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2015 SMALL GAME HARVEST SURVEY

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ABSTRACT

A survey was completed to estimate the number of people hunting small game, their days afield, and harvest during the 2015 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 189,999 people hunted small game species in 2015. Small game hunters most often sought ruffed grouse, squirrels, and cottontail rabbits. The number of hunters pursuing most of the small game species increased significantly between 2013 and 2015; however, estimates may not be directly comparable because of changes in hunting license types and sampling designs between the two years. Statewide estimates of hunting effort and harvest did not change significantly for most species between 2013 and 2015, except for the estimated number of squirrels taken increased significantly in 2015. The proportion of small game hunters that were satisfied with their overall small game hunting experience was similar in 2013 and 2015 (64% satisfied in 2013 versus 67% in 2015). In addition, similar proportions of small game hunters were satisfied with the amount of small game harvested and the amount of small game seen in 2013 and 2015. In 2015, 68% of woodcock hunters had registered with HIP. An estimated 5,246 hunters spent 20,899 days hunting small game on HAP land, and 7,251 hunters spent 23,379 days hunting ruffed grouse and woodcock on GEMS. An estimated 18,158 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 (84%), the quality of maps (75%), and the accuracy of information (77%) 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 2017). 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 2015 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 2015, the DNR leased about 170 private properties totaling about 20,100 acres throughout Michigan for public hunting through the Hunting Access Program (HAP). In addition, the DNR managed 16 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 2015 small game hunting seasons, a questionnaire (Appendix A) was sent to 10,995 randomly selected people that were eligible to hunt small game. 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 whether they had hunted waterfowl and to rate their overall hunting experience and indicate their satisfaction with the amount of game seen and amount harvested, and 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 in 2015. To accommodate the new license structure, a new sampling design was adopted 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 2015 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 2015 but had not purchased a small game license in either 2012 or 2013. A third stratum consisted of 2015 base license holders that had not purchased a small game license in either 2012 or 2013 and had not obtained a woodcock stamp in 2015. The overall sample consisted of 7,997 people from the first stratum (N=255,671), 1,498 people from the second stratum (N=43,905), and 1,500 people from the third stratum (N=420,093). 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 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 units 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 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially in late April 2016. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 271 people, primarily because of changes in residence. Questionnaires were returned by 5,033 people, yielding a 47% adjusted response rate.

RESULTS AND DISCUSSION

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 2015 was significantly less than the proportion of small game hunting license buyers in 2013 ($26 \pm 2\%$ 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 for previous years.

License sales and hunter participation

In 2015, 719,669 people purchased a base hunting license, a decrease of 1.7% from 2014 (Table 2). About $26 \pm 2\%$ of the licensees actually hunted small game in 2015 (Tables 2 and 3). An estimated 189,999 people actually hunted small game species in 2015 (excluded people hunting waterfowl only), which was significantly greater by 24% from the number of hunters reported in 2013 (Table 3). About 95% 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 2013 (Table 3). About $7.6 \pm 2\%$ of

the active hunters were less than 17 years old ($14,389 \pm 4,108$ youth hunters). Hunters most often sought squirrels, ruffed grouse, and cottontail rabbits (Table 4).

Harvest and hunting trends

The number of hunters pursuing most of the small game species increased significantly between 2013 and 2015 (Table 4); however, estimates may not be directly comparable because of changes in hunting license types and sampling designs between the two years. Statewide estimates of hunting effort and harvest did not change significantly for most species between 2013 and 2015, except for the estimated number of squirrels taken increased significantly in 2015 (Tables 5 and 6).

Although the number of small game hunters increased between 2013 and 2015, the number of small game hunters in Michigan in 2015 has declined about 71% 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 95% 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 (-80%), snowshoe hare (-76%), and squirrels (-55%, 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 2016, Vander Wagen et al. 2016). 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 2015 appeared to be approaching a near-term low (Vander Wagen et al. 2016).

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 38% of the small game hunters in Michigan hunted on private lands only, 24% hunted on public lands only, and 33% hunted on both private and public lands (Table 7). Private lands served as the primary area for hunters pursuing pheasants, cottontail rabbits, squirrels, crows, quail, and coyotes (Tables 7 and 8), while public lands were most popular among hunters pursuing grouse and woodcock.

Hunter satisfaction

The proportion of small game hunters that were satisfied with their overall small game hunting experience was similar in 2013 and 2015 (67% in 2015 versus 64% satisfied in 2013, Table 9). In addition, similar proportions of small game hunters were satisfied with the amount of small game harvested in 2013 and 2015 (33% in 2015 versus 31% in 2013) and the amount of small game seen (47% in 2015 versus 44% in 2013).

Woodcock hunters and Harvest Information Program (HIP) compliance

In 2015, $68 \pm 7\%$ of the woodcock hunters had registered with HIP. Compliance among woodcock hunters in 2015 was significantly less than reported in 2013 (85% in 2013, Frawley 2017). Hunters registered with HIP were responsible for about 83% of the woodcock taken and 79% of the woodcock hunting trips done in 2015 (Table 10).

Seamans and Rau (2016) reported estimates of harvest, hunter numbers, and hunting effort of Michigan woodcock hunters in 2015 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 $26,000 \pm 4,680$ hunters went afield $124,700 \pm 26,187$ days and harvested $63,200 \pm 14,536$ woodcock in 2015. Estimates of hunting effort and harvest were less than estimates from the present survey (Tables 4-6). Because about 32% 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 (Table 10) 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 20,089 acres on 170 farms were enrolled in HAP in 2015. An estimated 5,246 hunters spent 20,899 days afield hunting small game on HAP land (Table 11, Figure 6). These estimates were not

significantly different from estimates reported for 2013 (i.e., 3,319 hunters spent 16,413 days hunting on HAP).

Grouse Enhanced Management Sites (GEMS)

The DNR managed 16 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 7,251 hunters spent 23,379 days afield hunting ruffed grouse and woodcock on GEMS in 2015 (Table 12).

Mi-Hunt web application

The Michigan DNR developed an internet-based application called Mi-Hunt that could be used to locate hunting sites. In 2015, an estimated $18,158 \pm 4,405$ 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 ($84 \pm 8\%$), the quality of maps ($75 \pm 11\%$), and the accuracy of information ($77 \pm 10\%$) from Mi-Hunt (Tables 13 and 14). Although most hunters that used Mi-Hunt were satisfied with it, most ($55 \pm 12\%$) of these hunters also were uncertain whether Mi-Hunt had affected the quality of their small game hunting experience. In contrast, $42 \pm 12\%$ of the hunters using Mi-Hunt reported it had improved the quality of their hunt and $3 \pm 2\%$ reported it had decreased the quality of their hunt. In addition, about 1% of hunters did not provide an answer.

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Table 1. Small game hunting seasons in Michigan, 2015-2016.

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. 19 – Nov. 2
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	July 15 – April 15

^aSee Figure 1 for boundaries of hunt regions.

Table 2. The number of small game hunting licenses sold in Michigan, 2011-2015.

Item	Year					2014-2015 % Change
	2011	2012 ^a	2013	2014 ^b	2015	
Number of licenses sold ^{a,b}	260,544	279,968	277,609	734,893	722,216	-1.7
Number of people buying a hunting license ^b	276,360	275,450	276,360	732,174	719,669	-1.7

^aIn 2012, the minimum age requirement was eliminated to hunt small game, while hunters had to be at least 10 years old to participate in 2009-2011. The number of people buying a license was 264,982 in 2012 and 264,184 in 2013 if buyers less than 10 years old were excluded from tallies. Beginning 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 2014 and 2015 were not directly comparable to prior years.

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

^bA 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, 2009-2015.^a

Variable	2009	2010	2011	2013	2015	
					Estimate	95% CL
Hunters ^b	166,068	161,800	153,890	152,686	189,999	11,814*
Males (%)	96.6	96.9	96.6	95.4	94.5	1.9
Females (%)	3.4	3.1	3.4	4.6	5.5	1.9
Age (Years) ^c	44.9	46.1	46.2	46.1	47.8	1.4

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

^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 ($P < 0.005$).

Table 4. Estimated number of small game hunters by species and region in Michigan, 2009-2015.^a

Species and region	2009	2010	2013	2015		2013-15 % Change
				No.	95% CL	
Ring-necked pheasant ^b						
UP	1,670	1,229	1,696	1,587	616	-6
NLP	9,975	7,907	7,303	8,661	1,925	19
SLP	17,483	15,294	12,508	13,774	3,398	10
Statewide	27,450	23,351	20,659	23,209	4,153	12
Northern bobwhite quail						
NLP	0	49	183	0	0	-100*
SLP	838	393	492	406	323	-17
Statewide	838	442	575	406	323	-29
Ruffed grouse						
UP	39,291	36,041	35,063	39,715	4,883	13
NLP	43,536	39,714	34,103	40,879	4,547	20
SLP	9,137	6,680	6,846	7,759	2,287	13
Statewide	85,327	77,283	71,454	83,175	6,801	16*
American woodcock						
UP	9,980	9,410	10,712	12,912	2,843	21
NLP	23,559	21,100	20,699	21,095	2,548	2
SLP	6,110	3,952	4,381	5,688	2,172	30
Statewide	36,451	32,254	33,096	36,466	4,291	10
Cottontail rabbit						
UP	3,477	2,860	3,486	5,272	2,507	51
NLP	18,876	17,452	18,160	23,941	4,334	32
SLP	41,328	38,303	40,019	50,003	6,832	25*
Statewide	60,031	56,065	58,534	76,026	8,402	30*
Snowshoe hare						
UP	7,972	6,090	5,416	9,338	2,681	72*
NLP	6,093	5,688	4,348	7,038	2,233	62
SLP	1,445	757	1,092	1,861	1,456	70
Statewide	15,214	12,143	10,634	17,902	4,006	68*
Squirrels						
UP	4,782	4,219	4,629	7,436	2,267	61
NLP	29,602	27,448	25,497	36,162	5,587	42*
SLP	40,336	44,065	44,745	55,913	7,461	25*
Statewide	69,784	72,102	70,691	95,861	9,502	36*
American crows						
UP	1,099	917	794	1,956	1,463	146
NLP	4,500	4,489	3,474	4,275	996	23
SLP	7,348	7,640	6,178	8,820	2,951	43
Statewide	12,453	12,506	10,051	14,648	3,692	46
Coyote						
UP	5,689	4,987	4,404	6,113	1,760	39
NLP	14,857	13,264	10,824	16,181	3,468	49*
SLP	16,260	18,355	16,471	24,314	4,324	48*
Statewide	34,732	34,547	29,957	44,495	5,906	49*

^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.

^bIncluded both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly ($P < 0.005$).

Table 5. The estimated amount of small game hunter effort (days afield) by species and region, 2010-2015.^a

Species and region	2010	2011	2013	2015		2013-15 % Change
				No.	95% CL	
Ring-necked pheasant ^b						
UP	9,699	6,370	10,154	7,832	4,386	-23
NLP	33,238	31,093	24,930	29,624	8,734	19
SLP	63,892	63,159	47,536	40,929	14,448	-14
Statewide	106,829	100,622	82,620	78,385	17,811	-5
Northern bobwhite quail						
NLP	0	245	444	0	0	-100
SLP	3,034	589	401	541	571	35
Statewide	3,034	835	844	541	586	-36
Ruffed grouse						
UP	311,693	305,132	290,417	344,438	53,282	19
NLP	255,379	237,091	180,736	209,078	32,274	16
SLP	48,557	36,949	31,708	21,615	6,574	-32
Statewide	615,628	579,171	502,861	575,131	62,859	14
American woodcock						
UP	49,045	59,664	60,472	90,885	28,455	50
NLP	136,178	128,445	117,988	106,519	23,469	-10
SLP	27,601	19,187	20,393	15,180	5,237	-26
Statewide	212,824	207,295	198,853	212,584	38,737	7
Cottontail rabbit						
UP	19,718	18,923	24,204	28,345	14,874	17
NLP	112,693	102,822	80,514	93,790	20,167	16
SLP	232,450	240,626	207,979	205,808	43,124	-1
Statewide	364,861	362,371	312,697	327,943	50,565	5
Snowshoe hare						
UP	50,493	48,331	43,944	48,047	16,408	9
NLP	47,881	42,628	19,486	25,208	10,260	29
SLP	4,316	1,981	2,283	4,022	3,150	76
Statewide	102,690	92,940	65,713	77,277	19,699	18
Squirrels						
UP	36,539	49,522	29,082	74,126	44,720	155
NLP	151,028	164,935	121,823	164,766	29,873	35
SLP	207,814	271,127	250,142	231,961	47,248	-7
Statewide	395,380	485,583	401,046	470,852	71,387	17
American crow						
UP	2,379	6,321	3,916	6,786	5,517	73
NLP	14,605	15,734	12,091	13,216	4,313	9
SLP	25,582	30,705	26,200	19,740	13,826	-25
Statewide	42,566	52,760	42,208	39,743	16,150	-6
Coyote						
UP	37,743	42,408	28,660	43,291	18,428	51
NLP	88,133	89,784	85,492	73,205	19,617	-14
SLP	91,344	124,502	100,695	95,634	23,670	-5
Statewide	217,220	256,694	214,847	212,131	37,346	-1

^aNo survey was done in 2012.

^bIncluded both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly ($P < 0.005$).

Table 6. Estimated small game harvest by species and region in Michigan, 2010-2015.^a

Species and region	2010	2011	2013	2015		2013-15 % Change
				No.	95% CL	
Ring-necked pheasant ^b						
UP	2,059	2,047	2,170	2,766	1,922	27
NLP	10,268	7,539	6,541	8,727	2,684	33
SLP	14,898	13,034	12,844	10,898	4,202	-15
Statewide	27,224	22,620	21,555	22,391	7,648	4
Northern bobwhite quail						
NLP	0	0	232	0	0	-100
SLP	1,435	441	389	141	275	-64
Statewide	1,435	441	621	141	275	-77
Ruffed grouse						
UP	161,171	159,427	120,349	135,245	25,137	12
NLP	89,884	95,095	68,087	78,855	13,437	16
SLP	9,151	6,218	7,808	3,842	1,704	-51
Statewide	260,207	260,741	196,245	217,942	28,702	11
American woodcock						
UP	18,447	22,290	32,758	21,792	6,418	-33
NLP	68,920	66,936	70,756	63,120	14,643	-11
SLP	9,526	5,431	9,876	8,214	7,252	-17
Statewide	96,892	94,657	113,391	93,127	18,461	-18
Cottontail rabbit						
UP	4,210	4,048	12,183	4,233	3,150	-65
NLP	56,606	38,757	45,692	62,207	16,067	36
SLP	169,783	151,105	144,447	188,809	40,273	31
Statewide	230,598	193,910	202,322	255,248	44,635	26
Snowshoe hare						
UP	22,001	13,884	9,885	20,731	1,583	110*
NLP	11,766	10,157	3,334	14,200	4,128	326*
SLP	1,506	602	1,955	1,650	17,575	-16
Statewide	35,273	24,643	15,173	36,581	16,899	141
Squirrels						
UP	24,505	39,500	29,696	37,607	17,575	27
NLP	150,067	142,573	105,732	221,047	60,633	109*
SLP	195,734	254,845	218,487	276,386	56,429	26
Statewide	370,306	436,918	353,916	535,040	88,778	51*
American crow						
UP	3,978	3,132	12,455	4,900	3,180	-61
NLP	15,987	17,137	14,986	18,892	7,603	26
SLP	32,248	40,072	26,829	39,032	17,532	45
Statewide	52,213	60,341	54,270	62,825	28,312	16
Coyote						
UP	6,001	7,096	3,115	10,902	6,103	250*
NLP	24,209	10,372	15,384	12,438	3,671	-19
SLP	18,002	18,532	14,655	26,016	9,500	77
Statewide	48,212	36,001	33,154	49,356	20,335	49

^aNo survey was done in 2012.^bIncluded both regular and late pheasant hunting seasons.*Non-overlapping 95% confidence intervals indicated estimates differed significantly ($P < 0.005$).

Table 7. Estimated number and proportion of hunters hunting on private and public lands during the 2015 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	13,884	3,666	60	8	4,137	1,651	18	7	4,580	1,072	20	5	608	394	3	2
Northern bobwhite quail	205	230	50	40	67	131	17	29	67	131	17	29	67	131	17	29
Ruffed grouse	16,962	3,766	20	4	35,870	4,650	43	4	27,427	3,628	33	4	2,916	861	4	1
American woodcock	5,427	1,746	15	4	17,646	3,317	48	6	10,689	2,080	29	5	2,703	828	7	2
Cottontail rabbit	44,012	6,421	58	6	10,980	3,330	14	4	19,073	4,608	25	5	1,961	707	3	1
Snowshoe hare	4,105	2,097	23	10	7,363	2,622	41	11	5,829	2,195	33	10	604	391	3	2
Squirrels	48,872	7,082	51	5	23,343	5,208	24	5	19,576	4,053	20	4	4,070	1,646	4	2
American crow	10,634	3,317	73	10	1,848	1,466	13	9	1,488	616	10	5	679	417	5	3
Coyote	30,882	5,213	69	6	4,964	2,146	11	5	7,162	1,862	16	4	1,488	616	3	1
Combined	73,039	8,557	38	3	45,816	6,812	24	3	62,529	6,177	33	3	8,615	1,958	5	1

Table 8. Estimated number of days of hunting effort on private and public lands during the 2015 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	34,901	8,059	22,282	13,510	19,655	7,054	1,548	1,472
Northern bobwhite quail	339	435	201	392	0	0	0	0
Ruffed grouse	85,759	19,788	260,221	38,857	215,341	42,632	13,811	5,654
American woodcock	22,652	7,734	97,182	19,945	77,432	28,713	15,319	6,630
Cottontail rabbit	169,900	37,716	60,018	18,691	90,655	25,617	7,369	3,867
Snowshoe hare	13,904	7,759	25,704	9,210	33,843	15,300	3,827	2,790
Squirrels	241,225	59,661	107,751	27,613	97,028	23,081	24,848	16,668
American crow	29,169	15,327	5,120	3,945	3,124	2,361	2,329	2,121
Coyote	141,623	31,906	25,961	11,066	38,733	14,933	5,814	6,282

^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 9. Level of satisfaction among active small game hunters (% of hunters) with the 2015 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	17	3	30	3	22	3	20	3	12	2
Small game harvested	10	2	22	3	29	3	19	3	18	3
Length of season	37	3	25	3	28	3	6	2	3	1
Overall experience	30	3	37	3	19	3	9	2	5	1

^aAnalyses limited to small game license buyers that actually hunted in 2015 and indicated a level of satisfaction.

Table 10. Estimated number of Michigan woodcock hunters, woodcock harvested, and hunting effort (days afield) among people that registered with the Harvest Information Program, 2015.^a

Variable	No.	95% CL
Hunters	24,967	2,422
Days afield (effort)	167,336	31,413
Harvest	77,363	16,568

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

Table 11. Estimated number of Michigan hunters and hunting effort (days afield) among people that hunted on Habitat Access Program lands, 2015.

Variable	No.	95% CL
Hunters	5,246	2,519
Days afield (effort)	20,899	12,272
Mean days afield per hunter	4.0	1.5

Table 12. Estimated number of Michigan hunters and hunting effort (days afield) among people that hunted on Grouse Enhanced Management Sites (GEMS), 2015.

Variable	No.	95% CL
Hunters	7,251	1,870
Days afield (effort)	23,379	7,080
Mean days afield per hunter	3.2	0.7

Table 13. 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%		95%		95%		95%		95%		95%		95%	
	%	CL	%	CL	%	CL	%	CL	%	CL	%	CL	%	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 2015 (18,134 ± 4,395 small game hunters).

Table 14. 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	
	95%		95%		95%		95%		95%		95%		95%	
	Total	CL	Total	CL	Total	CL	Total	CL	Total	CL	Total	CL	Total	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 2015 (8,100 ± 1,204 small game hunters).

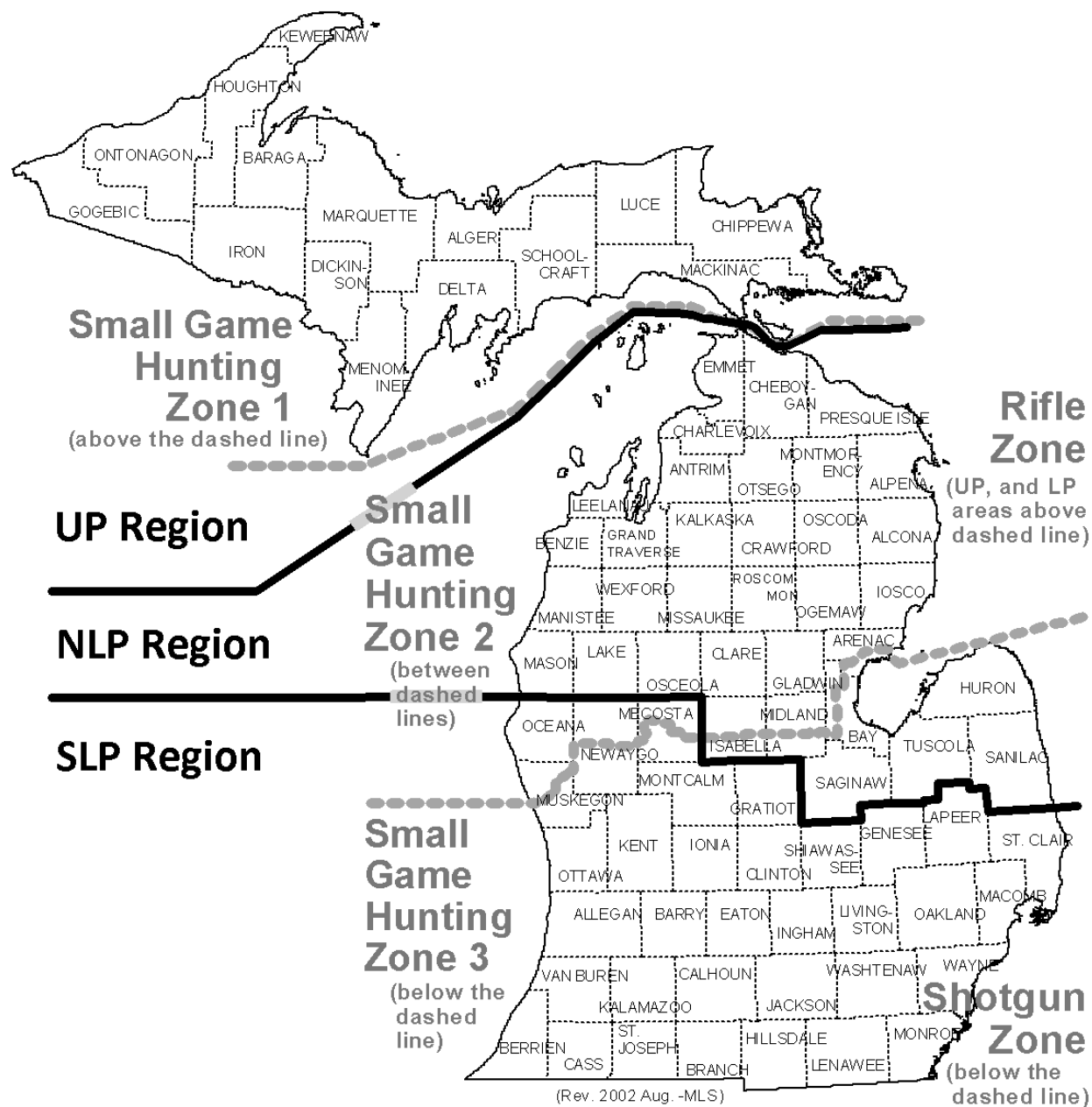


Figure 1. Regions used to summarize the survey data. Region boundaries in the Lower Peninsula did not match the small game management hunting zones.

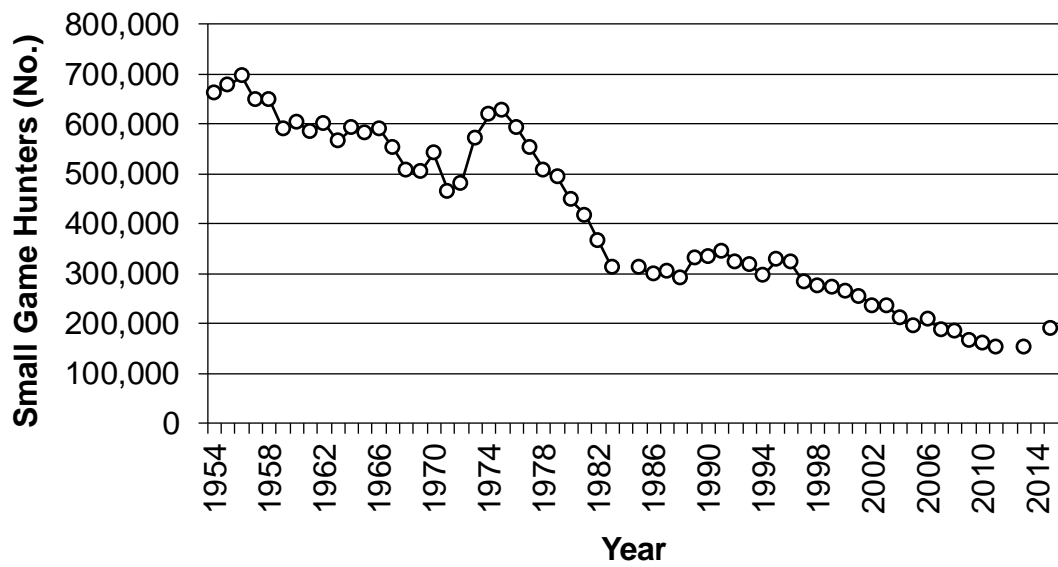


Figure 2. Estimated number of small game hunters in Michigan, 1954-2015 (estimate of the number of people that went afield). No estimates were available for 1984 and 2012.

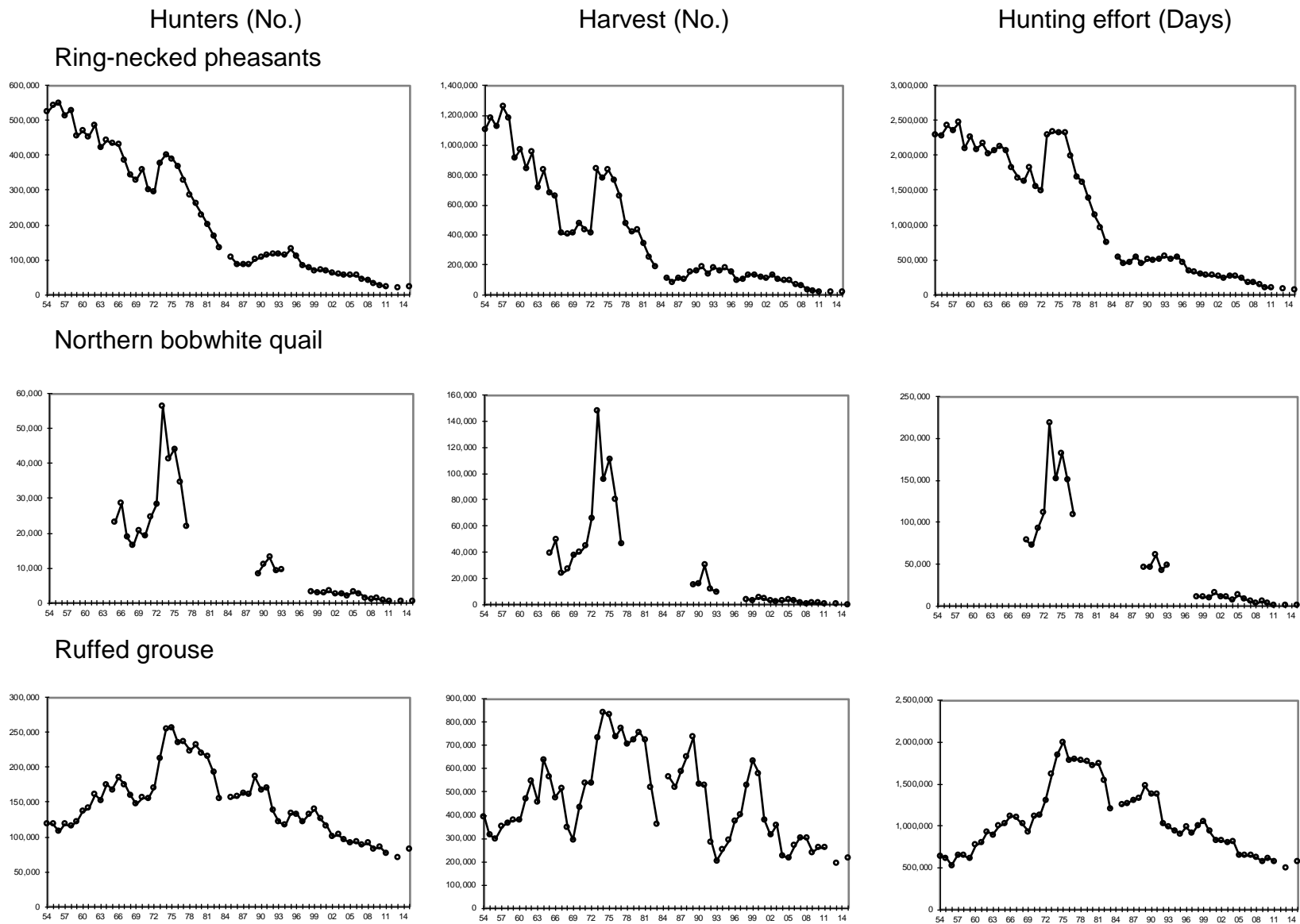


Figure 3. Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2015. No estimates were available or no seasons existed during years when no data are plotted.

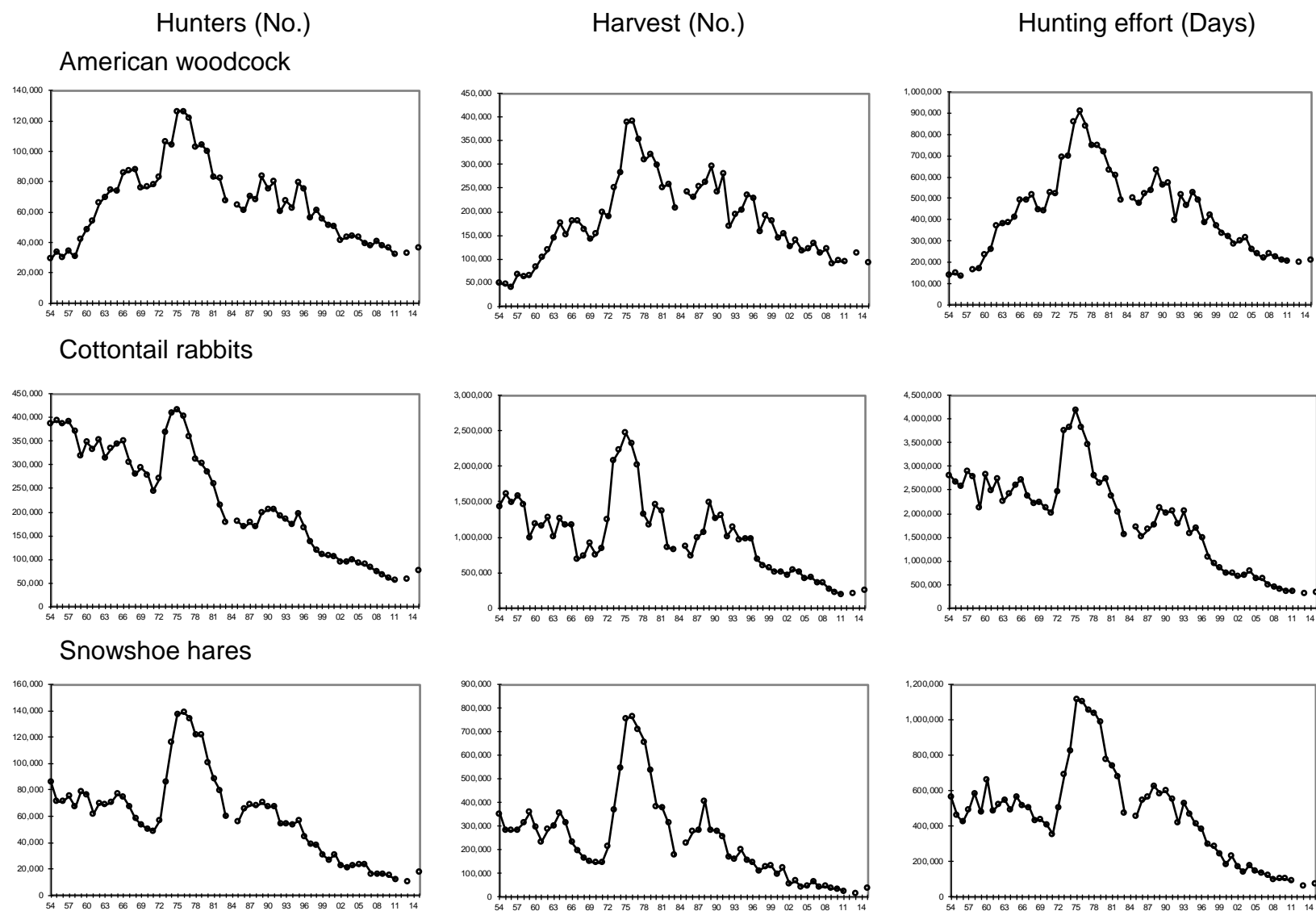


Figure 3 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2015. No estimates were available or no seasons existed during years when no data are plotted.

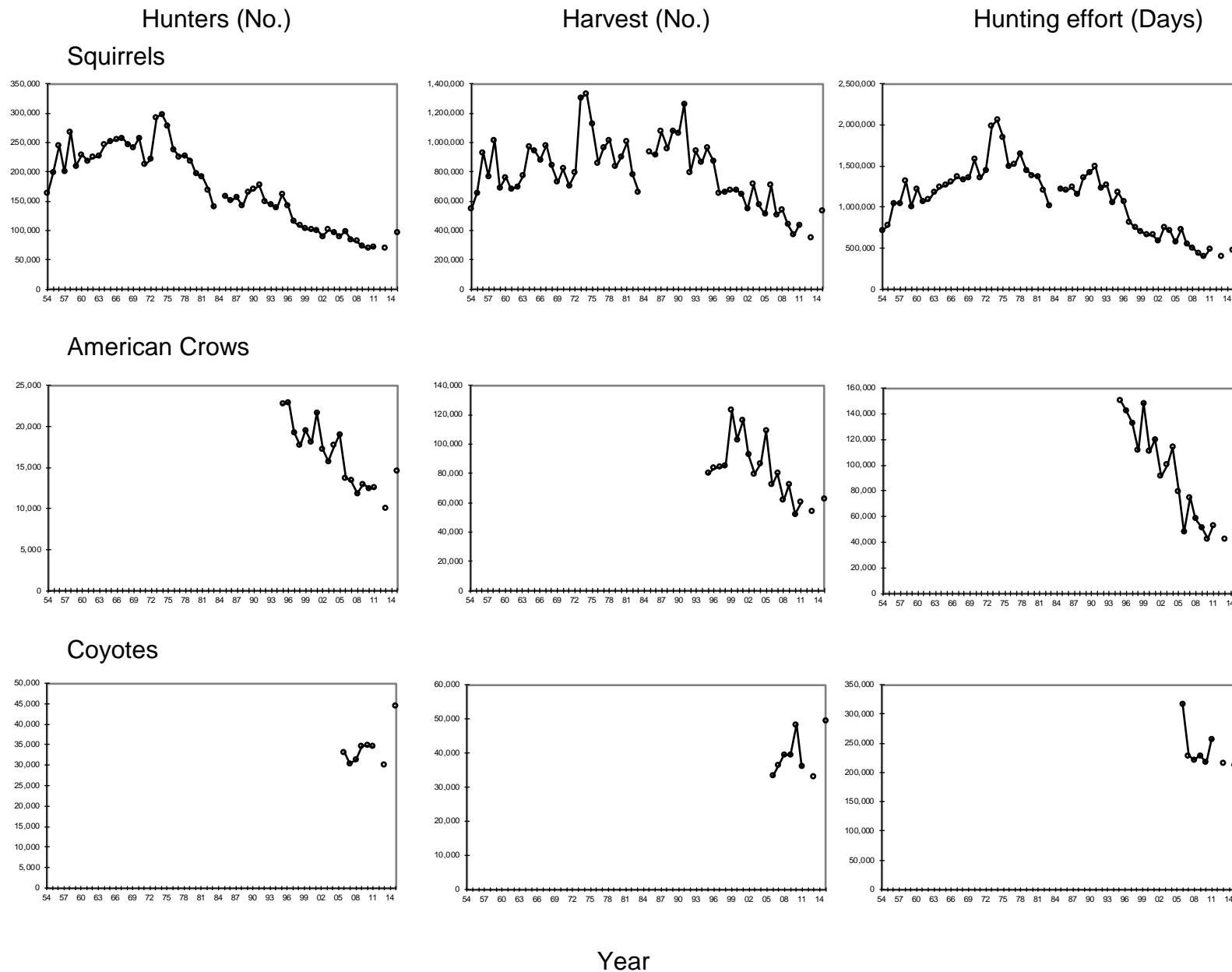


Figure 3. (continued) Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2015. No estimates were available or no seasons existed during years when no data are plotted.

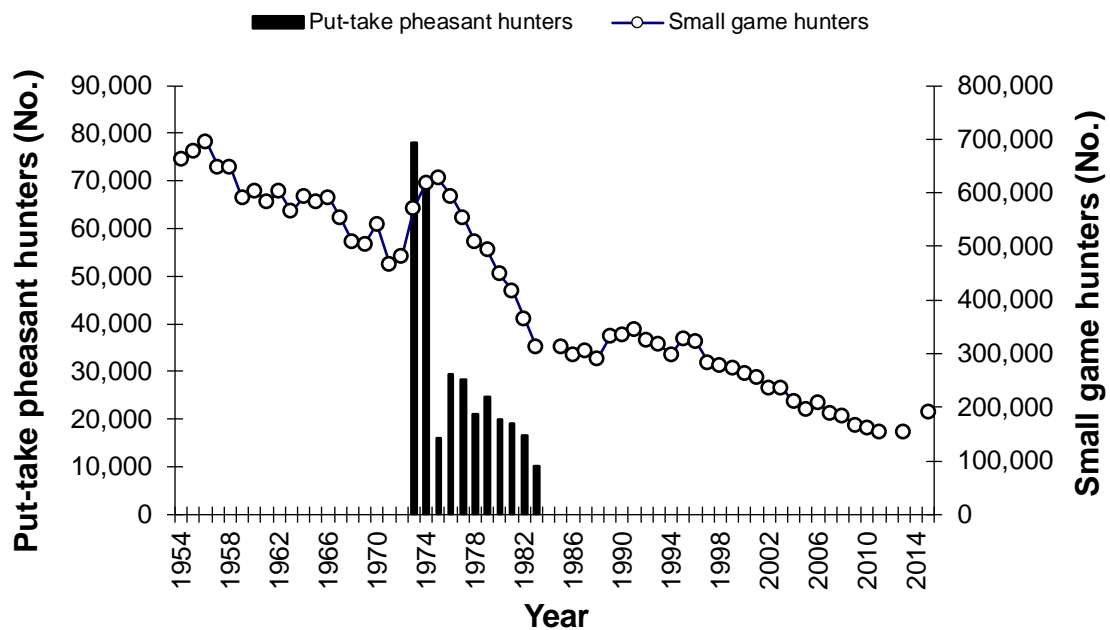


Figure 4. Estimated number of small game hunters in Michigan, 1954-2015 (estimate of the number of people that went afield) and number of people participating in put-take pheasant hunts (1973-1983). The numbers of put-take pheasant hunters were estimated for 1973-1974 (Janson 1975, Janson and Anderson 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.

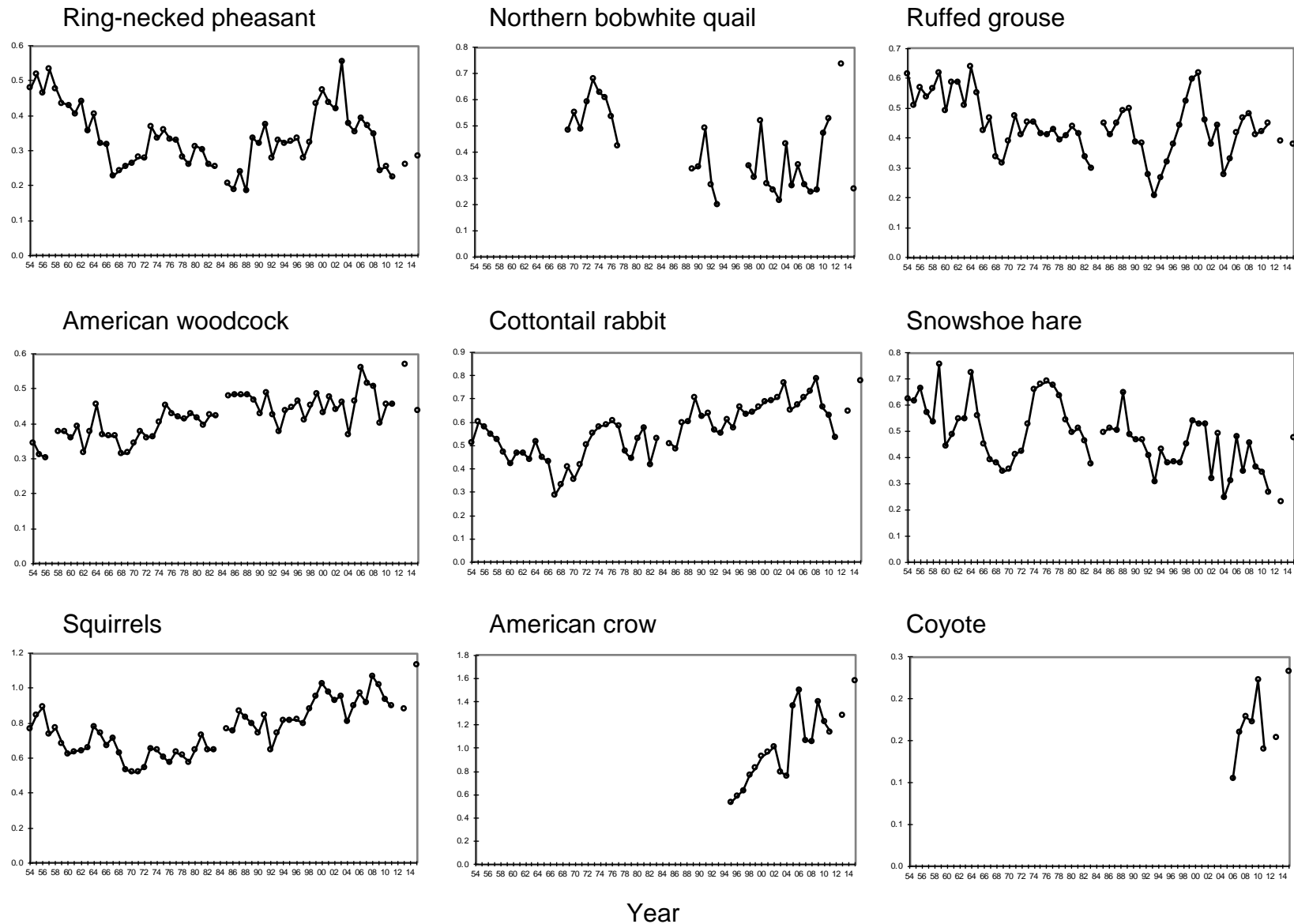


Figure 5. Estimated harvest per effort in Michigan during the small game hunting seasons, 1954-2015. No estimates were available or no seasons existed during years when no data are plotted.

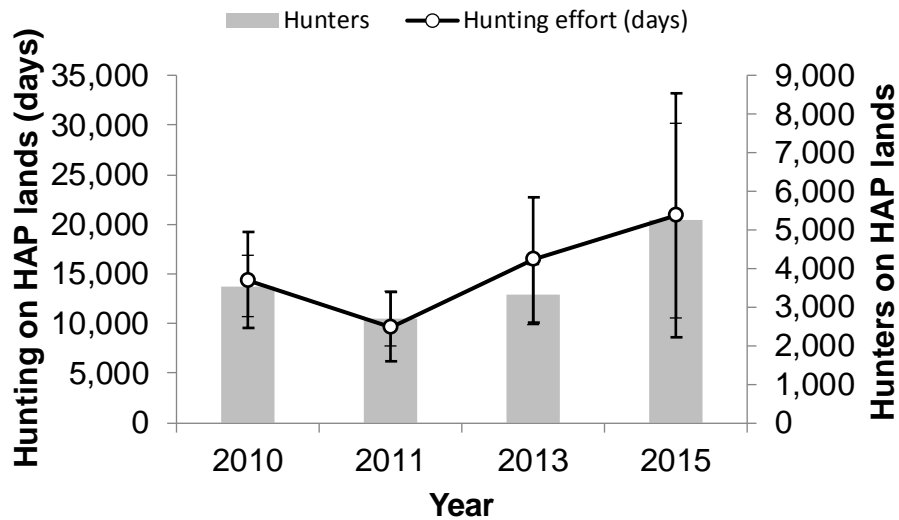


Figure 6. The estimated number of small game hunters and hunting effort (days afield) among people that hunted on Habitat Access Program lands, 2010-2015. Estimates were not available for 2012 and 2014.

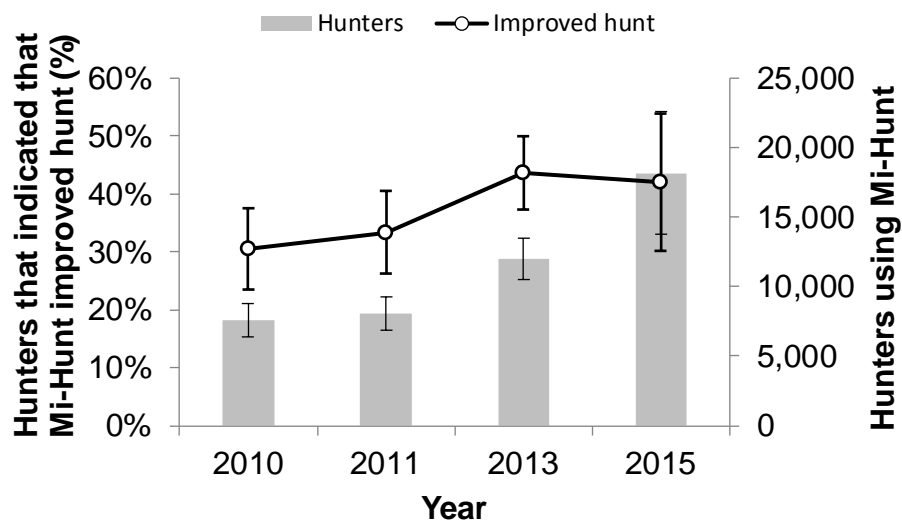


Figure 7. The estimated number of small game hunters that used the Mi-Hunt application to help locate a hunting area, and the proportion of hunters using Mi-Hunt that indicated that it had improved the quality of their hunt, 2010-2015. Estimates were not available for 2012 and 2014.

APPENDIX A

2015-2016 Small Game Harvest Questionnaire



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

2015-2016 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 2015-16?

¹ ☐ Yes. Please complete the table below.

² ☐ No. Skip the remaining questions and return questionnaire.

SPECIES (Check box if you hunted during the season.)	COUNTY HUNTED (List the counties hunted on separate lines.)	NUMBER OF DAYS HUNTED (Include all days hunted, even if you did not harvest anything.)	TYPE OF LAND	NUMBER OF ANIMALS TAKEN
⁰ <input checked="" type="checkbox"/> Example	1 Jackson	5	¹ <input checked="" type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	12
¹ <input type="checkbox"/> Pheasant (Do not count birds taken on a licensed shooting preserve)	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
² <input type="checkbox"/> Ruffed Grouse	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
³ <input type="checkbox"/> Woodcock	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
⁴ <input type="checkbox"/> Cottontail Rabbit	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
⁵ <input type="checkbox"/> Snowshoe Hare	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
⁶ <input type="checkbox"/> Squirrel	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
⁷ <input type="checkbox"/> Crow	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
⁸ <input type="checkbox"/> Quail (Portions of the Southern Lower Peninsula)	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
⁹ <input type="checkbox"/> Coyote	1		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	2		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	3		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	
	4		¹ <input type="checkbox"/> Private ² <input type="checkbox"/> Public ³ <input type="checkbox"/> Both	

Questions continued on back

2. 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

3. 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"/>

4. The Michigan Department of Natural Resources (MDNR) leased private lands throughout Michigan for public hunting through the Hunting Access Program (HAP). In 2015, the MDNR leased about 170 properties totaling about 20,100 acres. Did you hunt small game on any HAP property in 2015-16?

- 1 ☐ Yes 2 ☐ No. Skip to Question #5.

4a. If you hunted small game on a HAP property in 2015-16, how many days did you hunt on HAP properties?

_____ DAYS HUNTED

4b. If you hunted small game on a HAP property in 2015-16, which county was each HAP property located?

_____ COUNTIES HUNTED

5. Sixteen 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 2015?

- 1 ☐ Yes 2 ☐ No. Skip to Question #6.

5a. If you hunted ruffed grouse or woodcock at a GEMS in 2015, how many days did you hunt?

_____ DAYS HUNTED

5b. If you hunted ruffed grouse or woodcock at a GEMS in 2015, which county was each GEMS located?

_____ COUNTIES HUNTED

6. 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 2015-16?

- 1 ☐ Yes 2 ☐ No. Skip the remaining questions.

7. If you used MI-HUNT to select an area for your 2015-16 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"/>

8. How did MI-HUNT affect the quality of your small game hunting experience in 2015-16?

- 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!