BLACK BEAR DATA ANALYSIS UNIT
MANAGEMENT PLAN

Central Front Range

DAU B-19

GAME MANAGEMENT UNITS

39, 46, 50, 51, 104, 391, 461, 500, and 501

NE Region

Prepared for:

Colorado Parks & Wildlife

By:

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DATA ANALYSIS UNIT PLAN FOR B-19

EXECUTIVE SUMMARY

GMUs: 39, 46, 50, 51, 104, 391, 461, 500, & 501 (Douglas County and portions of Adams, Arapahoe, Elbert, Clear Creek, Jefferson, and Park Counties)

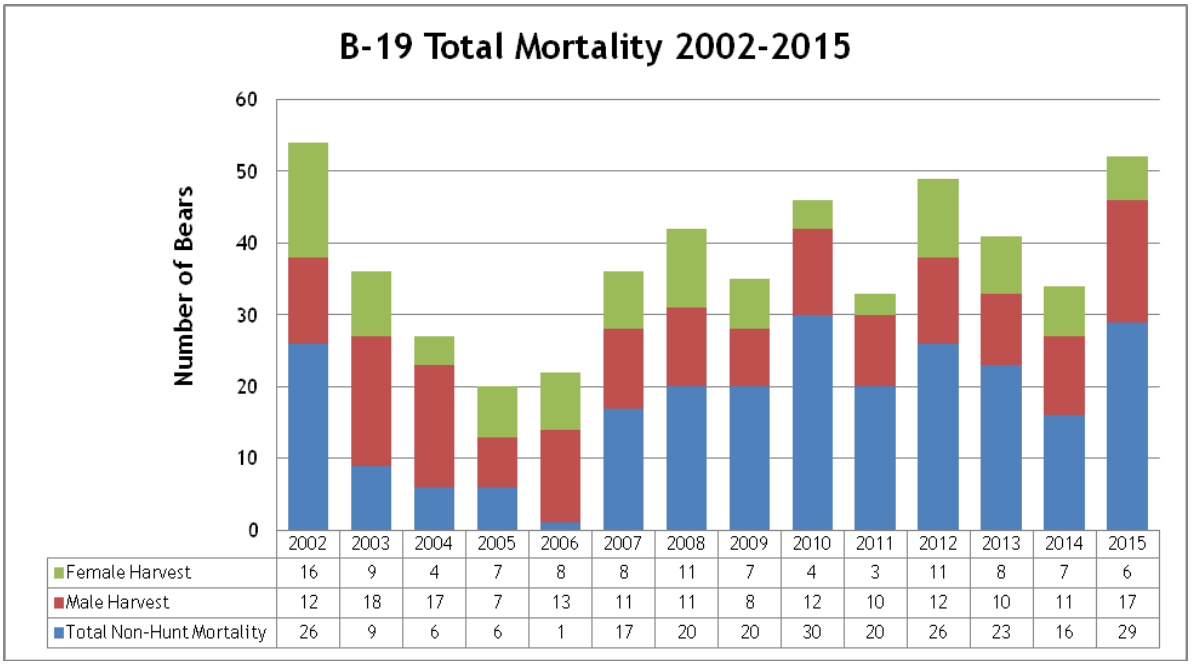
Land Ownership: 58% Private, 31% USFS, 4% State, 3% City/County, 3% Other Federal, 1% BLM

Previous Objective: Stable, no population objective for B-19

Previous Mortality Objectives:
For GMUs 39, 46, 50, 51, 391, 461, 500, & 501: Harvest objective: 20, Total mortality objective: 40

Current objective: Reduce the B19 bear population
Total annual mortality objective: up to 90
Total annual harvest objective: up to 60

Mortality objectives are derived and monitored through review of the age structure of bear mortality, the composition of gender in harvest, conflict/damage levels and from bear density estimates, where available.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Female Harvest	16	9	4	7	8	8	11	7	4	3	11	8	7	6
Male Harvest	12	18	17	7	13	11	11	8	12	10	12	10	11	17
Total Non-Hunt Mortality	26	9	6	6	1	17	20	20	30	20	26	23	16	29

Figure 1. Total Female Harvest, Male Harvest, and Total Non-Hunt Mortality in B-19 from 2002-2015.

BACKGROUND

Black bear Data Analysis Unit (DAU) B-19 is located in the central Front Range of Colorado. The DAU includes all of Douglas County as well as portions of Adams, Arapahoe, Elbert, Jefferson, Park, and Clear Creek Counties. The Game Management Units (GMUs) in B-19 are 39, 46, 50, 51, 104, 391, 461, 500, & 501. Much of Colorado's main human population centers occur within, or immediately adjacent to B-19, including the cities of Golden, Lakewood, Castle Rock, Parker and all the communities of the Denver metropolitan

area. Over half of the 2.64 million acre DAU is private land. Sixty-seven percent of the DAU or about 1.78 million acres is considered overall black bear range.

In general, overall annual bear mortality has increased over the last 10 years in B-19. Since 2000, total bear mortality in B-19 has ranged from a low of 20 in 2005 to a high of 52 in 2015, with an annual average of 35 bears. The 3-year annual average of hunting mortality is 19 bears and the 10-year annual average of hunting mortality is 18 bears. The 30 day September rifle season has an average 3-year success rate of ~6.5%, highest among methods of take, and is responsible for approximately 60% of the annual bear harvest in B-19. Archery hunters contribute an average of 6 bears per year to the harvest and have a success rate of ~4.5%. Harvest success rates for hunters in the 4 concurrent rifle seasons are very low; total harvest across all 4 seasons in B-19 has been 0 bears per year for last 4 years. Harvest and total mortality rarely exceed current mortality objectives for maintaining a stable bear population in B-19. Game damage claims have averaged 4 per year for the last 10 years and only 3 claims have exceeded $3,000. Conflicts between bears and humans are not uncommon in B-19. Often these are the result of bears using developed habitats and food sources associated with people and urban environments.

A suite of habitat and population models have been developed as part of the revision of the B-19 DAU plan to help provide estimates of the projected bear population in the unit. These include a general vegetation/bear density extrapolation, a use/occupancy surface extrapolation based on habitat classifications, and 2 model simulations with varying constraints (liberal and conservative).

SIGNIFICANT ISSUES

The most significant issue regarding bear management along the central Front Range relates to managing conflicts between bears and people. The central Front Range population is projected to increase by another 1 million people in the next 10 years which is likely to increase human conflicts with bears. These conflicts can take a number of forms including crop and livestock losses to agricultural producers and landowners, property damage to homeowners, roadkills, and direct contact between bears and humans across all landscape types. This management issue and what tools should be used to address it are complex and multifaceted. The structure of a DAU plan focuses on one specific tool, primarily hunting, out of a suite of tools including education, enforcement, lethal removal, relocation, habitat modification, that can also be used to manage conflicts. Unfortunately, the types of conflicts that occur with bears and the landscapes they occur in, often preclude simple changes in licensing or hunting structure from completely resolving the problem. Adding and/or expanding harvest strategies will be evaluated for this DAU with the intention of decreasing human-bear conflicts. CPW will continue the educational efforts toward resolving conflicts by collaborating with home owner associations, municipalities, other agencies, and private property owners. This DAU plan provides harvest related monitoring structures along with strategic goal alternatives that will directly impact bear population sizes in B-19.

MANAGEMENT ALTERNATIVES

The B-19 DAU was previously managed for a stable bear population. That requires harvest mortalities and total mortality levels to fall below a threshold. This plan revision outlines two strategic goal alternatives for bear management in B-19.

Alternative 1: Reduce the B-19 population

To achieve a strategic goal of reducing the bear population, harvest and total mortality rates would be in the liberal range with composition indices showing a decreasing population. Total mortality would increase to greater than 15% of the total population size. Proportion of adult males in the harvest can be low, even below 25%, with total female harvest rates going over 40%. Additionally, adult females could comprise over 55% of the total female harvest. Based on a primary management goal of minimizing bear conflicts, bear populations in areas with conflict and damage could be reduced to low levels. Sex and age composition of mortality and harvest would be reexamined annually to determine if the increased harvest had impacted the population. This information, combined with analysis of damage and nuisance complaints, would inform decisions on harvests rates, and whether the population was within an acceptable range and

conflicts had been minimized. Not every management index must be in complete agreement, but most should initially point toward a decreasing trend.

Alternative 2: Maintain a stable B-19 population

To achieve a strategic goal of maintaining a stable bear population in B-19, harvest and total mortality rates will fall in an intermediate range and would be similar to current levels. Total mortality should fall within 10-15% of the total population. Proportion of adult males in the harvest should be within 25-35%, with all females making up 30-40% of harvest. Additionally, adult females should comprise approximately 45-55% of the female harvest. Within the framework of an overall stable population, flexibility in off-take rates will be maintained to manage for minimized game damage and human/bear conflicts in localized areas of concern. Not every management index must be in complete agreement, but most should point toward a stable population.

RECOMMENDED STRATEGIC GOAL

The management strategy preferred by staff is Alternative 1. This management alternative was selected as the preferred alternative due to the long term projection of a rapidly increasing human population which will further diminish bear habitat and potentially increase conflicts within a DAU that already has high human-bear conflicts. During the DAU planning process, the public provided input on bear management and over half of the respondents stated they "worry about problems bears cause". Nearly 1/4 preferred a reduced population of bears in the DAU and half of the respondents preferred to see the bear population stay the same. CPW will continue bear education efforts to mitigate or reduce conflicts along with harvest and other mortality as management tools. This alternative offers CPW the most flexibility in minimizing human-bear conflicts and offering hunting opportunity. Flexibility in off-take rates will be maintained to manage for minimized game damage and human-bear conflicts within the population reduction ranges. With a population estimate of approximately 500 bears in B-19, this will translate to an overall mortality objective of 90 bears.

This plan was approved by the Colorado Parks & Wildlife Commission on February 8, 2018.

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INTRODUCTION

Colorado Parks and Wildlife (CPW) manages wildlife for the use, benefit and enjoyment of the people of the state in accordance with the CPW's Strategic Plan and mandates from the Parks and Wildlife Commission and the Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing impacts from people. CPW is responsible for the maintenance of Colorado's big game at population levels that are established through a public review process and approved by the Parks and Wildlife Commission.

DAU PLANS AND WILDLIFE MANAGEMENT BY OBJECTIVES

To manage the state's big game populations, the CPW uses a "management by objective" approach (Figure 2). Big game populations are managed to achieve objectives established for DAUs.

DAUs are geographic areas that typically contain an individual big game population. For large mobile carnivores, like black bears, DAUs are primarily administrative constructs with generally similar habitats and/or human social considerations. DAUs are composed of smaller areas designated as game management units (GMUs), which provide a more practical framework where the management goals can be refined and applied on a finer scale, typically through hunting regulations.

The DAU plan process is designed to balance public demands, habitat and big game populations into a management scheme for the individual DAU. The public, hunters, federal and local land use agencies, landowners and agricultural interests are involved in the determination of the plan objectives through input given during public meetings, the opportunity to comment on draft plans and when final review is undertaken by the Parks and Wildlife Commission.

The strategic goals and specific mortality objectives defined in the plan guide a long term cycle of annual information collection, information analysis and decision making. The end product of this process is a recommendation for numbers of hunting licenses for the DAU (Figure 1). The plan also specifically outlines the management techniques that will be used to reach desired objectives. CPW intends to update these plans as new information and data become available, at least once every ten years.

COLORADO'S BIG GAME MANAGEMENT BY OBJECTIVE PROCESS

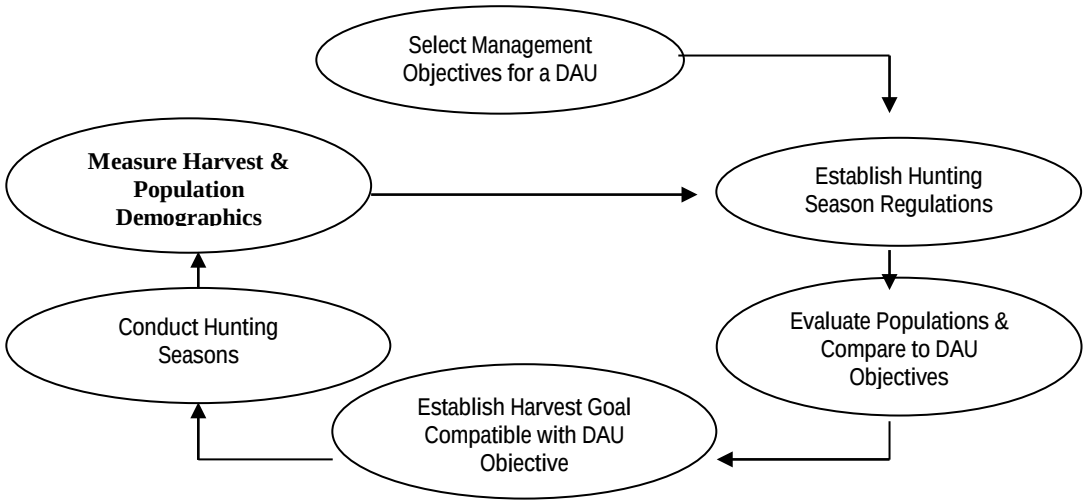

Figure 2. Management by objectives process used by CPW to manage big game populations on a DAU basis.

DATA ANALYSIS UNIT DESCRIPTION

Location

Data Analysis Unit (DAU) B-19 is located on the central Front Range of Colorado. It is bounded on the north by I-70 and I-25, on the west by US 6, the Continental Divide and US 285, on the south by US 24 and the Douglas-Teller County Line, and on the east by CO 79. The DAU includes all of Douglas County and portions of Adams, Arapahoe, Elbert, Jefferson, Park and Clear Creek Counties. The Game Management Units (GMUs) in B-19 are 39, 46, 50, 51, 104, 391, 46, 500, and 501. Much of Colorado's main human population centers occur within, or immediately adjacent to B-19, including the cities of Golden, Lakewood, Evergreen, Littleton, Castle Rock and all the communities south and west of Denver. Colorado's I-70 forms the northern boundary of the unit and I-25 runs through the center of the DAU.

Just over half of the 2.64 million acre DAU is private land (Figure 3). The US Forest Service (USFS) manages 31% of the land in the DAU, or 810,300 acres. The State of Colorado manages about 4% of the DAU or 106,500 acres which are mostly held as CPW State Wildlife Areas and Colorado State Land Board lands. City and County land management departments within the DAU manage 3% of the surface area or 87,000 acres. The Bureau of Land Management (BLM) is the land manager for 1% of the DAU or 34,000 acres.

Sixty-seven percent of the DAU or approximately 1,776,000 acres is considered overall black bear range. Much of what is not considered bear habitat are the urban population centers around Denver and to the east of I-25. Approximately 14% of the DAU or 375,000 acres is considered summer concentration habitat for black bears (Figure 4).

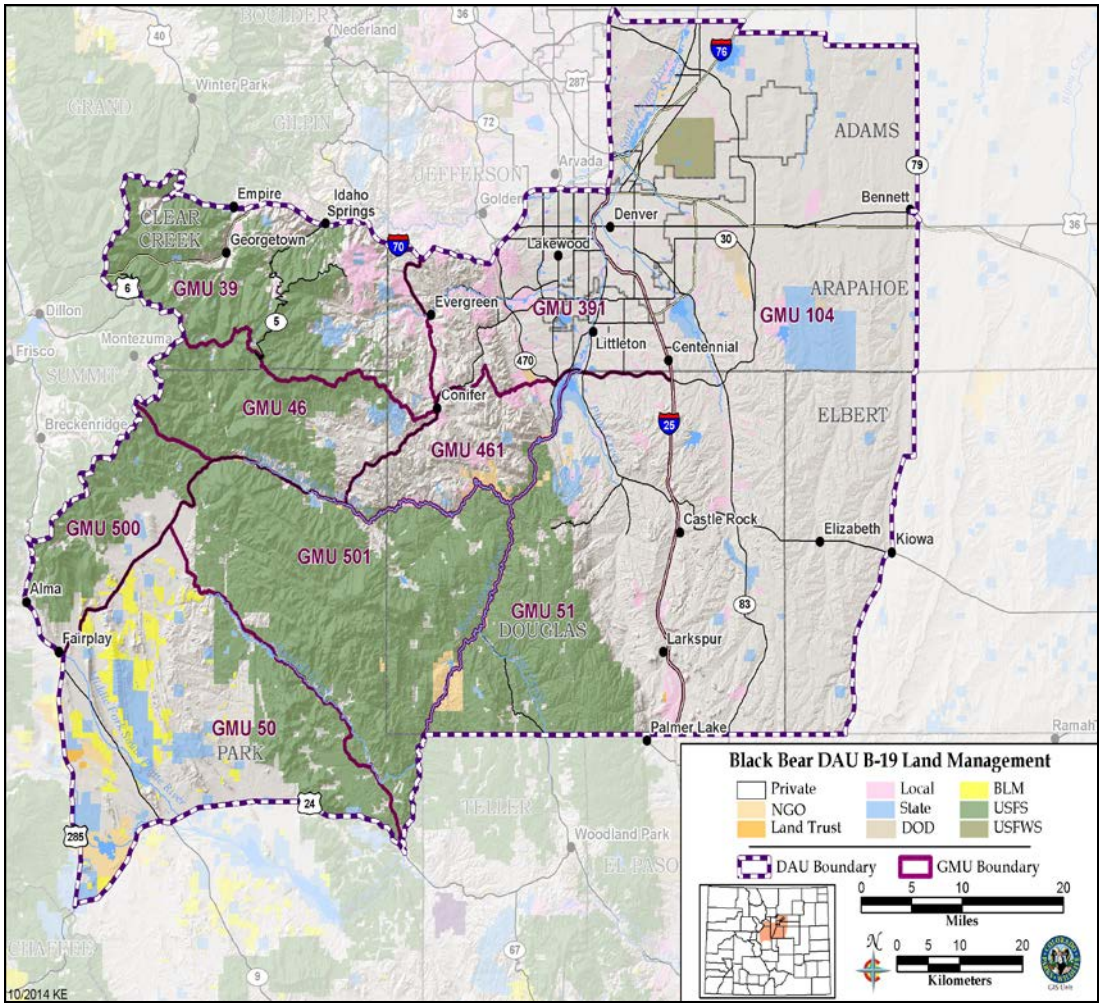

Figure 3. Location and land ownership patterns of B-19.

Land Use and Land Status

Human development along the central Front Range is perhaps the dominant issue when evaluating bear management in B-19. In the last 2 decades, nearly all of the counties in B-19 have experienced high levels of human population growth, as well as commensurate increases in roads, property subdivision, and development in bear habitat. The growth in human population and associated developments is expected to increase for another two decades.

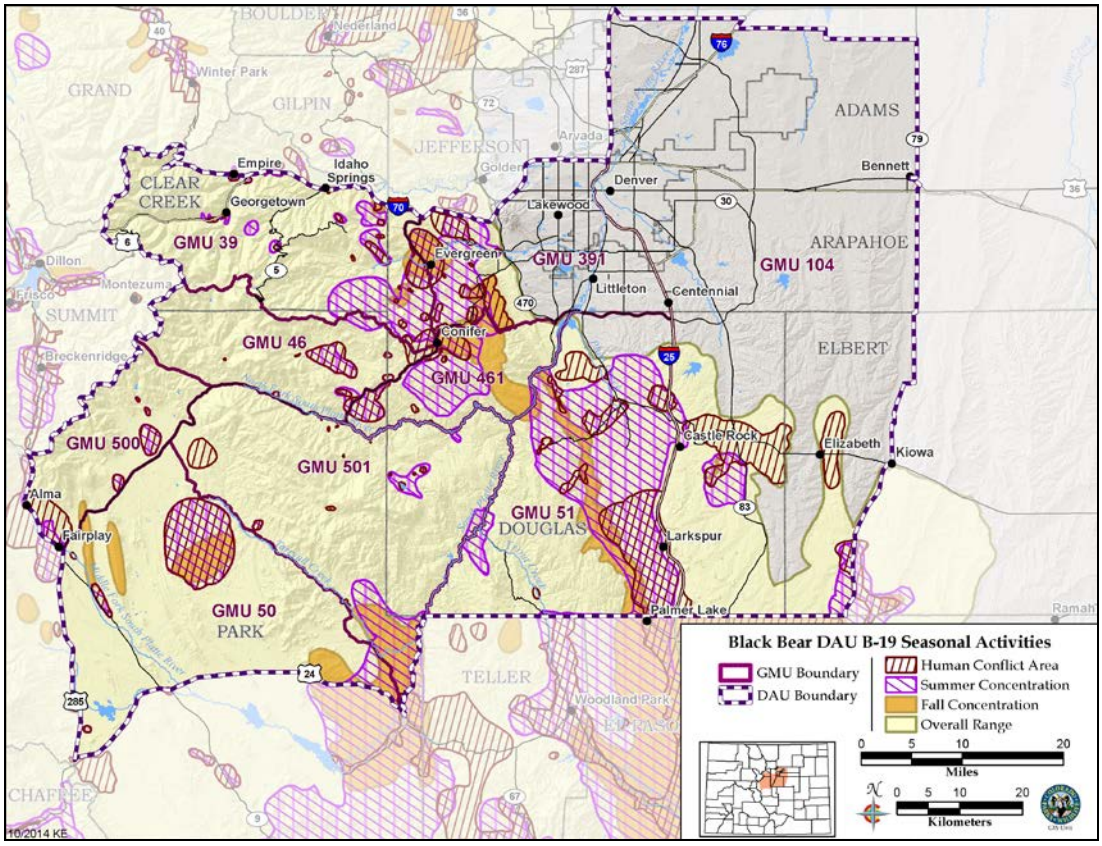

Figure 4. Black bear activity layers in B-19.

Topography & Climate

Elevations in the DAU range from over 14,000 feet at the top of Mount Evans on the western side of the unit to 5,000 feet along I-25 at the eastern border. The climate in B-19 is generally characterized by hot summers and mild winters, particularly at middle and lower elevations in the DAU. Winter snowfall events can be significant, particularly along the Continental Divide and at elevations above 8,000 feet. Most annual precipitation comes in the form of snow; however summer moisture in the form of rain can have a significant impact on the growth of plant forage sources used by bears. Annual precipitation totals across the DAU are approximately 15 inches of rain, while higher elevations that receive significantly more precipitation in the form of snow have annual totals in the 60-80 inch range.

Vegetation

Principal vegetation classes across the DAU include ponderosa pine, spruce fir, lodgepole pine and Douglas fir. There is a relatively smaller component of aspen, gambel oak and mesic upland shrub as well in B-19.

Natural bear habitat could be considered fair to poor in much of B-19 relative to other parts of Colorado and especially west of the Continental Divide. Relatively speaking, the central Front Range is not composed of a high percentage of hard mast food sources (i.e. oak brush) (Figure 5) therefore bears must rely on soft mast production like chokecherries and other forage types for their nutritional needs. While natural food sources may be moderately productive at best, bears living near human communities along the central Front Range have another significant source of high-quality nutrition in the form of anthropogenic

food. This would include all sources associated with human activities including trash, ornamental vegetation, pet food, and bird feeders. This is in addition to food associated with traditional human agricultural activities including some vegetable fields and livestock.

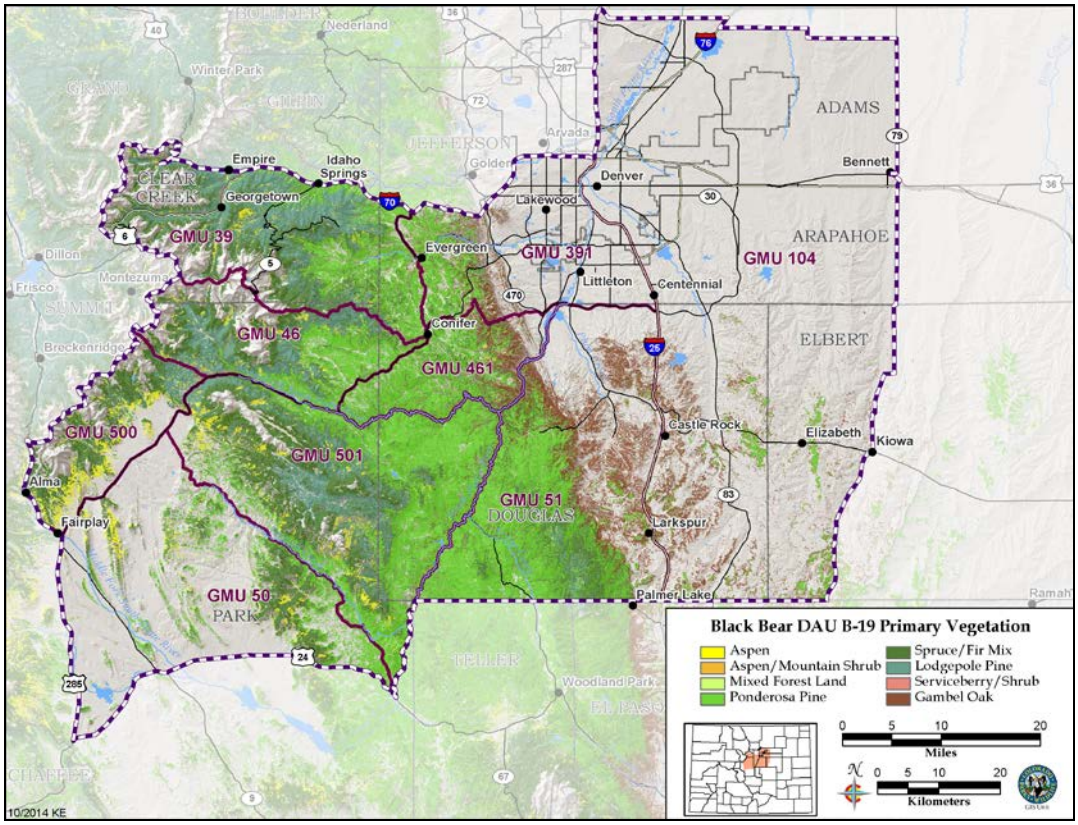

Figure 5. Vegetation classes in B-19.

MANAGEMENT HISTORY

Administrative

The boundaries of B-19 were changed in 2010 as part of the B-3 and B-2 DAU plans rewrite process. Prior to 2010, DAU B-19 had been comprised of GMUs 29, 38, 39, 46, 51, 104, 391, and 461. In 2010, GMUs 29 and 38 were added to DAU B-3 and GMUs 50, 500, and 501 were added to B-19. As revealed by evaluations of bear habitat, mortality causes and management issues during the initial phases of the DAU planning process, GMUs 29 and 38 were arguably more similar to the Northern Front Range, DAU B-3, bear population, than to units to the south. While all bears in Colorado could be considered part of one large meta-population, the similarities between GMUs 39, 46, 50, 51, 391, 461, 500 and 501 as similar habitats, having high human development levels and non-hunting mortality factors, all argued current DAU boundaries of B-3 and B-19. All historic data displays in this plan will include GMUs 50, 500, and 501 unless otherwise noted.

Hunting Seasons

Prior to 1935, black bears were not considered a game animal, which afforded them no protection from being shot on sight if they were encountered, or preyed on livestock. In 1935, they were awarded some protection by being classified by the state legislature as a game animal. This established limits on the annual harvest and on the number of licenses that an individual could possess. From 1935 to 1963, bears were hunted in the fall usually concurrently with the annual deer and elk seasons. In 1964, a spring hunting season was established with unlimited numbers of licenses available. This continued until 1986, when license quotas for the spring season were established (Beck 1991). The fall hunting seasons occurred concurrently with the established deer and elk seasons and licenses were unlimited in numbers until the

limited September rifle seasons were established in 1989. Hunters wishing to hunt bears during the established deer and elk season continued to have access to unlimited seasons until 2005 when license limits were established for these seasons.

In 1992, a constitutional amendment was passed and changed bear hunting within the state by preventing bear hunting prior to September 1st and outlawed the use of bait and dogs as aids for hunting black bears. Since 1992, September 2nd has been the opening date of the earliest bear seasons in Colorado.

From 2000-2015, black bear hunting seasons have started with an early, limited, rifle season that runs from September 2nd through September 30th each year, along with concurrent archery, muzzleloader, and the 4 regular rifle season licenses. Under the previous season structures, the 4 regular bear rifle seasons are 5 days, 9 days, 9 days and 5 days in length. Most harvest has occurred within archery and the limited September rifle seasons as they are concurrent with the initial phases of the bear hyperphagia period. Harvest and success rates decline as hunting seasons progress through the fall months (October-November) due to bears entering the initial stages of hibernation.

In 2014, the Parks and Wildlife Commission approved a new 5-year big game season structure that includes changes to the bear seasons. Changes included an extension of the black bear archery season by a couple of days and a concurrent black bear rifle season. From September 2-September 30, there will be an over the counter with a cap archery bear season and the early, limited rifle season for bears. Muzzleloader dates remain the same as previous to 2015. The second rifle season will begin with the first opening date of the first rifle elk season and close the last day of the fourth season for the regular deer and elk rifle seasons. The second rifle bear season increases the length of rifle hunting for bear by allowing hunting during all 4 rifle deer or elk seasons or until a license is filled.

License Allocation history

License allocations in B-19 have had two changes in the last 10 years. From 1999-2004 archery, muzzleloading, and concurrent regular rifle (first, second, third and fourth big game rifle seasons) licenses were specified in B-19, but unlimited in number. Beginning in the fall of 2005, those licenses became over-the-counter (OTC) with caps. That meant that a limited number of licenses (capped number) were issued for each huntcode, but licenses could be purchased without going through the limited draw (bought first-come, first-served). However, this had no functional impact on concurrent regular rifle season bear hunter opportunity, as the license cap was rarely reached. Archery and muzzleloader hunters did see an impact in opportunity in going from unlimited to OTC with caps, as those licenses often sell out within a few days of going on sale. The September rifle licenses available in B-19 have been limited and specified by hunting unit since 1999.

Starting in 2015, the first through the fourth black bear rifle licenses were eliminated and one rifle black bear license was valid across the deer and elk first through the fourth seasons. This license is referred to as the concurrent rifle license.

The license numbers in the graph in Figure 6 from 2005-2010 include GMUs 29, 38, 39, 46, 51, 391, and 461 and GMUs 39, 46, 50, 51, 391, 461, 500 and 501 from 2011-2014. Because GMUs 50, 500, and 501 were a part of DAU B-2 until 2011 and licenses for those GMUs were valid in a number of other GMUs, it would be impossible to separate license allocation for those three GMUs.

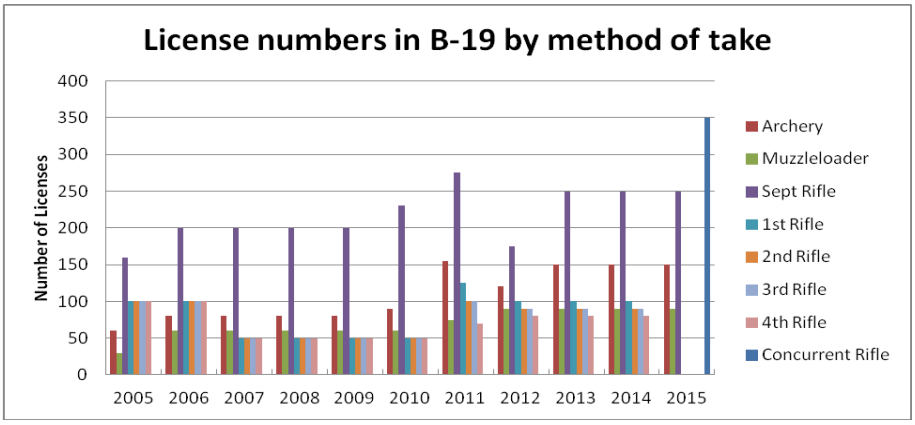

Figure 6. Ten-year license history in B-19.

Mortality: Harvest and Non-Harvest

In general, overall annual bear mortality has increased over the last 10 years in B-19 (Figure 7). Since 2004, total bear mortality in B-19 has ranged from a low of 19 in 2005 to a high of 52 in 2015. While the 10-year average of annual bear mortality is 39, the 3-year average is higher at 42 bears. Mortality from hunter harvest has stayed consistent over the past 10 years. The 10-year average of hunting mortality is 19 bears per year, with a similar 3-year average of 20 bears. The increase in total mortality in B-19 resulted from an increase in non-harvest mortality sources (control/conflict kills, roadkills, etc.).

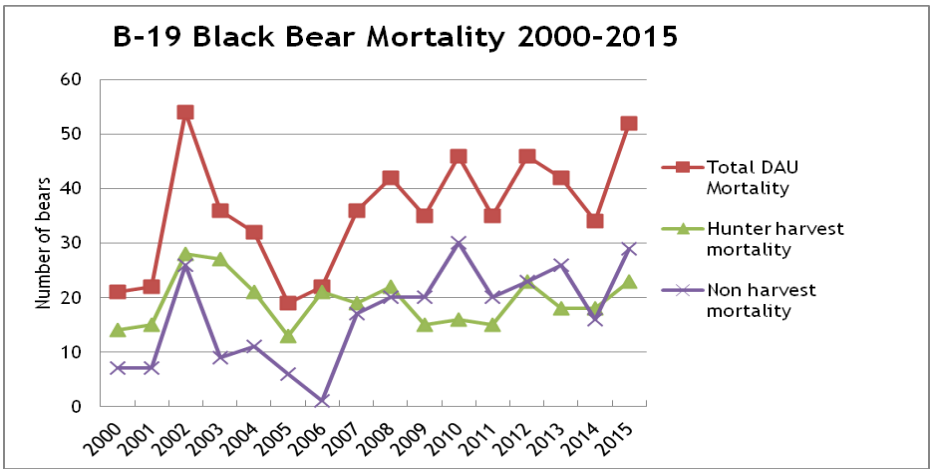

Figure 7. Black bear mortality (Harvest and Non-harvest) in B-19.

Harvest mortality and total mortality vary significantly by GMU, but are proportionally consistent across the last 5 years. Game Management Unit 51 has the highest levels of harvest in the DAU, followed by GMUs 461, 39, 46, 391 and 501 (Figure 8). GMU 461 has the highest level of total mortality followed by GMUs 51, 39, 391, 46, 501 and 104. Harvest levels appear to be roughly proportional to the amount of fall bear habitat, GMU size and hunting access levels.

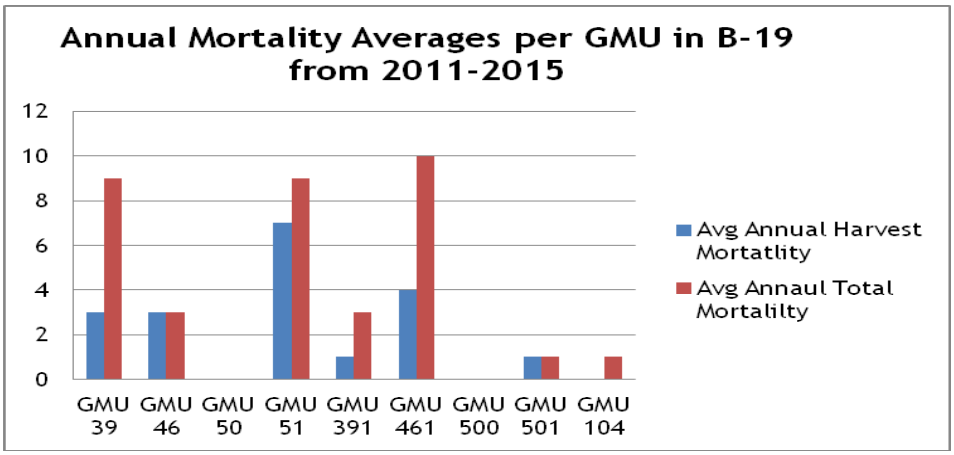

Figure 8. Annual average hunting and total mortality by GMU (2011-2015).

Total annual mortality varies more within the DAU than hunter harvest mortality (Figure 9). Total mortality factors are more influenced by annual variations in bear habitat conditions than hunter harvest mortality.

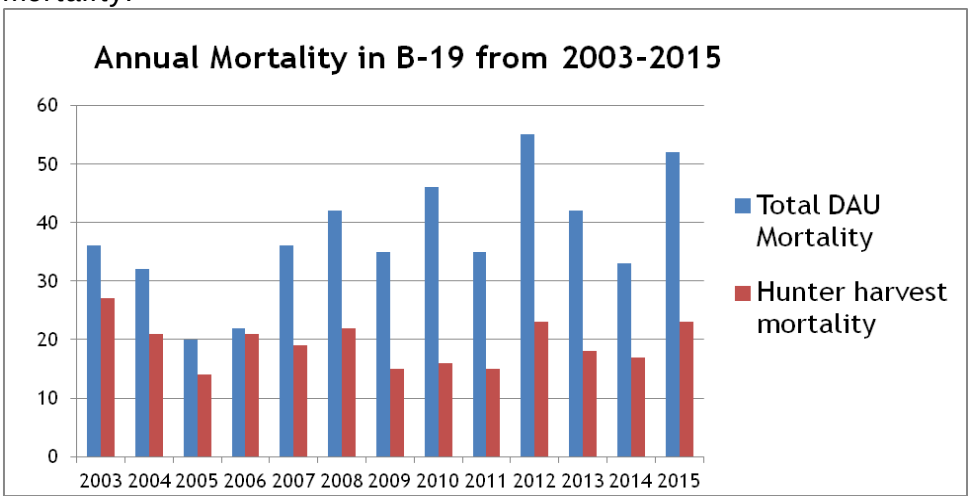

Figure 9. Annual average hunting and total mortality in B-19.

The proportion of females in B-19 harvest has fluctuated over the last 10 years (Figure 10). Proportion can vary significantly in any given year but the 3-year and 10-year averages of female proportions in the harvest are similar. The 3-year average proportion of females in the harvest is 35%, while the 10-year average is 39%. The proportion of non-hunt mortality varies more significantly year to year. The 3-year average proportion of females in the non-harvest mortality is 38% and the 10-year average proportion of females in non-harvest mortality is 23%.

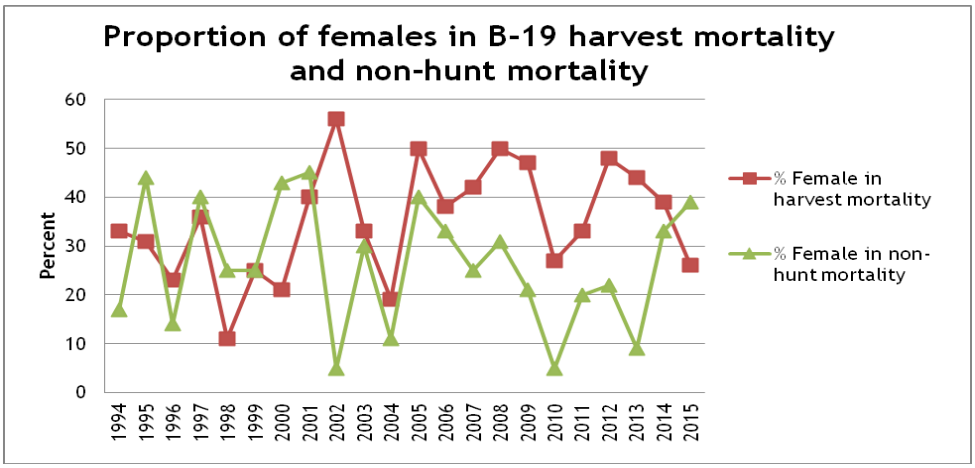

Figure 10. Proportion of females in B-19 harvest and non-harvest mortality.

Mortality by Method of Take

Among methods of take, the limited September rifle season and the archery season have the highest average 3-year success rate (~6.5% and 4% respectively), and were responsible for approximately 80% of the annual bear harvest in B-19 (Table 1). Muzzleloaders harvest an average of less than 2 bears per year in B-19 with a 4% success rate. The total harvest of all the combined rifle seasons was less than muzzleloader, with an average of 1 bear harvested per year. While always very low, harvest success rates during the regular rifle seasons varied from 1-3% in the first and second rifle seasons to nearly 0% in the third and fourth when many bears may be unavailable for harvest due to the onset of hibernation behavior.

B-19 Total Harvest

Year	Archery	Muzzleloader	September rifle	1st-4th Rifle
1997	1	0	9	1
1998	3	0	4	2
1999	2	0	3	3
2000	4	2	8	0
2001	5	1	9	0
2002	9	2	17	0
2003	3	1	23	0
2004	2	3	14	2
2005	1	3	9	1
2006	4	2	14	1
2007	2	5	11	1
2008	4	3	14	1
2009	3	2	8	2
2010	4	1	11	0
2011	5	2	8	0
2012	9	0	14	0
2013	6	2	10	0
2014	5	1	11	0
2015	7	3	13	0
Average	4.2	1.7	11.1	1.0

Table1. Black bear harvest history, by method of take, in B-19 (1997-2015).

Mortality- Age and Gender

Beginning in 2007, a premolar was extracted from harvested bears during the mandatory check process and all other deceased bears handled by CPW. These teeth were collected and submitted annually for aging via cementum annuli sectioning. Since bear age data have only been collected for 7 years, the sample sizes particularly when broken into classes, can be small (total sample across 7 years in B-19 is 96 bears).

The technique of counting annual rings in cementum of bear teeth is a reliable method for determining ages of black bears (Harshyne et al. 1998, Costello et al. 2004). This is especially true for bears less than five years of age. For bears five years of age or older, errors increased with the age of the bear (McLaughlin et al. 1990, Harshyne et al. 1998, Costello et al. 2004). Since most female black bears in Colorado do not reproduce until their 5th year, classification of females into sub-adult (non-reproducing) and adult (reproducing) age classes using cementum annuli is quite reliable. Therefore, all female black bears age five and over are considered adults for the purposes of harvest data analyses. Based on the sample of 5 female bears with a reproductive history in B-19, this classification breakpoint at 5 years of age was supported.

Below is a graph showing the frequency of each bear year-class, by gender from the 2007-2013 dataset (Figure 11). Harvest mortality sample sizes are greatly skewed towards the sub-adult age classes. In the case of males, the majority of black bear mortalities were in the 2.5-3.5-year old classes. Given that in cases of hunter harvest, the selection should be towards bigger, older male bears, compared to adult males occurring at much lower numbers it could be an indication of the age structure of the population. It may also be an indication that younger male bears are more easily harvested. Further discussion occurs in the Management Considerations section.

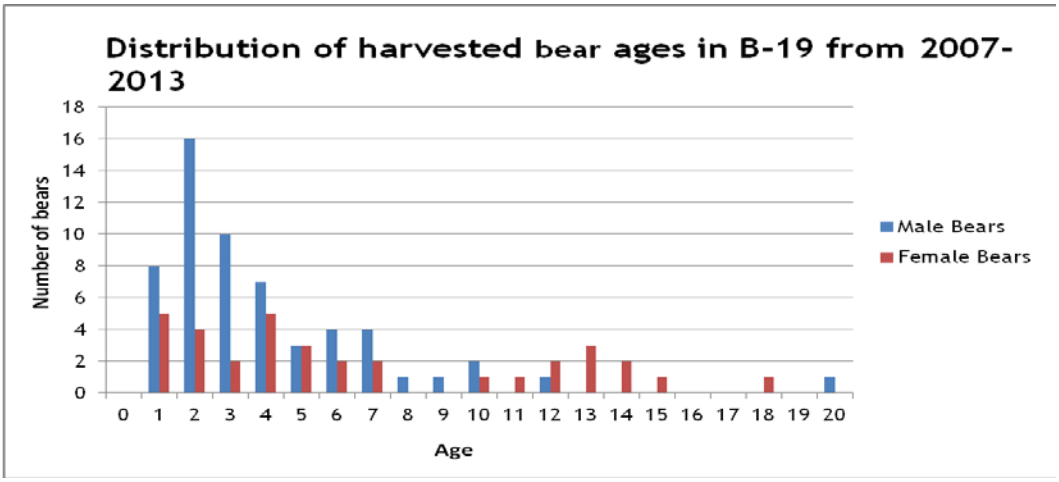

Figure 11. Age distribution of harvested bears in B-19 (2007-2013).

Below is a figure showing the thresholds used in analyses of sex and age classes of harvested bears for determining if a population is decreasing, stable, or increasing (Figure 12). Based on these thresholds, B-19 appears to be a stable to possibly decreasing population (Figure 13). Due to generally low hunter success rates and low hunter harvest, this population likely is not being suppressed by current hunter harvest. As stated previously, hunter harvest is low in B-19 so the samples sizes for this table are small therefore percentages may be somewhat unreliable.

Harvest Composition Monitoring Standards			
Age/Gender Class	Decreasing	Stable	Increasing
Adult Male Harvest in All Harvest	< 25%	25 - 35%	> 35%
Total Female Harvest in All Harvest	> 40%	30 - 40%	< 30%
Adult Female in Total Female Harvest	> 55%	45 - 55%	< 45%

Figure 12. Harvest composition monitoring standards used in evaluating if a bear population is decreasing, stable, or increasing.

DAU 19	'06-'08	'07-'09	'08-'10	'09-'11	'10-'12	'11-'13	'12-'14	'13-'15
Adult Male in All Harvest	29%	19%	18%	16%	20%	22%	25%	39%
Total Female in All Harvest	38%	36%	34%	32%	39%	43%	45%	35%
Adult Female in Total Female	73%	80%	73%	78%	67%	45%	52%	41%

Figure 13. Age distribution of bears from harvest in B-19 (2006-2015)

Game Damage and Human Conflict Management

There have been 42 black bear claims paid out in B-19 from 2005-2015. Over half these claims were for other livestock, with the rest being for beehives, sheep and other property. The average claim payment since 2005 is $2,939, with a range from $2,800-$12,739. During these ten years only 2 claims have been for over $4,000; both for other livestock. The three-year average for the amount paid in the DAU is $1,091 and in comparison the statewide three year average for amount paid is $397,400.

Human conflicts with black bears in B-19 are not unusual occurrences. In many cases, human interactions with bears are reported to the CPW call centers or field staff. This subset of conflicts is documented in written form by CPW staff and range from a second hand report of a bear being seen in a town or suburb to a physical incident between a bear and a person. While these conflict reports provide a snapshot of individual incidents, lumping reports into categories or evaluating summary statistics can be misleading. There are a number of issues related to capturing the location of the incident versus the location the report was filed from, the reliability of some reports and the bias in reporting associated with increased media coverage on an event or location that can significantly increase or decrease the number of conflict reports. CPW continues to document reported human conflicts with bears, and will continue to improve and refine the system and methods used for collecting and synthesizing those reports. Bears involved in conflicts will be handled per policy at the discretion of the field officer or supervisor.

Current Harvest and Total Mortality Objectives

Since B-19 boundaries changed in 2011 with removal of GMUs 28 and 39 and the inclusion of GMUs 50, 500, and 501, there has not been an updated and approved DAU plan with harvest and mortality objectives. The DAU objectives previous to 2011 and the GMU changes were a total mortality of 40 bears and a harvest mortality of 20 bears. Previous harvest and mortality proportions by GMU were evaluated and it was decided to maintain the DAU total mortality objective of 40 bears and harvest objective of 20 bears until a new DAU plan was written and approved.

MANAGEMENT CONSIDERATIONS

Habitat Models

Two different habitat models have been developed to relate bear use, occupancy and forage value to project possible populations by extrapolating bear densities. The population projections use densities derived from relevant Colorado data and from literature. Managers applied densities representative of similar habitats and vegetation types in Colorado to develop population projections and then select population ranges which best represent current conditions in the DAU.

General Vegetation/Bear Density Extrapolation

The first model was developed by Gill and Beck (1991) in an unpublished report to the Colorado Wildlife Commission and was modified by Apker (2003) in an internal CDOW report. This model applies subjective probable black bear densities for different vegetation types to the amount of land area of those vegetation types in the various GMUs. The vegetation type amounts for this model were derived from landsat GAP project coarse vegetation types. This vegetation/density model provides a snapshot extrapolation of possible bear population size in Colorado based on current vegetation classes and both measured and projected bear densities in those vegetation classes from the 1990s. This model and its subsequent extrapolation yields a projected bear population in B-19 of 433 black bears (Table 2).

DAU B-19
Summary Statistics for Vegetation

Common Name	Square Miles of Veg. Class in DAU	Acres of Veg. Class in DAU	Percent of DAU that is Veg. Class	Bear Density as 1 bear/X mi^2	Bear Numbers
Aspen	72.25	46240	2.02%	1	72
Bristlecone pine	43.42	27786	1.21%	10	4
Douglas fir	310.57	198763	8.67%	8	39
Forest dominated wetland/riparian	7.55	4830	0.21%	10	1
Gambel oak	94.15	60255	2.63%	1	94
Lodgepole pine	328.06	209958	9.16%	10	33
Mesic upland shrub	71.95	46047	2.01%	6	12
Mixed conifer	11.35	7264	0.32%	10	1
Ponderosa Pine	809.87	518316	22.60%	6	135
Shrub dominated wetland/riparian	1.17	751	0.03%	10	0
Spruce fir	381.63	244243	10.65%	10	38
Subalpine meadow	34.79	22266	0.97%	10	3
TOTAL	**2166.75**	**1386719**	**60.47%**		**433**

Table 2. B-19 bear numbers based on vegetation extrapolation.

Use/occupancy Density Extrapolation

General classes of habitat that occur in B-19 are presented in Figure 5 using CPW Basinwide GIS Vegetation Classification data. Each of these vegetation classes has been further refined relative to bear use/occupancy and relative forage value. Use/occupancy was defined at 3 levels; primary, secondary, and edge habitat.

Use/occupancy terms are defined as follows:
Primary – cover types that bears typically and normally use at various times of year.
Secondary – cover types that bears occasionally use but is not preferred.
Edge – cover types infrequently used, but bears may be found in when adjacent to Primary cover types.
Out – cover types that are not black bear habitat or those in which bears would only travel through.

The results of this analysis provides tables of bear habitat in terms of its relative use and state of occupancy and then for those habitats with varying levels of use, what their potential relative forage value may be. This resulted in a matrix for assigning habitat quality and subsequently for assigning bear densities to different habitat quality to extrapolate a potential population. The population results for B-19 can be incorporated into modeling or used as a comparison to independent population model runs (Table 3).

The following table provides the results of this surface area analysis for B-19.

B-19 Modeled Bear Habitat by GMU (km²)								
DAU	GMU	Primary	Secondary	Edge	Bear Density bear/km²			Projected Bear Population
B-19	39	668	8	188	0.08	0.04	0.008	55
	46	385	3	118	0.08	0.04	0.008	32
	50	282	72	161	0.08	0.04	0.008	27
	51	827	18	240	0.17	0.13	0.017	147
	104	236	72	949	0.08	0.04	0.008	29
	391	155	14	399	0.17	0.13	0.017	35
	461	271	11	36	0.17	0.13	0.017	48
	500	207	22	103	0.08	0.04	0.008	18
	501	1050	36	109	0.08	0.04	0.008	86
B-19 TOTAL		4082	257	2305				478

Modeled Bear Habitat by GMU (km²)					
DAU	GMU	Primary	Secondary	Edge	Projected Bear Population
B-19	39	668	8	188	55
	46	385	3	118	32
	50	282	72	161	27
	51	827	18	240	147
	104	236	72	949	29
	391	155	14	399	35
	461	271	11	36	48
	500	207	22	103	18
	501	1050	36	109	86
B-19 TOTAL		4082	257	2305	478

Table 3. Results of habitat surface area analysis for use/occupancy population estimate in B-19.

Published black bear densities across Rocky Mountain States range from 1.35 bears/100 sq. k. in Rocky Mountain National Park (Baldwin and Bender 2007) to 31-77 bears/100 sq. k. in Idaho (Beecham and Rohlman 1994). However, two 2009 Colorado mark-recapture surveys indicate higher densities than those found by most studies, analyses, or management reports in the western US (44-85 bears/100 sq. k.)(Apker et al. 2010). Although density estimates are influenced by the size of the study area and the methods by which density estimates were derived (see Apker et al. 2010); overall habitat quality in the two 2009 study areas in Colorado is probably better than that found in most other study areas. It should also be noted that both the Colorado 2009 survey areas were selected in large part because they were considered among the highest overall quality habitat in Colorado and the exact survey grid areas were structured to include mostly the highest quality cover and forage value habitat for the survey season. There isn't any published data collected within B-19 but the work conducted across Colorado and North America provides a comparison (Table 4).

Location	Source	Per 100 km2
Washington	Lindzey 1977	112 - 149
Nevada - Tahoe Basin (urban)	Beckmann and Berger 2003	120
Colorado - SESA	Apker et al. 2010 unpublished	47 - 52
Wisconsin	Belant et al. 2005	50 - 64
Colorado - NWSA	Apker et al. 2010 unpublished	45 - 50
Idaho	Beecham 1980	43 - 47
Alberta	Kemp 1976	38
Montana	Jonkel and Cowan 1971	38
Colorado - Uncompahgre	Beck 1995 unpublished Fed Aid Rpt	36
Idaho	Rohlman 1989	34
Arizona	LeCount 1982	33
Nevada - Sierra Range	Goodrich 1990	20 - 40
Arizona	Waddel and Brown 1984	27.8
Colorado - BMSA	Beck 1991	17.9
Colorado-Northern Front Range	Vieira 2014 Unpublished	8.15
Colorado - Middle Park	Beck 1997 Unpublished Fed Aid Rpt	8.1
Utah	Utah Division of Natural Resources 2000	7.7
Wyoming	Grogan and Lindzey 1999	2.1 - 3.0
Colorado - RMNP	Baldwin and Bender 2007	1.35

Table 4. Reported black bear densities from research, analysis, or management reports in diverse locations and habitat types.

Several other correlates of bear habitat use/occupancy are also available to managers in B-19 including harvest density/locations, roadkill/highway crossings, and conflict hotspots. An evaluation of B-19 harvest locations superimposed on the basic categories of bear habitat use and occupancy indicates that most harvest, and presumably most of the bears, are being found (in the fall) in primary habitat or within edge habitat that very closely adjoins primary habitat (Figure 14). The significant exception to this would be the presence of bears, as documented through roadkill, harvest and conflicts, in high densities in some localized areas of edge habitat (those associated with human food sources).

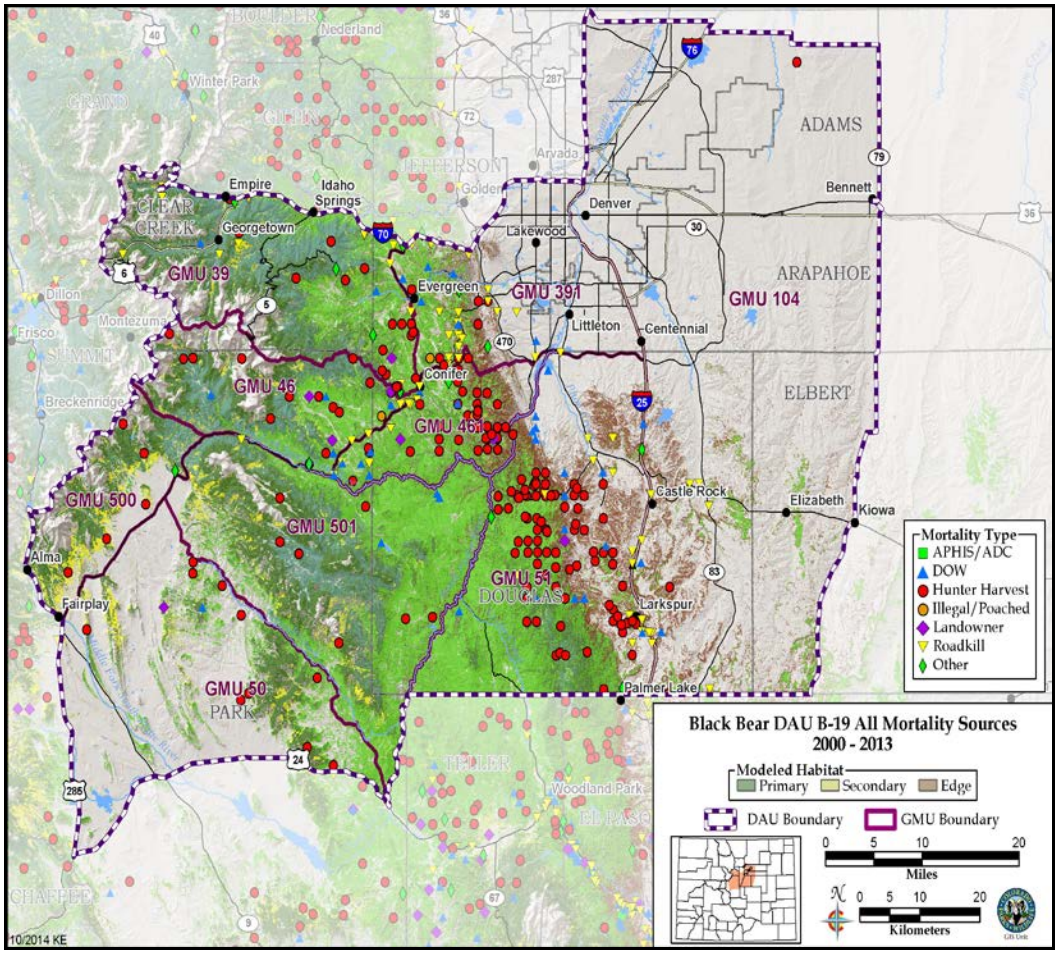

Figure 14. Location of bear mortalities in B-19 (2000-2013)

Mortality Density and Rates

The amount of human-caused mortality in relation to the amount of suitable habitat available is another method to gauge the impacts of human-caused mortality on black bear populations. This can be useful in illustrating impacts on a more local scale and standardizing mortality between DAUs with varying habitat suitability. The number of human-caused mortalities can be divided by the area of primary and secondary habitat.

Thus B-19 with 5,434 km2 of primary and secondary habitat and an average of about 40 bears killed per year over the past 10 years = a mortality density of 0.74 bears/100km2. Then assuming that the bear population is about 500 bears, which is roughly the mid-point between the various habitat and population model projections, then the median bear population density in the DAU is about 9.2 bears/100km2. Using these figures to calculate a mortality rate yields .0.74/9.2 = 8%. It is likely that some human-caused non-harvest bear mortality occurs in B-19 that is undetected, but it is unlikely that the average ten-year total mortality exceeds 50 bears. At that level the mortality rate would be about 10% with the median bear population density.

Miller (1990) demonstrated that under optimal conditions of reproduction and survival, maximum sustainable total mortality for black bears could be as high as 14.2%. Beck and White (1996 unpublished) conducted black bear population simulation analyses which, given their assumptions, produced stable bear populations with annual mortality at up to 15%.

It is unlikely that bears annually experience optimum reproduction and survival conditions due to environmental variation affecting forage conditions and black bear vulnerability to mortality factors. Therefore, we have formulated mortality rate thresholds associated with different management strategies which are somewhat lower than the foregoing:

Management Strategy	Mortality Rate Threshold
Increasing	< 10%
Stable	10% - 15%
Decreasing	> 15%

Forage Condition - Mast Production Surveys

Forage conditions influence bear reproductive success and certain gender and age specific survival rates due to changes in vulnerability to mortality (Beck 1991, Costello et al. 2001). Therefore, managers consider forage conditions when formulating annual management recommendations. Mast production surveys have been conducted since 2008 in parts of B-19. Results of these surveys are incorporated into population modeling efforts, as are mortality, age and gender structure data.

Population Models

Deterministic population models were developed on a framework of annual biological, harvest and density assumptions to project assumed populations using available data. We used a starting population at the higher end of the range taken from the early 1990s vegetation/density extrapolation and projected it to 2019. We used plausible values for age specific survival, number of cubs per litter, and the model includes input values to account for changes to reproduction and mortality rates due to poor forage years. For years 2008- 2013 we had actual forage condition monitoring data. For prior years we used the relative amount of non-hunt mortality to provide an index of forage conditions. The models use mortality data with harvest as a direct model input and non-hunt mortality adjusted upward since we know our records do not document all non-hunt mortality.

While the models do yield population estimates, these estimates are predicated on many plausible, yet assumed input values. The results do appear to conform to population extrapolations derived by the habitat models. Nonetheless, the value of the models is most worthwhile in the population trajectories and responses to mortality and forage condition variability than the absolute population numbers they produce.

Two models in B-19 are compared; one projects a liberal population with attendant liberal, but plausible model parameters, the other is a conservative population projection with more conservative parameters.

Assumptions common to both Liberal and Conservative Models

The initial population size of 500 bears and the starting age distributions for both models was derived from extrapolations of habitat quantity and known bear densities from the literature. Sex ratio at birth was assumed to be 50/50, with an average litter size of 2. Both models employ a non-harvest multiplier of 1.5 that increases the value of the reported non-harvest mortality.

Subadult and adult survival rates were largely midpoints of published ranges in New Mexico and Colorado (Costello et al. 2001, Beck 1991, Beck 1997), while cub survival fell within published ranges but was modulated by a mast index that is intended to reflect documented forage conditions on a yearly basis. Given the weak influence of mast in B-19 cub survival rates were assumed to be slightly lower but less variable than in models of mast-driven systems. Predicted population and age structure levels beyond the current year (2014) relied upon the continuation of assumptions used in the preceding years, as well as projected future mortality levels at levels necessary to stabilize the population.

Liberal Model

The assumptions used specifically in the liberal model include cub survival rates of 45% (poor food years), 60% (average food years) and 80% in good food years. Annual age and gender specific survival rates are unaffected by natural or human forage conditions, although the forage condition or mast index that modulates cub survival rates does minimally impact age class totals (see rates below).

Modeling efforts using the liberal inputs yields a 2014 post-hunt population projection of 803 bears, with 169 cubs, 398 females and 215 males. Excluding cubs, the 2014 B-19 projection of independent bears is 634.

Conservative Model

The assumptions used specifically in the conservative model includes cub survival rates of 45% (poor food years), 60% (average food years) and 77% in good food years. Annual age and gender specific survival rates are generally 1-2% lower than those used in the liberal model, and are unaffected by natural or human forage conditions.

Modeling efforts using the conservative inputs outlined above yields a 2014 post-hunt population projection of 625 bears, with 134 cubs, 327 females and 164 males. Excluding cubs, the 2014 B-19 projection of independent bears is 491.

Mortality Composition and Management Criteria

Black bear vulnerability to harvest and other mortality factors varies depending upon differences in habitat, hunter effort or pressure, access, and forage conditions. Bears are less vulnerable where cover is dense over large geographic areas. They are more vulnerable where vehicle access is good. The greatest influence in annual variation in bear vulnerability is forage conditions. When natural forage quality or availability is poor bears must become much more mobile in search of food, especially during fall hyperphagic periods. Increased mobility tends to result in bears being more visible to hunters, more likely to encounter human food sources, more frequently found along or crossing roads, and more concentrated in areas where there may be relatively more forage available. All of these tendencies can result in increased hunter harvest, increase human conflict mortality, more roadkills and other forms of mortality. Not all segments of bear populations are equally vulnerable however, regardless of other influences. Hunting pressure affects harvest rate, which affects age structure, sex ratios, and densities of black bear populations. Adult males are typically most vulnerable because they are bold (often use open areas) and have larger home ranges. Sub-adult males are slightly less vulnerable. Consequently, the adult male segment of a population is the first to be reduced under hunter pressure. As harvest rates increase, the proportion of sub-adult black bears (those less than 5 years old) in the harvest typically increases, whereas the proportion of adult males declines. **A low percentage of adult males (≥5 years old) in the harvest may be an indication of over-harvest.** This criterion is a more sensitive indicator of black bear population levels than median age (Idaho Dept. of Fish and Game 1998). The mean percent of adult males in the harvest in relatively stable populations in Idaho (Beecham and Rohlman 1994) and New Mexico (Costello et al. 2001) under moderate to high harvest levels was 30% and 28%, respectively. Studies of black bear populations in Alaska, Virginia, and Arizona showed similar relationships between lightly and heavily hunted populations. **Therefore, 25% to 35% adult males in the harvest could indicate a stable black bear population.** Levels lower than 25% may indicate a higher level of harvest, which has reduced the adult male segment of the population; whereas levels higher than 35% may indicate a much lighter harvest level. Based on the 3 years of available data in B-19, it appears that current harvest levels could be high, as adult males comprise 20% of the total harvest (Figure 14).

As harvest levels increase and additional adult and sub-adult males are removed from an area, the proportion of females in the harvest begins to increase (Fraser et al. 1982, Kolenosky 1986, Beecham and Rohlman 1994), because female are least vulnerable, especially if accompanied by cubs. The average percent females in the harvest of black bear populations under moderate and high hunting pressure in Idaho (Beecham and Rohlman 1994) and New Mexico (Costello et al. 2001) was 35% and 40%, respectively. Beecham and Rohlman (1994) suggest a desired proportion of female harvest of 35% to maintain a stable population, whereas Beck (1991) suggested maintaining <40% females in harvest. **Therefore, a range of 30% to 40% females in the total harvest could indicate a stable black bear population.** Data Analysis Unit B-19 appears lower than the stable range using this indicator, with a 24% female harvest rate over the last 3 years (Figure 15). Proportions higher than 40% may suggest reduction of the number of females in the population. Monitoring this criterion helps ensure a stable reproductive portion of the population and the ability of the population to rebound in the event of a decline.

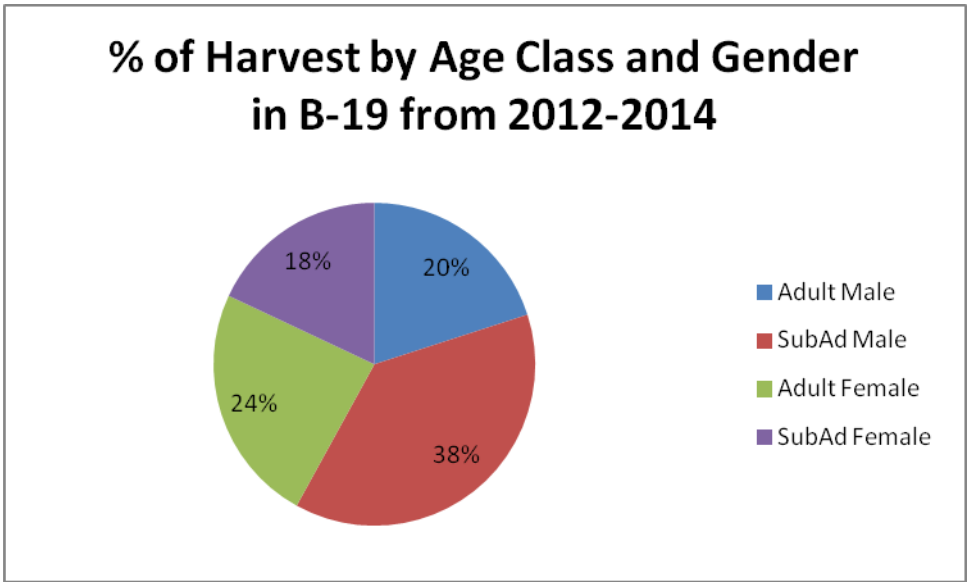

Figure 15. Bear harvest in B-19 by proportion of age class and gender.

With increasing harvest of a black bear population, younger females are removed and older females become more common in the harvest. **Thus, the proportion of adults in the female harvest should rise with harvest rates, increasing mean age of females in the harvest** (Kolenosky 1986, Beecham and Rohlman 1994). This phenomenon is especially important with late-reproducing species like bears, since removing adult females has the enhanced effect of not only reducing the number of bears in the population, but also decreasing reproductive potential of the population and, thus, its ability to respond to declines. The delayed response of slow reproducing populations to reductions was noted by Harris (1984) and was demonstrated in modeling efforts by Miller (1990), who predicted black bear populations reduced by 50% would take an average of 17 years to recover if hunting pressure was reduced by 25%.

The percent of adults in the female harvest, rather than mean or median age of the females in the harvest, can also be used to gauge the presumed population trajectory. Averaged over a three-year period, this criterion provides a more meaningful measurement of female harvest age structure, especially in areas with small sample sizes. The mean percent of adult females in the harvest of two New Mexico black bear populations under moderate and high harvest pressure was 55% and 70%, respectively (Costello et al. 2001). The mean percent adult females in the Wyoming statewide female black bear harvest from 1994-2005 was 47%, with a range of 32% – 57%, **suggesting that 45 - 55% adult female harvest provides a stable proportion of adult females** (Wyoming Game and Fish Dept. 2007). In B-19, adult females comprised 48% of the female harvest from 2012-2014, indicative of a stable population under this criteria (Figure 16).

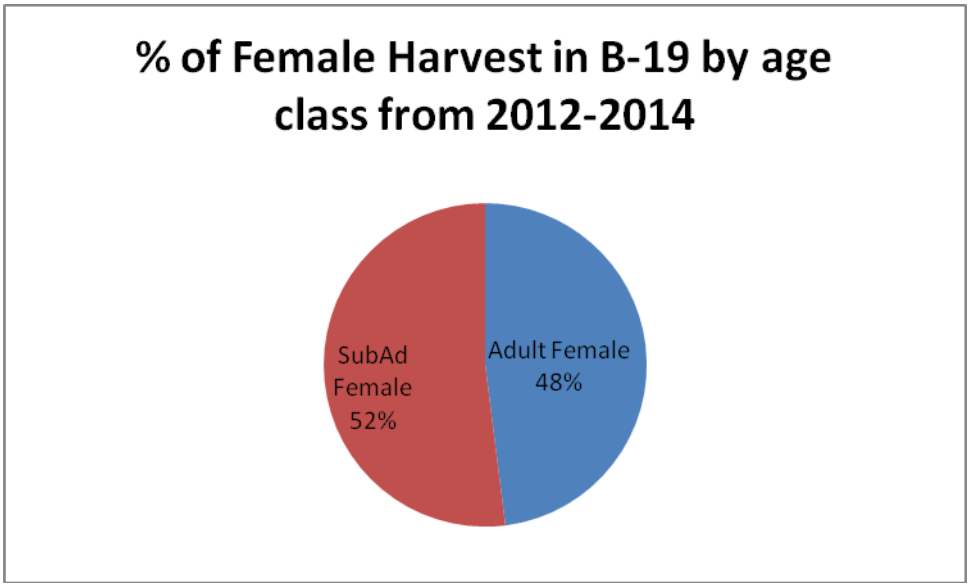

Figure 16. Proportion of female harvest, by age class in B-19.

Looking at criterion independently could give very different results than when considering them together. For instance, looking only at a reduced percentage of adult males in the harvest may indicate a population is moving from light to moderate harvest. However, evaluating the other criteria may show an increased proportion of females and higher proportion of adult females in the harvest, indicating a much higher level of harvest than looking at males alone. Alternatively, a high percentage of adults in the female harvest, assessed independently, would indicate population reduction. However, when the percent adult males and percent females in the harvest are both in the population increase or stable range, the population might actually be thriving. This situation might occur when the DAU is adjacent to or has an area providing a source of immigrating black bears. Source areas can be defined as areas of suitable habitat with little to no human-caused mortality that may provide dispersing bears to surrounding areas (Beecham and Rohlman 1994, Powell et al. 1996). Areas adjacent to sources may have a lower proportion of adults in the harvest due to sub-adults dispersing to occupy vacant home ranges of harvested bears. These areas may also be able to rebound more quickly from overharvest (Beecham and Rohlman 1994). Dispersing sub-adult males may also supplement surrounding populations and absorb much of the harvest to the point where female harvest remains low and adult females comprise a higher proportion of the population.

To better evaluate harvest data, black bear seasons are set for a five-year period as with most other big game species in Colorado. We recommend that harvest objectives and attendant license allocations be set for three-year periods. This would allow for a more complete analysis of the effects of harvest by holding dates and quotas the same for each three-year season cycle. In order to increase the sample size of the harvest data and to reduce the influence of high or low annual harvest rates due to environmental or other factors, three-year running averages will be used in harvest data analyses rather than analyzing annual data independently. While the evaluation of harvest criteria will be analyzed using a three-year average, data from the previous 10 years (two black bear generations) or longer should be analyzed to illustrate longer-term trends in harvest and related population trends.

Social Factors

The social factors that influence management scenarios in B-19 include game damage and human-bear conflicts. As stated above in the game damage section, the 10-year annual average number of game damage claims in the DAU is 6, with the largest number being for other livestock damage. Most of the game damage claims are related to hobby livestock on small acreage parcels. Game damage is mitigated through preventative materials, education, and compensation by CPW.

Direct, significant human conflicts with black bears in B-19 typically involve a bear entering or attempting to enter a home, cabin, trailer or car. These conflicts are dealt with by CPW field staff differently depending on severity of the incident, other site-specific qualities and whether the bear in

question had been previously handled by the CPW. There is a CPW policy on handling bears that have already received a first "strike", as well as procedures to follow if a bear makes physical contact with a person.

STRATEGIC GOALS AND MANAGEMENT OBJECTIVES

Process for Developing Strategic Goals and Management Objectives

Public Process

Local CPW staff has met on several occasions in the past year to develop feasible alternatives for strategic objectives for B-19. Three alternatives were developed based upon modeled population estimates, damage and nuisance issues, and hunting opportunity. These alternatives are outlined in APPENDIX A: STRATEGIC OBJECTIVE ALTERNATIVES. These alternatives were used merely as a basis for discussion; the introduction of other alternatives was strongly encouraged throughout the initial public input process.

In August 2015, initial public input was solicited. A survey was available in both printed and online formats in an effort to obtain public input on bear population goals and other comments directly related to management.

Approximately 2,500 postcards were mailed out to a cross-section of interested stakeholders, including B-19 license holders and landowners in Denver, Douglas, Clear Creek, Jefferson, and Park Counties requesting their input via the online or written survey. Information was provided to obtain a hard copy of the survey. The public survey is in full detail in APPENDIX B: PUBLIC SURVEY.

A total of 120 individuals responded to the online survey and 15 surveys were returned in the printed format. The public survey results and analysis are available in APPENDIX C: PUBLIC SURVEY RESULTS.

Following public input, a draft plan was reviewed by CPW staff. All public input received in written form was incorporated into this document. The first draft was available for public comment in May 2017. The draft plan was also available to impacted federal, county and local municipality land management and natural resource agencies for comment.

Following public review of the draft plan, all input was reviewed and incorporated. A preferred strategic objective was selected May 2017, the plan was presented to the Parks and Wildlife Commission in January 2018, and approved by the Parks and Wildlife Commission in February 2018.

Strategic Goals

Subsequent total mortality and harvest objectives are presented as a range of probable amounts necessary to achieve the strategic goal of the DAU. Annual monitoring of mortality amounts, gender and age structure, the Colorado black bear density study, and annual forage condition survey results are all incorporated into determining annual mortality objectives. However, the models and their results have not been validated with demographic data from Colorado bear populations. Moreover, the data that has been collected and used for model inputs result from relatively new efforts. We anticipate that the models will change and be improved over time and thus should be viewed as **presumptive** estimates. Therefore, although the plan identifies mortality and age and gender objectives, these are initial values. Modeling will be conducted every other to every third year, while other mortality data and demographics are collected and analyzed annually. Population extrapolations based on predicted densities, range-wide or within vegetation associations, will be re-evaluated as new data is gathered via research and mark-recapture surveys. While unlikely, objectives may be periodically adjusted in order to achieve the DAU strategic goals based on changes in the information sources above. Specific objectives will be documented in annual objective sheets approved by the Parks and Wildlife Commission. These objective sheets will also govern annual license levels to achieve the DAU strategic goals.

Two Alternative Strategic Goals in B-19 were considered:

Reduce the bear population in B-19

To achieve a strategic goal of reducing the bear population in B-19, management criteria applied to determining harvest and total mortality rates would be in the liberal range. Total mortality, or off-take, as a proportion of the population could increase to greater than 15%. Proportion of adult males in the harvest can be low, even below 25%, with total female harvest rates going over 40%. Additionally, adult female proportions in the female harvest can account for rates over 55%.

Stable bear population in B-19

To achieve a strategic goal of maintaining a stable bear population in B-19 management criteria applied to determining harvest and total mortality rates should fall in an intermediate range. Total mortality, or off-take, as a proportion of the population should fall in the 10-15% range. Proportion of adult males in the harvest should be within 25-35%, with all females making up 30-40% of harvest. Additionally, adult females should comprise approximately 45-55% of the female harvest.

Monitored Data to Inform Management

All known dead black bear, from both harvest and non-harvest sources, are checked by CPW staff to obtain biological information. The proportion in total mortality of each gender will continue to be closely monitored on an annual basis to assure that female mortality rates are not contrary to the DAU strategic goals. Age structure in total mortality and reproductive history are derived from extraction of a premolar tooth from bears when bear harvest and non-hunt mortality is reported through the mandatory check.

Because of low reproductive rates, black bear populations cannot sustain high harvest levels over prolonged periods. Research has shown that high harvest levels can quickly reduce black bear populations to levels where severe reductions in harvest quotas and season lengths may be necessary for greater than 10 years for full recovery of a population (Miller 1990, Beecham and Rohlman 1994). Therefore, the following harvest criteria will be assessed at the DAU level, with each DAU strategic goal set to achieve the criteria for decreasing, stable, or increasing black bear numbers.

Total Mortality and Proportion of Mortality by Age and Gender

Monitoring harvest and overall mortality totals in relation to projected population size will be important in interpreting mean age and relative proportions of age/gender classes as indices. The desired proportions and total mortality off-take range will be based on the preferred strategic objective. The following 3 harvest criteria will be monitored annually, using a 3-year average in B-19. Table 5: Harvest Composition Indicators outlines the guidelines that will inform management decisions based upon the selected strategic goal.

	Criteria	Adult Males in Total Harvest	Females In Total Harvest	Adult Females in Female Harvest	Total Off-take Rate
Strategic Goal	Decreasing	< 25%	> 40%	> 55%	>15%
	Stable	25 – 35%	30 – 40%	45 – 55%	10-15%
	Increasing	> 35%	< 30%	< 45%	<10%

Table 5. Harvest composition indicators.

Other conditions

Other conditions that will be monitored in B-19 to ensure that the strategic goals are met include hunter

success rates and satisfaction (anecdotally), annual fall forage condition monitoring and amount and number of game damage claims and human conflicts.

Forage condition monitoring

Collected annually this data can be used when projecting reproductive rates, cub survival, vulnerability to harvest and other factors related to modeling and predicting population trends for the upcoming year. Annual forage condition/mast production surveys are conducted in representative GMUs in DAU B-19. Results of these surveys are incorporated into population modeling efforts, as are mortality, age and gender structure data.

Game Damage & Human Conflict

Levels of submitted game damage claims and documented conflicts between humans and bears will be evaluated on an ongoing basis. In most cases, management efforts will be targeted at individual bears/locations that are involved in these situations. Management actions include a wide array of techniques and strategies that are employed on a case by case basis.

Management Objectives

The specific total mortality and harvest objectives are based on present information and assumptions about population status and trajectory. These represent starting points in an ongoing process. Annual changes to mortality and harvest objectives are anticipated based on new information and evaluation of monitored data. Annual quantitative objectives will be documented in DAU objective sheets approved by the Parks and Wildlife Commission during annual regulation cycles.

Using the 4 different models/techniques to project plausible bear population sizes in B-19 yields the following:

Vegetation/ Bear Density extrapolation = 433 independent bears
Use/occupancy density model population extrapolation = 478 independent bears
Liberal Population Model for 2014 = 803 bears (604 independent)
Conservative Population Model for 2014 = 625 bears (491 independent)

For purposes of calculating mortality objectives to correspond with the strategic goal in the DAU a 2016 presumptive post-hunt population of 500 independent bears will be used. This is based on the suite of models and extrapolations above and is supported by the ranges provided by those estimates. Overall mortality and hunter harvest objectives will be calculated based on this population projection and application of the harvest criteria that are appropriate for the selected strategic goal.

Mortality Objective – 3 year Running Average

Total Mortality Objective

In order to achieve a DAU strategic goal of a decreasing bear population in B-19, it is estimated that the average total mortality should be no more than 90 bears. This mortality objective is within (18%) of the off-take range (15-20%) for a decreasing population. Hunter opportunity and other mortality will be increased until the indicators for a decreasing population are met on a running three-year average and then the population will be stabilized to the off-take range of 10-15% at a mortality limit of 75 bears.

Hunter Harvest Objective

Annual hunter harvest objectives are determined by deducting the 3-year running average amount of non-hunter mortality from the total mortality objective. If the strategic goal is to maintain a decreasing population, then hunter harvest objectives could be adjusted up or down to (presumably) increase or decrease the rate population growth or decline. Based on a total mortality limit of 90 bears, the hunter harvest objective will be no more than 60.

Age & Gender Structure (harvest composition) in Hunter Harvest Objective

It is estimated that the 3-year running average proportion of age and gender structure in hunter harvest should meet the following criteria:

Harvest Criteria	Strategic Goal		
	Decreasing	Stable	Increasing
% of Adult Males in Total Harvest	< 25%	25-35%	> 35%
% of All Females in Total Harvest	> 40%	30-40%	< 30%
% of Adult Females in Total Female Harvest	> 55%	45-55%	< 45%

Game Damage and Human Conflict Objectives

Standard CPW management techniques will be employed in B-19 to reduce game damage and human conflicts with bears. Levels of submitted game damage claims and documented conflicts between humans and bears will be evaluated anecdotally on an ongoing basis. In most cases, management efforts will be targeted at individual bears/locations that are involved in these situations. Management actions include a wide array of techniques and strategies that are employed on a case by case basis. Other methods of non-lethal intervention will be used when the conditions and individual situation warrant it. Non-harvest bear mortality (including bear killed by CPW and other agencies, roadkills, game damage kills) will be evaluated for trends annually through mandatory reporting.

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APPENDIX A: STRATEGIC OBJECTIVE ALTERNATIVES

Reducing the B19 population

To achieve a strategic goal of reducing the population, harvest and total mortality rates would be in the liberal range with composition indices showing a decreasing population. Total mortality would increase to greater than 15% of the total population size. Proportion of adult males in the harvest can be low, even below 25%, with total female harvest rates going over 40%. Additionally, adult females could comprise over 55% of the total female harvest. Based on a primary management goal of minimizing bear conflicts, bear populations in areas with conflict and damage could be suppressed to low levels. Sex and age composition of mortality and harvest would be reexamined annually to determine if the increased harvest had impacted the population. This information, combined with analysis of damage and nuisance complaints, would inform decisions on harvest rates, or whether the population was within an acceptable range and conflicts had been minimized. Not every management index must be in complete agreement, but most should initially point toward a decreasing trend.

Maintain a Stable B-19 population

To achieve a strategic goal of maintaining a stable bear population in B-19, harvest and total mortality rates will fall in an intermediate range. Total mortality should fall within 10-15% of the total population. Proportion of adult males in the harvest should be within 25-35%, with all females making up 30-40% of harvest. Additionally, adult females should comprise approximately 45-55% of the female harvest. Within the framework of an overall stable population, flexibility in off-take rates will be maintained to manage for minimized game damage and human/bear conflicts in localized areas of concern. Not every management index must be in complete agreement, but most should point toward a stable population.

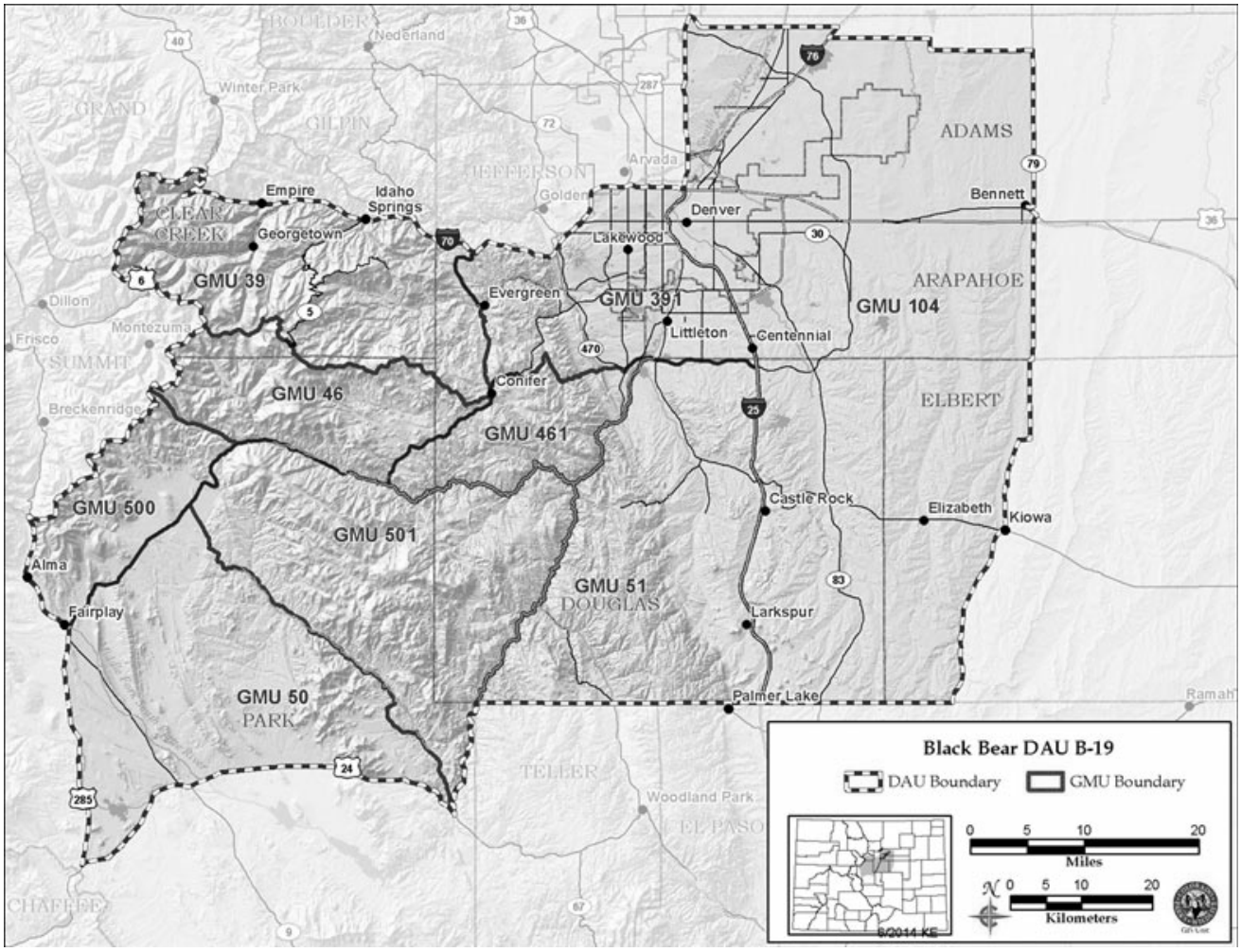
B19 Bear Management Plan

Introduction

Colorado Parks and Wildlife (CPW) is updating the black bear management plan for the Central Front Range bear management area. Obtaining input from a diverse spectrum of stakeholders who care about bear management is the first part of this process. This plan will outline goals for bear management in portions of Jefferson, Clear Creek, Park, Douglas, Denver, Arapahoe, Adams, and Elbert counties (see map below) and includes Game Management Units (GMUs) 39, 46, 50, 51, 104, 391, 461, 500 and 501. This bear management area is large and encompasses a diverse mix of bear habitats, land ownership, and human densities, and people living in the area have diverse views about how bears ought to be managed. As such, the Central Front Range bear management plan must be flexible enough to balance hunting and non-hunting sources of bear mortality to maintain bear populations across the entire area. In addition, the plan must attempt to balance desires to view and hunt bears with a desire to limit negative interactions between humans and bears. The following questions will help CPW understand your desires regarding black bear population management in this area. If you have any additional comments not addressed in the survey, please enter your comments in the last question of this survey.

If you have any questions about this survey or the management plan, please contact Shannon Shaller, Wildlife Biologist, Mark Lamb or Eliza Hunholz, Area Wildlife Managers. Only comments received via the online survey or in written form will be accepted. Written comments can be submitted to Shannon Schaller, Colorado Parks and Wildlife, 6060 Broadway, Denver, CO 81216, or emailed to shannon.schaller@state.co.us. All survey responses and written comments must be submitted by September 15, 2015.

Mark Lamb and Eliza Hunholz
Area Wildlife Managers
Colorado Parks and Wildlife
Denver, CO



B19 Bear Management Plan

1. Please enter your ID number. You can find your ID number printed above your name and address on thefront of the postcard you received inviting you to complete this survey. If you do not have access to your IDnumber, please leave this question blank.

ID number

B19 Bear Management Plan

2. Are you a resident of Colorado? (Please check one.)

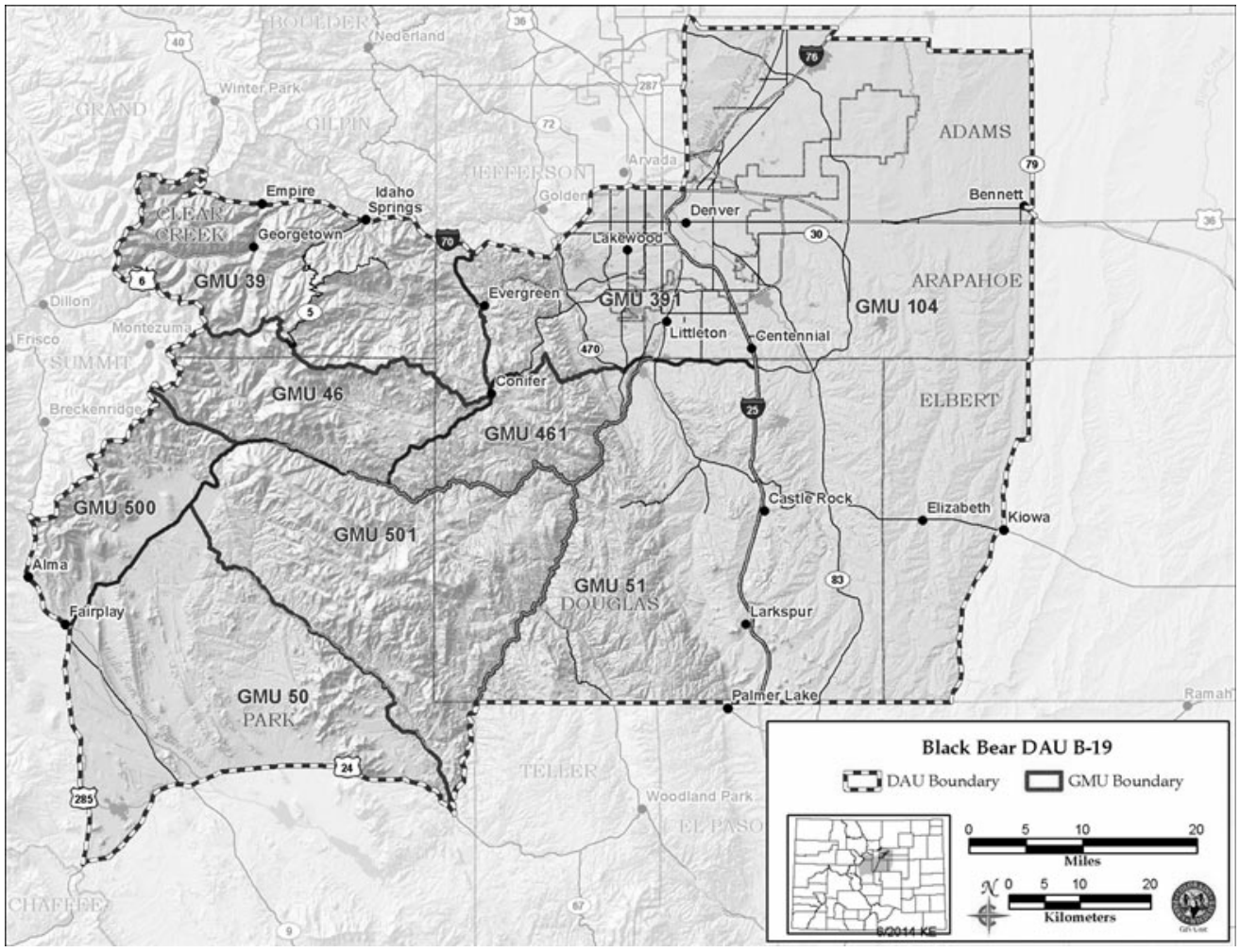
- ○ Yes
- ○ No

B19 Bear Management Plan

3. Do you live in GMU 39, 46, 50, 51, 104, 391, 461, 500 and 501? See the map below, which shows the boundaries of GMUs 39, 46, 50, 51, 104, 391, 461, 500 and 501. (Please check one.)

- ◯ Yes
- ◯ No

B19 Bear Management Plan

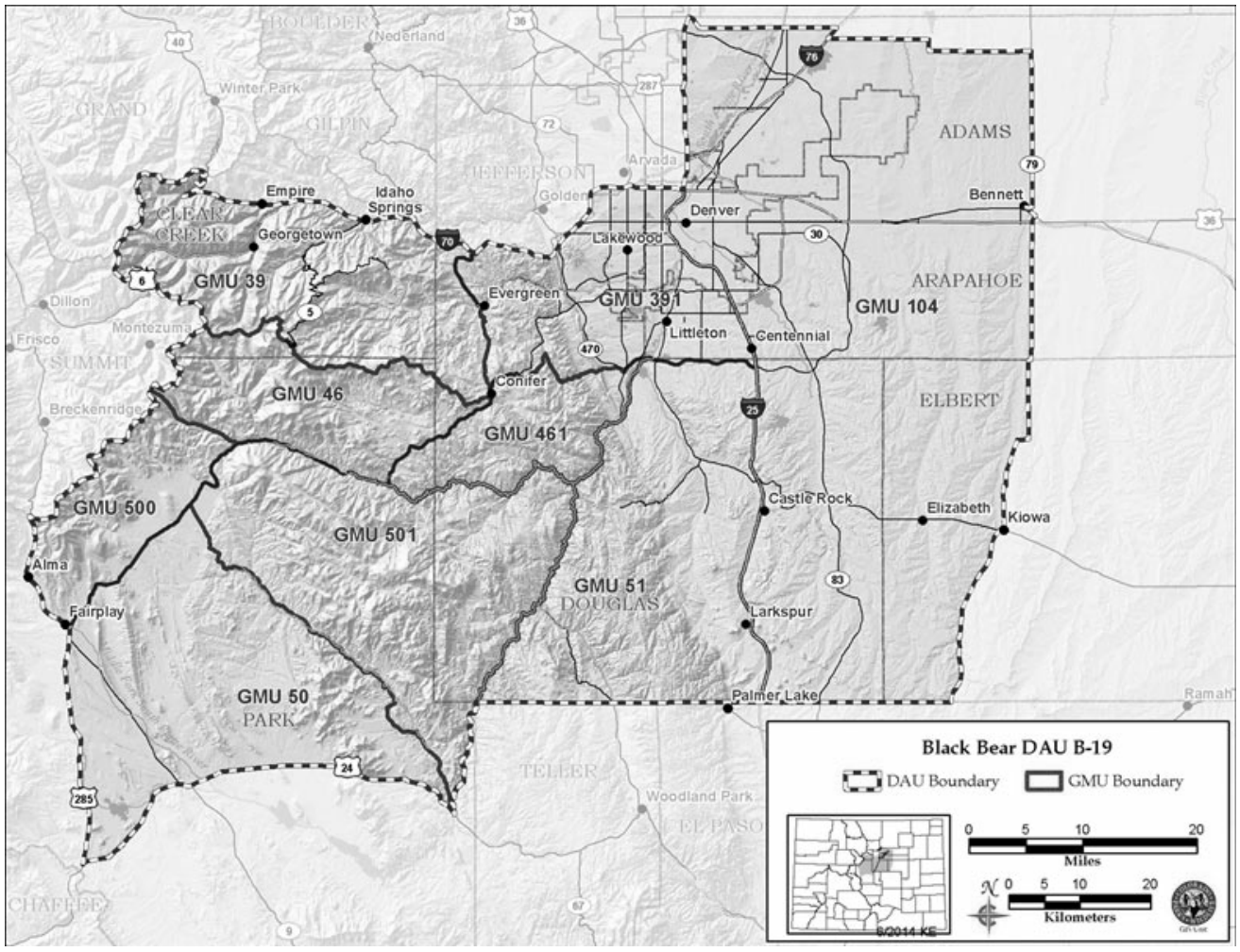


B19 Bear Management Plan

4. In which of the following GMUs do you live? See the map below, which shows the boundaries of GMUs39, 46, 50, 51, 104, 391, 461, 500 and 501. (Please check one.)

- ◯ 39
- ◯ 46
- ◯ 50
- ◯ 51
- ◯ 104
- ◯ 391
- ◯ 461
- ◯ 500
- ◯ 501

B19 Bear Management Plan



5. People are involved with wildlife in many ways. Which of the following statements best describes your current level of interest and involvement? (Please check one.)

- ○ I am interested in wildlife, BUT I don't do much that is specifically related to wildlife.
- ○ I am interested in wildlife, AND I actively take part in wildlife-related activities.
- ○ I am NOT very interested in wildlife AND I don't do much that is specifically related to wildlife.
- ○ I am NOT very interested in wildlife, BUT for various reasons I am involved in wildlife-related activities.

6. The following are some ways that people interact with wildlife.Have you participated in these activities in the past 3 years? (Please check one for each item.)

	Yes	No
a. Learned about wildlife by reading or watching television	○	○
b. Spent time watching or photographing wildlife or birds	○	○
c. Hiked, walked or biked in natural areas	○	○
d. Rode an ATV, Jeep or dirt bike in natural areas	○	○
e. Worked on a ranch or farm	○	○
f. Camped	○	○
g. Hunted any wildlife	○	○
h. Fished any fish species	○	○
i. Guided or outfitted individuals to hunt in Colorado	○	○
j. Participated in or commented on a CPW wildlife management plan or BLM, USFS or other federal land use plan	○	○
k. Participated in or commented on a county, city or other local land use plan	○	○

B19 Bear Management Plan

7. How important are black bears to you? (Please check one.)

- ◯ Very Important
- ◯ Somewhat Important
- ◯ Neither Important, nor Unimportant
- ◯ Somewhat Unimportant
- ◯ Very Unimportant
- ◯ I am not sure.

8. Which of the following best describes your general attitude about black bears in the Central Front Range area? (Please check one.)

- ◯ I do not enjoy black bears in the Central Front Range and regard them as a nuisance.
- ◯ I enjoy black bears in the Central Front Range, but worry about problems they may cause.
- ◯ I enjoy black bears in the Central Front Range and do not worry about the problems they may cause.
- ◯ I do not have particular feelings about black bears in the Central Front Range.

9. How important is it to you to know that black bears live in this area and that their populations will continue to exist in the future? (Please check one.)

- ◯ Very Important
- ◯ Somewhat Important
- ◯ Neither Important, nor Unimportant
- ◯ Somewhat Unimportant
- ◯ Very Unimportant
- ◯ I am not sure.

10. In your opinion, how important of an issue are negative interactions between humans and black bears in the Central Front Range? (Please check one.)

- ◯ Very Important
- ◯ Somewhat Important
- ◯ Neither Important, nor Unimportant
- ◯ Somewhat Unimportant
- ◯ Very Unimportant
- ◯ I am not sure.

B19 Bear Management Plan

11. How often have you experienced the following interactions with black bears in the past 3 years in the Central Front Range area? (Please check one for each item.)

	0 times	1-2 times	3-4 times	5 or more times	I am not sure.
a. Saw black bears in the wild, parks or preserves	○	○	○	○	○
b. Saw black bears in urban or suburban areas of town	○	○	○	○	○
c. Saw black bears near my home					
d. Had a black bear break in to or attempt to break into my garbage	○	○	○	○	○
e. Had a black bear damage my garden or fruit trees					
f. Had a black bear damage my agricultural crops	○	○	○	○	○
g. Had a black bear attack or harass my livestock					
h. Had a black bear damage my bird feeder, pet feeder, or grill	○	○	○	○	○
i. Had a black bear cause damage to other property (e.g. fences, car, garage, etc.)					
j. Had a black bear attack or harass my pets or livestock	○	○	○	○	○
k. Had a black bear enter or attempt to enter my home					
l. Knew someone who was attacked or harassed by a black bear	○	○	○	○	○
m. Was attacked or harassed by a black bear myself	○	○	○	○	○

B19 Bear Management Plan

12. Based on your experience, how has the number of black bears in the Central Front Range changed over the last 10 years? (Please check one.)

- Increased greatly
- Increased somewhat
- Stayed the same
- Decreased somewhat
- Decreased greatly
- I am not sure.

13. How would you like to see the number of black bears in the Central Front Range area change over the next 10 years? (Please check one.)

- Increase greatly
- Increase somewhat
- Stay the same
- Decrease somewhat
- Decrease greatly
- I am not sure.

14. How important is it to you that the change in black bear populations you indicated in the previous question occur over the next 10 years? (Please check one.)

- ○ Very important
- ○ Somewhat important
- ○ Slightly important
- ○ Not at all important
- ○ I am not sure.

B19 Bear Management Plan

15. Which of the following alternatives would you prefer to guide CPW's decisions about the number of black bears in the Central Front Range area in the next 10 years? (Please check one.)

- ◯ **Long-term increase from current population size.** Black bear populations would increase over the next 10 years, because of a reduction in hunter harvest. Hunting opportunity would be reduced, but may fluctuate in response to mortality from other sources such as bear-vehicle collisions. Bears may be seen in the area more often than they are now and the number of negative interactions with bears may also increase.
- ◯ **Maintain a stable population of black bears at current levels.** Black bear populations, and therefore, hunting opportunity will remain at or near current levels, but may fluctuate in response to mortality from other sources such as bear-vehicle collisions. Bears will be seen in the area as often as they are now and the number of negative interactions with bears will remain constant.
- ◯ **Short term population decrease from current levels, then maintain a stable population of black bears at decreased population size.** Black bear hunting opportunity would increase in the next 1 to 3 years, but decrease after that time as fewer black bears are available for harvest. Bears may be seen less often, but the number of negative interactions with bears may also decrease.
- ◯ **Long-term decrease in population size from current levels.** Black bear hunting would increase in the short-term, but will decrease in the long-term as bear populations decrease. Bears will probably be seen less often, and the number of negative interactions with bears will probably decrease.
- ◯ I am not sure.

16. Why did you choose the management goal, above, that you would like to see guide black bear management in the Central Front Range for the next 10 years? (Please describe.)

B19 Bear Management Plan

17. To what extent do you agree with the statement below? (Please check one.)

I believe that CPW is currently doing an adequate job of managing black bears in the Central Front Range(GMUs 39, 46, 50, 51, 104, 391, 461, 500 and 501).

- ◯ Strongly agree
- ◯ Somewhat agree
- ◯ Neither agree, nor disagree
- ◯ Somewhat disagree
- ◯ Strongly disagree
- ◯ I am not sure.

18. To what extent do you agree with the statement below? (Please check one.)

I believe that hunting, watching, and other bear-related forms of recreation contribute susbstantially to localeconomies of Jefferson, Clear Creek, Park, Douglas, Denver, Arapahoe, Adams, and Elbert counties.

- ◯ Strongly agree
- ◯ Neither agree, nor disagree
- ◯ Somewhat disagree

B19 Bear Management Plan

19. Do you take any of the following actions at your home to attempt to minimize your risk of having a negative interaction with black bears? (Please check one for each item.)

	Yes	No	Not applicable
Use a wildlife-resistant garbage container or dumpster	◯	◯	◯
Fence my garden and/or fruit trees	◯	◯	◯
Carry bear spray when walking or recreating	◯	◯	◯
Avoid hiking or recreating in areas where bears have been seen	◯	◯	◯
Put my garbage out on the morning of trash pick-up day, rather than the night before	◯	◯	◯
Feed my pets indoors	◯	◯	◯
Not using composters and avoiding planting gardens and fruit trees	◯	◯	◯
Remove bird and other wildlife feeders	◯	◯	◯
Fence beehives, chickens, or other livestock	◯	◯	◯
Keep my pets indoors	◯	◯	◯
Keep the doors and windows of my home and car closed and locked	◯	◯	◯

B19 Bear Management Plan

20. Who do you believe is most responsible for limiting the number of negative interactions between humans and black bears in the Central Front Range area? (Please check only one.)

- Individual residents and landowners (by doing things like keeping garbage secured from bears)
- City police departments (by doing things like ticketing residents for not keeping garbage secured)
- City Councils (by doing things like passing city ordinances that require bear-proofing)
- Citizens' groups or other non-profit organizations (by doing things like providing information about how to bear-proof)
- Colorado Parks and Wildlife (by doing things like setting harvest levels for bears and moving problem bears)
- Federal agencies (by doing things like moving problem bears)

21. How acceptable is it to you that Colorado Parks and Wildlife spends money collected through hunting and fishing license fees to address negative conflicts between people and bears? (Please check only one.)

Conflicts might include damage to private property, loss of livestock, or threats to humans or pets.
Methods to address these conflicts include moving problem bears, euthanizing bears that cause severe conflicts, and providing resources for bear-proofing.

- Very acceptable
- Somewhat acceptable
- Neither acceptable, nor unacceptable
- Somewhat unacceptable
- Very unacceptable
- I am not sure.

22. CPW takes many types of actions to reduce or prevent negative interactions between black bears and people. The list below contains things CPW currently does, and some that may be considered in the future. How acceptable would it be for CPW to take the following actions to manage black bears in the Central Front Range area? (Please check one for each item.)

	Acceptable	Neither acceptable, nor unacceptable	Unacceptable	I am not sure.
Educate citizens about how to coexist with bears in their area	○	○	○	○
Support city ordinances that require citizens to use wildlife-resistant garbage containers	○	○	○	○
Increase hunting licenses to increase bear harvest in areas with conflicts	○	○	○	○
Fine individuals who are feeding bears intentionally or unintentionally	○	○	○	○
Fine individuals who do not keep their residential garbage secured from bears	○	○	○	○
Fine business owners who do not keep their commercial garbage secured from bears	○	○	○	○
Fine individuals who do not keep bird feeders, pet food, and other unnatural food sources secured from bears	○	○	○	○
Trap and relocate bears that cause conflict	○	○	○	○
Kill bears that cause multiple conflicts	○	○	○	○

23. Have you hunted black bears in Colorado?

Yes

No

B19 Bear Management Plan

24. Have you hunted black bears in GMU 39, 46, 50, 51, 104, 391, 461, 500 and 501? (See the map below.)

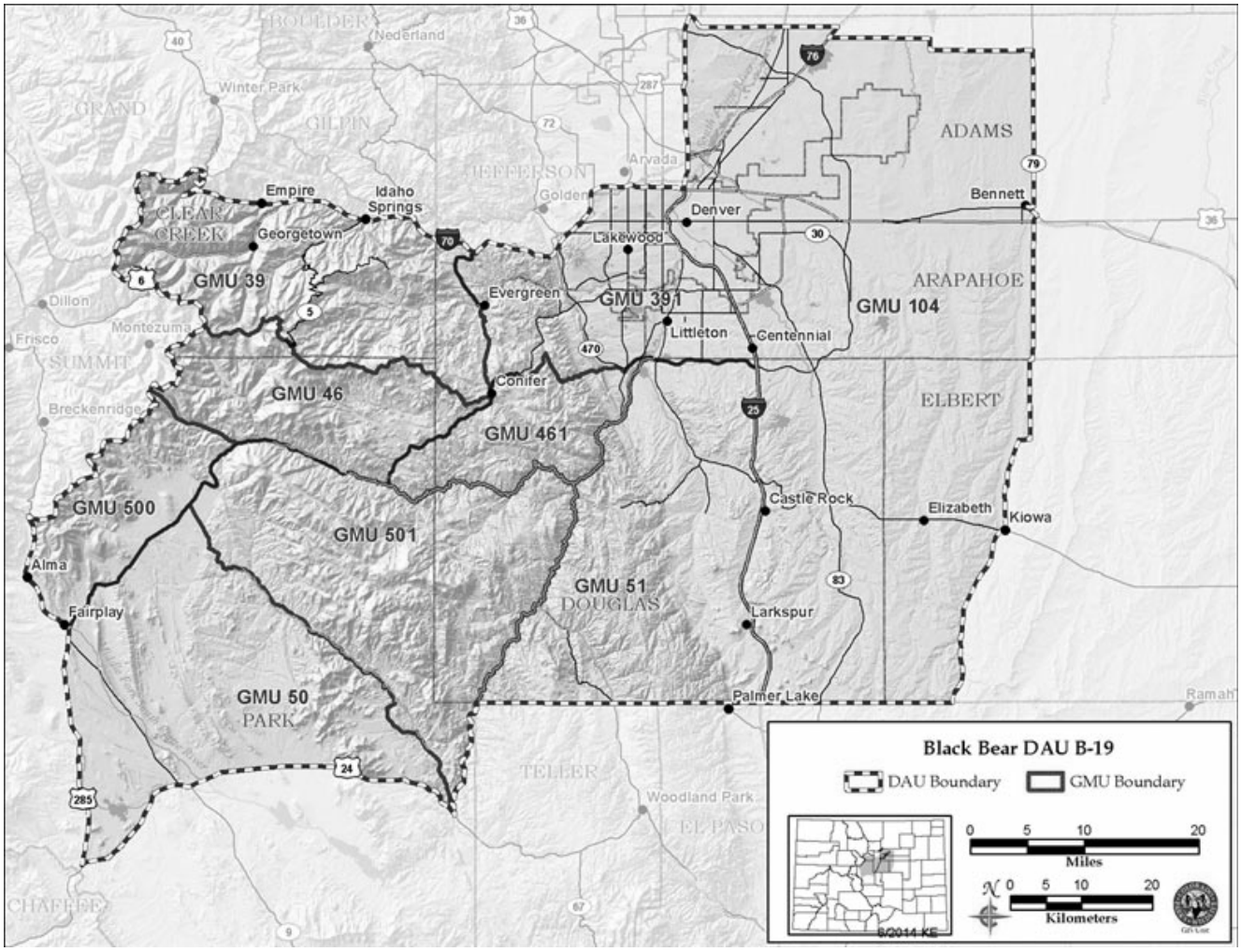
Yes

No

B19 Bear Management Plan

25. In which GMU did you hunt black bears in the Central Front Range area? (Please check one.)

- ◯ 39
- ◯ 46
- ◯ 50
- ◯ 51
- ◯ 104
- ◯ 391
- ◯ 461
- ◯ 500
- ◯ 501



26. Overall, how satisfied were you with your black bear hunting experience(s) in the Central Front Range area? (Please check one.)

- ◯ Very satisfied
- ◯ Somewhat satisfied
- ◯ Neither satisfied, nor unsatisfied
- ◯ Somewhat unsatisfied
- ◯ Very unsatisfied
- ◯ I am not sure.

27. Which of the following methods did you use to hunt black bears in the Central Front Range area? (Please check all that apply.)

- [ ] Encounter
- [ ] Predator call
- [ ] Spot and stalk
- [ ] Still hunting or tree stand
- [ ] I am not sure.

28. Which of the following is the most important reason that you hunt black bears in the Central Front Range area? (Please check one.)

- ◯ To provide meat for myself, family, and/or friends to eat
- ◯ To enjoy nature and spend time outdoors
- ◯ The chance to harvest a trophy black bear
- ◯ The opportunity to hunt black bears each year

29. Please use the space below to write any additional comments or observations about black bearmanagement that you would like to share.

B19 Bear Management Plan

Thank you for your time and assistance. The draft black bear management plan for the Central Front Range area will be available in fall 2016 at the CPW website (wildlife.state.co.us), with a final plan available in spring 2016. If you have any additional questions about this plan or survey, please contact Shannon Schaller (303-291-7367), Mark Lamb, or Eliza Hunholz.

Q1 Please enter your ID number. You can find your ID number printed above your name and address on the front of the postcard you received inviting you to complete this survey. If you do not have access to your ID number, please leave this question blank.

Answered: 3 Skipped: 117

Answer Choices	Average Number	Total Number	Responses
ID number	396,826,255	1,190,478,765	3
Total Respondents: 3			

#	ID number	Date
1	860376953	8/31/2015 2:21 PM
2	177354685	8/31/2015 9:54 AM
3	152747127	8/30/2015 4:16 PM

Q2 Are you a resident of Colorado? (Please check one.)

Answered: 120 Skipped: 0

Answer Choices	Responses	
Yes	**99.17%**	119
No	**0.83%**	1
Total		**120**

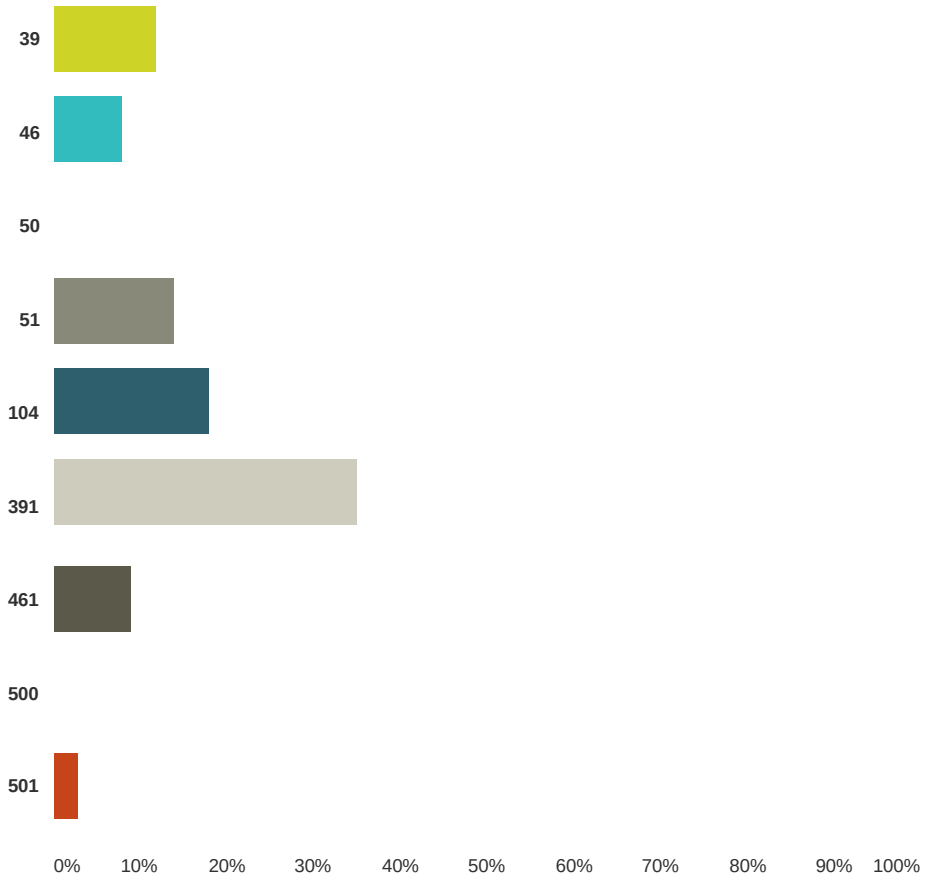
Q3 Do you live in GMU 39, 46, 50, 51, 104, 391, 461, 500 and 501? See the map below, which shows the boundaries of GMUs 39, 46, 50, 51, 104, 391, 461, 500 and 501.(Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
Yes	**83.19%**	99
No	**16.81%**	20
Total		**119**

Q4 In which of the following GMUs do you live? See the map below, which shows the boundaries of GMUs 39, 46, 50, 51, 104, 391, 461, 500 and 501. (Please check one.)

Answered: 100 Skipped: 20



Answer Choices	Responses	
39	12.00%	12
46	8.00%	8
50	0.00%	0
51	14.00%	14
104	18.00%	18
391	35.00%	35
461	9.00%	9
500	1.00%	1
501	3.00%	3
Total		100

Q5 People are involved with wildlife in many ways. Which of the following statements best describes your current level of interest and involvement? (Please check one.)

Answered: 118 Skipped: 2

Answer Choices	Responses	
I am interested in wildlife, BUT I don't do much that is specifically related to wildlife.	27.12%	32
I am interested in wildlife, AND I actively take part in wildlife-related activities.	72.88%	86
I am NOT very interested in wildlife AND I don't do much that is specifically related to wildlife.	0.00%	0
I am NOT very interested in wildlife, BUT for various reasons I am involved in wildlife-related activities.	0.00%	0
Total		118

Q6 The following are some ways that people interact with wildlife. Have you participated in these activities in the past 3 years? (Please check one for each item.)

Answered: 119 Skipped: 1

	Yes	No	Total
a. Learned about wildlife by reading or watching television	94.78% 109	5.22% 6	115
b. Spent time watching or photographing wildlife or birds	86.49% 96	13.51% 15	111
c. Hiked, walked or biked in natural areas	93.16% 109	6.84% 8	117
d. Rode an ATV, Jeep or dirt bike in natural areas	56.88% 62	43.12% 47	109
e. Worked on a ranch or farm	38.00% 38	62.00% 62	100
f. Camped	79.82% 91	20.18% 23	114
g. Hunted any wildlife	65.14% 71	34.86% 38	109
h. Fished any fish species	67.57% 75	32.43% 36	111
i. Guided or outfitted individuals to hunt in Colorado	4.08% 4	95.92% 94	98
j. Participated in or commented on a CPW wildlife management plan or BLM, USFS or other federal land use plan	21.15% 22	78.85% 82	104
k. Participated in or commented on a county, city or other local land use plan	20.95% 22	79.05% 83	105

Q7 How important are black bears to you? (Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
Very Important	65.55%	78
Somewhat Important	26.05%	31
Neither Important, nor Unimportant	7.56%	9
Somewhat Unimportant	0.00%	0
Very Unimportant	0.00%	0
I am not sure.	0.84%	1
Total		119

Q8 Which of the following best describes your general attitude about black bears in the Central Front Range area? (Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
I do not enjoy black bears in the Central Front Range and regard them as a nuisance.	2.52%	3
I enjoy black bears in the Central Front Range, but worry about problems they may cause.	58.82%	70
I enjoy black bears in the Central Front Range and do not worry about the problems they may cause.	34.45%	41
I do not have particular feelings about black bears in the Central Front Range.	4.20%	5
Total		119

Q9 How important is it to you to know that black bears live in this area and that their populations will continue to exist in the future? (Please check one.)

Answered: 118 Skipped: 2

Answer Choices	Responses	
Very Important	77.97%	92
Somewhat Important	17.80%	21
Neither Important, nor Unimportant	3.39%	4
Somewhat Unimportant	0.00%	0
Very Unimportant	0.00%	0
I am not sure.	0.85%	1
Total		118

Q10 In your opinion, how important of an issue are negative interactions between humans and black bears in the Central Front Range? (Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
Very Important	51.26%	61
Somewhat Important	38.66%	46
Neither Important, nor Unimportant	5.04%	6
Somewhat Unimportant	1.68%	2
Very Unimportant	0.84%	1
I am not sure.	2.52%	3
Total		119

Q11 How often have you experienced the following interactions with black bears in the past 3 years in the Central Front Range area? (Please check one for each item.)

Answered: 119 Skipped: 1

	0 times	1-2 times	3-4 times	5 or more times	I am not sure.	Total
a. Saw black bears in the wild, parks or preserves	**31.36%** 37	**27.12%** 32	**15.25%** 18	**25.42%** 30	**0.85%** 1	118
b. Saw black bears in urban or suburban areas of town	**56.52%** 65	**24.35%** 28	**3.48%** 4	**14.78%** 17	**0.87%** 1	115
c. Saw black bears near my home	**51.28%** 60	**17.09%** 20	**12.82%** 15	**18.80%** 22	**0.00%** 0	117
d. Had a black bear break in to or attempt to break into my garbage	**72.03%** 85	**16.95%** 20	**3.39%** 4	**7.63%** 9	**0.00%** 0	118
e. Had a black bear damage my garden or fruit trees	**90.60%** 106	**5.98%** 7	**1.71%** 2	**1.71%** 2	**0.00%** 0	117
f. Had a black bear damage my agricultural crops	**97.44%** 114	**0.85%** 1	**0.00%** 0	**0.85%** 1	**0.85%** 1	117
g. Had a black bear attack or harass my livestock	**93.10%** 108	**1.72%** 2	**2.59%** 3	**0.86%** 1	**1.72%** 2	116
h. Had a black bear damage my bird feeder, pet feeder, or grill	**73.50%** 86	**12.82%** 15	**6.84%** 8	**6.84%** 8	**0.00%** 0	117
i. Had black bear cause damage to other property (e.g. fences, car, garage, etc.)	**78.63%** 92	**16.24%** 19	**0.85%** 1	**4.27%** 5	**0.00%** 0	117
j. Had a black bear attack or harass my pets or livestock	**87.07%** 101	**6.03%** 7	**2.59%** 3	**3.45%** 4	**0.86%** 1	116
k. Had a black bear enter or attempt to enter my home	**90.52%** 105	**8.62%** 10	**0.86%** 1	**0.00%** 0	**0.00%** 0	116
l. Knew someone who was attacked or harassed by a black bear	**76.92%** 90	**15.38%** 18	**4.27%** 5	**3.42%** 4	**0.00%** 0	117
m. Was attacked or harassed by a black bear myself	**94.02%** 110	**5.13%** 6	**0.00%** 0	**0.85%** 1	**0.00%** 0	117

Q12 Based on your experience, how has the number of black bears in the Central Front Range changed over the last 10 years? (Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
Increased greatly	29.41%	35
Increased somewhat	35.29%	42
Stayed the same	15.13%	18
Decreased somewhat	2.52%	3
Decreased greatly	1.68%	2
I am not sure.	15.97%	19
Total		119

Q13 How would you like to see the number of black bears in the Central Front Range area change over the next 10 years? (Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
Increase greatly	6.72%	8
Increase somewhat	13.45%	16
Stay the same	50.42%	60
Decrease somewhat	20.17%	24
Decrease greatly	5.04%	6
I am not sure.	4.20%	5
Total		119

Q14 How important is it to you that the change in black bear populations you indicated in the previous question occurs over the next 10 years? (Please check one.)

Answered: 119 Skipped: 1

Answer Choices	Responses	
Very important	36.97%	44
Somewhat important	44.54%	53
Slightly important	9.24%	11
Not at all important	3.36%	4
I am not sure.	5.88%	7
Total		119

Q15 Which of the following alternatives would you prefer to guide CPW's decisions about the number of black bears in the Central Front Range area in the next 10 years? (Please check one.)

Answered: 116 Skipped: 4

Answer Choices	Responses	
Long-term increase from current population size. Black bear populations would increase over the next 10 years, because of a reduction in hunter harvest. Hunting opportunity would be reduced, but may fluctuate in response to mortality from other sources such as bear-vehicle collisions. Bears may be seen in the area more often than they are now and the number of negative interactions with bears may also increase.	6.90%	8
Maintain a stable population of black bears at current levels. Black bear populations, and therefore, hunting opportunity will remain at or near currentlevels, but may fluctuate in response to mortality from other sources such as bear-vehicle collisions. Bears will be seen in the area as often as theyare now and the number of negative interactions with bears will remain constant.	56.90%	66
Short term population decrease from current levels, then maintain a stable population of black bears at decreased population size. Black bear huntingopportunity would increase in the next 1 to 3 years, but decrease after that time as fewer black bears are available for harvest. Bears may be seen less often, but the number of negative interactions with bears may also decrease.	21.55%	25
Long-term decrease in population size from current levels. Black bear hunting would increase in the short-term, but will decrease in the long-term as bear populations decrease. Bears will probably be seen less often, and the number of negative interactions with bears will probably decrease.	11.21%	13
I am not sure.	3.45%	4
Total		116

Q17 To what extent do you agree with the statement below? (Please check one.)I believe that CPW is currently doing an adequate job of managing black bears in the Central Front Range (GMUs 39, 46, 50, 500, 501, 51, 104, 391, and 461)

Answered: 117 Skipped: 3

Answer Choices	Responses	
Strongly agree	20.51%	24
Somewhat agree	23.08%	27
Neither agree, nor disagree	19.66%	23
Somewhat disagree	7.69%	9
Strongly disagree	12.82%	15
I am not sure.	16.24%	19
Total		117

Q18 To what extent do you agree with the statement below? (Please check one.)I believe that hunting, watching, and other bear-related forms of recreation contribute susbstantially to local economies of Jefferson, Clear Creek, Park, Douglas, Denver, Arapahoe, Adams, and Elbert counties.

Answered: 117 Skipped: 3

Answer Choices	Responses	
Strongly agree	21.37%	25
Somewhat agree	28.21%	33
Neither agree, nor disagree	27.35%	32
Somewhat disagree	9.40%	11
Strongly disagree	8.55%	10
I am not sure.	5.13%	6
Total		117

Q19 Do you take any of the following actions at your home to attempt to minimize your risk of having a negative interaction with black bears? (Please check one for each item.)

Answered: 117 Skipped: 3

	Yes	No	Not applicable	Total
Use a wildlife-resistant garbage container or dumpster	**31.62%** 37	**43.59%** 51	**24.79%** 29	117
Fence my garden and/or fruit trees	**26.50%** 31	**29.06%** 34	**44.44%** 52	117
Carry bear spray when walking or recreating	**19.83%** 23	**69.83%** 81	**10.34%** 12	116
Avoid hiking or recreating in areas where bears have been seen	**15.52%** 18	**75.86%** 88	**8.62%** 10	116
Put my garbage out on the morning of trash pick-up day, rather than the night before	**56.90%** 66	**16.38%** 19	**26.72%** 31	116
Feed my pets indoors	**52.99%** 62	**13.68%** 16	**33.33%** 39	117
Not using composters and avoiding planting gardens and fruit trees	**25.64%** 30	**37.61%** 44	**36.75%** 43	117
Remove bird and other wildlife feeders	**28.21%** 33	**39.32%** 46	**32.48%** 38	117
Fence beehives, chickens, or other livestock	**12.93%** 15	**18.97%** 22	**68.10%** 79	116
Keep my pets indoors	**24.35%** 28	**38.26%** 44	**37.39%** 43	115
Keep the doors and windows of my home and car closed and locked	**57.26%** 67	**30.77%** 36	**11.97%** 14	117

Q20 Who do you believe is most responsible for limiting the number of negative interactions between humans and black bears in the Central Front Range area? (Please check only one.)

Answered: 117 Skipped: 3

Answer Choices	Responses	
Individual residents and landowners (by doing things like keeping garbage secured from bears)	**70.09%**	82
City police departments (by doing things like ticketing residents for not keeping garbage secured)	**0.85%**	1
City Councils (by doing things like passing city ordinances that require bear-proofing)	**3.42%**	4
Citizens' groups or other non-profit organizations (by doing things like providing information about how to bear-proof)	**0.00%**	0
Colorado Parks and Wildlife (by doing things like setting harvest levels for bears and moving problem bears)	**25.64%**	30
Federal agencies (by doing things like moving problem bears)	**0.00%**	0
Total		**117**

Q21 How acceptable is it to you that Colorado Parks and Wildlife spends money collected through hunting and fishing license fees to address negative conflicts between people and bears? (Please check only one.) Conflicts might include damage to private property, loss of livestock, or threats to humans or pets. Methods to address these conflicts include moving problem bears, euthanizing bears that cause severe conflicts, and providing resources for bear-proofing.

Answered: 116 Skipped: 4

Answer Choices	Responses	
Very acceptable	43.10%	50
Somewhat acceptable	24.14%	28
Neither acceptable, nor unacceptable	7.76%	9
Somewhat unacceptable	9.48%	11
Very unacceptable	14.66%	17
I am not sure.	0.86%	1
Total		116

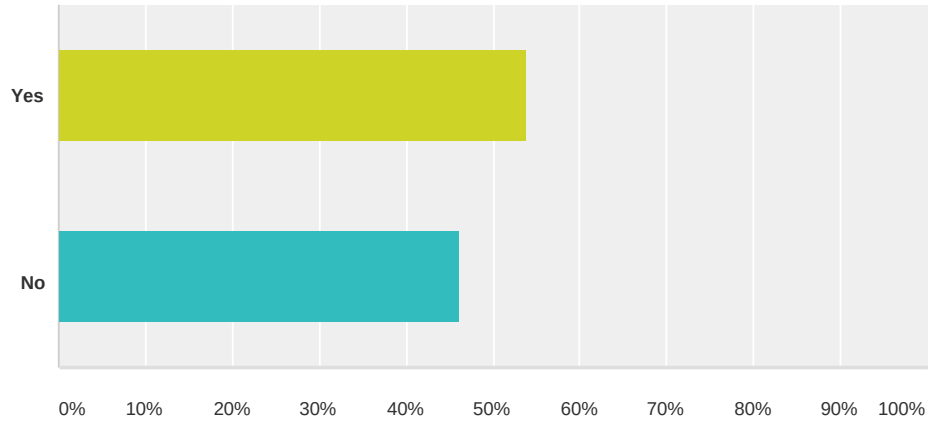
Q22 CPW takes many types of actions to reduce or prevent negative interactions between black bears and people. The list below contains things CPW currently does, and some that may be considered in the future. How acceptable would it be for CPW to take the following actions to manage black bears in the Central Front Range area? (Please check one for each item.)

Answered: 116 Skipped: 4

	Acceptable	Neither acceptable, nor unacceptable	Unacceptable	I am not sure.	Total
Educate citizens about how to coexist with bears in their area	94.78% 109	4.35% 5	0.87% 1	0.00% 0	115
Support city ordinances that require citizens to use wildlife-resistant garbage containers	60.87% 70	20.00% 23	16.52% 19	2.61% 3	115
Increase hunting licenses to increase bear harvest in areas with conflicts	65.22% 75	16.52% 19	16.52% 19	1.74% 2	115
Fine individuals who are feeding bears intentionally or unintentionally	77.59% 90	11.21% 13	7.76% 9	3.45% 4	116
Fine individuals who do not keep their residential garbage secured from bears	60.34% 70	19.83% 23	17.24% 20	2.59% 3	116
Fine business owners who do not keep their commercial garbage secured from bears	67.24% 78	17.24% 20	13.79% 16	1.72% 2	116
Fine individuals who do not keep bird feeders, pet food, and other food sources secured from bears	40.87% 47	33.04% 38	23.48% 27	2.61% 3	115
Trap and relocate bears that cause conflict	81.03% 94	6.90% 8	11.21% 13	0.86% 1	116
Kill bears that cause multiple conflicts	46.55% 54	14.66% 17	36.21% 42	2.59% 3	116

Q23 Have you hunted black bears in Colorado?

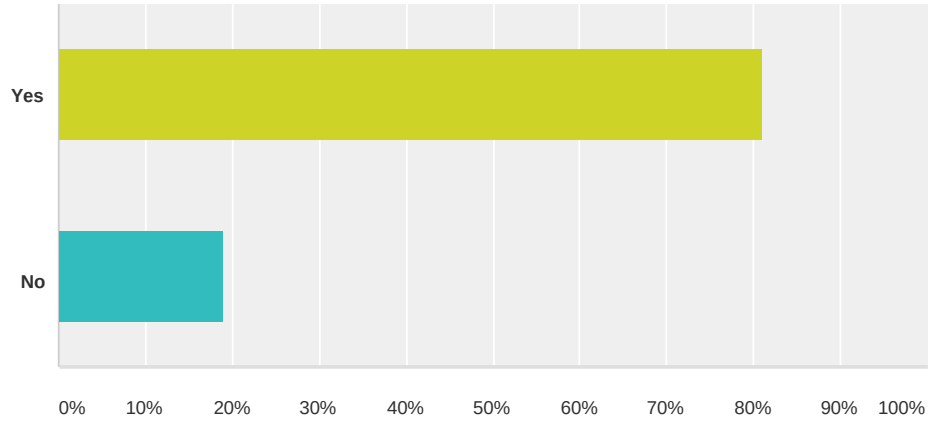
Answered: 115 Skipped: 5



Answer Choices	Responses	
Yes	53.91%	62
No	46.09%	53
Total		115

Q24 Have you hunted black bears in GMU 39, 46, 50, 51, 104, 391, 461, 500 and 501?

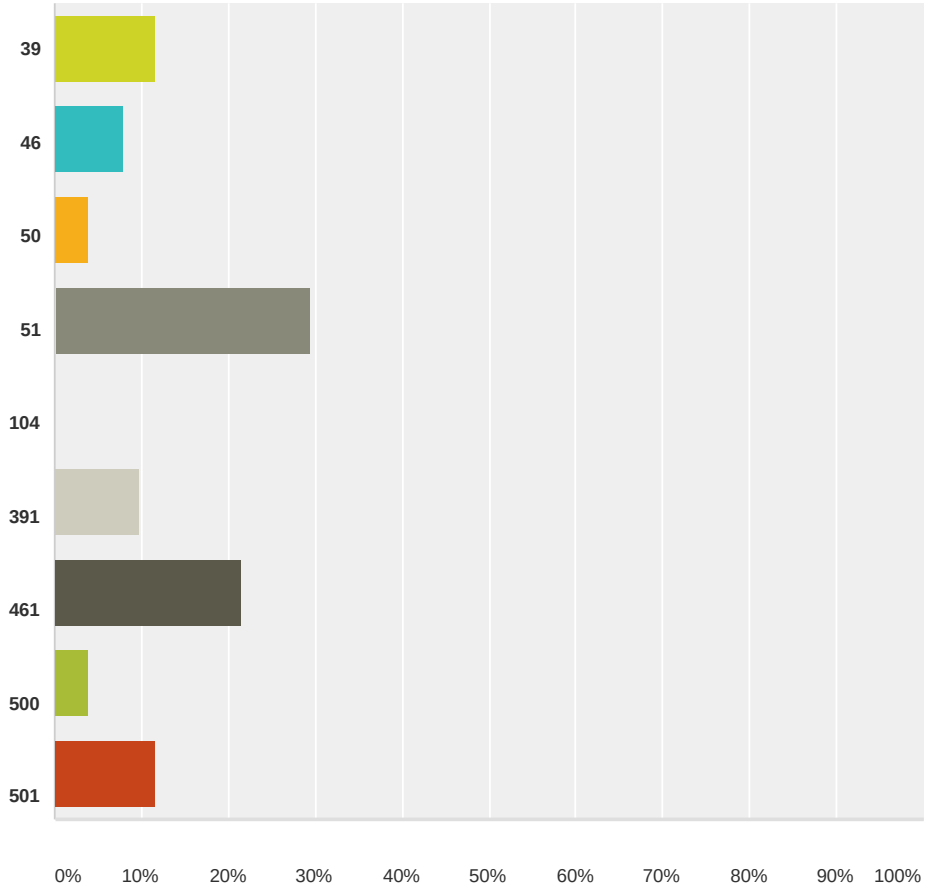
Answered: 63 Skipped: 57



Answer Choices	Responses	
Yes	80.95%	51
No	19.05%	12
Total		63

Q25 In which GMU did you hunt black bears in the Central Front Range area? (Please check one.)

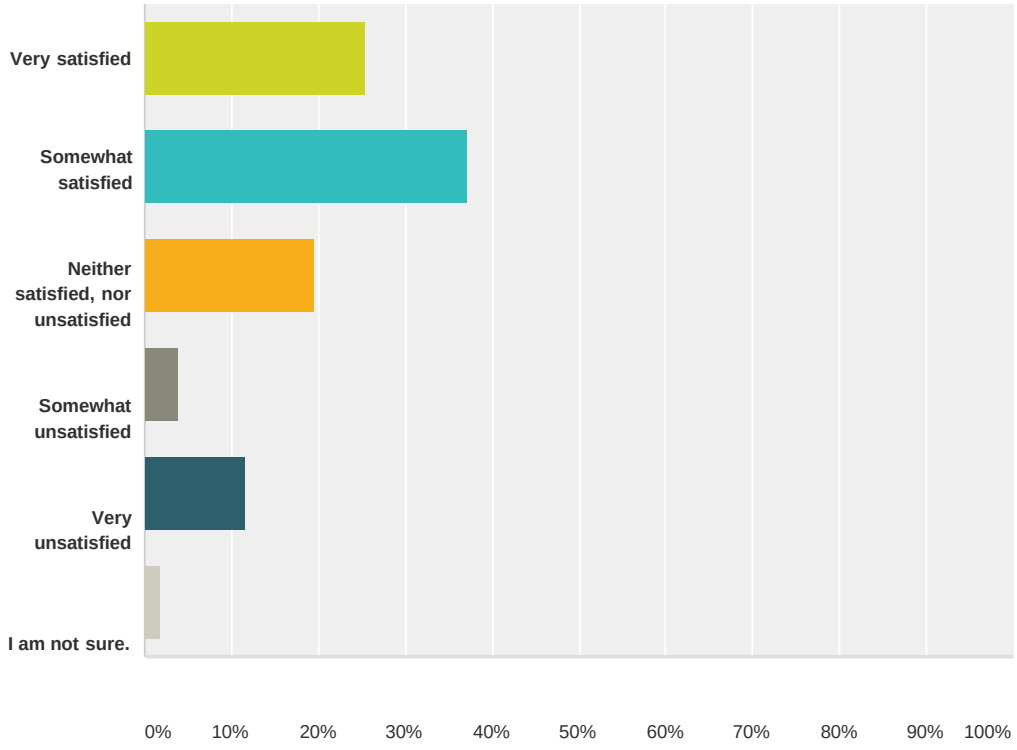
Answered: 51 Skipped: 69



Answer Choices	Responses	
39	11.76%	6
46	7.84%	4
50	3.92%	2
51	29.41%	15
104	0.00%	0
391	9.80%	5
461	21.57%	11
500	3.92%	2
501	11.76%	6
Total		51

Q26 Overall, how satisfied were you with your black bear hunting experience(s) in the Central Front Range area? (Please check one.)

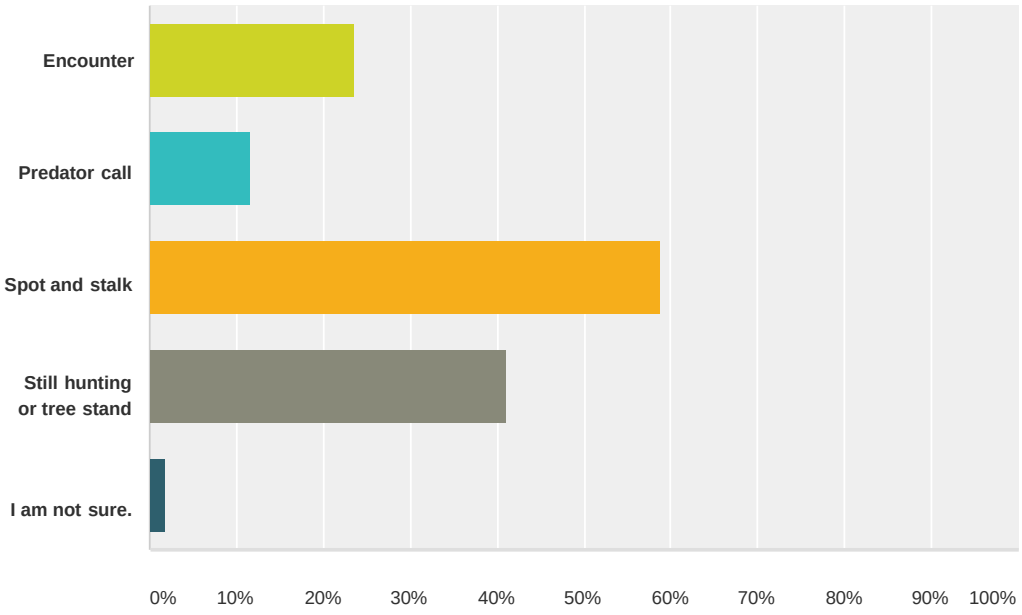
Answered: 51 Skipped: 69



Answer Choices	Responses	
Very satisfied	25.49%	13
Somewhat satisfied	37.25%	19
Neither satisfied, nor unsatisfied	19.61%	10
Somewhat unsatisfied	3.92%	2
Very unsatisfied	11.76%	6
I am not sure.	1.96%	1
Total		**51**

Q27 Which of the following methods did you use to hunt black bears in the Central Front Range area? (Please check all that apply.)

Answered: 51 Skipped: 69



Answer Choices	Responses	
Encounter	23.53%	12
Predator call	11.76%	6
Spot and stalk	58.82%	30
Still hunting or treestand	41.18%	21
I am not sure.	1.96%	1
Total Respondents: 51		

Q28. Which of the following is the most important reason that you hunt black bears in the Central Front Range area? (Please check one.)

Answered: 51 Skipped: 69

Answer Choices	Responses	
To provide meat for myself, family, and/or friends to eat	29.41%	15
To enjoy nature and spend time outdoors	21.57%	11
The chance to harvest a trophy black bear	5.88%	3
The opportunity to hunt black bears each year	43.14%	22
I am not sure.	0.00%	0
Total		51