



MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
Wildlife Division Report No. 3652  
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## 2016 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 2016, 3,478 people were identified as potential sharp-tailed grouse hunters. About 8% of these people hunted sharp-tailed grouse in 2016 (266 hunters). The number of hunters was not statistically different between 2015 and 2016 (285 versus 266). In 2016, sharp-tailed grouse hunters spent 1,014 days afield and harvested 137 sharp-tailed grouse ( $\bar{x} = 0.5$  grouse/hunter). In comparison, grouse hunters spent 1,440 days afield and harvested 145 sharp-tailed grouse in 2015. Hunting effort and harvest were not significantly different between 2015 and 2016. About 25% of the hunters in 2016 harvested at least one sharp-tailed grouse. Hunters spent an average of \$217 per year hunting sharp-tailed grouse. Collectively, hunters spent \$57,798 hunting sharp-tailed grouse in 2016. About 57% of hunters were either satisfied or somewhat satisfied with their hunting experience. Moreover, 92% of hunters reported that they were very likely or somewhat likely to continue hunting sharp-tailed grouse during the next two years.*

### INTRODUCTION

In 2016, 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). The area open to hunting included was the same as in 2015 and included a total of about 926 square miles. About 20% of the area open to hunting was publicly owned land (i.e., land owned by federal, state, county, or township governmental agencies). In addition, the Department of Natural Resources (DNR) leased nearly 2,300 acres of private lands for public hunting of sharp-tailed grouse in Chippewa County through the Hunting Access Program (HAP) in 2016. In order to hunt sharp-tailed grouse, hunters were required to



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obtain a base hunting license (i.e., small game) and a free sharp-tailed grouse hunting stamp. Hunters could harvest up to two birds per day with a seasonal limit of six birds.

The 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**

Beginning in 2014, hunting license types in Michigan were revised (see Public Act 108 of 2013). As a result, all hunters were required to purchase a newly created base hunting license before purchasing any other type of hunting license, except for youth less than 10 years old. The base license allowed hunters to pursue small game and purchase additional licenses. Once people had purchased a base license, they were immediately presented an option to obtain the sharp-tailed grouse stamp for free. A large number of the hunters selected this option. As a result, the number of stamps issued increased sharply with the creation of the new base license type.

In order to conduct a meaningful, statistically valid survey of sharp-tailed grouse hunters, only the 2016 stamp holders that had obtained a sharp-tailed grouse stamp at least once during 2010-2013 were considered potential sharp-tailed grouse hunters in 2016. From the 105,265 stamp holders in 2016, 3,478 had obtained a stamp at least once during 2010-2013.

Following the 2016 sharp-tailed grouse hunting season, a questionnaire (Appendix A) was sent to 2,999 randomly selected people that had been identified as potential sharp-tailed grouse hunters in 2016. 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 2016, and two follow-up

questionnaires were mailed to nonrespondents. Although 2,999 people were sent the questionnaire, 44 surveys were undeliverable resulting in an adjusted sample size of 2,955. Questionnaires were returned by 1,698 people, yielding a 57% response rate excluding undeliverables.

## RESULTS

In 2016, 3,478 people were identified as potential sharp-tailed grouse hunters in 2016 (hereafter referred to as stamp holders), which was 6% less than last year (3,683 stamp holders in 2015). The group of potential hunters in 2016 was predominantly males (3,322). In addition, the average age of the group was 50 years (Figure 2).

About  $8 \pm 1\%$  of the people that obtained a stamp actually went afield to hunt sharp-tailed grouse (266 hunters, Table 1). The number of hunters in 2016 was similar to the number of hunters in 2015 (Figure 3). Hunters spent 1,014 days hunting ( $\bar{x} = 3.8 \pm 0.5$  days/hunter), and harvested 137 sharp-tailed grouse ( $\bar{x} = 0.5$  birds/hunter). Hunting effort and harvest were not significantly different between 2015 and 2016. (In 2015, grouse hunters spent 1,132 days afield and harvested 134 sharp-tailed grouse.) The estimated number of grouse seen per hunter was not significantly different between 2015 and 2016 (7.5 grouse per hunter in 2015 and 8.2 grouse per hunter in 2016). Hunters most frequently hunted during the weekend (Figures 5 and 6).

About  $34 \pm 6\%$  of the sharp-tailed grouse hunters had hunted on HAP lands in 2016 ( $90 \pm 19$  hunters). Furthermore,  $17 \pm 5\%$  of the hunters indicated they would not have hunted sharp-tailed grouse in 2016 if HAP lands had not existed ( $45 \pm 13$  hunters).

About 25% of hunters in 2016 successfully harvested at least one sharp-tailed grouse. About 9% of hunters took one grouse; 8% took two grouse, 5% took three grouse; 2% took four grouse; and about 1% took five or six grouse (Figure 7). Most grouse were taken from Chippewa County.

About  $45 \pm 6\%$  of the hunters used a dog to locate sharp-tailed grouse (Table 2). The proportion of hunters harvesting a sharp-tailed grouse was significantly greater for hunters using a dog than for hunters not using a dog (32% versus 18%).

Of the estimated 266 people hunting sharp-tailed grouse in 2016, 57% of these hunters were satisfied with their hunting experience (Table 3). Nearly 22% of the hunters rated their experience as neutral. About 16% of the hunters were dissatisfied with their experience. Overall hunter satisfaction was significantly greater in 2016 than in 2015 (57% versus 43% of hunters satisfied). Approximately 41% of hunters in 2016 were satisfied with the number of grouse seen, which was the same as reported in 2015. Eighteen percent of hunters were satisfied with the number of grouse harvested, which also was not significantly different from 2015.

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 58% of hunters were satisfied with the opportunities they

had to access land in 2016. Nearly 52% of hunters were satisfied with the amount of area open to hunting and 48% were satisfied with the length of the hunting season. In addition, 50% of hunters were satisfied with the timing of the season.

Hunters spent an average of \$217 ± \$59 per year hunting sharp-tailed grouse. Expenditures included the costs of ammunition, food, travel, and lodging. Collectively, hunters spent about \$57,798 (±\$15,696) hunting sharp-tailed grouse in 2016.

Among people that hunted sharp-tailed grouse in 2016, 92 ± 3% of the hunters were very likely or somewhat likely to hunt sharp-tailed grouse during the next two years. About 5 ± 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 2% of the hunters were not sure whether they would hunt sharp-tailed grouse again during the next two years. Finally, 1% 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 significantly higher than 2015 (92% versus 80% of hunters were likely to hunt in the future).

## **ACKNOWLEDGEMENTS**

I thank all the hunters that provided information. Theresa Riebow completed data entry. Figure 1 was prepared by Marshall Strong. Al Stewart reviewed a draft version of this report.

## **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.

## Sharp-tailed Grouse Hunting Areas

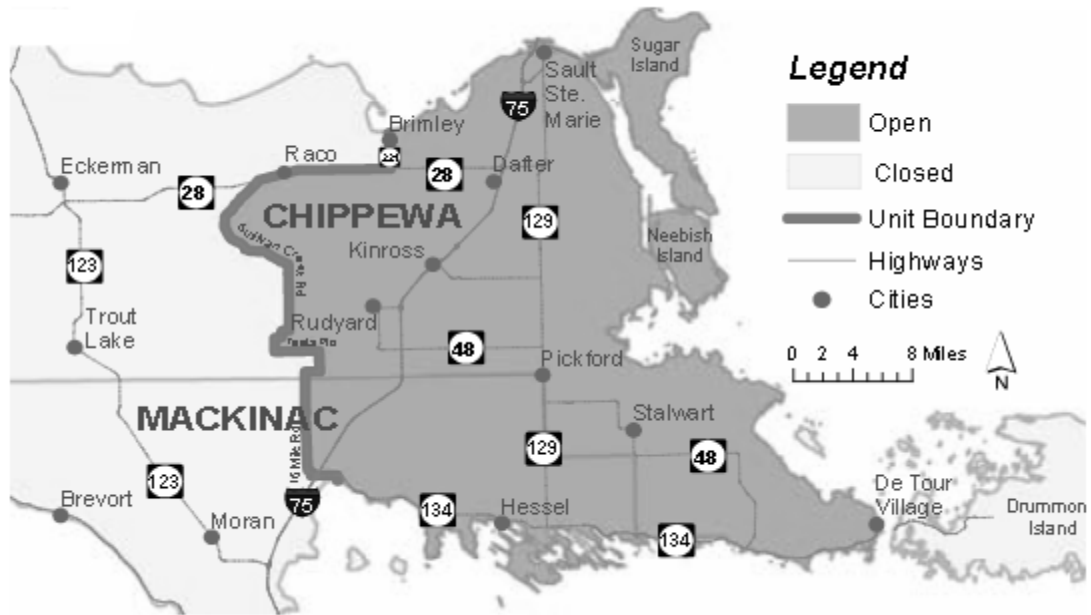


Figure 1. Area open for hunting sharp-tailed grouse in Michigan during 2016 hunting season.

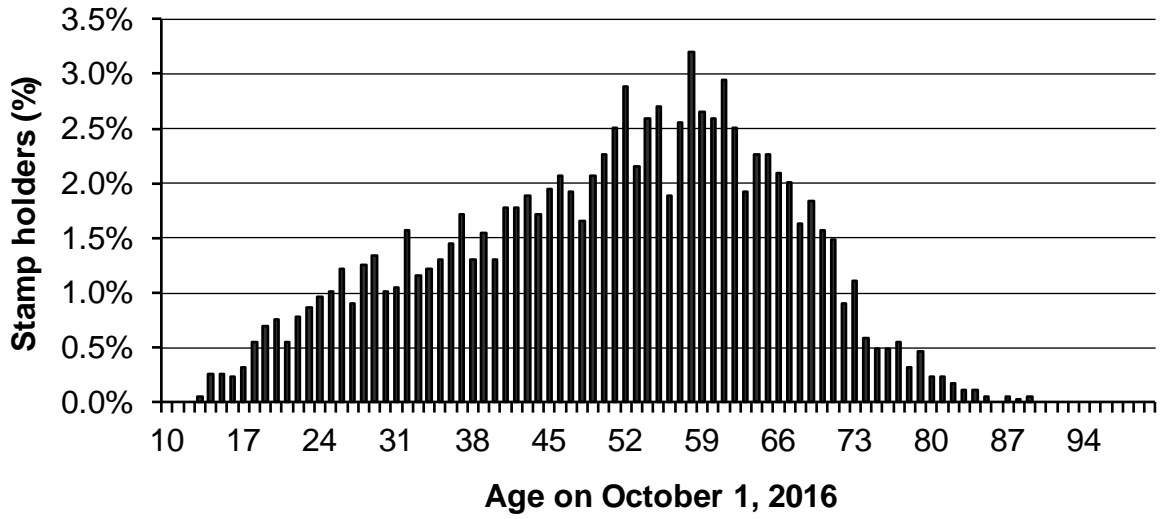


Figure 2. Age of people that obtained a sharp-tailed grouse hunting stamp and were likely to hunt sharp-tailed grouse in Michigan ( $\bar{x} = 50$  years). In 2016, 3,478 people were identified as potential sharp-tailed grouse hunters.

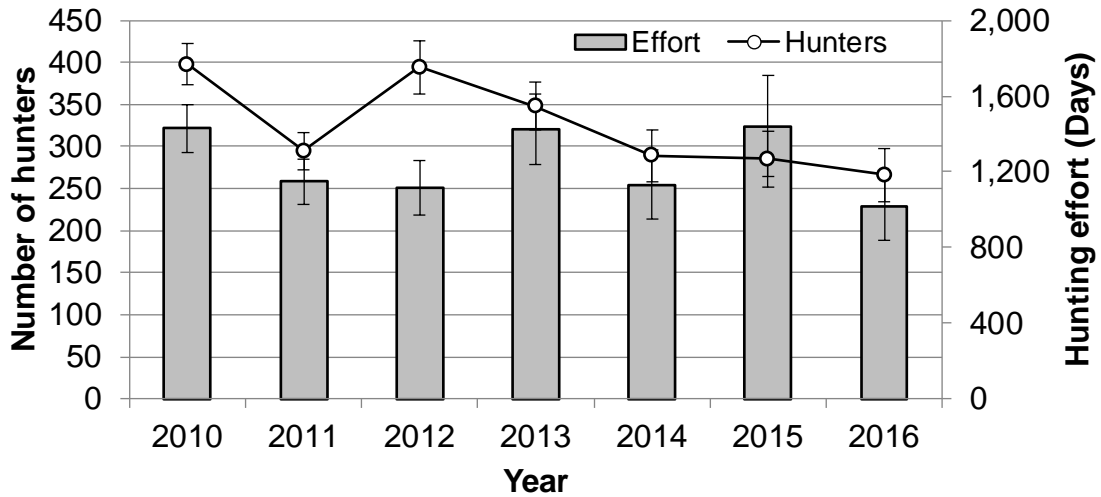


Figure 3. Estimated number of people hunting sharp-tailed grouse and the number of days of hunting effort during 2010-2016. Vertical bars represent the 95% confidence interval.

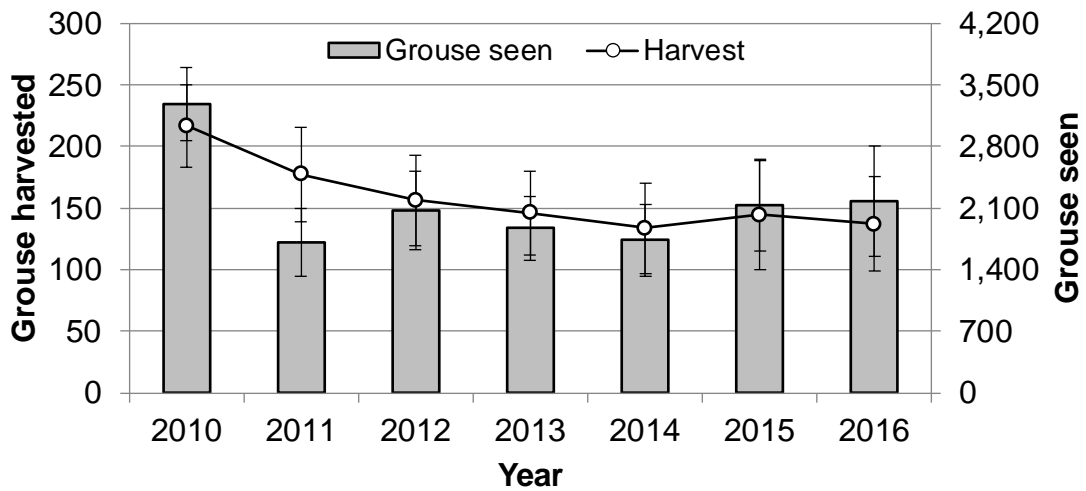


Figure 4. Estimated number of sharp-tailed grouse seen by hunters and the number of sharp-tailed grouse harvested during 2010-2016. Vertical bars represent the 95% confidence interval.

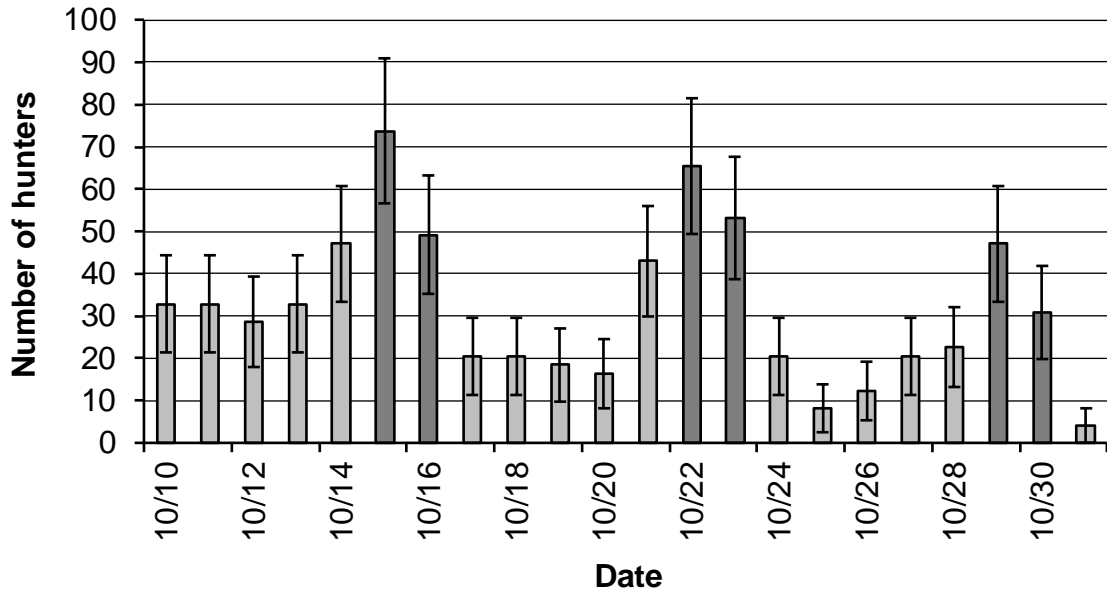


Figure 5. Estimated number of people hunting sharp-tailed grouse by date during the 2016 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

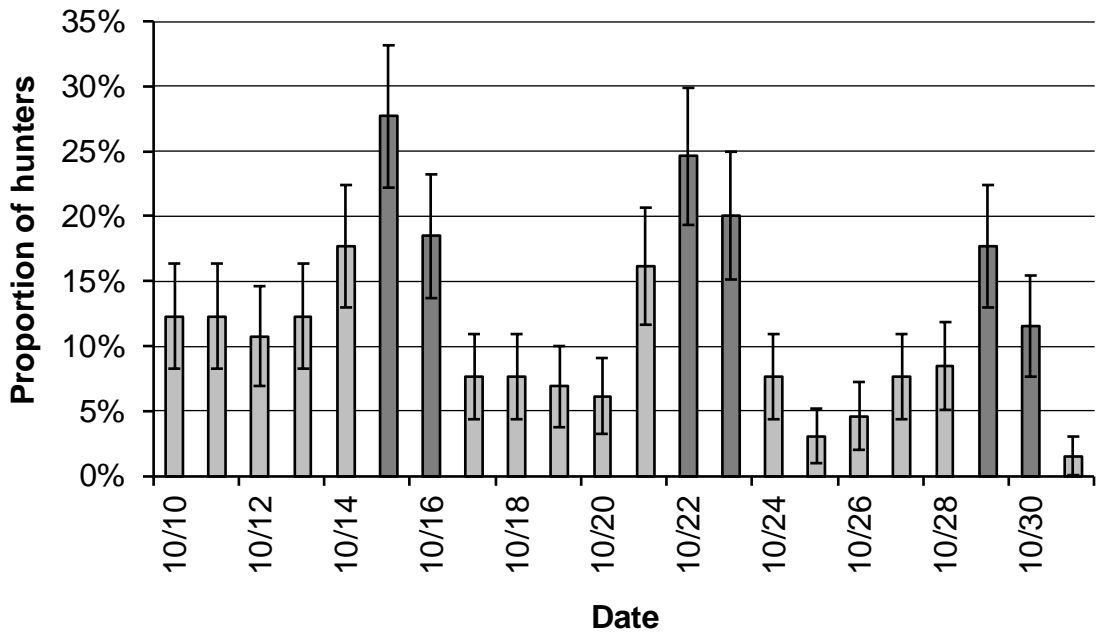


Figure 6. Estimated proportion of sharp-tailed grouse hunters afield by date during the 2016 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.



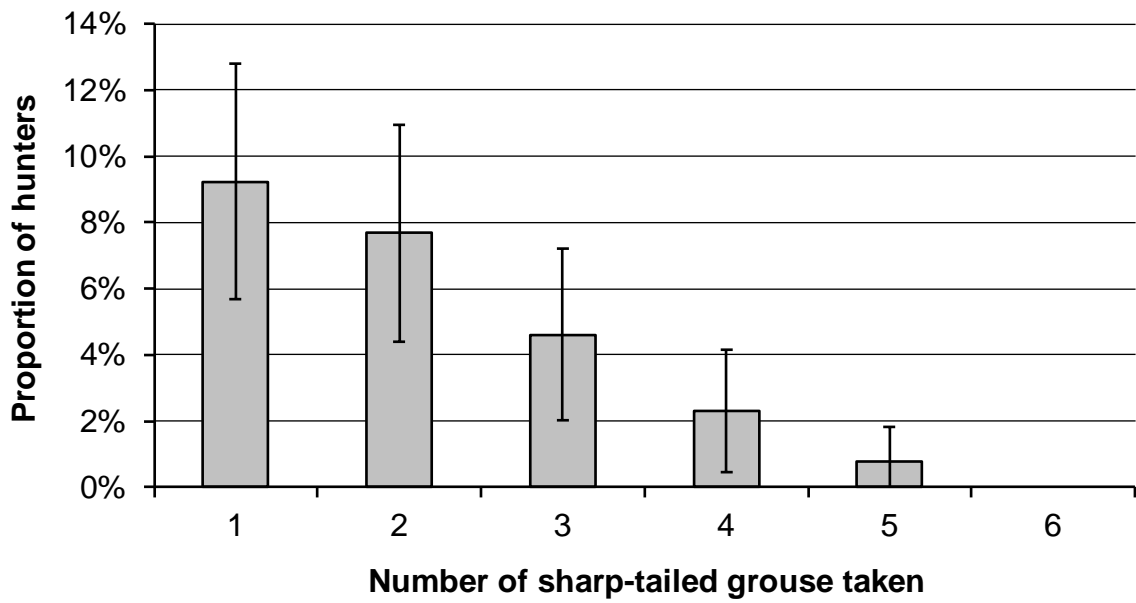


Figure 7. Estimated proportion of sharp-tailed grouse hunters that harvested one or more grouse during the 2016 hunting season, summarized by number of birds taken. Vertical bars represent the 95% confidence interval.

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 2016 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 <sup>a</sup>		Grouse seen per hunter		Harvest per hunter <sup>b</sup>	
	No.	95%	No.	95%	No.	95%	No.	95%	%	95%	No.	95%	No.	95%
		CL		CL		CL		CL		CL		CL		CL
<b>Chippewa County</b>														
Private lands	94	19	242	67	868	329	37	18	22	9	9.2	2.9	0.4	0.2
Public lands	61	16	229	74	617	459	31	17	27	11	10.0	7.0	0.5	0.3
Both lands	74	17	301	89	502	182	41	18	36	11	6.8	1.9	0.6	0.2
Unknown	4	4	2	3	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	231	30	774	134	1,987	611	109	32	27	6	8.6	2.4	0.5	0.1
<b>Mackinac County</b>														
Private lands	8	6	25	18	55	46	6	9	25	30	6.8	3.0	0.8	0.9
Public lands	33	11	94	45	90	74	6	6	13	12	2.8	2.1	0.2	0.2
Both lands	18	9	121	64	49	36	16	14	33	22	2.7	1.5	0.9	0.6
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	59	15	240	80	195	94	29	18	21	11	3.3	1.3	0.5	0.3
<b>All areas</b>														
Private lands	98	20	266	72	924	333	43	20	23	9	9.4	2.8	0.4	0.2
Public lands	90	19	324	87	707	465	37	19	23	9	7.8	4.9	0.4	0.2
Both lands	84	18	422	133	551	187	57	24	34	10	6.6	1.7	0.7	0.2
Unknown	4	4	2	3	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Grand total <sup>c</sup>	266	31	1,014	174	2,181	625	137	38	25	5	8.2	2.1	0.5	0.1

<sup>a</sup>Percentage of hunters harvesting at least one sharp-tailed grouse.

<sup>b</sup>The season bag limit was six birds.

<sup>c</sup>Number 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 2016 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 <sup>a</sup>		Grouse seen per hunter		Harvest per hunter <sup>b</sup>	
	No.	95% CL	No.	95% CL	No.	95% CL	No.	95% CL	%	95% CL	No.	95% CL	No.	95% CL
Used dog	121	22	350	84	1,528	602	86	31	32	9	12.6	4.4	0.7	0.2
Did not use dog	135	23	600	146	606	168	49	22	18	7	4.5	1.0	0.4	0.2
Unknown	10	6	63	50	47	49	2	3	20	25	4.6	3.8	0.2	0.3
Total	266	31	1,014	174	2,181	625	137	38	25	5	8.2	2.1	0.5	0.1

<sup>a</sup>Percentage of hunters harvesting at least one sharp-tailed grouse.

<sup>b</sup>The season bag limit was six birds.

Table 3. Hunters' level of satisfaction with the 2016 sharp-tailed grouse hunting season.

Index	Satisfaction level							
	Satisfied <sup>a</sup>		Neutral		Dissatisfied <sup>b</sup>		No answer or not applicable	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Grouse seen	41	6	25	5	25	5	8	3
Grouse harvested	18	5	31	6	31	6	20	5
Hunting experience	57	6	22	5	16	5	5	3
Access to hunting land	58	6	24	5	12	4	6	3
Area open to hunting	52	6	21	5	19	5	8	3
Length of season	48	6	26	5	22	5	4	2
Timing of season	58	6	31	6	7	3	4	2

<sup>a</sup>Included hunters who were "very satisfied" or "somewhat satisfied."

<sup>b</sup>Included hunters who were "somewhat dissatisfied" or "strongly dissatisfied."

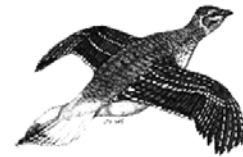
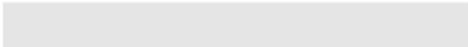
Appendix A. The questionnaire sent to a sample of sharp-tailed grouse hunters in this study.



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## 2016 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 2016.*

1. Did you attempt to hunt sharp-tailed grouse in Michigan during the 2016 season?

- 1  Yes                      2  No, Skip to question number 10.

2. If you attempted to hunt sharp-tailed grouse during the 2016 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. In 2016, the Department of Natural Resources leased about 4,000 acres of private lands for public hunting of sharp-tailed grouse in Chippewa County through the Hunting Access Program (HAP). Did you hunt sharp-tailed grouse on this HAP land during 2016?

- 1  Yes                      2  No, Skip to question number 5.

4. If you hunted on HAP lands, would you have hunted sharp-tailed grouse during the past year if the private lands enrolled in HAP were not available for hunting? *(Select one.)*

- 1  Yes                      2  No                      3  Not sure

*Questions continued on next page.*

5. 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 2016						
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					

6. Did you normally use a dog to hunt sharp-tailed grouse in Michigan during 2016?

1  Yes                      2  No

7. Please indicate how satisfied or dissatisfied you were with the following for the 2016 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 2016. 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.

8. How many trips did you take primarily to hunt sharp-tailed grouse during 2016?

\_\_\_\_\_ Trips

9. How much did an average trip cost you during 2016 when you went primarily to hunt sharp-tailed grouse (for example, fuel, food, lodging, ammunition)?

\$\_\_\_\_\_ per trip

10. 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

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

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