State of California
Natural Resources Agency
Department of Fish and Wildlife

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BLACK BEAR TAKE REPORT 2017

August 28, 2018

Wildlife Branch

1010 Riverside Parkway

West Sacramento, CA 95605

Executive Summary

The 2017 California black bear hunting season resulted in 1,418 bears taken, representing a 32.3% increase from the 2016 season harvest of 1,072 bears. A total of 27,846 bear tags were issued. Overall hunter success was 5.1%. The success rate among hunters who reported an attempt to hunt was 9.7%. The bear hunting season ran its full length and closed December 31, 2017. The top five counties for reported take were: Shasta (9.5%), Trinity (9.2%), Plumas (7.4%), Siskiyou (7.1%) and Mendocino (6.7%). In the Private Lands Management (PLM) Program for 2017, there were 28 licensees that turned in their general tags for PLM bear tags and resulted with a program harvest of one bear.

Of the returned harvest report tags that reported sex, 40.17% (564) indicated a female was taken. Of the successful bear hunters who reported effort, approximately 82.5% (1,136) indicated they spent 7 days or less in pursuit of bear. Lastly, bears killed with the assistance of guides only accounted for 0.5% of the total bears harvested. A premolar tooth was collected from the majority of hunter-killed bears (1,175) for age determination, which is one factor used to estimate the total population size within the bear hunt areas. From this analysis, the California Department of Fish and Wildlife (Department) produced an estimate of 23,397 (±7,176) bears in the area encompassed by the black bear hunt zone prior to the start of the 2017 bear hunting season. As bears occupy habitats outside the 2017 hunt areas, the statewide population is likely greater than this estimate. The Department expects that the relatively lower population estimates found since 2013 are an artifact of reduced annual harvests rather than a true reflection of reduced population size. The Department's modeling method is explained in further detail in the Estimated Population Size section of this report.

Introduction

The primary goal of the Department's black bear management program is to maintain a viable and healthy black bear population. To attain this goal, the Department manages bears in accordance with the Black Bear Management Plan (1998), which provides guidance for balancing the needs of this species with the diverse economic and recreational needs of the people of California. This plan was developed in accordance with the state's policy regarding wildlife resources (Fish and Game Code Section 1801), which states the following goals:

a.) To provide for the beneficial use and enjoyment of wildlife by all citizens of the state;
b.) To perpetuate all species for their intrinsic and ecological values;
c.) To provide aesthetic, educational, and non-appropriative uses;
d.) To maintain diversified recreational uses of wildlife including sport hunting;
e.) To provide for economic contributions to the citizens of the state through the recognition that wildlife is a renewable resource; and
f.) To alleviate economic losses or public health and safety problems caused by wildlife.

In order for the state to meet these goals, the Legislature has delegated the power to regulate the take and possession of bears- amongst other wildlife- to the California Fish and Game Commission. The Commission, in consultation with Department staff, reviews the factors which may affect the long-term health and viability of the black bear population. These factors are presented in the Black Bear

Management Plan as a monitoring matrix (see Table 3), and the results of such monitoring are presented herein.

In 1957, the Commission initiated a tag reporting system for black bears taken in California. The black bear harvest tag reporting system enables the Department to monitor both the bear population and hunter's bear-hunting patterns by collecting harvest attributes via a self-administered questionnaire. Since 1982, all bear tag holders have been required to return their bear harvest report tags to the Department whether or not they successfully took a black bear. Since 2013, successful bear hunters have been able to complete their tag questionnaire on-line through the Department's Automated License Data System (ALDS). The data obtained from these harvest tag reports comprise a substantial portion of this report.
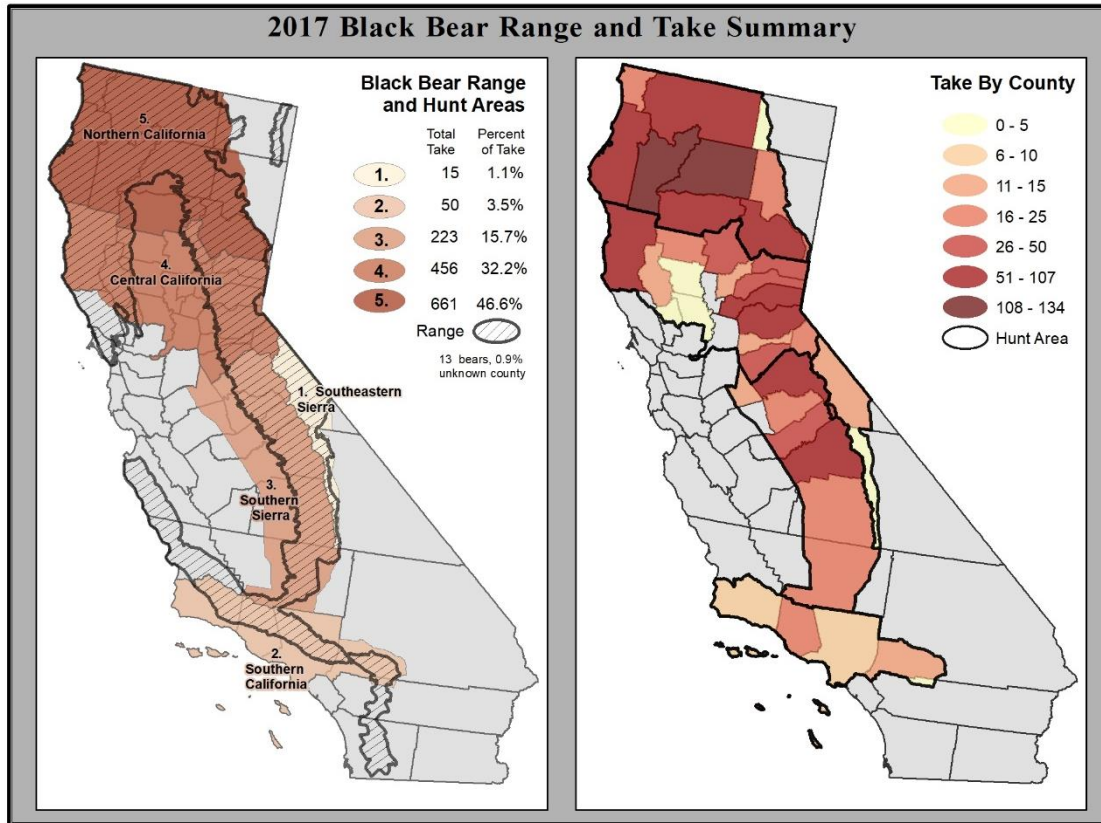
In addition to the data derived from the on-line reported or returned harvest report tags, the Department also relies on age estimates of bears taken during the season to develop population abundance estimates. Age data are obtained from bear premolar teeth extracted from hunter-killed bears. The age-at-harvest data provide insight to the age structure of bears taken during the season. Furthermore, the Department utilizes age-at-harvest data in conjunction with sex ratio information in a population estimation model to monitor population trends. The results of these analyses are also presented in this report.

Summary of 2017 Bear Hunting Regulations

Black bears are widely distributed in California forests and ranges, with Department bear hunt areas encompassing approximately 86.6% of the total estimated bear range (Figure 1). The 2017 general bear season opened concurrently with the opening of the general deer season in the A, B, C, D, X8, X9a, X9b, X10 and X12 deer hunting zones. In the remaining portions of the state where bear hunting is permissible, the general bear season opened on the second Saturday in October. Additionally, persons possessing a valid bear tag were able to hunt during a 23-day archery-only season from mid-August to early September. The 2017 general bear season was to close when the Department received report of 1,700 bears taken, or on December 31, whichever occurred first.

There was no limit on bear tag sales. The bag and possession limit is one adult bear per hunter. Cubs and females accompanied by cubs may not be taken. Cubs are defined as bears less than one year of age or weighing less than 50 pounds. Beginning in 2013, the use of dogs to take bear was unlawful during both the bear archery season and the general bear season.

Figure 1. Black Bear Range and Take Summary

2017 Black Bear Range and Take Summary

Black Bear Range and Hunt Areas

	Total Take	Percent of Take
1.	15	1.1%
2.	50	3.5%
3.	223	15.7%
4.	456	32.2%
5.	661	46.6%

Range

13 bears, 0.9% unknown county

Take By County

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 25
- 26 - 50
- 51 - 107
- 108 - 134
- Hunt Area

2017 Hunt Season Results

Season Length
The 2017 archery bear hunting season opened statewide on August 19 and ended on September 10. The general bear hunting season opened concurrently with general deer hunting season in the A, B, C, D, X8, X9a, X9b, X10, and X12 deer hunting zones. In the remaining deer hunting X zones, bear season commenced October 14 (the second Saturday in October). The bear season closed on December 31 (the last Sunday in December) pursuant to California Code of Regulations, Title 14, section 365, making it the seventh season since 2010 that the bear season did not close early.

Tag Sales
27,846 bear hunting tags were sold for the 2017 bear season. The total consisted of 27,752 resident bear tags and 94 non-resident bear tags. Total bear tag sales in 2017 was 2.2% (593) higher than 2016 bear tag sales (27,172) and 10.9% higher than the previous ten years' average. Non-resident bear tag sales increased by a total of 16.1% (13) from 2016 sales (81) with resident bear tag sales increasing by 2.1% (580) over 2016 sales. This reflects an overall revenue increase of $28,082 from 2016.

Total Take and Sex Composition

During the 2017 black bear hunting season, 1,418 bears were taken. The 2017 bear take was 32.3% (346) higher than the 2016 hunt year (Figure 2) and 10.7% (151) higher than the previous three years' average take of 1,267 bears. Of the 1,418 bears taken, 840 (59.2%) were male, 564 (39.8%) were female, and 14 (1.0%) harvest report tags did not report sex (Figure 3).

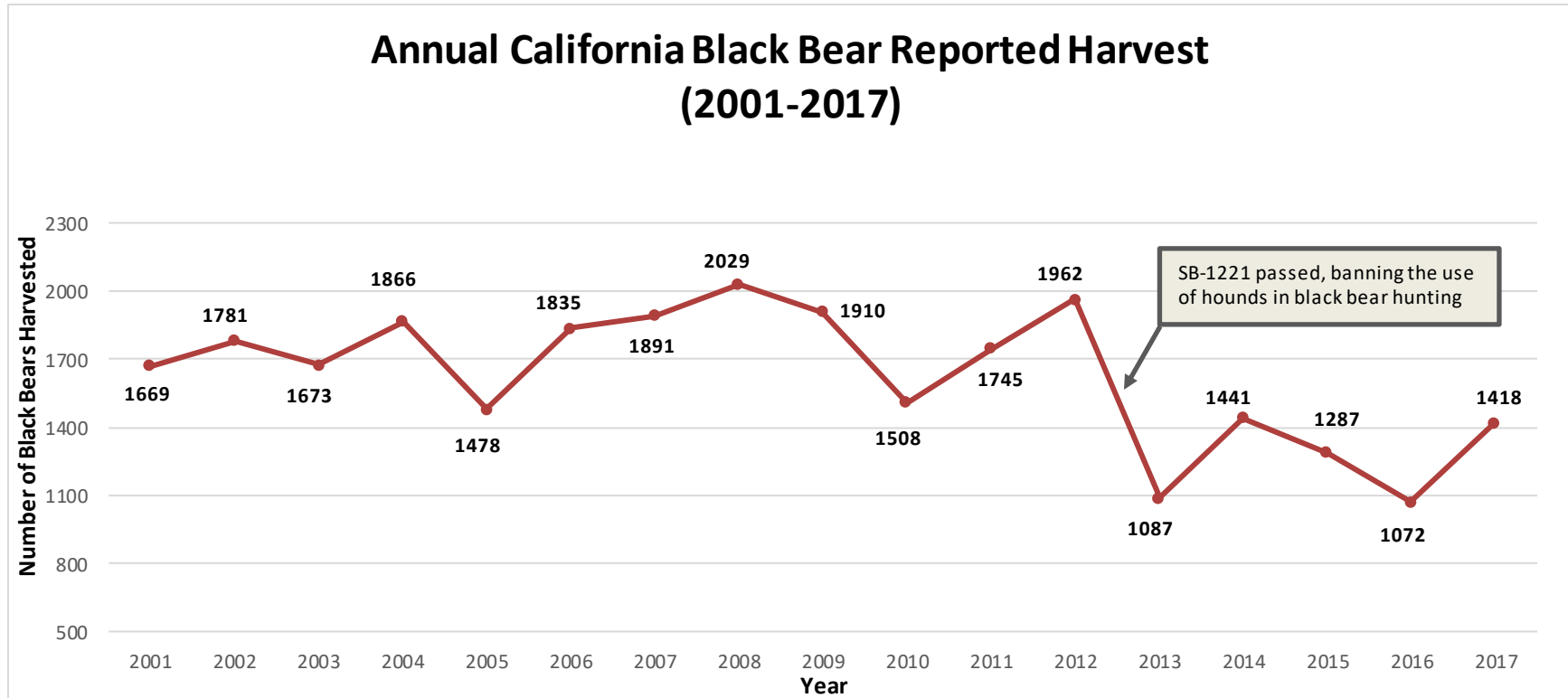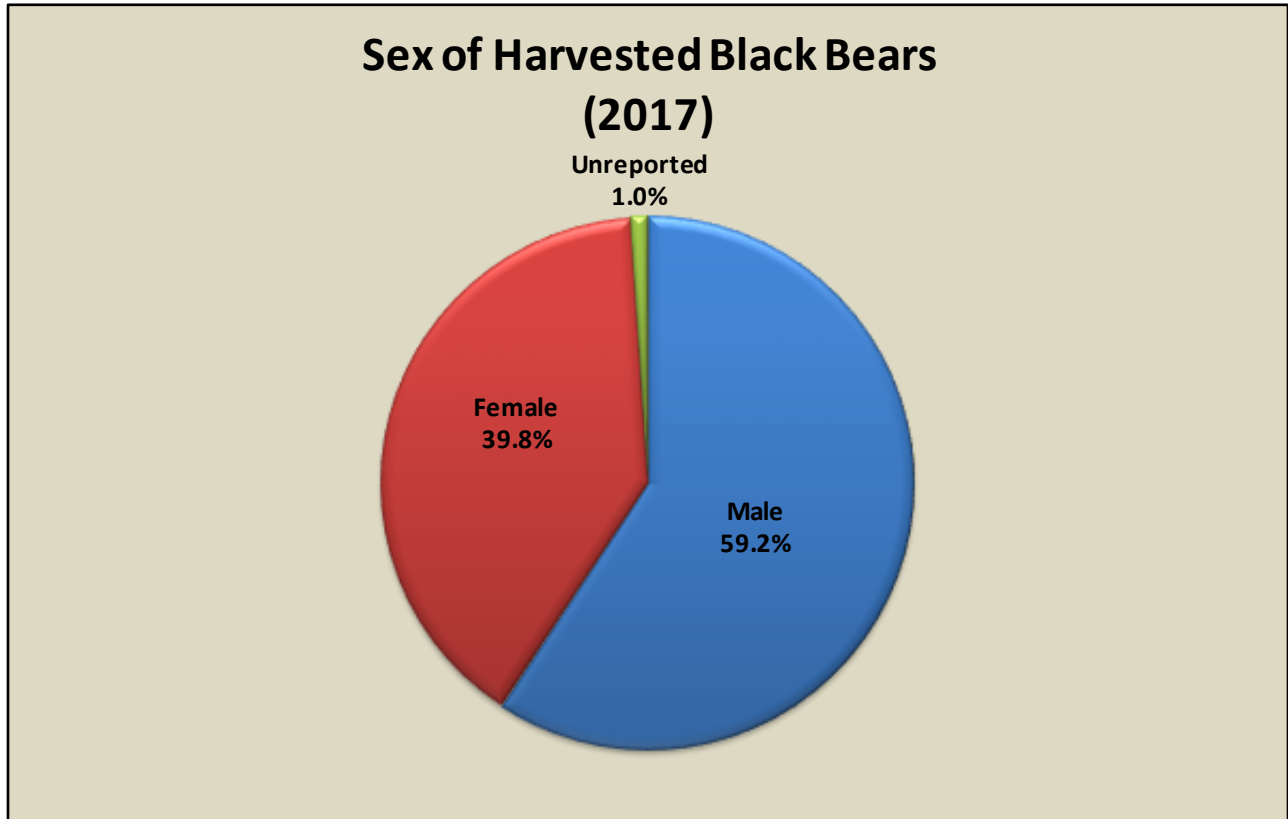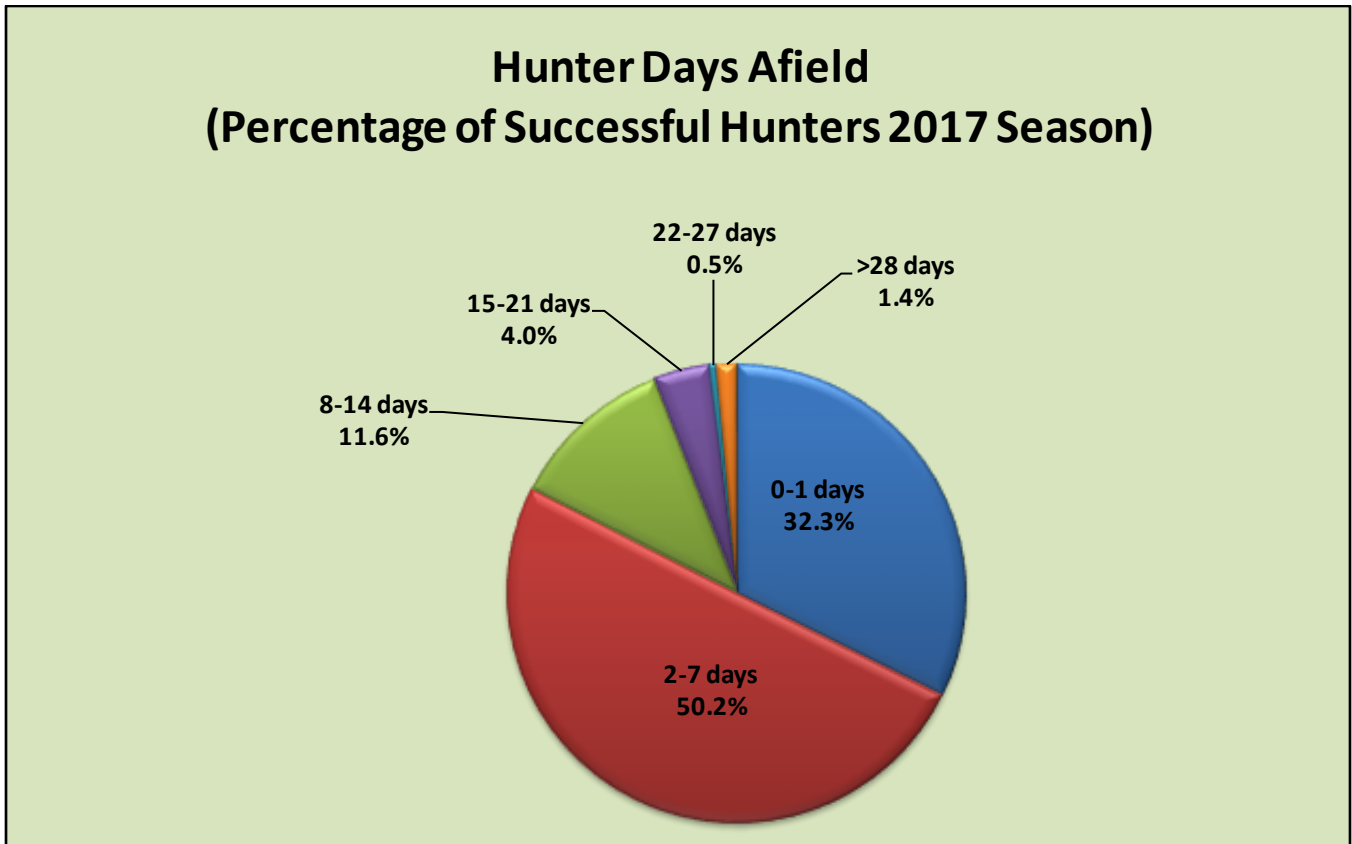Photo Courtesy of CDFW Flickr®.

Figure 2. Annual Black Bear Take

Annual California Black Bear Reported Harvest
(2001-2017)

Figure 3. Bear Take Sex Composition

Sex of Harvested Black Bears (2017)

- Unreported 1.0%
- Female 39.8%
- Male 59.2%

Hunter Effort

Similar to 2016, most bear hunters that were successful in harvesting a bear spent a week or less afield (Figure 4). Of the successful hunters who reported number of days hunting before take, 32.3% spent a day or less in the field while 50.2% spent 2 to 7 days in the field. The remaining 17.5% reported spending 8 or more days in the field. Successful hunters reporting effort spent an average of 4.6 days in the field before taking a bear. The 2017 season average represents a 14.8% increase in days spent afield for hunters when compared with the average of 5.4 days afield in the 2016 black bear hunting season.

Figure 4. Hunter Effort

Hunter Days Afield
(Percentage of Successful Hunters 2017 Season)

22-27 days
0.5%

>28 days
1.4%

15-21 days
4.0%

8-14 days
11.6%

0-1 days
32.3%

2-7 days
50.2%

Methods of Take

There are various methods by which Californians can legally harvest a bear. Of those who responded, the use of rifles accounted for 87.2% of bear take, followed by archery equipment (9.5%). Four archers used disabled archer licenses. Shotgun, pistol, muzzleloader, and crossbow comprised 2.1% of the total bear take (Figure 5). The remaining 1.2% did not report any method of take while harvesting bear. SB-1221 was passed in 2012 and prohibited the use of hounds in the take of bear. This law took effect January 1, 2013, so hounds are no longer listed in these reports as a method of bear take.

Individuals using a rifle spent an average 4.6 days in the field before taking a bear, whereas individuals using archery equipment spent an average 4.7 days and individuals using muzzleloaders spent an average 1.75 days in the field. Individuals hunting under a disabled archer license accounted for the lowest reported days afield average at 1.5 days before take.

Hunters were also asked to report whether a bear was taken while hunting exclusively for bear, or while deer hunting. Similar to previous years, the 2017 season hunters who took bear while concurrently hunting deer accounted for the majority (62.8%) of the total harvest scenarios (Table 1). Only 6.3% of hunters reported taking their bear using archery equipment while deer hunting. A total of 36.0% of

hunters took their bear while exclusively bear hunting, with 3.2% of those hunting exclusively for bear using archery equipment.

In the 2016 hunt season, ten (0.9%) of all successful bear hunters reported the use of a guide. Of all bear hunters reporting successful take in 2017, seven (0.5%) reported the use of a guide, representing no major change.
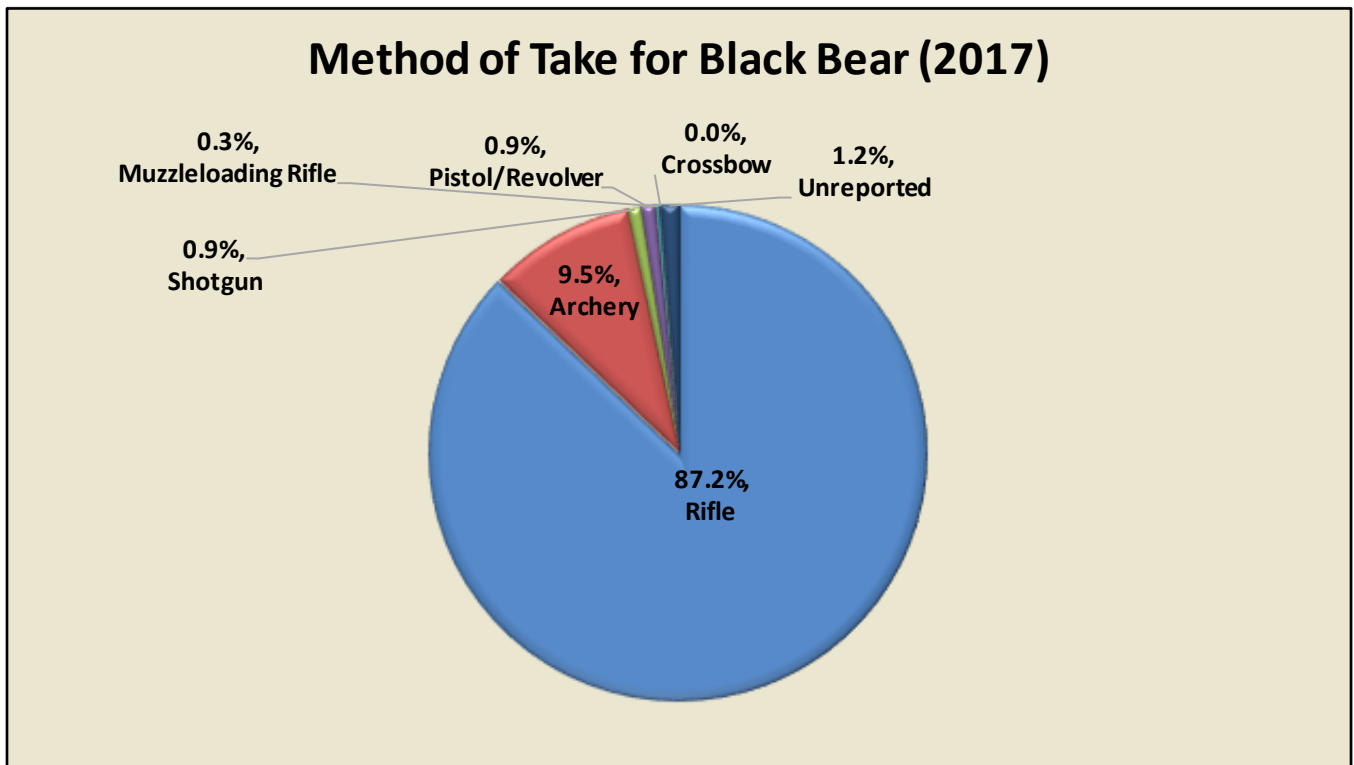
Figure 5. Method of Take Summary

Method of Take for Black Bear (2017)

0.3%, Muzzleloading Rifle
0.9%, Pistol/Revolver
0.0%, Crossbow
1.2%, Unreported
0.9%, Shotgun
9.5%, Archery
87.2%, Rifle

Table 1. Take Summary by Target Species and Method of Take (2017)

	Non-Archery	Archery	Unreported	Grand Total
Bear-targeted hunting	32.8%	3.2%	0.0%	**36.0%**
Took a bear while deer hunting	56.4%	6.3%	0.1%	**62.8%**
Unknown	0.1%	0.0%	1.1%	**1.2%**
Grand Total	**89.3%**	**9.5%**	**1.2%**	**100.0%**

Timing of Take

Bears were predominantly harvested in September and October (Figure 6). Similar to previous years, fewer bears were harvested in November and December than in September and October.

Figure 6. Monthly Bear Take

Monthly Black Bear Harvest (2017)
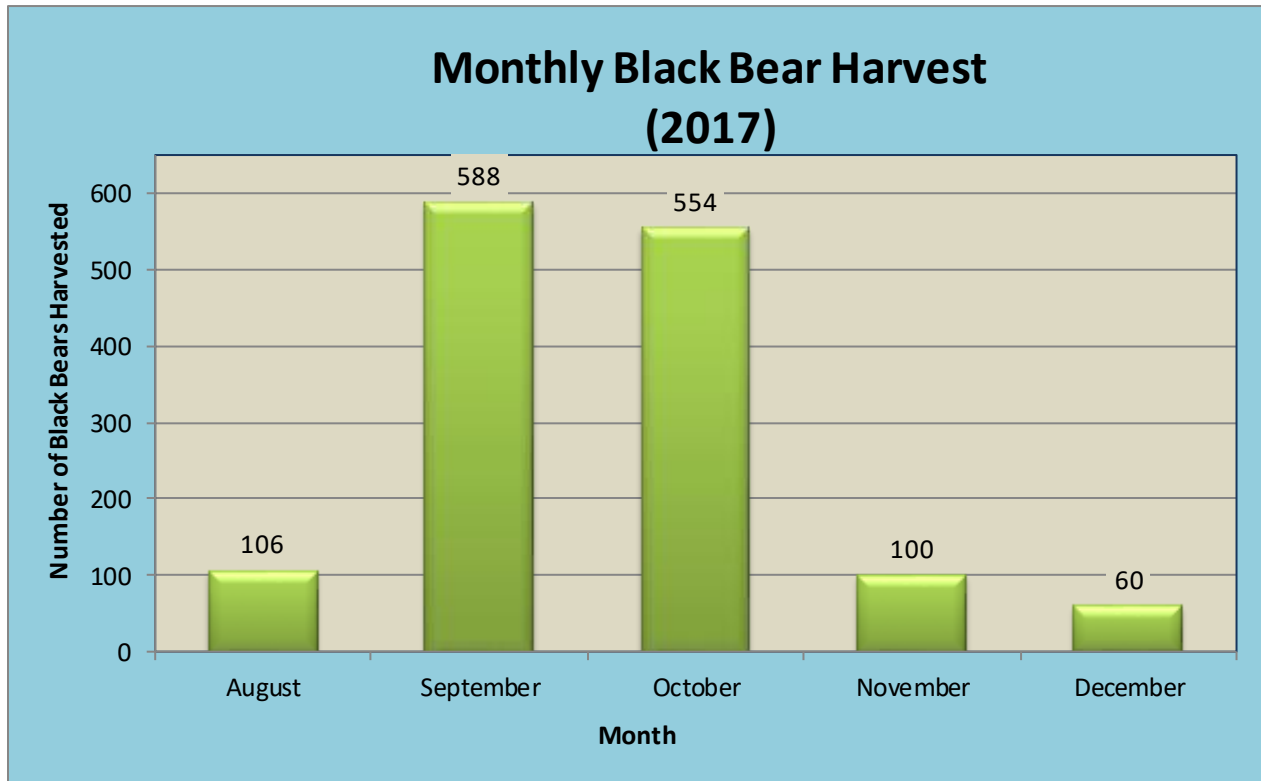
Location

Bears were known to be harvested in 36 of California's 58 counties (Table 2). The top five counties for reported take were: Shasta (9.5%), Trinity (9.2%), Plumas (7.4%), Siskiyou (7.1%) and Mendocino (6.7%). These five northern counties combined account for about 40% the total statewide 2017 bear harvest.

Table 2. Bear Take by County

County	# of Bears Harvested	Percent of Total Harvest
ALPINE	17	1.20%
AMADOR	12	0.85%
BUTTE	35	2.47%
CALAVERAS	39	2.75%
COLUSA	2	0.14%
DEL NORTE	17	1.20%
EL DORADO	84	5.92%
FRESNO	53	3.74%
GLENN	16	1.13%
HUMBOLDT	82	5.78%
INYO	1	0.07%
KERN	18	1.27%
LAKE	11	0.78%
LASSEN	17	1.20%
LOS ANGELES	7	0.49%
MADERA	33	2.33%
MARIPOSA	23	1.62%
MENDOCINO	95	6.70%
MONO	14	0.99%
NEVADA	27	1.90%
PLACER	59	4.16%
PLUMAS	105	7.40%
RIVERSIDE	3	0.21%
SAN BERNARDINO	15	1.06%
SANTA BARBARA	7	0.49%
SHASTA	134	9.45%
SIERRA	46	3.24%
SISKIYOU	101	7.12%
STANISLAUS	11	0.78%
TEHAMA	75	5.29%
TRINITY	130	9.17%
TULARE	25	1.76%
TUOLUMNE	60	4.23%
UNK	13	0.92%
VENTURA	18	1.27%
YOLO	1	0.07%
YUBA	12	0.85%
Total	**1418**	**100.00%**

Estimated Population Size

A premolar tooth was collected from 82.9% of hunter-killed bears for age estimation, which is one factor used to calculate the population size within the bear hunt zone. Teeth are processed by an independent laboratory in Montana. An age-at-harvest model is used to produce a conservative estimate of total bear abundance within the bear hunt area at the time the black bear hunting season began.

To produce a population estimate for a given year, the Department uses an age-at-harvest model reliant on the age and sex of bears harvested that year. In 2013, the use of hounds in the sport take of bears was prohibited, which violated a key assumption in that model regarding consistent hunter effort. Annual bear harvests have been relatively lower since this ban (Figure 2), resulting in correspondingly lower population estimates (Figure 7). The average population growth rate in the years following the ban (1.08 in 2013-2017) remains steady and on par with the average population growth rate in years before the ban (1.03 in 1993-2012). Due to this, the Department expects that the reduced population estimates are solely an artifact of the model's constraints. The Department is continuously working towards improving our methods of estimating bear abundance and changes in abundance over time.

The Department estimates approximately 23,397 (±7,176) bears inhabited the black bear hunt area prior to the start of the 2017 bear hunting season (Figure 1). It is important to note that this method only estimates within the current bear hunt area, prior to the commencement of the previous year's hunting season. Since bears occupy habitats outside the bear hunt area, the statewide population is an underestimate.

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Figure 7. Yearly Bear Population Estimates

California Black Bear Modeled Population Estimates (1993-2017) with 95% Confidence Intervals
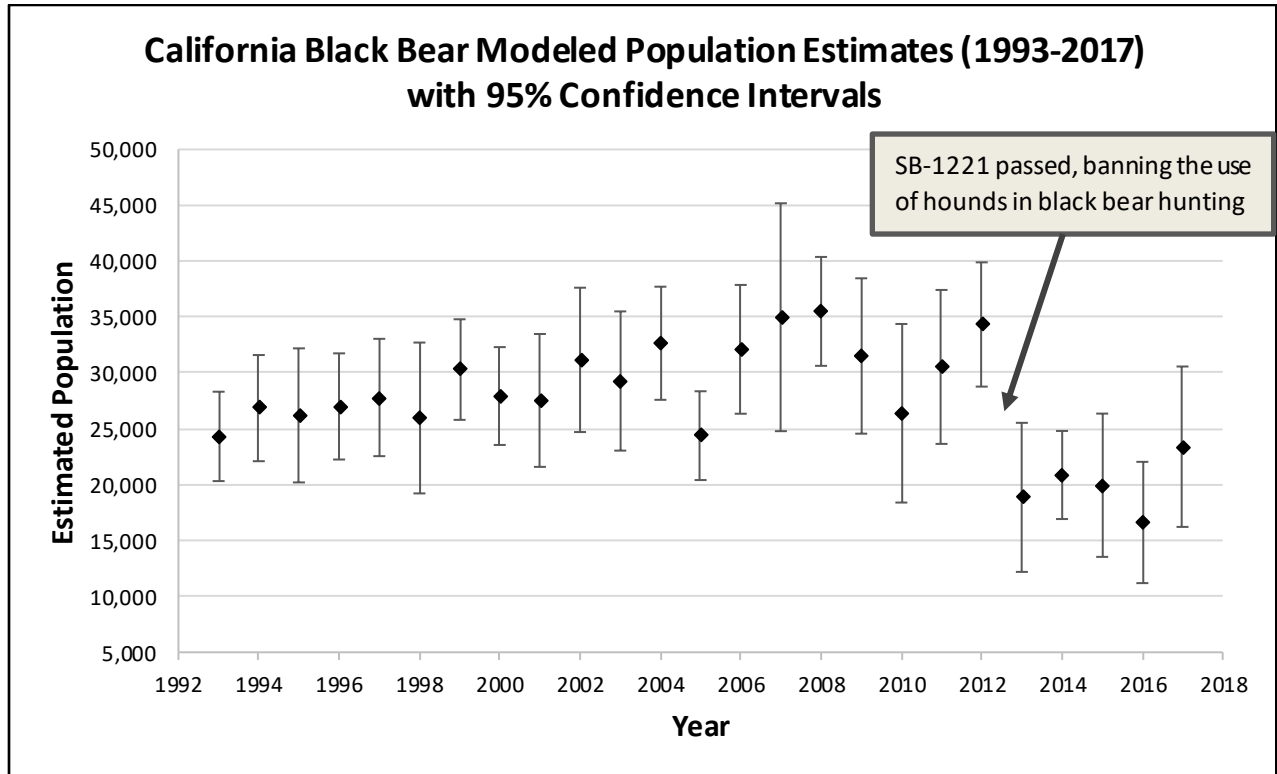
Monitoring Matrix

The Department monitors the black bear population in accordance with the 1998 Black Bear Management Plan. Contained within this plan is a matrix of thresholds of concern for the statewide black bear population (Table 3). The plan states that if two or more of these thresholds are exceeded, the Department will recommend to the Fish and Game Commission that the bear harvest be reduced.

One of the four thresholds of concern was exceeded. Of the harvested bears of known sex, 40.17% were female, which crosses the 40% threshold of concern. The median age for females in the harvest was 6 years old. The mean female age and standard deviation were 6.71 and 5.18, respectively. Per Mood's median test, the median age of all bears in 2017 (5) did not represent a significant decrease compared to the last three years of age data. The mean age of all bears was 6.23, with a standard deviation of 4.81. Total bear harvest did not drop below the threshold (harvest less than 1,000), nor was there reduction in harvest compared to the previous three years' average. There was a small decline in kill per hunter effort compared to the previous 3 years, but it was not statistically significant ($P = 0.48$).

To better reflect true population trends over time, the Department has re-calculated population estimates for 2013-2016 with the methodology used in this report, rather than what was previously published. These are 18,868, 20,865, 19,948, and 16,616, respectively (Figure 7). There was therefore no decline in the population estimate compared to the 2014-2016 average. Also, the 2017 bear harvest of 1,418 bears was 32.3% greater than the 2016 harvest of 1,072 bears.

Table 3. Resulting Monitoring Matrix

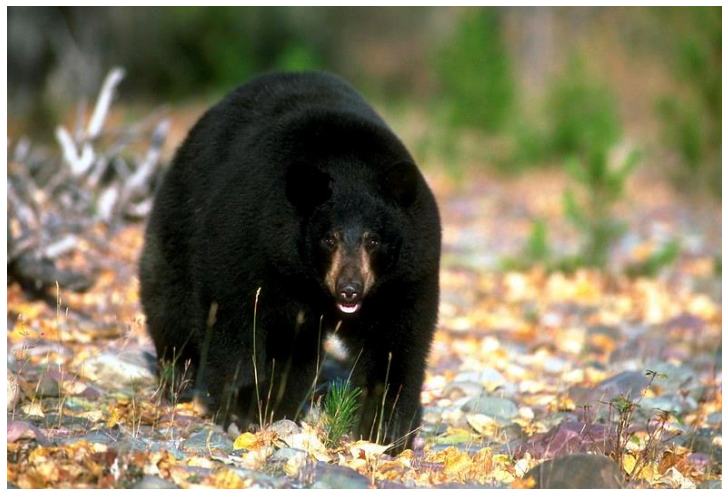| Monitoring Technique	Threshold of Concern	2017 Data	Threshold Exceeded?
Median Ages of Hunter Killed Bears	Female ages <4.0 years old; -or- statistically significant ($P < 0.05$) reduction in median age for combined sexes.	Median Female Age = 6 Total Combined Median Age = 5	NO
Percentage of Females in Harvest	>40%	40.17%	YES
Total Harvest	<1,000 **or** statistically significant (< 95% CI) reduction; only if reduction is independent of administrative action.	1,418 No reduction in harvest.	NO
Kill per Hunter Effort and Population Estimate	Statistically significant decline in **both** kill per hunter effort ($P < 0.05$) and population estimate (< 95% CI) .	No statistically significant decline in kill per hunter effort. No decline in population estimate.	NO

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