



# 2008 OTTER AND BEAVER HARVEST SURVEY

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## ABSTRACT

*A survey was completed to determine the number of otter harvest tag holders that set traps for otter and beaver, the number of animals caught, the types of traps used, and the number of days they trapped. In 2008, 2,748 furtakers obtained a harvest tag to take otter, which was 8% more than in 2007. About 25% of the tag holders set traps for otter (680 trappers) and 45% set traps for beaver (1,223). Trappers that targeted otter spent nearly 14,439 days trapping otter ( $\bar{x}$  = 21 days/trapper), captured 617 otter (included animals released alive), and registered 566 otter. An additional 198 otter were registered by trappers that were not targeting otter. The total number of otter registered by all trappers combined was not significantly different between 2007 and 2008. About 57% of trappers targeting otter captured at least one otter. The number of trappers that attempted to catch otter and their trapping effort (days afield) were not significantly different between 2007 and 2008. The mean number of days of effort per registered otter in 2008 was not significantly different from 2007. Beaver trappers spent nearly 30,578 days trapping beaver ( $\bar{x}$  = 25 days/trapper) and captured 15,270 beaver. About 90% of active beaver trappers captured at least one beaver. The estimated number of beaver caught increased 19% between 2007 and 2008. The number of trappers that attempted to catch beaver increased 7%, but the number of days devoted to trapping beaver was not significantly different between 2007 and 2008.*

## INTRODUCTION

The Michigan Natural Resources Commission and the 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 a management tool used to help accomplish this statutory responsibility. The main objectives of this harvest survey were to determine the number of trappers who set traps for otter (*Lontra canadensis*), the types of traps used, the



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number of days they trapped, and the number of animals captured. Because otter trappers frequently seek to catch beaver (*Castor canadensis*), they also were asked whether they attempted to trap beaver. If they trapped beaver, they were asked to report the number of days they trapped and the number of beaver caught.

While the primary objectives of this survey were estimating harvest, trapper numbers, and trapping effort, this survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to determine how often trappers set beaver traps under the ice and how often trappers attempted to capture beaver during April.

In 2008, the state was divided into three management zones (Figure 1), and the otter and beaver trapping seasons were different for each zone (Table 1). Seasons also differed for residents and nonresidents of Michigan. In order to trap otter, trappers were required to obtain a free otter harvest tag in addition to 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]). Beaver trappers also were required to purchase a fur harvesters license but did not need a harvest tag. Trappers were limited to three otter, except no more than one otter could be taken in Zone 2 and one otter from Zone 3. No maximum limit was set for the number of beaver that could be harvested. Successful trappers were required to register all otter taken by May 5, 2009, but trappers were not required to register beaver. Trappers were not allowed to keep incidentally caught otter. However, trappers were required to bring these incidentally caught otter to a registration station if they could not be released alive. Trappers could use body-gripping (conibear type) traps and foothold traps to capture otter and beaver. In addition, trappers could use snares to capture beaver from December 1 through March 31, during the open seasons, if they were placed under the ice.

## **METHODS**

A questionnaire (Appendix A) was sent to everyone who obtained an otter harvest tag in 2008 (2,748 harvest tag holders). Trappers receiving the questionnaire were asked to report if they trapped otter or beaver, number of days spent afield, number of otter and beaver caught, number of otter released alive, and number of otter registered (registration estimates included incidentally caught animals that were not returned to the trapper). Trappers were also asked to indicate their impression of the status of the otter and beaver populations in the county where they primarily trapped (i.e., absent, stable, increasing, or decreasing).

Questionnaires were mailed initially during late May 2009, and nonrespondents were mailed up to two follow-up questionnaires. Although 2,748 people were sent the questionnaire, 50 surveys were undeliverable, resulting in an adjusted sample size of 2,698. Questionnaires were returned by 1,710 people, yielding a 63% adjusted response rate.

Although all harvest tag holders were sent a questionnaire, not all questionnaires were returned. To extrapolate from the tag holders that returned their questionnaire to all people obtaining harvest tags, estimates were calculated using a simple random sampling design (Cochran 1977) and were presented along with their 95% confidence limit (CL). This CL 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 the true value would be within this interval 95 times out of 100. Estimates were not adjusted for possible response or nonresponse bias. The 2008 estimate of otter registered included incidental animals that trappers were not allowed to keep (i.e., harvest exceeding the bag limit); however, it did not include animals taken by trappers as part of a nuisance control business.

Trappers were asked to report otter captured in otter traps and otter captured in traps set for beaver. Comparisons of answers to these separate questions for this survey and surveys for 2006 and 2007 (Frawley 2007, 2008) revealed inconsistencies in the number of otter taken. Some beaver trappers that had reported accidentally taking otter had failed to report whether they registered these otter. Because beaver trappers frequently used traps designed to kill the captured animal (e.g., body-gripping traps), most non-target otter probably could not be released alive. Thus, estimates of otter harvest from the 2006 and 2007 surveys probably were underestimated because some accidental take by beaver trappers was excluded. Consequently, estimates for 2006 and 2007 surveys were recalculated in this report to account for the activity of trappers not targeting otter. These recalculated estimates are probably more comparable to estimates from previous harvest surveys (before 2006) because earlier estimates also included all otter taken. Only otter reported as incidentally taken by trappers that trapped beavers exclusively were used to derive estimates of otter taken by trappers not targeting otter.

Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. Rather, these estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

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).

## **RESULTS AND DISCUSSION**

### **Otter**

In 2008, 2,748 trappers obtained harvest tags to trap otter, which was 8% more than the 2,554 trappers with tags in 2007. In 2008, most of the harvest tags (2,631) were obtained by men. Harvest tags were obtained by 109 women, and the sex of 8 tag holders was unknown. About 25% of the otter tag holders set traps targeting otter (680 trappers, Table 2). These trappers spent 14,439 days trapping otter ( $\bar{x} = 21.2 \pm 1.5$  days/trapper), captured 617 otter, and registered 566 otter (Table 3). About 57% of trappers successfully captured at least one otter. The management zone with the greatest number of otter captured was the Upper Peninsula Management Zone (326 otter, Table 4), and among counties, Iron (55), Baraga (39), and Gogebic (39) counties had the highest harvest estimates (Table 5).

The estimated number of otter registered by trappers that targeted otter changed little between 2007 and 2008 (555 versus 566 otter, Table 3). An additional 198 otter were registered by trappers that were not targeting otter. The estimated total number of otter registered by all trappers combined was not significantly different between 2007 and 2008 (700 versus 763 otter, Table 3).

The number of otter registered (including incidental take) by trappers at registration stations increased 7% between 2007 and 2008 (665 versus 709 otter, Figure 2). The number of trappers that attempted to catch otter and their effort did not change significantly between 2007 and 2008 (Table 3, Figure 2). Among trappers targeting otter, the mean number of days of effort per registered otter was 25.6 days in 2008, which was not significantly different from 28.7 days in 2007 (Tables 3 and 6, Figure 3).

The number of otter registered in 2008 was 19% below the long-term yearly average since 1950 ( $\bar{x}$  = 868 during 1950-2008, Figure 4). Declining otter harvest trends in recent years have tracked declines in trapping effort (Figure 2) and declines in otter pelt prices (Figure 5). Although otter harvest has declined in recent years, estimates of effort per catch for otters have not changed significantly; suggesting otter numbers were stable statewide (Figure 3).

Most otter trappers used conibear-type traps to capture otter ( $94 \pm 1\%$ ), although foothold traps also were used frequently ( $46 \pm 3\%$ ). Among trappers using conibear traps, the mean number of conibear traps set was  $5.1 \pm 0.3$  traps. Among trappers using foothold traps, the mean number of foothold traps set was  $4.9 \pm 0.6$  traps.

Thirty-two percent of otter trappers ( $\pm 3\%$ ) believed otter numbers were increasing in the county where they trapped most often, while  $55 \pm 3\%$  thought otter numbers were stable,  $9 \pm 2\%$  thought otter were declining,  $3 \pm 1\%$  indicated otter were not present, and  $4 \pm 1\%$  did not comment on the status of otter.

## **Beaver**

Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. Rather, these estimates for beaver trappers only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag. Furthermore, trappers taking beaver as part of a nuisance control business were asked to exclude nuisance animals from their reported harvest on annual harvest surveys beginning in 2003. Thus, estimates associated with beaver may not be directly comparable among years.

About 45% of the otter harvest tag holders set traps for beaver (1,223 trappers, Table 2). Trappers spent 30,578 days trapping ( $25.0 \pm 1.3$  days/trapper) and captured 15,270 beaver (Table 7). About  $90 \pm 1\%$  of active trappers successfully captured at least one beaver. The greatest number of beaver were captured in the Upper Peninsula Management Zone (7,408 beaver, Table 8), and among counties, Chippewa (937), Roscommon (900), Marquette (894), Ontonagon (775), Baraga (683), Schoolcraft (664), and Iron (640) counties had the highest harvest estimates (Table 9).

The estimated number of beaver caught increased significantly (19%) between 2007 and 2008 (15,270 versus 12,819 beaver, Table 7). The number of trappers that attempted to catch beaver increased significantly (7%), but the days devoted to trapping did not change significantly between 2007 and 2008 (Table 7, Figure 6).

Most beaver trappers used conibear-type traps to capture beaver ( $93 \pm 1\%$ ), although  $70 \pm 2\%$  of trappers used foothold traps and  $18 \pm 2\%$  used snares. Among trappers using conibear traps, the mean number of conibear traps set was  $8.8 \pm 0.8$  traps. Among trappers using foothold traps, the mean number of foothold traps set was  $6.7 \pm 0.4$  traps, and among trappers using snares, the mean number of snares set was  $12.7 \pm 5.6$ .

Twenty-one percent of beaver trappers ( $\pm 2\%$ ) believed beaver numbers were increasing in the county where they trapped most often, while  $51 \pm 2\%$  thought beaver numbers were stable,  $23 \pm 2\%$  thought they were declining, about 5% of trappers either indicated beaver were absent in the area they trapped or did not comment on the status of beaver.

An estimated 236 trappers caught 1,644 beaver through the ice during the 2008 season (traps were set under the ice, Table 7). About 508 trappers caught 5,361 beaver during April 2009. Beaver harvested through the ice and taken during April represented about 11% and 35% of the estimated total beaver harvest, respectively. Among trappers that set traps for beaver,  $18 \pm 2\%$  caught otter in their beaver sets. These trappers caught  $310 \pm 36$  otter.

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Table 1. Otter and beaver trapping seasons in Michigan, 2008.

Zone	Season	
	Resident	Nonresident
1	October 25 – April 12 <sup>a</sup>	November 15 – April 12
2	November 1 – April 12	November 24 – April 12
3	November 10 – March 31	December 15 – March 31

<sup>a</sup>The season extended through April 30 in Zone 1 on designated trout streams for residents.

Table 2. Estimated number of otter harvest tag holders that attempted to trap otter or beaver in Michigan during 2008 season.

Harvest tag holders	%	95% CL <sup>a</sup>	Total	95% CL <sup>a</sup>
Trapped only otter	5	1	133	17
Trapped only beaver	25	1	677	34
Trapped both otter and beaver	20	1	546	32
Trapped either otter or beaver	49	1	1,356	40
Trapped otter <sup>b</sup>	25	1	680	35
Trapped beaver <sup>c</sup>	45	1	1,223	40

<sup>a</sup>95% confidence limits.

<sup>b</sup>Sum of trappers that trapped only otter and trappers that trapped both otter and beaver.

<sup>c</sup>Sum of trappers that trapped only beaver and trappers that trapped both otter and beaver.

Table 3. Estimated number of otter trappers, their trapping effort (days), number of otter captured, mean days required to harvest an otter, and trapping success in Michigan during 2006-2008. Estimates presented separately for trappers targeting otter and for trappers that were not targeting otter.

Variable	Year						Change <sup>a</sup> (%)
	2006		2007		2008		
	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	
<b>Among trappers targeting otter</b>							
Trappers (No)	1,071	39	731	33	680	35	-7
Effort (Days)	26,290	1,616	15,802	1,254	14,439	1,258	-9
Otters captured (No.)	1,033	64	648	67	617	52	-5
Otters released alive (No.)	85	19	94	43	51	18	-46
Otters registered (No.)	948	58	555	46	566	47	2
Trappers that captured an otter (%)	59	2	50	3	57	3	8*
Trappers that released an otter (%)	5	1	6	1	4	1	-2
Trappers that registered an otter (%)	58	2	48	3	56	3	8*
Mean days required to harvest an otter	27.7	1.8	28.7	2.4	25.6	2.4	-11
<b>Among trappers that did not target otter</b>							
Trappers (No)	349	26	102	14	129	17	26
Otters captured (No.)	326	40	146	24	198	31	35
Otters registered (No.)	326	40	146	24	198	31	35
<b>Among all trappers</b>							
Trappers (No)	1,419	40	833	35	808	36	-3
Otters captured (No.)	1,359	72	794	70	815	59	3
Otters registered (No.)	1,274	67	700	51	763	54	9
Mean days required to harvest an otter	20.6	1.4	22.8	1.9	18.9	1.7	-17*

<sup>a</sup>The change between 2007 and 2008 for proportion of trappers catching otters and registering otters is reported as the difference between years rather than the proportional change.

\*P<0.005.

Table 4. Estimated number of trappers, trapping effort, otter captured, otter released alive, otter registered, and success among otter trappers during the 2008 Michigan trapping season, summarized by area.

Area	Trappers		Trapping effort (days)		Otter captured <sup>a</sup>		Otter released alive		Otter registered <sup>b</sup>		Trapper success	
	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	%	95% CL <sup>c</sup>
Among trappers targeting otter												
Upper Peninsula	304	25	6,256	779	349	44	22	11	326	40	59	4
Lower Peninsula	402	28	8,183	1,013	268	30	29	14	239	25	53	4
Zone 2	291	25	5,731	892	191	24	21	12	170	20	57	4
Zone 3	127	17	2,452	476	77	17	8	8	69	15	46	7
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Statewide	680	35	14,439	1,258	617	52	51	18	566	47	56	3
Among trappers that did not target otter												
Statewide	129	17	NA	NA	198	31	NA	NA	198	31	NA	NA
Among all trappers combined												
Statewide	808	36	NA	NA	815	59	NA	NA	763	54	NA	NA

<sup>a</sup>All otter removed from traps, including all incidental catches and releases.

<sup>b</sup>Includes incidentally caught otter that were not returned to the trapper.

<sup>c</sup>95% confidence limits.

Table 5. Estimated number of trappers, trapping effort, otter captured (including all incidental catches and releases), otter released alive, and otter registered (including incidental catches) among otter trappers during the 2008 Michigan trapping season, summarized by county.

County	Trappers		Trapping effort (days)		Otter captured <sup>a</sup>		Otter released alive		Otter registered <sup>b</sup>	
	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>
Alcona	16	6	299	143	8	4	2	2	6	4
Alger	19	7	498	233	22	11	0	0	22	11
Allegan	10	5	79	45	3	3	0	0	3	3
Alpena	18	6	201	127	18	9	6	8	11	5
Antrim	3	3	26	29	3	3	0	0	3	3
Arenac	2	2	3	4	2	2	0	0	2	2
Baraga	29	8	421	137	39	15	2	2	37	15
Barry	13	5	170	98	13	9	6	8	6	4
Bay	2	2	96	116	2	2	0	0	2	2
Benzie	6	4	214	150	3	3	0	0	3	3
Berrien	0	0	0	0	0	0	0	0	0	0
Branch	0	0	0	0	0	0	0	0	0	0
Calhoun	0	0	0	0	0	0	0	0	0	0
Cass	3	3	71	64	0	0	0	0	0	0
Charlevoix	3	3	6	8	3	3	0	0	3	3
Cheboygan	10	5	103	71	5	4	2	2	3	3
Chippewa	37	9	964	438	27	11	0	0	27	11
Clare	11	5	185	110	6	4	0	0	6	4
Clinton	0	0	0	0	0	0	0	0	0	0
Crawford	13	5	217	112	3	3	2	2	2	2
Delta	10	5	119	74	5	4	0	0	5	4
Dickinson	19	7	363	133	16	8	0	0	16	8
Eaton	2	2	3	4	0	0	0	0	0	0
Emmet	16	6	297	132	13	6	2	2	11	5
Genesee	0	0	0	0	0	0	0	0	0	0
Gladwin	18	6	391	264	8	4	0	0	8	4
Gogebic	37	9	622	186	39	14	0	0	39	14
Gd. Traverse	10	5	183	104	6	4	0	0	6	4
Gratiot	3	3	35	39	3	3	0	0	3	3

<sup>a</sup>All otter removed from traps, including all incidental catches and releases.

<sup>b</sup>Includes incidentally caught otter that were not returned to the trapper.

<sup>c</sup>95% confidence limits.

Table 5 (continued). Estimated number of trappers, trapping effort, otter captured (including all incidental catches and releases), otter released alive, and otter registered (including incidental catches) among otter trappers during the 2008 Michigan trapping season, summarized by county.

County	Trappers		Trapping effort (days)		Otter captured <sup>a</sup>		Otter released alive		Otter registered <sup>b</sup>	
	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>
Hillsdale	0	0	0	0	0	0	0	0	0	0
Houghton	14	6	188	88	8	6	2	2	6	5
Huron	0	0	0	0	0	0	0	0	0	0
Ingham	2	2	8	10	0	0	0	0	0	0
Ionia	2	2	3	4	2	2	0	0	2	2
Iosco	14	6	355	206	6	4	0	0	6	4
Iron	37	9	988	346	55	19	5	6	50	16
Isabella	10	5	153	98	3	3	0	0	3	3
Jackson	0	0	0	0	0	0	0	0	0	0
Kalamazoo	0	0	0	0	0	0	0	0	0	0
Kalkaska	24	7	280	107	16	6	2	2	14	6
Kent	10	5	321	188	2	2	0	0	2	2
Keweenaw	5	3	39	39	6	5	2	2	5	3
Lake <sup>d</sup>	2	2	0	0	0	0	0	0	0	0
Lapeer	0	0	0	0	0	0	0	0	0	0
Leelanau	6	4	61	40	5	3	0	0	5	3
Lenawee	0	0	0	0	0	0	0	0	0	0
Livingston	2	2	39	46	0	0	0	0	0	0
Luce	24	7	256	96	22	14	5	6	18	10
Mackinac	26	8	362	122	29	14	5	6	24	10
Macomb	2	2	55	66	2	2	0	0	2	2
Manistee	19	7	297	138	11	5	0	0	11	5
Marquette	22	7	455	170	19	9	2	2	18	8
Mason	8	4	111	67	2	2	0	0	2	2
Mecosta	13	5	114	68	13	8	0	0	13	8
Menominee	6	4	177	131	10	7	0	0	10	7
Midland	14	6	199	134	11	5	0	0	11	5
Missaukee	19	7	365	167	6	4	0	0	6	4
Monroe	0	0	0	0	0	0	0	0	0	0

<sup>a</sup>All otter removed from traps, including all incidental catches and releases.

<sup>b</sup>Includes incidentally caught otter that were not returned to the trapper.

<sup>c</sup>95% confidence limits.

<sup>d</sup>Respondent to harvest survey failed to report days of trapping effort.

Table 5 (continued). Estimated number of trappers, trapping effort, otter captured (including all incidental catches and releases), otter released alive, and otter registered (including incidental catches) among otter trappers during the 2008 Michigan trapping season, summarized by county.

County	Trappers		Trapping effort (days)		Otter captured <sup>a</sup>		Otter released alive		Otter registered <sup>b</sup>	
	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>	Total	95% CL <sup>c</sup>
Montcalm	27	8	688	294	11	5	0	0	11	5
Montmorency	8	4	127	81	3	3	0	0	3	3
Muskegon	6	4	116	77	3	3	2	2	2	2
Newaygo	11	5	140	118	5	3	0	0	5	3
Oakland	0	0	0	0	0	0	0	0	0	0
Oceana	10	5	180	108	3	3	0	0	3	3
Ogemaw	10	5	270	190	2	2	0	0	2	2
Ontonagon	29	8	445	155	31	13	0	0	31	13
Osceola	6	4	211	180	8	5	0	0	8	5
Oscoda	27	8	323	126	18	7	0	0	18	7
Otsego	10	5	84	49	14	11	6	8	8	5
Ottawa	2	2	48	58	0	0	0	0	0	0
Presque Isle	8	4	294	199	3	3	0	0	3	3
Roscommon	21	7	508	282	10	5	0	0	10	5
Saginaw	3	3	16	14	2	2	0	0	2	2
St. Clair	0	0	0	0	0	0	0	0	0	0
St. Joseph	2	2	45	54	0	0	0	0	0	0
Sanilac	0	0	0	0	0	0	0	0	0	0
Schoolcraft	24	7	360	153	21	10	2	2	19	9
Shiawassee	3	3	29	30	3	3	0	0	3	3
Tuscola	2	2	24	29	0	0	0	0	0	0
Van Buren	0	0	0	0	0	0	0	0	0	0
Washtenaw	0	0	0	0	0	0	0	0	0	0
Wayne	0	0	0	0	0	0	0	0	0	0
Wexford	8	4	141	85	5	3	0	0	5	3
Unknown	0	0	0	0	0	0	0	0	0	0
Statewide <sup>e,f</sup>	680	35	14,439	1,258	617	52	51	18	566	47
Other <sup>g</sup>	129	17	NA	NA	198	31	NA	NA	198	31
Grand total <sup>h,f</sup>	808	36	NA	NA	815	59	NA	NA	763	54

<sup>a</sup>All otter removed from traps, including all incidental catches and releases.

<sup>b</sup>Includes incidentally caught otter that were not returned to the trapper.

<sup>c</sup>95% confidence limits.

<sup>e</sup>Estimates for trappers that targeted otter.

<sup>f</sup>Number of trappers does not add up to statewide total because trappers could trap in more than one county.

Column totals for trapping effort and capture may not equal statewide totals because of rounding errors.

<sup>g</sup>Estimates for trappers that did not target otter.

<sup>h</sup>Estimates for all trappers combined.

Table 6. Mean days required to harvest an otter among trappers that targeted otter, 1997-2008.

Year	Region							
	Upper Peninsula		Northern Lower Peninsula		Southern Lower Peninsula		Statewide	
	Mean	95% CL <sup>a</sup>	Mean	95% CL <sup>a</sup>	Mean	95% CL <sup>a</sup>	Mean	95% CL <sup>a</sup>
1997	17.2	13.3	33.0	19.1	16.7	21.6	22.5	10.2
1998	13.6	5.6	21.5	11.2	34.0	28.0	16.2	5.2
1999	12.9	2.7	25.8	7.4	23.3	20.2	17.2	3.1
2000	15.3	5.4	31.2	10.9	23.0	15.7	19.9	4.9
2001	13.5	3.5	25.5	6.7	32.7	26.1	19.2	3.8
2002	27.0	9.0	25.6	9.5	26.5	14.8	26.2	6.3
2003	21.8	3.4	42.5	9.3	28.8	8.5	26.3	3.2
2004	23.1	5.8	36.7	11.1	62.5	29.1	29.3	5.5
2005	19.6	5.3	38.5	14.1	35.1	21.1	26.9	6.1
Among trappers targeting otter <sup>b</sup>								
2006	21.5	1.7	37.9	4.5	43.6	7.2	27.7	1.8
2007	23.7	2.6	42.8	6.5	33.5	7.2	28.7	2.4
2008	19.3	2.2	33.4	5.4	35.5	8.6	25.6	2.4
Among all trappers <sup>b</sup>								
2006	17.8	1.5	26.5	3.4	29.6	4.9	20.6	1.4
2007	20.7	2.3	31.7	5.0	24.8	5.1	22.8	1.9
2008	15.4	1.8	27.4	4.4	28.3	6.7	18.9	1.7

<sup>a</sup>95% confidence limits.

<sup>b</sup>Beginning in 2006, two separate estimates were calculated: (1) an estimate excluding the activity of trappers that did not target otter and (2) an estimate of all trappers combined. The latter estimates are more comparable to estimates from previous years.

Table 7. Estimated number of beaver trappers, their trapping effort (days), number of beaver captured, and trapping success in Michigan during 2006-2008.<sup>a</sup>

Variable	Year						Change <sup>c</sup> (%)
	2006		2007		2008		
	Estimate	95% CL <sup>b</sup>	Estimate	95% CL <sup>b</sup>	Estimate	95% CL <sup>b</sup>	
Trappers (No.)	1,665	40	1,138	37	1,223	40	7*
Trapping effort (Days)	48,640	2,350	28,736	1,817	30,578	1,897	6
Beavers captured (No.)	20,912	1,348	12,819	1,025	15,270	1,169	19*
Trappers that captured a beaver (%) <sup>d</sup>	89	1	85	2	90	1	5*
Trapped beaver through ice (Trappers)	501	30	284	23	236	22	-17*
Beaver caught through ice (No.)	3,275	392	1,843	289	1,644	397	-11
Trapped beaver in April (Trappers)	653	34	409	27	508	31	24*
Beaver caught in April (No.)	5,478	562	3,986	548	5,361	652	34*

<sup>a</sup>Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

<sup>b</sup>95% confidence limits.

<sup>c</sup>The change between 2007 and 2008 for proportion of trappers catching beaver is reported as the difference between years rather than the proportional change.

<sup>d</sup>Trapper success was incorrectly reported in previous harvest report for 2007 (Frawley 2008).

\*P<0.005.

Table 8. Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2008 Michigan trapping season, summarized by area.<sup>a</sup>

Area	Trappers		Trapping effort (days)		Beaver captured <sup>a</sup>		Trapper success	
	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>	%	95% CL <sup>b</sup>
Upper Peninsula	607	33	12,548	1,111	7,408	826	88	2
Lower Peninsula	662	34	17,727	1,607	7,728	868	90	2
Zone 2	493	31	13,332	1,459	5,676	686	90	2
Zone 3	220	22	4,395	609	2,052	405	90	3
Unknown	10	5	304	228	133	102	NA	NA
Statewide	1,223	40	30,578	1,897	15,270	1,169	90	1

<sup>a</sup>Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

<sup>b</sup>95% confidence limits.

Table 9. Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2008 Michigan trapping season, summarized by county.<sup>a</sup>

County	Trappers		Trapping effort (days)		Beaver captured	
	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>
Alcona	21	7	400	179	275	126
Alger	29	8	553	219	313	125
Allegan	3	3	13	12	3	4
Alpena	37	9	667	222	344	119
Antrim	8	4	92	55	85	64
Arenac	5	3	96	98	79	71
Baraga	45	10	900	243	683	239
Barry	8	4	154	102	66	46
Bay	3	3	35	31	10	9
Benzie	10	5	278	157	42	32
Berrien	0	0	0	0	0	0
Branch	3	3	32	29	87	85
Calhoun	6	4	170	120	90	74
Cass	2	2	40	48	8	10
Charlevoix	10	5	121	76	59	42
Cheboygan	26	8	497	240	166	60
Chippewa	90	14	1,711	423	937	325
Clare	37	9	1,033	400	370	138
Clinton	0	0	0	0	0	0
Crawford	21	7	270	117	93	46
Delta	47	10	599	160	389	172
Dickinson	35	9	662	206	341	124
Eaton	0	0	0	0	0	0
Emmet	16	6	365	178	82	37
Genesee	10	5	270	207	157	135
Gladwin	31	8	808	330	294	133
Gogebic	53	11	845	213	521	199
Gd. Traverse	11	5	190	102	51	27
Gratiot	3	3	18	16	16	16

<sup>a</sup>Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

<sup>b</sup>95% confidence limits.

Table 9 (continued). Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2008 Michigan trapping season, summarized by county.<sup>a</sup>

County	Trappers		Trapping effort (days)		Beaver captured	
	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>
Hillsdale	2	2	96	116	24	29
Houghton	37	9	877	358	275	99
Huron	3	3	106	96	11	10
Ingham	3	3	8	10	5	6
Ionia	8	4	114	70	26	21
Iosco	18	6	614	274	145	76
Iron	63	12	1,345	320	640	240
Isabella	19	7	379	154	161	89
Jackson	2	2	6	8	8	10
Kalamazoo	2	2	3	4	3	4
Kalkaska	24	7	278	105	149	55
Kent	19	7	178	94	58	31
Keweenaw	13	5	325	294	77	45
Lake	18	6	382	277	108	48
Lapeer	5	3	64	47	42	48
Leelanau	6	4	80	53	43	30
Lenawee	0	0	0	0	0	0
Livingston	8	4	79	50	34	21
Luce	47	10	524	142	328	113
Mackinac	50	11	783	197	511	183
Macomb	2	2	55	66	13	15
Manistee	21	7	562	237	111	51
Marquette	69	13	1,445	328	894	322
Mason	11	5	154	91	42	21
Mecosta	43	10	861	276	503	214
Menominee	14	6	194	81	63	46
Midland	19	7	296	121	159	88
Missaukee	37	9	579	211	394	170
Monroe	0	0	0	0	0	0

<sup>a</sup>Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

<sup>b</sup>95% confidence limits.

Table 9 (continued). Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2008 Michigan trapping season, summarized by county.<sup>a</sup>

County	Trappers		Trapping effort (days)		Beaver captured	
	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>	Total	95% CL <sup>b</sup>
Montcalm	29	8	458	163	92	32
Montmorency	24	7	366	153	164	69
Muskegon	10	5	190	102	109	86
Newaygo	34	9	442	157	159	57
Oakland	5	3	80	65	32	32
Oceana	16	6	217	111	56	31
Ogemaw	22	7	786	350	233	116
Ontonagon	59	12	823	194	775	217
Osceola	48	11	775	223	535	183
Oscoda	35	9	378	161	239	88
Otsego	16	6	323	166	88	47
Ottawa	6	4	27	18	14	9
Presque Isle	27	8	630	261	259	117
Roscommon	50	11	1,499	472	900	383
Saginaw	10	5	109	56	56	34
St. Clair	2	2	11	14	11	14
St. Joseph	5	3	48	35	67	62
Sanilac	0	0	0	0	0	0
Schoolcraft	61	12	961	256	664	165
Shiawassee	2	2	5	6	10	12
Tuscola	3	3	29	30	18	19
Van Buren	0	0	0	0	0	0
Washtenaw	0	0	0	0	0	0
Wayne	2	2	16	19	0	0
Wexford	19	7	892	367	270	135
Unknown	10	5	304	228	133	102
Statewide <sup>c</sup>	1,223	40	30,578	1,897	15,270	1,169

<sup>a</sup>Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

<sup>b</sup>95% confidence limits.

<sup>c</sup>Number of trappers does not add up to statewide total because trappers could trap in more than one county. Column totals for trapping effort and capture may not equal statewide totals because of rounding errors.



*Note: the Otter and Beaver Management Unit boundary lines are the same as the Hunting and Trapping zone boundary lines.*

(rev. 10/15/2007 -MLS)

Figure 1. Otter and beaver management zones in Michigan, 2008.

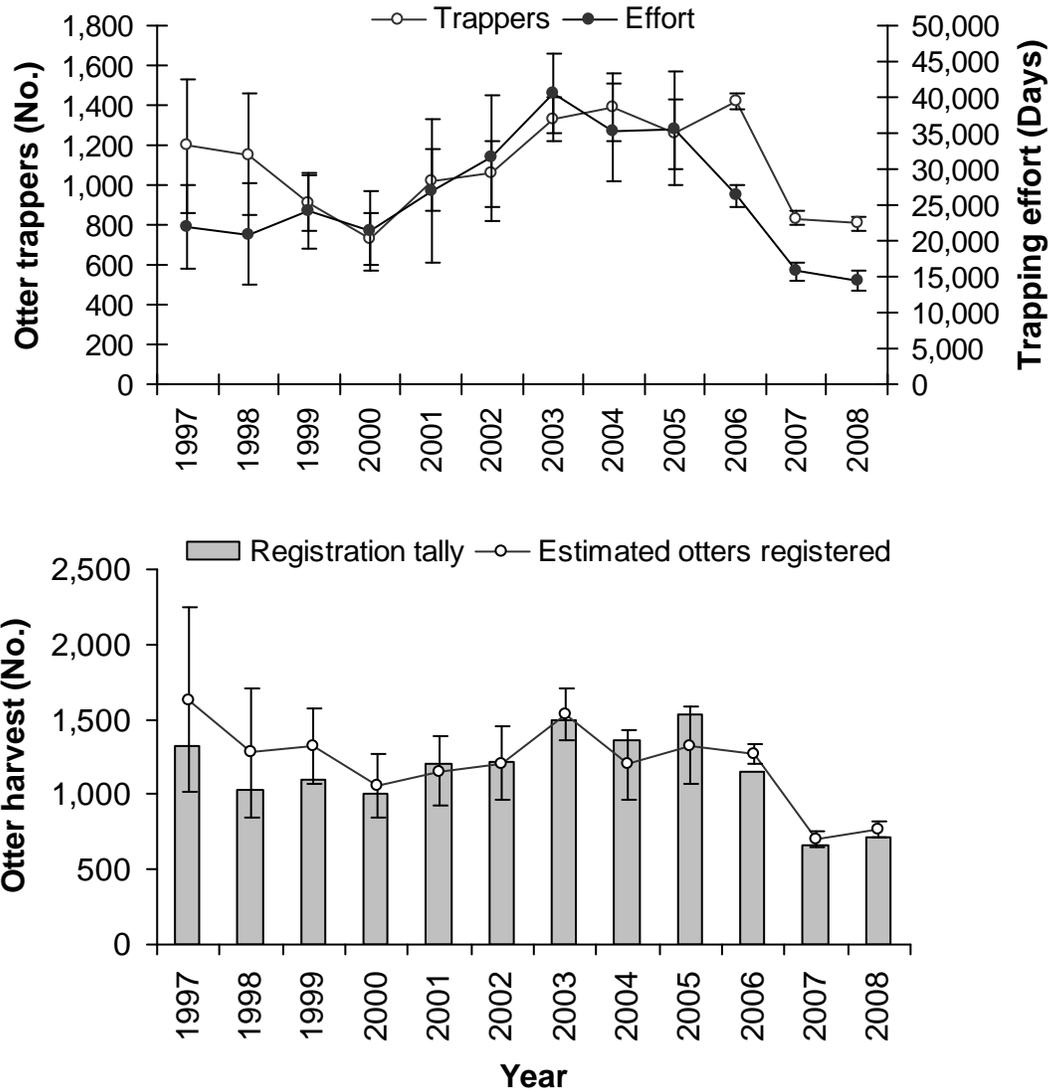


Figure 2. Estimated number of trappers, trapping effort (days), and number of otter captured and registered in Michigan, 1997-2008. Estimates of trapper numbers, trapping effort, and harvest were derived from harvest survey, while registration total was a tally of animals registered by trappers at registration stations (registration total included incidental catches not returned to trappers but excluded non-trapping mortality). Vertical bars represent the 95% confidence interval.

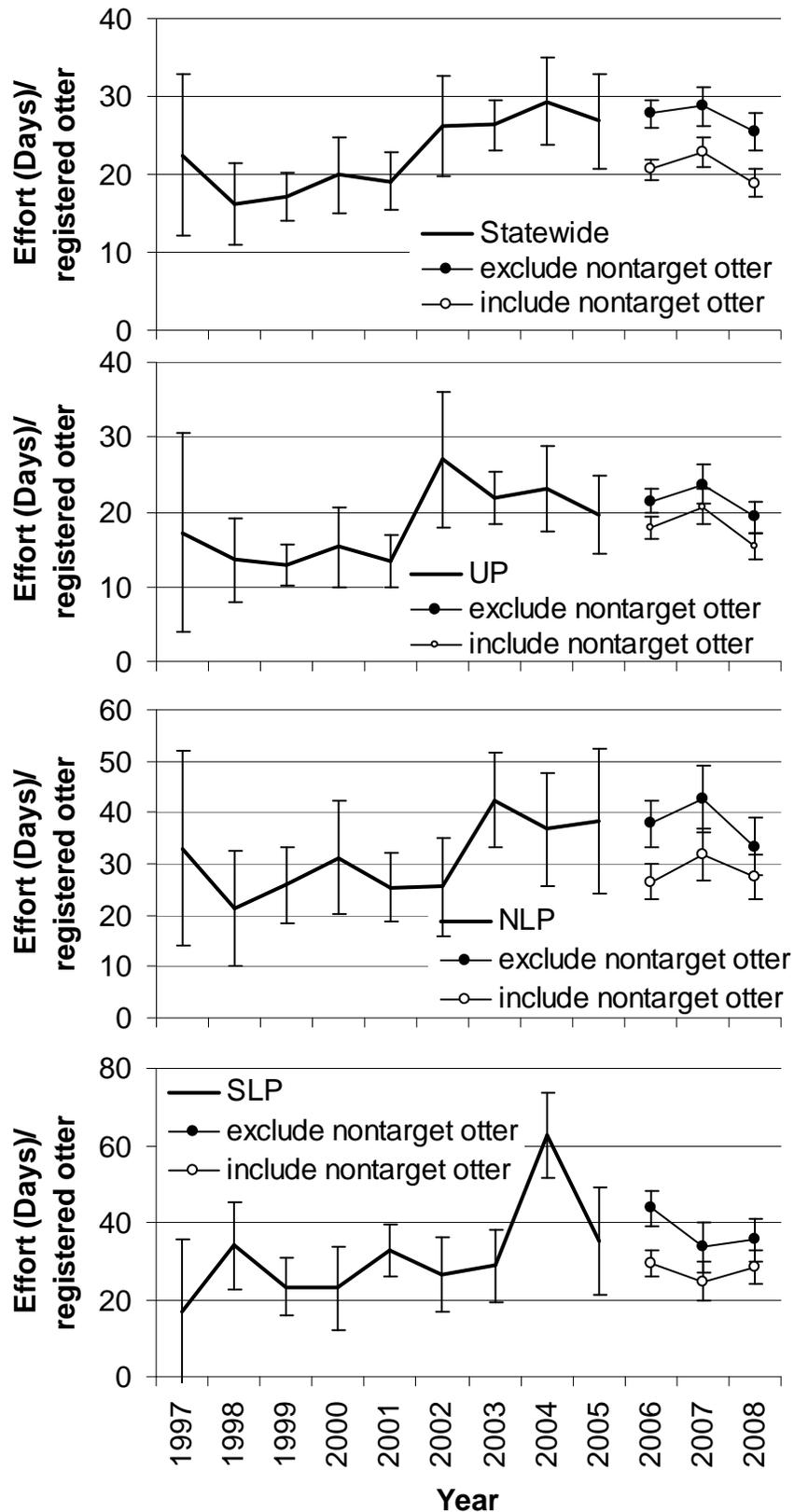


Figure 3. Estimated mean number of days required to harvest an otter in Michigan during 1997-2008, summarized by management zone. Beginning in 2006, two separate estimates were calculated: (1) an estimate excluding the activity of trappers that did not target otter and (2) an estimate of all trappers combined. The latter estimates are more comparable to estimates from previous years.

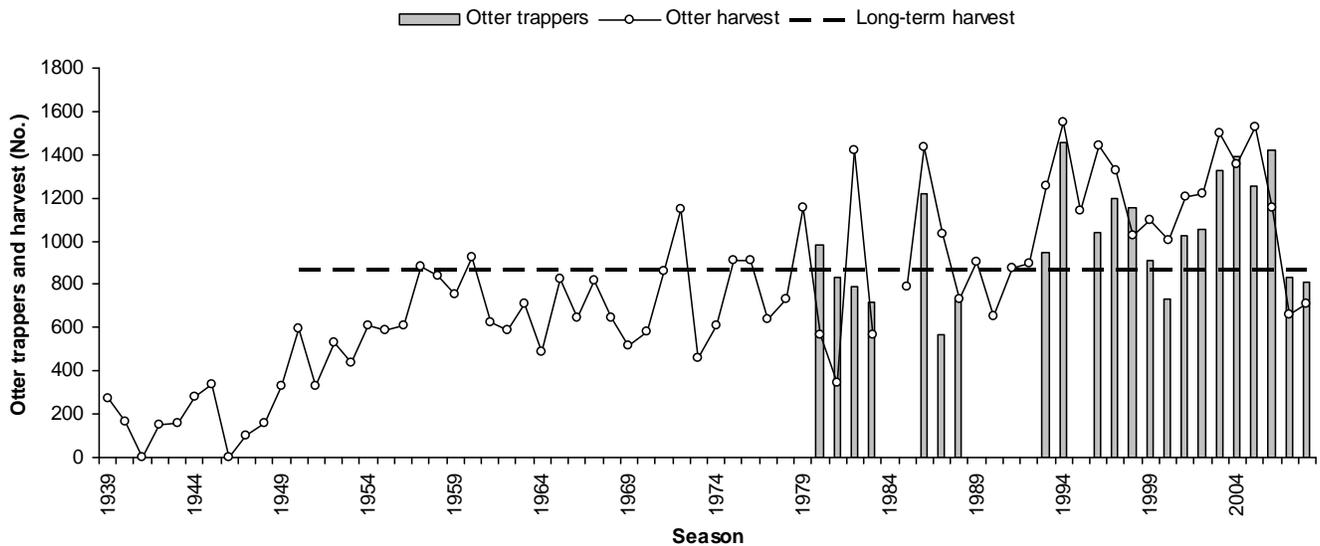


Figure 4. Otter harvest (sealing or registration tally, unpublished data) and estimated number of otter trappers (estimates from harvest survey) in Michigan, 1939-2008. Long-term (1950-2008) average harvest was 868 otter. Estimates were not available for years when values were not plotted.

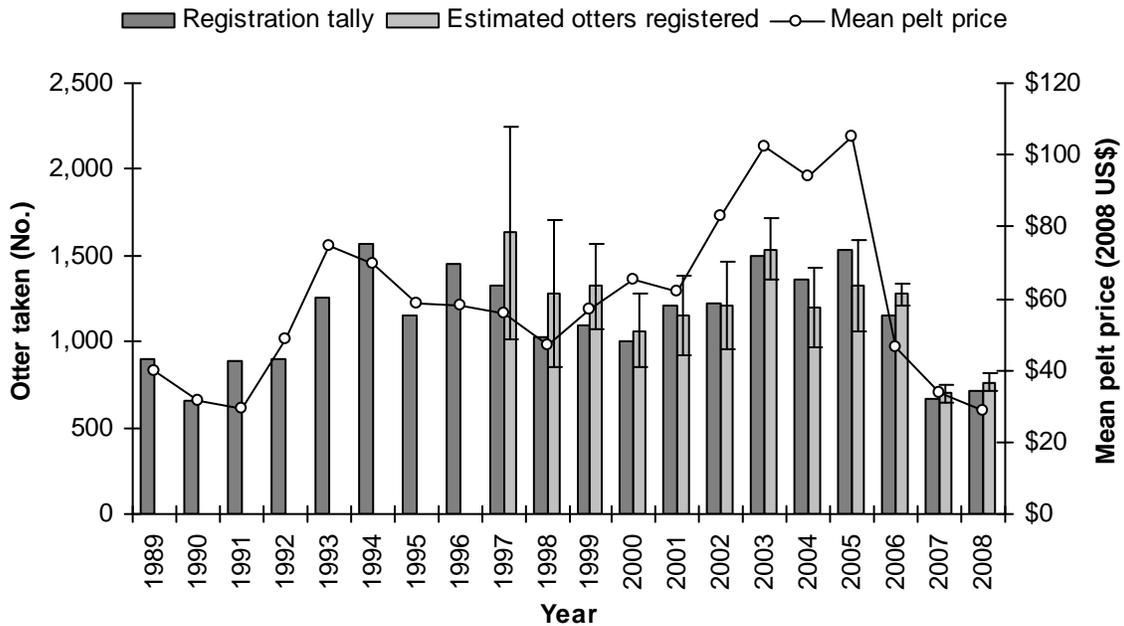


Figure 5. Otter registration totals, estimated otter harvest, and mean otter pelt prices in Michigan during 1989-2008. Mean pelt prices were the average paid in Minnesota and Wisconsin (Dexter 2008, Dhuey 2009). Pelt prices were reported in 2008 dollars by adjusting for inflation using the Consumer Price Index (Bureau of Labor Statistics 2008). Vertical bars represent the 95% confidence interval. Estimates were not available for years when values were not plotted.

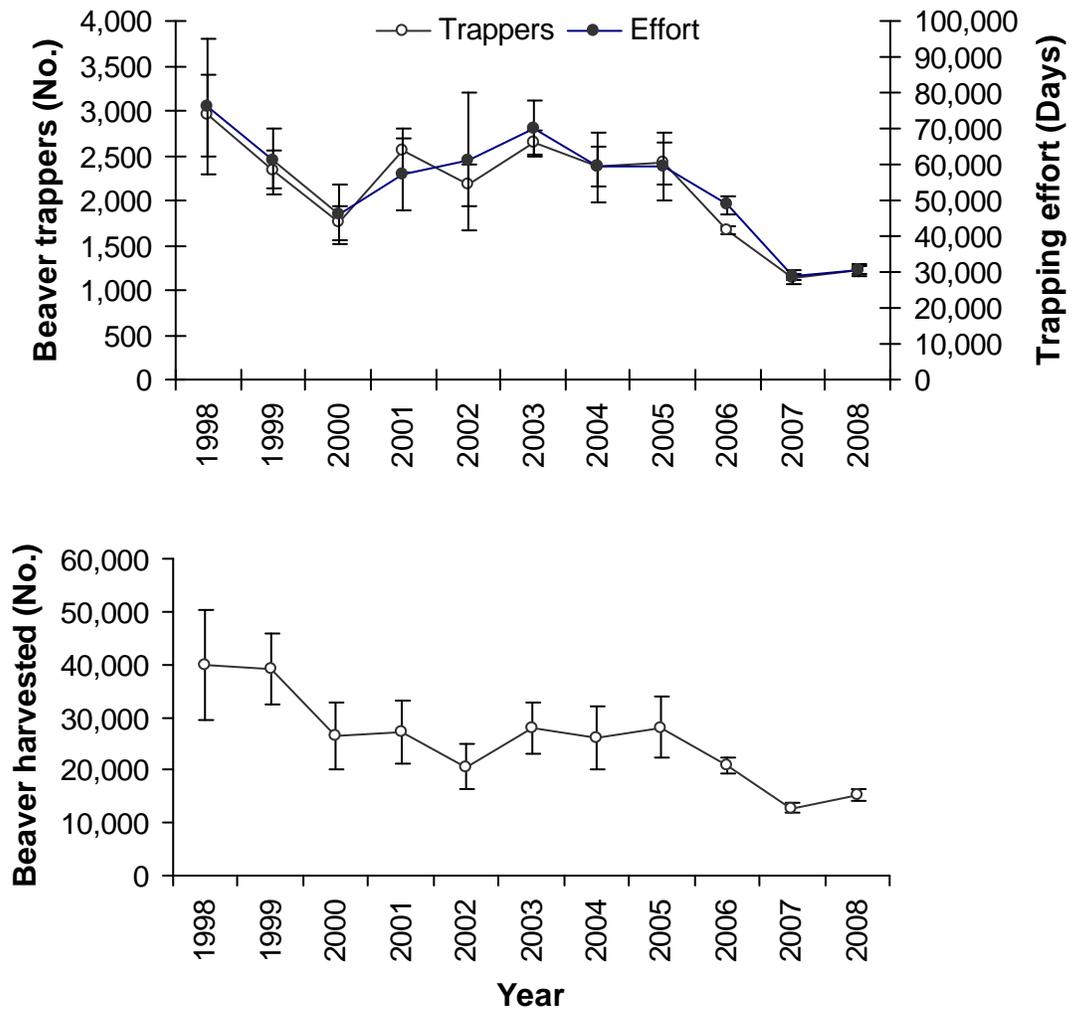


Figure 6. Estimated number of trappers, trapping effort (days), and number of beaver captured in Michigan, 1998-2008. Vertical bars represent the 95% confidence interval. The 2006-2008 estimates were not directly comparable to estimates from previous years because the 2006-2008 estimates only represent the participation, effort, and harvest of trappers that obtained an otter harvest tag. Also beginning in 2003, trappers taking beaver as part of a nuisance control business were asked to exclude nuisance animals from their reported harvest on annual harvest surveys.

Appendix A. Questionnaire used to collect data for 2008 otter and beaver harvest survey in Michigan.



# 2008-09 OTTER AND BEAVER HARVEST REPORT

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



*It is important that you complete and return this questionnaire even if you did not trap or capture any otter or beaver.*

1. Did you place traps specifically for otter during the 2008-09 season?

<sup>1</sup>  Yes                      <sup>2</sup>  No, Skip to question number 6.

2. If you trapped during the 2008-09 otter season, please complete the following table.  
(Do not report trapping done as part of a nuisance control business.)

COUNTY TRAPPED (List each county that you trapped for otter.)	NUMBER OF DAYS TRAPPED FOR OTTER	NUMBER OF OTTER CAUGHT AND RELEASED (Count only otters you released alive from your traps.)	NUMBER OF OTTER CAUGHT AND REGISTERED (Count all otter that were registered including incidental catches that were not returned to you.)

3. How many of the following traps did you set for otter in 2008-09?

(For each type, record the average number used per day.)

\_\_\_\_\_ Foothold  
\_\_\_\_\_ Conibear

4. What is the status of otter in the county you trapped most often in 2008-09?

<sup>1</sup>  Increasing      <sup>2</sup>  Decreasing      <sup>3</sup>  Stable      <sup>4</sup>  Not present

5. Do you have any comments or suggestions about otter management in Michigan?

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**6. Did you place traps for beaver during the 2008-09 season?**

<sup>1</sup>  Yes                      <sup>2</sup>  No, skip remaining questions and return questionnaire.

**7. If you trapped during the 2008-09 beaver season, please complete the following table.**  
*(Do not report trapping done as part of a nuisance control business.)*

<b>COUNTY TRAPPED</b> (List each county that you trapped for beaver.)	<b>NUMBER OF DAYS TRAPPED FOR BEAVER</b>	<b>NUMBER OF BEAVER CAUGHT</b>

**8. How many of the following traps did you set for beaver in 2008-09?**

*(For each type, record the average number used per day.)*

\_\_\_\_\_ Foothold  
 \_\_\_\_\_ Conibear  
 \_\_\_\_\_ Snares

**9. Did you attempt to trap beavers through the ice during the 2008-09 seasons (these traps were set under the ice)?**

<sup>1</sup>  Yes                      <sup>2</sup>  No (*Skip to Question 10*)

**9a. If you attempted to trap beavers through the ice, how many beavers did you harvest through the ice during the 2008-09 seasons?**

\_\_\_\_\_ **BEAVER TAKEN**

**10. Did you attempt to trap beavers during April 2009?**

<sup>1</sup>  Yes                      <sup>2</sup>  No (*Skip to Question 11*)

**10a. If you attempted to trap beavers during April 2009, how many beavers did you harvest in April?**

\_\_\_\_\_ **BEAVER TAKEN**

**11. What is the status of beaver in the county you trapped most often in 2008-09?**

<sup>1</sup>  Increasing      <sup>2</sup>  Decreasing      <sup>3</sup>  Stable      <sup>4</sup>  Not present

**12. Did you catch any otter in traps that were set for beaver in 2008-09?**

<sup>1</sup>  Yes                      <sup>2</sup>  No

**12a. If you answered yes, report number of otter caught in your beaver sets.**

\_\_\_\_\_ otter caught in beaver sets

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