2015 MICHIGAN BLACK BEAR HUNTER SURVEY

Brian J. Frawley and Caitlin E. Boon

ABSTRACT

We contacted a random sample of bear hunters after the 2015 hunting season to determine hunter participation, hunting methods, bear harvest, and hunter satisfaction. In 2015, an estimated 4,994 hunters spent nearly 34,502 days afield and harvested about 1,712 bears. The number of hunters and hunting effort declined significantly from 2014 to 2015, but bear harvest increased significantly by 10%. Statewide, 34% of hunters harvested a bear in 2015, which was significantly higher than in 2014. The average number of days required to harvest a bear statewide was 20.1 days in 2015, compared to 23.9 days in 2014. Baiting was the most common hunting method used to harvest bears, although hunters using dogs had greater hunting success than hunters using bait only. Statewide, about 57% of hunters rated their hunting experience as very good or good in 2015 (versus 51% in 2014).

INTRODUCTION

Beginning in 1990, the Michigan Department of Natural Resources (DNR) created black bear (*Ursus americanus*) management units and limited the number of bear hunting licenses issued for each unit. Before 1990, an unlimited number of bear licenses were available, and licenses were valid in all areas open to bear hunting. In 2000, the DNR modified the licensing system by implementing a zone and quota system based on preference points for issuing bear hunting licenses. Under this system, hunters received one preference point if they applied for a hunt but were unsuccessful in the drawing. Hunters also could obtain a preference point by completing an application but forgoing the drawing. Applicants with the greatest number of preference points had the greatest chance of being drawn for a hunt, but no more than 2% of the licenses were issued to nonresidents.

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

IC2578-9 (07/19/2016)

In 2015, ten bear management units in Michigan, totaling about 35,360 square miles, were open for bear hunting (Figure 1). Hunters could pursue bears from September 10-October 26 in all of the Upper Peninsula (UP) units, except the Drummond Island Management Unit (September 10-October 21). Hunters could pursue bears from September 11-26 in Benzie, Leelanau, Grand Traverse, and part of Kalkaska counties and during September 20-28 for remaining counties in the Northern Lower Peninsula (LP) units. The first day of hunt periods in the LP (September 20) was restricted to hunting with bait only, and the last two days of the hunt periods in the LP (September 27-28) were restricted to hunters using dogs. In addition, the first day of the Baldwin North Area season (Sept. 11) was for bait-only hunting. The Red Oak Management Unit in the LP also had an archery-only hunt during October 2-8 (firearms and crossbows prohibited).

The number of bear hunting licenses available in the state in 2015 (license quota) was reduced 11 percent from 2014. All units except Baldwin and Drummond Island had lower quotas in 2015 than 2014. Quota reductions ranged from a 4% decrease in the Red Oak Unit (from 675 to 650 licenses) to a 22% decrease in the Newberry Unit (from 1,520 to 1,190 licenses).

Hunters had to be at least 10 years old to purchase a hunting license. Licenses were valid on all land ownership types and allowed a hunter to take one bear of either sex, excluding cubs and female bears with cubs. Hunters could harvest bears with a firearm, crossbow, or archery equipment, except for the special archery-only hunt in the Red Oak Management Unit. Youth 10 to 13 years old could hunt with a firearm on private land only. Youth 14 years old and older could hunt with a firearm on private or public land. Hunters could use bait or dogs to hunt bears (except dogs could not be used during September 5-14 in the UP, excluding the Drummond Island Management Unit, September 15-20 in the Red Oak, Baldwin, and Gladwin units, September 6-11 in the Baldwin North Area, and during the archery-only season [October 2-8] in the Red Oak Management Unit).

The Pure Michigan Hunt (PMH) was a unique multi-species hunting opportunity offered for the first time in 2010. Individuals could purchase an unlimited number of applications for the PMH. Three winners, selected by random draw, received elk, bear, spring turkey, fall turkey, and antlerless deer hunting licenses and could participate in a reserved waterfowl hunt on a managed waterfowl area. The bear hunting licenses were valid for all areas open for hunting bear, except Drummond Island, and during all bear hunting periods. Furthermore, the PMH license holder could hunt any bear season until they filled their bear harvest tag.

The DNR and Natural Resources Commission (NRC) 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 its statutory responsibility. Estimating harvest, hunting effort, and hunter satisfaction are among the primary objectives of these surveys. The DNR and NRC use estimates derived from harvest surveys, as well as harvest reported by hunters at mandatory registration stations, and other indices to monitor bear populations and establish harvest regulations.

METHODS

The DNR provided all bear hunters the option to report information about their bear hunting activity voluntarily via an internet survey. The DNR notified hunters of the internet questionnaire by sending an email message to all license buyers that had provided an email address (N=2,488) and by posting the questionnaire on the DNR website. Hunters reported whether they hunted, number of days spent afield, whether they harvested a bear, date of harvest, and their hunting methods. Hunters also reported whether other hunters (including bear hunters) caused interference during their hunt. The questionnaire asked successful hunters to report harvest date, sex of the bear taken, and harvest method. Finally, the questionnaire asked hunters to report how satisfied they were with the number of bear seen, number of opportunities they had to take a bear, and their overall bear hunting experience. Following the 2015 bear hunting season, a questionnaire (Appendix A) was mailed to 3,080 randomly selected people (Table 1) that had purchased a bear hunting license (resident, senior, nonresident bear licenses, comprehensive lifetime bear license, and Pure Michigan Hunt) and had not already voluntarily reported harvest information via the internet. The questionnaire sent via mail asked the same questions as the internet version.

We calculated parameter estimates using a stratified random sampling design that included 12 strata (Cochran 1977). We stratified hunters based on the management unit where their license was valid (10 management units). We considered hunters who purchased a license valid in multiple management units (PMH license holders) as a separate stratum (stratum 11). In addition, we treated hunters that had voluntarily reported information about their hunting activity via the internet as a separate stratum (stratum 12). We calculated the statewide estimate of the mean number of days required to harvest a bear using a different ratio for each stratum (i.e., separate ratio estimator). To improve the precision of ratio estimates, we used the number of bears registered in each stratum as an auxiliary variate.

We calculated a 95% confidence limit (CL) for each parameter estimate. In theory, we can determine the 95% confidence interval by adding and subtracting the CL from the estimate. 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. Unfortunately, there are several other possible sources of error in surveys that are probably more serious than theoretical calculations of sampling error. They include failure of participants to provide answers (nonresponse bias), question wording, and question order. It is very difficult to measure these biases; thus, we did not adjust the estimates for these possible biases.

Statistical tests determine the likelihood that the differences among estimates are larger than expected by chance alone. To determine whether estimates differed, we examined the respective 95% confidence intervals for overlapping values. Non-overlapping 95% confidence intervals was equivalent to stating that the difference between the means was larger than would be expected 995 out of 1,000 times, if the study had been repeated (Payton et al. 2003).

We initially mailed questionnaires during late November 2015, and sent up to two follow-up questionnaires to nonrespondents. Of the 3,080 questionnaires mailed, 46 were undeliverable, resulting in an adjusted sample size of 3,034. We received questionnaires from 2,070 people, yielding a 68% adjusted response rate. In addition, 322 people voluntarily

reported information about their hunting activity via the internet before we selected the random sample.

RESULTS

In 2015, hunters purchased 5,464 bear hunting licenses (Table 1), which was about 10% lower than 2014 (6,082). Most of the hunters buying a license in 2015 were men (90%), and the average age of the license buyers was 49 years (Figure 2). About 4% of the license buyers (216) were younger than 17 years old.

Compared to 10 years ago, the number of people buying a bear hunting license in 2015 decreased 42% (9,462 people purchased a license in 2005). Although the overall number of license buyers decreased, hunter numbers among the youngest and oldest age classes were similar or slightly higher in 2015 than in 2005 (Figure 3). The consistency of hunter numbers 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. The increased participation among the youngest hunters likely reflected the lowering of the minimum age requirements. In 2015, hunters had to be at least 10 years old to participate; while the hunters had to be at least 12 years old to participate in 2005.

Nearly 91 ± 1% of the license buyers hunted bear (Table 2). These hunters spent 34,502 days afield ($\bar{x}$ = 6.9 days/hunter) and harvested 1,712 bears. The number of hunters and hunting effort decreased significantly from 2014 to 2015 (declined 9% and 7%, respectively), but the overall harvest increased significantly by 10% between 2014 and 2015 (Figure 4). Marquette, Baraga, and Ontonagon counties had the greatest number of bear hunters, and these three counties had the greatest number of bears harvested during 2015 (Table 3).

The average number of days required to harvest a bear statewide was 20.1 days in 2015 (Table 2, Figure 5), which was significantly fewer days than in 2014 (22.9 days). Mean effort per harvested bear also was significantly lower in the eastern UP or the LP between 2014 and 2015 (Figure 6). Long-term trends are difficult to interpret because of changes to hunting season's length, and the addition of hunt periods and areas open to hunting since 1992; thus, these annual estimates are not directly comparable. In 1994, most early hunt periods were increased from 37 to 42 days and a third hunt period was added in the Gwinn Management Unit. In 1995, a third hunt period was added in the Baraga Management Unit. In 1996, Baldwin and Gladwin management units were created, and a third period was added to Bergland, Amasa, Carney, and Newberry management units. In 2002, the units in the LP were expanded slightly to coincide with county boundaries. In 2006, the area of the Bladwin Unit was increased slightly with the addition of Leelanau County. The units having the highest effort per harvested bear during recent years have been Carney, Gladwin, Gwinn, and Newberry management units, while Amasa, Baldwin, Drummond Island, and Red Oak management units have had the lowest effort per harvested bear (Figure 7).

About 36% of the bear hunters hunted on private lands only in 2015, 46% hunted on public lands only, and 17% hunted on both private and public lands (Table 4). Bear hunters spent 12,660 days afield on private land, 14,589 days hunting on public land only, and 7,040 days hunting on both private and public lands (Table 5). Of the estimated 1,712 bear harvested in

2015, hunters harvested 38 ± 3% of these bears (654 ± 53) on private land. Hunters harvested about 62 ± 3% of the bears (1,058 ± 69) on public land.

Based on reported harvest dates, hunters took about 23% of these bears during the first five days and 43% during the first ten days of the hunting season (Figure 8). Of the bears harvested and their sex known, 60 ± 3% were males (1,026 ± 68) and 40 ± 3% were females (681 ± 56; Table 6). Statewide, 34% of hunters harvested a bear in 2015 (Table 2), which was significantly greater than in 2014 (28% success in 2014). Hunter success ranged from 27-100% among the bear management units (Table 2).

Most hunters (86%) used firearms while hunting bear, although 12% of the hunters used archery equipment (compound, recurve, or long bows), and 9% used a crossbow (Tables 7 and 8). Most hunters (89%) used a firearm to harvest their bear, while 6% used archery equipment, and 4% used a crossbow (Tables 9 and 10).

Most hunters (84 ± 1%) relied primarily on baiting only as a means of locating and attracting bears (Table 11). About 13% (±1%) of hunters relied primarily on dogs alone or a combination of baiting and dogs to locate bears. About 1% of hunters relied on a hunting method not involving dogs or bait. An estimated 18% of bear hunters used bait containing chocolate or cocoa derivatives during either the legal bear baiting or hunting periods (Table 12). The use of chocolate in ranged from 0% to 24% of hunters in the units.

Hunters harvested about 79 ± 2% of the bears with the aid of bait only (Table 13). Hunting success for hunters using bait only was 32 ± 2%, while hunting success for hunters using dogs was 52 ± 5% in 2015. Success among hunters using dogs has usually been greater than among hunters using baits only (Figure 9).

About 39% of bear hunters statewide rated the number of bear seen during the 2015 hunting season as very good or good, and 35% rated bear seen as poor or very poor (Table 14). Similarly, about 34% of hunters statewide rated the number of chances they had to take a bear during the 2015 hunting season as very good or good, and 36% rated their chances as poor or very poor (Table 15).

Statewide, about 57% of hunters rated their hunting experiences as very good or good (versus 51% in 2014), and 22% rated their hunting experiences as poor or very poor (Table 16). Many factors may affect hunter satisfaction, including hunting success and whether anyone interfered with their hunting activities (Figure 10). In 2015, 19% of the hunters reported that other hunters interfered with their hunts (Table 17). Other bear hunters accounted for most of the interference reported; 14% of the hunters reported that other bear hunters interfered with their hunt. Generally, hunters in the UP experienced less interference than hunters in the LP (Table 17, Figure 11).

Only 13% of the hunters (631 hunters) hired a hunting guide in 2015 (Table 18). Furthermore, most hunting guides (78%) relied on baiting only to locate bears for their clients in 2015 (Table 19).

LITERATURE CITED

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

Frawley, B. J. 2001. 2000 Michigan black bear hunter survey. Wildlife Division Report 3334. Michigan Department of Natural Resources, Lansing, 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.

Figure 1. Bear management units open to hunting in Michigan, 2015.
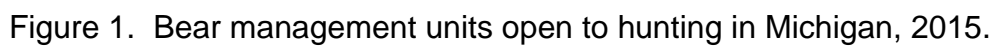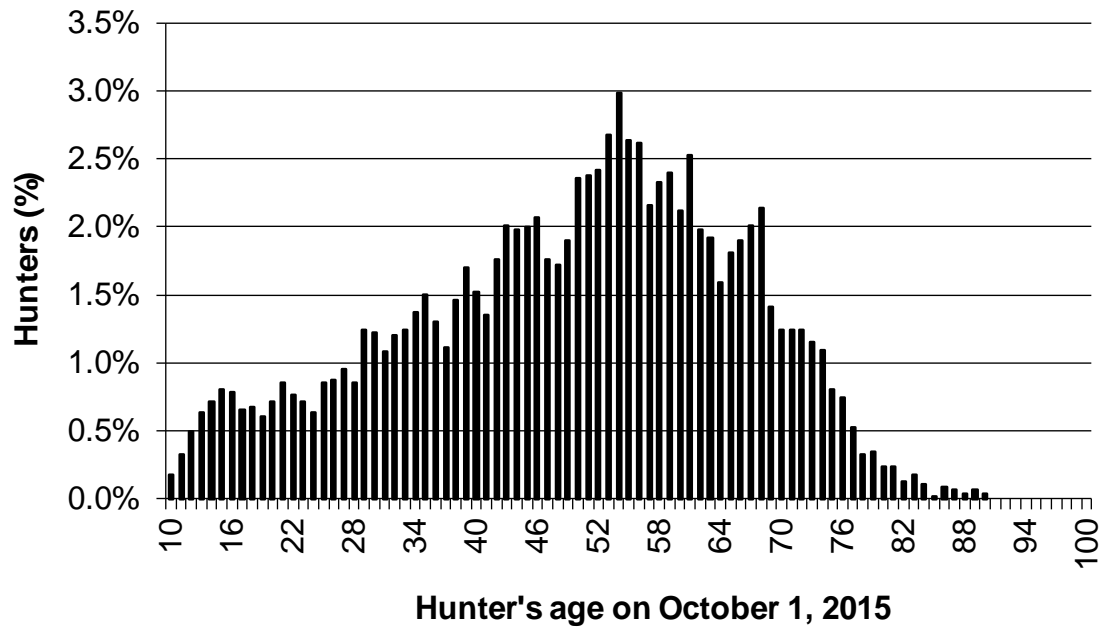
Figure 2. Age of people that purchased a bear hunting license in Michigan for the 2015 hunting season ($\bar{x}$ = 49 years). Licenses were purchased by 5,464 people.
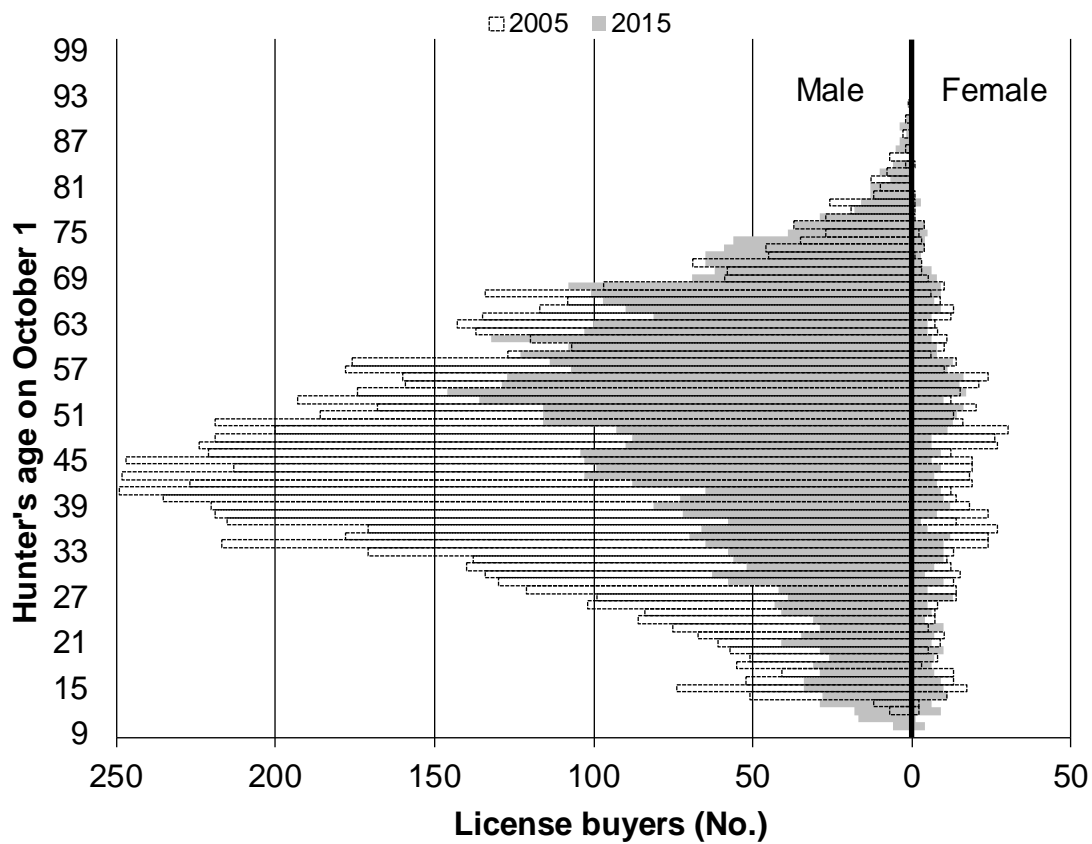
Figure 3. Number of bear hunting license buyers in Michigan by age and sex during 2005 and 2015 hunting seasons. The number of people buying a license was 9,462 in 2005 and 5,464 in 2015.

9
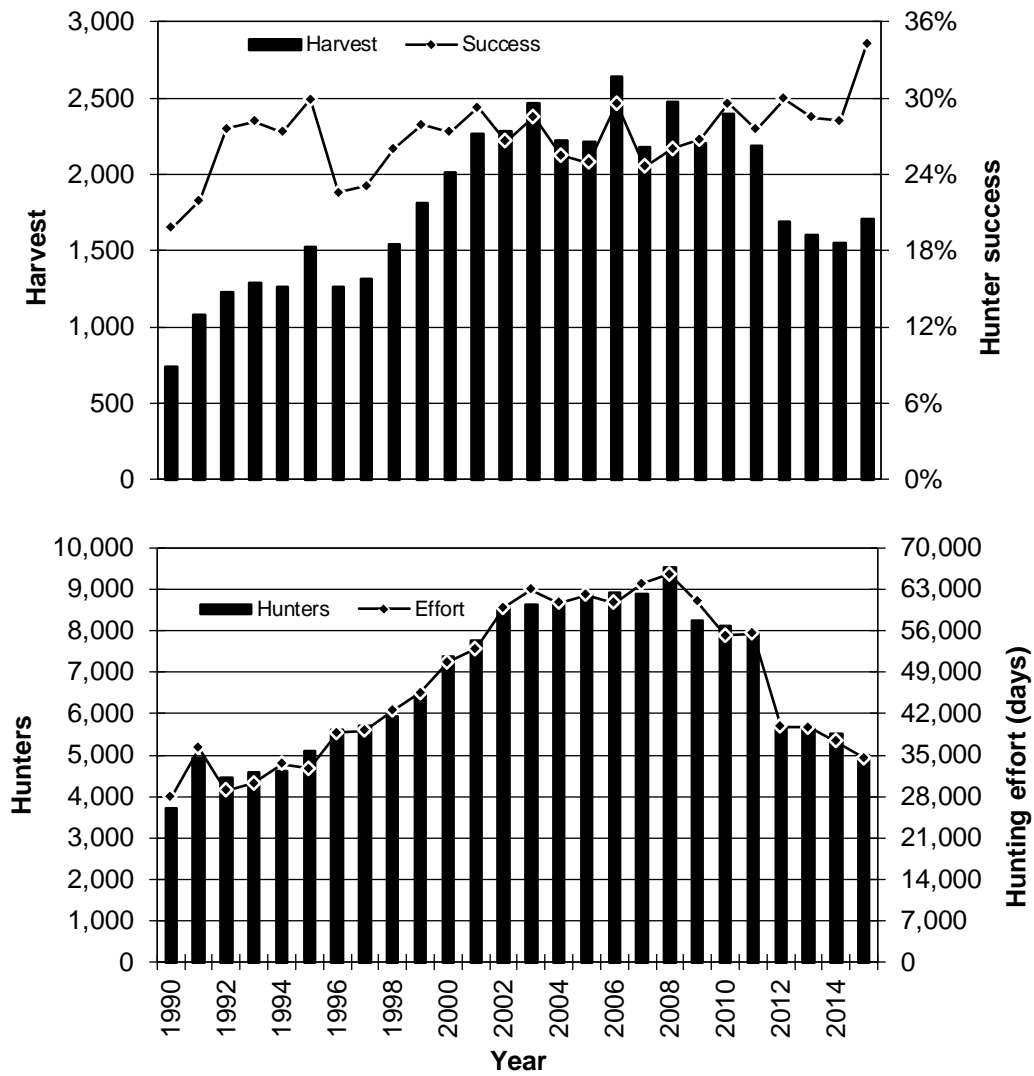
Figure 4. Estimated harvest, hunting success, number of hunters, and hunting effort during bear hunting seasons, 1990-2015.
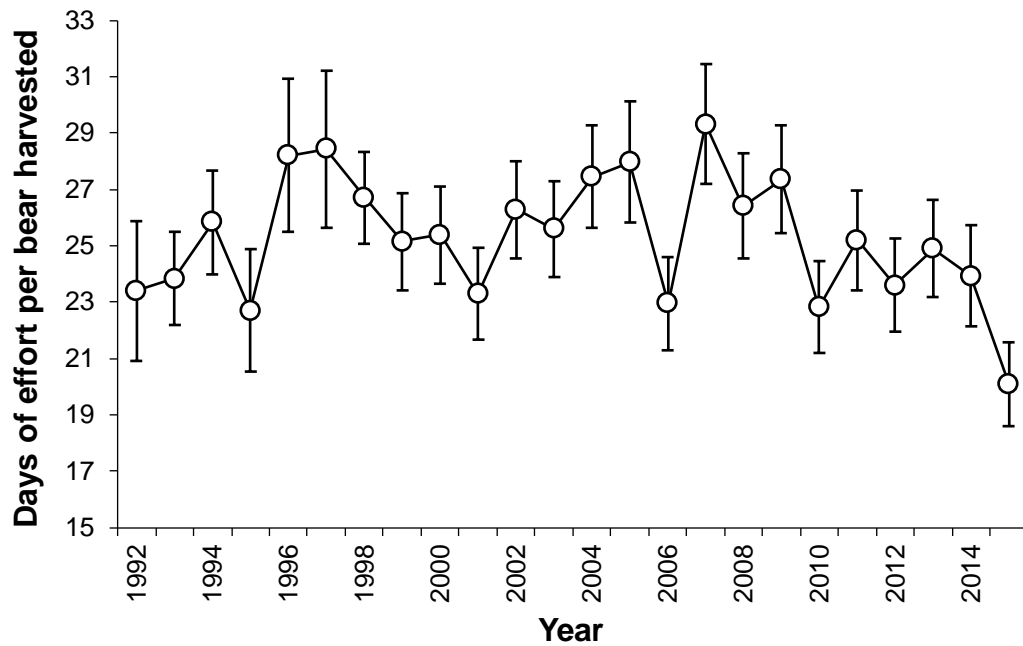
Figure 5. Estimated mean number of days required to harvest a bear statewide in Michigan during 1992-2015. Vertical bars represent the 95% confidence interval.
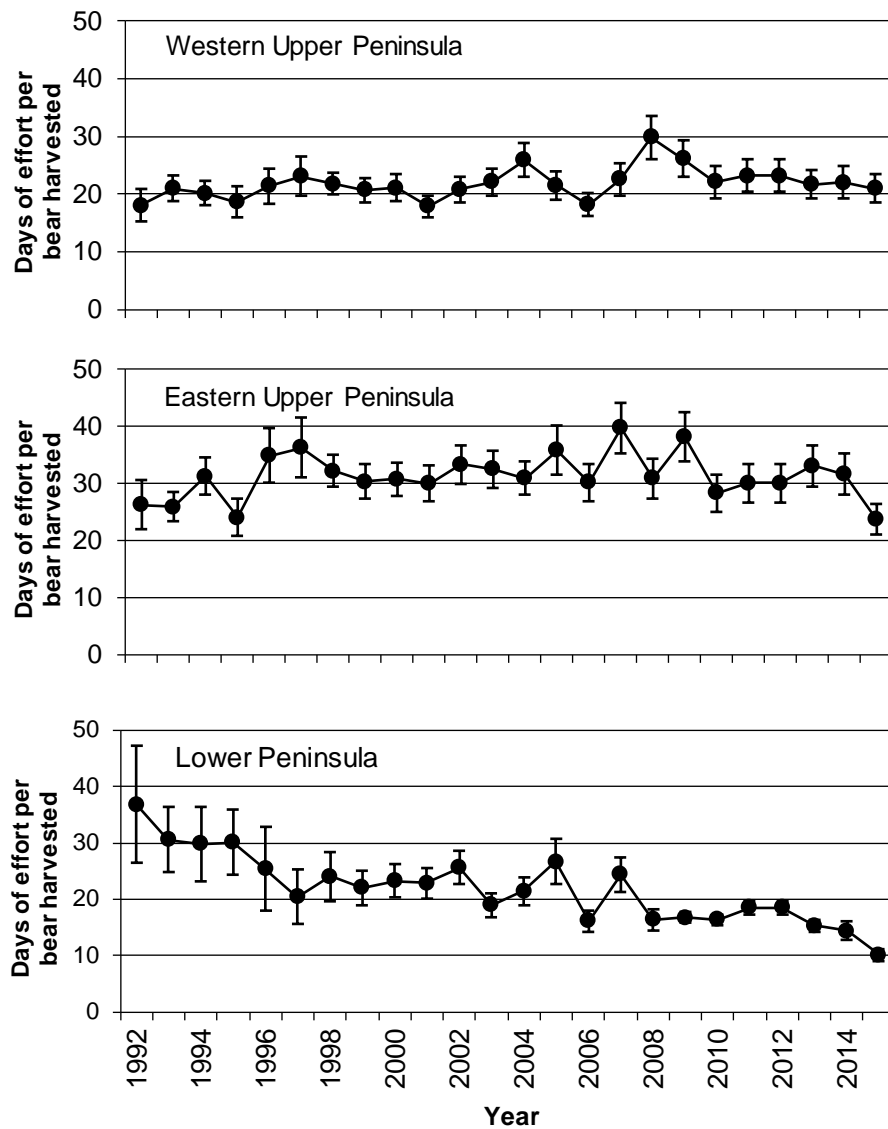
Figure 6. Estimated mean number of days required to harvest a bear in Michigan during 1992-2015, summarized by ecological region. Western UP consisted of Amasa, Baraga, and Bergland units, and Eastern UP consisted of Carney, Gwinn, and Newberry units (Drummond Island Management Unit excluded). Lower Peninsula consisted of Baldwin, Gladwin, and Red Oak management units. Vertical bars represent the 95% confidence interval.
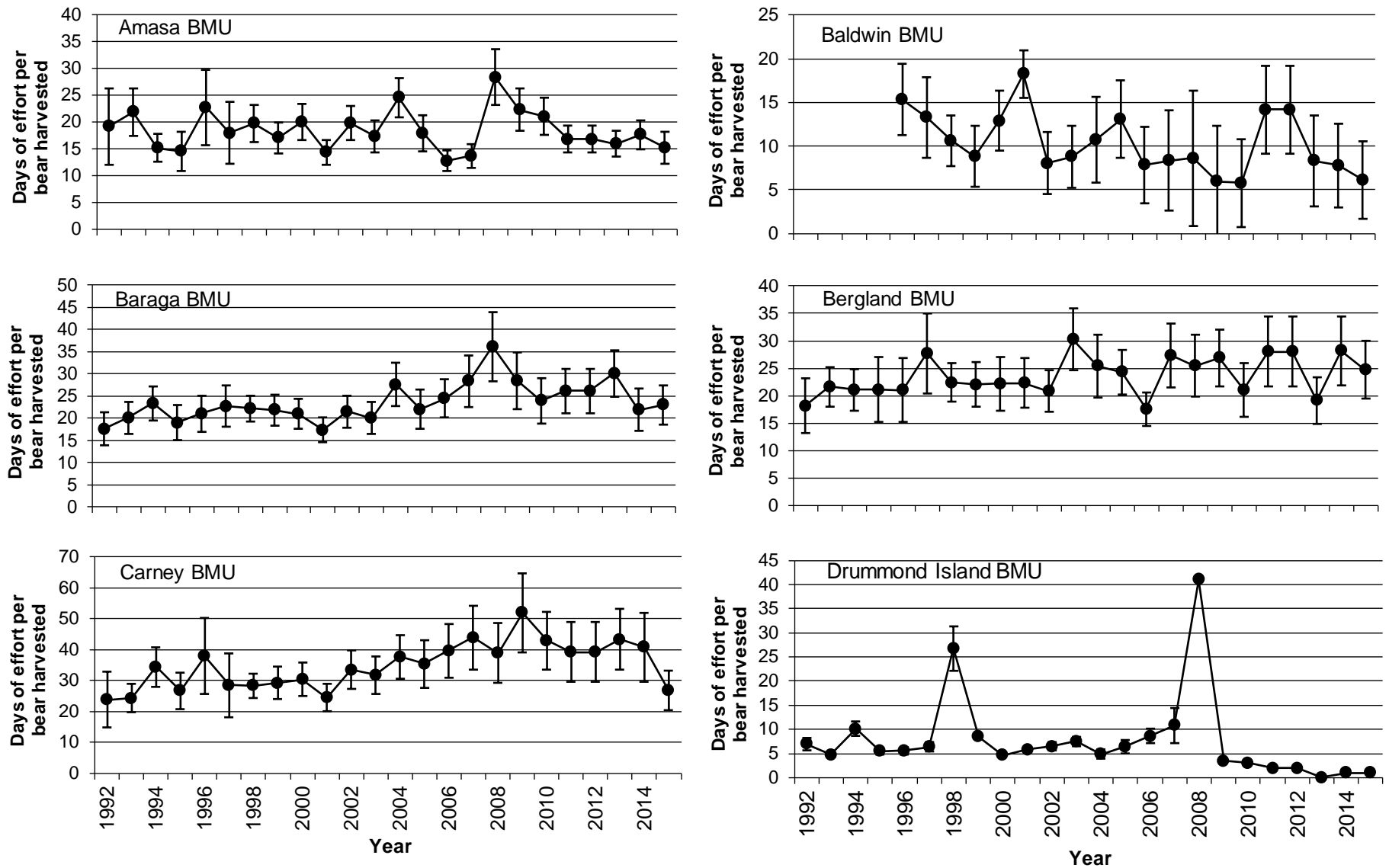
Figure 7. Estimated mean number of days required to harvest a bear in Michigan during 1992-2015, summarized by management unit. Baldwin and Gladwin management units were created in 1996. Vertical bars represent the 95% confidence interval.
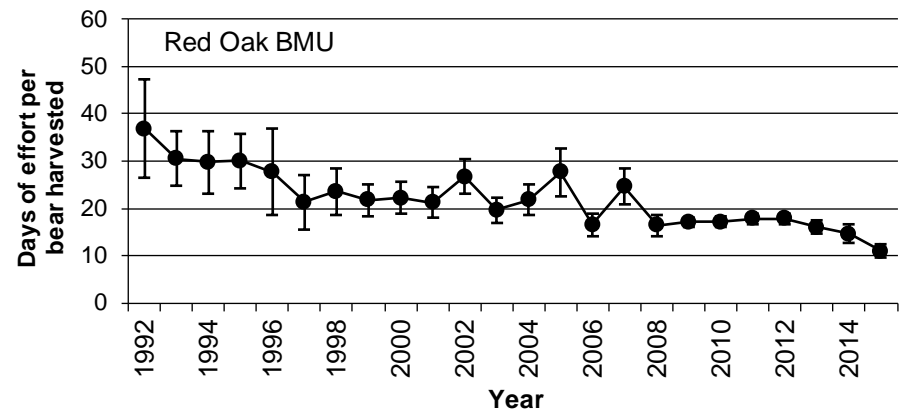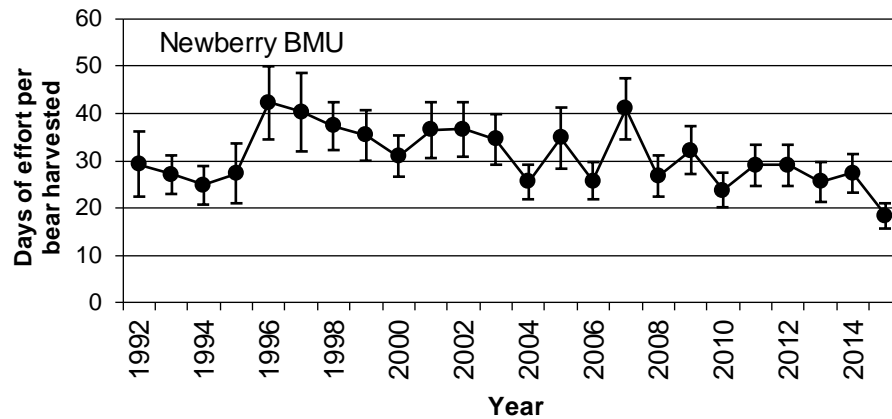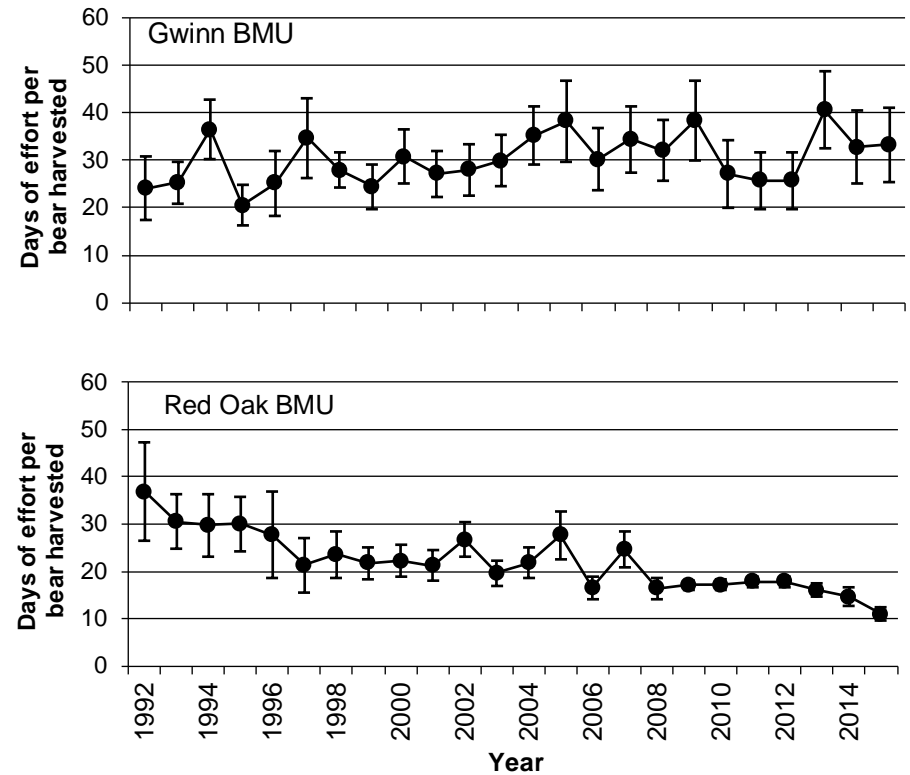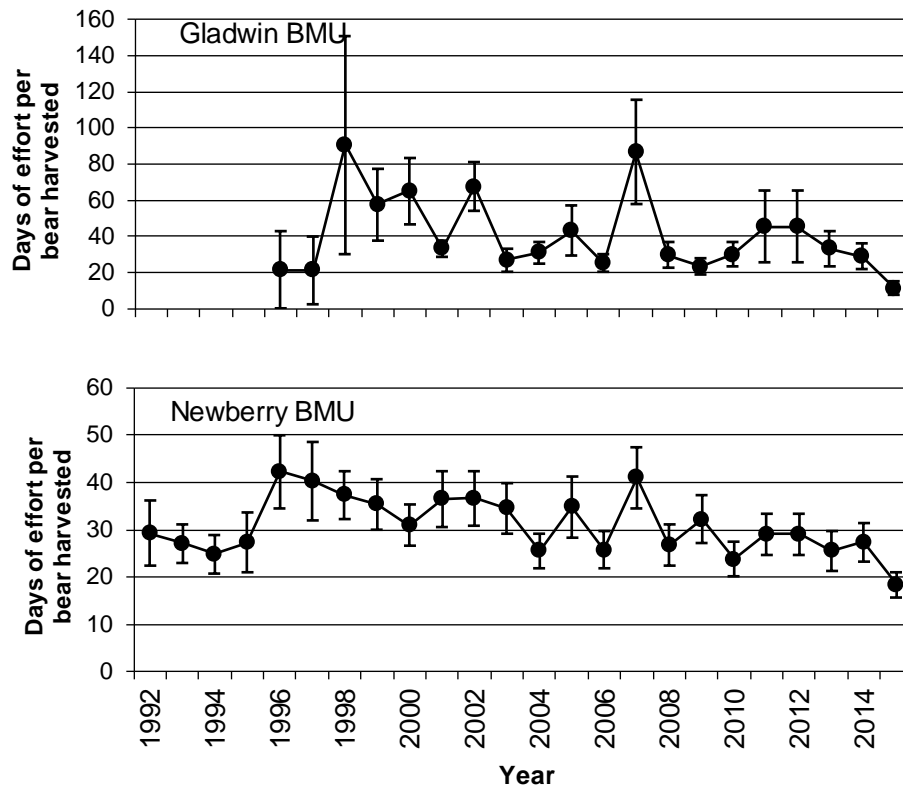
Figure 7 (continued). Estimated mean number of days required to harvest a bear in Michigan during 1992-2015, summarized by management unit. Baldwin and Gladwin management units were created in 1996. Vertical bars represent the 95% confidence interval.
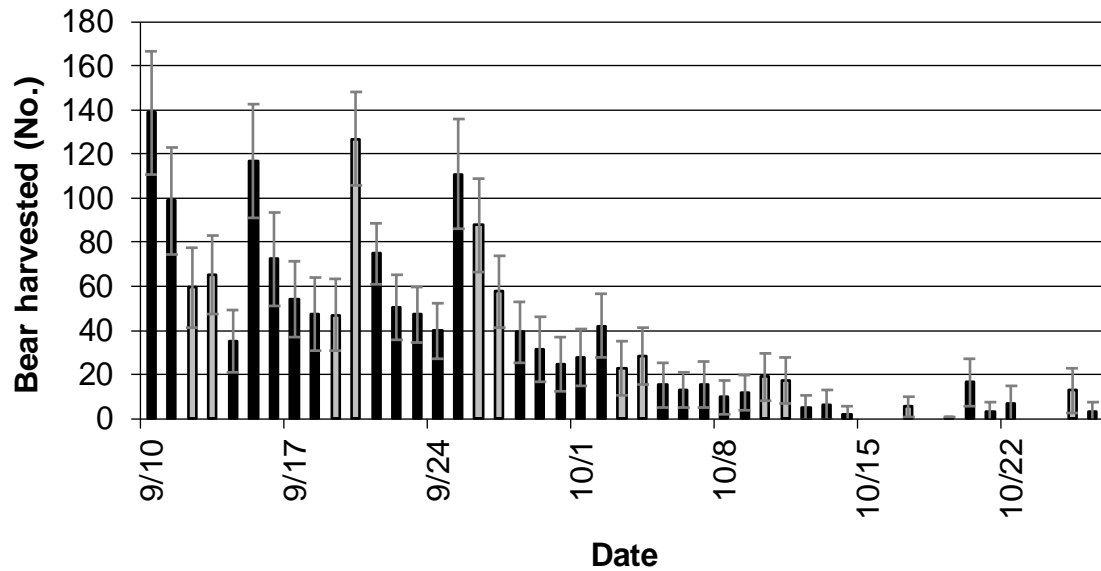
Figure 8. Estimated number of bear harvested by date during the 2015 bear hunting season (includes all hunt periods). Gray-shaded bars indicate weekends. Vertical bars represent the 95% confidence interval. The opening of the bear hunting season was September 10 in the UP and September 20 in the LP (except northern Baldwin Unit). Hunting with dogs in the UP started on September 15.
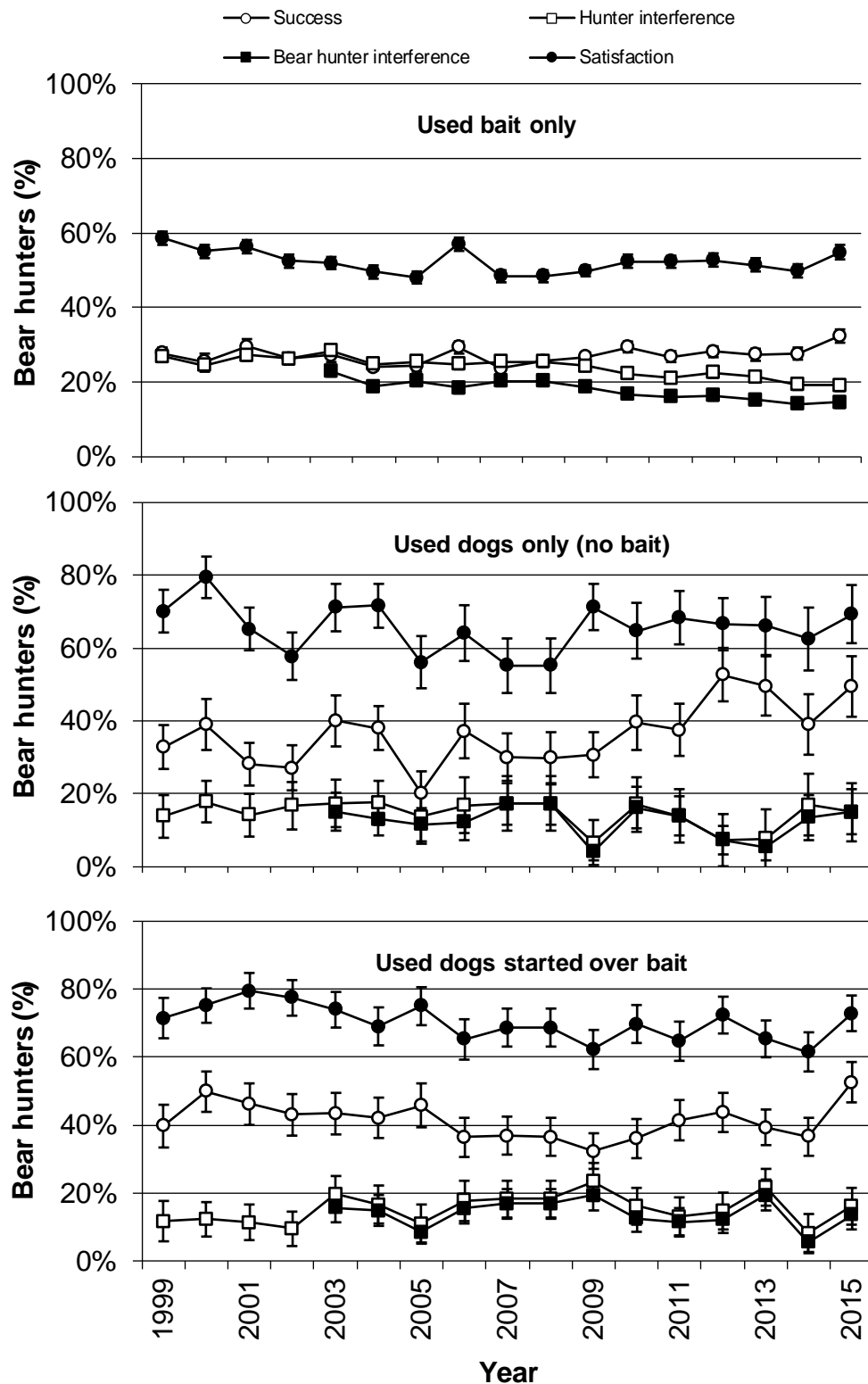
Figure 9. Estimated hunter success, interference, and satisfaction of bear hunters with their hunting experience in Michigan during 1999-2015, summarized by primary method of hunt. Vertical bars represent the 95% confidence interval. Interference was the proportion of hunters indicating they experienced interference from other hunters. Satisfaction was the proportion of hunters rating their hunting experience as very good or good.
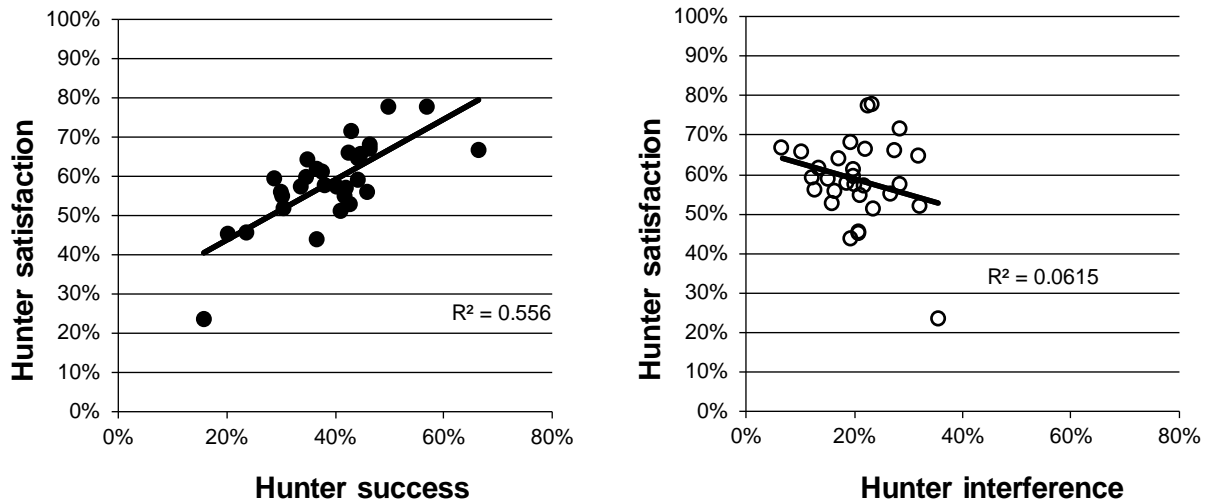
Figure 10. Hunter satisfaction (hunters rating their hunting experience as very good or good) relative to hunter success and hunter interference for 30 counties in Michigan during the 2015 bear hunting season (included only counties with at least 20 hunters). Interference was the proportion of hunters that reported interference from other hunters (all types of hunters).
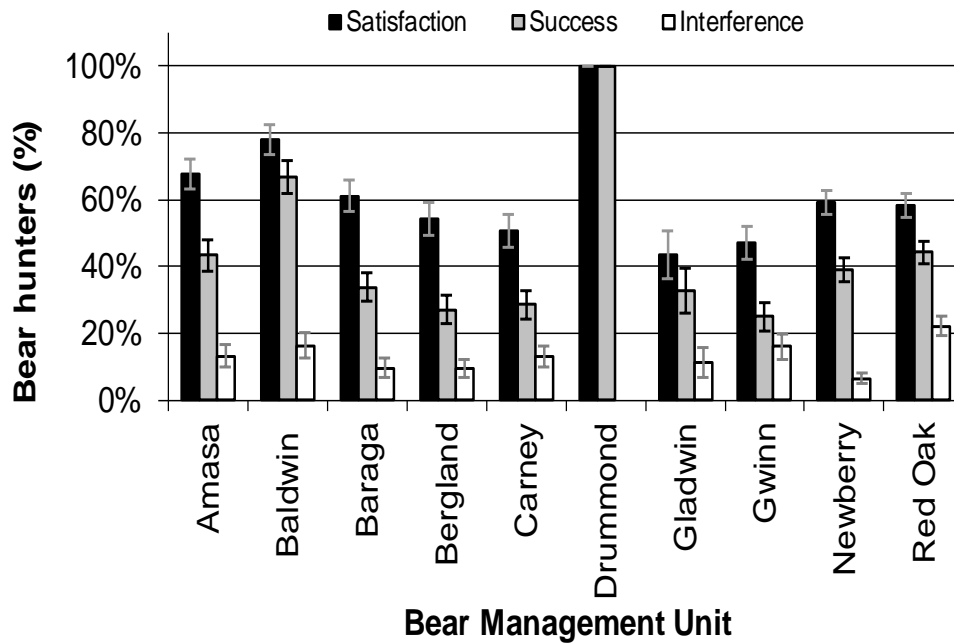
Figure 11. Estimated hunter satisfaction, hunting success, and level of hunter interference in Michigan's bear management units during the 2015 bear hunting season. Satisfaction measures the proportion of hunters rating their hunting experiences as very good or good. Error bars represent the 95% confidence limit. Interference was the proportion of hunters that reported interference from other hunters (all types of hunters).

17

Table 1. Number of people purchasing hunting licenses for the 2015 Michigan bear hunting seasons and number of people selected for survey sample.

Management unit	Licenses available (quota)	Number of eligible applicants[a]	Licenses sold[b]	Number of people included in mail survey sample[c]
Amasa	460	1,941	383	270
Baldwin	80	2,652	73	60
Baraga	1,490	3,326	1,120	472
Bergland	1,090	1,833	834	420
Carney	735	1,761	563	344
Drummond Island	1	174	1	1
Gladwin	90	1,002	74	68
Gwinn	1,165	2,520	860	426
Newberry	1,190	5,729	968	586
Red Oak	650	9,880	585	431
Pure Michigan Hunt	3	NA	3	2
Statewide	6,954	30,818	5,464	3,080
Applicants opting for Preference Point[d]		20,259		

[a]Number of eligible applicants selecting the management unit as their first choice to hunt.
[b]Fewer licenses were sold than the number available because some successful applicants failed to purchase a license.
[c]An additional 322 hunters responded on the internet before the mail sample was selected; these internet responders were used in the calculating survey estimates.
[d]Applicants that chose to receive a preference point rather than enter into the drawing for a hunting license.

Table 2. Estimated number of hunters, harvest, hunter success, hunting effort, mean days hunted, and mean effort per harvested bear during the 2015 Michigan bear hunting season.

Manage-ment Unit	Hunters		Harvest		Hunter success		Hunting effort		Days hunted per hunter ($\bar{x}$)		Days hunted per harvested bear ($\bar{x}$)	
	No.	95% CL[a]	No.	95% CL[a]	%	95% CL[a]	Days	95% CL[a]	Days	95% CL[a]	Days	95% CL[a]
Amasa	362	8	157	18	43	5	2,395	237	6.6	0.6	15.2	2.8
Baldwin	73	0	49	4	67	5	296	23	4.1	0.3	6.1	0.8
Baraga	984	33	334	44	34	4	7,200	656	7.3	0.6	21.5	4.0
Bergland	754	23	205	33	27	4	5,094	451	6.8	0.6	24.8	5.0
Carney	503	16	144	22	29	4	3,848	372	7.6	0.7	26.7	5.9
Drummond Is.	1	0	1	0	100	0	3	0	3.0	0.0	3.0	0.0
Gladwin	71	2	23	5	33	7	273	26	3.8	0.3	11.8	3.4
Gwinn	774	25	195	34	25	4	6,344	637	8.2	0.8	32.6	7.3
Newberry	901	17	352	31	39	3	6,395	453	7.1	0.5	18.2	2.5
Red Oak	567	7	251	20	44	4	2,640	159	4.7	0.3	10.5	1.3
Pure MI Hunt	3	0	2	0	67	0	14	0	4.7	0.0	7.0	0.0
Statewide[b]	4,994	54	1,712	80	34	2	34,502	1,210	6.9	0.2	20.1	1.5

[a]95% confidence limits.
[b]Column totals may not equal statewide totals because of rounding error.

Table 3. Estimated number of hunters, harvest, hunter success, hunting effort, hunter satisfaction, and hunt interference during the 2015 Michigan bear hunting season.

| County | Hunters[a] | | Harvest[a] | | Hunter success | | Hunting effort (days)[a] | | Hunter satisfaction[b] | | Interfered hunters[c] | |
	Total	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	%	95% CL
Alcona	75	14	31	9	42	10	269	75	55	10	27	9
Alger	167	30	63	19	38	9	1,044	265	61	9	20	8
Alpena	56	12	26	8	46	12	223	57	56	12	16	9
Antrim	9	5	5	4	60	29	57	38	80	24	40	29
Arenac	1	0	0	0	0	0	5	0	0	0	0	0
Baraga	433	48	152	33	35	7	2,924	496	64	7	17	5
Bay	0	0	0	0	0	0	0	0	0	0	0	0
Benzie	4	2	2	1	64	23	4	2	100	0	0	0
Charlevoix	7	5	2	2	25	29	27	25	50	33	50	33
Cheboygan	28	9	13	6	46	16	115	45	67	16	7	8
Chippewa	212	27	89	19	42	7	1,501	272	57	7	22	6
Clare	19	5	7	3	34	13	57	18	34	13	29	13
Crawford	25	8	16	7	66	16	79	40	66	16	22	15
Delta	270	38	64	20	24	7	2,228	455	46	8	21	7
Dickinson	221	32	81	20	37	8	1,659	361	44	8	19	6
Emmet	16	7	2	2	11	14	80	43	44	22	44	22
Gladwin	27	5	8	3	31	11	121	26	52	12	32	11

[a]Number of hunters does not add up to statewide total because hunters can hunt in more than one county. Column totals for hunting effort and harvest may not equal statewide totals because of rounding errors.
[b]Proportion of hunters that rated their hunting experience as very good or good.
[c]Proportion of hunters that indicated that they experienced interference from other hunters (all types of hunters).

Table 3 (continued). Estimated number of hunters, hunting effort, harvest, hunter success, hunter satisfaction, and hunt interference during the 2015 Michigan bear hunting season.

County	Hunters[a]		Harvest[a]		Hunter success		Hunting effort (days)[a]		Hunter satisfaction[b]		Interfered hunters[c]	
	Total	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	%	95% CL
Gogebic	323	38	123	27	38	7	2,256	421	58	7	19	6
Gd. Traverse	7	3	7	3	100	0	11	5	82	16	0	0
Houghton	188	36	64	21	34	10	1,153	325	57	10	20	8
Iosco	13	6	7	4	58	23	39	22	58	23	22	17
Iron	250	17	112	16	45	6	1,692	233	66	5	10	3
Isabella	0	0	0	0	0	0	0	0	0	0	0	0
Kalkaska	32	9	5	3	16	8	146	51	23	12	35	14
Keweenaw	86	26	18	11	20	12	651	247	45	16	21	13
Lake	19	3	11	3	61	11	76	20	80	9	34	11
Leelanau	1	0	0	0	0	0	5	0	100	0	0	0
Luce	233	28	81	18	35	7	1,637	299	60	7	20	5
Mackinac	114	21	42	13	37	9	710	186	62	9	13	6
Manistee	4	2	1	1	33	24	11	8	100	0	0	0
Marquette	567	56	172	35	30	5	4,587	670	55	6	21	5
Mason	2	1	0	0	0	0	7	1	100	0	0	0
Mecosta	1	2	0	0	0	0	11	12	0	0	100	0
Menominee	296	25	85	18	29	6	2,278	317	59	6	12	4

[a]Number of hunters does not add up to statewide total because hunters can hunt in more than one county. Column totals for hunting effort and harvest may not equal statewide totals because of rounding errors.
[b]Proportion of hunters that rated their hunting experience as very good or good.
[c]Proportion of hunters that indicated that they experienced interference from other hunters (all types of hunters).

Table 3 (continued). Estimated number of hunters, hunting effort, harvest, hunter success, hunter satisfaction, and hunt interference during the 2015 Michigan bear hunting season.

County	Hunters[a]		Harvest[a]		Hunter success		Hunting effort (days)[a]		Hunter satisfaction[b]		Interfered hunters[c]	
	Total	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	%	95% CL
Midland	0	0	0	0	0	0	0	0	0	0	0	0
Missaukee	33	9	17	7	50	15	156	58	77	11	23	11
Montmorency	71	13	29	9	40	10	291	65	57	10	29	9
Muskegon	0	0	0	0	0	0	0	0	0	0	0	0
Newaygo	13	3	7	2	54	11	58	15	70	12	28	10
Oceana	3	1	1	0	31	10	13	5	100	0	0	0
Ogemaw	25	8	11	5	44	15	95	43	59	15	15	8
Ontonagon	450	48	136	31	30	6	2,726	408	56	6	13	4
Osceola	22	5	9	3	41	11	72	18	51	12	23	10
Oscoda	43	11	18	7	43	13	147	47	66	12	28	12
Otsego	32	10	14	6	43	15	193	76	72	14	28	14
Presque Isle	76	14	32	9	43	10	410	100	53	10	16	7
Roscommon	54	12	24	8	44	11	198	61	65	11	32	11
Schoolcraft	222	27	103	20	47	7	1,604	302	68	7	19	6
Wexford	29	4	17	3	57	9	87	16	78	9	23	9
Unreported	436	49	5	6	1	1	2,791	424	44	6	22	5

[a]Number of hunters does not add up to statewide total because hunters can hunt in more than one county. Column totals for hunting effort and harvest may not equal statewide totals because of rounding errors.
[b]Proportion of hunters that rated their hunting experience as very good or good.
[c]Proportion of hunters that indicated that they experienced interference from other hunters (all types of hunters).

Table 4. Estimated number and proportion of hunters hunting on private and public lands during the 2015 bear hunting season.

	Private land only				Public land only				Both private and public lands				Unknown land			
Management unit	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL
Amasa	149	18	41	5	142	17	39	5	65	13	18	4	6	5	2	1
Baldwin	16	3	21	4	41	4	56	5	17	3	23	4	0	0	0	0
Baraga	294	43	30	4	454	48	46	5	220	39	22	4	17	12	2	1
Bergland	167	31	22	4	457	38	61	5	121	27	16	4	9	8	1	1
Carney	263	25	52	5	143	22	28	4	88	19	17	4	9	7	2	1
Drummond Is.	0	0	0	0	0	0	0	0	1	0	100	0	0	0	0	0
Gladwin	34	5	47	7	25	5	35	7	11	4	15	5	1	2	2	2
Gwinn	271	37	35	5	398	40	51	5	102	26	13	3	3	5	0	1
Newberry	320	31	35	3	421	32	47	3	151	24	17	3	9	6	1	1
Red Oak	284	21	50	4	213	20	38	3	61	13	11	2	9	5	2	1
Pure MI Hunt	1	0	33	0	1	0	33	0	1	0	33	0	0	0	0	0
Statewide	1,798	81	36	2	2,296	88	46	2	837	65	17	1	63	19	1	0

Table 5. Estimated number of days of hunting effort on private and public lands during the 2015 Michigan bear hunting season.

Management unit	Private lands		Public lands		Both private and public lands		Unknown	
	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL
Amasa	1,041	202	843	148	438	138	73	82
Baldwin	78	16	149	20	69	19	0	0
Baraga	2,151	469	2,942	486	2,083	489	24	29
Bergland	1,232	342	2,774	360	1,056	292	32	37
Carney	2,140	319	846	186	852	261	9	13
Drummond Is.	0	0	0	0	3	0	0	0
Gladwin	134	26	97	24	36	15	6	6
Gwinn	2,265	459	3,272	565	801	285	6	10
Newberry	2,224	327	2,703	344	1,453	315	16	14
Red Oak	1,387	147	956	130	250	74	47	36
Pure MI Hunt	7	0	7	0	0	0	0	0
Statewide[a]	12,660	905	14,589	936	7,040	774	212	104

[a]Column totals may not equal statewide totals because of rounding errors.

Table 6. Number of applicants, licenses sold, estimated number of hunters, harvest, hunting effort (days), and hunting success during Michigan bear hunting seasons, 2009-2015.

				Year			
Region	2009	2010	2011	2012	2013	2014	2015
Upper Peninsula							
Applicants	23,086	22,370	20,175	18,880	18,776	17,510	17,284
Licenses sold	7,260	7,786	7,813	5,323	5,408	5,322	4,729
Hunters	6,664	6,975	6,808	4,782	4,871	4,784	4,280
Harvest	1,759	2,046	1,873	1,376	1,350	1,297	1,387
Males (%)	62	57	61	59	60	63	59
Females (%)	38	42	39	41	40	36	41
Unknown (%)	1	0	0	0	0	0	0
Hunter-days	53,197	49,329	49,627	35,348	35,847	33,702	31,279
Hunter success (%)	26	29	28	29	28	27	32
Lower Peninsula							
Applicants	16,020	14,855	13,644	13,224	13,169	12,641	13,534
Licenses sold	1,693	1,187	1,204	900	806	757	732
Hunters	1,592	1,122	1,141	860	754	715	711
Harvest	451	347	313	314	252	256	323
Males (%)	54	54	59	49	55	55	64
Females (%)	46	46	40	51	45	45	36
Unknown (%)	0	0	0	0	0	0	0
Hunter-days	7,697	5,791	5,862	4,385	3,851	3,548	3,209
Hunter success (%)	28	31	27	37	33	36	45
Statewide							
Applicants[a]	56,772	54,937	51,621	51,152	51,715	48,882	51,077
Licenses sold[b]	8,953	8,976	9,020	6,226	6,217	6,082	5,464
Hunters[c]	8,256	8,097	7,949	5,643	5,626	5,499	4,991
Harvest[c]	2,210	2,393	2,187	1,690	1,602	1,552	1,710
Males (%)	60	57	61	57	59	62	60
Females (%)	40	43	39	43	41	38	40
Unknown (%)	0	0	0	0	0	0	0
Hunter-days[c]	60,894	55,120	55,489	39,733	39,699	37,250	34,488
Hunter success (%)[c]	27	30	28	30	28	28	34

[a]Number of applicants statewide included people that applied for a preference point.
[b]Number of license sold statewide included people that received Pure Michigan Hunt licenses, which were valid in both the UP and LP.
[c]Excluded Pure Michigan Hunt licenses.

Table 7. Estimated proportion of hunters that used firearms, crossbows, and archery equipment while hunting bears in Michigan, 2015.

| | Hunting equipment | | | | | | | |
| | Firearms | | Compound, recurve, or long bows | | Crossbows | | Unknown | |
Management unit	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Amasa	85	3	13	3	7	2	0	0
Baldwin	82	4	16	4	7	3	0	0
Baraga	87	3	10	3	10	3	0	0
Bergland	87	3	9	3	8	3	0	0
Carney	84	3	13	3	11	3	0	0
Drummond Is.	100	0	0	0	0	0	0	0
Gladwin	86	5	11	5	4	3	0	0
Gwinn	80	4	16	4	10	3	0	0
Newberry	90	2	7	2	7	2	0	0
Red Oak	90	2	22	3	10	2	0	0
Pure MI Hunt	67	0	33	0	0	0	0	0
Statewide[a]	86	1	12	1	9	1	0	0

[a]Row totals equal more than 100% because hunters could use more than one type of equipment during season.

Table 8. Estimated number of hunters that used firearms, crossbows, and archery equipment while hunting bears in Michigan, 2015.

| | Hunting equipment | | | | | | | |
| | Firearms | | Compound, recurve, or long bows | | Crossbows | | Unknown | |
Management unit	No.	95% CL	No.	95% CL	No.	95% CL	No.	95% CL
Amasa	308	14	48	12	27	9	0	0
Baldwin	60	3	12	3	5	2	0	0
Baraga	861	41	96	27	101	28	0	0
Bergland	652	32	71	20	62	20	0	0
Carney	424	22	66	16	56	15	0	0
Drummond Is.	1	0	0	0	0	0	0	0
Gladwin	61	4	8	3	3	2	0	0
Gwinn	621	36	124	28	79	23	0	0
Newberry	812	24	59	15	61	16	0	0
Red Oak	509	14	126	17	55	12	0	0
Pure MI Hunt	2	0	1	0	0	0	0	0
Statewide[a]	4,312	74	611	54	448	50	0	0

[a]Row totals equal more than the estimated number of hunters in the unit because hunters could use more than one type of equipment during season.

Table 9. Estimated proportion of bears harvested by firearms, crossbows, and archery equipment during the 2015 bear hunting season in Michigan.

	Hunting equipment							
	Firearms		Compound, recurve, or long bows		Crossbows		Unknown	
Management unit	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Amasa	85	3	13	3	7	2	0	0
Baldwin	82	4	16	4	7	3	0	0
Baraga	87	3	10	3	10	3	0	0
Bergland	87	3	9	3	8	3	0	0
Carney	84	3	13	3	11	3	0	0
Drummond Is.	100	0	0	0	0	0	0	0
Gladwin	86	5	11	5	4	3	0	0
Gwinn	80	4	16	4	10	3	0	0
Newberry	90	2	7	2	7	2	0	0
Red Oak	90	2	22	3	10	2	0	0
Pure MI Hunt	67	0	33	0	0	0	0	0
Statewide	86	1	12	1	9	1	0	0

Table 10. Estimated number of bears harvested during the 2015 bear hunting season in Michigan, summarized by hunting equipment used to take the bear.

	Hunting equipment							
	Firearms		Compound, recurve, or long bows		Crossbows		Unknown	
Management unit	No.	95% CL	No.	95% CL	No.	95% CL	No.	95% CL
Amasa	143	17	8	5	6	5	0	0
Baldwin	39	4	9	3	1	0	0	0
Baraga	306	43	17	11	11	8	0	0
Bergland	188	32	10	8	7	7	0	0
Carney	123	21	9	7	11	7	0	0
Drummond Is.	1	0	0	0	0	0	0	0
Gladwin	19	5	3	2	1	2	0	0
Gwinn	158	31	25	14	11	8	0	0
Newberry	330	31	10	6	12	7	0	0
Red Oak	216	20	20	7	12	6	2	2
Pure MI Hunt	2	0	0	0	0	0	0	0
Statewide	1,527	78	111	23	73	18	2	2

Table 11. Primary hunting methods used to hunt bear in Michigan, 2015.
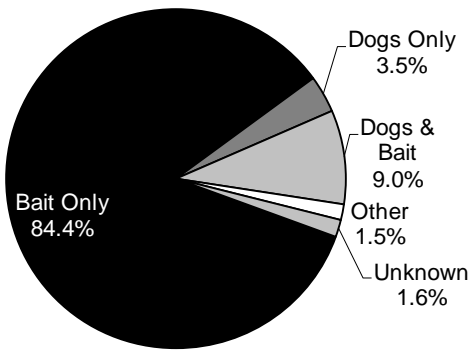
Method	Number of hunters	95% CL	Method used (%)
Bait only	4,213	77	
Dogs only	177	29	
Dogs and bait	448	51	
Other	74	22	
Unknown	82	23	

Dogs Only 3.5%
Dogs & Bait 9.0%
Bait Only 84.4%
Other 1.5%
Unknown 1.6%

Table 12. Number and proportion of hunters that used bait containing chocolate or cocoa derivatives during the legal bear baiting and hunting periods in Michigan during 2015.[a]

Management unit	%	95% CL	No.	95% CL
Amasa	13	3	46	12
Baldwin	18	4	14	3
Baraga	15	3	144	33
Bergland	20	4	154	30
Carney	24	4	120	21
Drummond Island	0	0	0	0
Gladwin	23	6	16	4
Gwinn	21	4	161	31
Newberry	17	3	155	24
Red Oak	19	3	106	16
Pure MI Hunt	0	0	0	0
Statewide	18	1	916	66

[a]Bait was allowed from 31 days before the start of the bear hunting season until the end of the season. It was illegal to establish a bait station that attracted bear prior to August 10 and after October 26 in Amasa, Bergland, Baraga, Carney, Gwinn, and Newberry units; prior to August 10 and after October 21 in Drummond Island Unit; prior to August 11 and after September 26 in the Baldwin north area, prior to August 20 and after September 28 in Baldwin, Gladwin, and Red Oak units, and prior to September 2 and after October 8 in the Red Oak bow and arrow-only season.

Table 13. Hunting methods used to harvest bear in Michigan, 2015.
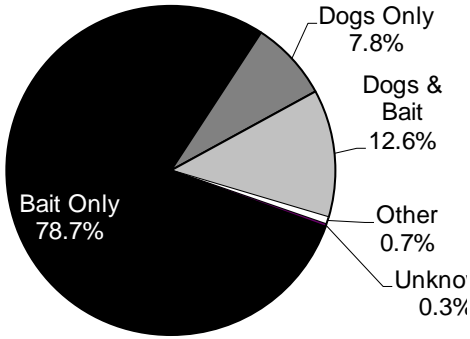
Method	Number of hunters	95% CL	Method used (%)
Bait only	1,346	74	
Dogs only	134	26	
Dogs and bait	215	35	
Other	12	10	
Unknown	4	3	

Method used (%)

Dogs Only 7.8%
Dogs & Bait 12.6%
Bait Only 78.7%
Other 0.7%
Unkno 0.3%

Table 14. Hunters' level of satisfaction with the number of bear seen during the 2015 bear hunting season.

	Satisfaction level							
Management unit	Very good or good		Neutral		Poor or very poor		No answer or not applicable	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Amasa	53	5	12	3	27	4	8	3
Baldwin	68	5	12	3	17	4	3	2
Baraga	36	4	20	4	34	4	9	3
Bergland	34	5	16	4	41	5	9	3
Carney	41	5	15	3	35	5	10	3
Drummond Is.	100	0	0	0	0	0	0	0
Gladwin	26	6	5	3	49	7	20	6
Gwinn	32	5	19	4	39	5	10	3
Newberry	40	3	17	3	32	3	12	2
Red Oak	43	4	12	2	37	3	8	2
Pure MI Hunt	67	0	33	0	0	0	0	0
Statewide	39	2	16	1	35	2	10	1

Table 15. Hunters' level of satisfaction with the number of opportunities to take a bear during the 2015 bear hunting season.

	Satisfaction level							
	Very good or good		Neutral		Poor or very poor		No answer or not applicable	
Management unit	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Amasa	45	5	14	3	27	4	14	3
Baldwin	51	5	22	4	23	4	5	3
Baraga	34	4	16	3	36	5	14	3
Bergland	28	4	17	4	38	5	16	4
Carney	31	4	15	3	37	5	17	4
Drummond Is.	100	0	0	0	0	0	0	0
Gladwin	21	6	4	3	44	7	31	7
Gwinn	25	4	15	4	42	5	18	4
Newberry	38	3	14	2	31	3	17	3
Red Oak	41	4	9	2	38	4	12	2
Pure MI Hunt	67	0	33	0	0	0	0	0
Statewide	34	2	15	1	36	2	16	1

Table 16. Hunters' level of satisfaction with overall bear hunting experience during the 2015 bear hunting season.

	Satisfaction level							
	Very good or good		Neutral		Poor or very poor		No answer or not applicable	
Management unit	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Amasa	68	4	12	3	16	3	4	2
Baldwin	78	5	12	4	8	3	2	2
Baraga	61	5	18	4	16	3	5	2
Bergland	54	5	17	4	24	4	4	2
Carney	51	5	19	4	25	4	6	2
Drummond Is.	100	0	0	0	0	0	0	0
Gladwin	43	7	15	5	31	7	10	5
Gwinn	47	5	20	4	29	5	4	2
Newberry	59	3	18	3	18	3	5	2
Red Oak	58	4	11	2	27	3	4	1
Pure MI Hunt	100	0	0	0	0	0	0	0
Statewide	57	2	17	1	22	1	5	1

Table 17. Number and proportion of hunters that experienced interference with another hunter during the 2015 bear hunting season.

Management unit	Hunters interfered by other hunters (all types of hunters)				Hunters interfered by other bear hunters			
	%	95% CL	No.	95% CL	%	95% CL	No.	95% CL
Amasa	11	3	40	11	9	3	31	10
Baldwin	22	5	16	3	17	4	12	3
Baraga	16	3	160	35	15	3	145	33
Bergland	16	4	123	27	14	3	108	26
Carney	17	4	84	18	11	3	53	15
Drummond Is.	0	0	0	0	0	0	0	0
Gladwin	31	7	22	5	12	5	9	3
Gwinn	22	4	169	32	17	4	130	29
Newberry	20	3	180	25	15	3	139	23
Red Oak	24	3	136	18	16	3	88	15
Pure MI Hunt	0	0	0	0	0	0	0	0
Statewide	19	1	931	66	14	1	717	61

Table 18. Number and proportion of hunters that used a hunting guide during the 2015 bear hunting season.

Management unit	%	95% CL	No.	95% CL
Amasa	15	3	54	12
Baldwin	22	4	16	3
Baraga	12	3	121	30
Bergland	15	3	114	26
Carney	8	3	41	13
Drummond Island	100	0	1	0
Gladwin	8	4	6	3
Gwinn	10	3	79	23
Newberry	16	3	149	23
Red Oak	8	2	47	11
Pure MI Hunt	67	0	2	0
Statewide	13	1	631	56

Table 19. Hunting methods used by guides to hunt bear in Michigan, 2015.

Management unit	Hunted over bait only		Used dogs only (no bait)		Used dogs started over bait		Used other method		Unknown method	
	No.	95% CL	No.	95% CL	No.	95% CL	No.	95% CL	No.	95% CL
Amasa	91	5	0	0	2	0	0	0	7	5
Baldwin	84	9	8	7	8	7	0	0	0	0
Baraga	84	9	3	5	6	6	0	0	7	6
Bergland	89	7	0	0	3	4	0	0	9	6
Carney	63	15	5	8	24	14	0	0	7	2
Drummond Island	0	0	0	0	100	0	0	0	0	0
Gladwin	50	27	50	27	0	0	0	0	0	0
Gwinn	63	15	4	6	27	14	0	0	6	6
Newberry	77	7	13	6	3	3	0	0	7	3
Red Oak	62	11	24	9	12	8	0	0	2	0
Pure MI Hunt	50	0	0	0	50	0	0	0	0	0
Statewide	78	4	7	2	9	3	0	0	7	2

Appendix A

2015 Michigan Bear Harvest Questionnaire

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

2015 MICHIGAN BEAR 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 report even if
you did not hunt or harvest a bear. If you want to provide your answers via the internet,
visit our website at https://secure1.state.mi.us/wildlifesurveys/bear.aspx.*

---

1. **Did you hunt bear in Michigan during the 2015 season?**

   [1] ☐ Yes   [2] ☐ No; (If you select "No", you are finished. Please return the survey.)

2. **Please report the number of days for each county that you hunted bear in the following table.**

COUNTY HUNTED (List each county that you hunted for bear; for example, Marquette County)	NUMBER OF DAYS HUNTED	TYPE OF LAND		
		[1] ☐ Private	[2] ☐ Public	[3] ☐ Both
		[1] ☐ Private	[2] ☐ Public	[3] ☐ Both
		[1] ☐ Private	[2] ☐ Public	[3] ☐ Both
		[1] ☐ Private	[2] ☐ Public	[3] ☐ Both
		[1] ☐ Private	[2] ☐ Public	[3] ☐ Both

3. **Did you hunt with a firearm, crossbow, or bow during the 2015 bear season?**
   (select all that apply)

   [1] ☐ Firearm   [2] ☐ Crossbow   [3] ☐ Bow (recurve, compound, or long bow)

4. **What hunting method did you use most often when hunting bear in Michigan during the 2015 bear season?** (P*lease select only one item.*)

   [1] ☐ Hunted over bait only   [2] ☐ Used dogs only (bait not used)

   [3] ☐ Used dogs started over bait   [4] ☐ Used other methods not involving dogs or bait

5. **If you used bait to attract bears, what was the total number of gallons you used during the legal baiting and hunting periods?**

   _____
   Please write in gallons used.

6. **If you used bait, did you use bait containing chocolate or any cocoa derivative?**

   [1] ☐ Yes   [2] ☐ No   [3] ☐ Not sure

Please continue on back

7. At any time during the 2015 season, did you hire a guide's service to hunt bear in Michigan?

¹ ☐ Yes   ² ☐ No (*If no, please skip to question 8.*)

7. If yes, what hunting techniques were used most often by the guide? (P*lease select only one item.*)

¹ ☐ Hunted over bait only   ² ☐ Used dogs only (bait not used)

³ ☐ Used dogs started over bait   ⁴ ☐ Used other methods not involving dogs or bait

8. Did you kill a bear and place your harvest tag on it?

¹ ☐ Yes   ² ☐ No (*If no, please skip to question 10.*)

9. If your harvest tag was put on a bear, please fill in the information below

a. What date was the bear harvested?
(*please check [X] the box for the date of harvest*)

September 2015						
S	M	T	W	T	F	S
				10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

October 2015						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26					

b. What was the sex of the bear?

¹ ☐ Male   ² ☐ Female   ³ ☐ Not sure

c. In what county was it harvested?   _____
please write in county name

d. On what type of land was the bear harvested?

¹ ☐ Private   ² ☐ Public

e. What weapon was used to harvest bear?

¹ ☐ Firearm   ² ☐ Crossbow   ³ ☐ Bow (recurve, compound, or long bow)

f. What was the method of harvest?

¹ ☐ Taken over bait   ² ☐ Used dogs only (bait not used)

³ ☐ Used dogs started over bait   ⁴ ☐ Used other methods not involving dogs or bait

g. If you used a hunting guide, was your hunting guide responsible for your success in taking a bear? (You can skip this question if you did not use a hunting guide.)

¹ ☐ Yes   ² ☐ No   ³ ☐ Not sure

10. Did other hunters interfere with your bear hunting?   ¹ ☐ Yes   ² ☐ No (*Skip to question 12.*)

11. If you answered "yes" to the previous question, was the interference caused by other bear hunters?   ¹ ☐ Yes   ² ☐ No

12. How would you rate the following for your 2015 bear hunting season:
(Select one choice per item.)

	Very Good	Good	Neutral	Poor	Very Poor	Not Applicable
a. Number of bear you saw.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
b. Number of opportunities you had to take a bear.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐
c. Your overall bear hunting experience.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐

Return the completed report in the enclosed postage-paid envelope. Thanks for your help.