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2007 MICHIGAN FURBEARER HARVEST SURVEY

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ABSTRACT

A sample of furtakers was contacted after the 2007 hunting and trapping seasons to estimate the number of participants, days afield (effort), and furbearer harvests. In 2007, about 14,321 furtakers pursued furbearers. About 32% of the license buyers trapped (7,763 trappers), 41% hunted (9,897 hunters), and 14% (3,339) both trapped and hunted. Trapper numbers decreased 12%, and hunter numbers were nearly unchanged between 2006 and 2007. Significantly fewer trappers pursued bobcat, fisher, mink, muskrat, otter, and red fox in 2007, compared to 2006, and significantly fewer hunters pursued bobcat. Changes for hunting and trapping effort and harvest between 2006 and 2007 generally followed changes in the number of furtakers. Hunters most commonly sought coyotes, raccoons, and red fox, while trappers most frequently sought raccoons, muskrats, and coyotes. Trends in harvest can be affected by both changes in furtaker and furbearer numbers; thus, harvest per furtaker was examined for trends. The mean number of raccoon and opossum taken per furtaker has increased since the 1980s. The mean harvest of red fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining. Foothold traps were the most common type of trap used by trappers in 2007; about 83% of trappers used foothold traps. About 70% of trappers used body-gripping traps, 17% of trappers used cable restraints, and 15% of trappers used colony traps. If the DNR developed a trapper education course covering furbearer biology, trapping techniques, and trapping regulations, most trappers were opposed to making this course mandatory for all trappers (57% opposed).

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Rather, most trappers supported mandatory trapper education for first-time trappers (59%) and for trappers younger than 17 years of age (64%).

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. Harvest surveys are one of the management tools used by the DNR to accomplish this statutory responsibility. Estimating harvests and hunter participation are 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 (*Felis 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 2007). Opossum, weasels, and skunks could be taken year-round with any hunting or fur harvester license. The remaining furbearers could be harvested in 2007 during late fall through winter by a person possessing a fur harvesters license (included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur [trap only], and Junior Fur [trap only]) (Table 1). Landowners or their designees could take raccoons and coyotes throughout the year on their property without a license if these animals were doing or about to do damage. Coyotes can also be taken by hunters possessing a small game hunting license. Thus, harvest estimates of coyotes, raccoons, opossum, skunks, and weasels from this survey do not represent all possible forms of harvest, but only those taken by people with a fur harvesters license.

METHODS

The Wildlife Division provided all furtakers the option to report voluntarily information about their hunting and trapping activity via the Internet. This option was advertised on the DNR Web site and an email message was sent to people who had purchased a fur harvester license and also had provided an email address to the DNR (4,070 licensees). Furtakers reported what species hunted or trapped, location where animals sought (county), number of days spent afield, and number of animals harvested. Following the 2007 furbearer hunting and trapping seasons, a questionnaire was sent to 4,196 randomly selected people who had purchased a fur harvester license and had not already voluntarily reported harvest information via the Internet. Furtakers receiving the questionnaire in the mail were asked the same questions as furtakers responding on the Internet. Although furtakers that purchased a small game hunting license could take coyotes; these license buyers were not included in the sample.

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 and whether they had voluntarily reported their hunting and trapping activity on the Internet. Residents of the Upper Peninsula (UP), northern Lower Peninsula (NLP), southern Lower Peninsula (SLP), and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). Another stratum consisted of furtakers that had voluntarily reported their hunting and trapping activity on the Internet before the sample for the mail survey was selected. The overall sample consisted of 614 people from the UP stratum (N= 3,488), 886 people from the NLP stratum (N= 4,713), 2,673 from the SLP stratum (N= 15,520), and 27 people from the nonresident and unknown residency stratum (N=174). In addition, 401 people that had responded voluntarily via the Internet were part of the final sample. 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 occurred 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 were to be 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. 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 was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

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 probably 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. In this report, marten harvest was determined only by registration.
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 trappers statewide pursuing these species. Using these list, the DNR was able to design separate harvest surveys that provided more precise estimates (i.e., narrower confidence intervals) than previous harvest from surveys of all furtakers. Separate surveys were conducted to estimate furtaker participation, harvest, and effort for bobcat (Frawley and Etter 2008), fisher and marten (Frawley 2008a), and otter (Frawley 2008b) seasons during recent years.

While the primary objectives of the fur harvester's survey were estimating harvest, 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 whether trappers had used cable restraints (snares) while attempting to capture coyote or fox during 2007 seasons. Trappers were asked whether they had placed body-gripping traps (e.g., conibears) having a jaw spread of at least seven inches on dry land or set them less than four feet above the ground. If these traps had been used, these trappers were asked what species they intended to catch. In addition, trappers were asked to report the average number of traps set daily for furbearers. Furtakers were asked whether trappers should be required to attend trapper education course before purchasing a license.

Questionnaires were mailed initially in mid-June. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 60 people, primarily because of changes in residence. Questionnaires were returned by 2,531 people, yielding a 61% adjusted response rate. In addition, 401 furtakers voluntarily reported information about their hunting and trapping activity via the Internet before the random sample was selected.

RESULTS AND DISCUSSION

In 2007, 24,617 fur harvester licenses were purchased by 24,296 people (Figure 2, Table 2). The number of license buyers in 2007 was 2% higher than in 2006. Most license buyers were men (98%), with an average age of 44 years (Figure 3). About 6% of the license buyers (1,505) were younger than 17 years of age.

Mail Harvest Survey

Overall, approximately 59% of license buyers either hunted or trapped furbearers during 2007 (Table 3). The number of active furtakers decreased 5% from 2006, although the change was not statistically significant. About 32% of the license buyers trapped and 41% hunted furbearers during 2007. Trappers most often pursued raccoons, muskrat, and coyote (Table 4). Hunters most commonly sought coyotes, raccoon, and red fox. Coyotes and raccoons ranked as the most frequently sought furbearers when trappers and hunters were combined.

The estimated number of trappers decreased 12% between 2006 and 2007 (Table 3). Moreover, the estimated number of people trapping during recent years is well below the record highs of nearly 16,000 in the early 1980s (Figure 4). The peaks in furtaker numbers corresponded closely to periods when pelt values peaked for many species such as muskrat, raccoon, and red fox (Iowa Department of Natural Resources 2002). The number of trappers during recent years has been comparable to the numbers active during the 1960s, prior to the peak in fur prices. The estimated number of people hunting furbearers was nearly unchanged between 2006 and 2007 (Table 3). Since 1999, the number of people hunting furbearers has been consistently greater than the number of people trapping (Figure 4).

Collectively, fewer people trapped furbearers in 2007 compared to 2006. Moreover, significantly fewer trappers pursued bobcat, fisher, mink, muskrat, otter, and red fox (Table 4). Only beaver had more trappers pursuing them in 2007 than 2006; however, the 2006 estimates associated with beaver came from a separate survey that produced estimates that were not directly comparable with 2007 estimates (Frawley 2008b). Overall, similar numbers of people hunted furbearers in 2007 than 2006; however, a significant decrease in hunter numbers was noted among people hunting bobcat. Changes for hunting and trapping effort and harvest between 2006 and 2007 generally followed changes in the number of furtakers.

Harvest levels of most furbearers in 2007 were within historical ranges (Figures 5-7). Many factors influence harvest trends such as hunter numbers, wildlife population size, hunting regulations, habitat conditions, and fur prices; thus, any interpretations of trends should be viewed cautiously. Trends in harvest per furtaker were examined because this measure may eliminate some of the affects 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 and opossum taken per furtaker has generally increased since the early 1980s (Figures 8 and 9). The mean harvest of red fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining.

These trends in furbearer numbers are not unique to Michigan. Increasing raccoon numbers have also been reported in Illinois since the 1980s (Gehrt et al. 2002). Furthermore, declining red fox numbers have been reported in portions of the northern Great Plains since the 1980s (Sovada et al. 1995). The decline in red fox numbers in the northern Great Plains during recent years has been attributed largely to competition from increased coyote numbers (Sovada et al. 1995).

The mean harvest of fisher per trapper has declined during the last ten years (Figure 8). Frawley (2008a) 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 ten years.

The mean number of bobcats taken per trapper declined from 2003 to 2007 (Figure 8). The seasonal harvest limit for bobcats was lowered from three to two bobcats in 2004, and this reduction probably contributed to the decline of bobcats taken per trapper since 2003 (Frawley and Etter 2007).

Registration Data

Compared to 2006, more marten (65% increase) were registered in 2007; however, fewer otter (44% decline), fisher (-28%), and bobcat (-26%) were registered (Figure 10, Table 5). Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons. Also, registration totals only included animals that were registered and returned to the furtaker.

Supplemental Questions

Foothold traps were the most common type of trap used by trappers in 2007 (Table 6). An estimated 83% of trappers used foothold traps, and these trappers set an average of 19 foothold traps per day. About 70% of trappers used body-gripping traps (e.g., conibears), and these trappers set an average of 17 traps per day. Cable restraints (snares) were used by about 17% of trappers, and colony traps were used by nearly 15% of trappers. These trappers set an average of 10 and 8 traps per day, respectively.

Trappers were prohibited from setting body-gripping traps (e.g., conibears) larger than six inches in width on dry lands that were publicly owned, or over frozen submerged publicly owned bottomlands or on commercial forest lands unless the trap was four feet or more above the ground or placed in a container inaccessible to dogs. Body-gripping traps set on private lands were not restricted by these regulations. An estimated 24% of trappers set body-gripping traps larger than six inches in width on dry lands or set them within four feet of the ground (Table 7). Most of these sets were constructed to catch raccoon.

An estimated 91% of trappers that tried to catch coyote or fox used foothold traps (Table 8, 3,849 trappers). About 29% of coyote and fox trappers used cable restraints (snares) in their attempt to catch coyote or fox (1,215 trappers). An estimated 3,498 coyote trappers caught 8,809 coyotes with foothold traps, while 2,813 fox trappers caught 7,780 fox with foothold traps (Table 9). These trappers also reported 2,501 coyotes and 1,295 fox escaping from foothold traps. Among trappers using cable restraints, 1,178 trappers caught 1,953 coyotes, and 670 trappers caught 446 fox. In addition, trappers reported 1,271 coyotes and 766 fox escaping from cable restraints.

If the DNR developed a trapper education course covering furbearer biology, trapping techniques, and trapping regulations, most trappers were opposed to making this course mandatory for all trappers (57% opposed, Table 10). Rather, most trappers supported mandatory trapper education for first-time trappers (59%) and for trappers younger than 17 years of age (64%).

ACKNOWLEDGEMENTS

I thank all the furtakers that provided information. Autumn Feldpausch, Theresa Riebow, and Becky Walker completed data entry. Nick Portelli and Chris Larson developed the Internet harvest reporting application. Marshall Strong prepared Figure 1. Mike Bailey, Adam Bump, Dwayne Etter, Russ Mason, Cheryl Nelson, and Doug Reeves reviewed a draft version of this report.

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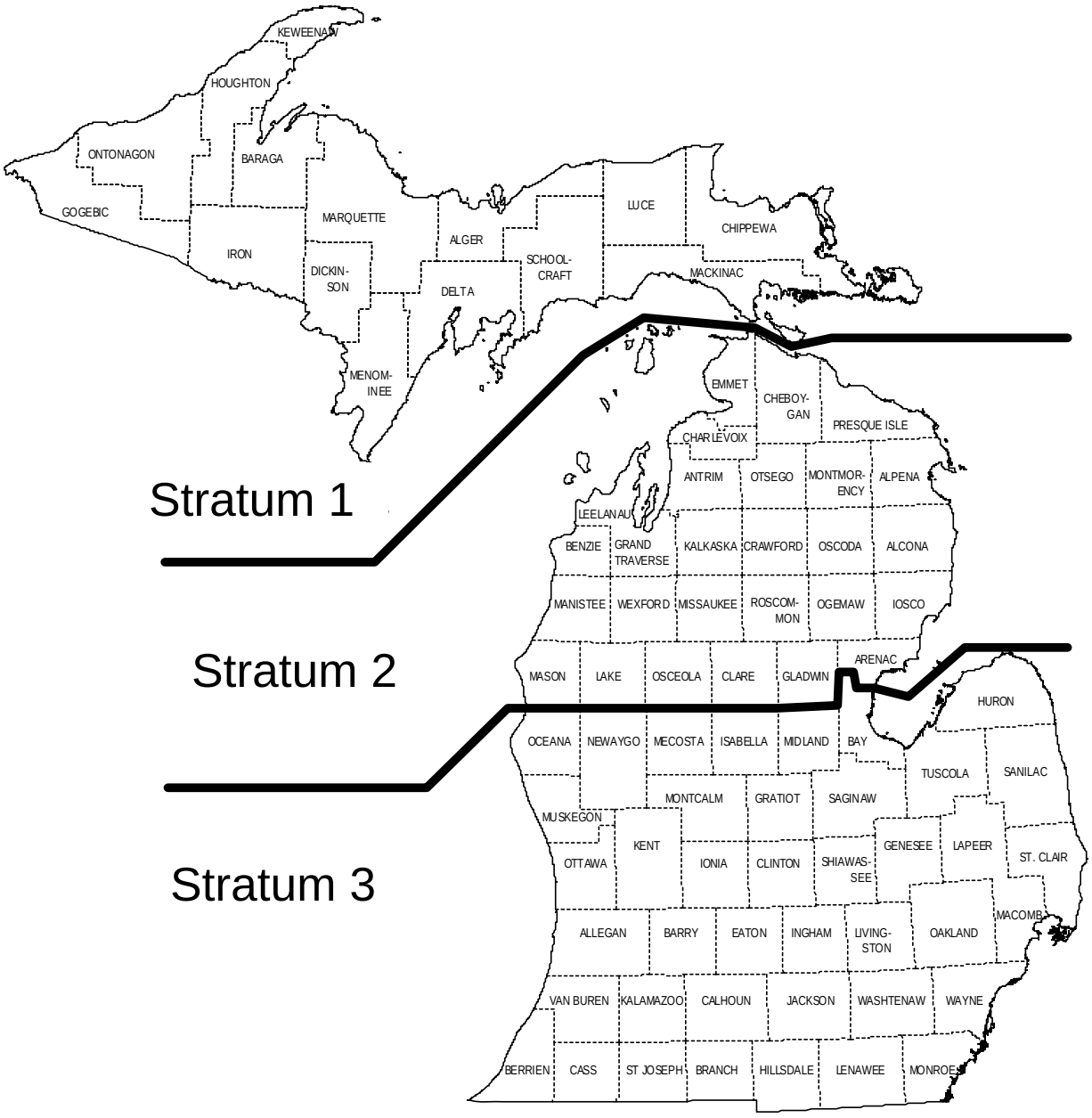


Figure 1. Stratum boundaries used for the analysis of the Michigan furbearer harvest survey. Nonresidents were included as a fourth stratum.

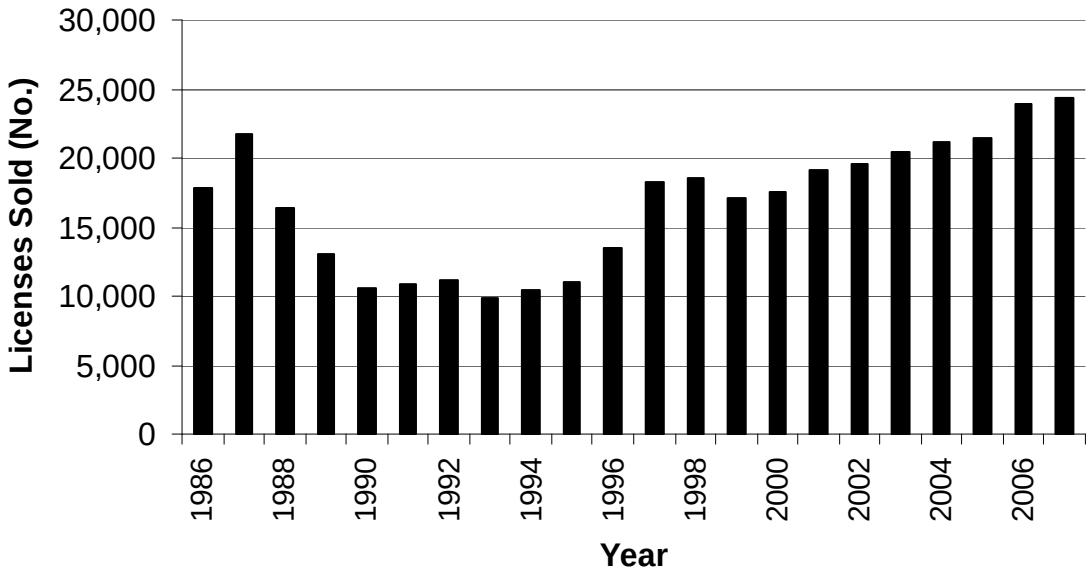


Figure 2. Number of fur harvester licenses sold in Michigan, 1986-2007. Fur harvester licenses included Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, and Nonresident Fur Harvester licenses. During 1996-2007, totals also included Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses.

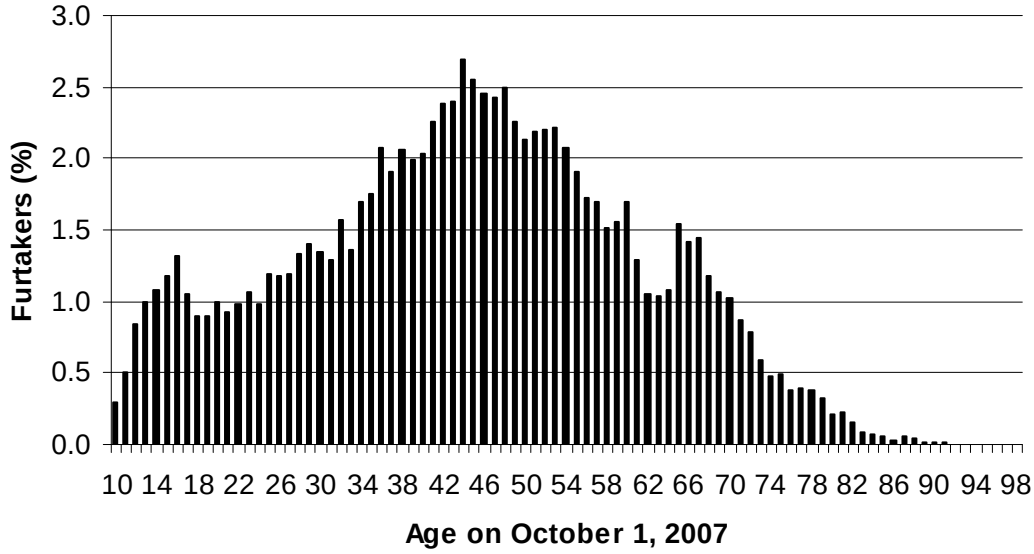


Figure 3. Ages of people that purchased a license to hunt or trap furbearers in Michigan for the 2007 hunting and trapping seasons ($\bar{x}$ = 44 years).

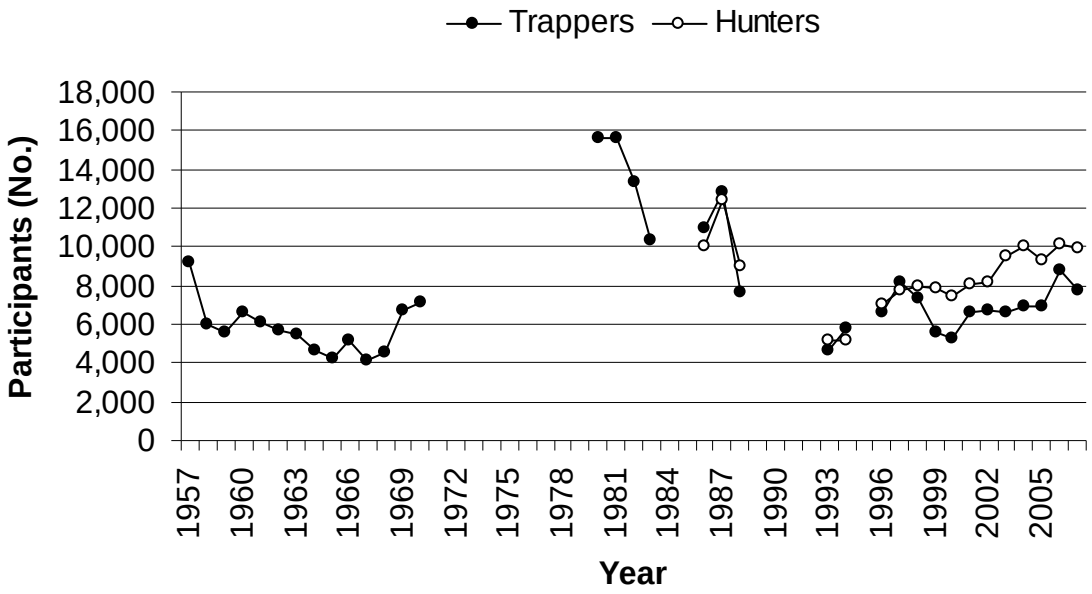


Figure 4. Estimated number of trappers and hunters in Michigan, 1957-2007. Estimates included only license buyers that actually trapped or hunted furbearers (any species). Data were not available for all years.

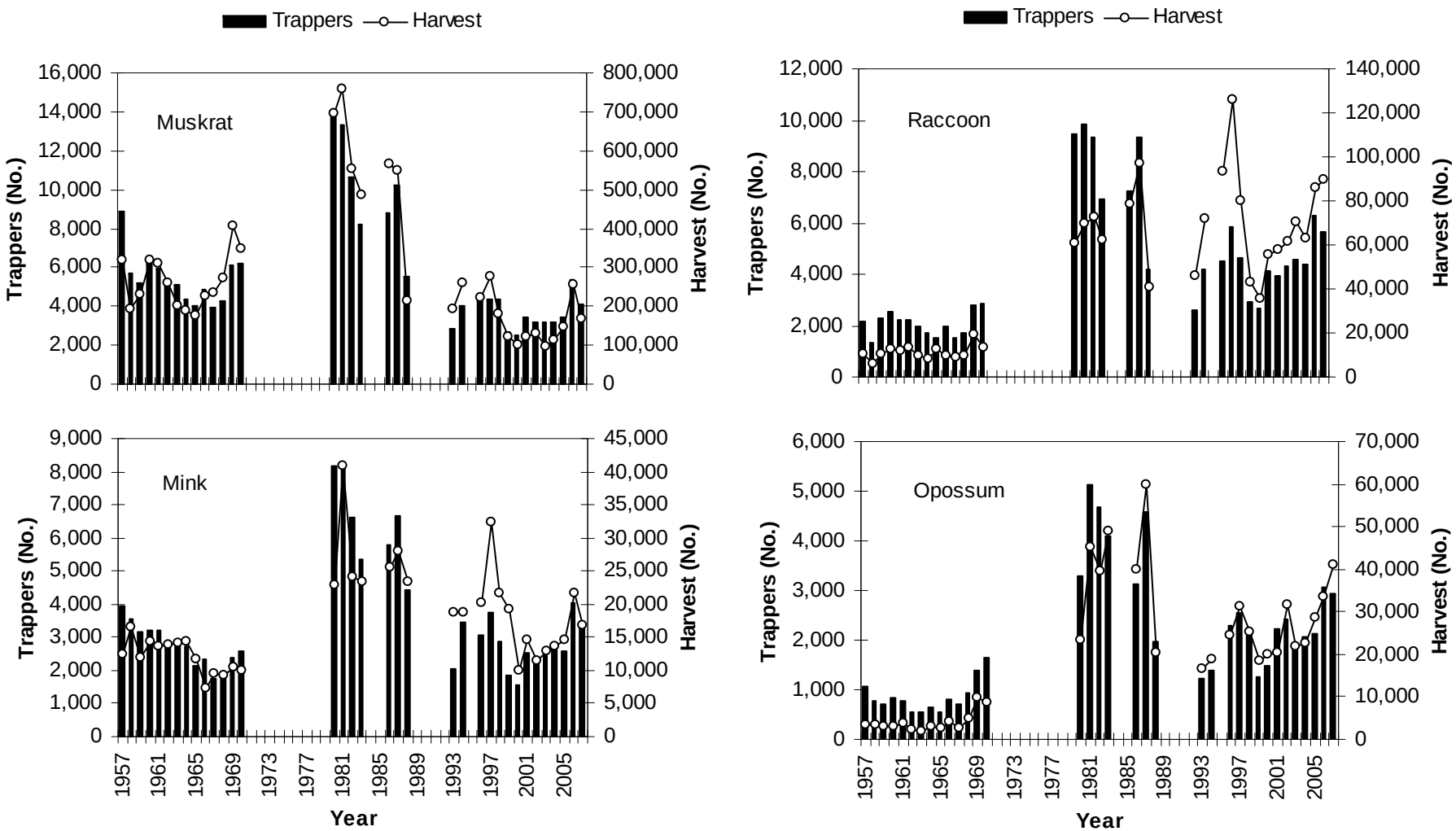
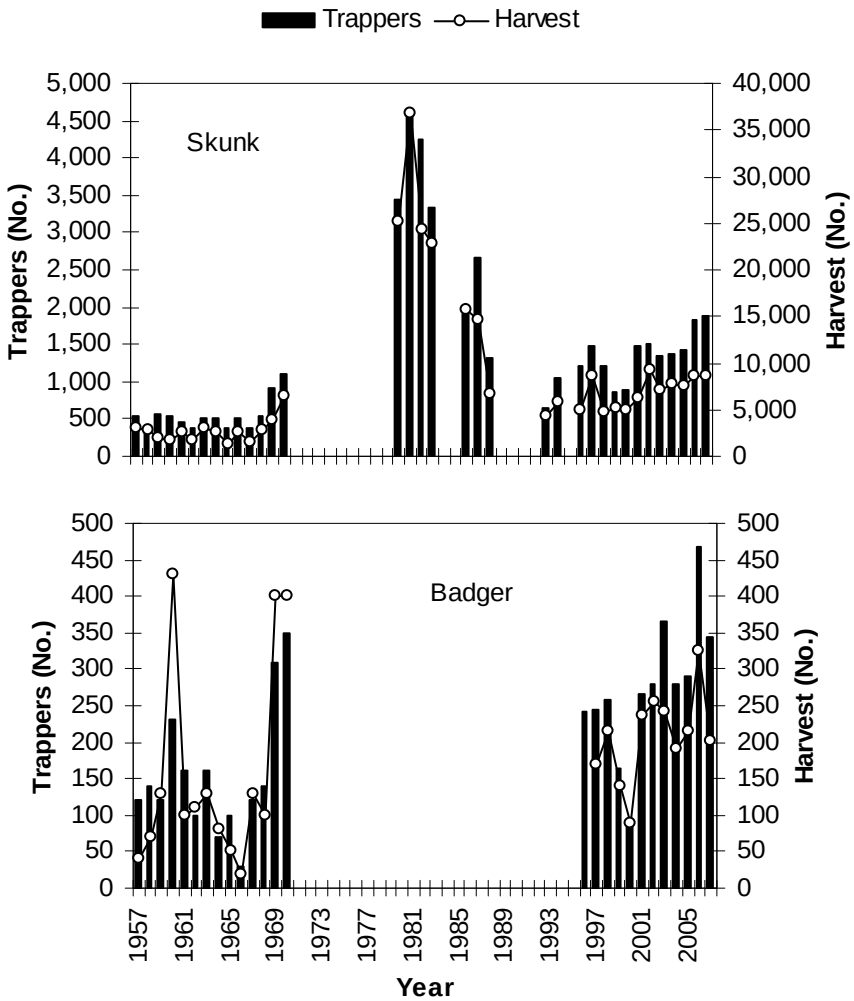
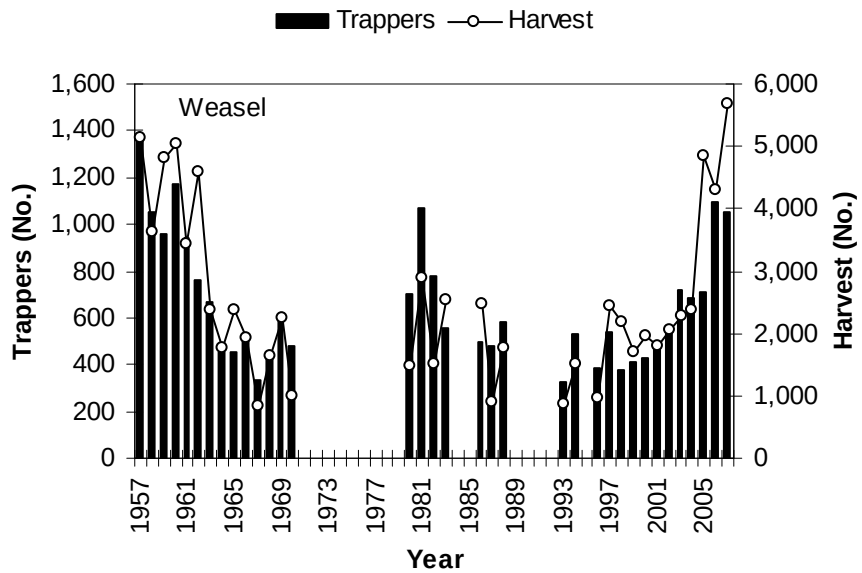


Figure 5. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2007. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2007, 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. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.





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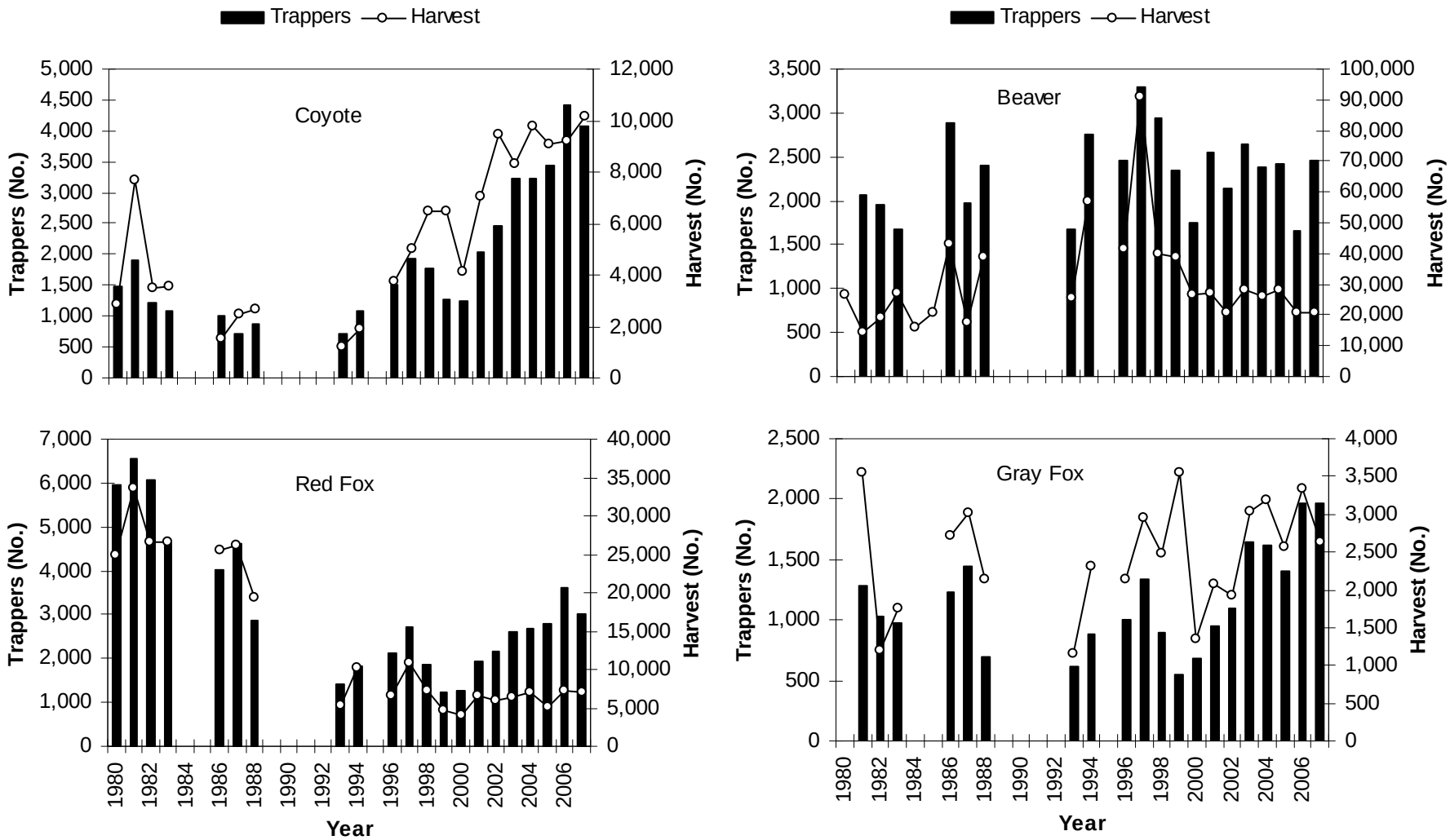

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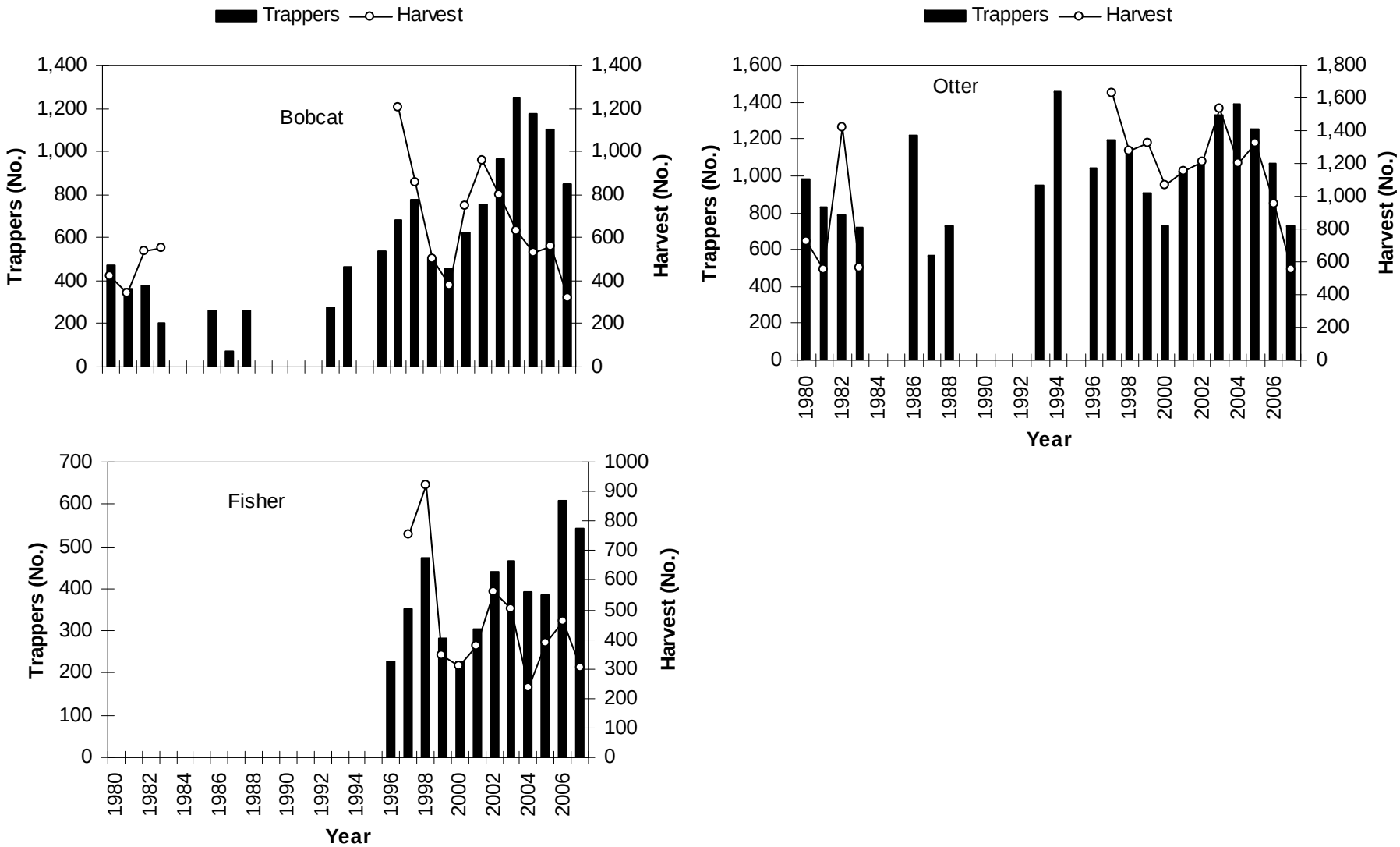

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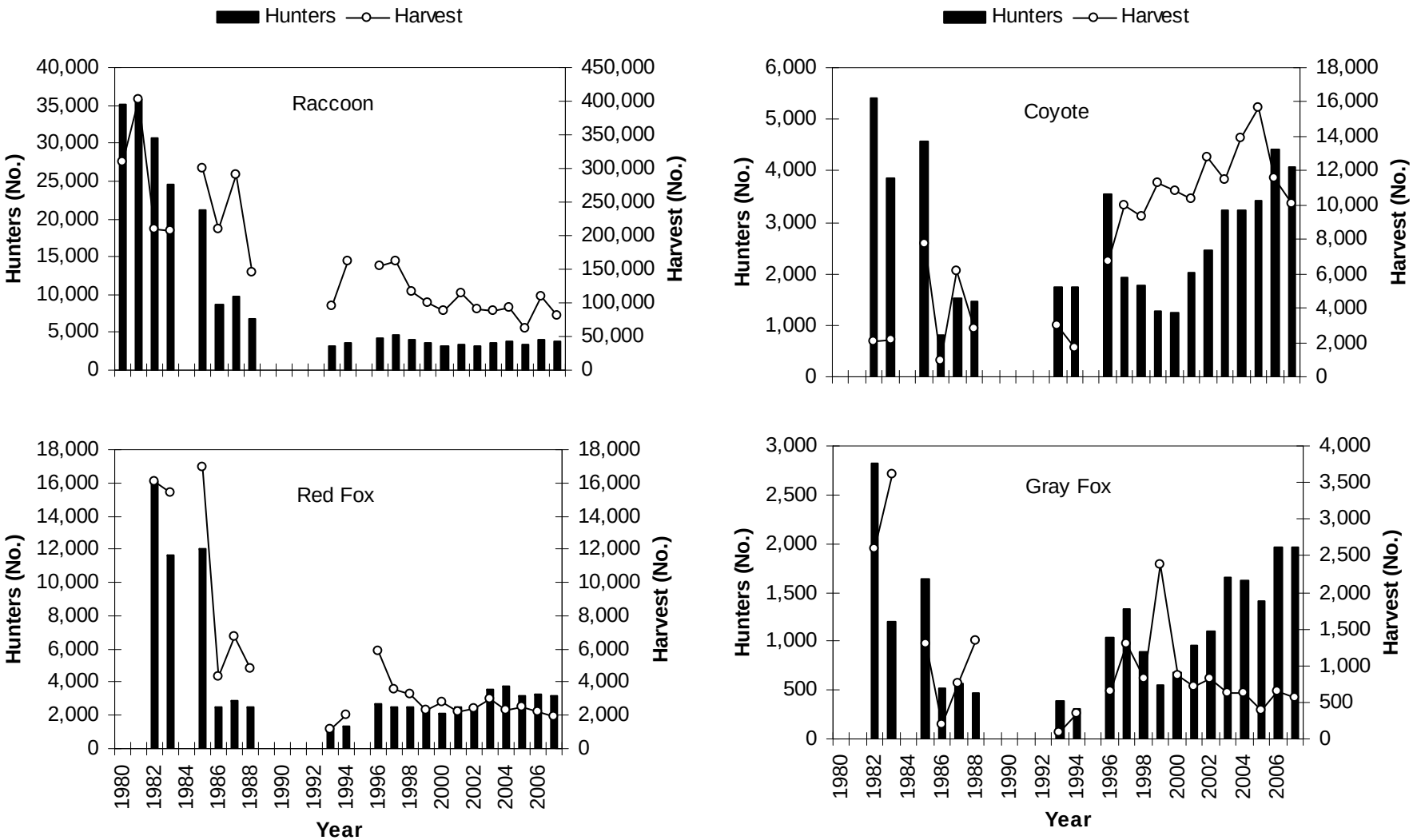
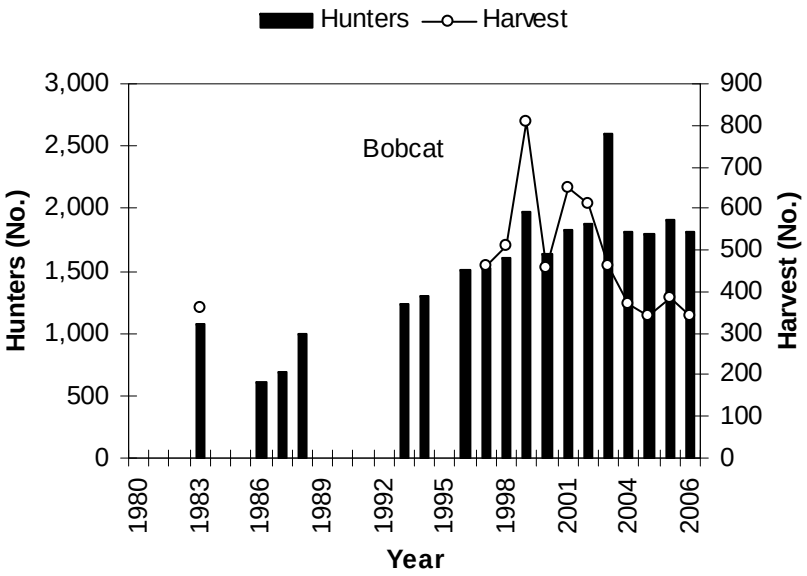


Figure 7. Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2007. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2007, 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. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.



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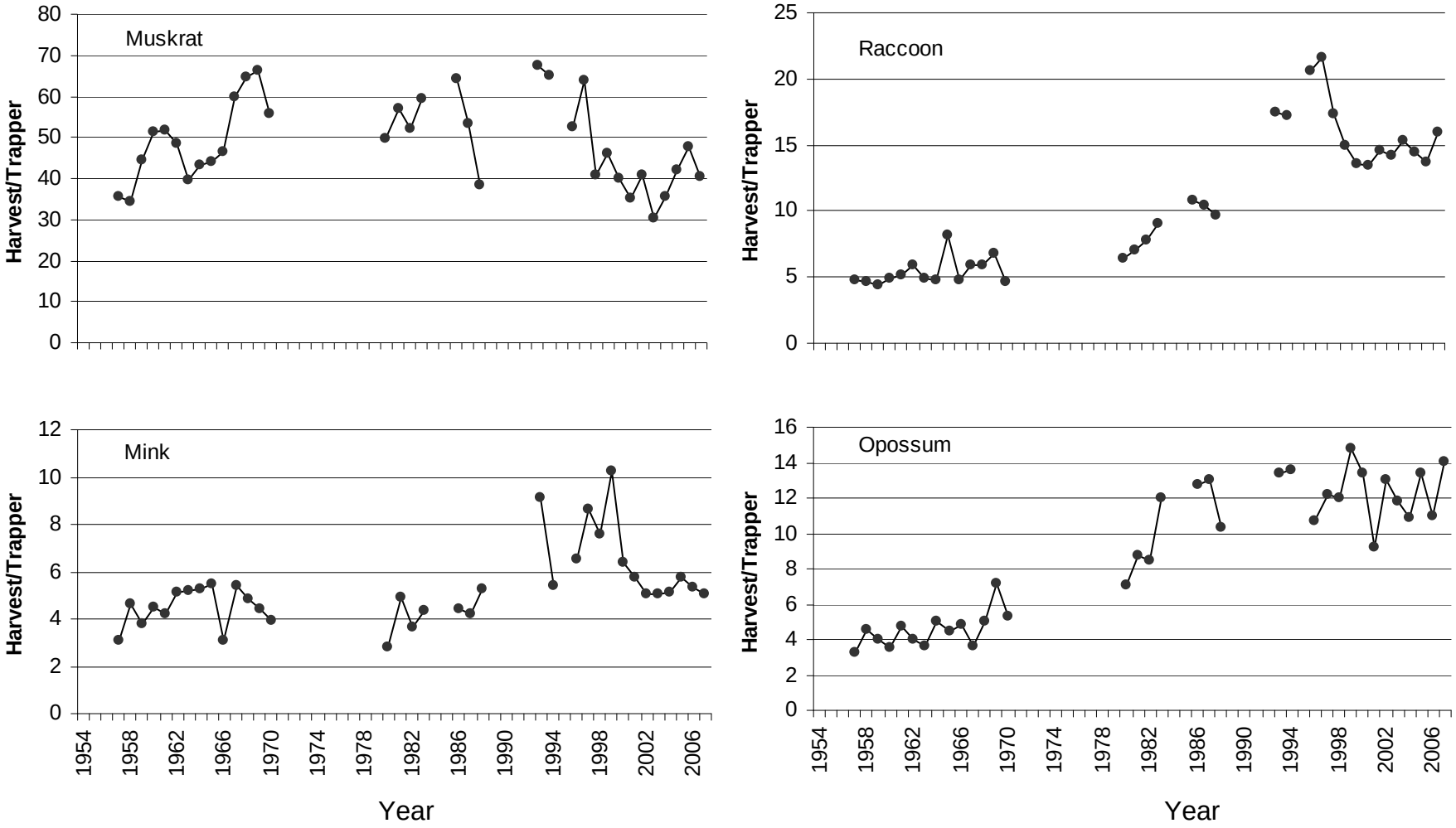
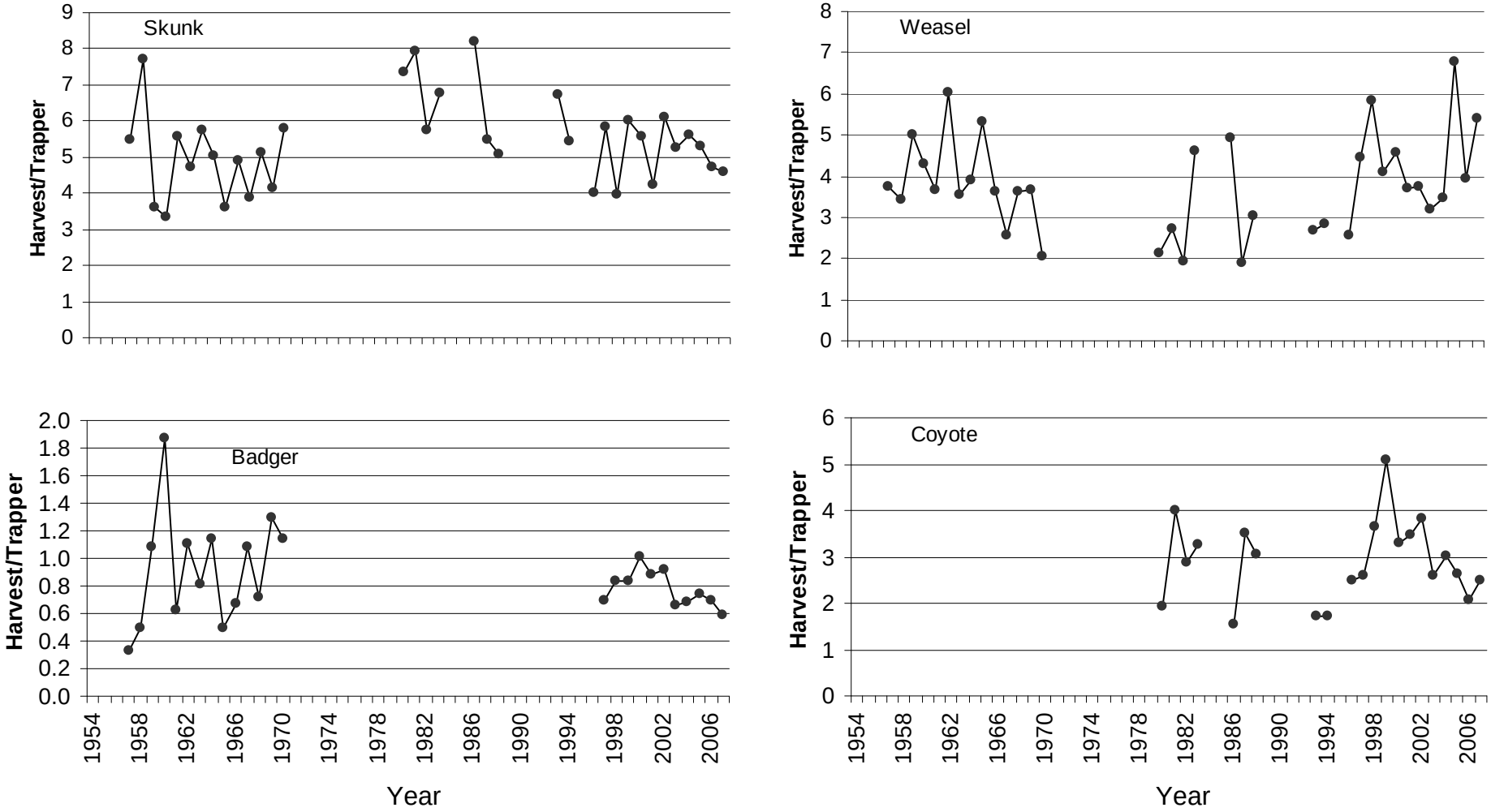


Figure 8. Estimated mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2007. Data were not available for all years.



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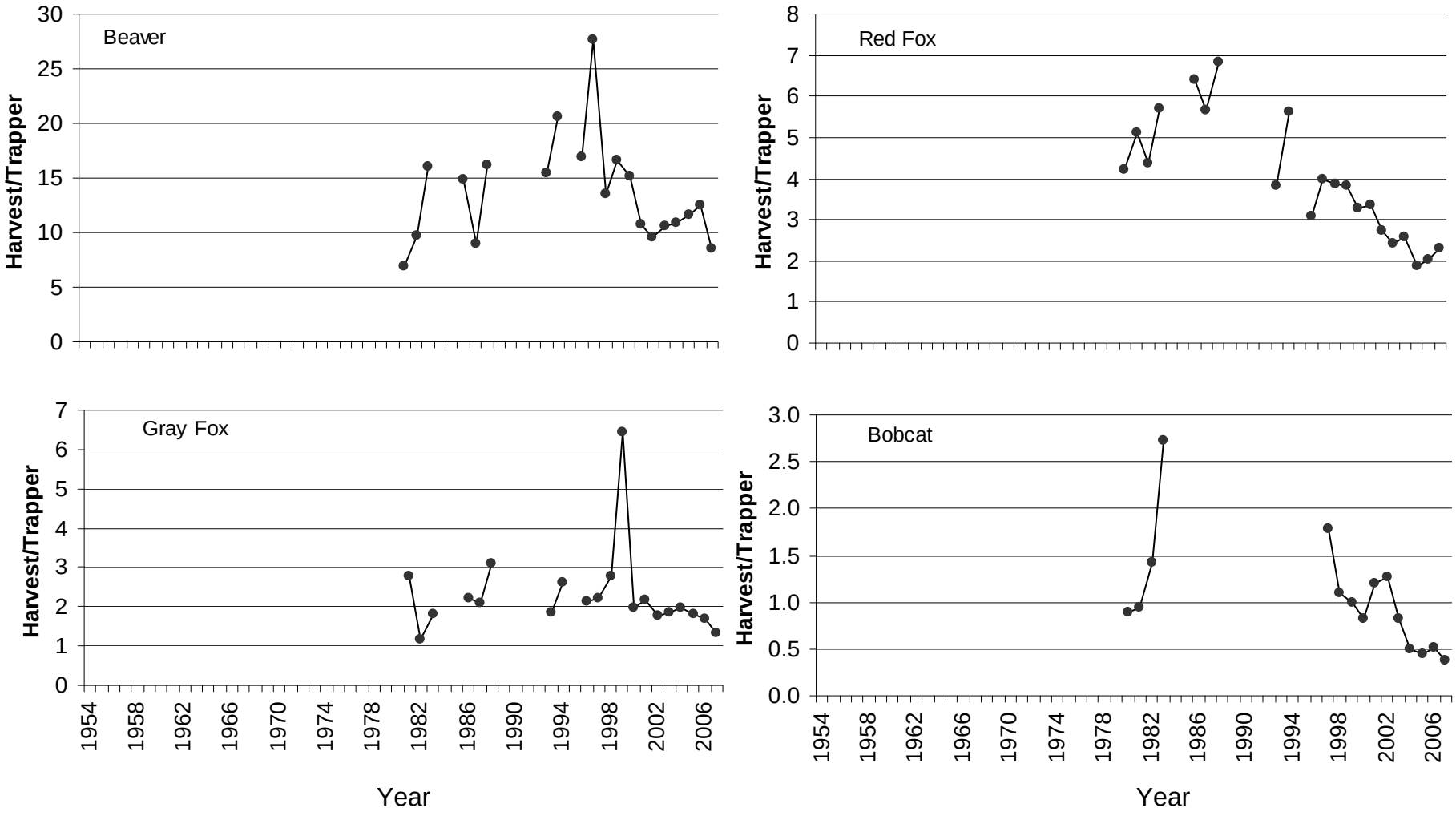

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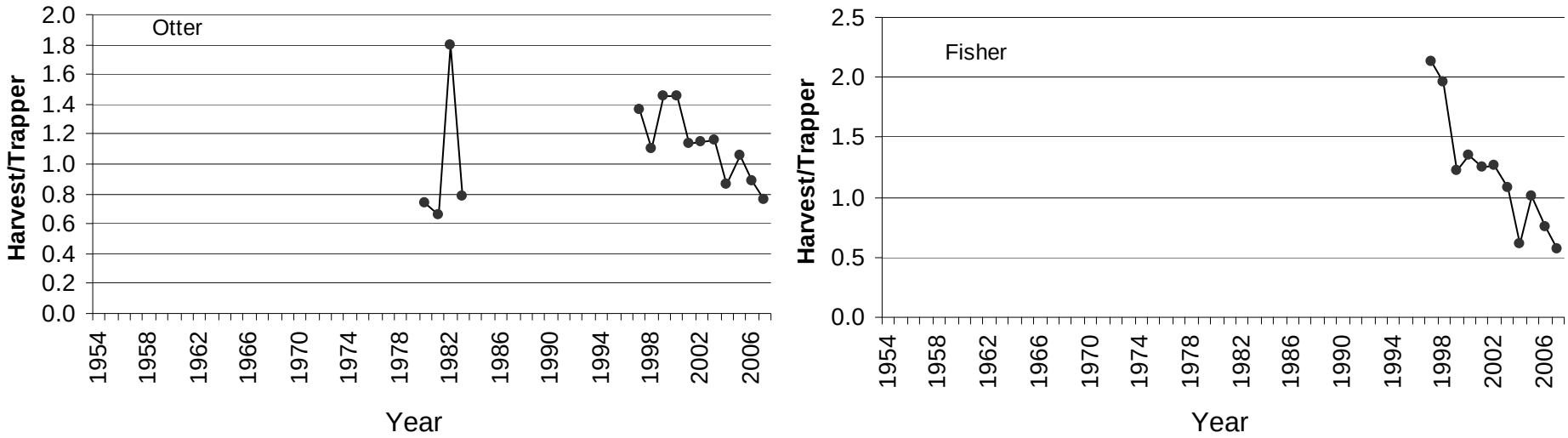

Figure 8 (continued). Estimated mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2007. Data were not available for all years.

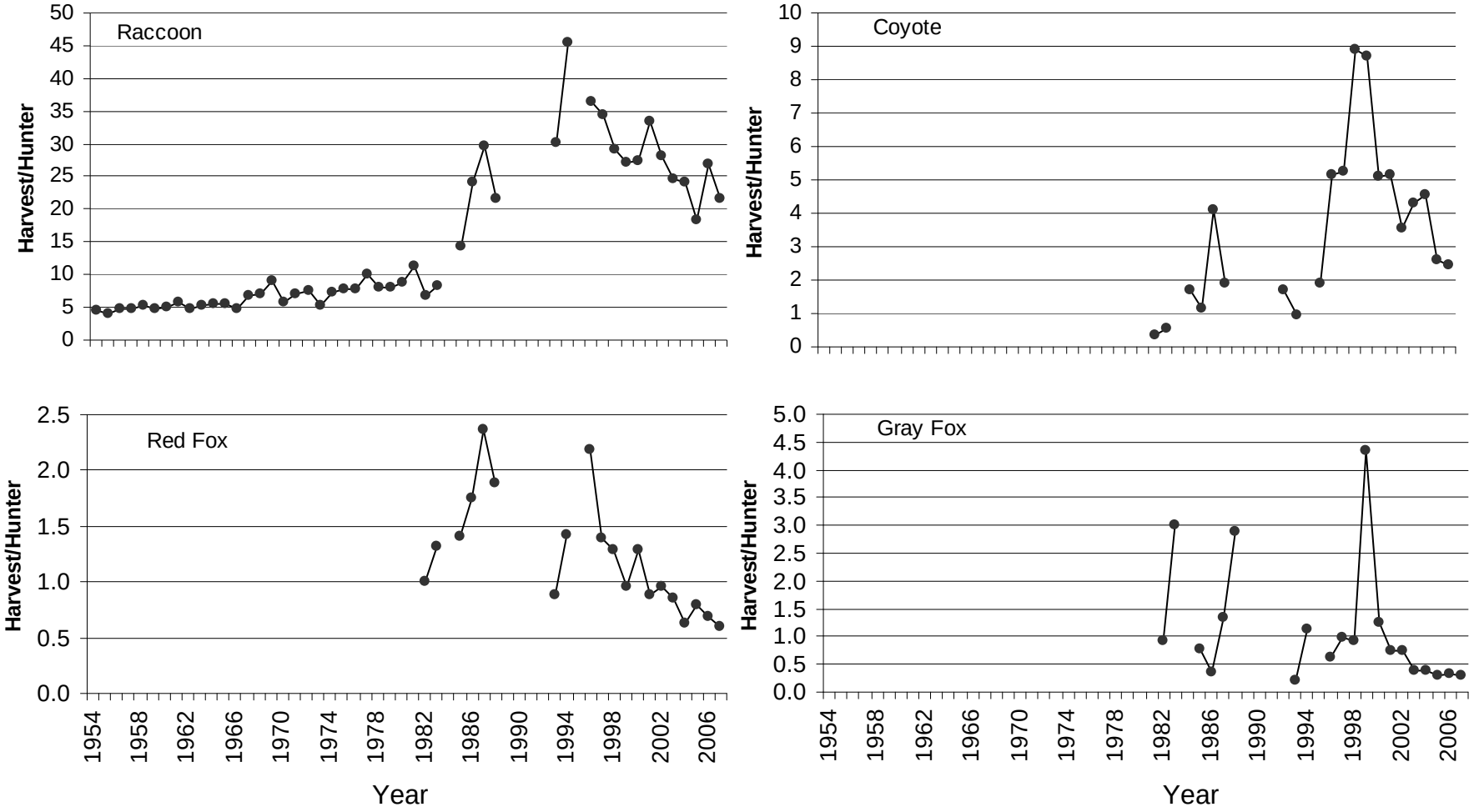

Figure 9. Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2007. Data were not available for all years.

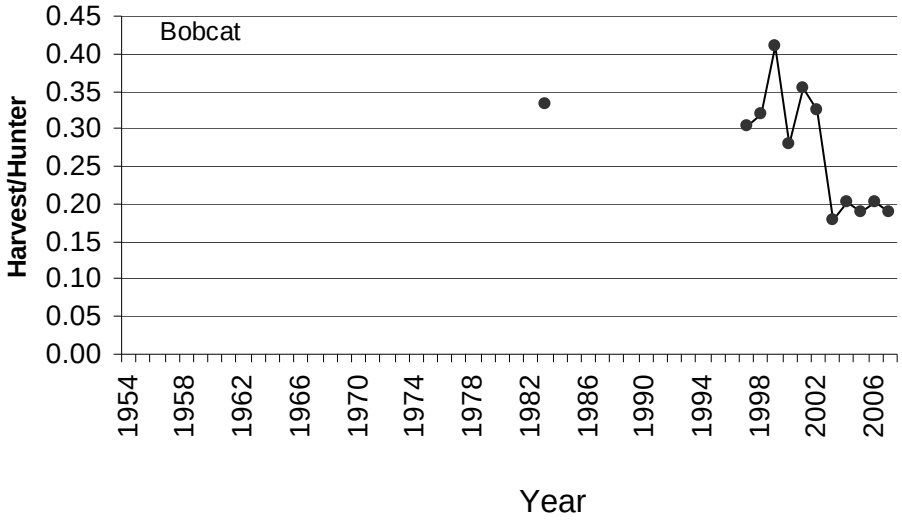

Figure 9 (continued). Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2007. Data were not available for all years.

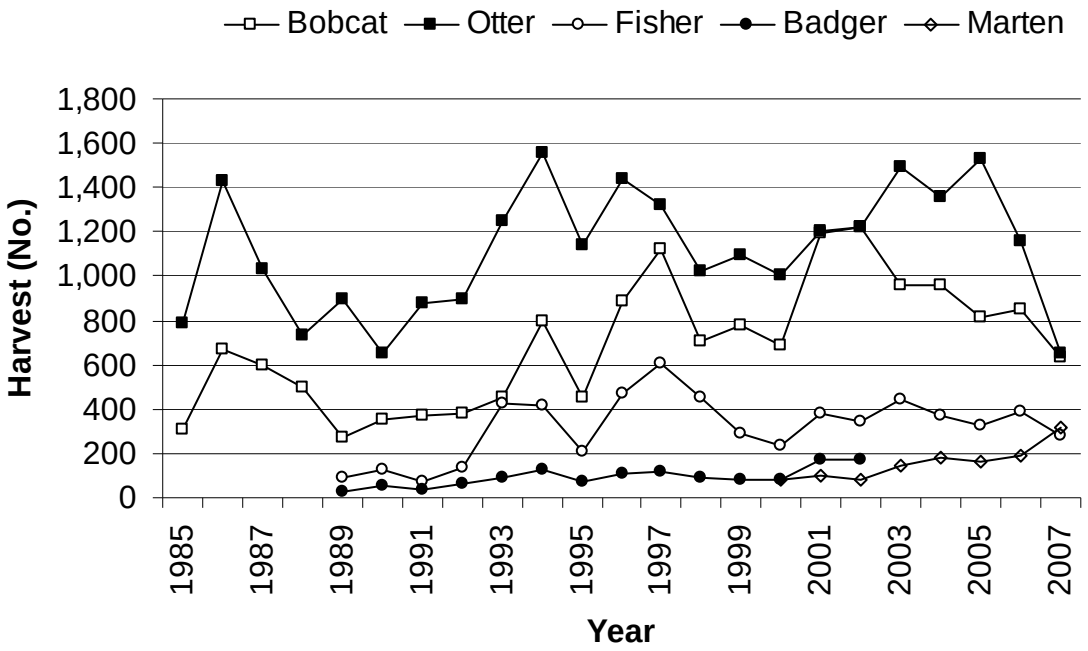

Figure 10. Number of bobcat, otter, fisher, badger, and marten registered by furtakers in Michigan, 1985-2007. Badger and fisher seasons were established in 1989, and marten season started in 2000. Totals for 2007 were preliminary. Beginning in 2003, badger were no longer registered.

Table 1. Trapping and hunting seasons when furbearing animals could be harvested in Michigan during 2007 seasons.[a]

Season, species, and area	Season dates
Trapping seasons[b]	
Muskrat and Mink	
UP	October 25 – January 31
NLP	November 1 – January 31
SLP	November 10 – January 31
Raccoon	
UP and NLP	October 15 – January 31
SLP	November 1 – January 31
Fox and Coyote	
Statewide	October 15 – March 1
Bobcat	
UP	October 25 – March 1
Badger	
UP and NLP	October 15 – November 14
SLP	November 1 – March 1
Fisher and Marten	
UP	December 1 – 15
Beaver and Otter[c]	
UP	October 25 – April 15
NLP	November 1 – April 15
SLP	November 10 – March 31
Hunting seasons	
Bobcat	
UP	December 1 – March 1
NLP (northern portion)	January 1 – March 1
NLP (southern portion)	January 1 – February 1
Fox	
Statewide	October 15 – March 1
Raccoon	
Statewide	October 1 – January 31
Coyote	
Statewide[d]	July 15 – April 15

[a]No closed season for opossum, weasel, and skunk.
[b]Nonresidents may trap from November 15 through the regular season closing date, except for beaver. The opening date for nonresident beaver trapping varied by area.
[c]Resident seasons only.
[d]Season closed during firearm deer season (November 15-30) in the UP and NLP.

Table 2. Number of fur harvester licenses sold and people receiving and returning harvest questionnaire, 2004-2007.

Item	Year			
	2004	2005	2006	2007
Licenses sold	21,466	21,680	24,149	24,617
Individuals buying licenses[a]	21,228	21,406	23,844	24,296
Questionnaires mailed	4,000	3,998	4,000	4,196
Non-deliverable questionnaires	70	66	79	60
Questionnaires returned	2,879	2,637	2,580	2,531
Questionnaires returned (%)[b]	73	67	66	61

[a]A person was counted only once, regardless of how many licenses they purchased. License types included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur (trap only), and Junior Fur (trap only).
[b]Response rate adjusted to exclude non-deliverable questionnaires.

Table 3. Estimated number of fur harvester license buyers who trapped or hunted furbearers in Michigan, 2005-2007.

Activity	2005		2006		2007		Change between 2006 and 2007 (%)
	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	
Trapped							
Number	6,959	357	8,793	418	7,763	410	-12*
%	33	2	37	2	32	2	-5*
Hunted							
Number	9,333	379	10,183	430	9,897	431	-3
%	44	2	43	2	41	2	-2
Trapped or hunted[a]							
Number	13,234	372	15,051	420	14,321	433	-5
%	62	2	63	2	59	2	-4*
Trapped only							
Number	3,902	295	4,868	350	4,424	339	-9
%	18	1	20	1	18	1	-2
Hunted only							
Number	6,275	348	6,258	381	6,558	389	5
%	29	2	26	2	27	2	1
Trapped and hunted							
Number	3,058	267	3,925	323	3,339	303	-15
%	14	1	16	1	14	1	-3*

[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 2006 and 2007 ($P<0.005$).

Table 4. Estimated number of participants, harvest, and days afield during Michigan furbearer seasons, 2006 and 2007.

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 (%)
	2006	2007			2006	2007			2006	2007		
Trapping												
Mink	4,024	3,333	303	-17*	21,572	16,798	3,519	-22	115,934	89,538	12,564	-23
Raccoon	6,261	5,652	372	-10	85,739	89,953	14,669	5	175,782	151,654	15,387	-14
Opossum	3,053	2,934	284	-4	33,413	41,077	11,653	23	88,680	78,204	12,004	-12
Skunk	1,815	1,886	235	4	8,590	8,692	2,578	1	53,349	49,273	9,929	-8
Weasel	1,099	1,055	176	-4	4,315	5,686	2,687	32	31,617	32,340	8,523	2
Red fox	3,603	2,999	289	-17*	7,299	6,942	1,528	-5	100,264	77,722	11,511	-22
Gray fox	1,966	1,964	238	0	3,328	2,636	600	-21	55,678	53,163	10,018	-5
Coyote	4,428	4,081	328	-8	9,185	10,179	1,969	11	126,756	104,689	12,917	-17
Bobcat[b]	1,103	850	40	-23*	560	320	32	-43*	32,285	24,848	1,813	-23*
Beaver[c]	1,665	2,449	262	47*	20,912	20,765	4,917	-1	48,640	60,603	11,176	25
Muskrat	5,322	4,143	332	-22*	254,301	167,359	32,218	-34*	151,603	110,871	13,787	-27*
Otter[c]	1,071	731	33	-32*	948	555	46	-41*	26,290	15,802	1,254	-40*
Fisher[d]	608	544	24	-11*	462	306	30	-34*	6,759	5,900	319	-13*
Badger	467	345	103	-26	326	203	79	-38	8,612	6,437	2,623	-25
Hunting												
Raccoon	4,102	3,777	318	-8	110,651	81,553	22,948	-26	84,565	75,113	12,365	-11
Red fox	3,262	3,139	295	-4	2,258	1,899	470	-16	44,770	44,392	8,197	-1
Gray fox	1,723	1,628	220	-6	646	572	204	-11	23,994	26,628	6,967	11
Coyote	7,561	7,364	404	-3	11,609	10,040	1,668	-14	102,163	101,290	11,774	-1
Bobcat[b]	1,903	1,805	48	-5*	386	340	28	-12	19,188	19,096	1,036	0
Trapping and hunting combined												
Raccoon	8,865	8,106	415	-9	196,390	171,506	27,888	-13	260,347	226,767	21,408	-13
Red fox	5,969	5,335	363	-11	9,557	8,841	1,674	-7	145,034	122,115	16,274	-16
Gray fox	3,223	3,126	293	-3	3,974	3,208	645	-19	79,672	79,792	14,288	0
Coyote	9,991	9,709	431	-3	20,793	20,219	2,746	-3	228,919	205,979	19,211	-10
Bobcat[b]	2,772	2,462	48	-11*	946	660	42	-30*	51,473	43,943	2,040	-15*

[a]95% CL for the 2007 estimate.
[b]Bobcat estimates from separate mail harvest survey (Frawley and Etter 2008). See Table 5 for registration totals.
[c]Otter estimates and 2006 beaver estimates from separate mail harvest survey (Frawley 2008b). See Table 5 for registration totals.
[d]Fisher estimates from separate mail harvest survey (Frawley 2008a). See Table 5 for registration totals.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2006 and 2007 (P<0.005).

Table 5. Number of bobcat, otter, fisher, badger and marten registered by furtakers in Michigan, 1985-2007.[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	266	85	0	351	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	450	1,143	210	75	
1996	463	420	0	883	1,438	471	109	
1997	347	771	0	1,118	1,324	609	117	
1998	331	375	0	706	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[e]	333	299	0	632	651	280		316

[a]Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons. Also, totals only included animals that were registered and returned to the furtaker.
[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. Proportion of active trappers using various types of traps and mean number of traps set per day in 2006 and 2007.

	Year							
	2006				2007			
	Trappers		Traps set per day[a]		Trappers		Traps set per day[a]	
Trap type	%	95% CL	Mean	95% CL	%	95% CL	Mean	95% CL
Foothold traps	83.9	2.3	18.2	1.8	83.2	2.5	18.7	1.9
Body-gripping traps (conibears)	74.4	2.8	16.3	1.4	70.2	3.1	16.5	1.7
Cable restraints (snares)	17.8	2.4	10.6	2.8	17.1	2.6	10.3	1.9
Colony traps[b]	NA	NA	NA	NA	14.7	2.4	7.5	2.8

[a]Mean number of traps used among trappers that reported using these trap types.
[b]Colony traps allow the capture of multiple muskrats in one trap. Estimates associated with colony traps were not available for 2006.

Table 7. Proportion and total number of trappers using body-gripping traps (e.g., conibear) having a jaw spread of 7-10 inches on dry land or set less than four feet above the ground in 2007.[a]

Body-gripping traps used and target species	Number of trappers		Proportion of trappers	
	No.	95% CL	%	95% CL
Conibear 220 and equivalent traps[b]				
Bobcat	105	58	1.4	0.7
Coyote	67	46	0.9	0.6
Fisher	105	59	1.4	0.8
Fox	181	76	2.3	1.0
Raccoon	1,658	222	21.4	2.6
Subtotal (all species)	1,725	226	22.2	2.7
Conibear 280 and equivalent traps[c]				
Bobcat	48	39	0.6	0.5
Coyote	20	24	0.3	0.3
Fisher	19	25	0.2	0.3
Fox	47	39	0.6	0.5
Raccoon	131	64	1.7	0.8
Subtotal (all species)	160	71	2.1	0.9
Conibear 330 and equivalent traps[d]				
Bobcat	58	44	0.7	0.6
Coyote	113	60	1.5	0.8
Fisher	29	31	0.4	0.4
Fox	56	42	0.7	0.5
Raccoon	228	85	2.9	1.1
Subtotal (all species)	304	98	3.9	1.2
Grand total (all traps and species)	1,852	234	23.9	2.7

[a]Trappers were prohibited from setting body-gripping traps larger than six inches in width on dry lands that were publicly owned, or over frozen submerged publicly owned bottomlands or on commercial forest lands unless the trap was four feet or more above the ground or placed in a container inaccessible to dogs.
[b]Body-gripping traps approximately seven inches wide.
[c]Body-gripping traps approximately eight inches wide.
[d]Body-gripping traps approximately ten inches wide.

Table 8. Estimated coyote and fox trappers using foothold traps or snares to capture coyote and fox in Michigan during the 2007 season.[a]

	Trappers		Proportion of coyote and fox trappers	
Trap type	No.	95% CL	%	95% CL
Foothold traps	3,849	321	91	2
Cable restraints (snares)	1,215	192	29	4
Either foothold traps or cable restraints	4,228	333	100	0
Foothold traps only	3,013	290	71	4
Cable restraints only	379	109	9	2
Both foothold traps and cable restraints	836	160	20	3

[a]None of the 2007 estimates differed statistically from 2006 estimates (Frawley 2007).

Table 9. Estimated number of trappers using foothold traps and cable restraints (snares) to catch coyote and fox, trapping effort, mean number of traps set per day, number of animals captured, and number of animals escaping from traps in Michigan during 2007 season.[a]

	Trappers		Trapping effort (day)		Traps set per day		Animals caught		Animals that escaped	
Type of trapper	No.	95% CL	No.	95% CL	Mean	95% CL	No.	95% CL	No.	95% CL
Using foothold traps to catch coyote	3,498	308	82,659	10,720	9.3	1.1	8,809	1,879	2,501	621
Using foothold traps to catch fox	2,813*	280	64,684*	9,136	9.0	1.2	7,780	1,693	1,295	644
Using cable restraints to catch coyote	1,178	189	29,781	6,634	8.5	1.7	1,953	807	1,271	631
Using cable restraints to catch fox	670	144	14,337	3,971	8.3	2.3	446	182	766	522

*Non-overlapping 95% confidence intervals indicated estimates declined significantly between 2006 and 2007 ($P<0.005$).

Table 10. Proportion of trappers in 2007 that supported mandatory trapper education for all trappers and new trappers.

	Proportion of trappers[a]											
	Strongly support		Support		Oppose		Strongly oppose		Not sure		No answer	
Group required to attend trapper education	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL
All trappers	8	2	14	2	30	3	26	3	12	2	9	2
First-time trappers	30	3	29	3	15	2	11	2	8	2	7	2
Trappers younger than 17	35	3	29	3	12	2	11	2	7	2	7	2

[a]Row totals may not equal 100% because of rounding error.