



MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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2018 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 2018, 3,292 people were identified as potential sharp-tailed grouse hunters. About 6% of these people hunted sharp-tailed grouse in 2018 (204 hunters). The number of hunters in 2018 declined significantly by 23% from 2017. In 2018, sharp-tailed grouse hunters spent 703 days afield and harvested 106 sharp-tailed grouse ($\bar{x} = 0.5$ grouse/hunter). In comparison, grouse hunters spent 999 days afield and harvested 167 sharp-tailed grouse in 2017. Hunting effort and harvest were not significantly different between 2017 and 2018. About 27% of the hunters in 2018 harvested at least one sharp-tailed grouse. Hunters spent an average of \$228 per year hunting sharp-tailed grouse. Collectively, hunters spent \$46,445 hunting sharp-tailed grouse in 2018. About 55% of the hunters were either satisfied or somewhat satisfied with their hunting experience. Moreover, 87% of the hunters reported that they were very likely or somewhat likely to continue hunting sharp-tailed grouse during the next two years.

INTRODUCTION

In 2018, 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 was the same as in 2017 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 5,000 acres of private lands for public hunting of sharp-tailed grouse in Chippewa County through the Hunting Access Program (HAP) in 2018. 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 hunters 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 2018 stamp holders that had obtained a sharp-tailed grouse stamp at least once during 2010-2013 were considered potential sharp-tailed grouse hunters in 2018. From the 131,031 stamp holders in 2018, 3,292 had obtained a stamp at least once during 2010-2013.

Following the 2018 sharp-tailed grouse hunting season, a questionnaire (Appendix A) was sent to 3,000 randomly selected people that had been identified as potential sharp-tailed grouse hunters in 2018. Hunters receiving the questionnaire were asked to report if they hunted sharp-tailed grouse, the number of days spent afield, and the 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 were equivalent to stating the difference between the means was larger than would be expected 95 out of 100 times ($P < 0.05$), if the study had been repeated (Payton et al. 2003).

RESULTS

Questionnaires were mailed initially during early February 2019, and two follow-up questionnaires were mailed to nonrespondents. Although 3,000 people were sent the questionnaire, 36 surveys were undeliverable resulting in an adjusted sample size of 2,964. Questionnaires were returned by 1,676 people, yielding a 57% response rate excluding undeliverables.

In 2018, 3,292 people were identified as potential sharp-tailed grouse hunters (hereafter referred to as stamp holders), which was 7% fewer than last year (3,536 stamp holders in 2017). The group of potential hunters in 2018 was predominantly males (3,149). In addition, the average age of the group was 52 years (Figure 2).

About $6 \pm 1\%$ of the people that obtained a stamp actually went afield to hunt sharp-tailed grouse (204 hunters, Table 1). The number of hunters in 2018 declined significantly by 23% from 2017 (Figure 3). Hunters spent 703 days hunting ($\bar{x} = 3.4 \pm 0.5$ days/hunter) and harvested 106 sharp-tailed grouse ($\bar{x} = 0.5$ birds/hunter) in 2018. Hunting effort and harvest were not significantly different between 2017 and 2018. The estimated number of grouse seen per hunter was not significantly different between 2017 and 2018 (8.4 grouse per hunter in 2017 and 10.2 grouse per hunter in 2018). Hunters most frequently hunted during weekends (Figures 5 and 6).

About $29 \pm 6\%$ of the sharp-tailed grouse hunters had hunted on HAP lands in 2018 (59 ± 15 hunters). Furthermore, $17 \pm 5\%$ of the hunters indicated they would not have hunted sharp-tailed grouse in 2018 if HAP lands had not existed (35 ± 11 hunters).

About 27% of hunters in 2018 successfully harvested at least one sharp-tailed grouse. About 17% of hunters took one grouse; 4% took two grouse, 2% took three grouse; 1% took four grouse, and about 3% took five or six grouse (Figure 7). Most grouse were taken from Chippewa County (Table 1).

About $44 \pm 7\%$ 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 the hunters using a dog and the hunters not using a dog (30% versus 25%).

Of the estimated 204 people hunting sharp-tailed grouse in 2018, 55% of these hunters were satisfied with their hunting experience (Table 3). Nearly 24% of the hunters rated their experience as neutral. About 17% of the hunters were dissatisfied with their experience. Overall hunter satisfaction was not significantly different between 2018 and 2017 (55% versus 50% of hunters satisfied in 2017). Approximately 38% of hunters in 2018 were satisfied with the number of grouse seen, which was similar to the level reported in 2017. Twenty-two percent of hunters were satisfied with the number of grouse harvested, which also was not significantly different from 2017.

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 60% of hunters were satisfied with the opportunities they had to access land in 2018. Nearly 50% of hunters were satisfied with the amount of area open

to hunting and 50% were satisfied with the length of the hunting season. In addition, 53% of hunters were satisfied with the timing of the season.

Hunters spent an average of \$228 ± \$37 per year hunting sharp-tailed grouse. Expenditures included the costs of ammunition, food, travel, and lodging. Collectively, hunters spent about \$46,445 (±\$7,635) hunting sharp-tailed grouse in 2018.

Among people that hunted sharp-tailed grouse in 2018, 87 ± 5% of the hunters were very likely or somewhat likely to hunt sharp-tailed grouse during the next two years. About 10 ± 4% 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 4% of the hunters were not sure whether they would hunt sharp-tailed grouse again during the next two years. The proportion of hunters likely to hunt grouse during the next two years was not significantly different from levels reported in 2017 (87% versus 86% in 2017).

ACKNOWLEDGEMENTS

I thank all the hunters that provided information. Theresa Riebow completed data entry. Figure 1 was prepared by Marshall Strong. Mike Donovan and 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

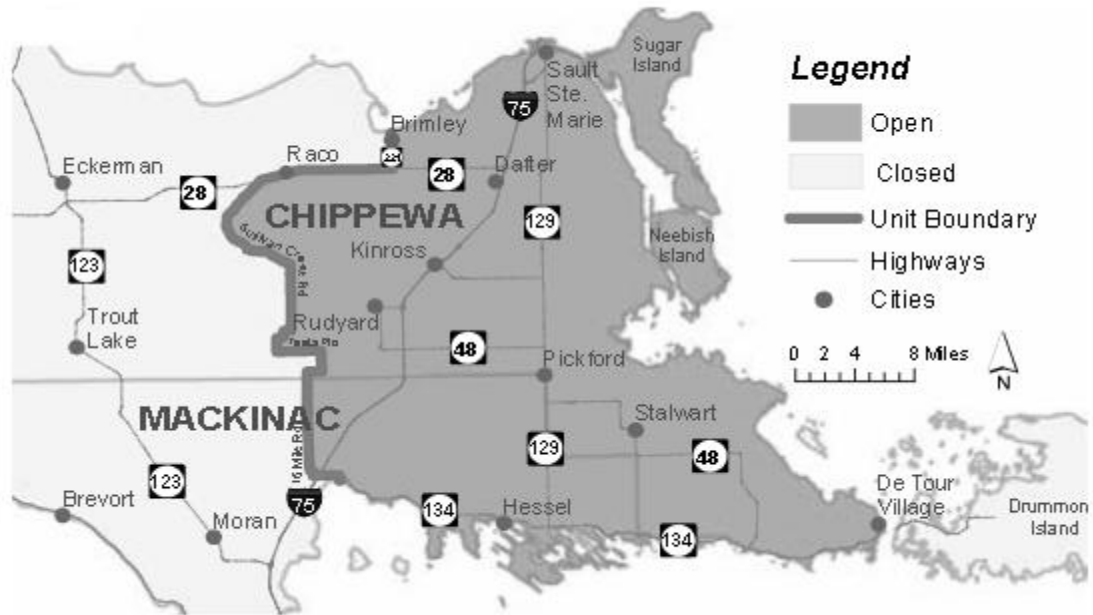


Figure 1. Area open for hunting sharp-tailed grouse in Michigan during 2018 hunting season.

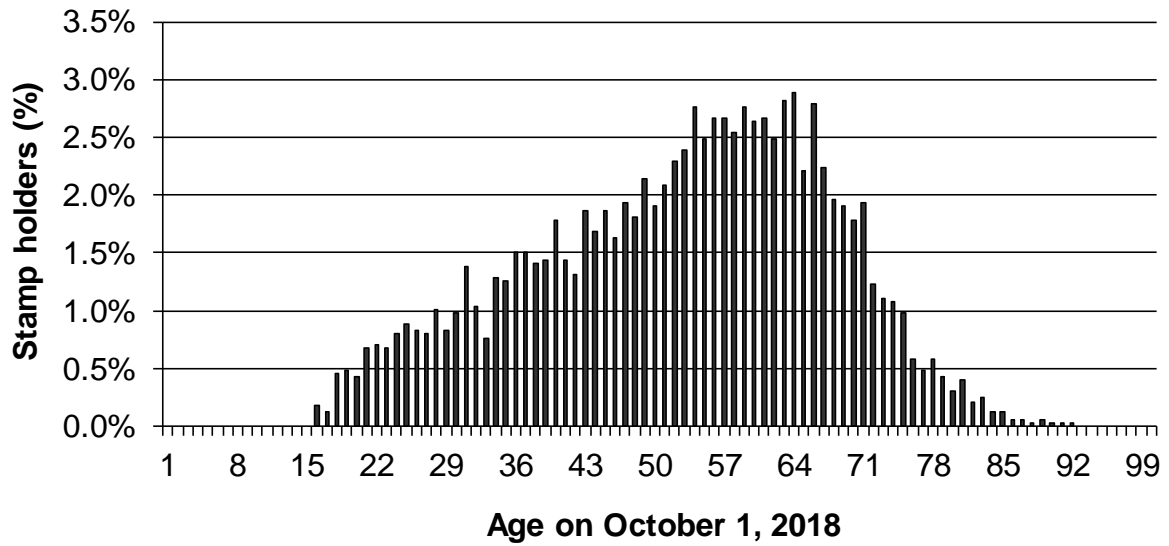


Figure 2. Age of people that obtained a sharp-tailed grouse hunting stamp and were likely to hunt sharp-tailed grouse in Michigan (\bar{x} = 52 years). In 2018, 3,292 people were identified as potential sharp-tailed grouse hunters.

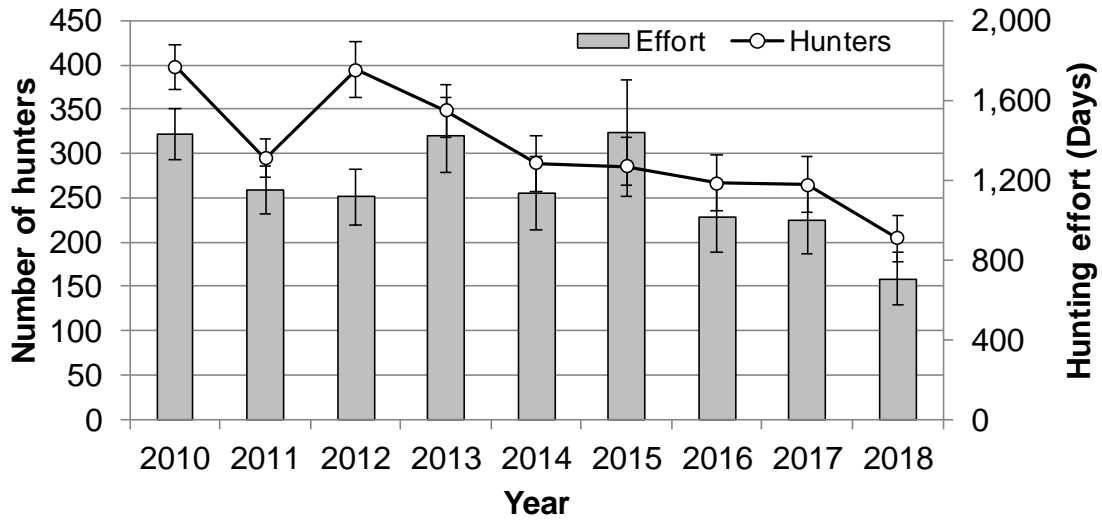


Figure 3. Estimated number of people hunting sharp-tailed grouse and the number of days of hunting effort during 2010-2018. Vertical bars represent the 95% confidence interval.

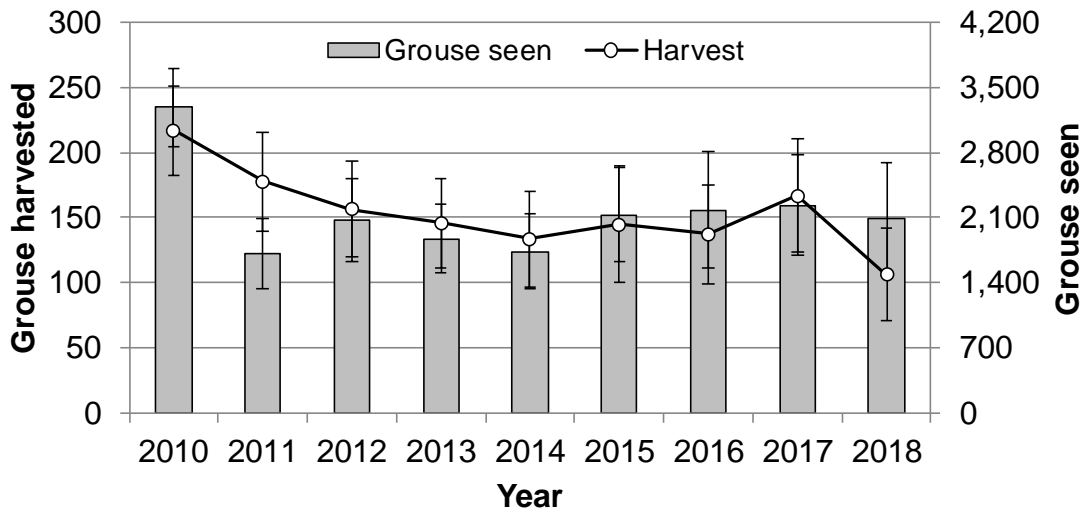


Figure 4. Estimated number of sharp-tailed grouse seen by hunters and the number of sharp-tailed grouse harvested during 2010-2018. Vertical bars represent the 95% confidence interval.

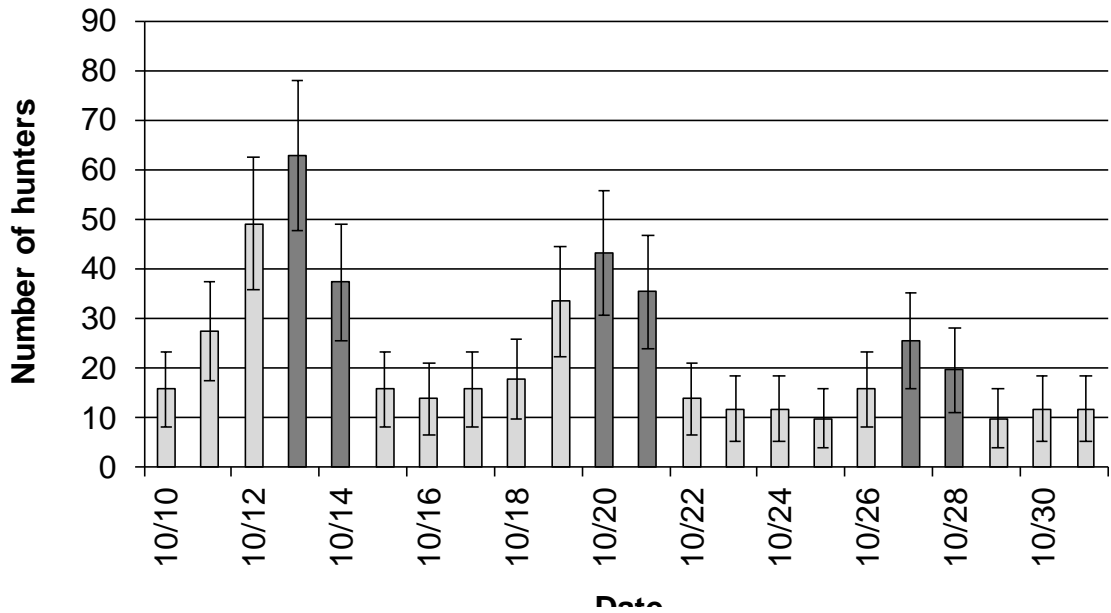


Figure 5. Estimated number of people hunting sharp-tailed grouse by date during the 2018 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

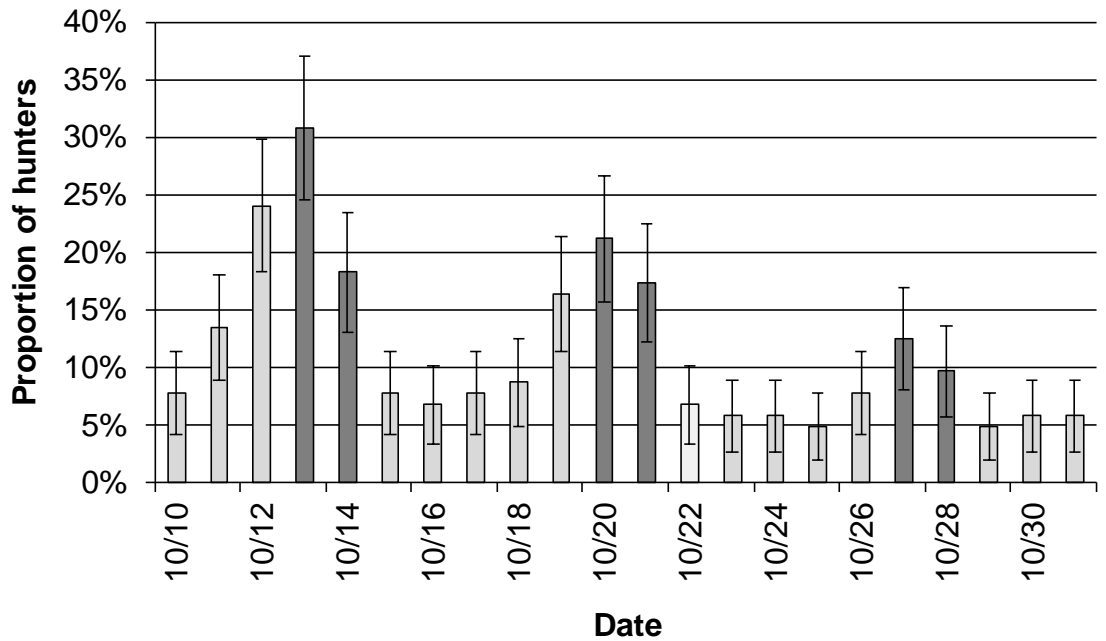


Figure 6. Estimated proportion of sharp-tailed grouse hunters afield by date during the 2018 hunting season. Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval.

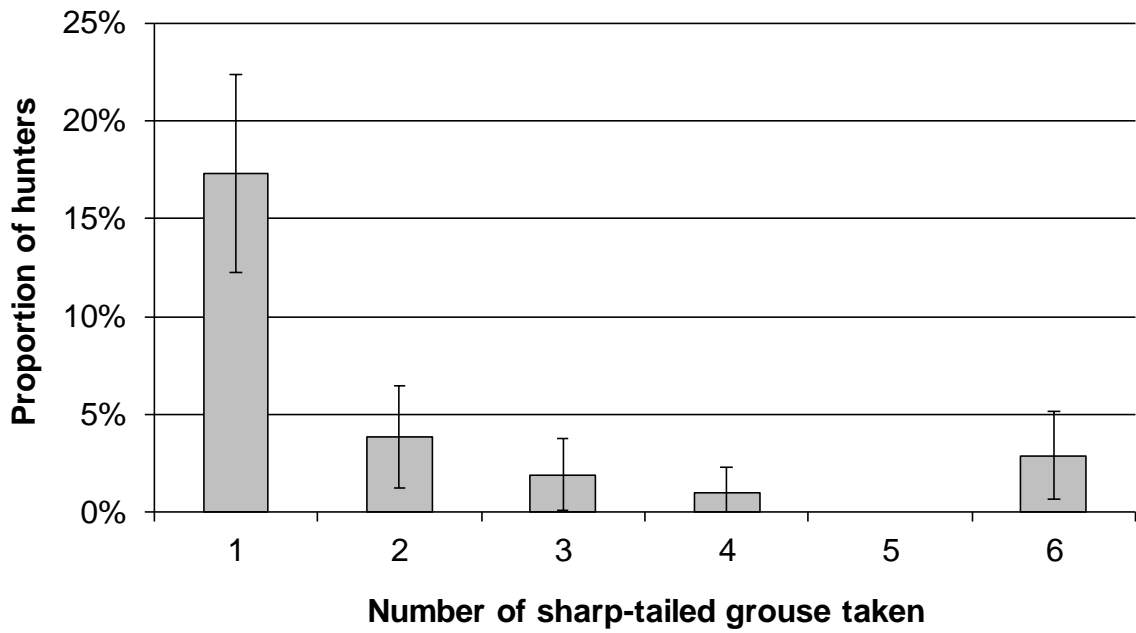


Figure 7. Estimated proportion of sharp-tailed grouse hunters that harvested one or more grouse during the 2018 hunting season, summarized by number of birds taken. Vertical bars represent the 95% confidence interval.

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 2018 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	75	16	226	74	574	220	31	21	18	9	7.7	2.4	0.4	0.3
Public lands	47	13	122	48	660	408	18	12	21	11	14.0	7.7	0.4	0.2
Both lands	45	13	228	89	719	387	47	26	48	14	15.9	7.3	1.0	0.5
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	167	24	576	124	1,952	601	96	35	27	7	11.7	3.2	0.6	0.2
Mackinac County														
Private lands	10	6	14	9	16	15	4	4	40	30	1.6	1.1	0.4	0.3
Public lands	24	9	53	23	59	33	2	3	8	11	2.5	1.0	0.1	0.1
Both lands	14	7	61	37	55	47	4	4	29	23	4.0	2.7	0.3	0.2
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	47	13	128	45	130	60	10	6	21	11	2.8	1.0	0.2	0.1
All areas														
Private lands	82	17	240	74	589	220	35	21	21	9	7.1	2.2	0.4	0.2
Public lands	69	16	175	55	719	409	20	12	17	9	10.5	5.4	0.3	0.2
Both lands	59	15	289	96	774	389	51	26	43	12	13.1	5.7	0.9	0.4
Unknown	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Grand total ^c	204	27	703	132	2,082	604	106	36	27	6	10.2	2.6	0.5	0.2

^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 2018 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	90	18	240	65	1,055	414	51	23	30	9	11.7	3.9	0.6
Did not use dog	110	20	430	110	772	314	55	27	25	8	7.0	2.6	0.5	0.2
Unknown	4	4	33	39	255	313	0	0	0	0	65.0	48.6	0.0	0.0
Total	204	27	703	132	2,082	604	106	36	27	6	10.2	2.6	0.5	0.2

^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 2018 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	38	7	23	6	33	6	7	3
Grouse harvested	22	6	29	6	30	6	19	5
Hunting experience	55	7	24	6	17	5	4	3
Access to hunting land	60	7	17	5	12	4	12	4
Area open to hunting	50	7	19	5	22	6	9	4
Length of season	50	7	25	6	19	5	6	3
Timing of season	53	7	33	6	10	4	5	3

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

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

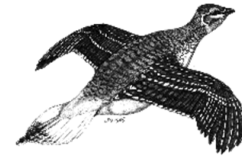
Appendix A. The questionnaire sent to a sample of sharp-tailed grouse hunters in this study.



MICHIGAN DEPARTMENT OF NATURAL RESOURCES - WILDLIFE DIVISION
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2018 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 2018.

1. Did you attempt to hunt sharp-tailed grouse in Michigan during the 2018 season?

¹ Yes ² No, Skip to question number 10.

2. If you attempted to hunt sharp-tailed grouse during the 2018 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 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	
		¹ <input type="checkbox"/> Private	² <input type="checkbox"/> Public	³ <input type="checkbox"/> Both	

3. In 2018, the Department of Natural Resources leased about 5,000 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 2018?

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 2018						
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 2018?

1 Yes 2 No

7. Please indicate how satisfied or dissatisfied you were with the following for the 2018 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 2018. 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 2018?

_____ Trips

9. How much did an average trip cost you during 2018 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?

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