



2002 MICHIGAN FURBEARER HARVEST SURVEY

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ABSTRACT

Furtakers were surveyed following the 2002 hunting and trapping seasons to determine the number of participants, days afield, and furbearer harvests. In 2002, about 12,000 furtakers pursued furbearers, approximately the same as in 2001. The species most frequently pursued by trappers were raccoons, muskrats, coyotes, and opossum. Hunters most commonly sought coyotes and raccoons. Harvest levels of most furbearers in 2002 were within historical ranges except for coyote. A record high number of coyotes was taken by trappers in 2002. Trends in harvest are affected by both changes in furtaker and furbearer numbers; thus, harvest per furtaker was also examined for trends. The mean number of raccoon and opossum taken per furtaker has increased since the 1980s. The mean harvest of coyotes per hunter has increased since the mid-1980s, while the mean harvest of red fox by both hunters and trappers has declined during this same period. These trends suggest that raccoon, opossum, and coyote may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining.

INTRODUCTION

The Michigan Department of Natural Resources (DNR) has the authority and responsibility to protect and manage the wildlife resources of the State of Michigan. Harvest surveys are one of the management tools used by the DNR to accomplish its statutory responsibility. Estimating harvests and hunter participation are a primary objective of these surveys. Information from harvest surveys, mandatory registration, winter track counts, and population modeling are used to monitor furbearer populations and establish harvest regulations.



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The primary furbearing animals harvested for their pelts in Michigan during recent years have been muskrat (*Ondatra zibethica*), mink (*Mustela vison*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), weasels (*Mustela* spp.), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), bobcat (*Felis rufus*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), badger (*Taxidea taxus*), fisher (*Martes pennanti*), and marten (*Martes americana*) (Frawley 2002). Opossum, weasels, and skunks could be taken year-round with any hunting or trapping license. The remaining furbearers could be harvested in 2002 during late fall through mid-winter (Table 1). Landowners could take raccoons and coyotes throughout the year on their property without a license if these animals were causing damage.

METHODS

Following the 2002 hunting and trapping seasons, a questionnaire was sent to a random sample of people who had purchased a fur harvester license (Table 2). 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, number of days spent afield, and whether they harvested any furbearing animals. Estimates were calculated using a stratified random sampling design (Cochran 1977). The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means that similar estimates should be obtained if this survey was repeated.

Estimates were calculated along with their 95% confidence limit (CL). This confidence limit can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies that the true value would be within this interval 95 times out of 100. Harvest estimates did not include nuisance animals legally taken out of season and illegal take by unlicensed people. Estimates were based on information collected from random samples of hunting license buyers. Thus, these estimates were subject to sampling errors (Cochran 1977). Also, estimates were not adjusted for possible response or nonresponse biases.

Questionnaires were mailed initially during mid-April 2003, and up to two follow-up questionnaires were mailed to nonrespondents. About 2% of the questionnaires were undeliverable (Table 2). Of the questionnaires that were delivered, 75% of the questionnaires were completed and returned.

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, 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, badger, fisher, or marten were required to present these animals at a DNR office for registration. Marten

harvest was determined only by registration. A separate survey was also conducted to estimate harvest and trapping activity for marten (Frawley 2003).

RESULTS AND DISCUSSION

In 2002, 19,577 licenses were purchased by 19,386 people (Figure 2, Table 2). This was a 9% increase over the preceding 3-year average of 17,923. Most license buyers were men (98%), with an average age of 43 years (Figure 3). About 5% of the license buyers (1,064) were younger than 17 years of age.

Mail Harvest Survey. Overall, approximately 63% of license buyers either hunted or trapped furbearers during 2002 (Table 3). About 35% of the license buyers trapped, and 42% hunted furbearers during 2002. Trappers most often pursued raccoons, although muskrat, coyote, and opossum were popular targets (Table 4). Hunters most commonly sought coyotes and raccoon. Coyotes and raccoons ranked as the most frequently sought furbearers when trappers and hunters were combined.

The estimated number of trappers increased by about 3% between 2001 and 2002; however, the estimated number of people trapping during recent years is still well below the record highs of nearly 16,000 in the early 1980s (Figure 4). The number of trappers during recent years has been comparable to the numbers active during the 1960s. The number of hunters pursuing furbearers (all legal species) was not estimated prior to 1986 (Figure 4). Changes in trapper and hunter numbers have followed a similar pattern since 1986.

Harvest levels of most furbearers in 2002 were within historical ranges except for coyote (Figures 5-7). Estimated harvest of coyotes by trappers increased to a record high level (Figure 6). The number of raccoons taken by hunters declined to near record-low levels in 2002 (Figure 7). Furthermore, the harvest of muskrats by trappers was near record-low levels (Figure 5), and the harvest of red fox by both trappers and hunters was near record-low levels in 2002 (Figures 6 and 7).

Trends in harvest were affected by both changes in furtaker and furbearer numbers; thus, harvest per furtaker was also examined for trends (Figures 8 and 9). The mean number of raccoon and opossum taken per furtaker has increased since the early 1980s (Figures 8 and 9). The mean harvest of coyotes per hunter has increased since the mid-1980s, while the mean harvest of red fox by both hunters and trappers has declined during this same period. These trends suggest that raccoon, opossum, and coyote may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining.

Registration Data. The number of bobcat, fisher, and badger registered generally has increased since 1985, while the number of otter has shown no clear trends (Figure 10, Table 5). The number of furbearers registered was similar between 2001 and 2002. A record high number of bobcats were registered in 2002 (1,218 bobcats), although this was only 2% higher than the number registered in 2001.

ACKNOWLEDGEMENTS

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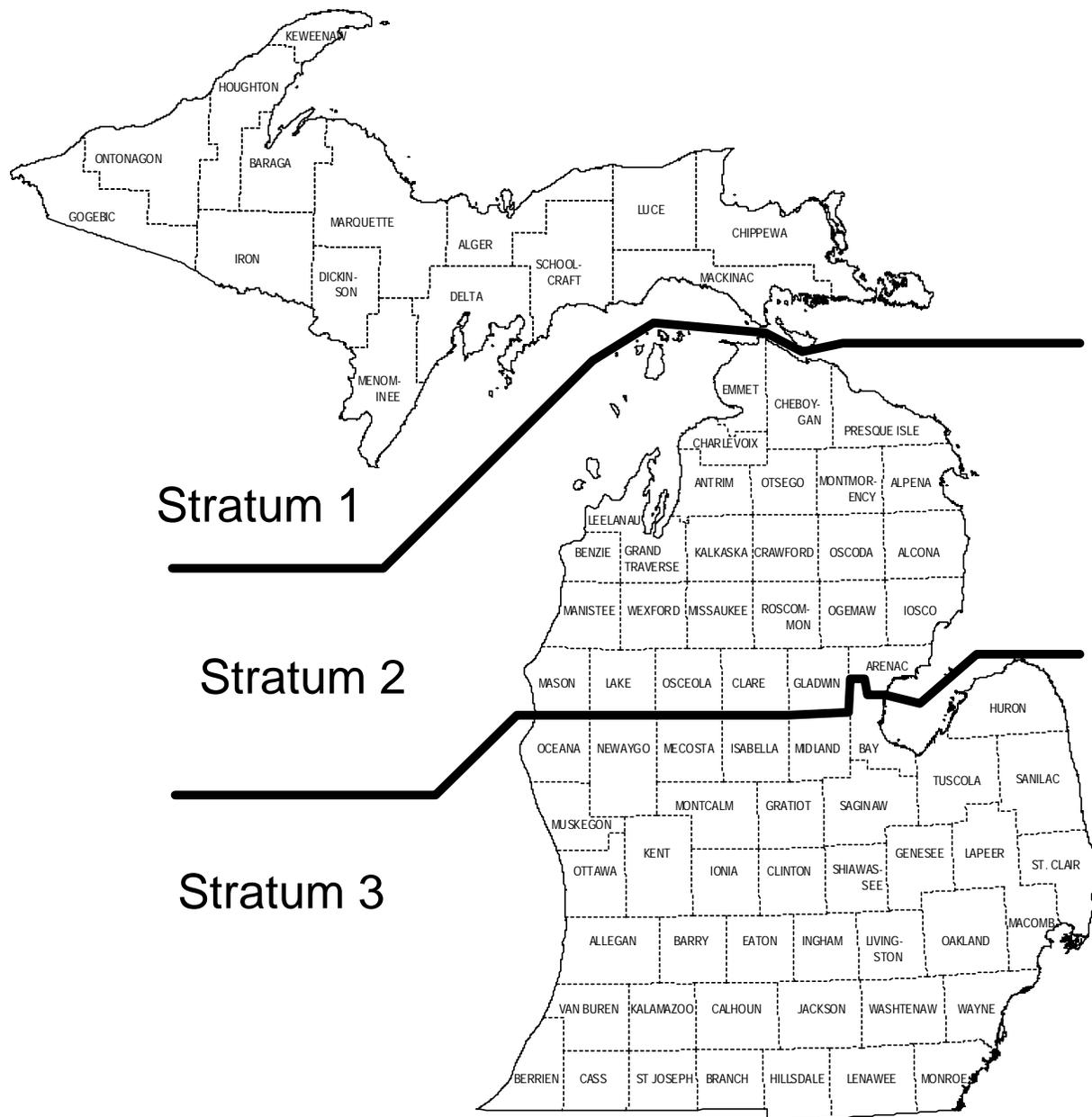


Figure 1. Stratum boundaries used for the analysis of the Michigan furbearer harvest survey. Nonresidents were included as a fourth stratum.

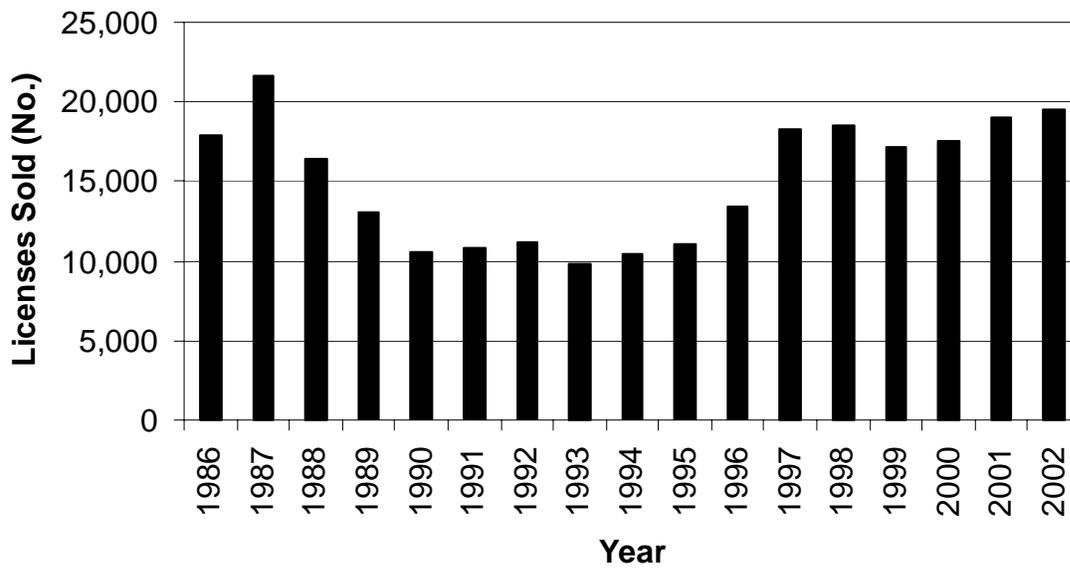


Figure 2. Number of fur harvester licenses sold in Michigan, 1986-2002. Fur harvester licenses included Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, and Nonresident Fur Harvester licenses. During 1996-2002, totals also included Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses.

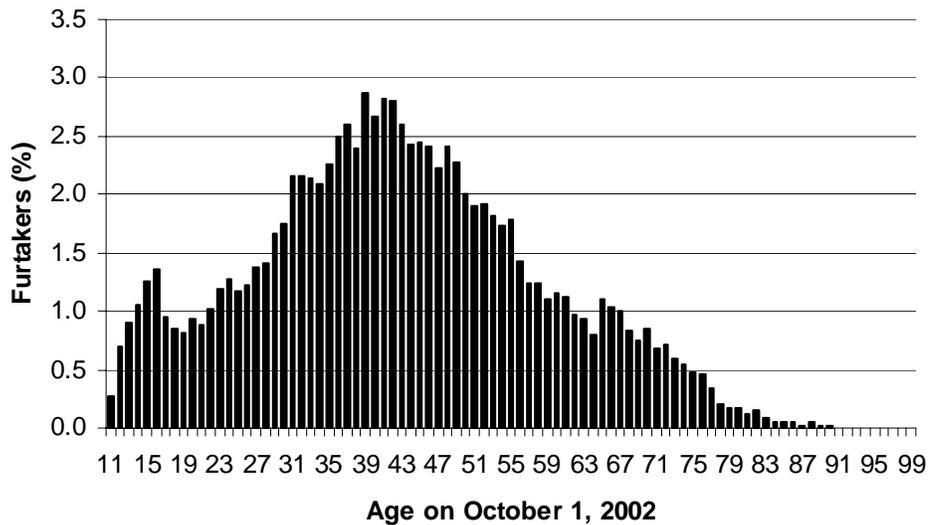


Figure 3. Ages of people that purchased a license to hunt or trap furbearers in Michigan for the 2002 hunting and trapping seasons (\bar{x} = 43 years).

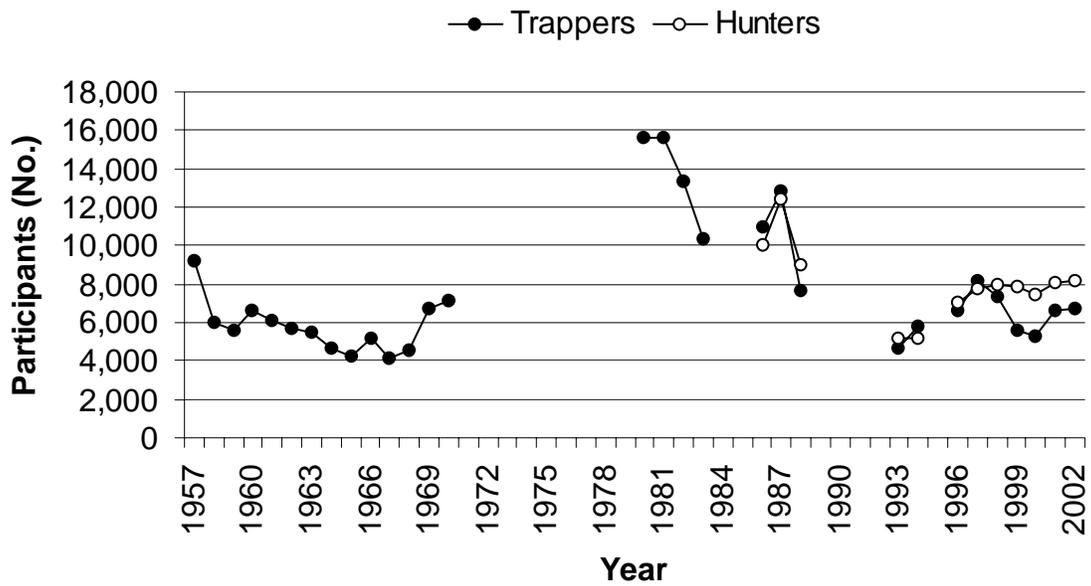


Figure 4. Estimated number of trappers and hunters in Michigan, 1957-2002. Estimates included only license buyers that actually trapped or hunted furbearers (any species). Estimates were not available for years when data are missing.

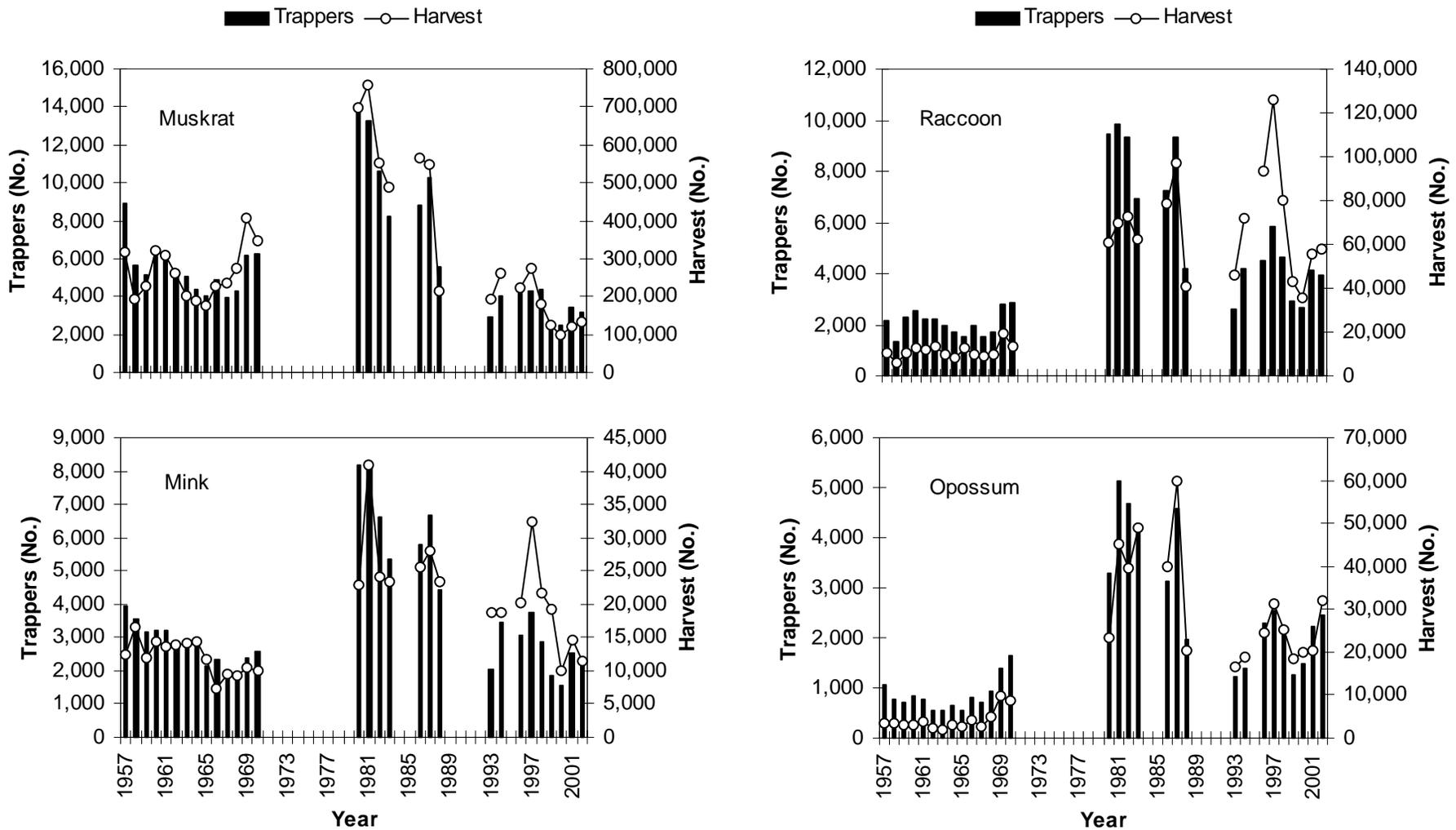


Figure 5. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2002. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2002, 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. A survey was not completed for the years that data was missing.

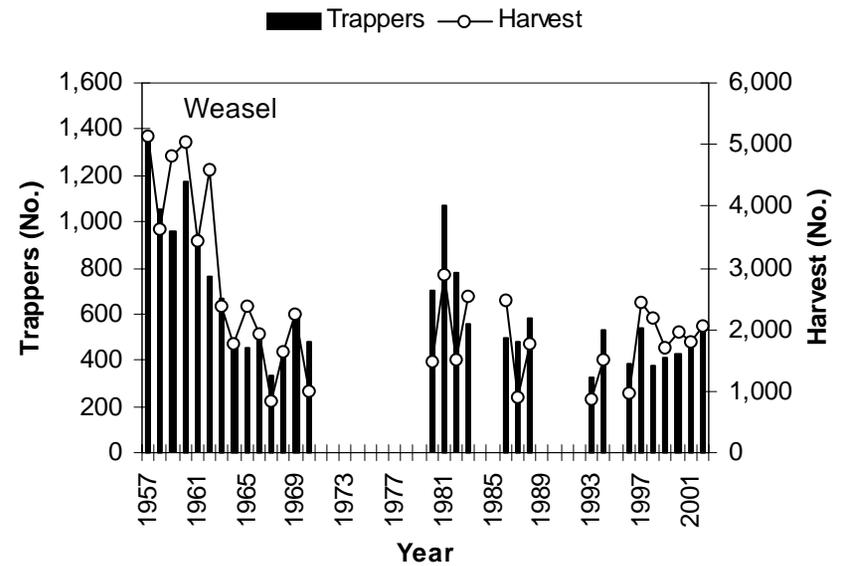
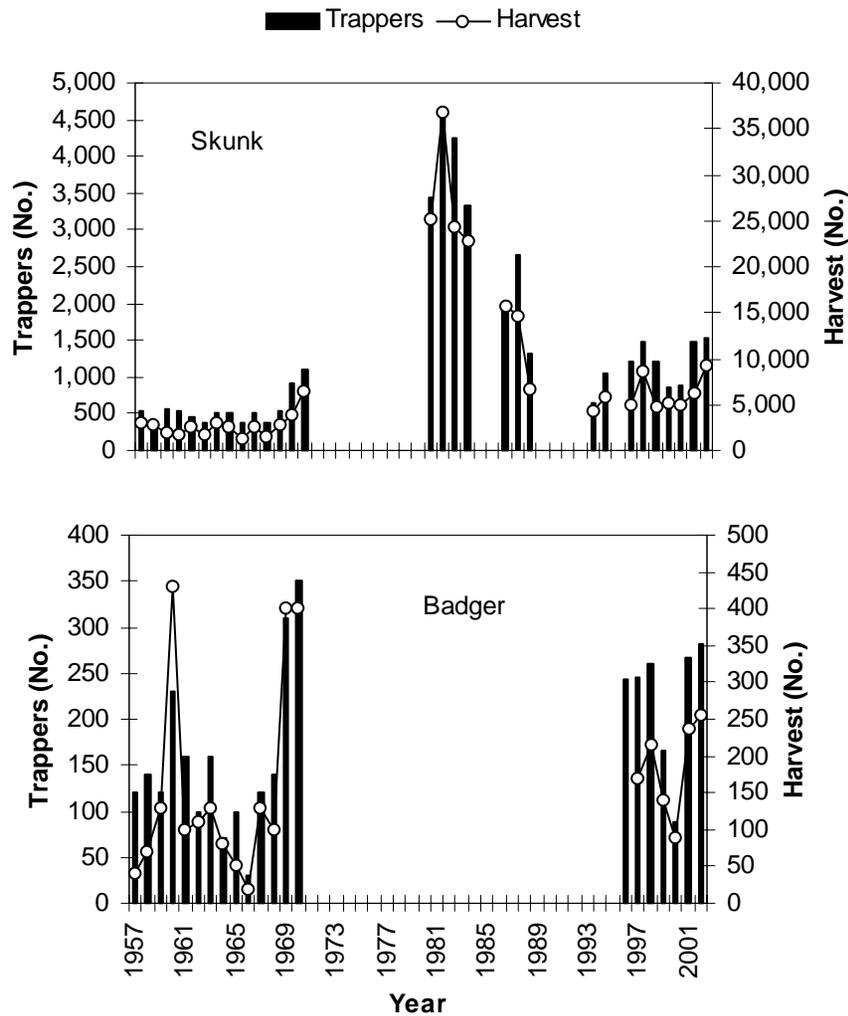


Figure 5 (Continued). Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2002. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2002, 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. A survey was not completed for the years that data was missing.

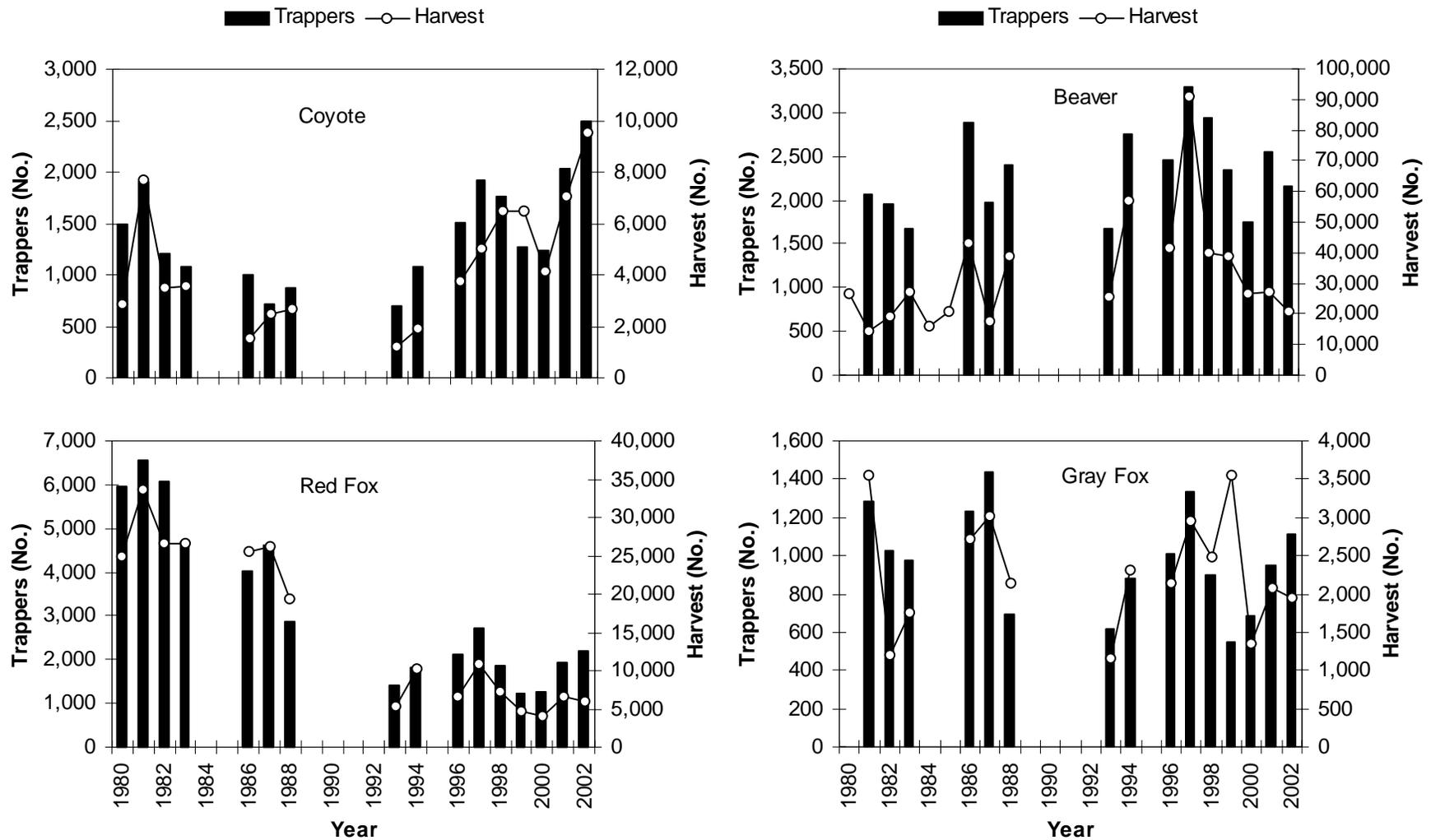


Figure 6. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1980-2002. The mail survey was sent to a random sample of Trapping and Senior Hunting license buyers during 1980-1983. During 1986-2002, the sample was selected from people buying 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. A survey was not completed for the years that data was missing.

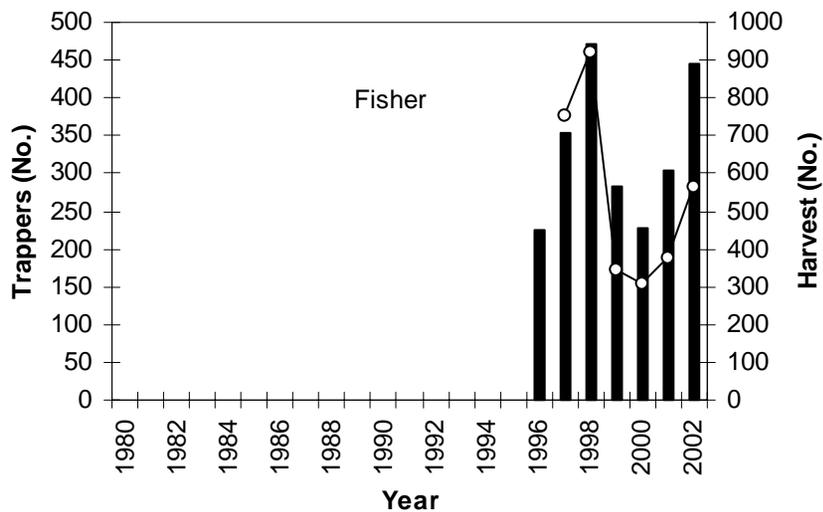
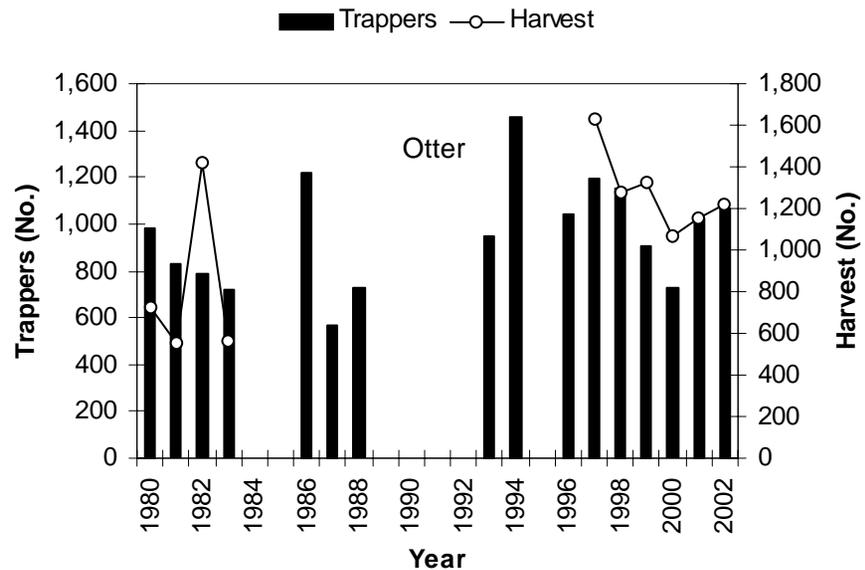
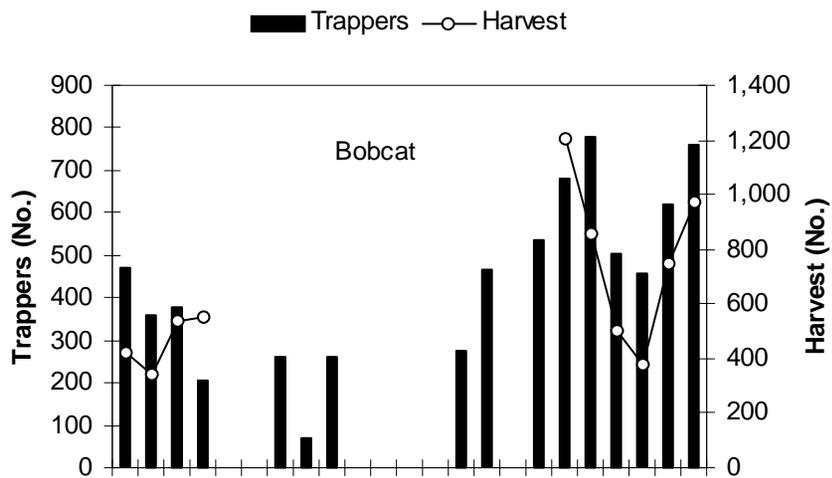


Figure 6 (Continued). Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1980-2002. The mail survey was sent to a random sample of Trapping and Senior Hunting license buyers during 1980-1983. During 1986-2002, the sample was selected from 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. A survey was not completed for the years that data was missing.

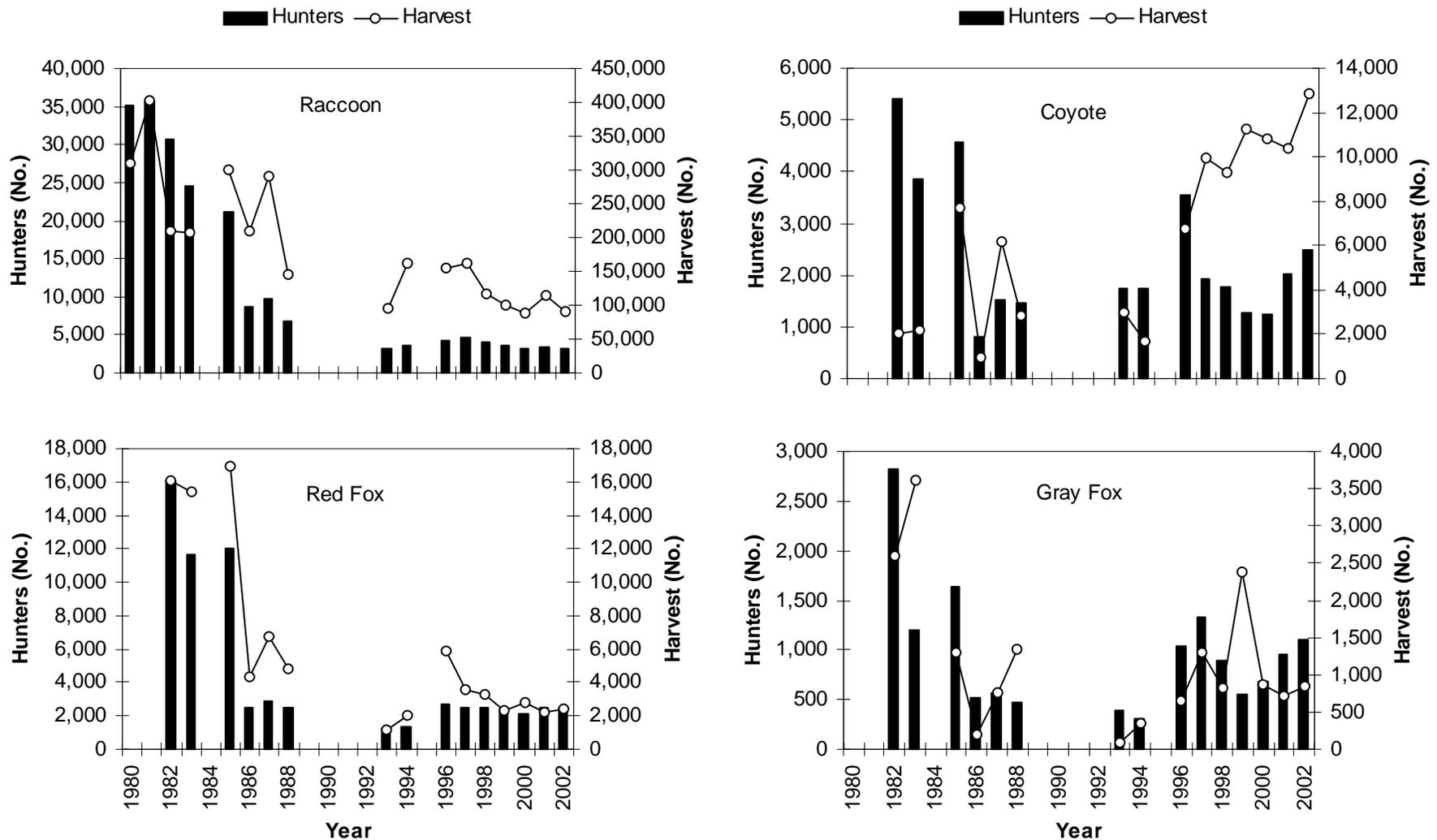


Figure 7. Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2002. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2002, 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. A survey was not completed for the years that data was missing.

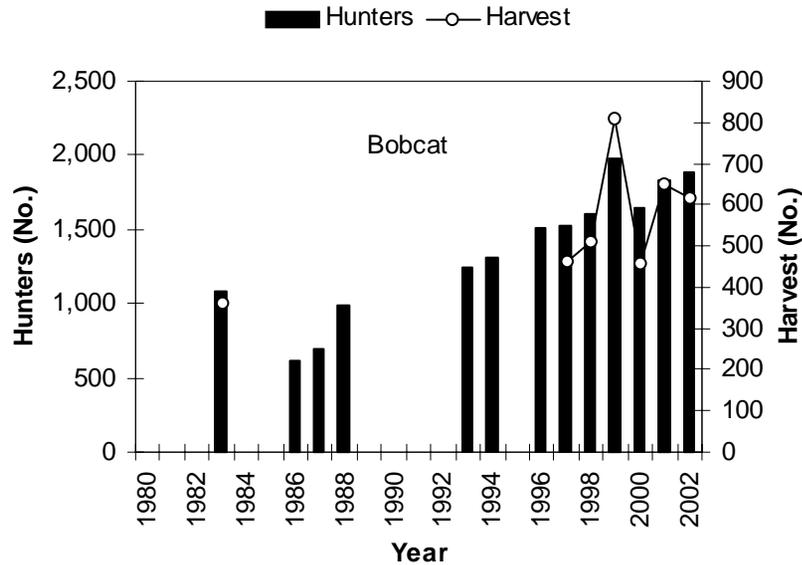


Figure 7 (Continued). Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2002. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2002, 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. A survey was not completed for the years that data was missing.

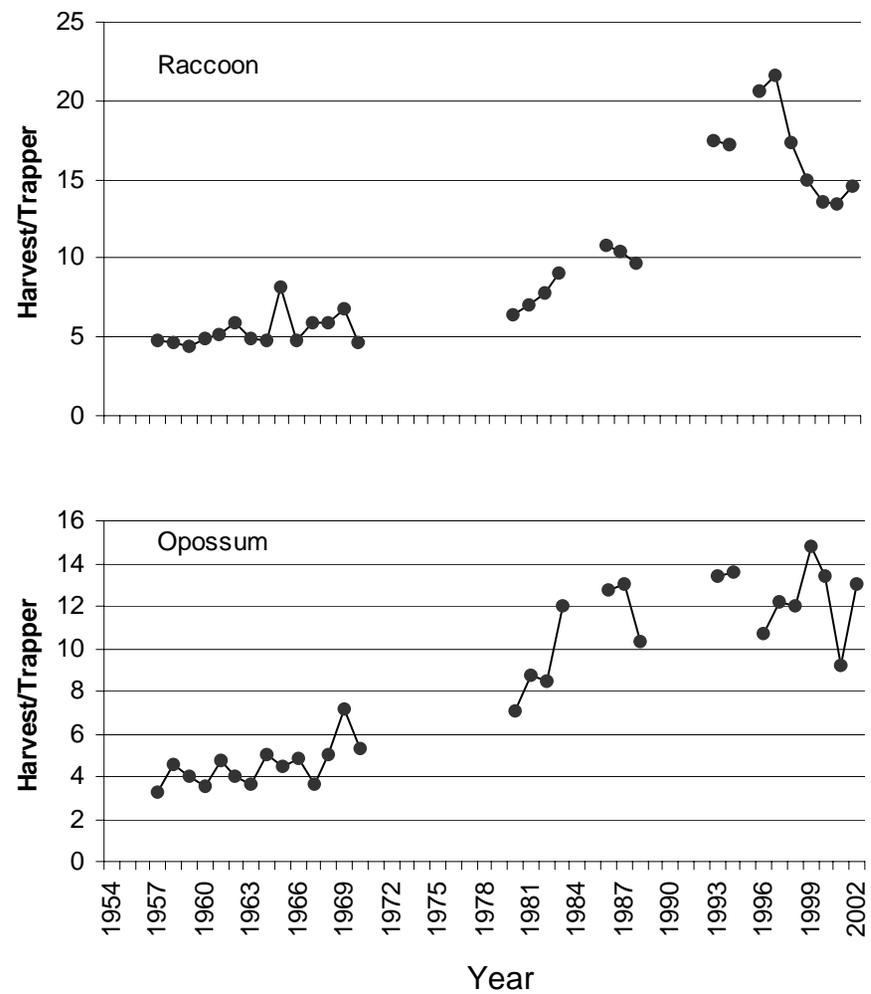
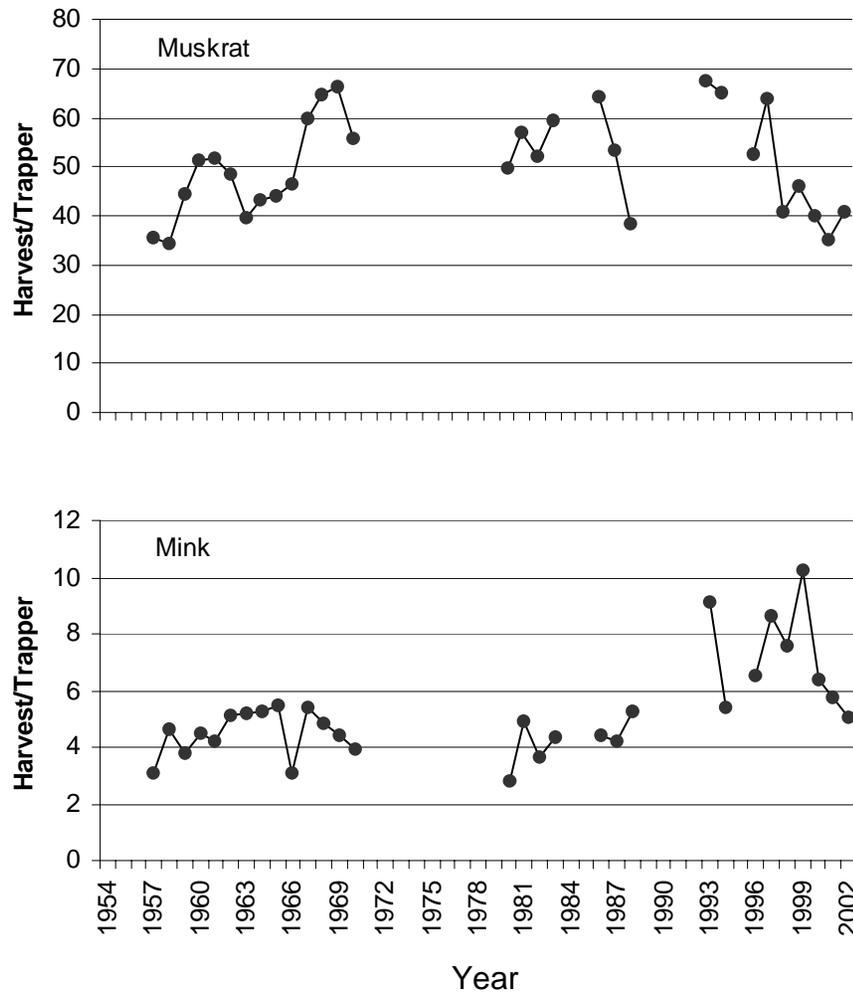


Figure 8. Estimated mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2002. A survey was not completed for the years that data was missing.

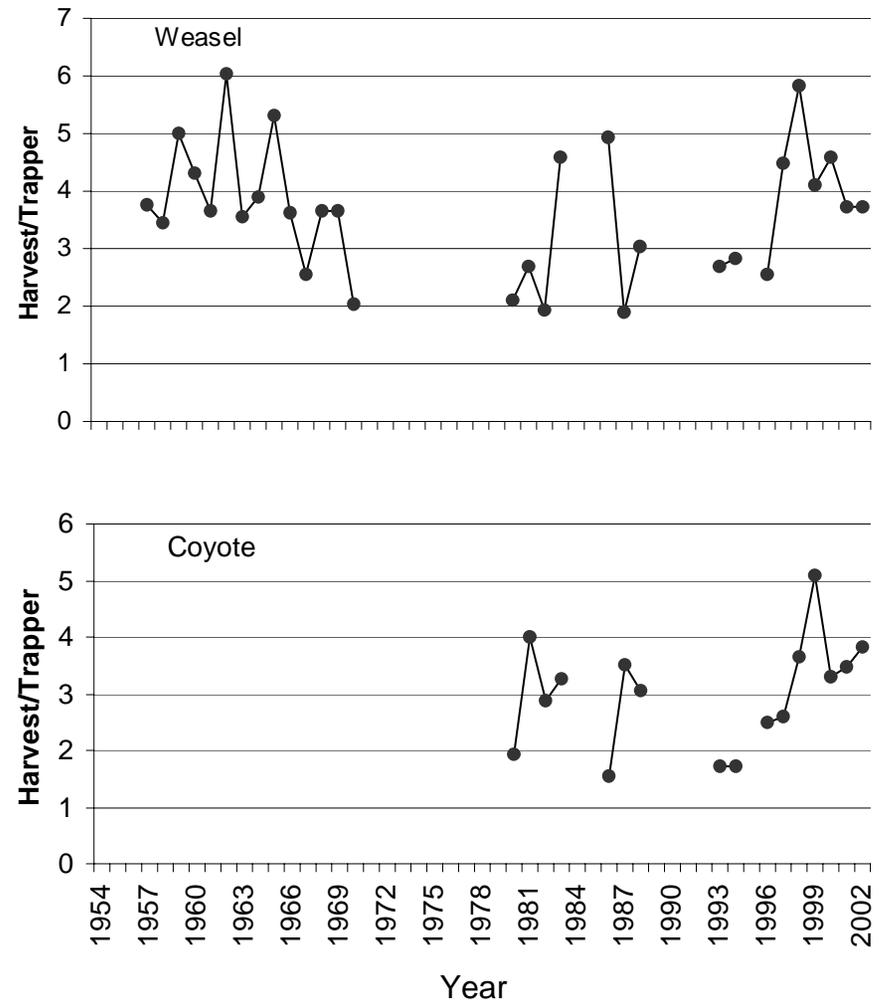
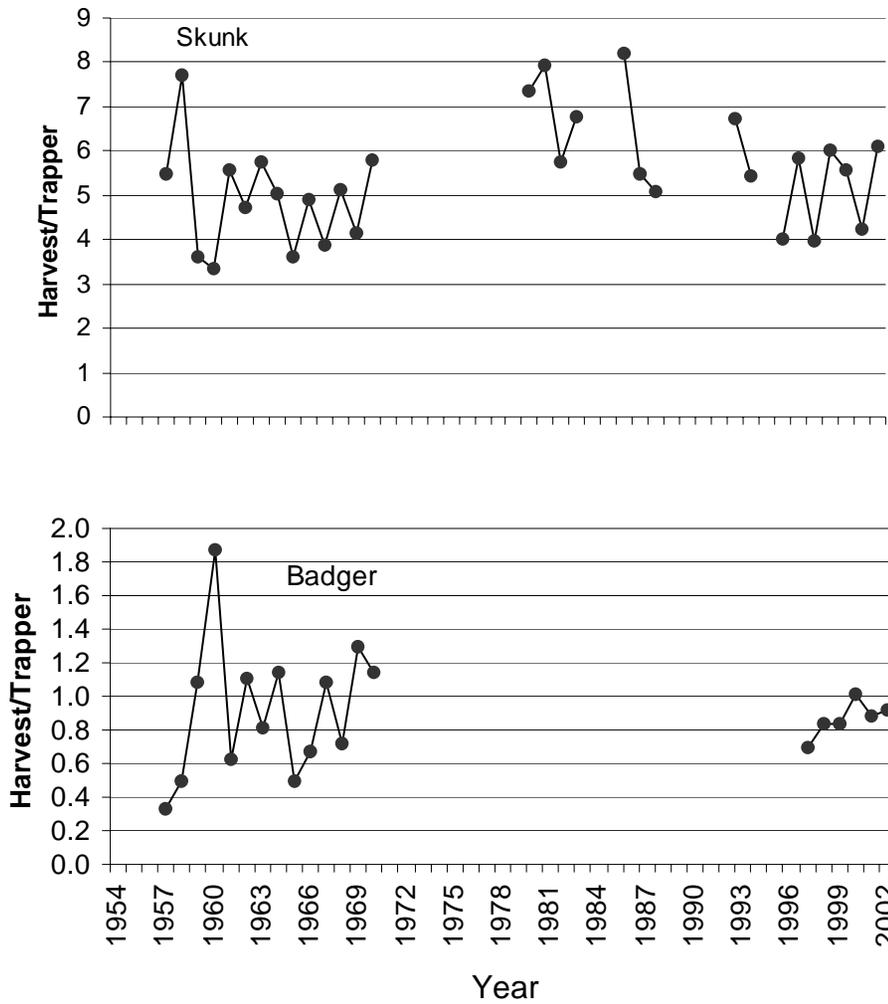


Figure 8 (continued). Estimated mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2002. A survey was not completed for the years that data was missing.

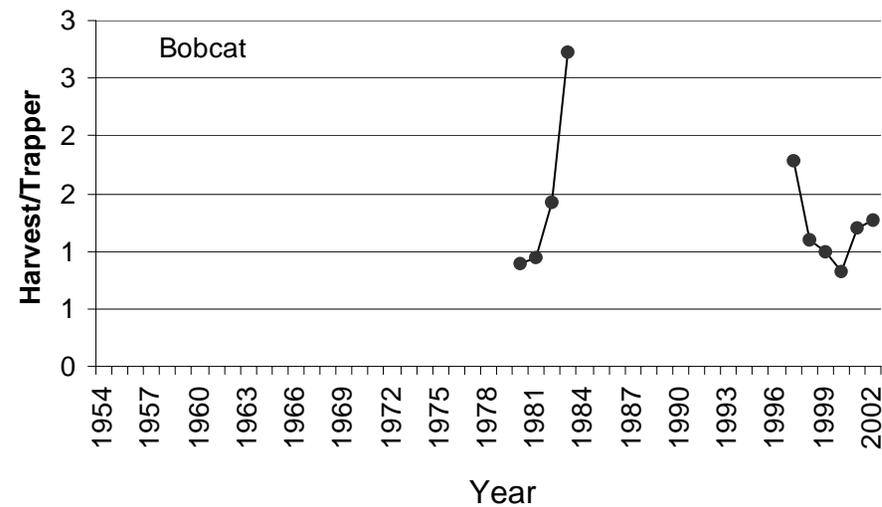
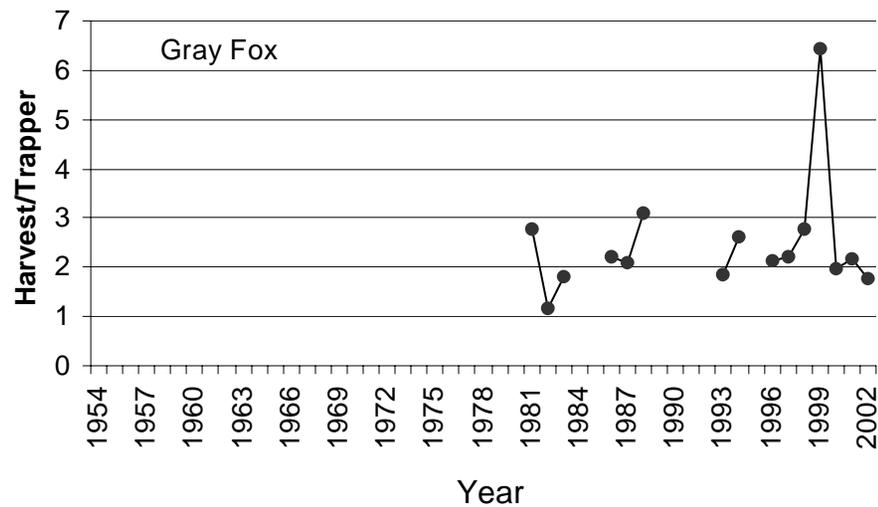
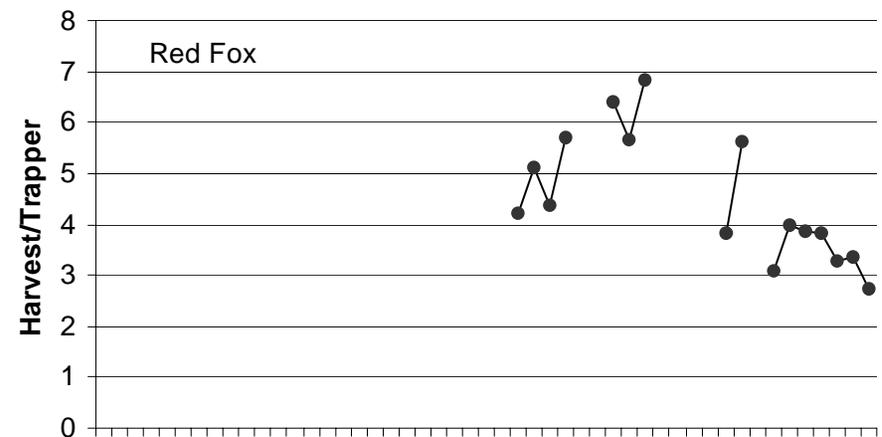
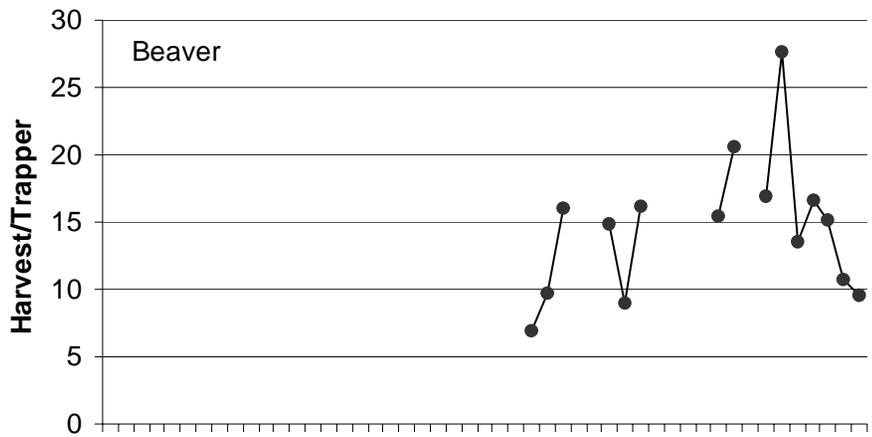


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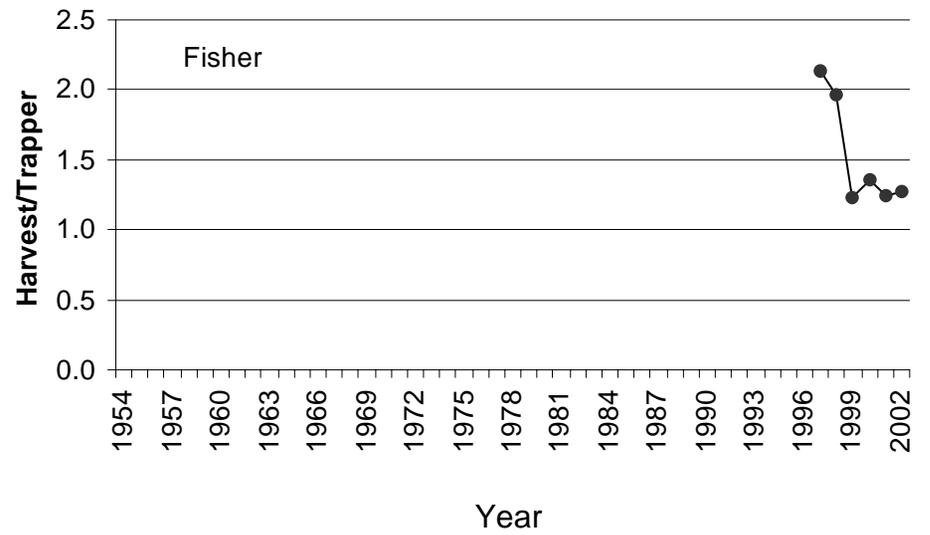
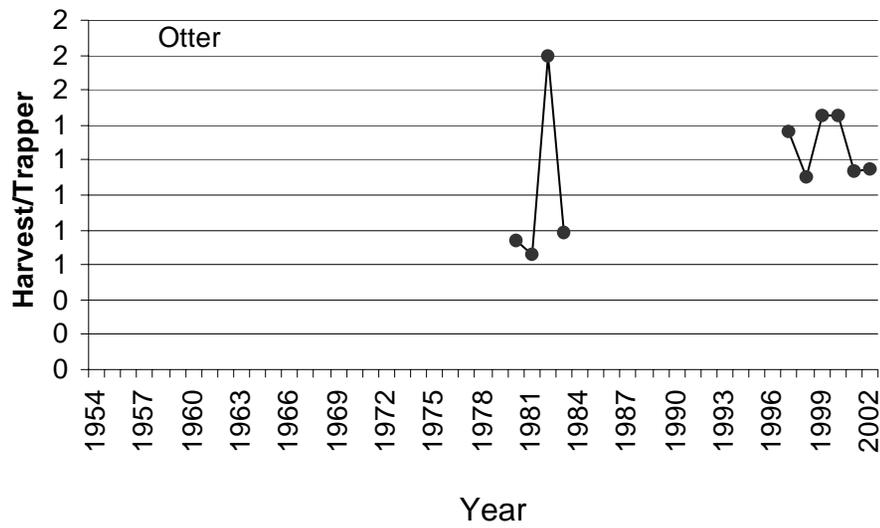


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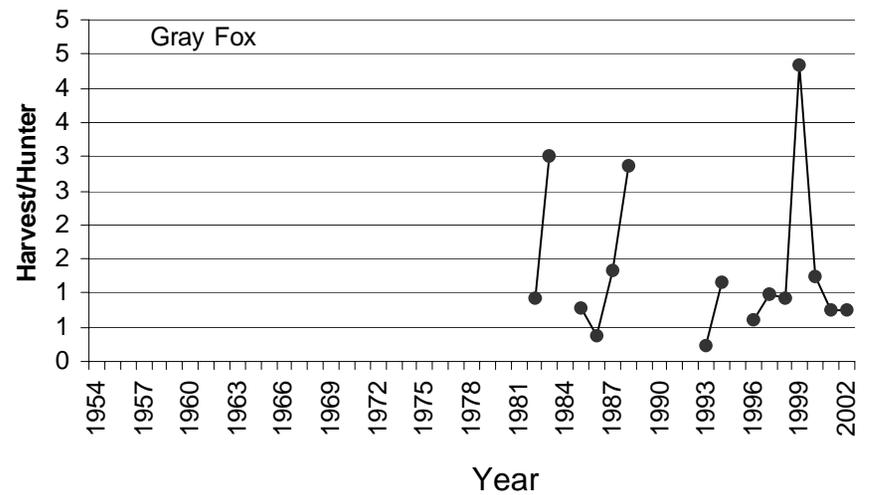
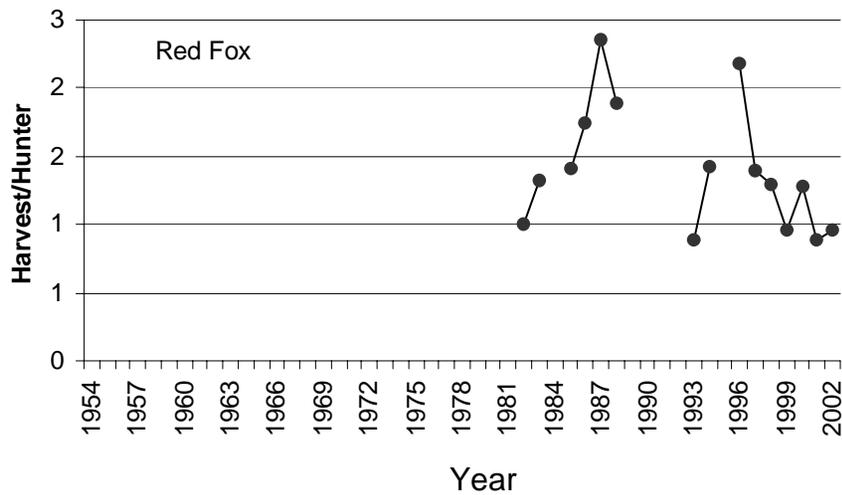
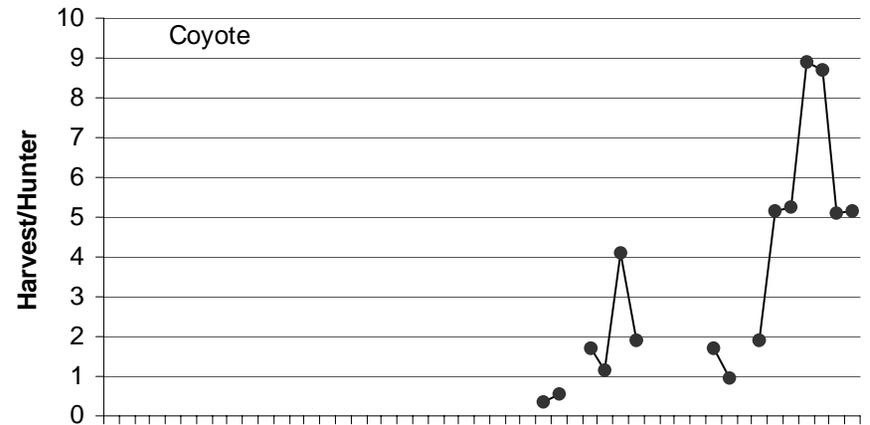
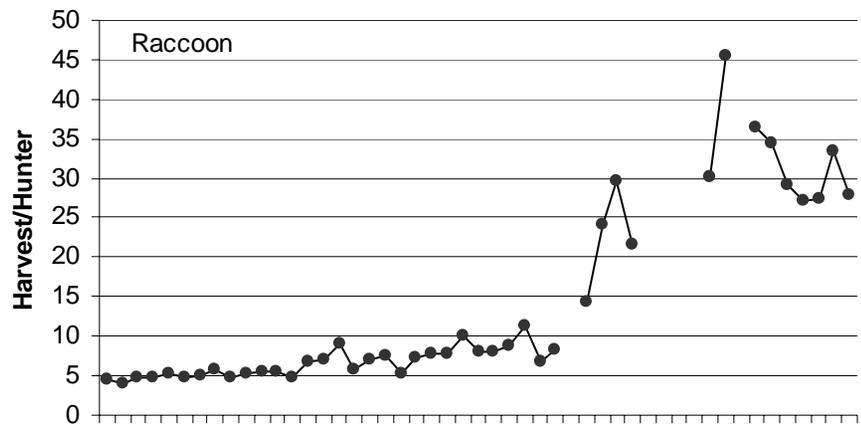


Figure 9. Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2002. A survey was not completed for the years that data was missing.

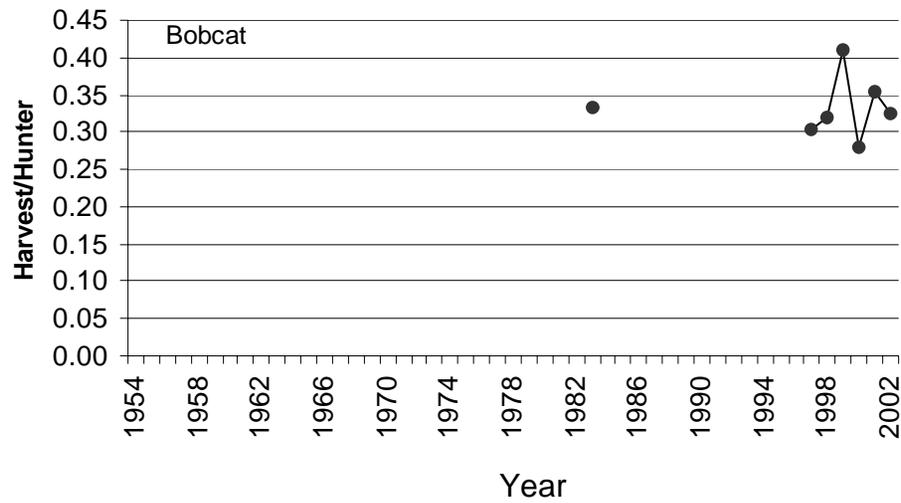


Figure 9 (continued). Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2002. A survey was not completed for the years that data was missing.

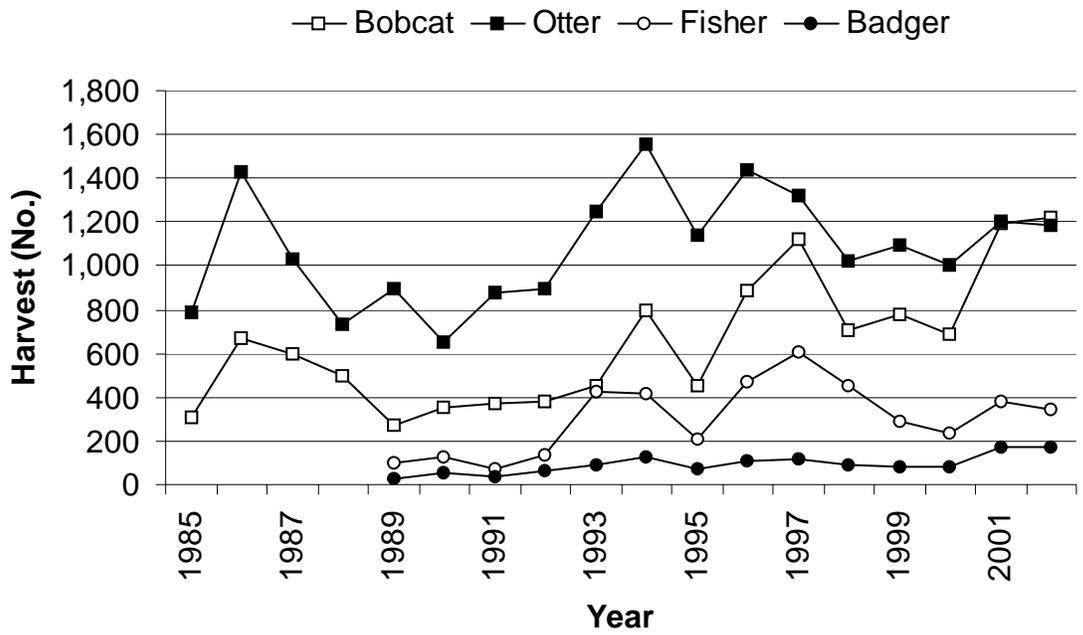


Figure 10. Number of bobcat, otter, fisher, and badger registered by furtakers in Michigan, 1985-2002. Badger and fisher seasons were established in 1989. Totals for 2002 were preliminary.

Table 1. Trapping and hunting seasons when furbearing animals could be harvested in Michigan during 2002 seasons.^a

Season, species, and area	Season dates ^b
Trapping seasons	
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 – 11
Beaver and Otter ^c	
UP	October 25 – April 13
NLP	November 1 – April 13
SLP	December 1 – March 31
Hunting seasons	
Bobcat	
UP	December 1 – March 1
NLP (northern portion)	January 1 – March 1
NLP (southern portion)	January 15 – February 16
Fox	
Statewide	October 15 – March 1
Raccoon	
Statewide	October 1 – January 31
Coyote	
Statewide ^c	July 15 – April 15

^aNo closed season for opossum, weasel, and skunk.

^bNonresidents may trap from November 15 through the regular season closing date, except for beaver.

^cResident seasons only.

^cSeason closed during firearm deer season in the UP.

Table 2. Number of fur harvester licenses sold and people receiving and returning harvest questionnaire, 1999-2002.

Item	Year			
	1999	2000	2001	2002
Licenses sold	17,169	17,519	19,082	19,577
Individuals buying licenses ^a	16,991	17,339	18,874	19,386
Questionnaires mailed	3,100	3,100	3,100	3,100
Non-deliverable questionnaires	43	52	69	50
Questionnaires not returned	589	694	657	768
Questionnaires returned	2,468	2,354	2,374	2,282
Questionnaires returned (%) ^b	81	77	78	75

^aA 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).

^bResponse rate adjusted to exclude non-deliverable questionnaires.

Table 3. Estimated number of fur harvester license buyers who trapped or hunted furbearers in Michigan, 1999-2002.

Participants	1999		2000		2001		2002	
	No.	95% CL						
Trappers	5,617	292	5,318	300	6,594	337	6,767	347
%	33	2	31	2	35	2	35%	2%
Hunters	7,903	309	7,403	322	8,034	347	8,212	368
%	47	2	43	2	43	2	42%	2%
Combined ^a	11,187	294	10,739	316	12,086	341	12,168	362
%	66	2	62	2	64	2	63%	2%

^aA person was counted only once, although they may have both trapped and hunted furbearers.

Table 4. Estimated number of participants, harvest, and days afield (effort) during Michigan furbearer seasons, 2001 and 2002.

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
	2001	2002			2001	2002			2001	2002		
Trapping												
Mink	2,542	2,271	242	-11%	14,593	11,416	2,360	-22%	63,069	54,134	8,456	-14%
Raccoon	4,140	3,965	303	-4%	55,637	57,936	9,988	4%	92,597	96,971	11,574	5%
Opossum	2,210	2,454	249	11%	20,431	32,020	7,026	57%	56,229	69,293	15,014	23%
Skunk	1,466	1,525	203	4%	6,203	9,281	2,673	50%	35,802	40,079	8,426	12%
Weasel	483	555	124	15%	1,792	2,069	1,028	16%	11,095	18,437	6,338	66%
Red fox	1,945	2,191	238	13%	6,494	5,999	1,538	-8%	47,344	54,961	8,801	16%
Gray fox	952	1,108	175	16%	2,073	1,951	622	-6%	23,390	31,249	7,087	34%
Coyote	2,033	2,488	250	22%	7,068	9,537	2,170	35%	52,767	67,910	9,914	29%
Bobcat ^b	620	760	130	22%	746	969	235	30%	11,730	22,126	5,771	89%
Beaver	2,558	2,167	230	-15%	27,372	20,665	4,347	-25%	57,165	60,884	19,186	7%
Muskrat	3,409	3,203	279	-6%	120,201	131,036	25,035	9%	82,997	74,860	10,419	-10%
Otter ^b	1,023	1,064	166	4%	1,157	1,219	249	5%	26,864	31,804	8,710	18%
Fisher ^b	304	445	103	46%	379	565	212	49%	2,173	4,174	1,262	92%
Badger ^b	267	281	89	5%	236	256	88	9%	3,866	4,554	2,890	18%
Hunting												
Raccoon	3,413	3,237	277	-5%	113,789	91,216	18,005	-20%	75,118	65,271	10,981	-13%
Red fox	2,463	2,497	249	1%	2,178	2,390	871	10%	30,882	31,959	6,502	3%
Gray fox	1,016	1,079	171	6%	708	836	665	18%	13,343	18,593	5,699	39%
Coyote	5,271	5,984	343	14%	10,349	12,847	2,793	24%	72,203	91,939	13,311	27%
Bobcat ^b	1,827	1,888	222	3%	649	616	191	-5%	15,216	19,160	3,829	26%
Trapping and hunting combined												
Raccoon	6,806	6,599	355	-3%	169,426	149,152	20,539	-12%	167,715	162,242	15,684	-3%
Red fox	4,161	4,251	309	2%	8,672	8,389	1,790	-3%	78,226	86,920	11,520	11%
Gray fox	1,905	2,002	228	5%	2,781	2,786	926	0%	36,732	49,841	9,793	36%
Coyote	6,780	7,548	364	11%	17,417	22,385	3,607	29%	124,970	159,848	17,807	28%
Bobcat ^b	2,366	2,585	245	9%	1,395	1,585	300	14%	26,946	41,286	6,966	53%

^a95% CL for the 2002 estimate.

^bEstimates from mail harvest survey. See Table 5 for the number of animals registered.

Table 5. Number of bobcat, otter, fisher, badger and marten registered by furtakers in Michigan, 1985-2002.

Year	Species						
	Bobcat (by method of capture)			Otter	Fisher ^a	Badger ^a	Marten ^b
Hunting	Trapping	Unknown					
1985	193	100	14	791			
1986	268	390	11	1,431			
1987	315	277	5	1,030			
1988	327	170	0	731			
1989	178	91	0	896	99	28	
1990	266	85	0	654	125	52	
1991	292	79	0	878	68	35	
1992	276	104	0	896	140	63	
1993	285	163	0	1,251	425	90	
1994	373	422	0	1,552	417	124	
1995	311	138	1	1,137	208	75	
1996	463	420	0	1,438	471	109	
1997	347	771	0	1,323	609	117	
1998	331	375	0	1,026	455	91	
1999	434	343	0	1,097	291	81	
2000	379	307	0	1,006	236	85	85
2001	464	728	0	1,201	381	174	97
2002 ^c	478	740	0	1,187	348	173	85

^aBadger and fisher seasons were established in 1989.

^bMarten season was established in 2000.

^cPreliminary totals.