



MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Wildlife Division Report No. 3578
October 2013

Printed by Authority of: P.A. 451 of 1994
Total Number of Copies Printed:30
Cost per Copy:.....\$2.10
Total Cost:.....\$63.00

Michigan Department of Natural Resources

2012 MICHIGAN FURBEARER HARVEST SURVEY

Brian J. Frawley

ABSTRACT

A sample of furtakers was contacted after the 2012 hunting and trapping seasons to estimate the number of participants, days afield (effort), and furbearer harvests. In 2012, 28,425 people purchased a fur harvester license, which was 11% greater than in 2011. In 2012, about 16,214 license buyers either hunted or trapped furbearers. About 36% of the license buyers trapped (10,241 trappers), 36% hunted (10,239 hunters), and 15% (4,266) both trapped and hunted. The number of trappers increased significantly by 19%, while the number of hunters was not significantly different between 2011 and 2012. Significantly more trappers pursued mink, raccoon, opossum, red fox, coyote, bobcat, muskrat, and fisher in 2012. Changes for hunting and trapping effort between 2011 and 2012 generally followed changes in the number of furtakers. Although the number of trappers and their days of effort increased significantly for many species, harvest usually was not significantly different between 2011 and 2012. 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. An estimated 287 trappers caught and released 469 bobcats that were caught in traps set for another species in 2012.



A contribution of Federal Aid in Wildlife Restoration, Michigan Project W-147-R

Equal Rights for Natural Resource Users

The Michigan Department of Natural Resources provides equal opportunities for employment and access to Michigan's natural resources. Both State and Federal laws prohibit discrimination on the basis of race, color, national origin, religion, disability, age, sex, height, weight or marital status under the U.S. Civil Rights Acts of 1964 as amended, 1976 MI PA 453, 1976 MI PA 220, Title V of the Rehabilitation Act of 1973 as amended, and the 1990 Americans with Disabilities Act, as amended.

If you believe that you have been discriminated against in any program, activity, or facility, or if you desire additional information, please write:
Human Resources, Michigan Department of Natural Resources, PO Box 30028, Lansing MI 48909-7528, or
Michigan Department of Civil Rights, Cadillac Place, 3054 West Grand Blvd, Suite 3-600, Detroit, MI 48202, or
Division of Federal Assistance, U.S. Fish & Wildlife Service, 4401 North Fairfax Drive, Mail Stop MBSP-4020, Arlington, VA 22203.

For information or assistance on this publication, contact Michigan Department of Natural Resources, Wildlife Division, P.O. Box 30444, MI 48909.
This publication is available in alternative formats upon request.

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 vison*), 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 2013a). Opossum, weasels, and skunks could be taken year-round with any hunting or fur harvester license. The remaining furbearers could be harvested in 2012 during late fall through winter by a person possessing a fur harvester 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 could also be taken by hunters possessing a small game hunting 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 small game hunting 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 harvest, but only those taken by people with a fur harvester license.

METHODS

Following the 2012 hunting and trapping seasons, a questionnaire was sent to a random sample of people (4,199) 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). 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 567 people from the UP stratum (N= 3,949), 838 people from the NLP stratum (N= 5,636), 2,767 from the SLP stratum (N= 18,599), and 28 people from the nonresident and unknown residency stratum (N=241). 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. 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 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 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 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 2013b), fisher and marten (Frawley 2013c), and otter (Frawley 2013d) seasons during recent years.

Although furtakers that purchased a small game hunting license could harvest coyotes without a fur harvester license; these license buyers were not included in this survey. Rather, a separate survey was conducted to estimate the harvest of coyotes taken by small game hunting license buyers (e.g., Frawley 2012).

While the primary objectives of the fur harvesters' 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 (snare) while attempting to capture coyote or fox during 2012 seasons. Trappers also were asked whether they caught any bobcats incidentally in traps set for another species.

Questionnaires were mailed initially in early May 2013. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 69 people, primarily because of changes in residence. Questionnaires were returned by 2,499 people, yielding a 60% adjusted response rate.

RESULTS AND DISCUSSION

In 2012, 28,776 fur harvester licenses were purchased by 28,425 people (Figure 2, Table 2). The number of license buyers in 2012 was 11% greater than in 2011. Most license buyers were men (97%), with an average age of 46 years (Figure 3). About 7% of the license buyers (2,090) were younger than 17 years of age. (Furtakers less than 10 years of age using a mentored youth license were not included in analyses.)

Compared to 10 years ago, the number of people buying a fur harvester license in 2012 increased by about 48% (19,386 people purchased a license in 2002). Although the overall number of license buyers increased, there were fewer license buyers for most age classes between 30 and 40 years of age in 2012, compared to 2002 (Figure 4). However, there were increased furtakers among the youngest and oldest age classes in 2012. 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 57% of license buyers either hunted or trapped furbearers during 2012 (Table 3). The number of active furtakers increased significantly by 6% from 2011. The

number of trappers increased significantly by 19%, while the number of hunters was not significantly different between 2011 and 2012. About 36% of the license buyers trapped and 36% hunted furbearers during 2012. 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 number of trappers has increased gradually during recent years (Figure 5). This increase has paralleled increased fur prices (Dhuey 2012, 2013). Historically, 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). 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 in 2012 (Figure 5).

Significantly more trappers pursued mink, raccoon, opossum, red fox, coyote, bobcat, muskrat, and fisher in 2012, compared to 2011. Changes for hunting and trapping effort between 2011 and 2012 generally followed changes in the number of furtakers. Although the number of trappers and their days of effort increased significantly for many species, harvest usually was not significantly different between 2011 and 2012 (Table 4).

Harvest of red fox, bobcat, and fisher in 2012 were near the low end of their historical ranges (Figures 6-8). In contrast, harvest of coyote was near the high end of their historical ranges. Many factors influence harvest trends such as furtaker numbers, wildlife population size, harvest regulations, 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 and opossum taken per furtaker has generally increased since the early 1980s (Figures 9 and 10). 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 9). Frawley (2013c) 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. Using fisher trapper effort data with harvest at age information, researchers demonstrated 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 fisher in 2011, and this reduction likely contributed to the decline in fisher taken per trapper in 2012 (Frawley 2013c).

The mean number of bobcats taken per trapper declined from 2003 to 2012 (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 likely contributing to the decline of bobcats taken per trapper since 2003 (Frawley 2013b).

Registration Data

Compared to 2011, more marten (50% increase), fisher (16%), and bobcats (3%) were registered in 2012; however, fewer otter (-9% decline) were registered (Figure 11, Table 5). Registration totals excluded harvest by tribal members. Registration totals only included animals that were registered and returned to the furtaker.

Supplemental Questions

An estimated 4,722 coyote trappers caught 8,673 coyotes with foothold traps, while 3,523 fox trappers caught 4,946 fox with foothold traps (Table 6). These trappers also reported 2,482 coyotes and 1,067 fox escaping from foothold traps. Among trappers using cable restraints, 1,394 trappers caught 3,291 coyotes, and 611 trappers caught 511 fox. In addition, trappers reported 2,002 coyotes and 462 fox escaping from cable restraints.

An estimated 287 trappers caught a bobcat incidentally in traps set for another species (Table 7). These trappers caught 469 incidental bobcats that were released alive from their traps. In addition, 59 incidental bobcats were registered because they could not be released alive. 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 2013d). 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 only represent 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 2,911 furtakers sought beavers (Tables 4 and 8). About 54% of these trappers possessed an otter harvest tag (Table 8), and they were responsible for 77% of the beaver taken.

ACKNOWLEDGEMENTS

I thank all the furtakers that provided information. Sheree Kershaw and Theresa Riebow completed data entry. Marshall Strong prepared Figure 1. Dwayne Etter, Sarah Cummins, Russ Mason, Cheryl Nelson, and Doug Reeves reviewed a draft version of this report.

LITERATURE CITED

Cochran, W. G. 1977. Sampling techniques. John Wiley & Sons, New York. USA.

Dhuey, B. 2012. Wisconsin fur buyers report, 2011-2012. Unpublished report. Wisconsin Department of Natural Resources, Madison, USA.

Dhuey, B. 2013. Wisconsin fur buyers report, 2012-2013. Unpublished report. Wisconsin Department of Natural Resources, Madison, USA.

Frawley, B. J. 2013a. 2011 Michigan furbearer harvest survey. Wildlife Division Report 3563. Michigan Department of Natural Resources, Lansing, USA.

Frawley, B. J. 2013b. 2012 bobcat hunter and trapper harvest in Michigan. Wildlife Division Report 0000. Michigan Department of Natural Resources, Lansing, USA.

Frawley, B. J. 2013c. 2012 marten and fisher harvest survey. Wildlife Division Report 3567. Michigan Department of Natural Resources, Lansing, USA.

Frawley, B. J. 2013d. 2012 Michigan otter and beaver harvest survey. Wildlife Division Report 0000. Michigan Department of Natural Resources, Lansing, USA.

Frawley, B. J. 2012. 2010 small game harvest survey. Wildlife Division Report 3542. Michigan Department of Natural Resources, Lansing, USA.

Gehrt, S. D., G. F. Huber, and J. A. Ellis. 2002. Long-term population trends of raccoons in Illinois. Wildlife Society Bulletin 30:457-463.

Iowa Department of Natural Resources. 2002. Trends in Iowa wildlife populations and harvest – 2001. Iowa Department of Natural Resources, Des Moines, Iowa, USA.

Payton, M. E., M. H. Greenstone, and N. Schenker. 2003. Overlapping confidence intervals or standard error intervals: what do they mean in terms of statistical significance? Journal of Insect Science 3:34.

Poole, K. G. and G. Mowat. 2001. Alberta furbearer harvest data analysis. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 31. Edmonton, Alberta, Canada.

Sovada, M. A., A. B. Sargeant, and J. W. Grier. 1995. Differential effects of coyotes and red foxes on duck nest success. *Journal of Wildlife Management* 59:19.

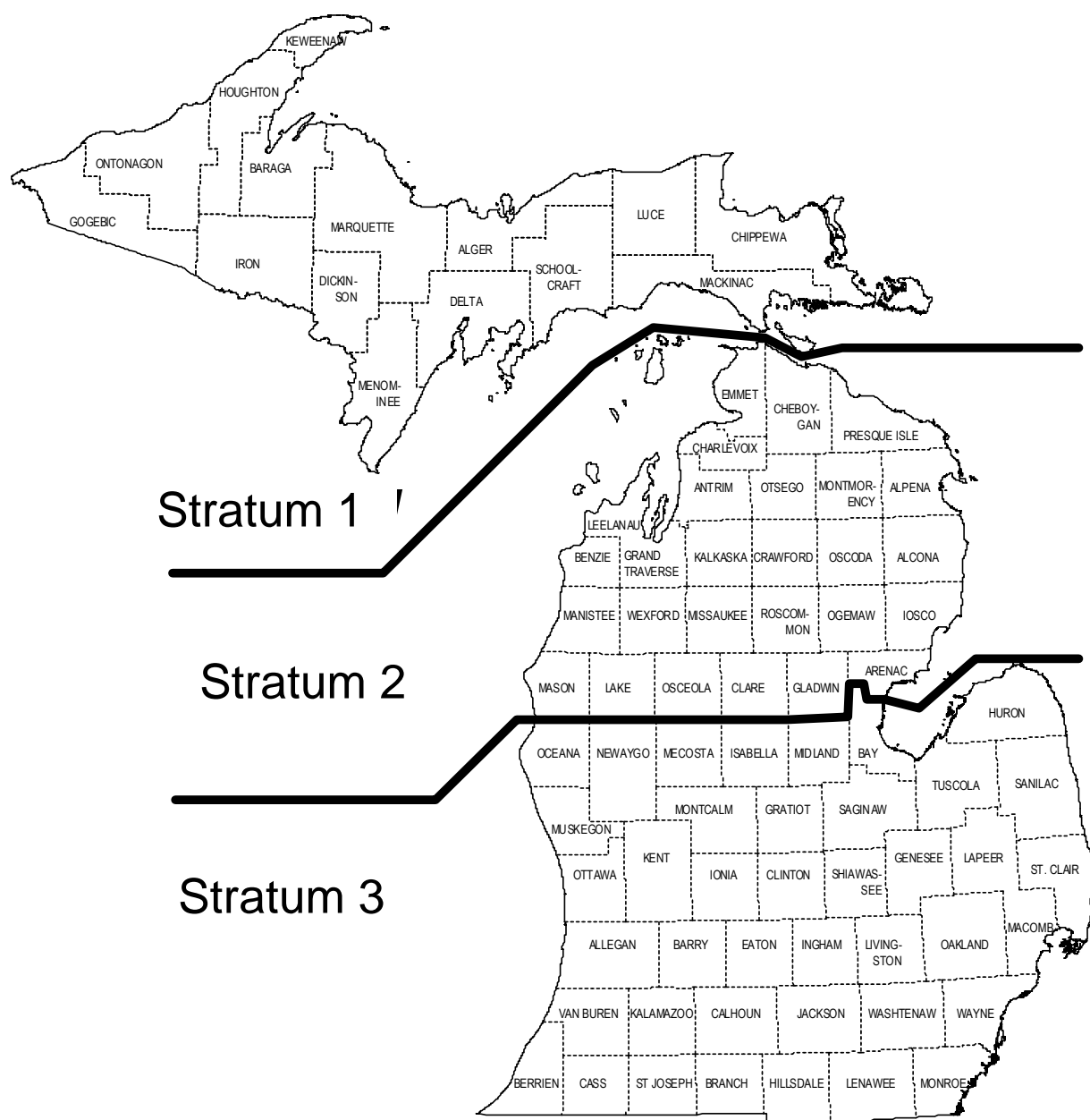


Figure 1. Stratum boundaries used for the analysis of the Michigan furbearer harvest survey. Nonresidents were included as a fourth stratum.

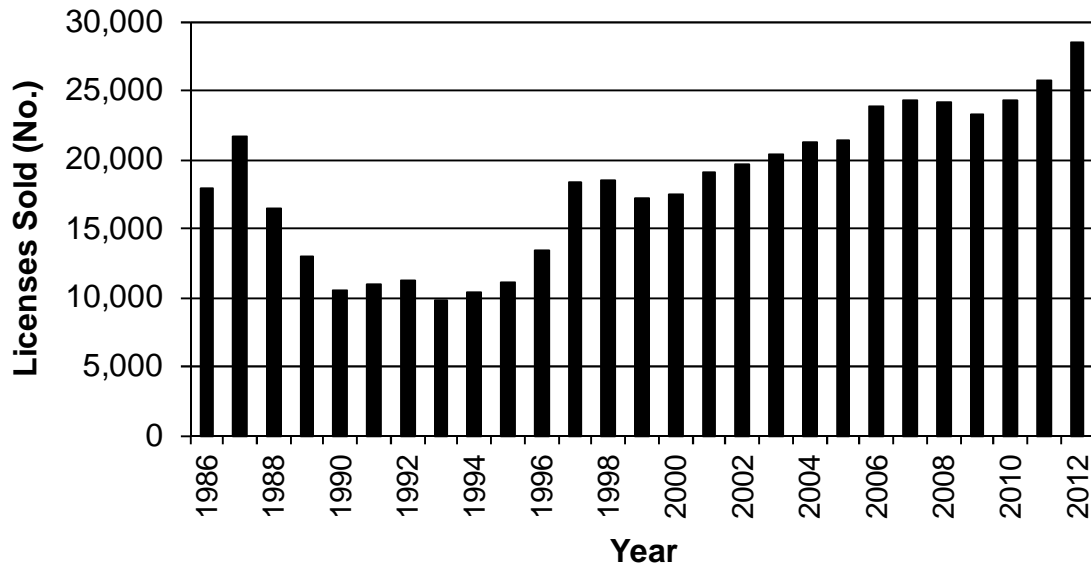


Figure 2. Number of fur harvester licenses sold in Michigan, 1986-2012. Fur harvester licenses included Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, and Nonresident Fur Harvester licenses. During 1996-2012, totals also included Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses.

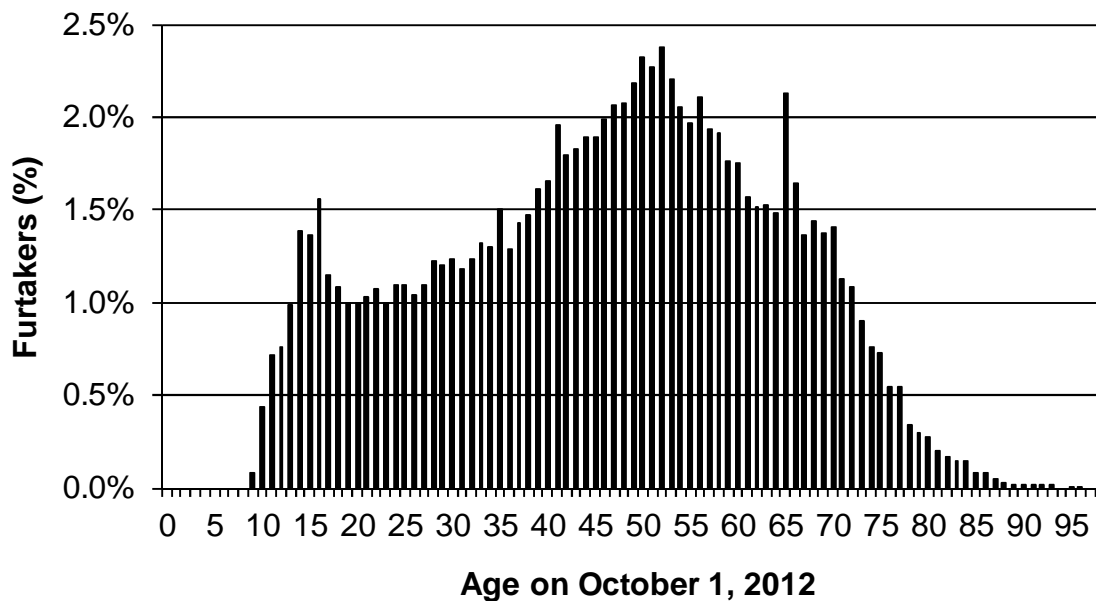


Figure 3. Ages of people that purchased a license to hunt or trap furbearers in Michigan for the 2012 hunting and trapping seasons ($\bar{x} = 46$ years).

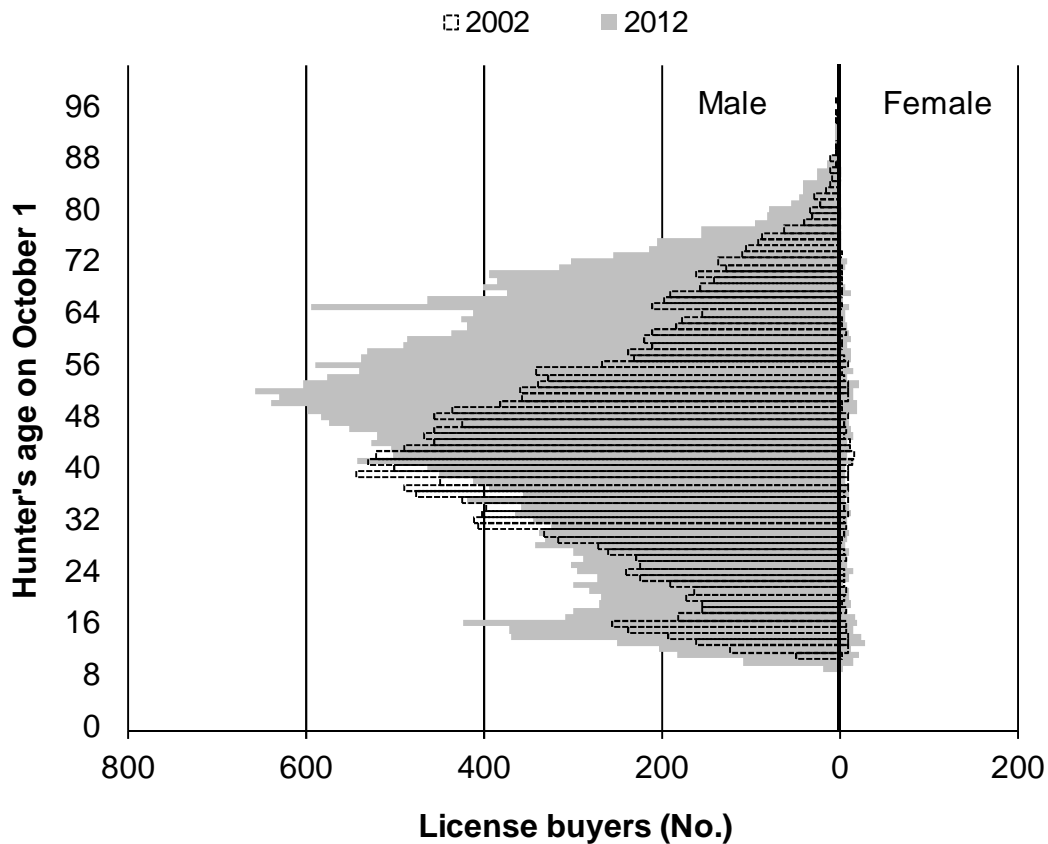


Figure 4. Number of fur harvester license buyers in Michigan by age and sex during 2002 and 2012 hunting seasons. The number of people buying a license was 19,386 in 2002 and 28,425 in 2012.

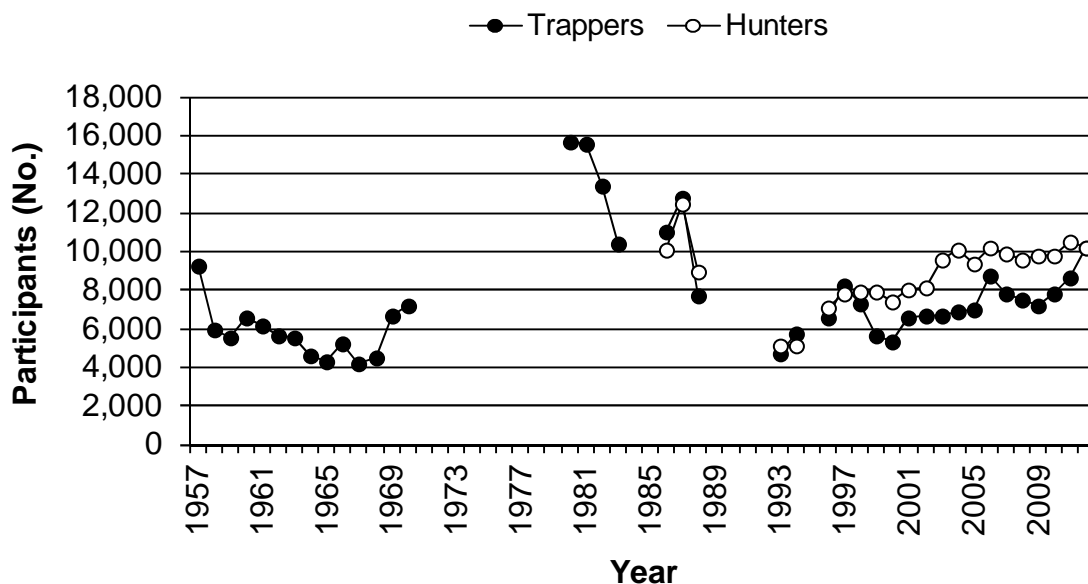


Figure 5. Estimated number of furtakers (trappers and hunters) in Michigan, 1957-2012. Estimates included only license buyers that actually trapped or hunted furbearers (any species). Data were not available for all years.

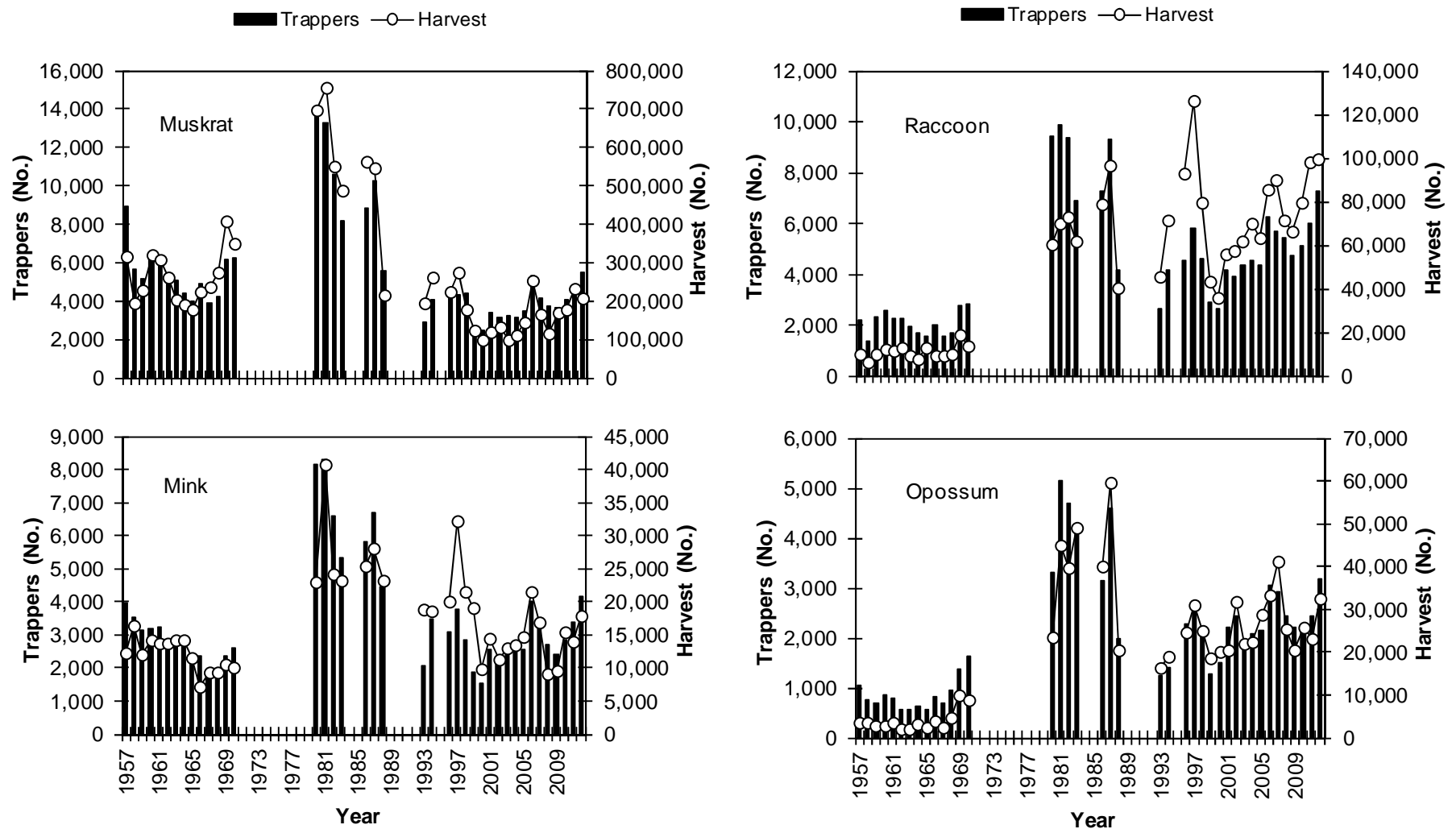


Figure 6. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2012. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2012, 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.

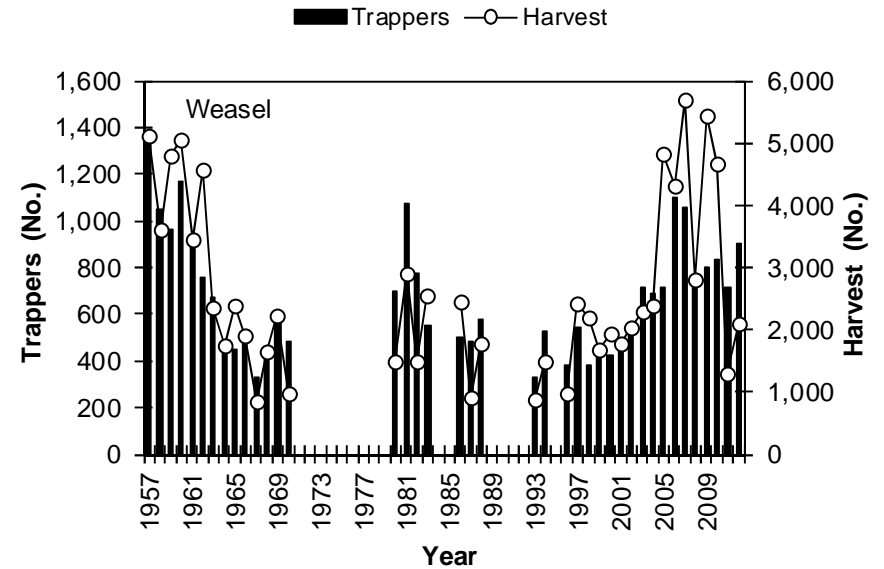
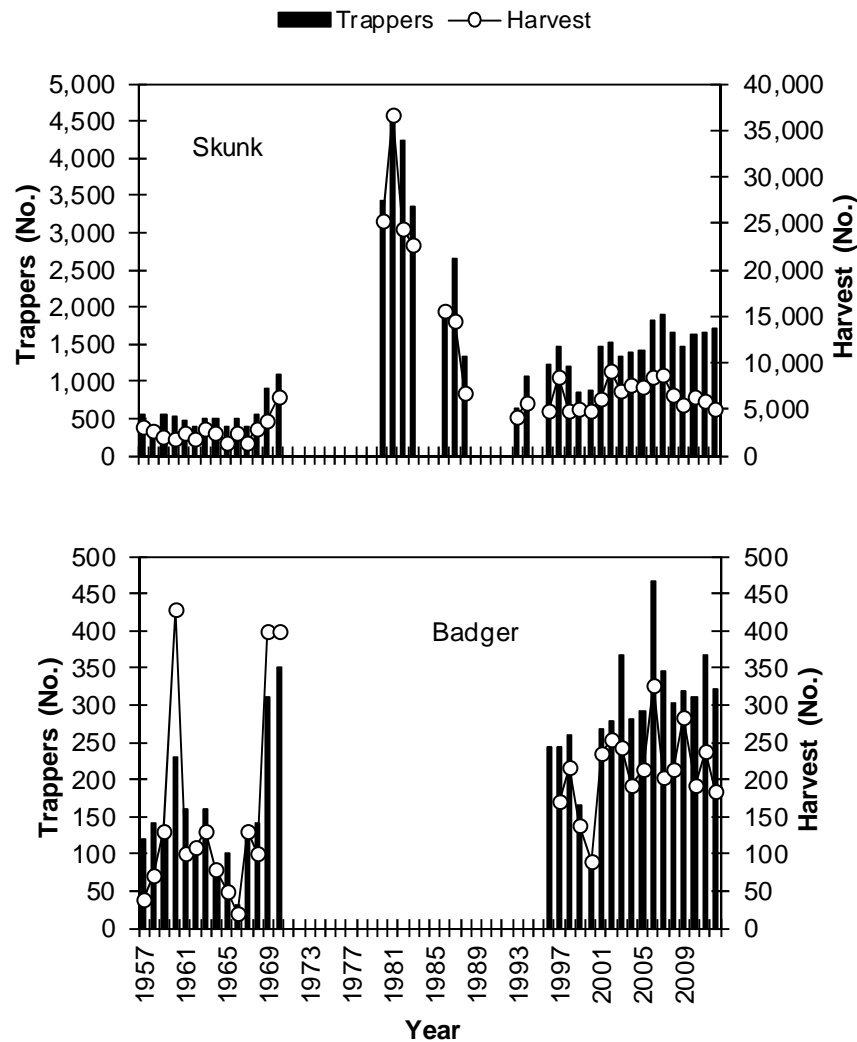


Figure 6 (Continued). Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2012. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2012, 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.

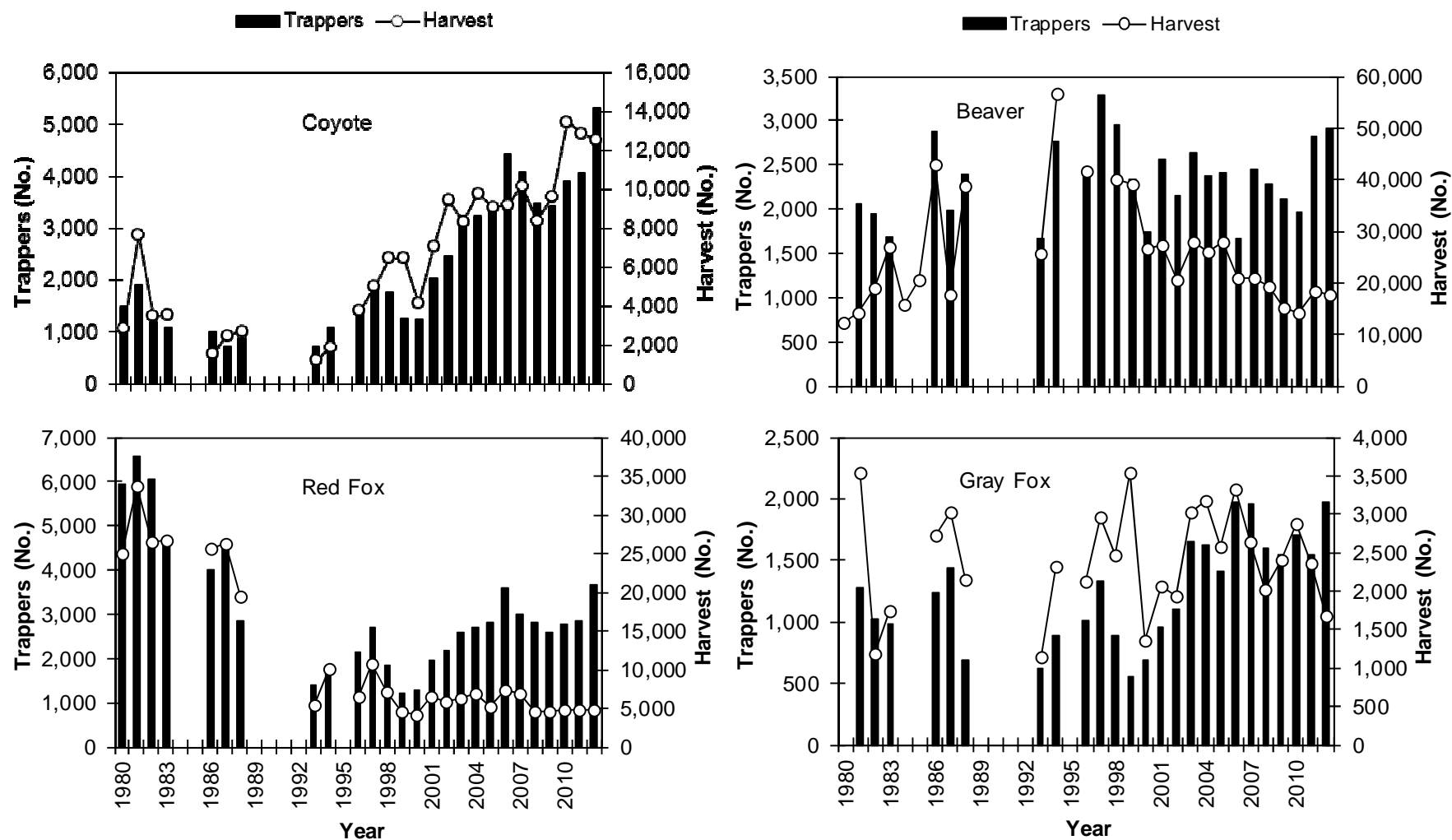


Figure 7. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1980-2012. The mail survey was sent to a random sample of Trapping and Senior Hunting license buyers during 1980-1983. During 1986-2012, the sample was selected from people buying 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.

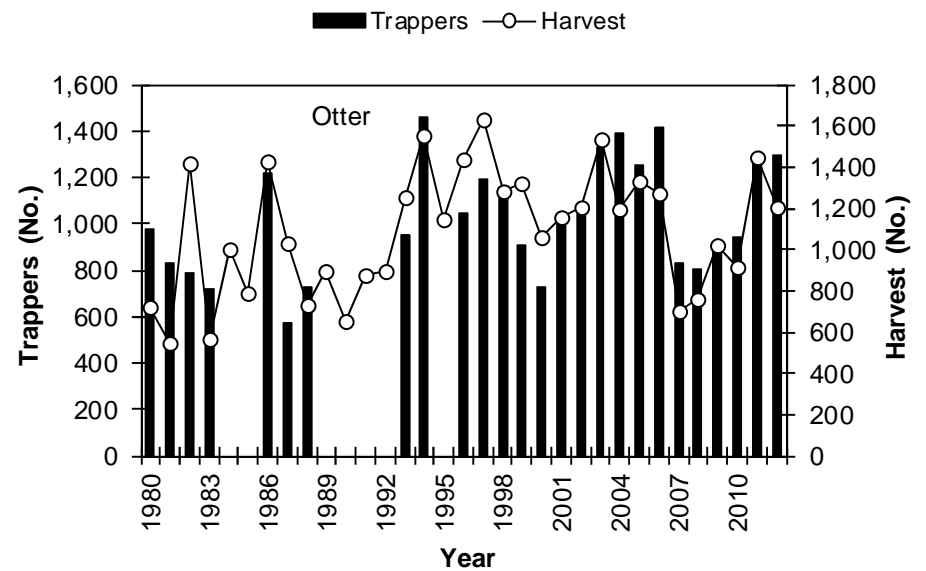
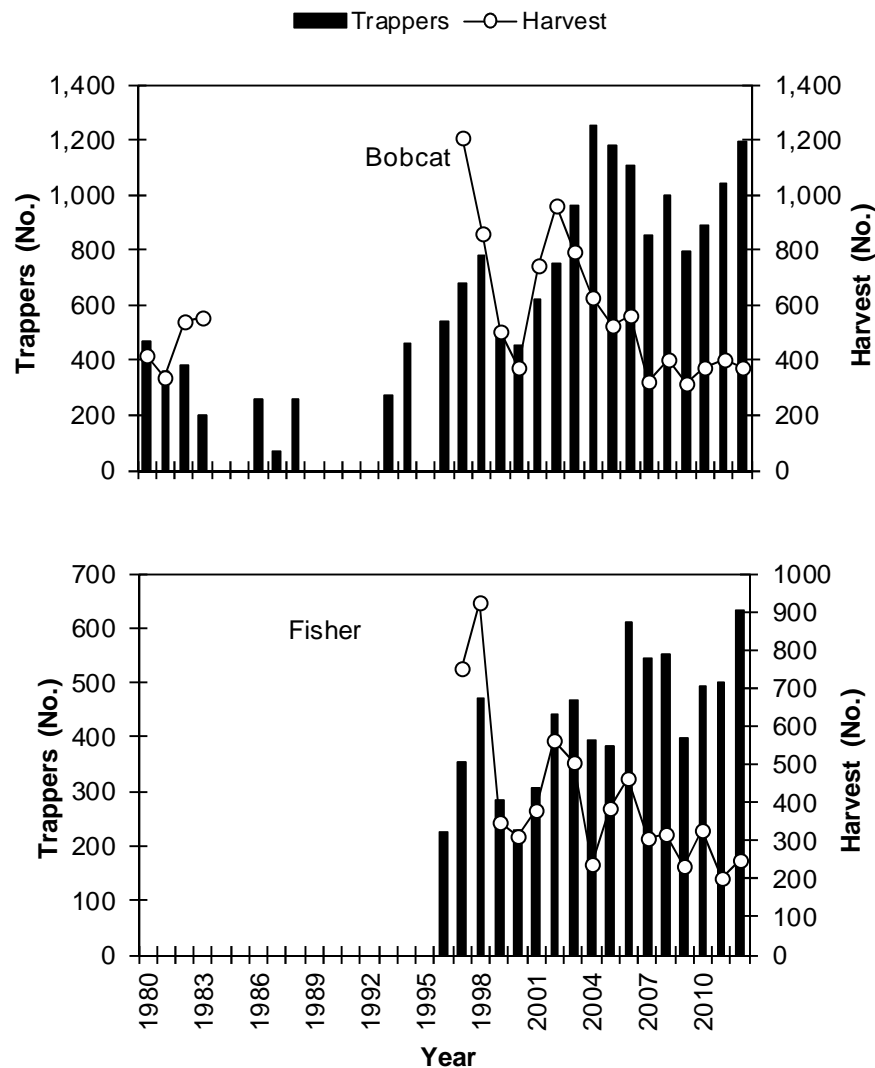


Figure 7 (Continued). Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1980-2012. The mail survey was sent to a random sample of Trapping and Senior Hunting license buyers during 1980-1983. During 1986-2011, the sample was selected from 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.

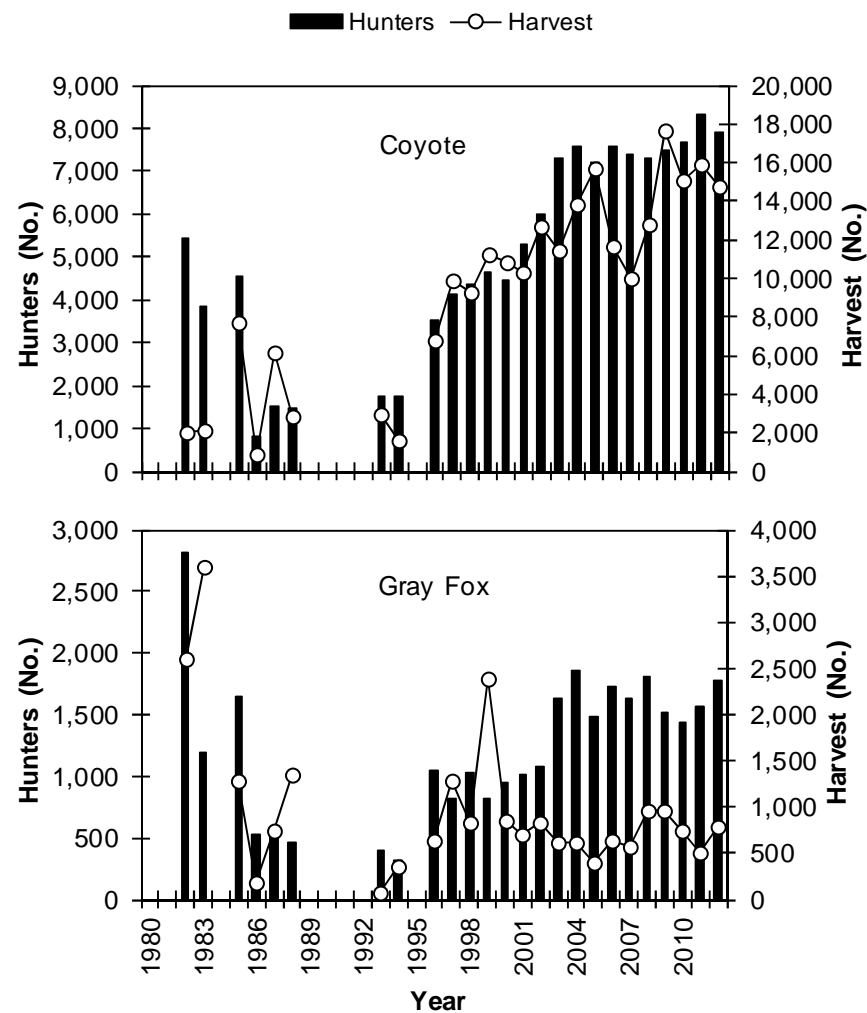
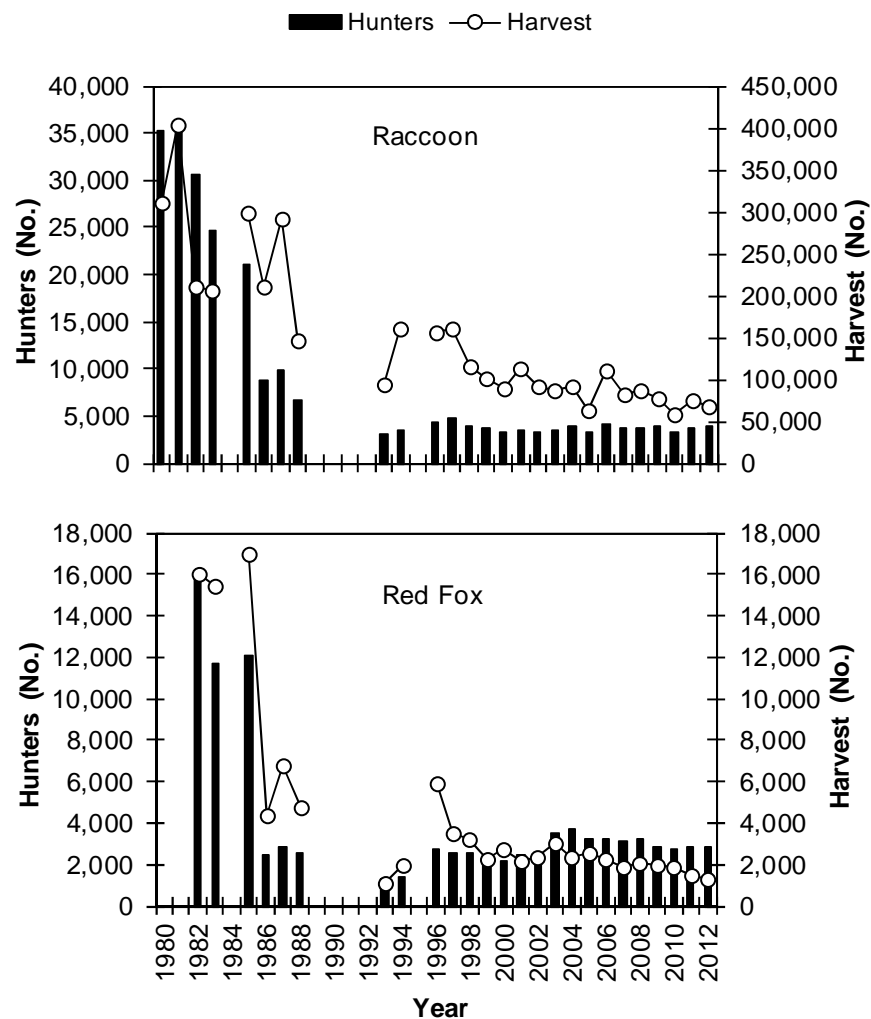


Figure 8. Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2011. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2011, 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.

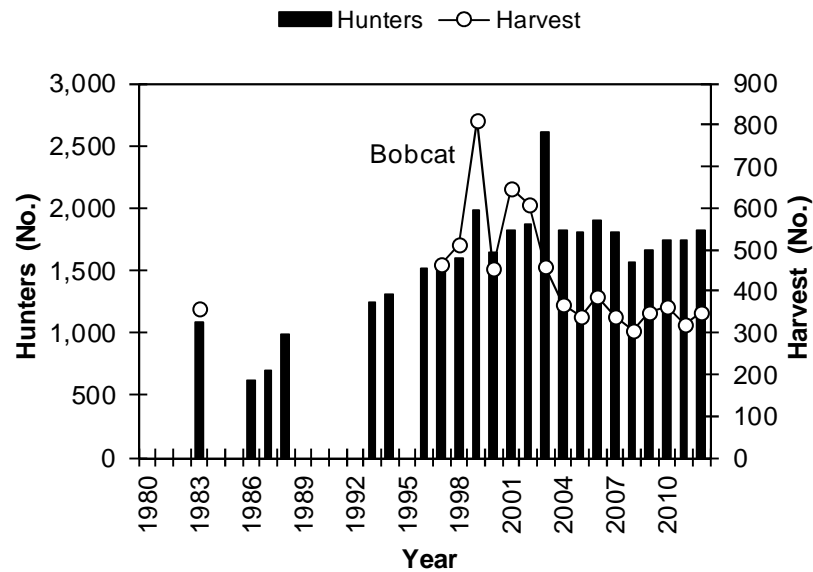


Figure 8 (Continued). Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2012. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2012, 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.

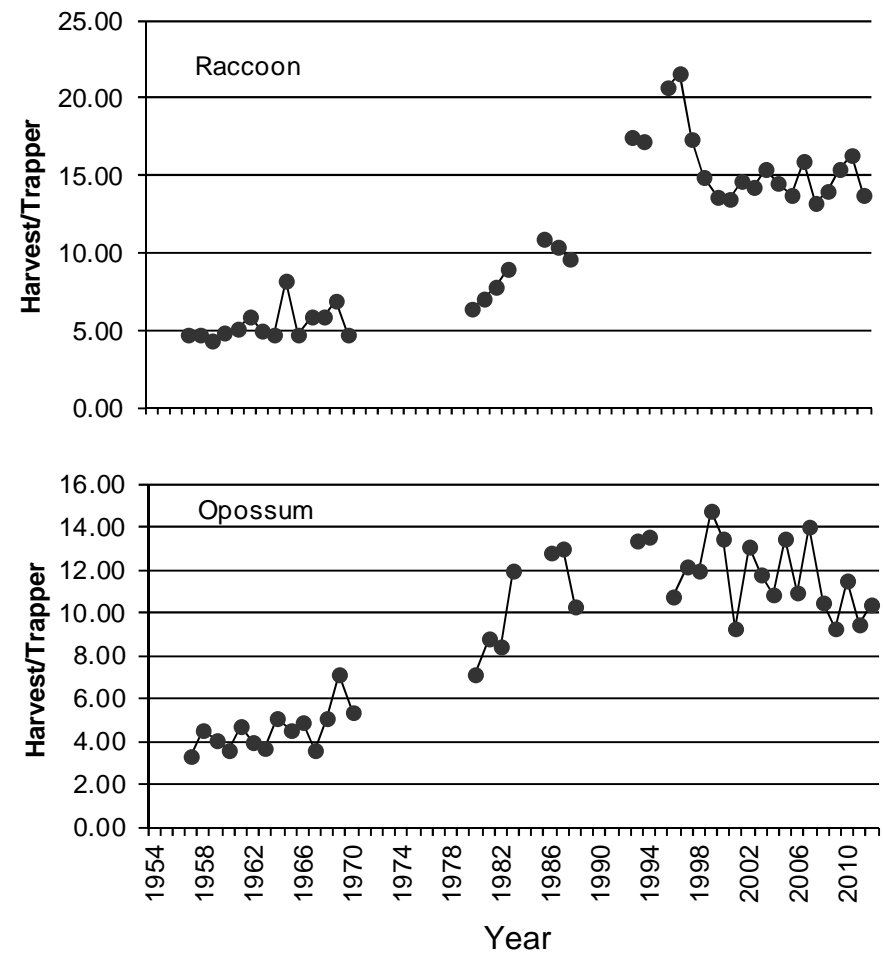
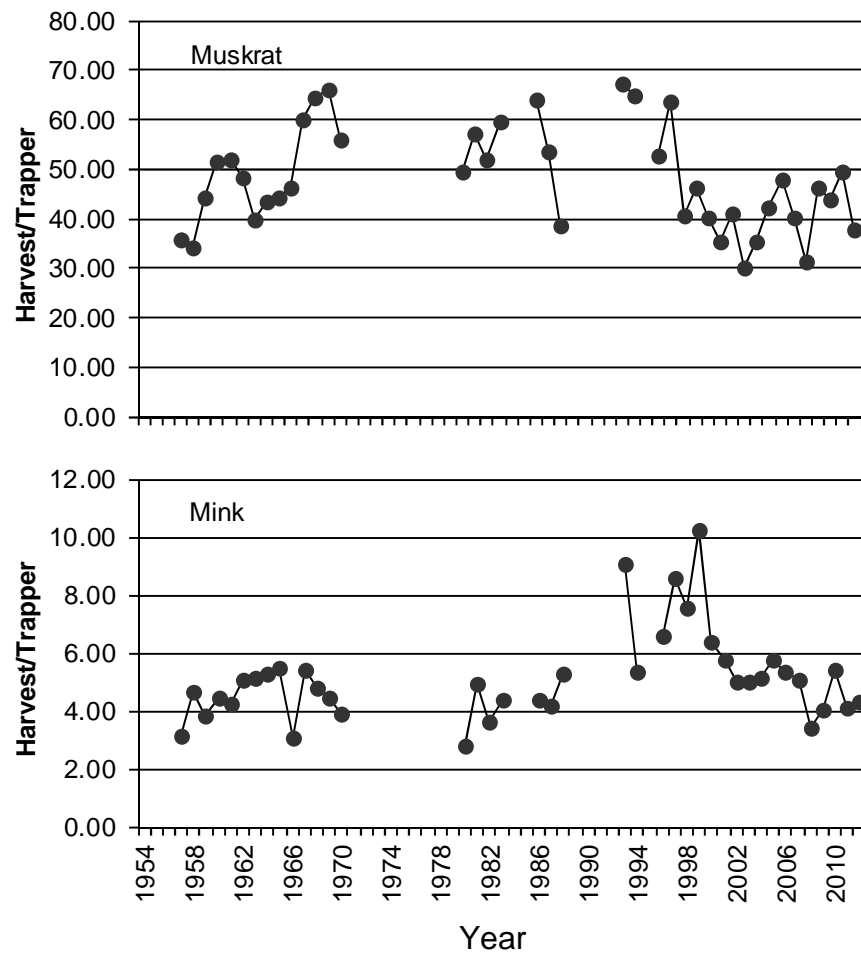


Figure 9. Mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2012. Data were not available for all years.

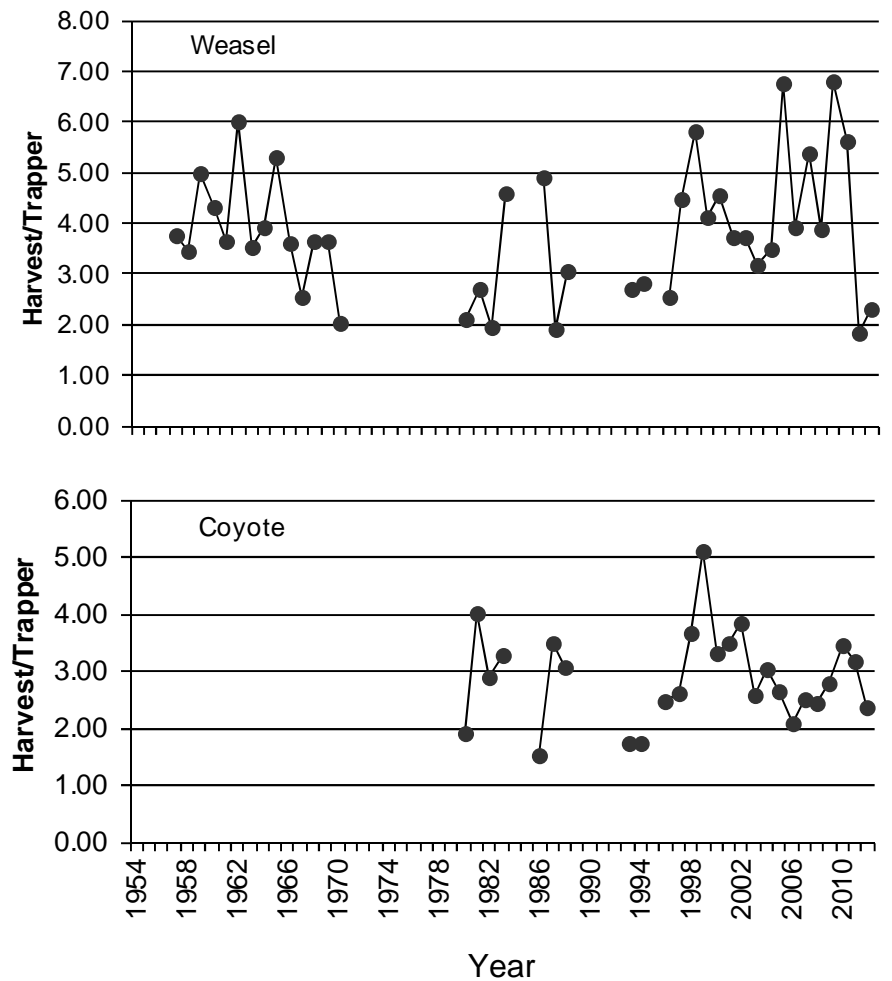
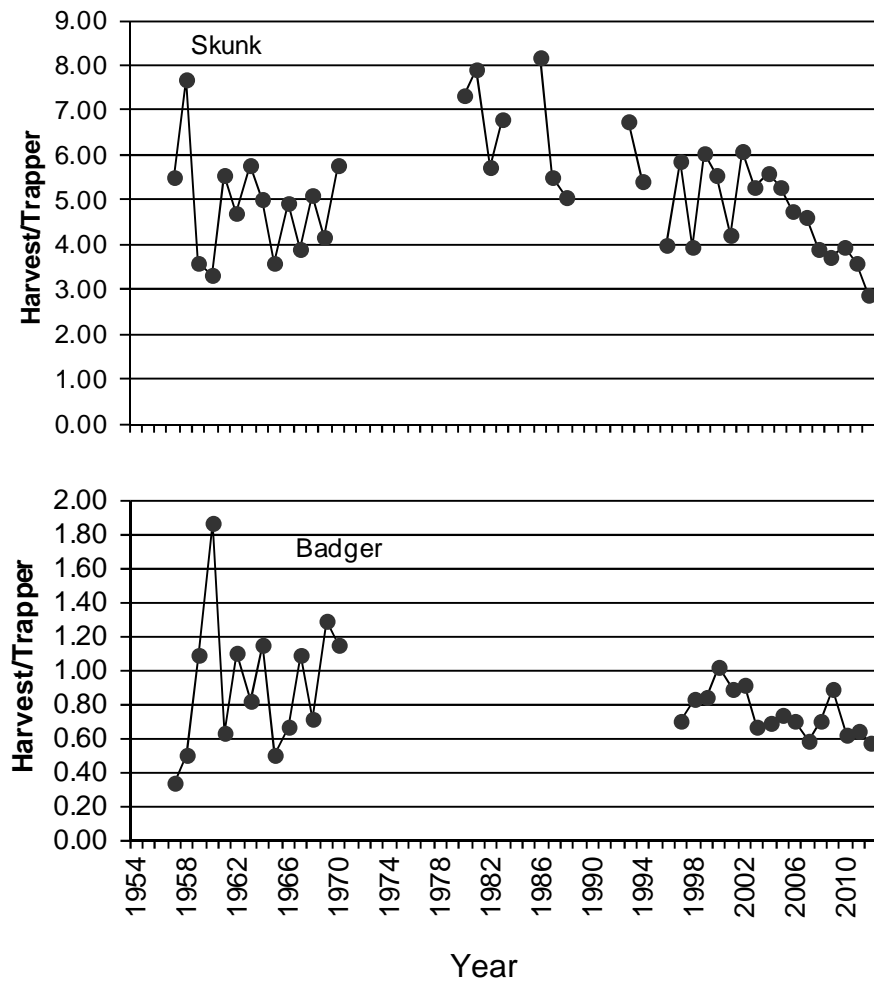


Figure 9 (continued). Mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2012. Data were not available for all years.

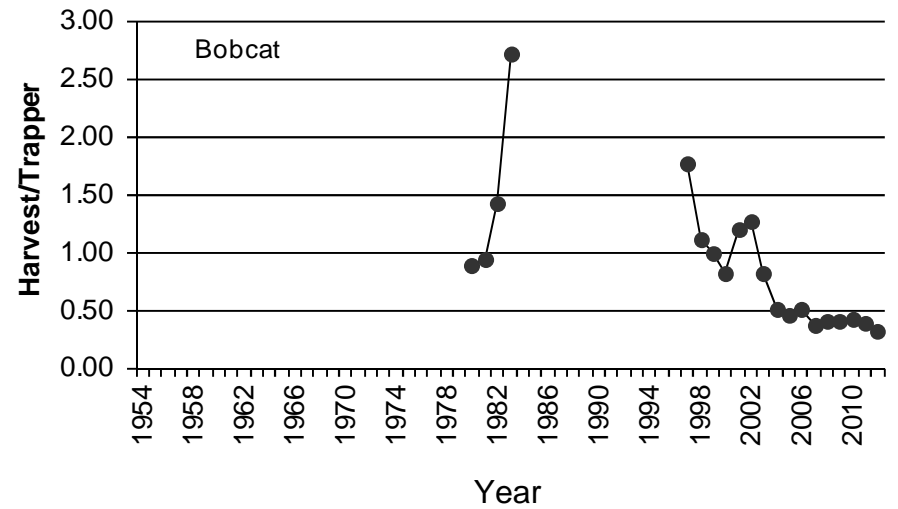
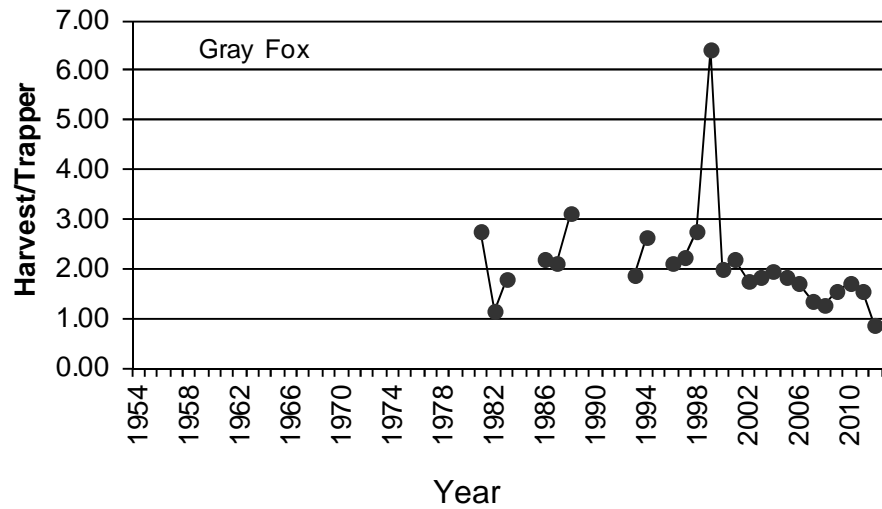
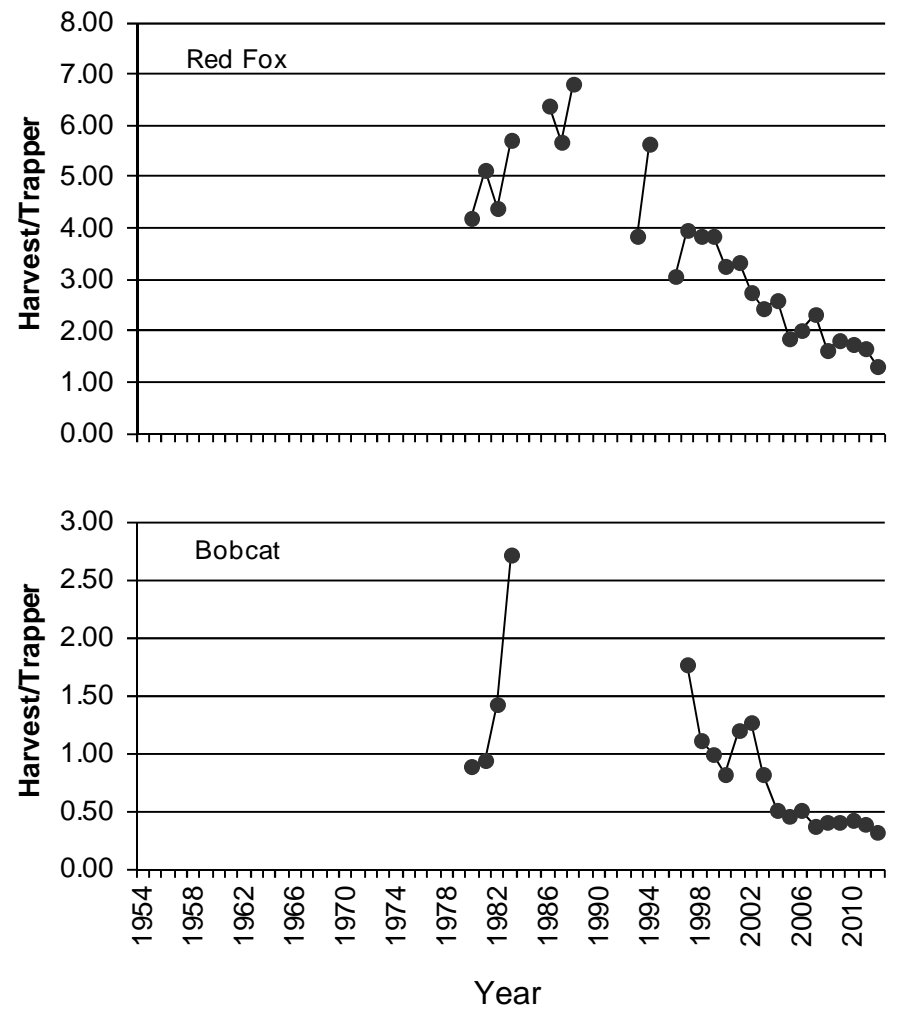
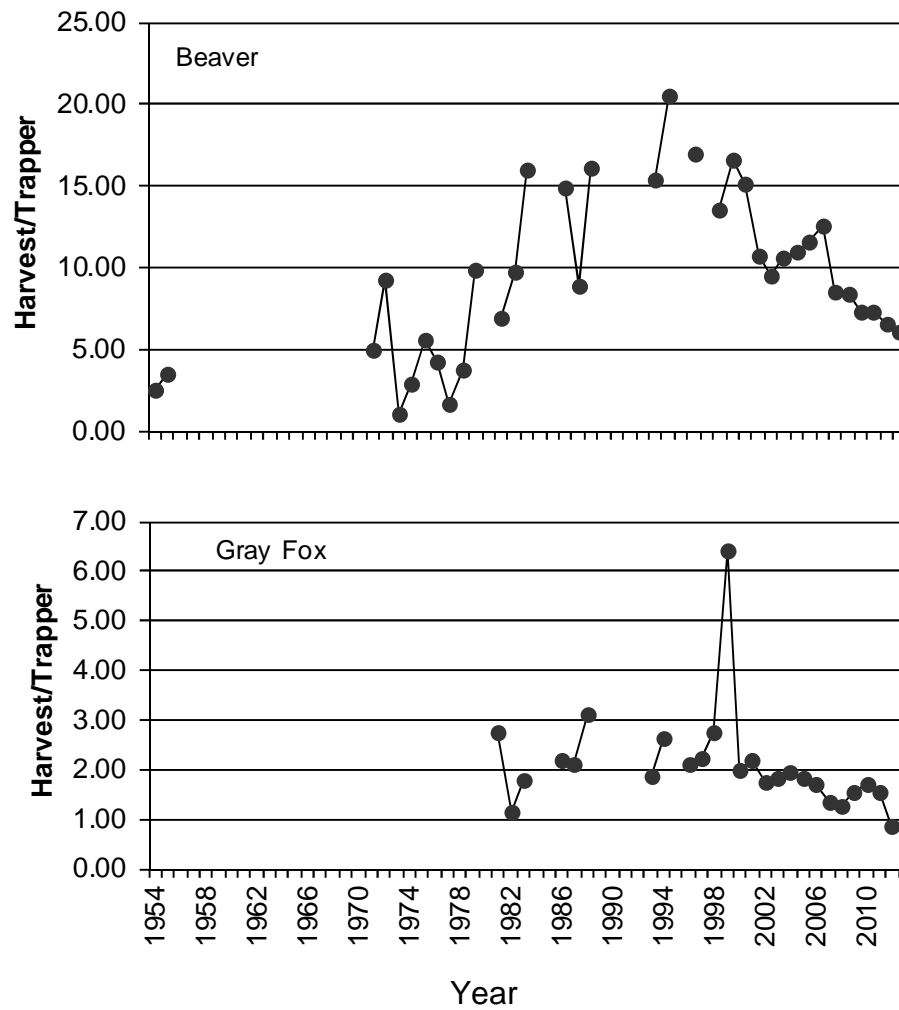


Figure 9 (continued). Mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2012. Data were not available for all years.

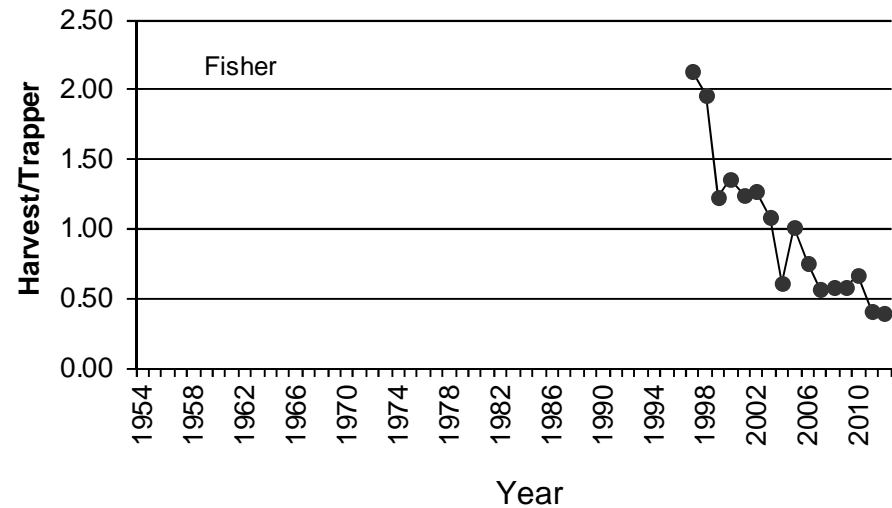
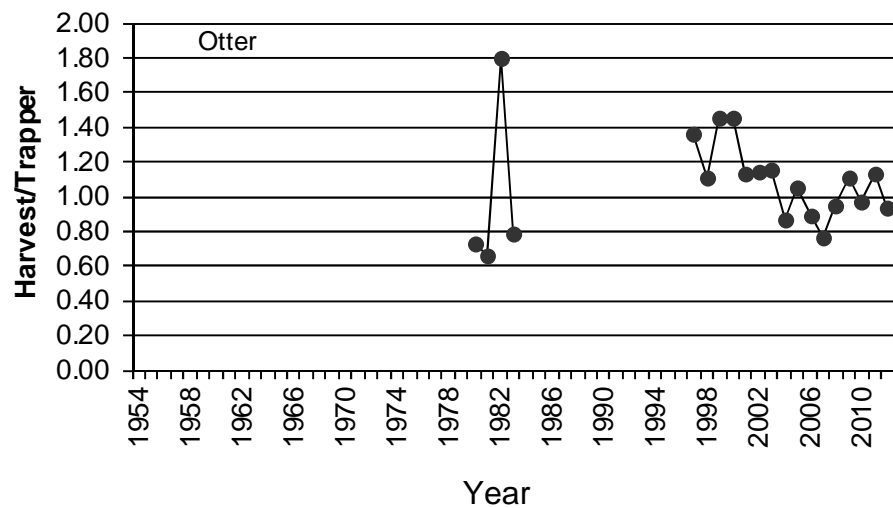


Figure 9 (continued). Mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2012. Data were not available for all years.

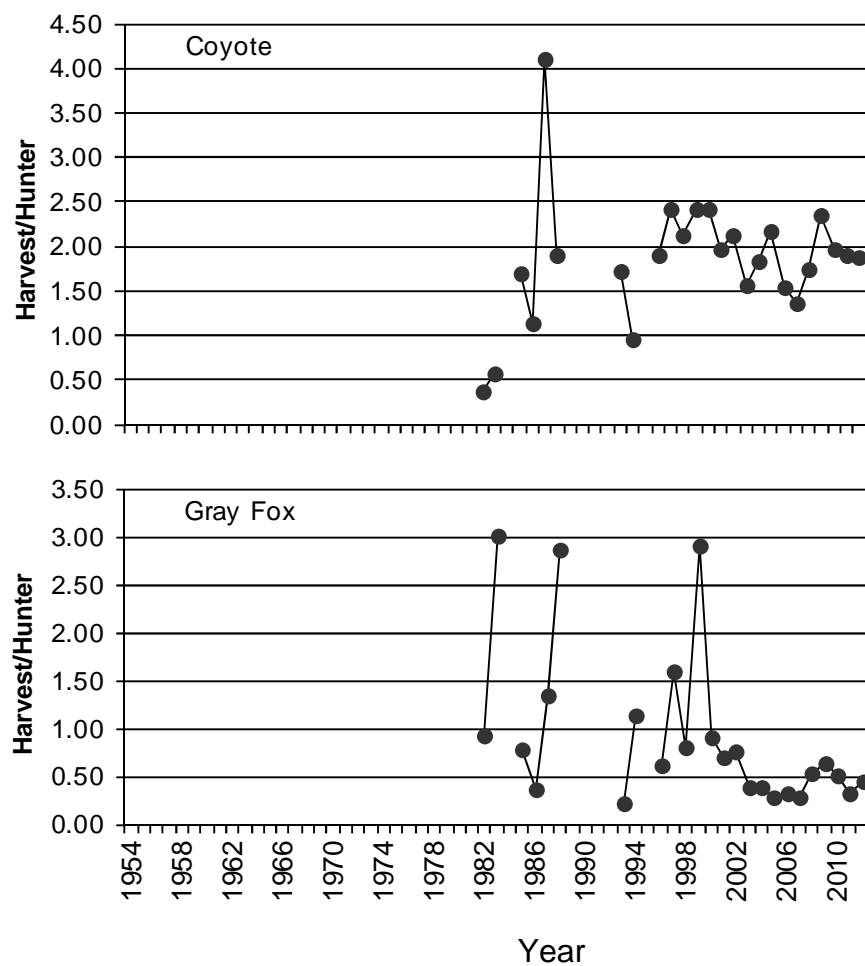
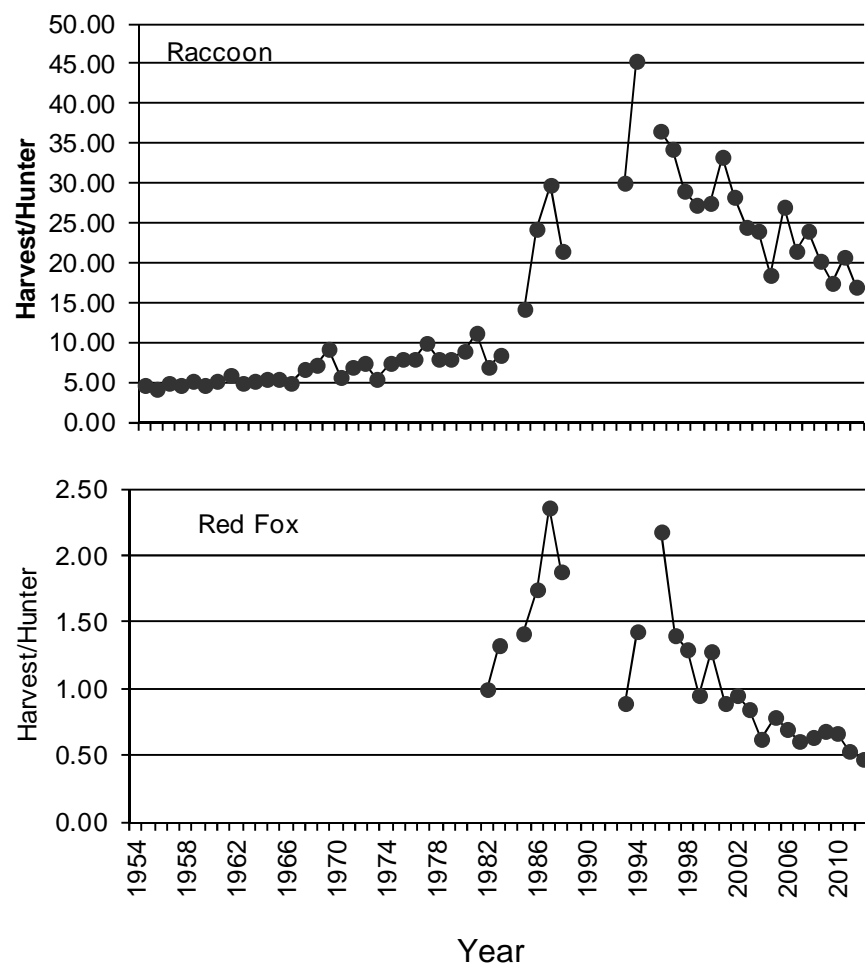


Figure 10. Mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2012. Data were not available for all years.

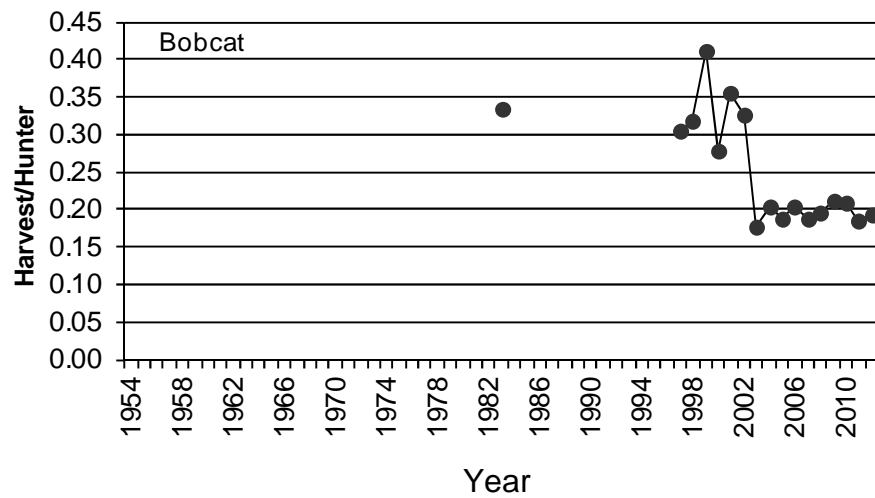


Figure 10 (continued). Mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2012. Data were not available for all years.

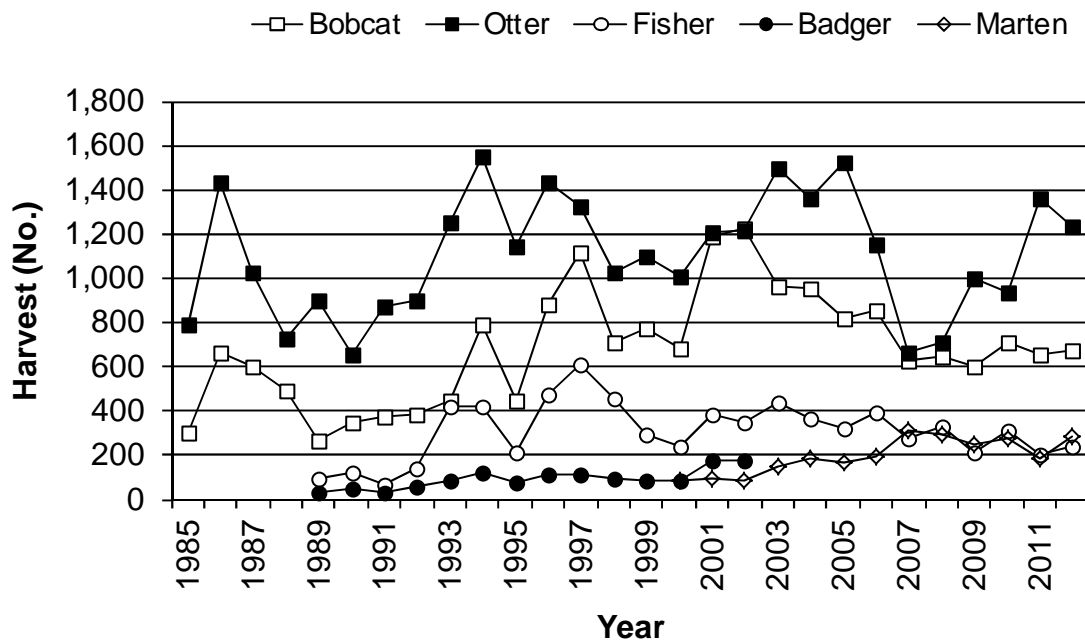


Figure 11. Number of bobcat, otter, fisher, badger, and marten registered by furtakers in Michigan, 1985-2012. Badger and fisher seasons were established in 1989, and marten season started in 2000. Totals for 2012 were preliminary. Beginning in 2003, badger were no longer registered. Registration totals 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 2012 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	
UP and NLP	October 15 – January 31
SLP	November 1 – January 31
Fox and Coyote	
Statewide	October 15 – March 1
Bobcat	
UP	December 1 – February 1
NLP	December 10 – 20
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 14
NLP	November 1 – April 14
SLP	November 10 – March 31
Hunting seasons	
Bobcat	
UP	January 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	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. The opening date for nonresident beaver trapping varied by area.

^cResident seasons only. Nonresident season occurred during November 15-April 14 (UP), November 24-April 14 (NLP), and December 15 – March 31 (SLP).

Table 2. Number of fur harvester licenses sold and people receiving and returning harvest questionnaire, 2009-2012.

Item	Year			
	2009	2010	2011	2012
Licenses sold ^a	23,520	24,582	26,034	28,776
Individuals buying licenses ^{a,b}	23,251	24,288	25,675	28,425
Mentored youth license buyers ^c	NA	NA	NA	10,406
Questionnaires mailed	4,200	4,200	4,198	4,200
Non-deliverable questionnaires	57	57	63	69
Questionnaires returned	2,670	2,661	2,609	2,499
Questionnaires returned (%) ^d	64	64	63	60

^aLicense 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).

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

^cThe 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.

^dResponse rate adjusted to exclude non-deliverable questionnaires.

Table 3. Estimated number of fur harvester license buyers who trapped or hunted furbearers in Michigan, 2010-2012.

Activity	2010		2011		2012		Change between 2011 and 2012 (%)
	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	
Trapped							
Number	7,812	408	8,597	442	10,241	510	19*
%	32	2	33	2	36	2	3
Hunted							
Number	9,783	427	10,450	458	10,239	511	-2
%	40	2	41	2	36	2	-5*
Trapped or hunted ^a							
Number	14,106	430	15,226	459	16,214	527	6*
%	58	2	59	2	57	2	-2
Trapped only							
Number	4,323	334	4,776	364	5,975	433	25*
%	18	1	19	1	21	2	2
Hunted only							
Number	6,294	381	6,629	408	5,974	434	-10
%	26	2	26	2	21	2	-5*
Trapped and hunted							
Number	3,489	306	3,821	333	4,266	379	12
%	14	1	15	1	15	1	0

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

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2011 and 2012 ($P < 0.005$).

Table 4. Estimated number of participants, harvest, and days afield during Michigan furbearer seasons, 2011 and 2012.

Species and season	Participants (No.)				Harvest (No.)				Days afield (No.)			
	Year		95%	Change	Year		95%	Change	Year		95%	Change
	2011	2012	CL ^a	(%)	2011	2012	CL ^a	(%)	2011	2012	CL ^a	(%)
Trapping												
Mink	3,382	4,154	376	23*	13,975	17,909	4,444	28	91,427	131,493	17,359	44*
Raccoon	6,022	7,273	463	21*	98,422	99,718	13,674	1	161,067	199,466	19,771	24*
Opossum	2,441	3,166	332	30*	23,097	32,731	6,274	42	64,285	99,423	15,939	55*
Skunk	1,645	1,718	254	4	5,904	4,951	1,108	-16	40,816	49,690	11,322	22
Weasel	718	907	187	26	1,312	2,106	842	60	12,571	24,317	8,730	93
Red fox	2,831	3,649	356	29*	4,690	4,809	1,292	3	76,364	102,920	14,935	35*
Gray fox	1,545	1,969	270	27	2,367	1,678	401	-29	44,472	62,060	12,742	40
Coyote	4,065	5,324	415	31*	12,889	12,519	3,405	-3	107,898	146,275	17,253	36*
Bobcat ^b	1,043	1,191	51	14*	401	377	37	-6	16,948	18,436	1,219	9
Beaver ^c	2,812	2,911	322	4	18,479	17,606	4,532	-5	57,453	66,496	12,498	16
Muskrat	4,680	5,516	420	18*	231,556	208,070	44,567	-10	124,515	161,587	18,328	30*
Otter ^c	1,282	1,291	54	1	1,450	1,203	80	-17*	25,185	27,200	2,210	8
Fisher ^d	500	633	37	27*	203	247	26	21	4,109	5,107	378	24*
Badger	367	320	112	-13	238	183	100	-23	6,081	5,870	2,590	-3
Hunting												
Raccoon	3,617	4,008	368	11	74,729	68,142	15,575	-9	61,004	72,435	14,286	19
Red fox	2,805	2,823	317	1	1,506	1,326	534	-12	38,801	30,904	6,624	-20
Gray fox	1,572	1,768	256	12	519	785	545	51	21,152	22,461	6,170	6
Coyote	8,304	7,903	477	-5	15,876	14,801	3,874	-7	113,357	104,834	14,721	-8
Bobcat ^b	1,739	1,823	58	5	320	351	33	10	15,844	16,271	953	3
Trapping and hunting combined												
Raccoon	8,182	9,595	501	17	173,151	167,860	21,593	-3	222,072	271,902	25,048	22*
Red fox	5,032	5,665	425	13	6,196	6,135	1,410	-1	115,164	133,824	16,956	16
Gray fox	2,890	3,306	341	14	2,886	2,462	678	-15	65,624	84,521	14,769	29
Coyote	10,505	11,145	520	6	28,765	27,319	5,168	-5	221,254	251,109	23,241	13
Bobcat ^b	2,501	2,727	60	9*	721	728	48	1	32,792	34,707	1,511	6

^a95% CL for the 2012 estimate.^bBobcat estimates from separate mail harvest survey (Frawley 2011c). See Table 5 for registration totals.^cOtter estimates from separate mail harvest survey (Frawley 2011b). See Table 5 for registration totals.^dFisher estimates from separate mail harvest survey (Frawley 2011a). See Table 5 for registration totals.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2011 and 2012 (P<0.005).

Table 5. Number of bobcat, otter, fisher, badger and marten registered by furtakers in Michigan, 1985-2012.^a

Michigan, 1985-2012.

Year	Species							
	Bobcat (by method of capture)				Otter	Fisher ^a	Badger ^{b,c}	Marten ^d
	Hunting	Trapping	Unknown	Total				
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	336	299	0	632	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 ^e	311	367	0	678	1,233	237		281

^aRegistration 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.

^bBadger and fisher seasons were established in 1989.

^cFurtakers no longer were required to register badgers beginning in 2003.

^dMarten season was established in 2000.

^ePreliminary totals.

Table 6. Estimated number of trappers using foothold traps and cable restraints (snare) 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 2012 season.^a

Type of trapper	Trappers		Trapping effort (day)		Traps set per day		Animals caught		Animals that escaped	
	No.	95% CL	No.	95% CL	Mean	95% CL	No.	95% CL	No.	95% CL
Using foothold traps to catch coyote	4,722*	396	117,905*	14,146	7.8	0.7	8,673	2,520	2,482	533
Using foothold traps to catch fox	3,523*	351	91,988*	12,858	7.8	0.8	4,946	1,112	1,067	294
Using cable restraints to catch coyote	1,394	229	38,301	8,487	11.9	3.0	3,291	1,053	2,002	789
Using cable restraints to catch fox	611	154	17,857	6,052	13.3	5.6	511	239	462	382

*Non-overlapping 95% confidence intervals indicated estimates declined significantly between 2011 and 2012 ($P < 0.005$).

Table 7. Estimated number of trappers that caught an incidental bobcat and number of incidental bobcats caught and registered in Michigan, 2012.

Region ^a	Trappers		Incidental bobcats captured and released alive ^b		Incidental bobcats captured and registered ^b	
	No.	95% CL	No.	95% CL	No.	95% CL
Upper Peninsula	116	68	71	62	47	70
Northern Lower Peninsula	92	61	219	181	12	22
Southern Lower Peninsula	90	59	180	126	0	0
Unknown	0	0	0	0	0	0
Statewide	287	107	469	229	59	73

^aSee Figure 1 for region boundaries.

^bIncidental bobcats caught in Chippewa, Gogebic, Grand Traverse, Iron, Lake, Manistee, Mason, Mecosta, Menominee, Newaygo, Oceana, Oscoda, Ottawa, and Roscommon counties.

Table 8. Estimated number of beaver trappers, beaver harvested, and trapping effort (days afield), summarized by trappers with and without an otter harvest tag in Michigan, 2012.

Beaver trapper group	Trappers		Days afield		Harvest	
	No.	95% CL	No.	95% CL	No.	95% CL
Without an otter harvest tag	1,328	224	24,558	6,278	4,135	1,131
With an otter harvest tag	1,583	243	13,471	4,409	13,471	4,409
Combined	2,911	322	66,496	12,498	17,606	4,532