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2017 SMALL GAME HARVEST SURVEY

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ABSTRACT

A survey was completed to estimate the number of people hunting small game species, their days afield, and harvest during the 2017 hunting seasons. The survey also was used to investigate hunter satisfaction, to measure compliance with the Harvest Information Program (HIP), to estimate the number of people hunting on Hunting Access Program (HAP) lands and on Grouse Enhanced Management Sites (GEMS), and to estimate the number of hunters using the internet application Mi-Hunt to locate hunting areas. An estimated 159,270 people hunted small game species in 2017, which was significantly less by 16% from the number of hunters reported in 2015. Small game hunters most often sought ruffed grouse, squirrels, and cottontail rabbits. The statewide number of hunters pursuing grouse, squirrels, and crows declined significantly between 2015 and 2017; however, the estimated number of hunters pursuing the other species was not significantly different between the two years. Statewide estimates of hunting effort and harvest did not change significantly for most species between 2015 and 2017, except for the estimated number of days spent hunting grouse and estimated number of grouse, rabbits, and squirrels taken decreased significantly in 2017. The proportion of small game hunters that were satisfied with their overall small game hunting experience was similar in 2015 and 2017 (67% satisfied in 2015 versus 66% in 2017). In 2017, 81% of woodcock hunters had registered with the HIP. An estimated 2,261 hunters spent 8,912 days hunting small game on HAP land, and 7,763 hunters spent 26,064 days hunting ruffed grouse and woodcock on GEMS. An estimated 12,599 small game hunters used Mi-Hunt to assist with their small game hunting. Most of these hunters were satisfied with how easy the application was to use (73%), the quality of the maps (79%), and the accuracy of information (76%) from Mi-Hunt.



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INTRODUCTION

The Natural Resources Commission and the Michigan Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. This responsibility is shared with the U.S. Fish and Wildlife Service (USFWS) for the management of migratory species such as woodcock (*Scolopax minor*), ducks (Anatinae), and geese (*Branta* and *Anser* spp.). Harvest surveys are one of the management tools used by the DNR to accomplish its statutory responsibility. Estimates derived from harvest surveys, as well as breeding bird counts, are used to monitor game populations and help establish harvest regulations.

Since the 1950s, the primary small game species harvested in Michigan have been ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), American woodcock, cottontail rabbit (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), squirrels (*Sciurus* spp. and *Tamiasciurus hudsonicus*), American crow (*Corvus brachyrhynchos*) and coyote (*Canis latrans*) (Frawley 2018). Most of these animals could be harvested during fall and early winter (Table 1) by a person possessing a base hunting license. Woodcock hunters also were required to register with the National Migratory Bird Harvest Information Program (HIP) and obtain a free woodcock stamp.

The HIP is a cooperative effort between state wildlife agencies and the USFWS. It was implemented to improve knowledge about the harvest of migratory game birds. Beginning in 1995, any person who hunted migratory game birds in Michigan was required to register with HIP and answer several questions about their hunting experience during the previous year. The HIP provided the USFWS with a national registry of migratory bird hunters from which they can select participants for harvest surveys.

Estimating harvest, hunter numbers, and hunting effort were the primary objectives of the small game harvest survey. This survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to investigate hunter satisfaction with the 2017 hunting season and small game numbers, to estimate the number of people hunting on Hunting Access Program (HAP) lands, to estimate the number of people hunting on land managed through the Grouse Enhanced Management Sites (GEMS), and to estimate the number of hunters using the internet application Mi-Hunt to locate hunting areas. In 2017, the DNR leased about 205 private properties totaling about 24,000 acres throughout Michigan for public hunting through the Hunting Access Program (HAP). In addition, the DNR managed 18 GEMS, ranging from 500 to 12,000 acres, located in the northern Lower and Upper Peninsulas. GEMS were locations where hunters can hunt grouse and woodcock.

METHODS

Following the 2017 small game hunting seasons, a questionnaire (Appendix A) was sent to 10,995 randomly selected people that were eligible to hunt small game species. Hunters reported species hunted, county hunted, type of land on which hunting occurred (public or private lands), number of days spent afield, and number of animals harvested. In addition, hunters were asked to rate their overall hunting experience and indicate their satisfaction with the amount of game seen and amount harvested, and the number of days in the hunting season.

A new hunting license structure took effect in Michigan on March 1, 2014. The small game hunting license was eliminated and replaced by a new base hunting license. This base license was required for any person hunting game species in Michigan. Consequently, a separate hunting license for small game species no longer existed starting in 2015. To accommodate the new license structure, a new sampling design was adopted starting in 2015. Estimates were calculated using a new stratified random sampling design (Cochran 1977). Using stratification, hunters were placed into similar groups (strata) based on the type of license they had purchased.

Hunters that had purchased a base hunting license in 2017 and a small game hunting license in either 2012 or 2013 were grouped into a separate stratum (stratum 1). A second stratum consisted of hunters that had purchased a base license and woodcock stamp in 2017 but had not purchased a small game license in either 2012 or 2013. A third stratum consisted of 2017 base license holders that had not purchased a small game license in either 2012 or 2013 and had not obtained a woodcock stamp in 2017. The overall sample consisted of 8,000 people from the first stratum (N=229,426), 1,498 people from the second stratum (N=69,473), and 1,499 people from the third stratum (N=381,387). Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each group matched the proportion its members contributed to the statewide population of hunters. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

The DNR sells hunting licenses using a statewide automated license sales system. This system allowed the DNR to maintain a central database containing license sales information (e.g., sales transactions) for each license buyer. The license sales database was used to identify whether woodcock hunters had registered with the HIP.

Estimates were derived separately for the UP, NLP, and SLP (Figure 1). Hunting effort and animals harvested from unknown locations were allocated among areas in proportion to the known effort and harvest.

Estimates were subject to both sampling and nonsampling error. When a sample rather than the entire population has been surveyed, there is a chance that the sample estimates may differ from the true population values they represent. The difference, or

sampling error, varies depending on the particular sample selected, and this variability was measured by the 95% confidence limit (CL). In theory, this CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100.

Estimates also were affected by nonsampling error. Nonsampling error can occur for many reasons, including the failure to include a segment of the population, the inability to obtain data from all people in the sample, the inability or unwillingness of respondents to provide data, mistakes made by respondents, and errors made in the collection or processing of the data. It is very difficult to measure this error. Thus, estimates were not adjusted for nonsampling error. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals).

Statistical tests are used routinely to determine the likelihood the 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 AND DISCUSSION

Questionnaires were mailed initially in late April 2018. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 258 people, primarily because of changes in residence. Questionnaires were returned by 4,645 people, yielding a 43% adjusted response rate.

The small game hunting license was replaced by a new base hunting license in 2014. The proportion of base hunting license buyers that hunted small game species in 2017 was significantly less than the proportion of small game hunting license buyers in 2013 ($23 \pm 2\%$ versus $55 \pm 1\%$). To accommodate the new base license, a new sampling design was adopted for the current survey. Because of the elimination of the small game hunting license and changes to the sampling design, estimates from the current survey may not be directly comparable to estimates calculated before 2015.

License sales and hunter participation

In 2017, 680,286 people purchased a base hunting license, a decrease of 2.7% from 2016 (Table 2). About $23 \pm 2\%$ of the licensees actually hunted small game in 2017 (Tables 2 and 3). An estimated 159,270 people actually hunted small game species in 2017, which was significantly less by 16% from the number of hunters reported in 2015 (Table 3). About 93% of the active small game hunters were males, and the average age of active small game hunters was 48 years, which was not significantly different from 2015 (Table 3). About $11.3 \pm 3\%$ of the active hunters were less than 17 years old

(17,940 ± 5,739 youth hunters). Hunters most often sought squirrels, ruffed grouse, and cottontail rabbits (Table 4).

Harvest and hunting trends

The number of hunters pursuing grouse, squirrels, and crows declined significantly between 2015 and 2017 (Table 4); however, the estimated number of hunters pursuing the other species was not significantly different between the two years. Statewide estimates of hunting effort and harvest did not change significantly for most species between 2015 and 2017, except for the estimated number of days spent hunting grouse and estimated number of grouse, rabbits, and squirrels taken decreased significantly in 2017 (Tables 5 and 6).

Among rabbit hunters (cottontail rabbit and snowshoe hare combined), about 61% of them (41,162 hunters) pursued rabbits during January (Table 7). These hunters spent about an average of 2.2 days hunting rabbits in January. Hunters also frequently hunted rabbits in December (39% of hunters) and February (37%).

Among squirrel hunters, about 47% of them (33,974 hunters) pursued squirrels during October (Table 8). These hunters spent about an average of 1.9 days hunting rabbits in October. Hunters also frequently hunted squirrels in September (39% of hunters).

The number of small game hunters in Michigan in 2017 has declined by about 76% since the mid-1950s (Figure 2). This trend has been previously reported in Michigan and nationally (Brown et al. 2000, Enck et al. 2000, Frawley 2006, U.S. Department of the Interior 2008). Hawn (1979) speculated declining ring-necked pheasant populations was the primary reason for declining small game hunter numbers in Michigan. The number of people hunting pheasants has declined by about 97% between the mid-1950s and recent years (Figure 3). Many other factors have contributed to the decline of small game hunting, including increased urbanization of the human population, increased competition between hunting and other leisure activities, and loss of wildlife habitat (Brown et al. 2000).

Declining small game hunting participation since the mid-1950s also has been noted among hunters pursuing cottontail rabbits (-84%), snowshoe hare (-84%), and squirrels (-66%, Figure 3). Long-term changes in hunter participation and harvest were generally similar.

Hunter numbers in the 1970s through the early 1980s were likely affected by the initiation and subsequent elimination of the put-take pheasant program (Figure 4). This program was created for the purpose of providing additional pheasant hunting opportunities. Each year while the program existed, pen-raised pheasants were released on several state properties in southern Michigan (Janson 1975, Janson and Anderson 1976).

Changes in the harvest of game species and hunter participation usually track changes in game populations. The number of hunters that pursued pheasants, rabbits, snowshoe hares, and squirrels were near record low levels during recent years (Figure 3). Game population surveys have also indicated pheasant and woodcock populations are currently among their lowest recorded levels since the 1960s (Seamans and Rau 2017, Stewart and Trowbridge 2019a, 2019b). The abundance of quail, rabbit, hare, and squirrels was not monitored annually; thus, it was not possible to determine whether harvest and population trends were similar. Michigan's grouse population generally follows a cyclic pattern lasting about 10 years, and the grouse population in 2017 appeared to be approaching a near-term low (Stewart and Trowbridge 2019b).

Although many small game species are not as abundant today as during previous decades (e.g., pheasant, quail, woodcock), the mean number of animals taken per hunting effort has not paralleled changes in the population (Figure 5). For example, hunting efficiency has been high among hunters despite declining numbers of woodcock.

About 41% of the small game hunters in Michigan hunted on private lands only, 22% hunted on public lands only, and 33% hunted on both private and public lands (Table 9). Private lands served as the primary area for hunters pursuing pheasants, cottontail rabbits, squirrels, crows, quail, and coyotes (Tables 9 and 10), while public lands were most popular among hunters pursuing grouse, woodcock, and snowshoe hares.

Hunter satisfaction

The proportion of small game hunters that were satisfied with their overall small game hunting experience was similar in 2015 and 2017 (66% in 2017 versus 67% satisfied in 2015, Table 11). In addition, similar proportions of small game hunters were satisfied with the amount of small game harvested in 2015 and 2017 (32% in 2017 versus 33% in 2015) and the amount of small game seen (48% in 2017 versus 47% in 2015).

Woodcock hunters and Harvest Information Program (HIP) compliance

In 2017, $81 \pm 6\%$ of the woodcock hunters had registered with the HIP. Compliance among woodcock hunters in 2017 was not significantly different from the level reported in 2015 (68% compliance in 2015, Frawley 2018). Hunters registered with HIP were responsible for about 89% of the woodcock taken and 88% of the woodcock hunting trips done in 2017 (Table 12).

Seamans and Rau (2017) reported estimates of harvest, hunter numbers, and hunting efforts of Michigan woodcock hunters in 2017 from an independent survey done by the USFWS. These estimates were based on responses received from a random sample of HIP registrants. Seamans and Rau estimated $24,100 \pm 4,508$ hunters went afield $107,100 \pm 22,736$ days and harvested $64,900 \pm 16,856$ woodcock in 2017. The estimate of hunting effort was less than the estimate from the present survey (Tables 4-6). Because about 19% of Michigan woodcock hunters failed to register with

HIP, the estimates derived from the USFWS survey would be expected to be lower than estimates from the present survey. Estimates derived from a subset of Michigan hunters that had registered with HIP in 2017 (Table 12) were not significantly different from estimates from the USFWS survey.

Hunting access program (HAP)

The Michigan Hunting Access Program (HAP) was created in 1977 to lease private lands to provide access for hunting (Oliver 2005). About 24,000 acres on 205 farms were enrolled in HAP in 2017. An estimated 2,261 hunters spent 8,912 days afield hunting small game on HAP land (Table 13, Figure 6). These estimates were not significantly different from estimates reported for 2015 (i.e., 5,246 hunters spent 20,899 days hunting on HAP).

Grouse Enhanced Management Sites (GEMS)

The DNR managed 18 GEMS, ranging from 500 to 12,000 acres, located in the northern Lower and Upper Peninsulas. GEMS were locations where hunters could hunt grouse and woodcock. An estimated 7,763 hunters spent 26,064 days afield hunting ruffed grouse and woodcock on GEMS in 2017 (Table 14). These estimates were not significantly different from estimates reported for 2015 (i.e., 7,251 hunters spent 23,379 days hunting on GEMS).

Mi-Hunt web application

The Michigan DNR developed an internet-based application called Mi-Hunt that could be used to locate hunting sites. In 2017, an estimated $12,599 \pm 2,967$ small game hunters used Mi-Hunt to assist with their small game hunting (Figure 7). Most of these hunters were satisfied (combined very satisfied and somewhat satisfied responses) with how easy the application was to use ($73 \pm 11\%$), the quality of the maps ($79 \pm 7\%$), and the accuracy of information ($76 \pm 8\%$) from Mi-Hunt (Tables 15 and 16). Although most hunters that used Mi-Hunt were satisfied with it, most ($55 \pm 11\%$) of these hunters also were uncertain whether Mi-Hunt had affected the quality of their small game hunting experience. In contrast, $42 \pm 11\%$ of the hunters using Mi-Hunt reported it had improved the quality of their hunt and $1 \pm 1\%$ reported it had decreased the quality of their hunt. In addition, about 2% of hunters did not provide an answer.

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Table 1. Small game hunting seasons in Michigan, 2017-2018.

Species, season, and region ^a	Season dates
Ring-necked pheasant	
Upper Peninsula (Zone 1)	Oct. 10 – 31
Lower Peninsula (Zone 2)	Oct. 20 – Nov. 14
Lower Peninsula (Zone 3)	Oct. 20 – Nov. 14 and Dec. 1 – Jan. 1
Northern bobwhite quail	
Southern Lower Peninsula	Oct. 20 – Nov. 14
Ruffed grouse	
Statewide	Sept. 15 – Nov. 14 and Dec. 1 – Jan. 1
American woodcock	
Statewide	Sept. 23 – Nov. 6
Cottontail rabbit	
Statewide	Sept. 15 – March 31
Snowshoe hare	
Statewide	Sept. 15 – March 31
Squirrels	
Statewide	Sept. 15 – March 1
American crow	
Statewide	Aug. 1 – Sept. 30 and Feb. 1 – March 31
Coyote	
Statewide	Year-round

^aSee Figure 1 for boundaries of hunt regions.

Table 2. The number of small game hunting licenses sold in Michigan, 2013-2017.

Item	Year					2016-2017 % Change
	2013	2014 ^a	2015	2016	2017	
Number of licenses sold ^{a,b}	277,609	734,893	722,216	701,903	682,848	-2.7
Number of people buying a hunting license ^c	276,360	732,174	719,669	699,199	680,286	-2.7

^aBeginning in 2014, the small game hunting license was eliminated, and small game hunters were required to purchase a base hunting license. The base license was required for all hunters including small game and deer hunters. Thus, license sales in 2013 were not directly comparable to sales in more recent years.

^bThe number of licenses sold is higher than the number of people buying licenses because some people purchased multiple licenses.

^cA person was counted only once, regardless of how many licenses they purchased.

Table 3. Estimated sex and age of active small game hunters in Michigan, 2010-2017.^a

Variable	2010	2011	2013	2015	2017	
					Estimate	95% CL
Hunters ^b	161,800	153,890	152,686	189,999	159,270*	11,386
Males (%)	96.9	96.6	95.4	94.5	92.6	2.8
Females (%)	3.1	3.4	4.6	5.5	7.4	2.8
Age (Years) ^c	46.1	46.2	46.1	47.8	48.2	1.7

^aAnalyses included only those people that hunted. No survey was done in 2012, 2014, and 2016.

^bPeople that hunted American crow, American woodcock, cottontail rabbit, coyote, northern bobwhite quail, ring-necked pheasant, ruffed grouse, snowshoe hare, or squirrels.

^cMean age of active hunters on October 1.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between the last two years (P<0.05).

Table 4. Estimated number of small game hunters by species and region in Michigan, 2011-2017.^a

Species and region	2011	2013	2015	2017		2015-17 % Change
				No.	95% CL	
Ring-necked pheasant ^b						
UP	1,229	1,696	1,587	1,151	592	-27
NLP	7,907	7,303	8,661	6,138	1,841	-29
SLP	15,294	12,508	13,774	9,605	3,348	-30
Statewide	23,351	20,659	23,209	16,443	4,089	-29
Northern bobwhite quail						
NLP	49	183	0	161	177	NA
SLP	393	492	406	161	177	-60
Statewide	442	575	406	322	280	-21
Ruffed grouse						
UP	36,041	35,063	39,715	30,635	3,843	-23*
NLP	39,714	34,103	40,879	34,075	3,446	-17
SLP	6,680	6,846	7,759	6,420	2,620	-17
Statewide	77,283	71,454	83,175	68,102	6,076	-18*
American woodcock						
UP	9,410	10,712	12,912	8,832	1,615	-32
NLP	21,100	20,699	21,095	18,834	2,599	-11
SLP	3,952	4,381	5,688	3,852	2,124	-32
Statewide	32,254	33,096	36,466	29,647	3,624	-19
Cottontail rabbit						
UP	2,860	3,486	5,272	3,039	1,595	-42
NLP	17,452	18,160	23,941	20,550	4,186	-14
SLP	38,303	40,019	50,003	40,932	6,738	-18
Statewide	56,065	58,534	76,026	62,526	8,387	-18
Snowshoe hare						
UP	6,090	5,416	9,338	6,504	1,806	-30
NLP	5,688	4,348	7,038	4,200	1,014	-40
SLP	757	1,092	1,861	1,875	2,000	1
Statewide	12,143	10,634	17,902	12,192	3,200	-32
Squirrels						
UP	4,219	4,629	7,436	3,296	978	-56*
NLP	27,448	25,497	36,162	30,249	5,338	-16
SLP	44,065	44,745	55,913	43,345	7,027	-22
Statewide	72,102	70,691	95,861	72,429	8,784	-24*
American crows						
UP	917	794	1,956	324	327	-83
NLP	4,489	3,474	4,275	3,354	1,619	-22
SLP	7,640	6,178	8,820	3,415	1,633	-61*
Statewide	12,506	10,051	14,648	7,029	2,321	-52*
Coyote						
UP	4,987	4,404	6,113	4,622	2,177	-24
NLP	13,264	10,824	16,181	18,547	4,329	15
SLP	18,355	16,471	24,314	18,086	4,101	-26
Statewide	34,547	29,957	44,495	39,128	6,102	-12

^aThe number of hunters does not add up to the statewide total because hunters can hunt in more than one region. No survey was done in 2012, 2014, or 2016.

^bIncluded both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly ($P < 0.05$).

Table 5. The estimated amount of small game hunter effort (days afield) by species and region, 2011-2017.^a

Species and region	2011	2013	2015	2017		2015-17
				No.	95% CL	% Change
Ring-necked pheasant ^b						
UP	6,370	10,154	7,832	5,590	4,148	-29
NLP	31,093	24,930	29,624	24,042	8,280	-19
SLP	63,159	47,536	40,929	40,347	16,420	-1
Statewide	100,622	82,620	78,385	69,979	19,797	-11
Northern bobwhite quail						
NLP	245	444	0	147	251	NA
SLP	589	401	541	369	627	-32
Statewide	835	844	541	516	687	-5
Ruffed grouse						
UP	305,132	290,417	344,438	236,009	45,887	-31*
NLP	237,091	180,736	209,078	177,334	27,940	-15
SLP	36,949	31,708	21,615	36,733	22,757	70
Statewide	579,171	502,861	575,131	450,076	61,120	-22*
American woodcock						
UP	59,664	60,472	90,885	57,228	16,766	-37
NLP	128,445	117,988	106,519	95,774	19,633	-10
SLP	19,187	20,393	15,180	9,836	4,948	-35
Statewide	207,295	198,853	212,584	162,838	26,954	-23
Cottontail rabbit						
UP	18,923	24,204	28,345	26,159	14,195	-8
NLP	102,822	80,514	93,790	144,240	38,094	54
SLP	240,626	207,979	205,808	210,873	45,107	2
Statewide	362,371	312,697	327,943	381,272	75,642	16
Snowshoe hare						
UP	48,331	43,944	48,047	43,872	19,894	-9
NLP	42,628	19,486	25,208	23,648	14,037	-6
SLP	1,981	2,283	4,022	3,268	3,411	-19
Statewide	92,940	65,713	77,277	70,788	24,745	-8
Squirrels						
UP	49,522	29,082	74,126	30,953	13,160	-58
NLP	164,935	121,823	164,766	200,737	49,200	22
SLP	271,127	250,142	231,961	236,381	60,037	2
Statewide	485,583	401,046	470,852	468,071	81,073	-1
American crow						
UP	6,321	3,916	6,786	1,572	2,481	-77
NLP	15,734	12,091	13,216	19,594	15,762	48
SLP	30,705	26,200	19,740	12,390	7,972	-37
Statewide	52,760	42,208	39,743	33,556	17,825	-16
Coyote						
UP	42,408	28,660	43,291	21,813	12,284	-50
NLP	89,784	85,492	73,205	110,455	48,556	51
SLP	124,502	100,695	95,634	144,051	76,075	51
Statewide	256,694	214,847	212,131	276,319	91,121	30

^aNo survey was done in 2012, 2014, or 2016.

^bIncluded both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly ($P < 0.05$).

Table 6. Estimated small game harvest by species and region in Michigan, 2011-2017.^a

Species and region	2011	2013	2015	2017		2015-17
				No.	95% CL	% Change
Ring-necked pheasant ^b						
UP	2,047	2,170	2,766	2,086	1,903	-25
NLP	7,539	6,541	8,727	6,982	2,822	-20
SLP	13,034	12,844	10,898	3,786	1,818	-65*
Statewide	22,620	21,555	22,391	12,855	3,998	-43
Northern bobwhite quail						
NLP	0	232	0	0	0	NA
SLP	441	389	141	0	0	NA
Statewide	441	621	141	0	0	NA
Ruffed grouse						
UP	159,427	120,349	135,245	99,692	17,452	-26
NLP	95,095	68,087	78,855	54,528	11,533	-31
SLP	6,218	7,808	3,842	9,129	11,379	138
Statewide	260,741	196,245	217,942	163,349	25,206	-25*
American woodcock						
UP	22,290	32,758	21,792	23,912	8,978	10
NLP	66,936	70,756	63,120	43,855	10,636	-31
SLP	5,431	9,876	8,214	4,238	2,678	-48
Statewide	94,657	113,391	93,127	72,005	15,192	-23
Cottontail rabbit						
UP	4,048	12,183	4,233	6,778	5,867	60
NLP	38,757	45,692	62,207	56,745	18,758	-9
SLP	151,105	144,447	188,809	105,866	24,203	-44*
Statewide	193,910	202,322	255,248	169,388	32,211	-34*
Snowshoe hare						
UP	13,884	9,885	20,731	14,995	1,988	-28*
NLP	10,157	3,334	14,200	6,362	3,363	-55*
SLP	602	1,955	1,650	1,716	9,950	4
Statewide	24,643	15,173	36,581	23,072	7,808	-37
Squirrels						
UP	39,500	29,696	37,607	21,414	9,950	-43
NLP	142,573	105,732	221,047	135,318	26,743	-39
SLP	254,845	218,487	276,386	179,034	35,784	-35*
Statewide	436,918	353,916	535,040	335,766	47,051	-37*
American crow						
UP	3,132	12,455	4,900	4,765	8,421	-3
NLP	17,137	14,986	18,892	52,264	81,648	177
SLP	40,072	26,829	39,032	7,964	5,396	-80*
Statewide	60,341	54,270	62,825	64,993	82,266	3
Coyote						
UP	7,096	3,115	10,902	2,292	1,271	-79*
NLP	10,372	15,384	12,438	22,330	11,347	80
SLP	18,532	14,655	26,016	29,350	14,475	13
Statewide	36,001	33,154	49,356	53,973	18,935	9

^aNo survey was done in 2012, 2014, or 2016.

^bIncluded both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly ($P < 0.05$).

Table 7. The estimated number rabbit (cottontail rabbits and snowshoe hares combined) hunters and their days of hunting effort by month in Michigan, 2017.

Month	Hunters				Days of hunting effort			
	% of rabbit hunters	95% CL	Total number of hunters	95% CL	Mean days per hunter	95% CL	Total days	95% CL
September	6.0	2.7	4,056	1,849	0.3	0.2	18,672	10,263
October	12.2	3.1	8,328	2,099	0.7	0.2	44,605	13,171
November	15.5	4.4	10,566	3,013	0.6	0.2	42,202	12,730
December	38.7	6.7	26,331	4,533	1.5	0.3	101,585	19,450
January	60.5	6.5	41,162	4,435	2.2	0.3	149,867	22,361
February	36.8	6.6	25,049	4,523	1.4	0.3	95,458	21,540
March	17.5	5.2	11,944	3,563	0.7	0.2	45,348	13,925

Table 8. The estimated number squirrel hunters and their days of hunting effort by month in Michigan, 2017.

Month	Hunters				Days of hunting effort			
	% of squirrel hunters	95% CL	Total number of hunters	95% CL	Mean days per hunter	95% CL	Total days	95% CL
September	38.7	6.4	28,062	4,635	1.5	0.3	108,356	23,849
October	46.9	6.3	33,974	4,590	1.9	0.3	141,103	20,651
November	22.8	5.1	16,487	3,726	1.1	0.4	79,287	27,972
December	25.2	5.4	18,278	3,925	1.0	0.2	74,627	17,788
January	30.4	6.0	22,030	4,334	1.1	0.2	78,258	16,657
February	21.9	5.6	15,877	4,021	0.7	0.2	49,111	14,533

Table 9. Estimated number and proportion of hunters hunting on private and public lands during the 2017 small game hunting season, summarized by species.

Species	Land type															
	Private land only				Public land only				Both private and public lands				Unknown land			
	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL
Ring-necked pheasant	9,088	3,096	55	12	4,195	2,166	26	11	2,966	1,604	18	9	193	217	1	1
Northern bobwhite quail	193	217	60	43	64	125	20	35	64	125	20	35	0	0	0	0
Ruffed grouse	14,646	3,349	22	4	27,039	3,518	40	4	24,627	3,914	36	5	1,790	741	3	1
American woodcock	4,453	2,180	15	6	14,419	2,420	49	6	8,977	1,579	30	5	1,798	703	6	2
Cottontail rabbit	40,965	7,163	66	6	11,778	4,141	19	6	8,816	2,023	14	3	967	485	2	1
Snowshoe hare	2,583	1,566	21	11	5,876	2,249	48	13	3,345	1,650	27	12	387	307	3	3
Squirrels	42,191	7,091	58	6	14,210	3,771	20	5	13,376	3,742	18	5	2,652	1,562	4	2
American crow	4,313	1,719	61	17	1,233	1,448	18	18	1,161	531	17	8	322	280	5	4
Coyote	26,742	5,425	68	7	3,410	938	9	3	8,008	2,716	20	6	967	485	2	1
Combined	65,950	8,733	41	4	34,564	5,313	22	3	52,891	6,220	33	3	5,865	1,814	4	1

Table 10. Estimated number of days of hunting effort on private and public lands during the 2017 small game hunting season in Michigan, summarized by species.^a

Species	Land type							
	Private lands		Public lands		Both private and public lands		Unknown	
	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL
Ring-necked pheasant	40,247	14,421	20,012	10,454	8,881	4,521	838	913
Northern bobwhite quail	451	675	0	0	64	125	0	0
Ruffed grouse	74,262	21,590	182,522	32,220	181,158	46,400	12,134	6,114
American woodcock	16,685	6,644	70,525	14,461	58,617	17,591	17,011	10,097
Cottontail rabbit	222,298	63,006	81,647	29,875	72,360	25,195	4,966	4,337
Snowshoe hare	8,400	5,413	30,109	14,296	28,281	18,424	3,999	5,513
Squirrels	263,016	65,247	108,352	35,776	84,426	27,355	12,277	7,002
American crow	24,568	12,386	3,247	4,346	5,160	7,084	580	601
Coyote	176,648	80,714	19,773	8,678	75,189	41,050	4,708	3,902

^aPeople that hunted small game on both private and public lands were not asked to record the amount of effort separately for each land type; thus, it was not possible to estimate the total amount or proportion of effort devoted to either private or public lands separately.

Table 11. Level of satisfaction among active small game hunters (% of hunters) with the 2017 small game hunting season in Michigan.^a

The index used to measure season satisfaction	Level of satisfaction									
	Very satisfied		Somewhat satisfied		Neutral		Somewhat dissatisfied		Very dissatisfied	
	95%		95%		95%		95%		95%	
	%	CL	%	CL	%	CL	%	CL	%	CL
Small game seen	18	3	28	4	19	3	17	3	13	3
Small game harvested	12	2	18	3	25	3	18	3	21	3
Length of season	36	4	22	3	27	4	5	2	4	2
Overall experience	31	4	32	4	18	3	9	2	5	2

^aAnalyses limited to small game license buyers that actually hunted in 2017 and indicated a level of satisfaction.

Table 12. Estimated number of Michigan woodcock hunters, woodcock harvested, and hunting effort (days afield) among people that registered with the Harvest Information Program, 2017.^a

Variable	No.	95% CL
Hunters	24,037	2,876
Days afield (effort)	143,783	26,212
Harvest	64,410	14,627

^aAnalyses limited to people that registered with HIP and hunted woodcock.

Table 13. Estimated number of Michigan hunters and hunting effort (days afield) among people that hunted on Habitat Access Program lands, 2017.

Variable	No.	95% CL
Hunters	2,261	1,541
Days afield (effort)	8,912	8,275
Mean days afield per hunter	3.9	3.4

Table 14. Estimated number of Michigan hunters and hunting effort (days afield) among people that hunted on Grouse Enhanced Management Sites (GEMS), 2017.

Variable	No.	95% CL
Hunters	7,763	1,998
Days afield (effort)	26,064	7,328
Mean days afield per hunter	3.4	0.7

Table 15. Level of satisfaction among active small game hunters (% of hunters) with the Mi-Hunt internet application.^a

The index used to measure satisfaction	Level of satisfaction													
	Very satisfied		Somewhat satisfied		Neutral		Somewhat dissatisfied		Strongly dissatisfied		Not applicable		No answer	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Ease of use	44	12	39	12	12	8	3	2	<1	1	<1	1	0	0
Quality of maps	37	12	38	12	13	8	7	7	1	1	<1	1	4	7
Accuracy of information	39	12	38	12	16	8	2	2	1	1	<1	1	4	7

^aAnalyses limited to small game license buyers that had used the Mi-Hunt internet application and had hunted in 2017 (18,134 ± 4,395 small game hunters).

Table 16. Level of satisfaction among active small game hunters (total number of hunters) with the Mi-Hunt internet application.^a

The index used to measure satisfaction	Level of satisfaction													
	Very satisfied		Somewhat satisfied		Neutral		Somewhat dissatisfied		Strongly dissatisfied		Not applicable		No answer	
	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL
Ease of use	8,004	3,218	7,161	2,613	2,250	1,501	608	394	67	131	67	131	0	0
Quality of maps	6,681	2,590	6,960	2,603	2,314	1,506	1,240	1,413	134	185	67	131	763	1,368
Accuracy of information	7,104	2,911	6,826	2,597	2,922	1,556	339	295	138	190	67	131	763	1,368

^aAnalyses limited to small game license buyers that had used the Mi-Hunt internet application and had hunted in 2017 (8,100 ± 1,204 small game hunters).

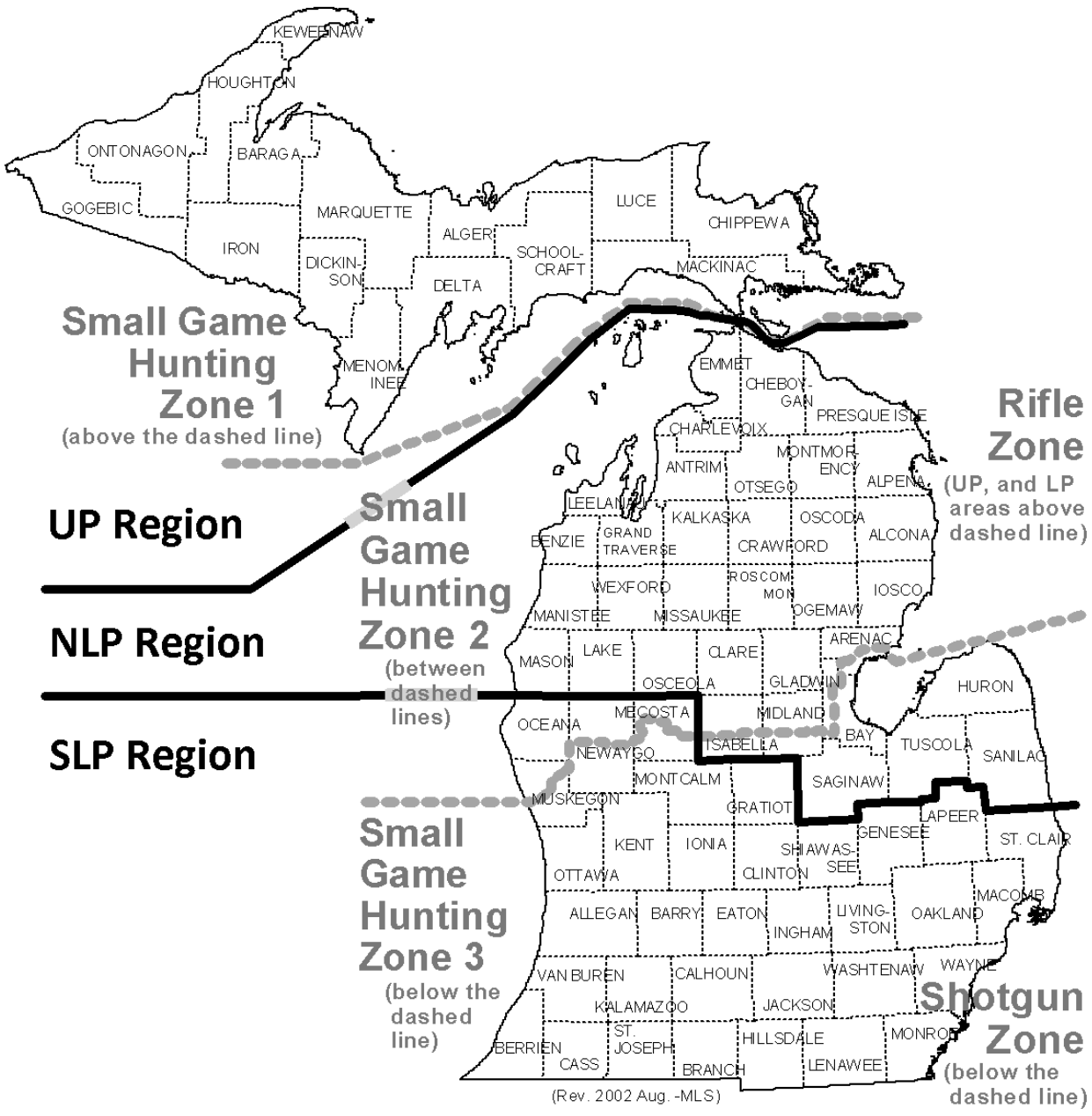


Figure 1. Regions used to summarize the survey data. Region boundaries in the Lower Peninsula did not match the small game management hunting zones.

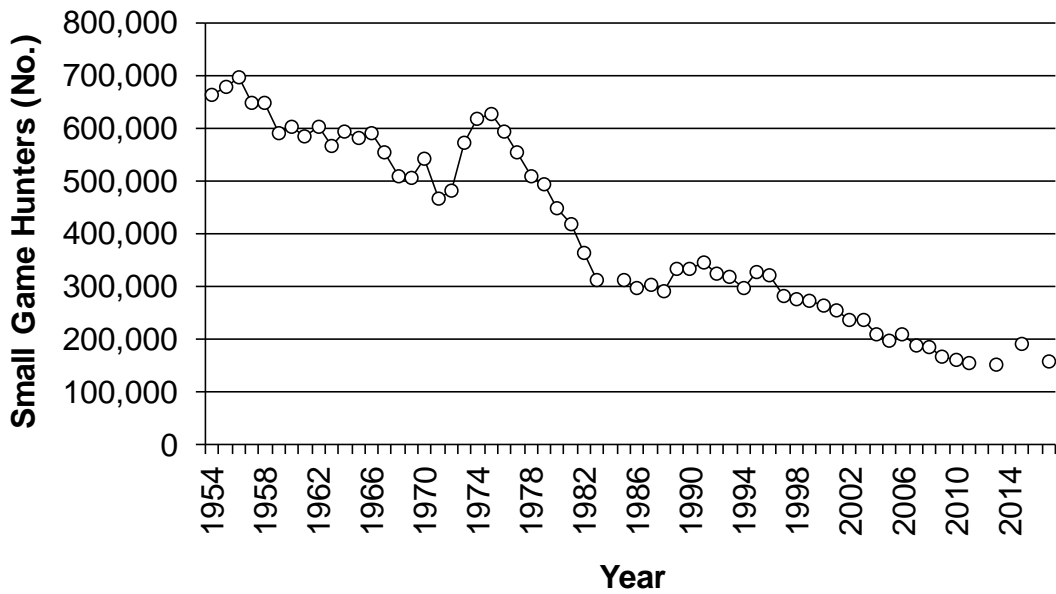


Figure 2. Estimated number of small game hunters in Michigan, 1954-2017 (estimate of the number of people that went afield). No estimates were available for 1984 and 2012.

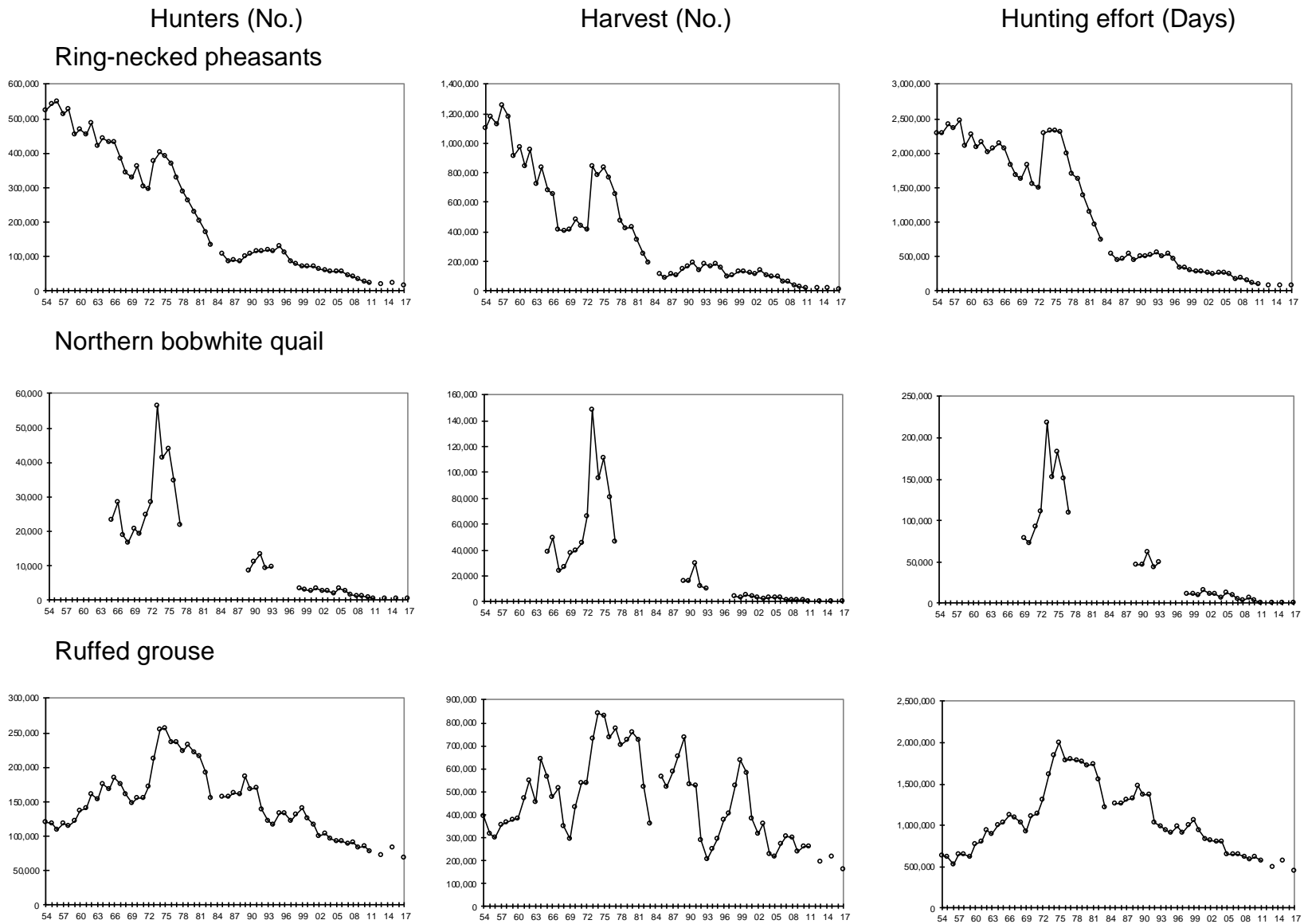


Figure 3. Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2017. No estimates were available or no seasons existed during years when no data are plotted.

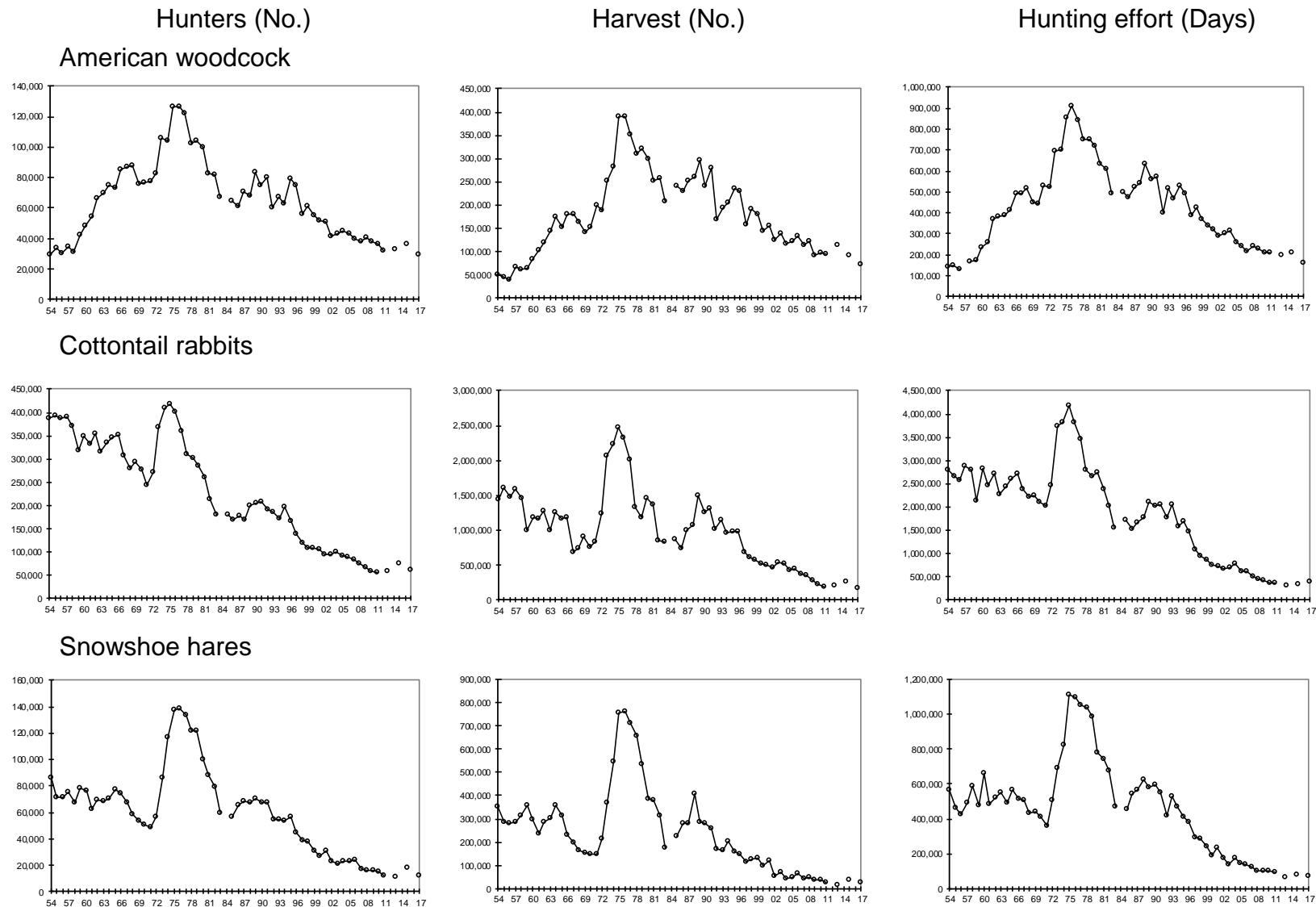


Figure 3 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2017. No estimates were available or no seasons existed during years when no data are plotted.

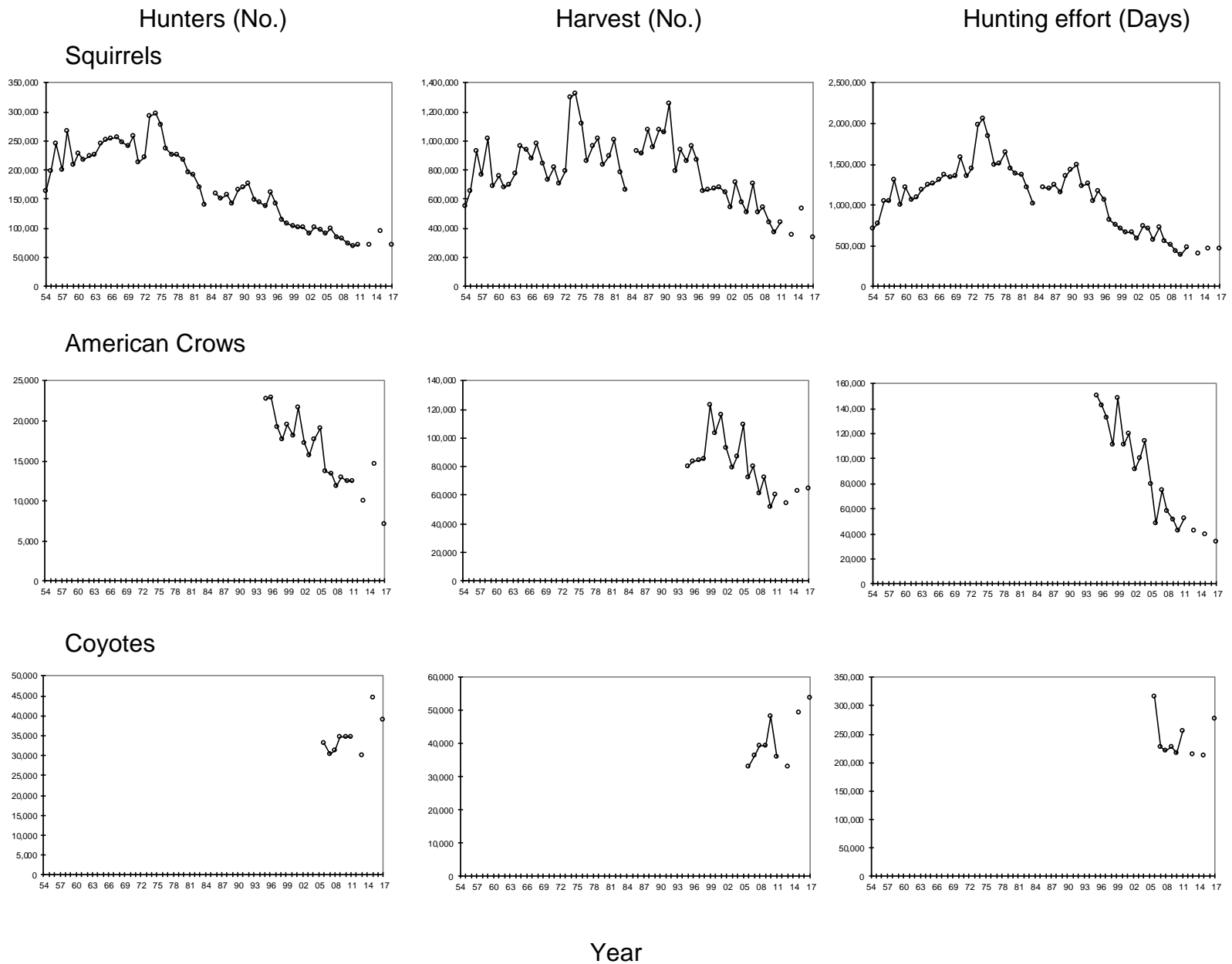


Figure 3. (continued) Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2017. No estimates were available or no seasons existed during years when no data are plotted.

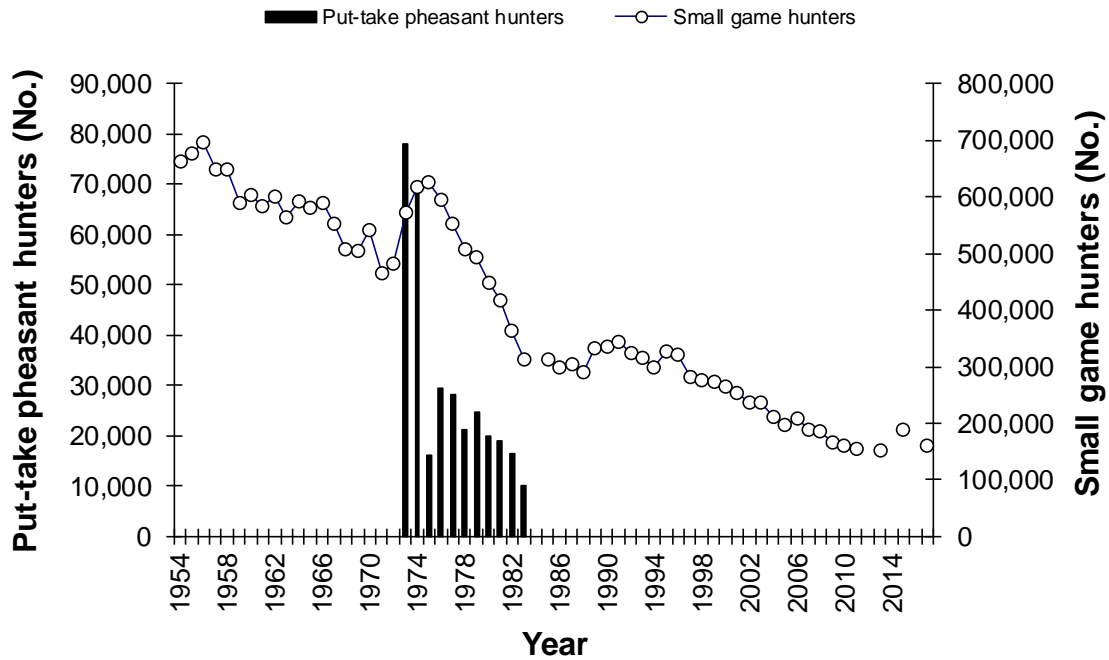


Figure 4. Estimated number of small game hunters in Michigan, 1954-2017 (estimate of the number of people that went afield) and number of people participating in put-take pheasant hunts (1973-1983). The numbers of put-take pheasant hunters were estimated for 1973-1974 (Janson 1975, Janson and Anderson 1976), while numbers of hunters during 1975-1983 were tallies of annual put-take permits sold (DNR, unpublished data). Thus, the estimates of put-take hunters during 1973-1975 and 1976-1983 periods are not directly comparable. No estimates of small game hunters or put-take pheasant hunters were available for 1984.

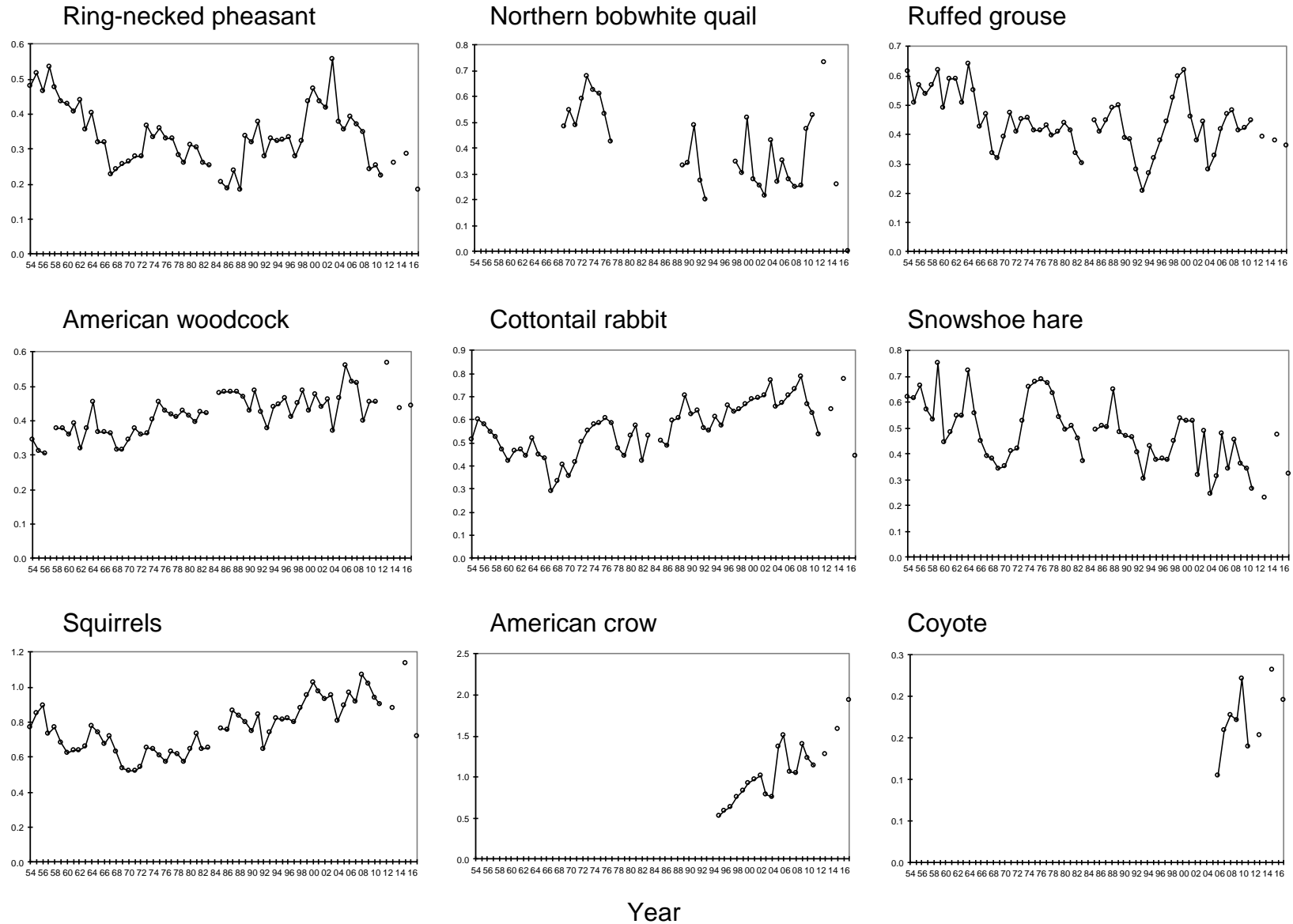


Figure 5. Estimated harvest per effort in Michigan during the small game hunting seasons, 1954-2017. No estimates were available or no seasons existed during years when no data are plotted.

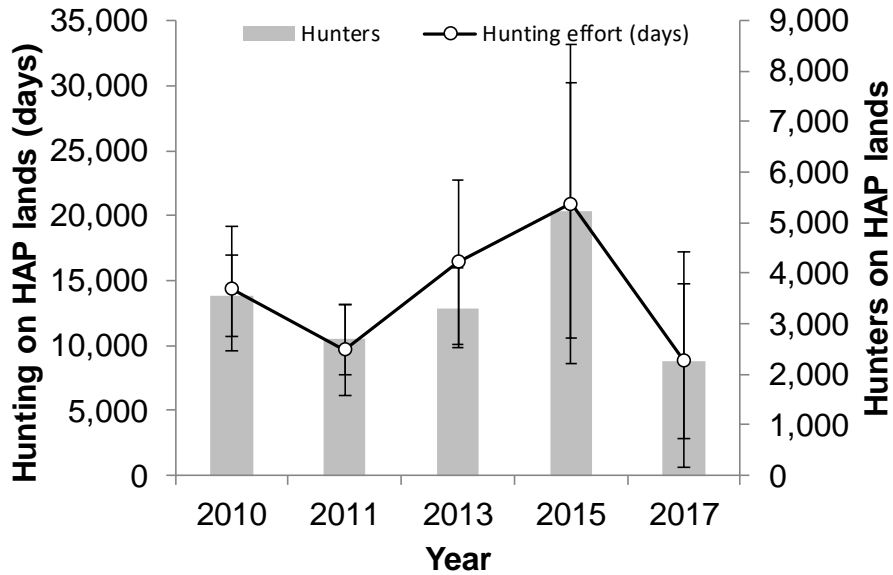


Figure 6. The estimated number of small game hunters and hunting effort (days afield) among people that hunted on Habitat Access Program lands, 2010-2017. Estimates were not available for 2012 and 2014.

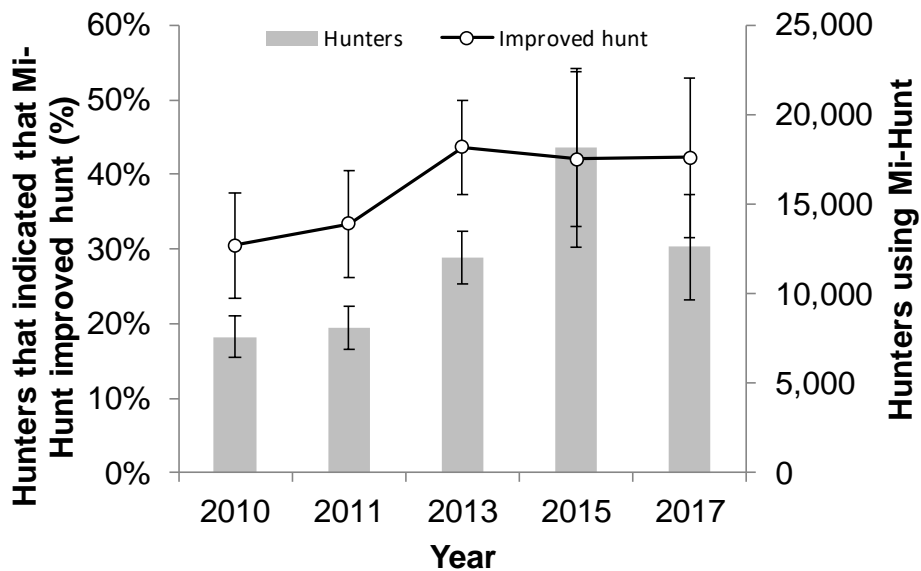


Figure 7. The estimated number of small game hunters that used the Mi-Hunt application to help locate a hunting area, and the proportion of hunters using Mi-Hunt that indicated that it had improved the quality of their hunt, 2010-2017. Estimates were not available for 2012 and 2014.

APPENDIX A

2017-2018 Small Game Harvest Questionnaire



MICHIGAN DEPARTMENT OF NATURAL RESOURCES, WILDLIFE DIVISION
 PO BOX 30030 LANSING MI 48909-7530

2017-2018 UPLAND GAME 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 animals. Report only your hunting activities and the animals that you harvested. Do not report any game taken on a licensed shooting preserve.

1. Did you attempt to hunt upland small game species in Michigan during 2017-18?

- ¹ Yes. Please complete the table below.
- ² No. Skip the remaining questions and return questionnaire.

SPECIES <i>(Check box if you hunted during the season.)</i>	COUNTY HUNTED <i>(List the counties hunted on separate lines.)</i>	NUMBER OF DAYS HUNTED <i>(Include all days hunted, even if you did not harvest anything.)</i>	TYPE OF LAND	NUMBER OF ANIMALS TAKEN
<input checked="" type="checkbox"/> Example	1 Jackson	5	<input checked="" type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	12
<input type="checkbox"/> Pheasant <i>(Do not count birds taken on a licensed shooting preserve)</i>	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Ruffed Grouse	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Woodcock	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Cottontail Rabbit	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Snowshoe Hare	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Squirrel	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Crow	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Quail <i>(Portions of the Southern Lower Peninsula)</i>	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
<input type="checkbox"/> Coyote	1		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	2		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	
	3		<input type="checkbox"/> Private <input type="checkbox"/> Public <input type="checkbox"/> Both	

2. If you hunted rabbits, how many days did you rabbit hunt in each month?

September October November December January February March

Report Days:

3. If you hunted squirrels, how many days did you squirrel hunt in each month?

September October November December January February

Report Days:

Questions continued on back

4. What was the primary small game species you sought during the past year?

(Select one.)

- 1 Pheasant 2 Ruffed Grouse 3 Woodcock 4 Cottontail rabbit
 5 Snowshoe hare 6 Squirrel 7 Crow 8 Quail
 9 Coyote

5. During the last upland small game hunting season, indicate how satisfied or dissatisfied you were with the following for the primary species you hunted.

	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
a. The amount of small game seen.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
b. Number of small game harvested.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
c. Number of days in the hunting season.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
d. Your overall hunting experience.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

6. The Michigan Department of Natural Resources (MDNR) leased private lands throughout Michigan for public hunting through the Hunting Access Program (HAP). In 2017, the MDNR leased about 205 properties totaling about 24,000 acres. Did you hunt small game on any HAP property in 2017-18?

- 1 Yes 2 No. Skip to Question #7.

- 6a. If you hunted small game on a HAP property in 2017-18, how many days did you hunt on HAP properties? _____ DAYS HUNTED
- 6b. If you hunted small game on a HAP property in 2017-18, which county was each HAP property located? _____ COUNTIES HUNTED

7. Eighteen Grouse Enhanced Management Sites (GEMS), ranging from 500 to 12,000 acres, can be found in the northern Lower and Upper peninsulas. GEMS are locations where hunters can hunt grouse and woodcock. Did you hunt ruffed grouse or woodcock at a GEMS in 2017?

- 1 Yes 2 No. Skip to Question #8.

- 7a. If you hunted ruffed grouse or woodcock at a GEMS in 2017, how many days did you hunt? _____ DAYS HUNTED
- 7b. If you hunted ruffed grouse or woodcock at a GEMS in 2017, which county was each GEMS located? _____ COUNTIES HUNTED

8. The MDNR developed an internet-based application called Mi-HUNT that can be used to locate hunting, trapping, boating or camping sites. Did you use Mi-HUNT to help locate a hunting area in 2017-18?

- 1 Yes 2 No. Skip the remaining questions.

9. If you used Mi-HUNT to select an area for your 2017-18 small game hunts, please indicate how satisfied or dissatisfied you were with the following features of Mi-HUNT: (Select one choice per item.)

	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Strongly Dissatisfied	Not Applicable
a. Ease of use.	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. Quality of maps.	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. Accuracy of information.	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>

10. How did Mi-HUNT affect the quality of your small game hunting experience in 2017-18?

- 1 Greatly improved quality of hunt 2 Improved quality of hunt 3 Not Sure 4 Decreased quality of hunt 5 Greatly decreased quality of hunt

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