MICHIGAN DEPARTMENT OF NATURAL RESOURCES
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2018 MICHIGAN FURBEARER HARVEST SURVEY

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ABSTRACT

A sample of furtakers was contacted after the 2018 hunting and trapping seasons to estimate the number of participants, days afield (effort), and furbearer harvests. In 2018, 23,422 people purchased a fur harvester license, which was 2% greater than in 2017. About 12,052 license buyers either hunted or trapped furbearers in 2018. About 31% of the license buyers trapped (7,202 trappers), 34% hunted (7,869 hunters), and 13% (3,019) both trapped and hunted. The number of active furtakers in 2018 was not significantly different from the number in 2017. The number of furtakers seeking fisher (29% increase), bobcat (23%), and otter (19%) increased significantly in 2018; however, the number of furtakers pursuing the other species was unchanged. Changes for hunting and trapping effort and harvest between 2017 and 2018 generally followed changes in the number of furtakers, although most of these changes were not significant. Hunters most commonly sought coyotes, raccoons, and bobcats, while trappers most frequently sought raccoons, coyotes, and muskrats. Only harvest for coyote in 2018 was near the high-end of its historical range. Harvest for badger, beaver, bobcat, opossum, raccoon (trappers only), and skunk were near the averages of their historical ranges. In contrast, the harvest of grey fox, mink, muskrat, raccoon (hunters only), red fox, and weasel were near the lows of their historical ranges. Trends in harvest per furtaker were examined because this measure may eliminate some of the effects of changing furtaker and furbearer numbers over time. The mean number of raccoon and opossum taken per trapper has generally increased since the early 1950s. The mean harvest of fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance, while fox numbers may have been declining. Hunters and trappers combined spent an average of $422 per year pursuing furbearers. Collectively, furtakers spent about $5,088,000 hunting and trapping furbearers in 2018.

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INTRODUCTION

The Department of Natural Resources (DNR) has the authority and responsibility to protect and manage wildlife resources in Michigan, while the Natural Resources Commission (NRC) has the authority to regulate the taking of game (Natural Resources and Environmental Protection Act, Public Act 451 of 1994). Harvest surveys are one of the management tools used by the DNR to accomplish its statutory responsibility. Estimating harvests and furtaker participation are the primary objectives of these surveys. Information from harvest surveys, mandatory registration, and other indices are used to monitor furbearer populations and help establish harvest regulations.

The primary furbearing animals harvested for their pelts in Michigan during recent years have been badger (*Taxidea taxus*), beaver (*Castor canadensis*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), fisher (*Martes pennanti*), gray fox (*Urocyon cinereoargenteus*), marten (*Martes americana*), mink (*Mustela vision*), muskrat (*Ondatra zibethica*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), river otter (*Lontra canadensis*), striped skunk (*Mephitis mephitis*), and weasels (*Mustela* spp.) (Frawley 2019a). Coyote, opossum, weasels, and skunks could be taken year-round with a fur harvester license. The remaining furbearers could be harvested in 2018 during late fall through spring by a person possessing a fur harvester license (Table 1); however, nonresidents could not trap badger, bobcat, fisher, marten, or otter.

Landowners or their designees could take raccoons, coyotes, and skunks throughout the year on their property without a license if these animals were doing or about to do damage. Coyotes could also be taken by resident hunters possessing a base license. In addition, a mentored hunting program was started in 2012. Under this program, a mentored youth hunting license was created and could be purchased by youth hunters aged 9 and younger. The youth hunter had to participate with a mentor who was at least 21 years old. The mentored youth hunting license allowed the youth hunter to hunt small game, turkey, deer, trap furbearers, and fish for all species. Hunters taking furbearers on their own land without a license, or taking furbearers with either a base license or a mentored youth hunting license were not included in our sample. Thus, harvest estimates from this survey do not represent all possible forms of furbearer harvest, but only those taken by people with a fur harvester license.

METHODS

Following the 2018 hunting and trapping seasons, a questionnaire (Appendix A) was sent to a random sample of people (5,000) who had purchased a fur harvester license (Table 2). This level of sampling should produce statewide estimates with a margin of error of less than 20% for the most commonly pursued species. All licensees had an equal chance of being included in the random sample. After the sample was selected, licensees were grouped into one of four strata on the basis of their residence. These strata included residents of the Upper Peninsula (UP), Northern Lower Peninsula (NLP), Southern Lower Peninsula (SLP), and nonresidents (Figure 1). People receiving the questionnaire were asked to report

whether they pursued furbearers, the number of days spent afield, and whether they harvested any furbearing animals.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, furtakers were placed into similar groups (strata) based on their county of residence. Residents of the UP, NLP, SLP, and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). The overall sample consisted of 630 people from the UP stratum (N= 3,008), 1,154 people from the NLP stratum (N= 5,357), 3,122 from the SLP stratum (N= 14,590), and 94 people from the nonresident and unknown residency stratum (N=487). 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 represented in the statewide population of furtakers. 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 was repeated.

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. The nonsampling error could occur for many reasons, including the failure to include a segment of the survey 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 95 out of 100 times ($P < 0.05$), if the study had been repeated (Payton et al. 2003).

Estimates of events that occur infrequently are difficult to estimate precisely using common sampling designs (Cochran 1977). Relatively few furtakers harvest river otter, bobcat, badger, fisher, and marten; thus, some estimates associated with these species should be viewed cautiously. More precise harvest estimates were obtained for these species through tallying registration reports. All furtakers harvesting a river otter, bobcat, fisher, or marten were required to present these animals at a DNR office for registration. Prior to 2003, furtakers were also required to register badger; however, this requirement was eliminated in 2003.

During recent years, all licensed furtakers attempting to harvest bobcat, fisher, marten, and otter in Michigan were required to obtain a free harvest tag from the DNR. The list of furtakers obtaining these harvest tags formed a complete list of statewide trappers pursuing these species. Using these lists, the DNR was able to design separate harvest surveys that provided more precise estimates (i.e., narrower confidence intervals) than previous surveys of all furtakers. Separate surveys were conducted to estimate furtaker participation, harvest, and effort for bobcat (Frawley 2019c), fisher and marten (Frawley 2019a), and otter (Frawley 2019b) seasons during recent years.

While the primary objectives of the fur harvesters' survey were estimating harvest, the number of participants, and trapping and hunting effort, this survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to determine furtakers satisfaction with furbearer numbers, animals harvested, and overall hunting or trapping experience. In addition, furtakers were asked to report how much they spent on things related to hunting and trapping furbearers (e.g., fuel, food, lodging, equipment, and ammunition) during 2018 seasons. Trappers also were asked whether they caught any bobcats incidentally in traps set for another species.

RESULTS AND DISCUSSION

Questionnaires were mailed initially in late April 2019. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 95 people, primarily because of changes in residence. Questionnaires were returned by 2,457 people, yielding a 50% adjusted response rate (Table 2).

In 2018, 23,444 fur harvester licenses were purchased by 23,442 people (Figure 2, Table 2). The number of license buyers in 2018 was 2% greater than in 2017. Most license buyers were men (97%), with an average age of 48 years (Figure 3). About 3% of the license buyers (759) were younger than 17 years of age. Furtakers less than 10 years of age using a mentored youth license were not included in the analyses.

Compared to 10 years ago, the number of people buying a fur harvester license in 2018 decreased by about 3% (24,071 people purchased a license in 2008). In addition, there were fewer license buyers for most age classes between 10 and 54 years of age in 2018, compared to 2008 (Figure 4). However, there were increased furtakers among the oldest age classes in 2018. The increased furtakers in the oldest age classes likely represented the rising share of older people in the population as the baby-boom generation aged and life expectancies have increased.

Mail Harvest Survey

Overall, approximately 51% of license buyers either hunted or trapped furbearers during 2018 (Table 3). The number of active furtakers in 2018 was not significantly different from the number of furtakers in 2017. About 31% of the license buyers trapped and 34% hunted furbearers during 2018. Trappers most often pursued raccoon, coyote, and muskrat (Table 4). Hunters most commonly sought coyote, raccoon, and bobcats. Coyotes and

raccoons also ranked as the most frequently sought furbearers when trappers and hunters were combined.

The estimated number of hunters and trappers statewide has declined gradually since 2013, although current estimates are well above the lowest estimates reported during the mid-1990s (Figure 5). Recent changes in furtaker numbers have paralleled declining fur prices (e.g., Dhuey 2018, Rees 2015, Conlee and Johnston 2018, Evelsizer 2018). Historically, the peaks in furtaker numbers corresponded closely to periods when pelt values peaked for many species such as muskrat, raccoon, and red fox (Evelsizer 2018, Conlee and Johnston 2018). Between 1999 and 2011, the number of people hunting furbearers was greater than the number of people trapping; however, the number of trappers and hunters was nearly equal since 2012 (Figure 5).

The number of furtakers pursuing most furbearers was similar between 2017 and 2018 (Table 4), except for fisher, bobcat, and otter. A significantly greater number of furtakers pursued these three species in 2018. Changes for hunting and trapping effort and harvest between 2017 and 2018 generally followed changes in the number of furtakers, although most of these differences were not significant (Table 4).

Only harvest for coyote in 2018 was near the high-end of its historical range. Harvest for badger, beaver, bobcat, opossum, raccoon (trappers only), and skunk were near the averages of their historical ranges. In contrast, the harvest of grey fox, mink, muskrat, raccoon (hunters only), red fox, and weasel were near the lows of their historical ranges (Figures 6-8). Many factors influence harvest trends such as furtaker numbers, wildlife population size, harvest regulations, weather, habitat conditions, and fur prices; thus, any interpretations of trends should be viewed cautiously.

Trends in harvest per furtaker (Figures 9 and 10) were examined because this measure may eliminate some of the effects of changing furtaker and furbearer numbers over time, although many other factors may still complicate interpretations of these trends (Poole and Mowat 2001). The mean number of raccoon taken per trapper has generally increased since the early 1950s (Figures 9 and 10). The mean harvest of fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance since the 1950s, while fox numbers may have been declining.

These trends in furbearer numbers are not unique to Michigan. Increasing raccoon numbers and declining red fox numbers have been reported in many Midwestern states since the 1980s (e.g., Gehrt et al. 2002, Conlee and Johnston 2018, Evelsizer 2018). The decline in red fox numbers has been attributed largely to competition from increased coyote and bobcat (Sovada et al. 1995, Conlee and Johnston 2018, Evelsizer 2018). Gray fox numbers may also have been reduced because of the distemper virus associated with raccoons (Conlee and Johnston 2018).

The mean harvest of fisher and bobcat per trapper has declined during the last twenty years (Figure 9). Frawley (2019a) also reported increasing effort expended by trappers for each fisher registered during the last ten years. Both the declining mean harvest of fisher per trapper and the increasing effort per registered fisher suggest fisher numbers may have declined over the last twenty years. Using fisher trapper effort data with harvest at age

information, researchers reported a 70% decline in fisher abundance in the Upper Peninsula (unpublished data; J.R. Skalski, School of Aquatic & Fishery Sciences, University of Washington, Seattle). The seasonal harvest limit for fisher was lowered from three to one in 2011, and this reduction likely contributed to the decline in fisher taken per trapper in recent years (Frawley 2019a).

The mean number of bobcats taken per trapper declined between 2003 to 2018 (Figure 9). The seasonal harvest limit for bobcats was lowered from three to two bobcats in 2004, and the UP hunting and trapping season lengths were reduced in 2009, which likely contributed to the decline of bobcats taken per trapper since 2003 (Frawley 2019c).

Registration Data

Compared to 2017, increased numbers of marten (103%), bobcat (61%), fisher (37%), and otter (9%) were taken in 2018 (Figure 11, Table 5). Registration totals excluded harvest taken by tribal members. In addition, registration totals only included animals that were registered and returned to the furtaker.

Incidental Capture of Bobcats

An estimated 184 trappers caught a bobcat incidentally in a trap set for another species (Table 6). These trappers caught 298 incidental bobcats that were released alive from their traps. In addition, trappers caught an estimated 10 incidental bobcats that were registered. Because incidental bobcats could be captured more than once, the estimate of incidental bobcats caught by trappers probably does not represent unique bobcats.

Beaver Trapping Activity by Otter Trappers

In order to trap otter, trappers were required to obtain a free otter harvest tag in addition to a fur harvester license. A separate survey was sent to these trappers obtaining an otter harvest tag to estimate their trapping activity (Frawley 2019b). Because otter trappers frequently sought beaver, these trappers also were asked to report information about their beaver trapping activity. However, these estimates associated with beaver trapping represent only the participation, effort, or harvest of trappers that obtained an otter harvest tag. In order to put these estimates into a broader perspective, it is important to know what proportion of beaver trapping activity was attributed to trappers having an otter harvest tag.

An estimated 2,286 furtakers sought beavers (Tables 4 and 7). About 70% of these trappers possessed an otter harvest tag (Table 7), and they were responsible for an estimated 84% of the beaver taken.

Furtaker Satisfaction

Furtakers were asked to identify the furbearer species they primarily sought, and then report how satisfied they were the number of animals seen, the number of animals taken, and their overall hunting or trapping experience for this primary species. At least 58% of furtakers were either very satisfied or somewhat satisfied with the number of raccoon, fox, coyote, fisher, muskrat, and beaver seen during 2018 (Table 8). Over 50% of furtakers seeking raccoon,

fisher, muskrat, and beaver were satisfied with the number of animals taken; otherwise, less than 50% of furtakers were satisfied with the number of animals that they harvested (Table 9). Over 60% of furtakers pursuing all species were either very satisfied or somewhat satisfied with their overall hunting or trapping experiences (Table 10).

Expenditures by Furtakers

The average furtaker devoted 26 ± 1.9 days hunting or trapping furbearers and spent an average of $422 ± $43 in 2018. Expenditures included the costs of fuel, food, lodging, equipment, and ammunition. Collectively, furtakers spent about $5,088,000 (±$515,000) on hunting and trapping furbearers in the 2018 seasons.

ACKNOWLEDGEMENTS

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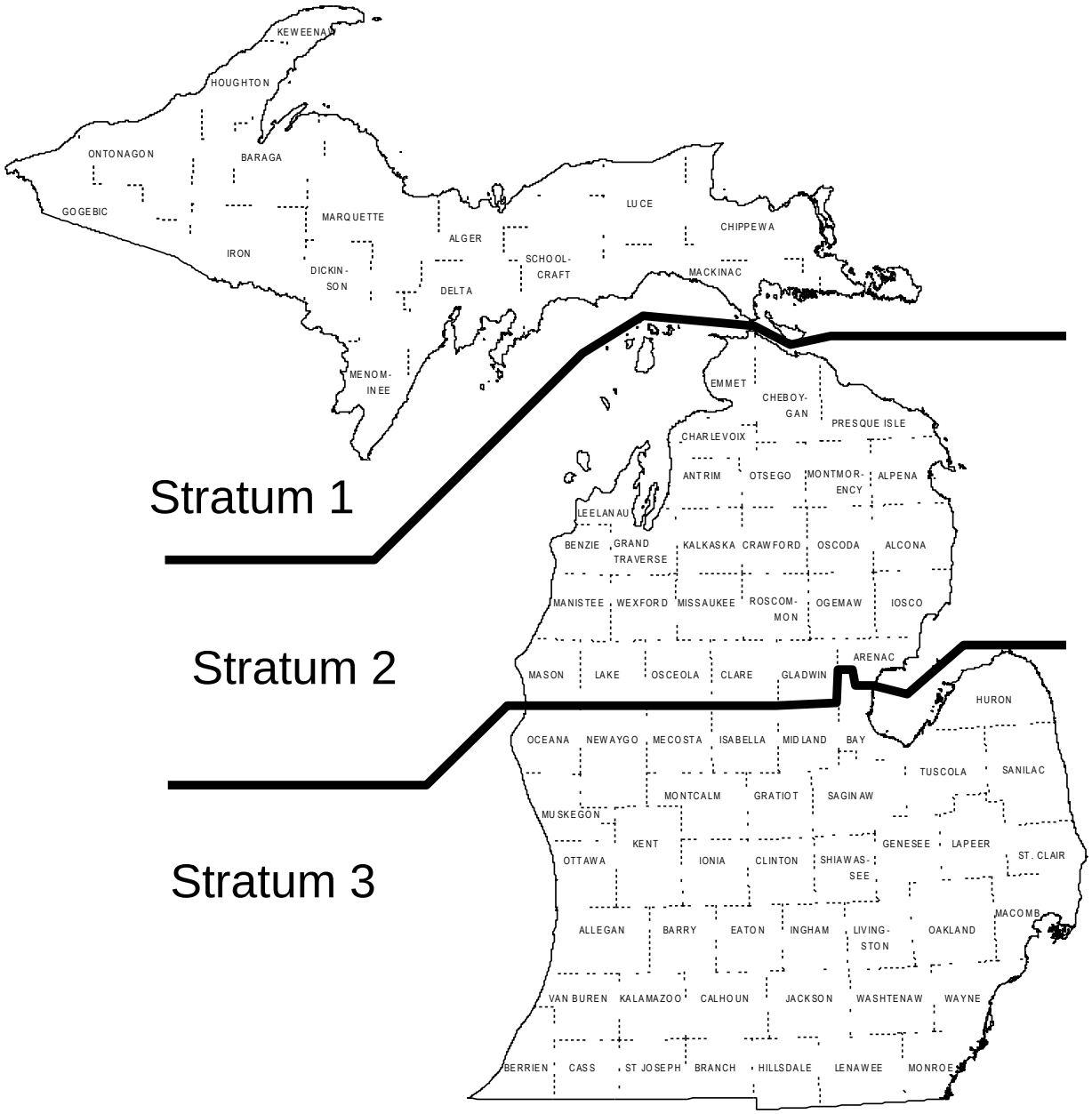


Figure 1. Stratum boundaries used for the analysis of the Michigan furbearer harvest survey.

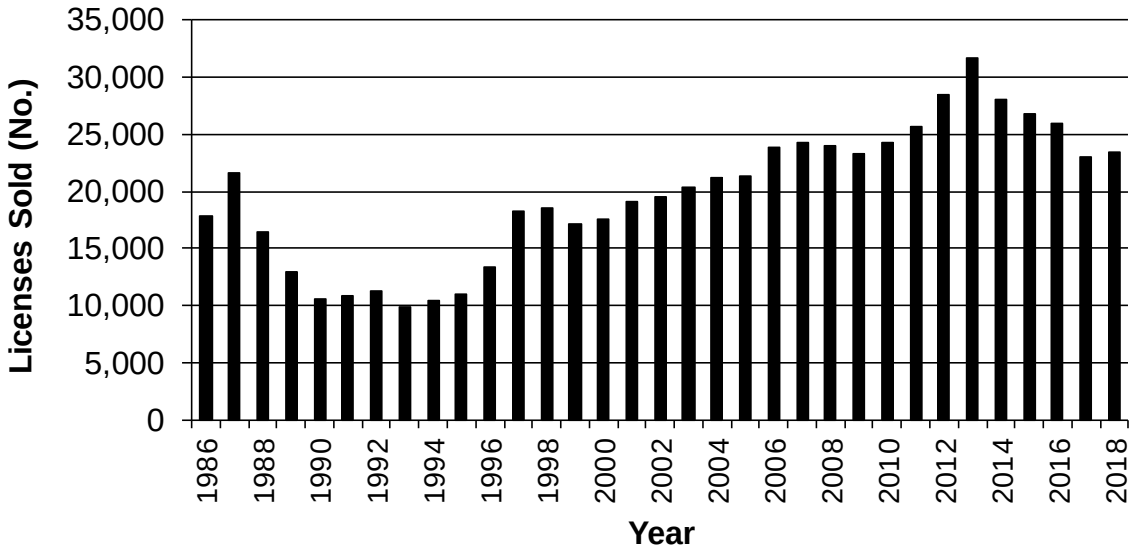


Figure 2. Number of fur harvester licenses sold in Michigan, 1986-2018.

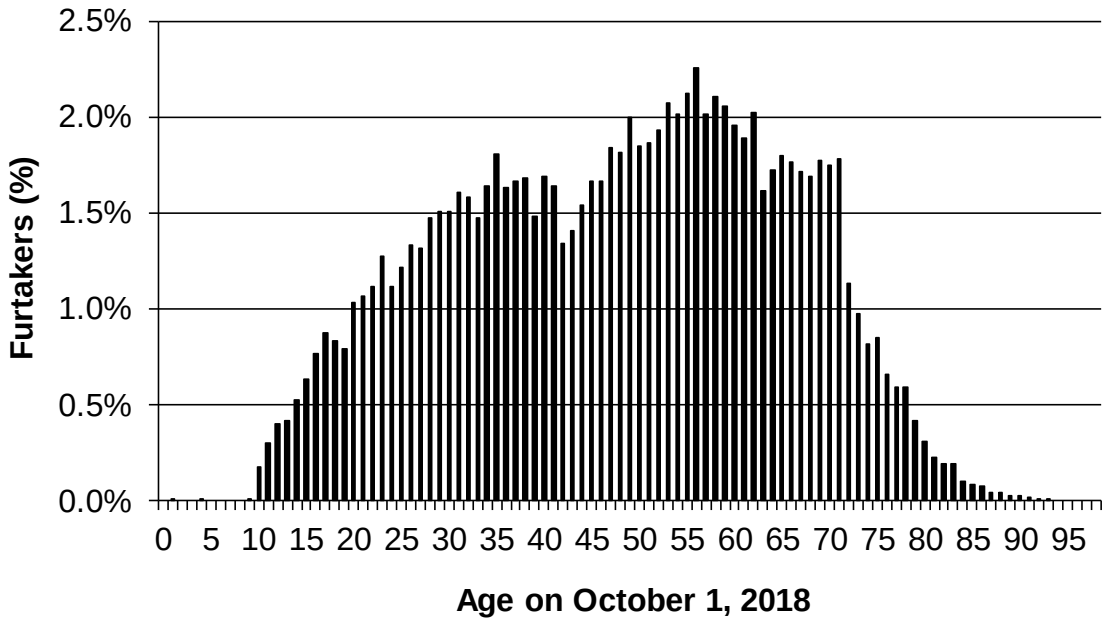


Figure 3. Ages of people that purchased a license to hunt or trap furbearers in Michigan for the 2018 hunting and trapping seasons (mean = 48 years).

Figure 4. Number of fur harvester license buyers in Michigan by age and sex during 2005 and 2018 hunting seasons. The number of people buying a license (all ages combined) was 24,296 in 2005 and 22,981 in 2018.

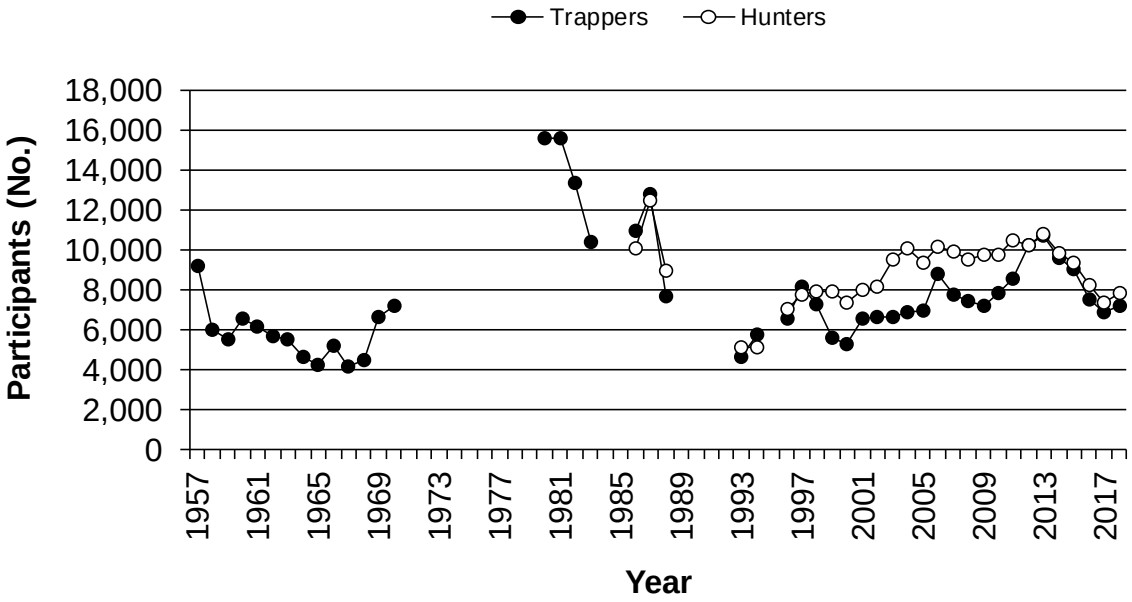


Figure 5. Estimated number of furtakers (trappers and hunters) in Michigan, 1957-2018. Estimates included only license buyers that actually trapped or hunted furbearers (any species). Data were not available for all years.

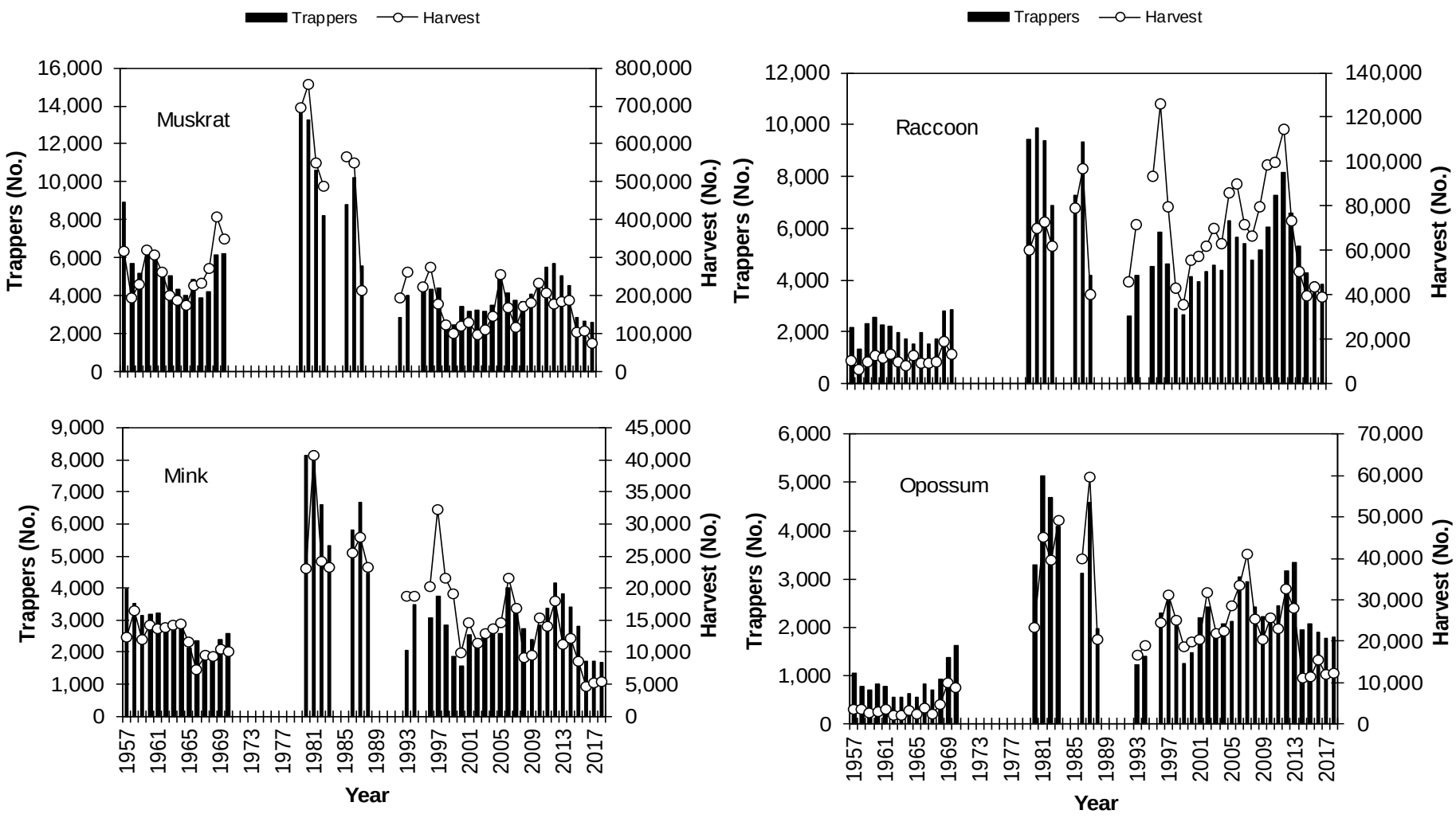
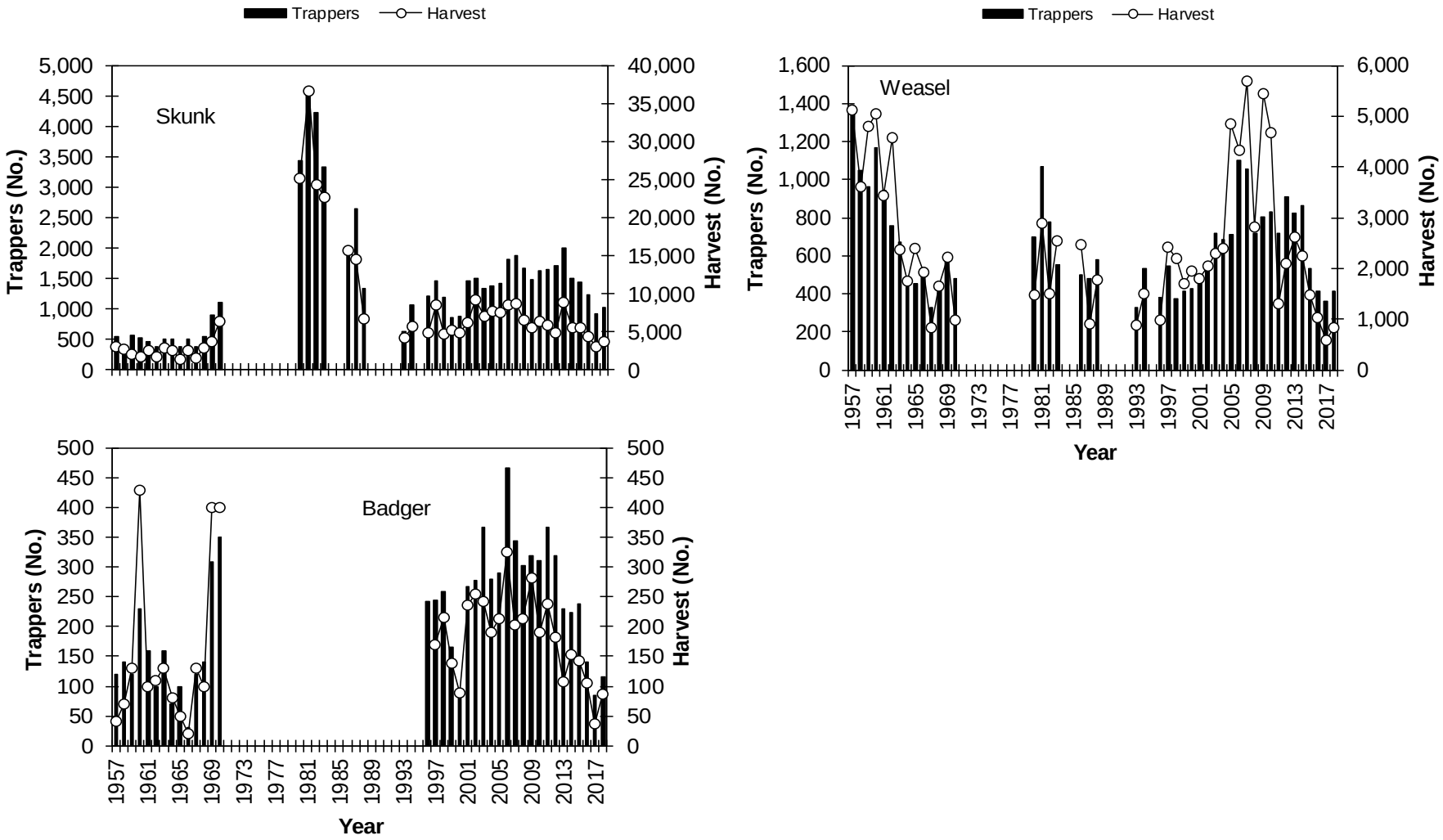


Figure 6. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2018. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2013, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. During 1996-2013, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Starting in 2014, license types were consolidated into a fur harvesters license type. Data were not available for all years.



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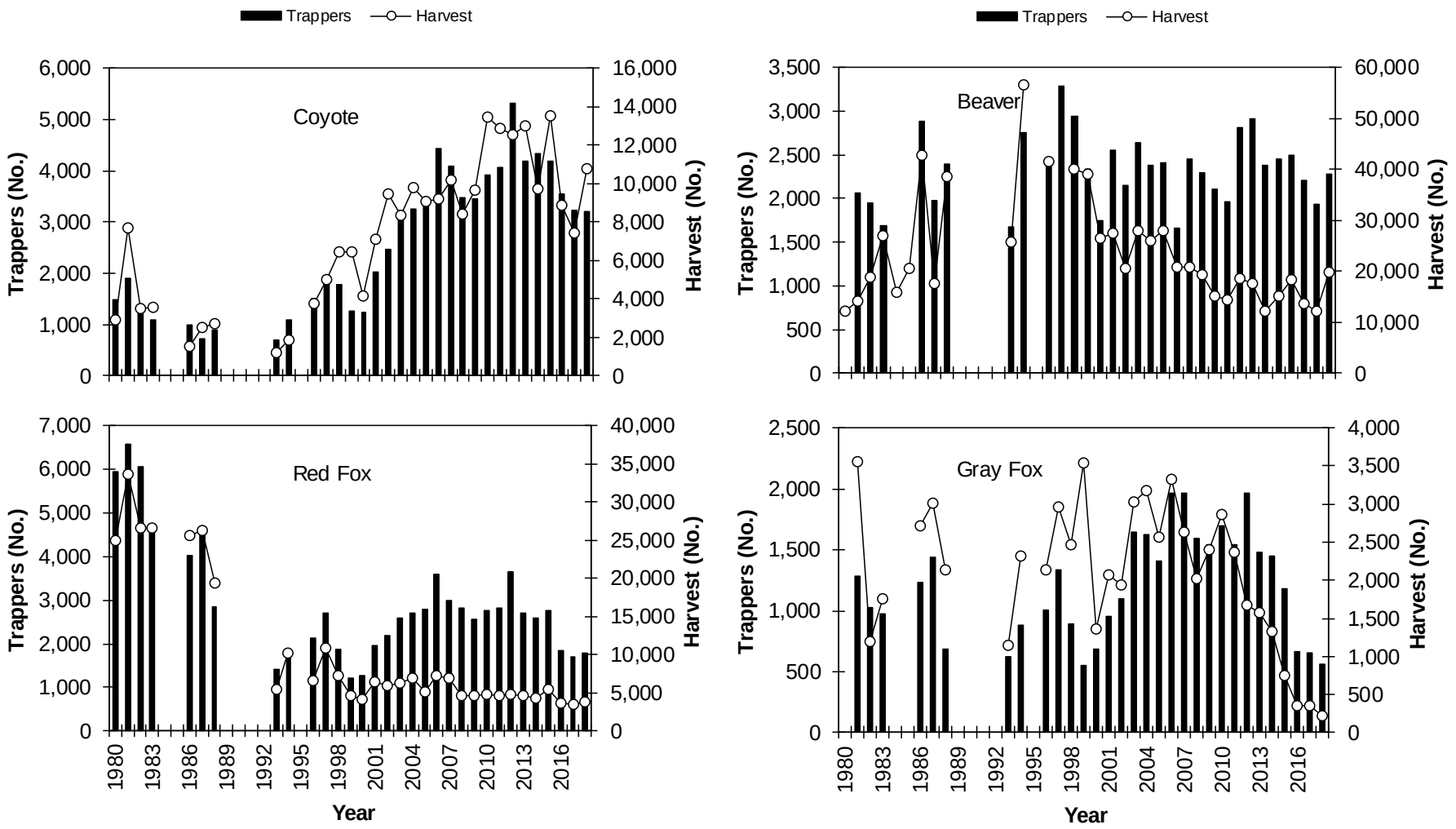

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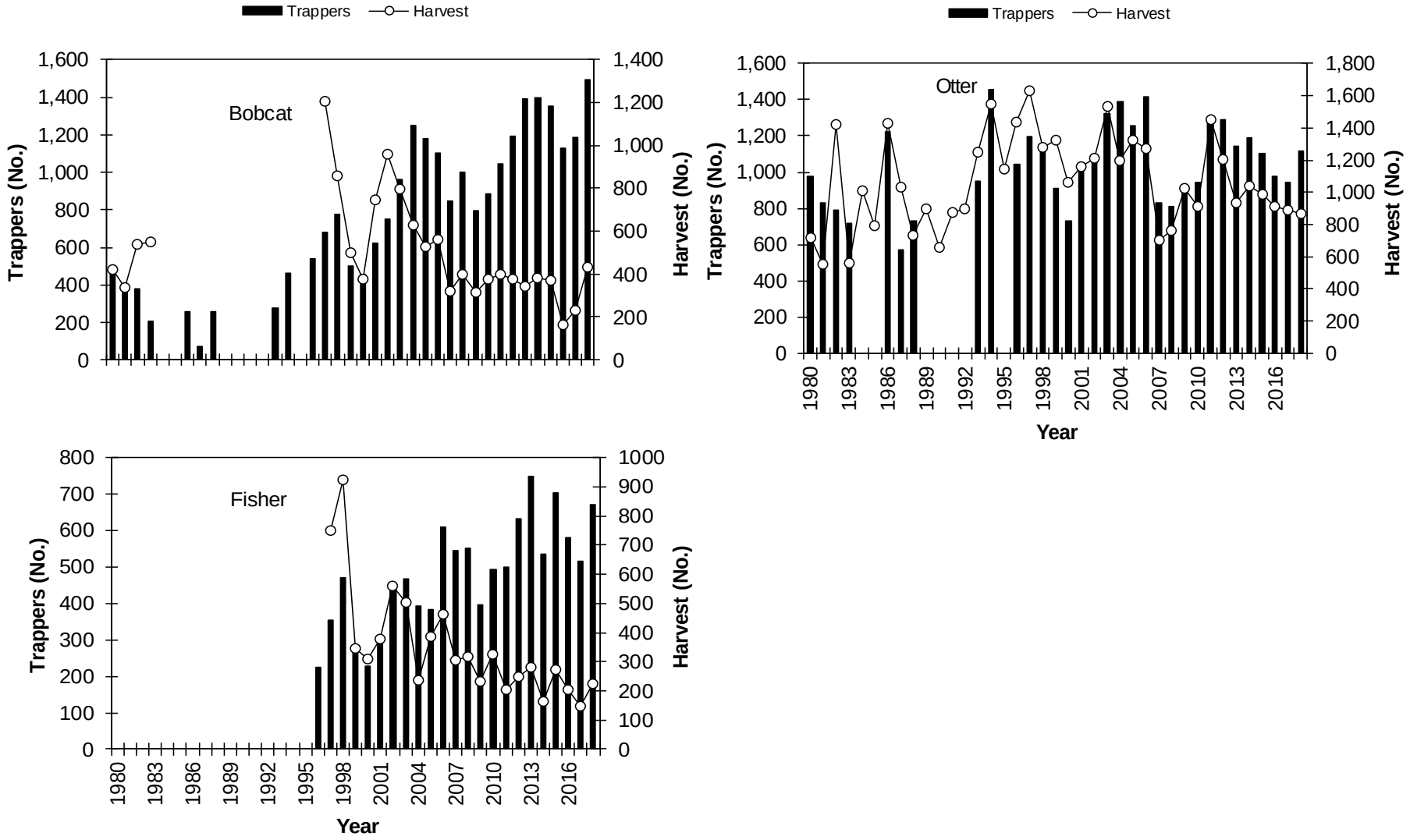

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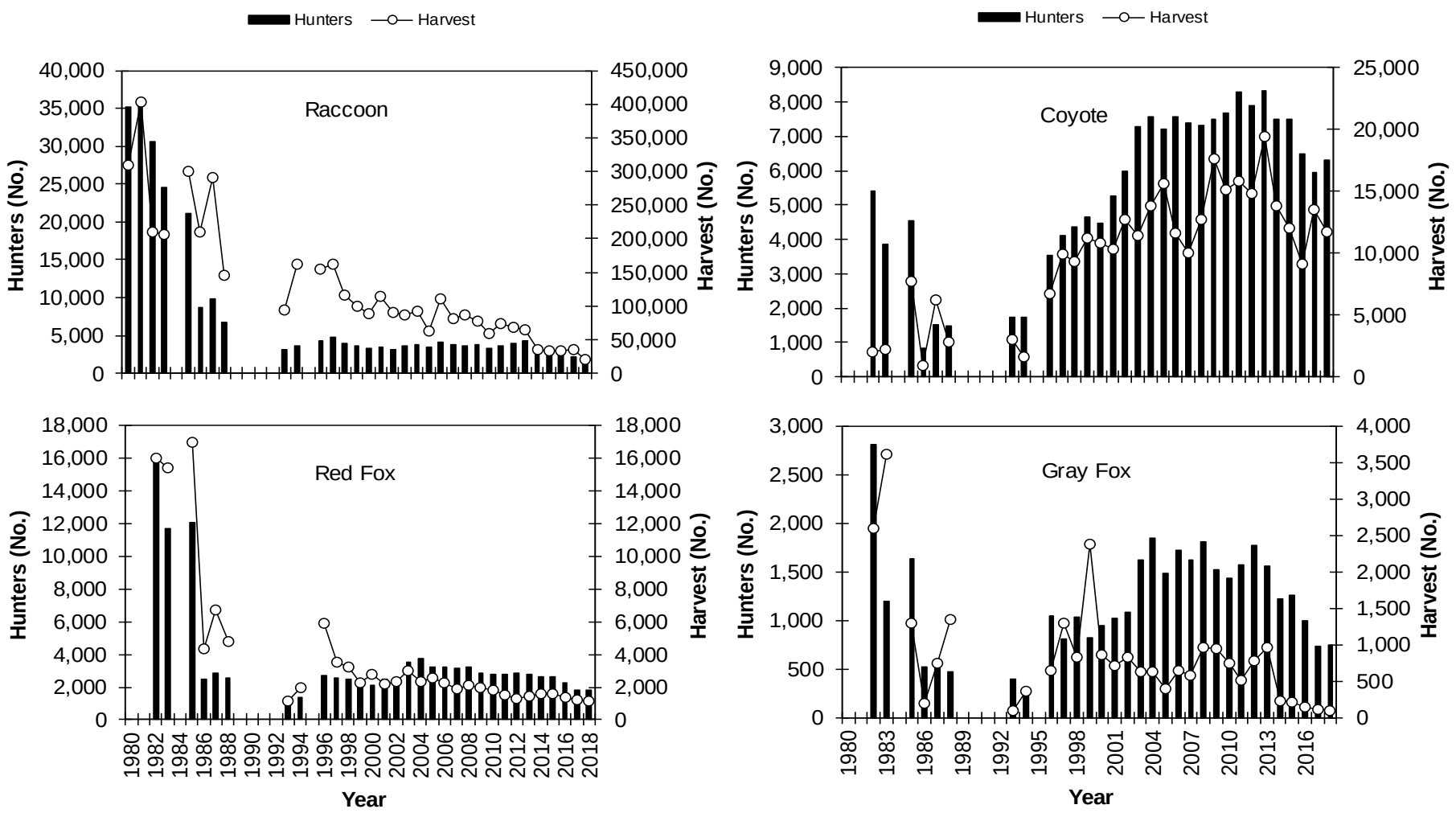
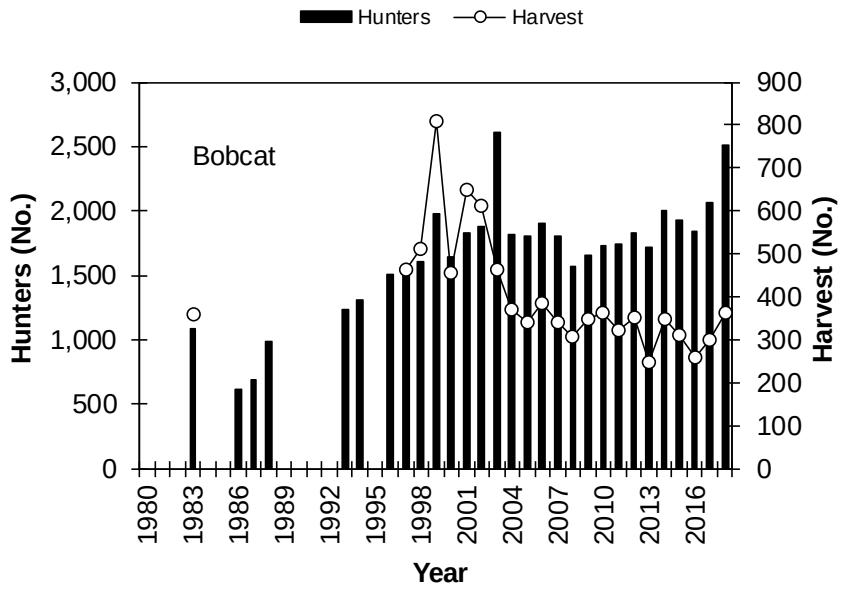


Figure 8. Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2018. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2013, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. During 1996-2013, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Starting in 2014, license types were consolidated into a fur harvesters license type. Data were not available for all years.



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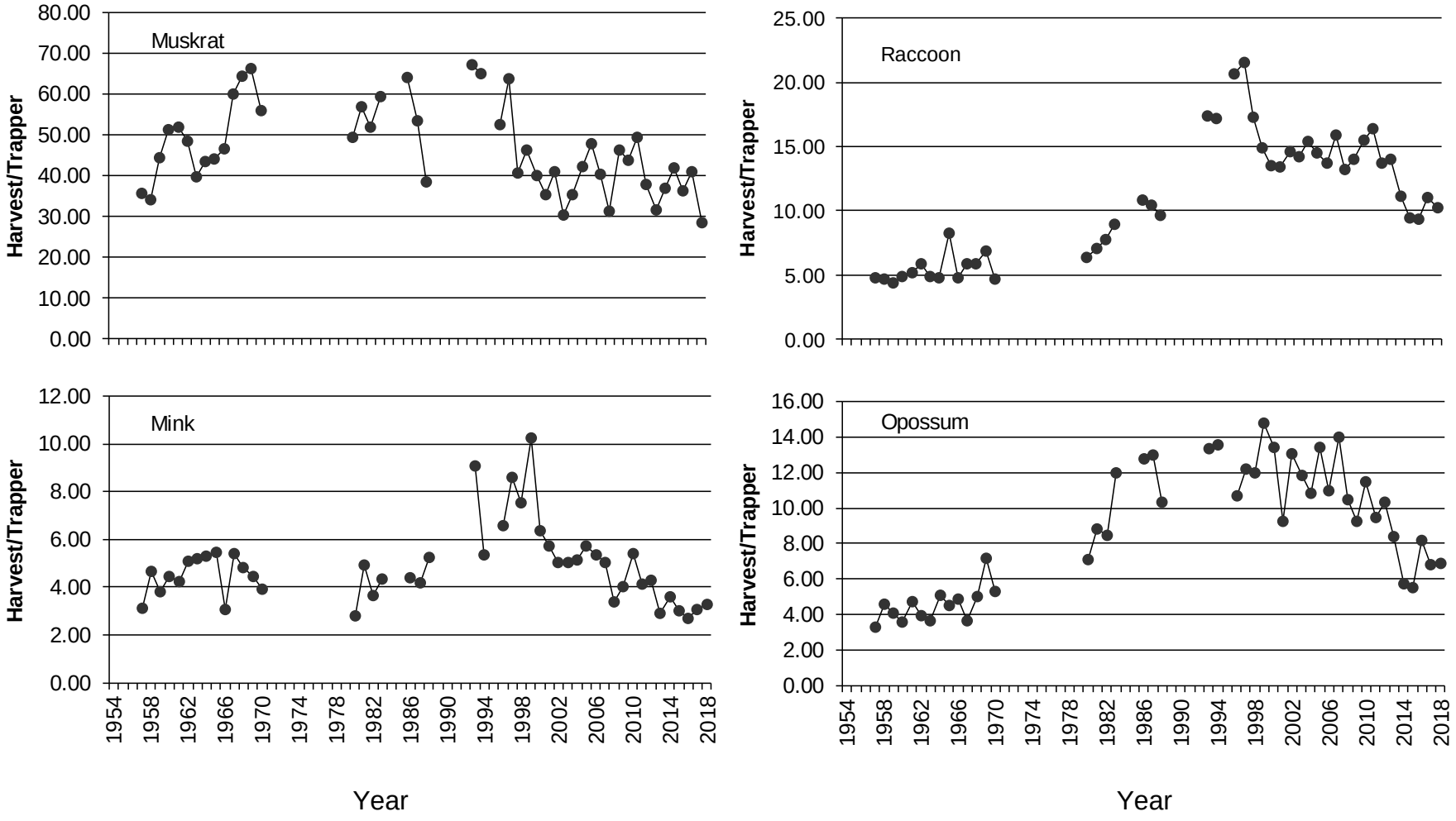
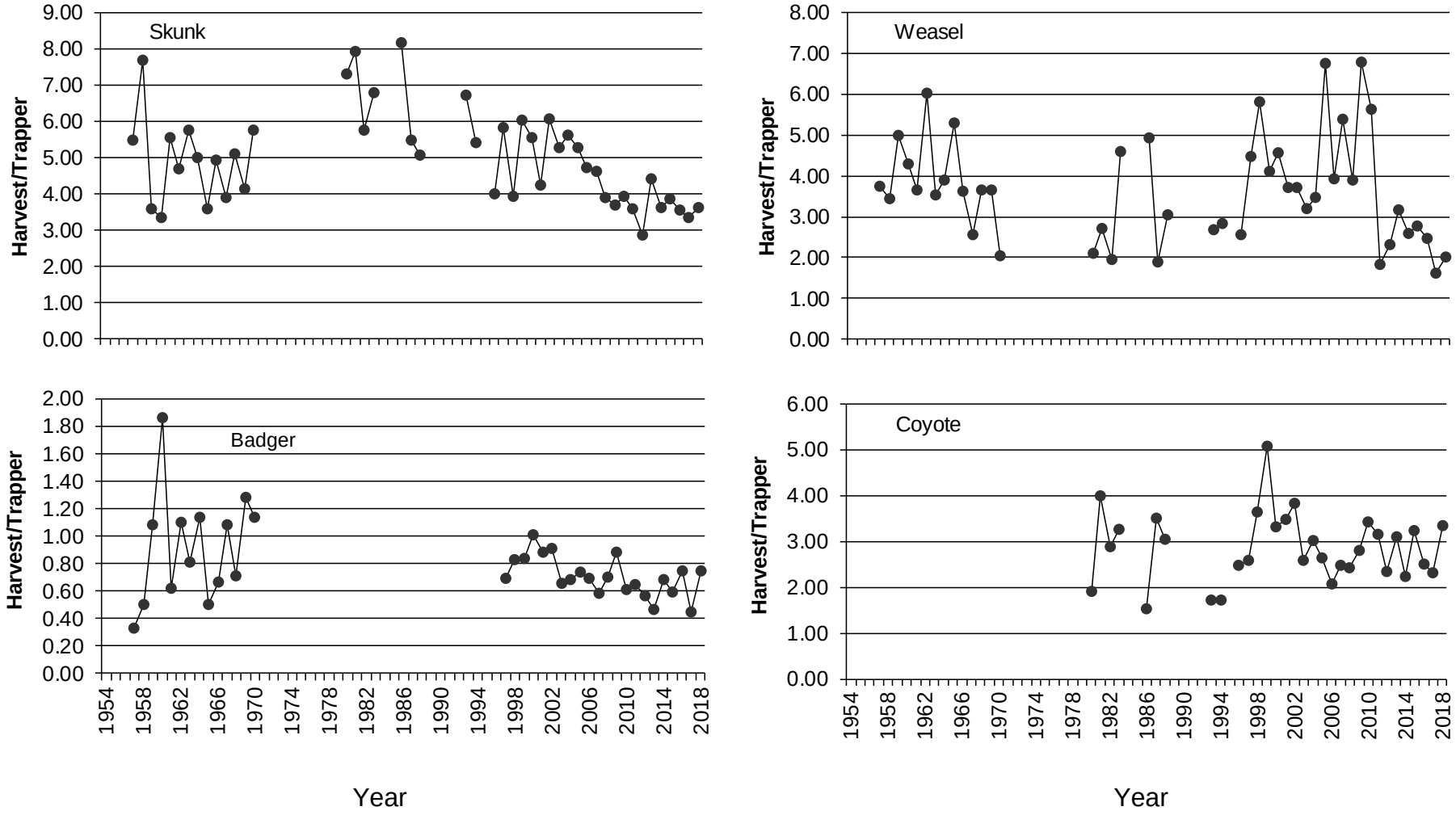


Figure 9. Mean number of furbearers harvested annually per trapper in Michigan estimated from mail harvest surveys, 1954-2018. Data were not available for all years.



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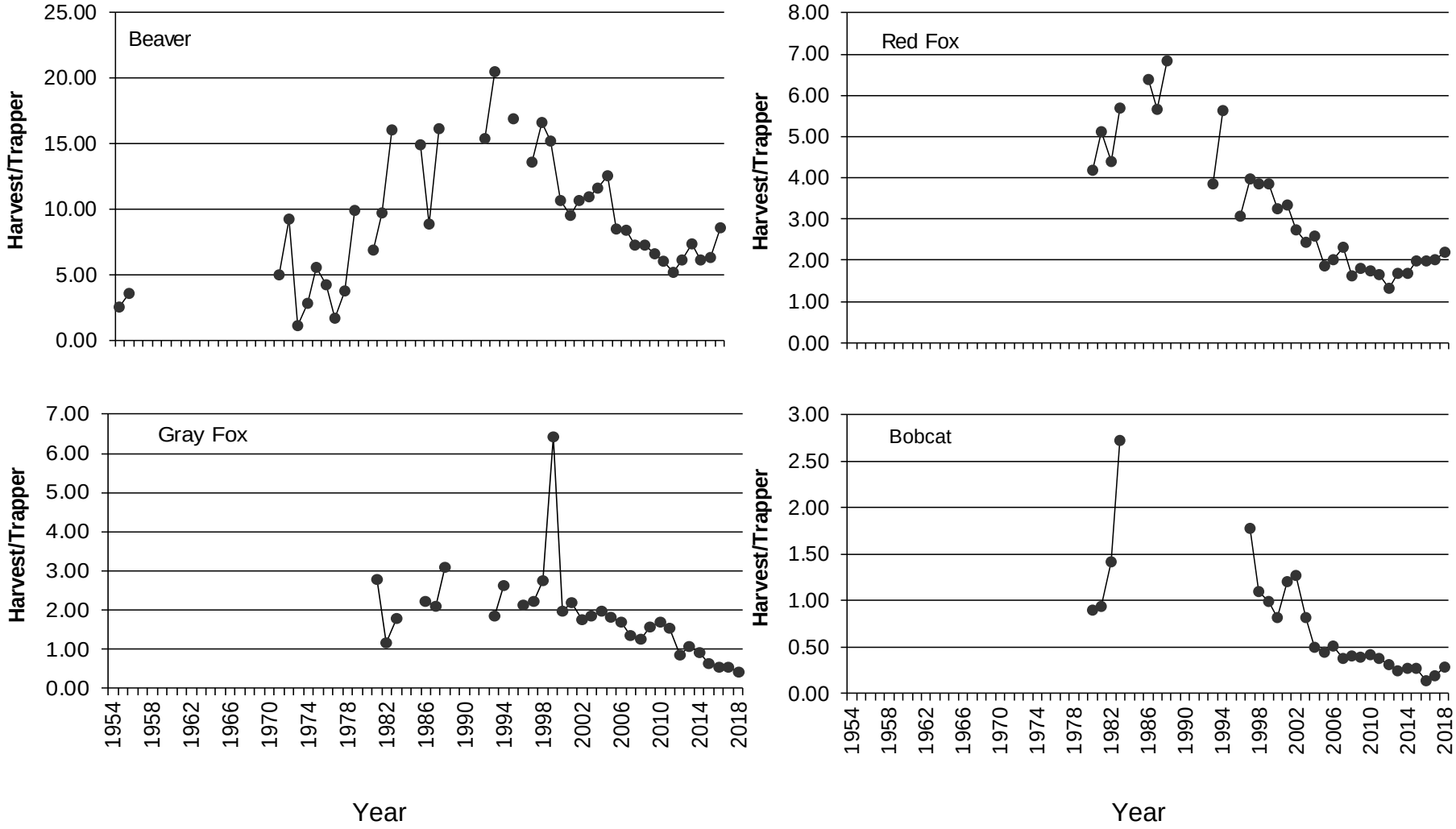

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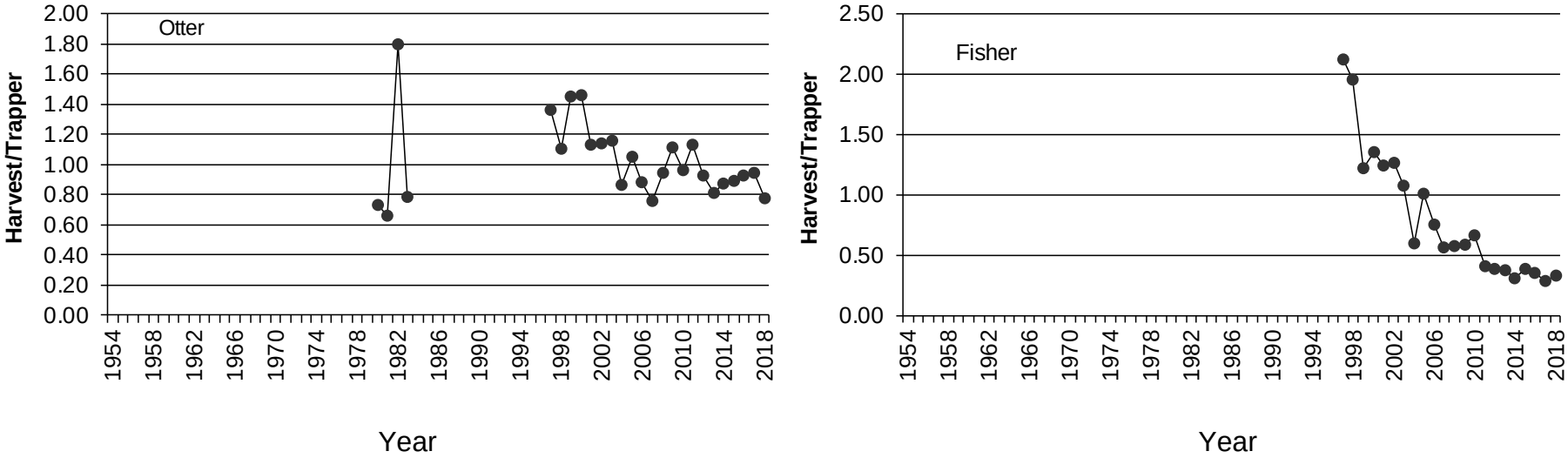

Figure 9 (continued). Mean number of furbearers harvested annually per trapper in Michigan estimated from mail harvest surveys, 1954-2018. Data were not available for all years.

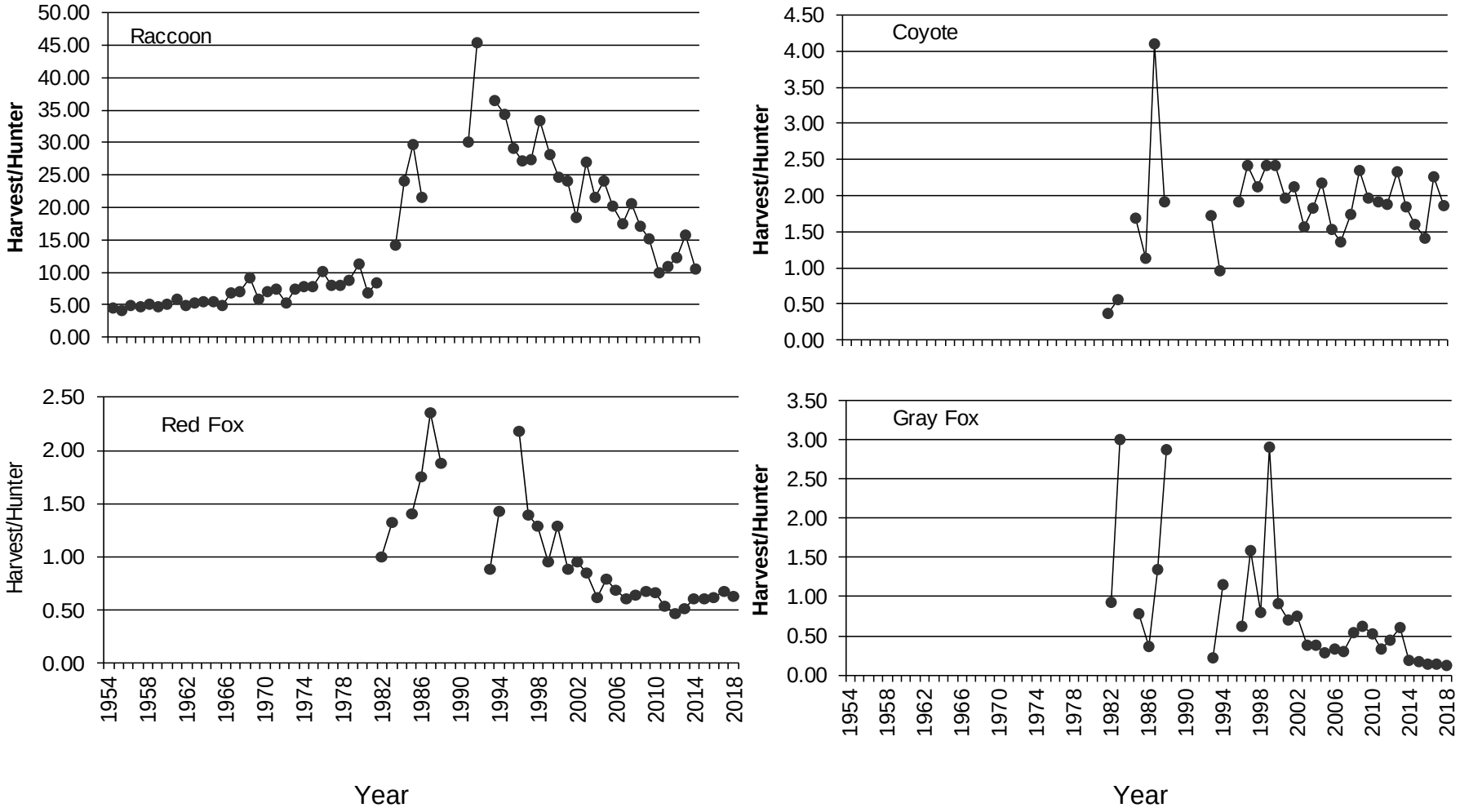

Figure 10. Mean number of furbearers harvested annually per hunter in Michigan estimated from mail harvest surveys, 1954-2018. Data were not available for all years.

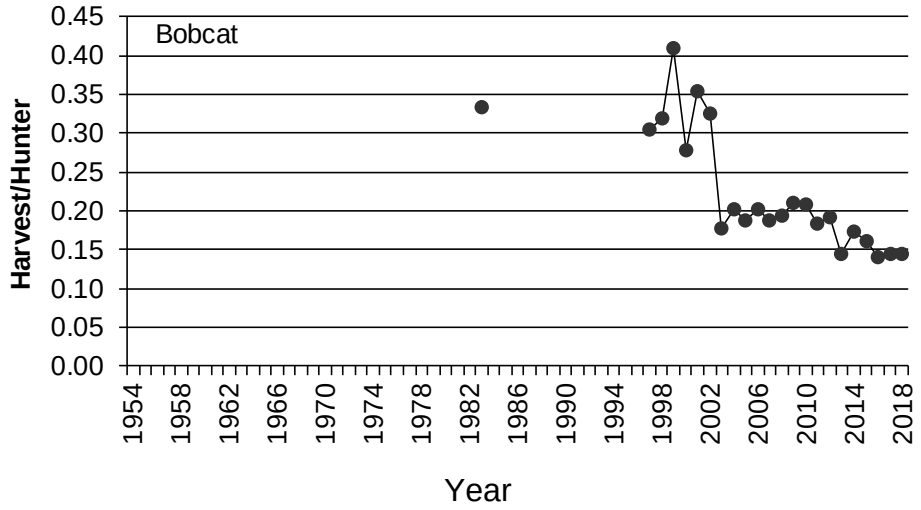

Figure 10 (continued). Mean number of furbearers harvested annually per hunter in Michigan estimated from mail harvest surveys, 1954-2018. Data were not available for all years.

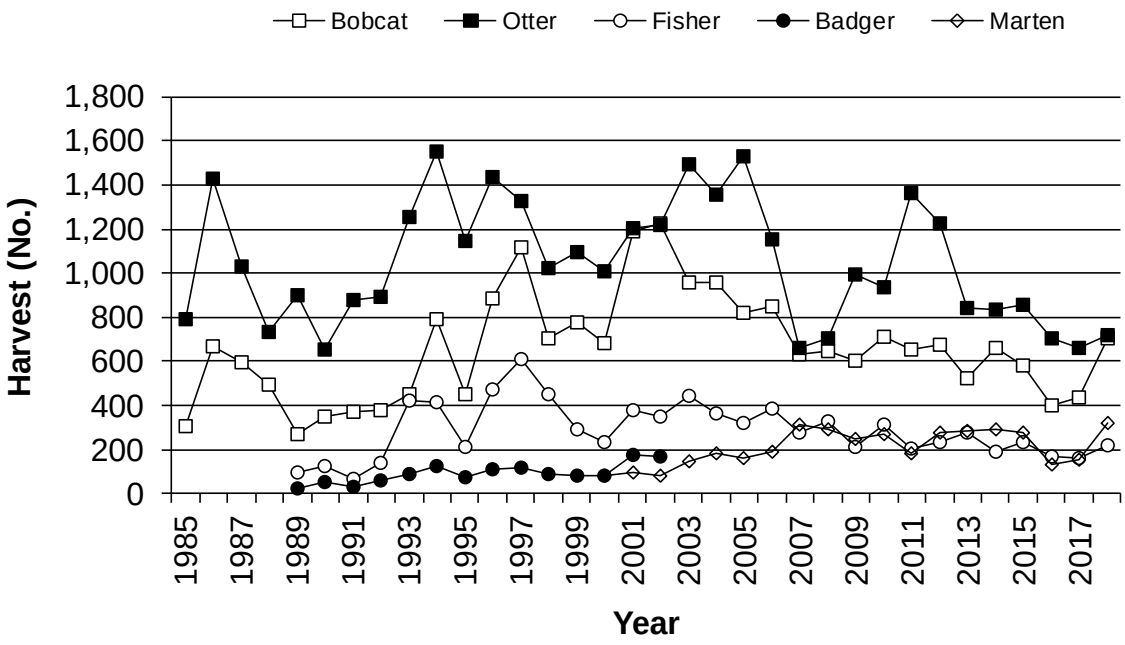

Figure 11. Number of bobcat, otter, fisher, badger, and marten registered by furtakers in Michigan, 1985-2018. Badger and fisher seasons were established in 1989, and marten season started in 2000. Totals for 2013 were preliminary. Beginning in 2003, badger were no longer registered. Registration totals only included animals that were registered and returned to the furtaker and excluded harvest by tribal members.

Table 1. Trapping and hunting seasons when furbearing animals could be harvested in Michigan during 2018 seasons.[a]

Season, species, and area	Season dates
Trapping seasons[b]	
Muskrat and Mink	
UP	October 25 – March 1
NLP	November 1 – March 1
SLP	November 10 – March 1
Raccoon	
Statewide	October 15 – March 31
Fox and Coyote	
Statewide	October 15 – March 1
Bobcat[c]	
UP (units A and B)	December 1 – February 1
NLP (units C, D, E, and F)	December 10 – 20
Badger[c]	
UP and NLP	October 15 – November 14
SLP	November 1 – March 1
Fisher and Marten[c]	
UP	December 7 – 16
Beaver and Otter[c,d]	
UP	October 25 – April 14
NLP	November 1 – April 14
SLP	November 10 – March 31
Hunting seasons	
Bobcat[c]	
UP (units A B and C)	January 1 – March 1
NLP (Unit D)	January 1 – February 1
NLP (units E and F)	January 1 – 11
Fox	
Statewide	October 15 – March 1
Raccoon	
Statewide	October 1 – January 31
Coyote	
Statewide	Year-round

[a]No closed season for opossum, weasel, and skunk.
[b]Nonresidents may trap from November 15 through the regular season closing date, except nonresidents could not trap badger, bobcat, fisher, marten, or otter. In addition, the opening date for nonresident beaver trapping varied by area.
[c]No nonresident season existed for badger, bobcat, fisher, marten, and otter.
[d]Resident seasons only. Nonresident beaver season occurred during November 15-April 16 (UP), November 24-April 16 (NLP), and December 15 – March 31 (SLP).

Table 2. Number of fur harvester licenses sold and people receiving and returning harvest questionnaire, 2015-2018.

	Year			
Item	2015	2016	2017	2018
Licenses sold[a]	26,873	25,948	22,982	23,444
Individuals buying licenses[a,b]	26,865	25,938	22,981	23,442
Mentored youth license buyers[c]	11,929	11,342	11,691	11,278
Questionnaires mailed	4,200	4,200	5,000	5,000
Non-deliverable questionnaires	85	66	68	95
Questionnaires returned	2,267	2,269	2,468	2,457
Questionnaires returned (%)[d]	55	55	50	50

[a]License types included Fur Harvester, Senior Fur Harvester, and Lifetime Fur Harvester.
[b]A person was counted only once, regardless of how many licenses they purchased.
[c]The mentored youth hunting license was created in 2012 and was valid for hunting small game, waterfowl, turkey, and deer. These youth could also trap furbearers and fish all species. Although these license buyers were eligible to take furbearers, they were not included in survey sample.[d]Response rate adjusted to exclude non-deliverable questionnaires.

Table 3. Estimated number of fur harvester license buyers who trapped or hunted furbearers in Michigan, 2016-2018.

	2016		2017		2018		
Activity	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	Change between 2017 and 2018 (%)
Trapped							
Number	7,525	462	6,879	391	7,202	403	5
%	29	2	30	2	31	2	1
Hunted							
Number	8,266	473	7,331	399	7,869	414	7
%	32	2	32	2	34	2	2
Trapped or hunted[a]							
Number	12,762	510	11,397	429	12,052	439	6
%	49	2	50	2	51	2	2
Trapped only							
Number	4,496	386	4,066	327	4,183	335	3
%	17	1	18	1	18	1	0
Hunted only							
Number	5,237	408	4,518	340	4,850	355	7
%	20	2	20	1	21	2	1
Trapped and hunted							
Number	3,029	327	2,814	280	3,019	294	7
%	12	1	12	1	13	1	1

[a]A person was counted only once, although they may have both trapped and hunted furbearers.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2017 and 2018 ($P<0.05$).

Table 4. Estimated number of participants, harvest, and days afield during Michigan furbearer seasons, 2017 and 2018.

Species and season	Participants (No.)				Harvest (No.)				Days afield (No.)			
	Year		95% CL[a]	Change (%)	Year		95% CL[a]	Change (%)	Year		95% CL[a]	Change (%)
	2017	2018			2017	2018			2017	2018		
Trapping												
Mink	1,699	1,658	225	-2	5,176	5,452	1,702	5	46,728	36,084	7,095	-23
Raccoon	3,927	3,813	321	-3	43,391	38,828	7,248	-11	102,091	99,120	13,499	-3
Opossum	1,782	1,792	231	1	12,143	12,324	2,877	1	46,325	51,256	10,682	11
Skunk	922	1,024	179	11	3,093	3,730	1,258	21	28,291	26,714	6,875	-6
Weasel	362	414	116	14	589	829	524	41	9,468	7,520	2,767	-21
Red fox	1,714	1,778	232	4	3,472	3,883	1,008	12	50,735	58,131	11,253	15
Gray fox	650	562	134	-13	350	229	117	-35	19,024	17,411	5,688	-8
Coyote	3,219	3,209	301	0	7,449	10,755	2,818	44	87,204	95,613	13,620	10
Bobcat[b]	1,185	1,492	122	26*	229	431	77	88*	13,196	16,876	2,094	28*
Beaver[c]	1,939	2,286	259	18	12,172	19,714	4,935	62	38,121	52,038	17,573	37
Muskrat	2,643	2,603	275	-1	108,237	74,440	18,640	-31	68,815	55,736	8,985	-19
Otter[c]	942	1,117	97	19*	893	864	117	-3	16,003	16,841	2,383	5
Fisher[d]	517	670	58	29*	149	224	36	50*	4,585	4,278	437	-7
Badger	84	116	62	37	38	87	54	130	791	990	955	25
Hunting												
Raccoon	2,197	1,960	242	-11	34,544	20,433	5,614	-41	39,891	29,106	6,773	-27
Red fox	1,782	1,801	234	1	1,215	1,132	389	-7	28,852	24,539	5,809	-15
Gray fox	734	748	154	2	102	94	74	-8	13,027	9,504	3,225	-27
Coyote	5,948	6,310	389	6	13,501	11,719	2,548	-13	84,221	87,746	14,713	4
Bobcat[b]	2,058	2,512	149	22*	298	362	64	21	16,248	15,815	1,587	-3
Trapping and hunting combined												
Raccoon	5,247	5,042	358	-4	77,935	59,262	9,372	-24	141,982	128,227	15,508	-10
Red fox	3,099	3,159	299	2	4,687	5,015	1,117	7	79,587	82,670	13,132	4
Gray fox	1,226	1,197	193	-2	452	322	138	-29	32,052	26,914	6,702	-16
Coyote	7,713	8,135	418	5	20,950	22,475	3,879	7	171,425	183,359	20,639	7
Bobcat[b]	2,956	3,630	165	23*	527	793	99	50*	29,444	32,690	2,640	11

[a]95% CL for the 2018 estimate.
[b]Bobcat estimates from separate mail harvest survey (Frawley 2019c). See Table 5 for registration totals.
[c]Otter estimates from separate mail harvest survey (Frawley 2019b). See Table 5 for registration totals.
[d]Fisher estimates from separate mail harvest survey (Frawley 2019a). See Table 5 for registration totals.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2017 and 2018 (P<0.05).

Table 5. Number of bobcat, otter, fisher, badger and marten registered by furtakers in Michigan, 1985-2018.[a]

	Species							
	Bobcat (by method of capture)							
Year	Hunting	Trapping	Unknown	Total	Otter	Fisher[a]	Badger[b,c]	Marten[d]
1985	193	100	14	307	791			
1986	268	390	11	669	1,431			
1987	315	277	5	597	1,030			
1988	327	170	0	497	731			
1989	178	91	0	269	900	94	28	
1990	265	85	0	350	654	125	52	
1991	292	79	0	371	877	68	35	
1992	276	104	0	380	896	139	63	
1993	285	163	0	448	1,252	425	90	
1994	373	422	0	795	1,552	417	124	
1995	311	137	1	449	1,143	210	75	
1996	463	420	0	883	1,438	471	109	
1997	347	771	0	1118	1,324	609	117	
1998	331	373	0	704	1,026	455	91	
1999	434	343	0	777	1,097	291	82	
2000	379	307	0	686	1,006	236	85	85
2001	465	727	0	1,192	1,204	381	174	97
2002	482	741	0	1,223	1,221	348	173	85
2003	340	621	0	961	1,496	442		149
2004	321	637	0	958	1,358	368		184
2005	309	508	0	817	1,526	322		164
2006	336	515	0	851	1,154	390		192
2007	336	299	0	635	663	280		316
2008	284	364	0	648	707	326		290
2009	331	270	0	601	997	216		247
2010	365	344	0	709	935	312		274
2011	290	367	0	657	1,360	205		187
2012	311	367	0	678	1,234	237		279
2013	217	308	0	525	849	280		284
2014	333	325	0	658	834	191		289
2015	286	297	0	583	856	237		280
2016	259	140	0	399	711	171		131
2017	251	186	0	437	665	162		157
2018[e]	348	354	0	702	721	222		319

[a]Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons; excluded harvest by tribal members. Also, totals only included animals that were registered and returned to the furtaker (i.e., excluded accidental take).
[b]Badger and fisher seasons were established in 1989.
[c]Furtakers no longer were required to register badgers beginning in 2003.
[d]Marten season was established in 2000.
[e]Preliminary totals.

Table 6. Estimated number of trappers that caught an incidental bobcat and number of incidental bobcats caught and registered in Michigan, 2018.

	Trappers		Incidental bobcats captured and released alive[b]		Incidental bobcats captured and registered[b]	
Region[a]	No.	95% CL	No.	95% CL	No.	95% CL
Upper Peninsula	48	40	58	50	10	18
Northern Lower Peninsula	117	62	165	97	0	0
Southern Lower Peninsula	19	25	75	101	0	0
Unknown	0	0	0	0	0	0
Statewide	184	78	298	149	10	18

[a]See Figure 1 for region boundaries.
[b]Incidental bobcats caught in counties.

Table 7. Estimated number of beaver trappers, beaver harvested, and trapping effort (days afield), summarized by trappers with and without an otter harvest tag in Michigan, 2018.

	Trappers		Days afield		Harvest	
Beaver trapper group	No.	95% CL	No.	95% CL	No.	95% CL
Without an otter harvest tag	694	149	10,328	3,395	3,186	1,405
With an otter harvest tag	1,592*	219	16,528	4,746	16,528	4,746
Combined	2,286	259	52,038	17,573	19,714	4,935

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2017 and 2018 ($P<0.05$).

Table 8. Furtakers' level of satisfaction with the number of animal or animal sign seen during the 2018 hunting and trapping seasons, summarized by the primary species the furtaker targeted.[a]

	Satisfaction level							
	Very satisfied or somewhat satisfied		Neutral		Very dissatisfied or somewhat dissatisfied		No answer	
Species	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Raccoon	69	7	21	6	9	4	1	1
Fox	71	17	16	14	8	11	4	8
Coyote	67	5	23	4	6	2	4	2
Bobcat	65	10	26	9	8	6	1	2
Fisher	78	25	22	25	0	0	0	0
Mink	58	35	42	35	0	0	0	0
Muskrat	65	10	15	8	15	8	4	4
Beaver	74	8	17	7	7	5	1	2

[a]Furtakers were grouped in subgroups based on the primary species they targeted, and then satisfaction was summarized for each subgroup separately.

Table 9. Furtakers' level of satisfaction with the number of animal harvested during the 2018 hunting and trapping seasons, summarized by the primary species the furtaker targeted.[a]

	Satisfaction level							
	Very satisfied or somewhat satisfied		Neutral		Very dissatisfied or somewhat dissatisfied		No answer	
Species	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Raccoon	60	7	25	7	12	5	3	2
Fox	46	19	33	18	17	14	4	8
Coyote	34	5	35	5	28	4	4	2
Bobcat	32	9	38	10	27	9	4	4
Fisher	56	31	33	29	11	20	0	0
Mink	43	35	43	35	14	24	0	0
Muskrat	60	10	19	8	19	8	1	2
Beaver	69	9	18	7	13	6	0	0

[a]Furtakers were grouped in subgroups based on the primary species they targeted, and then satisfaction was summarized for each subgroup separately.

Table 10. Furtakers' level of satisfaction with their overall hunting or trapping experience during 2018, summarized by the primary species the furtaker targeted.[a]

	Satisfaction level							
	Very satisfied or somewhat satisfied		Neutral		Very dissatisfied or somewhat dissatisfied		No answer	
Species	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Raccoon	73	7	17	6	6	4	3	3
Fox	67	18	21	15	8	11	4	8
Coyote	67	5	23	4	7	2	3	2
Bobcat	63	10	25	9	9	6	2	3
Fisher	67	29	33	29	0	0	0	0
Mink	72	32	28	32	0	0	0	0
Muskrat	74	9	13	7	9	6	4	4
Beaver	84	7	10	6	6	5	0	0

[a]Furtakers were grouped in subgroups based on the primary species they targeted, and then satisfaction was summarized for each subgroup separately.

Appendix A. Questionnaire used to collect data for 2018 fur harvesters survey in Michigan.

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

2018-2019 FUR HARVESTER'S REPORT

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.

It is important you return this report even if you did not capture any furbearers.
If you did not hunt or trap, answer "No" to questions 1 and 2 and return this report.
Do not report hunting and trapping activity done as part of a nuisance control business.
Do not report incidental captures you were not allowed to keep.

1. **Did you attempt to hunt any of the animals listed in the tables below during 2018-2019 seasons?** [1] ☐ Yes [2] ☐ No
2. **Did you set a trap (including cable restraints or snares) for any of the animals listed in the tables below during 2018-2019 seasons?** [1] ☐ Yes [2] ☐ No

- If you did not attempt to hunt or trap furbearers during 2018-2019 seasons, you can skip the remaining questions and return the questionnaire. Otherwise, please read the following instructions. In addition, questions continue on the back side of this page.
- Place an "X" in the box next to the name of each animal you attempted to hunt or trap. Record your hunting and trapping activity separately. If you attempted to harvest a species but were unsuccessful, you still should report that you sought this species and report the number of days you tried to capture this species.
- For each species you attempted to hunt or trap, list the three primary COUNTIES where you hunted or trapped. Also report the number of DAYS you hunted or trapped and the number of animals TAKEN in each county you listed. If you do not know the county name, give the name of the nearest village, town or city.

3. Please report your HUNTING ACTIVITY in the table below:

SPECIES HUNTED	1ST COUNTY	NO. OF DAYS	NO. TAKEN	2ND COUNTY	NO. OF DAYS	NO. TAKEN	3RD COUNTY	NO. OF DAYS	NO. TAKEN
[1] ☐ RACCOON									
[2] ☐ RED FOX									
[3] ☐ GRAY FOX									
[4] ☐ COYOTE									
[5] ☐ BOBCAT									

4. Please report your TRAPPING ACTIVITY in the table below (include snaring):

SPECIES TRAPPED	1ST COUNTY	NO. OF DAYS	NO. TAKEN	2ND COUNTY	NO. OF DAYS	NO. TAKEN	3RD COUNTY	NO. OF DAYS	NO. TAKEN
[6] ☐ RACCOON									
[7] ☐ RED FOX									
[8] ☐ GRAY FOX									
[9] ☐ COYOTE									
[10] ☐ BOBCAT									
[11] ☐ OPPOSUM									
[12] ☐ SKUNK									
[13] ☐ WEASEL									
[14] ☐ BADGER									
[15] ☐ FISHER									
[16] ☐ MINK									
[17] ☐ MUSKRAT									
[18] ☐ BEAVER									

Please continue on back

If you set a trap (including cable restraints or snares) during the 2018-2019 seasons, please continue with the following questions. If you did not trap, skip the remaining questions.

5. Did you incidentally catch any bobcat while trapping for other species that you have not already reported in Question #4.

1 ☐ Yes 2 ☐ No, *Skip to question number 7.*

6. If you answered yes in the previous question, please report the location and number of incidental bobcats you captured. Please do not report bobcat already reported in question #4.

COUNTY WHERE INCIDENTAL BOBCAT CAUGHT (List each county that you caught an incidental bobcat.)	NUMBER OF INCIDENTAL BOBCAT CAUGHT AND RELEASED (Count only incidental bobcats you released alive from your traps.)	NUMBER OF INCIDENTAL BOBCAT CAUGHT AND REGISTERED (Count incidental bobcats that were registered including catches that were not returned to you.)

7. What was the <u>primary</u> furbearer species you sought during the past year?
(Select one.)

1 ☐ Raccoon 2 ☐ Fox 3 ☐ Coyote 4 ☐ Bobcat
5 ☐ Fisher 6 ☐ Mink 7 ☐ Muskrat 8 ☐ Beaver
9 ☐ Other (please specify:_____)

8. During the fur harvesters trapping and hunting seasons, indicate how satisfied or dissatisfied you were with the following for the <u>primary</u> furbearer species you hunted or trapped.	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
a. Number of animals or sign (e.g., tracks) seen.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. Number of animals harvested.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. Your overall hunting or trapping experience.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

In the next two questions, you will be asked about the time and costs you spend hunting or trapping furbearers during the 2018 seasons.

9. How many total days did you hunt or trap furbearers during the 2018 seasons? *Please exclude days spent scouting.*

_____ Days

10. How much did you spend on things related to hunting or trapping furbearers during the 2018 seasons (for example, fuel, food, lodging, equipment, and ammunition)? *Please report only costs incurred during the 2018 seasons.*

$_____ Total cost

11. Do you have any comments or suggestions about furbearer management in Michigan?

_____
_____
_____
_____

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