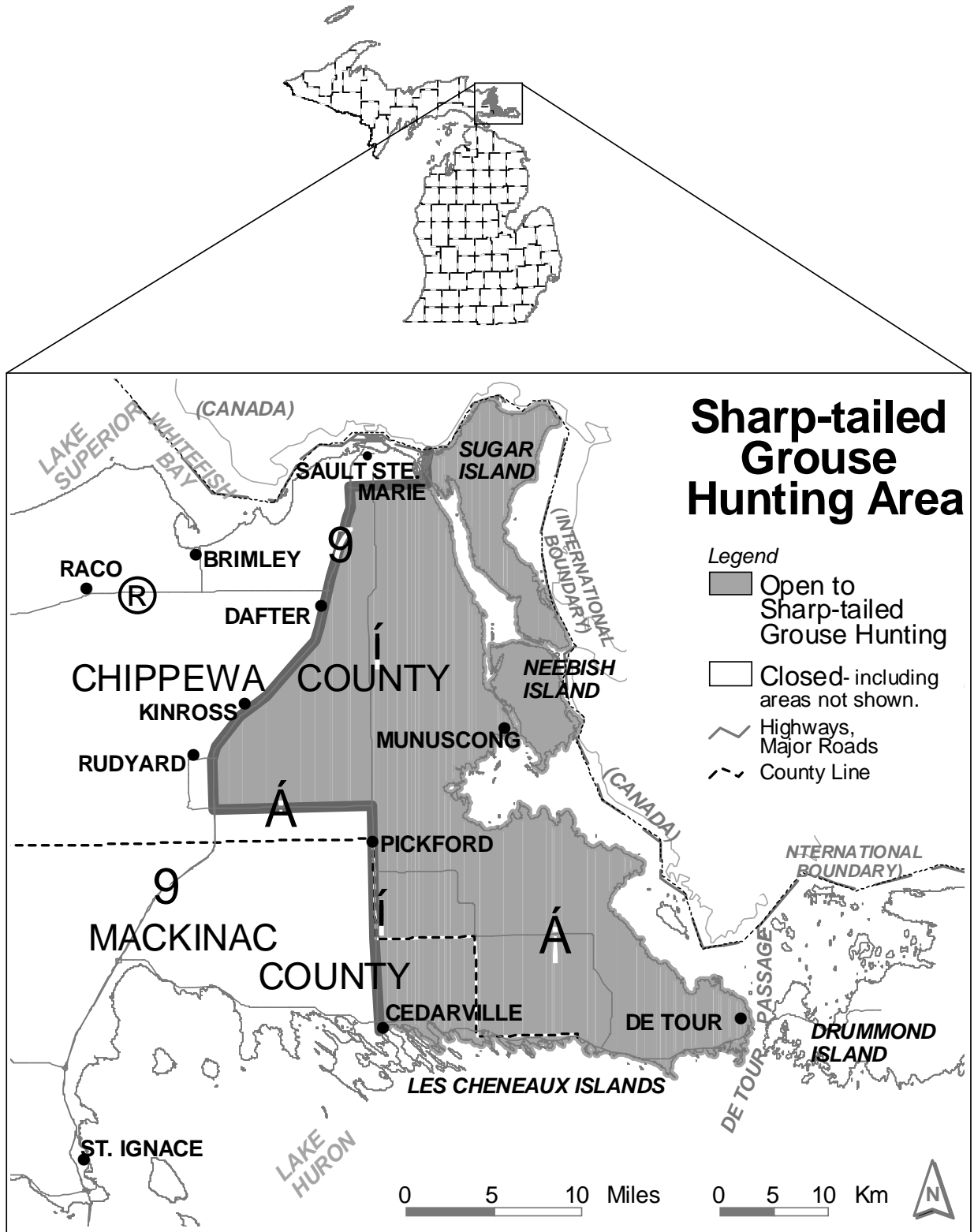


Figure 1. Area open for hunting sharp-tailed grouse in Michigan during 2013 hunting season.

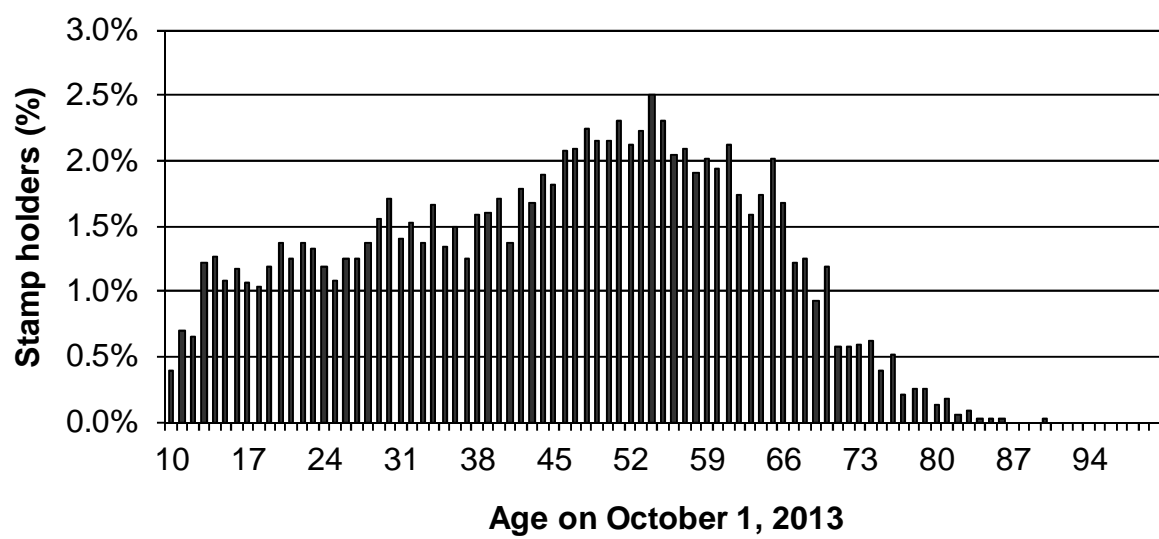


Figure 2. Age of people that obtained a sharp-tailed grouse hunting stamp in Michigan for the 2013 sharp-tailed grouse hunting season (\bar{x} = 45 years). Stamps were obtained by 3,867 people.

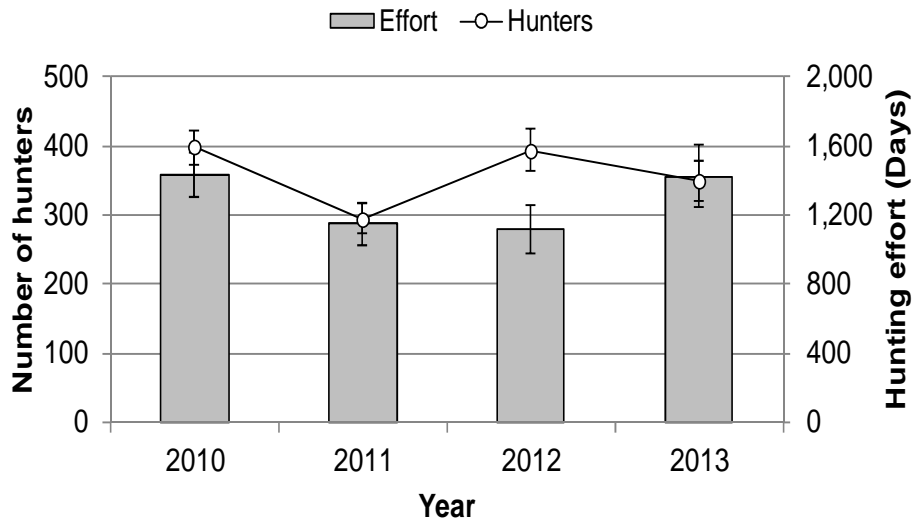


Figure 3. Estimated number of people hunting sharp-tailed grouse and the number of days of hunting effort during 2010-2013. Vertical bars represent the 95% confidence interval.

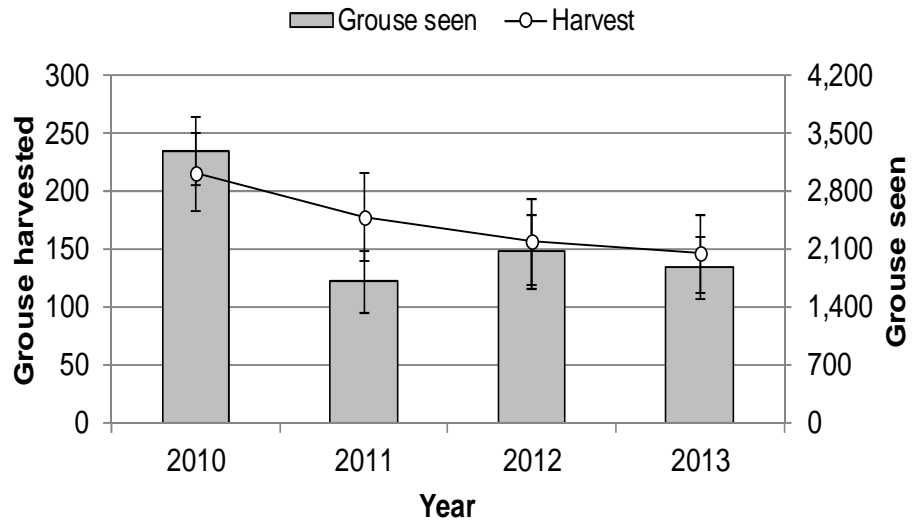


Figure 4. Estimated number of sharp-tailed grouse seen by hunters and the number of sharp-tailed grouse harvested during 2010-2013. Vertical bars represent the 95% confidence interval.

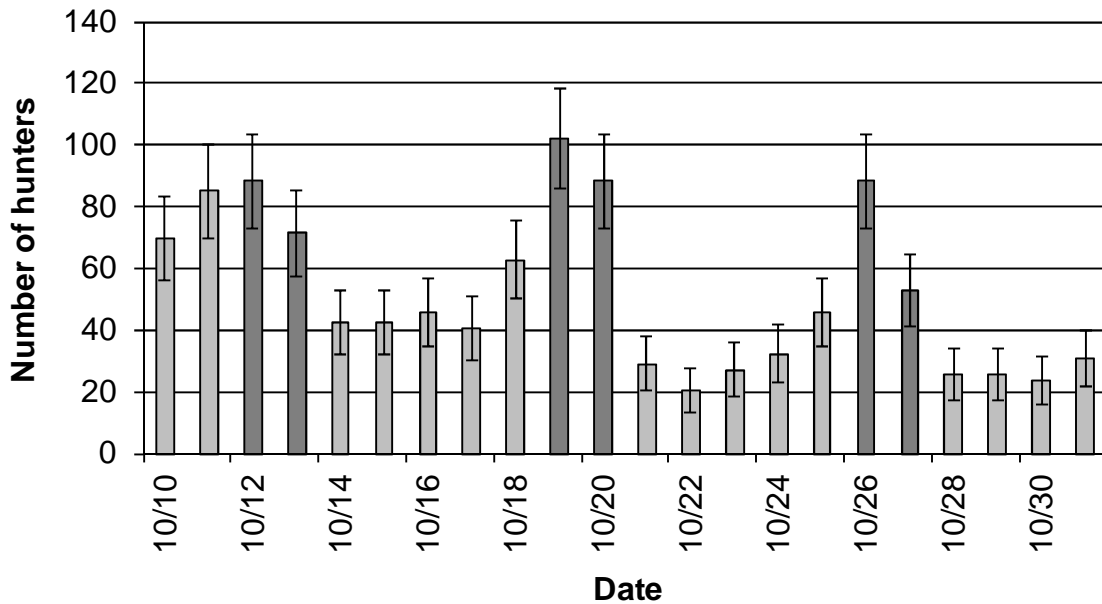


Figure 5. Estimated number of people hunting sharp-tailed grouse by date during the 2013 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

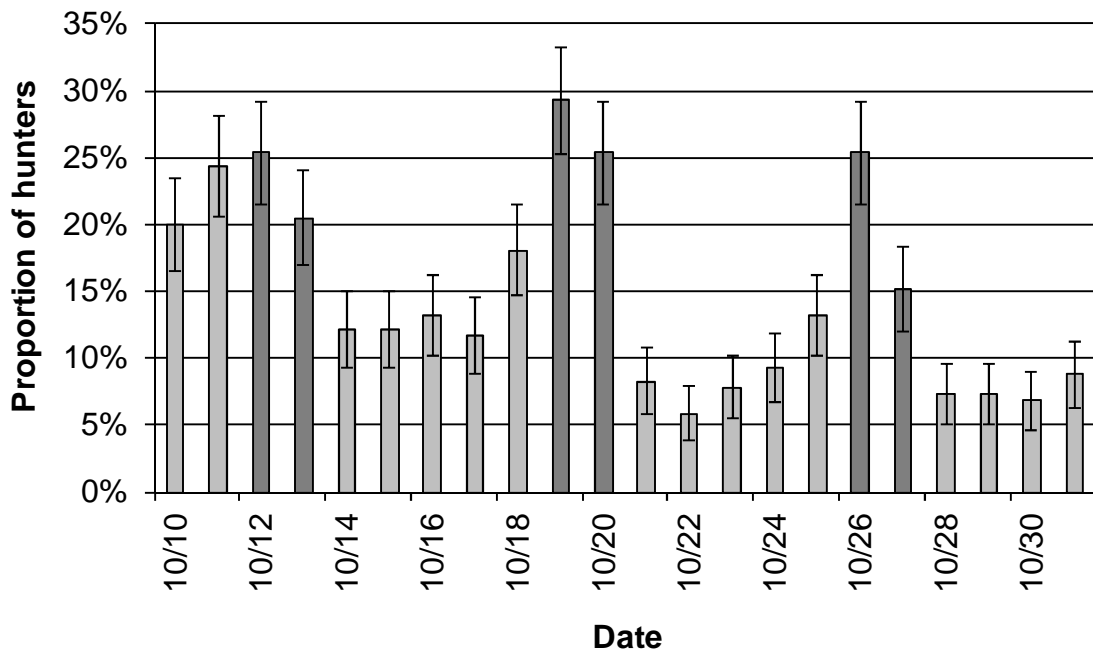


Figure 6. Estimated proportion of sharp-tailed grouse hunters afield by date during the 2013 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

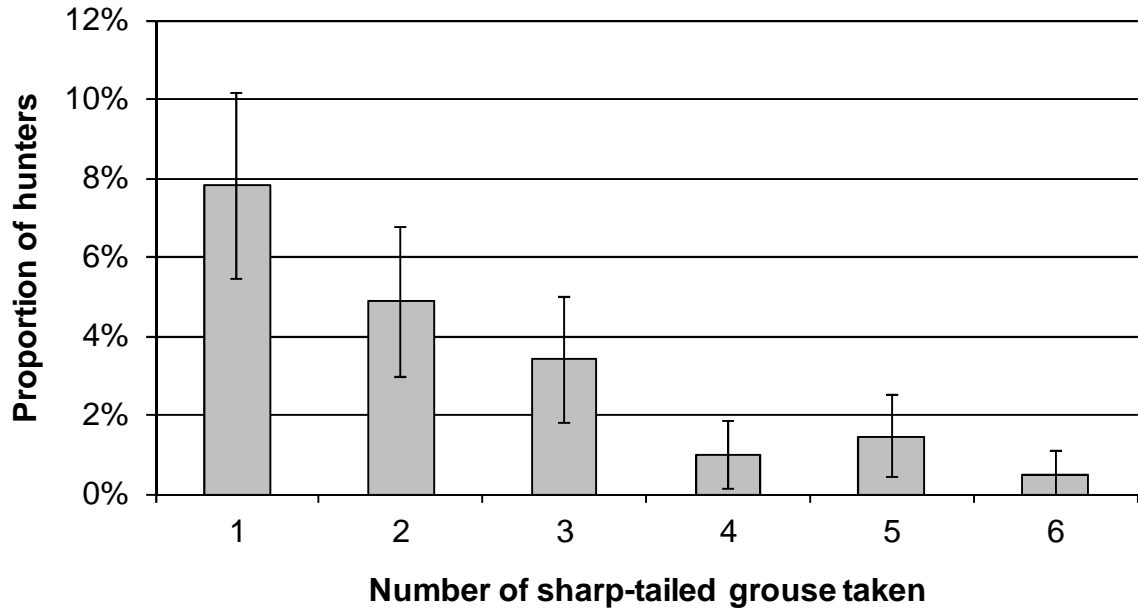


Figure 7. Estimated proportion of sharp-tailed grouse hunters that harvested one or more grouse during the 2013 hunting season, summarized by number of birds taken. Vertical bars represent the 95% confidence interval.

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 2013 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		CL
Chippewa County														
Private lands	90	15	280	67	854	294	48	22	17	7	9.5	2.9	0.5	0.2
Public lands	99	16	258	55	433	149	37	15	22	7	4.4	1.3	0.4	0.1
Both lands	87	15	481	120	375	122	34	14	22	7	4.3	1.2	0.4	0.1
Unknown	2	2	8	11	10	13	3	4	100	0	6.0	0.0	2.0	0.0
Subtotal	277	26	1,027	147	1,673	350	122	31	21	4	6.0	1.1	0.4	0.1
Mackinac County														
Private lands	15	6	36	17	8	6	0	0	0	0	0.6	0.3	0.0	0.0
Public lands	34	10	155	64	73	41	8	9	10	9	2.2	1.1	0.3	0.3
Both lands	25	8	110	42	51	28	5	6	7	8	2.0	0.9	0.2	0.3
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	75	14	301	78	132	50	14	11	7	5	1.8	0.6	0.2	0.1
Unknown County														
Subtotal	15	6	99	62	68	49	10	8	33	21	4.4	2.7	0.7	0.5
All areas														
Private lands	104	16	316	69	863	294	48	22	15	6	8.3	2.5	0.5	0.2
Public lands	136	19	469	99	574	178	56	19	23	6	4.2	1.2	0.4	0.1
Both lands	109	17	633	143	426	128	39	17	17	6	3.9	1.0	0.4	0.1
Unknown	3	3	8	11	10	13	3	4	50	63	3.0	3.8	1.0	1.3
Grand total ^c	348	29	1,427	186	1,873	365	146	34	19	3	5.4	0.9	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 2013 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	
	95%		95%		95%		95%		95%		95%		95%	
	No.	CL	No.	CL	No.	CL	No.	CL	%	CL	No.	CL	No.	CL
Used dog	143	19	392	72	1,004	297	71	23	25	6	7.0	1.9	0.5	0.1
Did not use dog	200	23	1,024	173	846	213	75	26	15	4	4.2	1.0	0.4	0.1
Unknown	5	4	10	10	24	26	0	0	0	0	4.7	4.7	0.0	0.0
Total	348	29	1,427	186	1,873	365	146	34	19	3	5.4	0.9	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 2013 sharp-tailed grouse hunting season.

Index	Satisfaction level							
	Satisfied ^a		Neutral		Dissatisfied ^b		No answer or not applicable	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Grouse seen	25	4	22	4	45	4	8	2
Grouse harvested	16	3	25	4	40	4	20	3
Hunting experience	40	4	25	4	27	4	7	2
Access to hunting land	46	4	23	4	24	4	7	2
Area open to hunting	34	4	27	4	32	4	7	2
Length of season	38	4	36	4	21	4	6	2
Timing of season	44	4	37	4	12	3	6	2

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

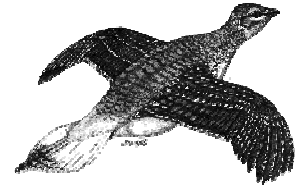
^bIncluded hunters who were "somewhat dissatisfied" or "strongly dissatisfied."

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



2013 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 2013.

1. Did you attempt to hunt sharp-tailed grouse in Michigan during the 2013 season?

- ¹ Yes ² No, Skip to question number 8.

2. If you attempted to hunt sharp-tailed grouse during the 2013 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 2013						
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 2013?

- ¹ Yes ² No

Questions continued on next page.

5. Please indicate how satisfied or dissatisfied you were with the following for the 2013 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"/>
d. Access to land for hunting sharp-tailed grouse	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
e. Size of the area open to sharp-tailed grouse hunting	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
f. Length of the sharp-tailed grouse hunting season	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>
g. Timing of the sharp-tailed grouse hunting season	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

In the next two questions, you will be asked about all your hunting trips to hunt sharp-tailed grouse in 2013. A hunting trip includes trips that take place during a single day, as well as, trips that require an overnight stay away from home. Consequently, the cost of these hunting trips can vary greatly. On a long trip you may spend money for food, travel, and lodging, while on a short trip you may only spend money for gas.

6. How many trips did you take primarily to hunt sharp-tailed grouse during 2013?

_____ Trips

7. How much did an average trip cost you during 2013 when you went primarily to hunt sharp-tailed grouse (for example, fuel, food, lodging, ammunition)?

\$_____ per trip

8. 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

9. 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.*