BLACK BEAR DATA ANALYSIS UNIT MANAGEMENT PLAN

Sangre de Cristo Mountains

DAU B-7

GAME MANAGEMENT UNITS

69, 82, 83, 84, 85, 86, 140, 691, 851, and 861

SE Region

Prepared for:

Colorado Division of Wildlife

By:

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Date: March 2011

Executive Summary
DATA ANALYSIS PLAN FOR B-07

GMUs: 69, 82, 83, 84, 85, 86, 140, 691, 851, and 861 (portions of Alamosa, Chaffee, Costilla, Custer, Fremont, Huerfano, Las Animas, Pueblo and Saguache Counties).

Land Ownership: 70% Private, 13% USFS, 6% BLM, 2% State Land Board, and 2% CDOW

Current objective (2000 DAU plan): To maintain a recreational harvest and reduce property damage and human-bear conflicts.

Current Mortality Objectives:
For GMUs 82, 86, and 861: Total mortality objective 30 bears
For GMUs 69, 84, and 691: Total mortality objective 40 bears
For GMUs 83, 85, 851, and 140: Total mortality objective 80 bears

Strategic Goal Alternatives Examined:
  1.) *Maintain a stable B-7 population*
  2.) *Decrease the B-7 population for 5 years or by 15% then manage for a stable population*
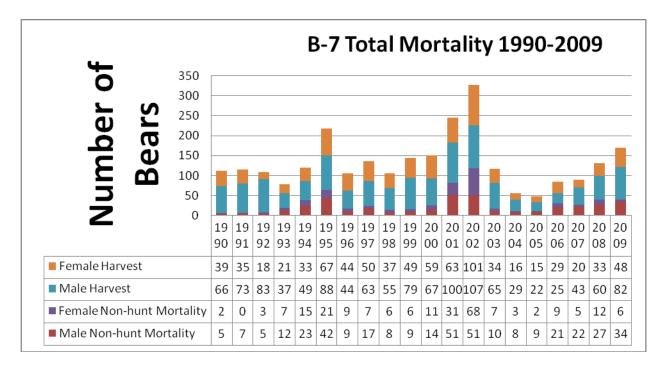 3.) *Decrease the B-7 population for 7 years or by 25% then manage for a stable population*

Presumptive 2009 Post-hunt Bear Population Estimate: 3,500 bears

New Strategic Goal: To decrease the population for up to 5 years or approximately 15% from post-hunt 2009 population estimates then manage for a stable population at the lower population level.

Total annual mortality objective: The annual mortality level will be greater than 455 bears annually to reduce the population for the first five years of the plan and then the off-take rates will be reevaluated to maintain the population at the lower level.

Total annual harvest objective: The annual harvest objective will be 415 bears annually for the first five years of the plan and then will be reevaluated to maintain the population at the lower level.

Annual mortality objectives are derived and monitored through review of the age structure of the bear mortality, the composition of male and female bears in harvest, annual forage conditions and from the bear density estimates from the hair snag study in GMU 85.

B-7 Total Mortality 1990-2009

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
■ Female Harvest	39	35	18	21	33	67	44	50	37	49	59	63	101	34	16	15	29	20	33	48
■ Male Harvest	66	73	83	37	49	88	44	63	55	79	67	100	107	65	29	22	25	43	60	82
■ Female Non-hunt Mortality	2	0	3	7	15	21	9	7	6	6	11	31	68	7	3	2	9	5	12	6
■ Male Non-hunt Mortality	5	7	5	12	23	42	9	17	8	9	14	51	51	10	8	9	21	22	27	34

The Sangre de Cristo Mountains Bear Data Analysis Unit (DAU B-7) is located in south-central Colorado and lies within portions of Alamosa, Chaffee, Costilla, Custer, Fremont, Huerfano, Las Animas, Pueblo and Saguache Counties. It consists of Game Management Units (GMU's) 69, 82, 83, 84, 85, 86, 140, 691, 851 and 861. The DAU is bounded on the north by US Highway 50; on the east by Interstate 25, US 160 and Colo. 389; on the south by the New Mexico State Line; and west by CO Highways 142, 17 and 285. This DAU covers 9,932 mi^2 (17,958 km^2) ranging in elevation from 14,345 ft at the summit of Mount Blanca to about 4,640 ft where the Arkansas River flows under I-25. Of the 9,932 mi^2 within the DAU approximately 3,766 mi^2 is considered bear habitat.

Annual harvest has varied greatly within the DAU due to bear vulnerability, hunter effort and license numbers. Since 1990, total harvest has fluctuated from a low of 37 bears in 2005 to a high of 208 bears in 2002. Higher levels of harvest in 1995 (218 bears) and 2002 (327 bears) were associated with fall mast crop failures that increase bear vulnerability. Most of the bear harvest occurs during the September rifle seasons followed by the archery and muzzleloader seasons. During the four concurrent rifle seasons bear harvest is highest during the first combined season and falls off to almost nothing during the 4th combined season.

Historically, off take rates in B-7 were derived by quantifying the amount of available habitat within the DAU and extrapolating density estimates to estimate the population. These historic density estimates ranged from 8.1 to 36 bears/100 km^2 (Beck 1997 and Beck 1995). For this DAU plan, both habitat and population models were developed to provide estimates for the predicted bear population within the DAU. Density estimates for this plan were derived from a bear hair snagging density study that was initiated in the DAU in 2009. Density estimates from this study (44 to 52 bears/100km^2, the high end of this density estimate differs from the original estimate derived in 2010 as a mistake was found and corrected in the data analysis) indicate that the number of bears within the DAU exceeds historic density estimates.   Extrapolations from these density estimates suggest that there were approximately 3,100-4,000 bears in the B-7 DAU post hunt 2009. This population extrapolation will be refined in future years as additional density estimates are derived.   It is important to note that although we believe this population has been increasing since the high mortality levels in 2002-2003, the primary factor in the higher estimate of bears in this DAU can be attributed to the use of better methodologies to estimate bear density within the DAU.

Utilizing the population objective of 3,100-4,000 bears derived from the density projection, we selected the approximate mid-point of the range, 3,500, as the presumptive population estimate to determine hunter off-take and total mortality rates of the population.

As additional information on population density is collected in future years, it will be used to refine this

estimate. This may result in a lower or higher population estimate that could have the effect of changing the estimated off-take rates to better fit the new information, but the strategic goal and the management criteria of the population will remain the same.

SIGNIFICANT ISSUES

The most significant issue for black bear management in this DAU is the minimization of human/bear conflicts. These conflicts are broken into two types: agricultural damage and damage to personal property/human safety.

The frequency and intensity of conflicts varies annually with higher incidences reported in years of poor natural forage production when bears seek alternative food sources. In years of high mast crop failures multiple communities within Bear DAU B-7 experience significant human bear conflicts. These range from simple sightings in town, to bears entering homes and causing extensive damage to personal property.

Agricultural damage is also a concern within the DAU. From January 2002 through June 2010, the CDOW has paid 126 claims, totaling $121,434.49, for damage caused by bear in B-07. Annual variation is extreme because of environmental conditions and the number of apiaries that are damaged in a given year. Excluding the incomplete data for 2010 annual claims annual damages ranged from $2,579.25 in 2003 to $42,710 in 2007.

MANAGEMENT ALTERNATIVES PRESENTED TO THE PUBLIC

The B-3 DAU is currently being managed maintain a recreational harvest, reduce property damage and reduce human-bear conflicts. Achievement of these criteria requires harvest mortalities and total mortality levels to fall below or within a threshold. This plan revision outlines three strategic goal alternatives for future bear management in B-3. For each alternative, off-take rates were calculated based on the our post hunt 2009 population projection of 3,400 bears and the following criteria will be monitored on a 3-year running average to access objective achievement:

Criteria	Population Trend		
	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%

Maintain a stable B-7 population
This alternative will require annual hunter harvest of 240-400 bears with a maximum total mortality level of 450 bears.

Decrease the B-7 population for 5 years or by 15% then manage for a stable population
This alternative will require annual hunter harvest levels of greater than 400 bears with a maximum total mortality level of 550 bears for the first 5 years of the plan, or until a 15% reduction is detected from the hair snagging density estimation study. After this period, off-take rates will be reduced to maintain at stable population goal at the lower level.

Decrease the B-7 population for 7 years or by 25% then manage for a stable population
This alternative will require annual hunter harvest levels of greater than 400 bears with a maximum total mortality level of 550 bears for the first 7 years of the plan, or until a 25% reduction is detected from the hair snagging density estimation study. After this period, off-take rates will be reduced to maintain at stable population goal at the lower level.

SELECTED MANAGEMENT OPTION

Based on input from external and internal publics the CDOW has selected Alternative #2, suppress the

bear population in B-7 for a period of up to 5 years, or 15%, and then hold the population stable at the suppressed level for the period covered by this DAU plan. In the event that mortality is elevated because of mast crop failures, we acknowledge that it may not take the full 5 years of suppression to obtain a decrease of 15% of the population. We will monitor the population parameters listed below to determine if further reductions need to be made or if the population has reached the desired population level prior to the full 5 years of suppression.

Total Mortality Objective

In order to achieve a DAU strategic goal of decreasing the population for a period of up to 5 years or 15%, then managing as a stable population, it is estimated that the average total mortality should be greater than 455 bears annually while meeting the age and gender criteria listed below for the first 5 years of the DAU plan then managing the lower population level as stable for the remainder of the DAU plans timeframe.

Hunter Harvest Objective

Annual hunter harvest objectives are determined by deducting the 3-year running average amount of non-hunter mortality, three year average (2007-2009) of 36 bears, from the total mortality objective. If the strategic goal is to Decrease the population for a period of up to 5 years, 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 objective of greater than 455 bears, for the first 5 years of the plan, the hunter harvest objective will be approximately 415 bears. When it is determined that the population has reached the approximately 15% decrease from post-hunt 2009 levels these off take rates will be reevaluated to suit the new DAU plan objective.

This plan was approved by the Colorado Parks and Wildlife commission in July, 2011.

BEAR DATA ANALYSIS UNIT (DAU) B-7
GAME MANAGEMENT UNITS
69, 82, 83, 84, 85, 86, 140, 691, 851, and 861

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INTRODUCTION

The Colorado Division of Wildlife (CDOW) manages wildlife for the use, benefit and enjoyment of the people of the state in accordance with the CDOW's Strategic Plan and mandates from the Colorado 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. CDOW 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 Colorado Wildlife Commission.

DAU PLANS AND WILDLIFE MANAGEMENT BY OBJECTIVES

To manage the state's big game populations, the CDOW uses a "management by objective" approach (Figure 1). 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 Colorado 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. CDOW intends to update these plans as new information and data become available, at least once every ten years.
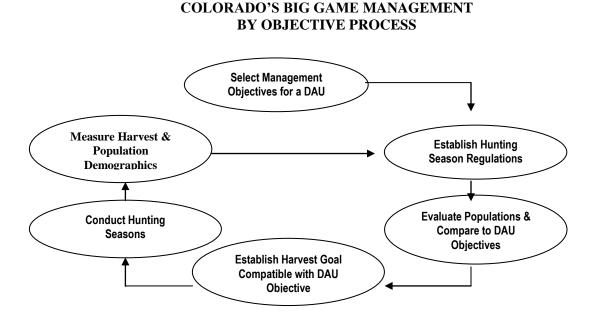
COLORADO'S BIG GAME MANAGEMENT
BY OBJECTIVE PROCESS

Figure 1. Management by objectives process used by the CDOW to manage big game populations on a DAU basis.

DATA ANALYSIS UNIT DESCRIPTION

Location

The Sangre de Cristo Mountains Bear Data Analysis Unit (DAU) is located in south-central Colorado and lies within portions of Alamosa, Chaffee, Costilla, Custer, Fremont, Huerfano, Las Animas, Pueblo and Saguache Counties (Figure 2). It consists of Game Management Units (GMU's) 69, 82, 83, 84, 85, 86, 140, 691, 851 and 861. The DAU is bounded on the north by US Highway 50; on the east by Interstate 25, US 160 and Colo. 389; on the south by the New Mexico State Line; and west by the Rio Grande and CO Highways 17 and 285. This DAU covers 9,932 mi^2 (17,958 km^2) ranging in elevation from 14,345 ft at the summit of Mount Blanca to about 4,640 ft where the Arkansas River flows under I-25. Topography ranges from fairly flat grasslands to steep foothills to mountain peaks in excess of 14,000 ft. Precipitation falls in the form of winter snows and spring and summer rains with the possibility of higher elevations receiving over 20 inches of moisture while the lower elevations may receive less than 6 inches annually. Weather patterns and timing of rainfall can have a significant effect on bear behavior, reproduction and hibernation. Of these, the timing of rainfall and the date of the last freeze have the largest effect on the bear population because of the effects on summer and fall food sources.

Several major highways cross through the DAU as well as form the boundaries of the area. Some of those include: Interstate 25; US highways 50, 160, and 285; and Colorado Highways 12, 17, 67, 69, 78, 96, 142, 159 and165. Bear mortalities associated with vehicle collisions a significant factor especially during the hyperphagia periods and during fall forage failure years. There are several locations which have historically seen higher road kill than others, including I-25 from Raton Pass to Trinidad and Highway 160 on the east side of La Veta Pass.
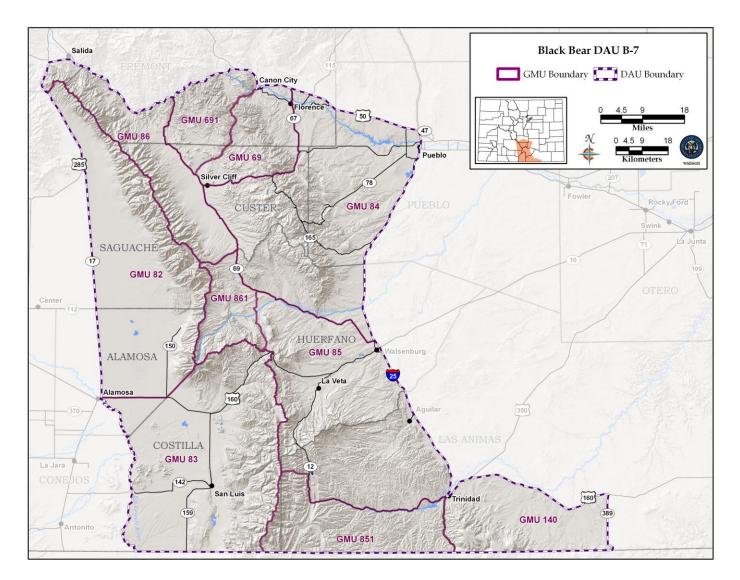
Figure 2. Black Bear DAU B-7

Major creeks and rivers in B-7 are: Howard Creek, Cherry Creek, Hayden Creek, Lake Creek, Texas Creek, Arkansas River, Grape Creek, Oak Creek, Newlin Creek, and Hardscrabble Creek in Fremont County; Brush Creek, Taylor Creek, Alvarado Creek, Venable Creek, Horn Creek, Colony Creek, Grape Creek, Hardscrabble Creek, Antelope Creek, Froze Creek, St. Charles River, Beaver Creek, Ophir Creek and Cottonwood Creek in Custer County; Muddy Creek, Manzanares Creek, May Creek, Williams Creek, Turkey Creek, Apache Creek and the Huerfano River in Huerfano County; Poncha Creek, King Gulch and Logging Gulch in Chaffe County; Little Graneros Creek, Greenhorn Creek, Cold Spring Creek, Muddy Creek, St. Charles River, Arkansas River and Red Creek in Pueblo County. Cucharas River, Apishipa River, Purgatoire River, Trinchera Creek, San Francisco Creek in Las Animas County; Sangre de Cristo Creek, Ute Creek, San Francisco Creek, and Trinchera Creek in Costilla County; San Luis Creek, Rock Creek, Hayden Pass Creek, San Isabel Creek, Crestone Creek, Deadman Creek, Sand Creek and Medano Creek in Saguache County; Mosca Creek, Zapata Creek and Holbrook Creek in Alamosa County.

Land Status and Vegetation

Of the 9,932 square miles in B-7, the Colorado Division of Wildlife (CDOW) controls about 134 mi^2 or 2% of the DAU, land ownership in the rest of the DAU breaks down as follows: State Land Board 160 mi^2 (2%), Bureau of Land Management 412 mi^2 (6%), United States Forest Service 874 mi^2 (13%) and private ownership 4,868 mi^2 (70%, Figure 3).
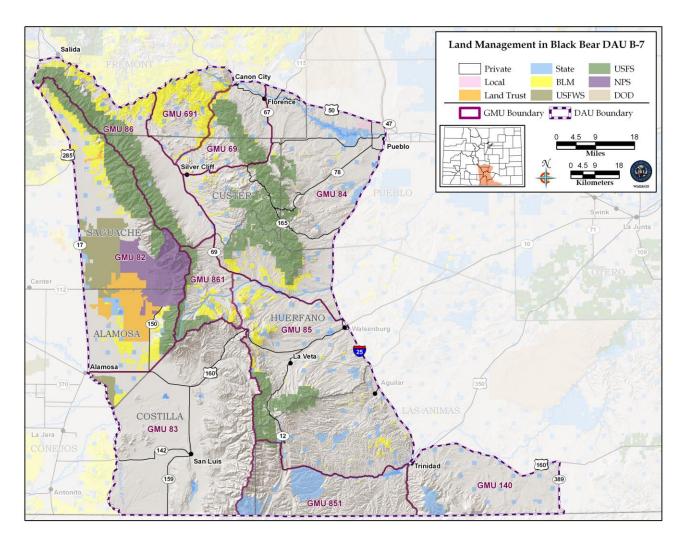

Figure 3. Black Bear DAU B-7 Land Management

Predominate biotic communities are: alpine tundra, sub-alpine conifer, montane conifer, montane shrub, mountain meadow and plains grassland. Bears may be found in all of these communities but are most common in the montane conifer, montane shrub and mountain meadow. A vegetative analysis was conducted in B-7 to classify bear habitat within the DAU. Of the 9,932 smi^2 (17,958 km^2), 6,166 mi^2 (8,202 km^2) is not considered bear habitat. The remaining 3,766 square miles (9,756 km^2) is considered bear habitat with 2,402 mi^2 (6,224 km^2) identified as primary habitat (cover types that bears typically and normally are found at various times of year), 232 mi^2 (600km^2) identified as secondary habitat (cover types that bears occasionally use but is not preferred) and 1,132 mi^2 (2,932 km^2) identified as edge habitat (cover types infrequently or rarely used and might be found in mostly when adjacent to primary cover types). Bear densities are highest in areas with an abundance of soft mast trees and shrubs, such as Chokecherry (*Prunus virginiana*), Skunkbrush sumac (*Rhus trilobata*), American plum (Prunus Americana); and Gambel's oak (*Quercus gambelii*, Figure 4).
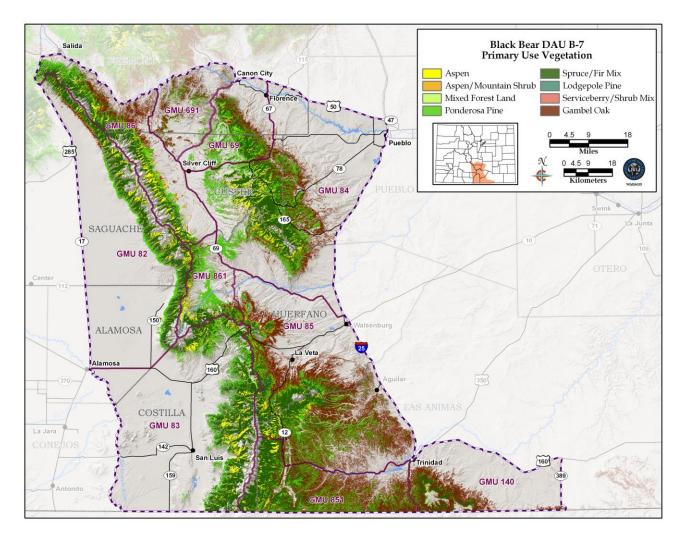
Figure 4. Black Bear DAU B-7 Primary Use Vegetation

Land Use

Predominate land use in the Sangre de Cristo Mountains Bear DAU is agricultural, with livestock grazing occurring on both private and public lands. Irrigated hay meadows are common while row crops are uncommon and generally confined to smaller farms at lower elevations. In some areas, nurseries and orchards are in operation and serve as a major conflict areas.

Within the past decade most GMU's have demonstrated moderate to high levels of housing development. While the resulting loss of historic bear habitat is the primary problem, it also increases the chance of humans coming into contact with the existing bear population. As the housing density increases in the DAU, human/bear conflicts are expected to increase as most of the housing construction is occurring within prime oakbrush dominated bear habitat along the Front Range. Historical areas of human conflict include the towns of Trinidad, Aguilar, Weston, Stonewall, Walsenburg, La Veta, Cuchara, Colorado City, Rye, Beulah, Wetmore, Canon City, Howard and Crestone. Many of the outlying subdivisions in the area can also have a large number of conflicts depending on the year.

MANAGEMENT HISTORY

Administrative

As recently as 1999, the SE portion of Colorado was broken up into 4 bear DAU's for license setting, hunting and mortality management. These DAU's included: B-7 with GMU's 69, 84 and 691; B-8 with GMU's 82, 86 and 861; and B-9 with GMU's 83, 85, 140 and 851; and B-20 with GMU's 133, 134, 136, 141, 142, 143 and 147. In 2003, GMU's 133, 134, 136, 141, 142, 143 and 147 were added to B-9 and DAU B-20 was dissolved.

This DAU plan revises the historical DAU boundaries by combining GMU's from the historic B-8 and B-9 Bear DAU's into the B-7 DAU. This adds GMU's 82, 83, 85, 86, 140, 851 and 861 to the 3 GMU's already within the DAU and places the Eastern Plains GMU's 133, 134, 141, 142, 143, 147 into the B-99 DAU. This effectively dissolves the B-8 and B-9 DAU's. We combined the three DAU's based on the similar habitat within the region and because bear movements, during the spring breeding and fall hyperfagia periods, can cover a linear distance of several hundred miles.

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 licenses available. This continued until 1986, when licenses for the spring season were limited (Beck 1991). The fall hunting seasons occurred concurrently with the established deer and elk seasons and licenses were unlimited until the limited September rifle seasons were established in 1989. Hunters wishing to hunt bears during the established deer and elk season still had access to unlimited licenses until 2005 when license caps were established for these licenses (Appendix B).

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, the annual hunting seasons have begun on September 2nd annually.

Since 2000, 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, 1st, 2nd, 3rd and 4th rifle season licenses. Harvest is concentrated in the limited September rifle season as it is 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.

License Allocation History

Prior to 2003, archery and muzzleloader licenses in the DAU were valid statewide, were unlimited in number, and could be purchased at a license agent until midnight the day prior to opening day. In 2004, archery and muzzleloader harvest in GMU's 83, 85, 140 and 851 surpassed the season participation and success thresholds outlined in the divisions bear management plan and the units began to have limited licenses for these two methods of take. In 2005, all licenses for the concurrent Archery, Muzzleloader and the 4 rifle seasons licenses were limited by a cap on the number of Over-the-Counter (OTC) licenses sold (Figure 5). The limitation of the number of OTC licenses sold allowed for more controlled harvest, especially following years of fall mast crop failure when harvest success can increase greatly.

Limited licenses have been established for the DAU's to achieve harvest objectives and provide the dedicated bear hunter the opportunity to hunt bears outside of the concurrent seasons. B-07 has a limited September season with both unrestricted and private land only (PLO) licenses. Private land licenses were utilized to give landowners an opportunity to draw a limited license and to increase bear harvest on private land.
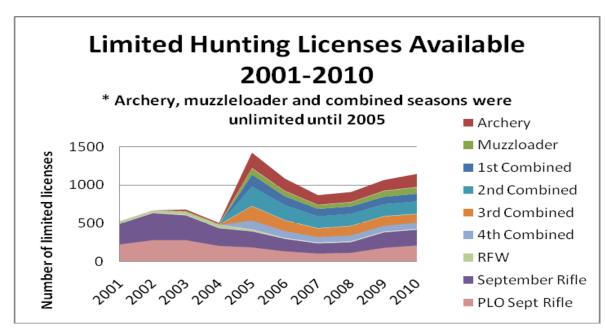
Figure 5. Limited Black Bear Hunting Licenses Available in B-7 from 2001-2010

Mortality – Harvest and Non-Harvest

Annual harvest has varied greatly within the DAU due to bear vulnerability, hunter effort and license numbers. Since 1990, total harvest has fluctuated from a low of 37 bears in 2005 to a high of 208 bears in 2002. Higher levels of harvest (1995 and 2002) were associated with fall mast crop failures that increase bear vulnerability (Figure 6).
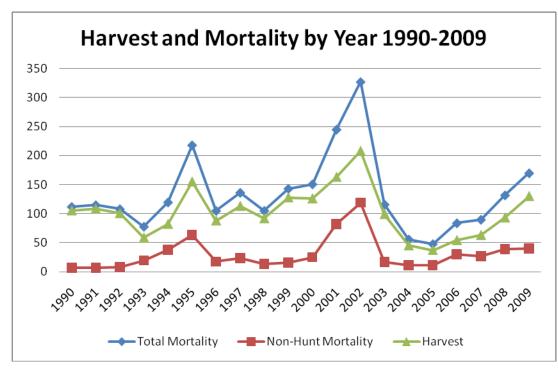

Figure 6. Black Bear Harvest and Mortality by Year in B-7 from 1990-2009

One indicator used to examine the affects of harvest is the proportion of females in hunter harvest. 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 females 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 for a stable population. Therefore, a range of 30% to 40% females in the total harvest could indicate a stable black bear population. 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. The proportion of females in harvest has shown an increase since the passage of Amendment 10 in 1993. The twenty year trend in proportion of females in harvest, 1990-2009, is showing a slight upward trend (Figure 7).
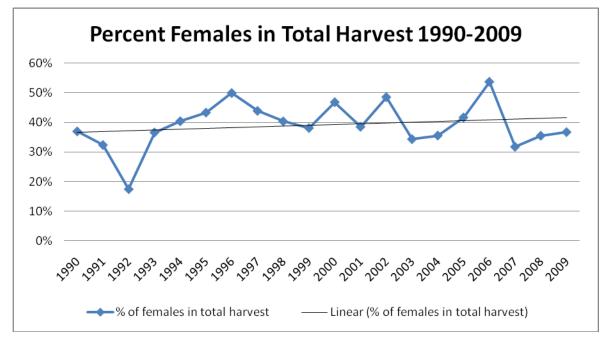

Figure 7. Percent females in black bear harvest in B-7 harvest from 1990-2009

While the 10 year trend, 2000-2009, is showing a steady to slightly decreasing trend (Figure 8), with the three year average of females in harvest at 35%.
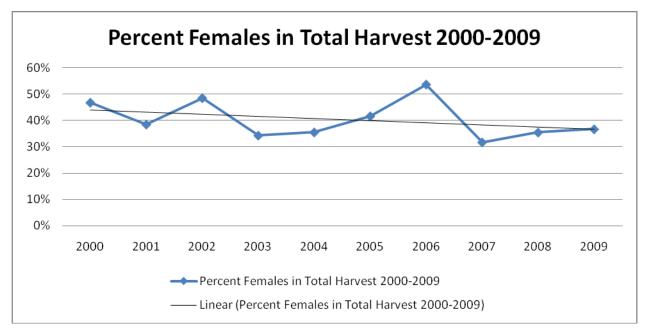
Figure 8. Percent females in black bear harvest in B-7 harvest from 1990-2009

Mortality – Method of Take

Among methods of take, the regular September rifle season has the highest average 3-year success rate (~20%, 2003-2009), followed by the PLO September rifle season at 19%. The combined September rifle seasons are responsible for approximately 59% of the annual bear harvest in B-7 with a high of 76% in 2009 and a low of 47% in 2005(Table 1). Archery hunters contribute an average of 8 bears per year to the harvest and have a 3-year average success rate around 14% in B-7. Muzzleloaders harvest an average of 3 bears per year in B-7 with a 13% success rate. While always low, harvest success rates during the regular rifle seasons varies from 6-10% in the first and second rifle seasons to 2-3% in the third and fourth when many bears are unavailable for harvest due to the onset of hibernation.

Table 1. Black bear harvest in B-7, by method of take from 2003-2009.

Year	Archery Harvest	Muzzleloader Harvest	Sept. Rifle Harvest	1st Combined Harvest	2nd Combined Harvest	3rd Combined Harvest	4th Combined Harvest
2003	4	4	39	2	3	3	0
2004	5	2	21	2	2	1	1
2005	2	1	11	3	5	1	0
2006	9	1	34	8	4	1	0
2007	8	2	35	7	8	2	1
2008	17	8	32	6	11	6	1
2009	13	4	100	4	7	3	0
Average	8	3	39	5	6	2	0

Harvest Distribution

Black Bear harvest is distributed unevenly across the DAU with most of the harvest occurring within the modeled primary bear habitat (Figure 9). When we examine the harvest distribution by GMU, we notice that approximately 27% of the black bear harvest occurred in GMU 84 followed by 24% in GMU 85 (Figure 10).

Approximately 58% of the total bear harvest occurred within GMU's 84, 85 and 86.
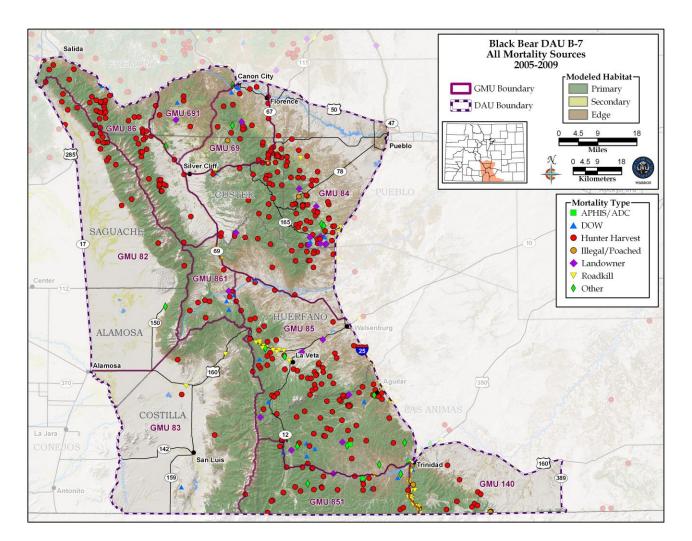

Figure 9. Black Bear mortality locations in DAU B-7 from 2005-2009.*

　　　* Due to unsurveyed portions of GMU's 83 and 851 all mortalities may not be represented in this figure.
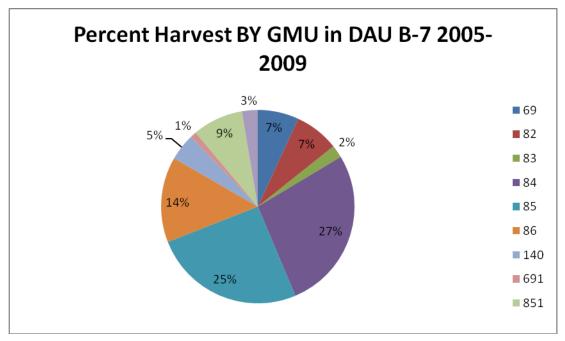
Figure 10. Percent Black Bear harvest By GMU in DAU B-7 from 2005-2009

Mortality – Age and Gender

All harvested and known non-harvest mortalities are physically checked by CDOW personnel so that they can gather biological information. In 2006, the CDOW began pulling the first premolar to gather age and reproductive information. Using the cementum annuli method to determine age of all teeth we were able to extrapolate the age of all bears harvested along with age of first parturition along with parturition interval of the female portion of the harvest. From 2007-2009, we annuli aged 195 teeth from male bears and 112 teeth from female bears from hunter harvested bears and aged an additional 67 males and 13 females from other sources of mortality. From this information we have determined that 71% of our male harvest and 54% of our female harvest are sub-adults (Figure 11). The percentages remain similar with the addition of the other forms of mortality, with 71% sub-adult males and 55% sub-adult females.
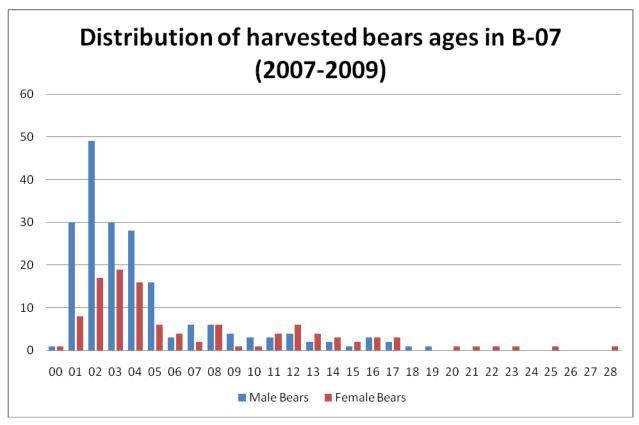
Figure 11. Age Distribution of bears harvested in DAU B-7 from 2007-2009

Game Damage and Human Conflict Management

By Colorado Statute the CDOW is responsible for damage caused by big game, this includes damage caused by black bears. In 2001, the statute was revised to only allow payment for damage for agricultural crops and materials.

From January 2002 through June 2010, the CDOW has paid 126 claims, totaling $121,434.49, for damage caused by bear in B-07. Annual variation is extreme often due to environmental conditions and the number of apiaries that are damaged in a given year. Excluding the incomplete data for 2010 annual claims annual damages ranged from $2,579.25 in 2003 to $42,710 in 2007(Figure 12).

Figure 12. Amount of game damage claims paid for bear damage in B-7 from 2002-2010

Individual claims ranged from $40.50 for damage to 9 poultry all the way to $35,932.10 for damage to 188 beehives. Damage to poultry are the most frequent claim with 26 claims, followed by beehives (20 claims), Cattle (18 claims) and goats (18 claims), and sheep (16 claims) (Figure 13).

Figure 13. Number of bear game damage claims by type in B-7 from 2002-2010

Damage to Beehives was the most expensive damage claim from 2002-2010 with damages totaling $73,152.46, followed by other animals ($15,153.00) and Cattle ($8,017.20) (Figure 14).

Damages Paid by Type 2002-2010

Figure 14. Amount of bear game damage paid by type in B-7 from 2002-2010

A breakdown of bear damage by county can be found in Appendix C.

Human conflicts have varied throughout time and are usually dependant on weather patterns, the success or failure of fall mast crops, and the increase of the human population within the region. A wet spring fol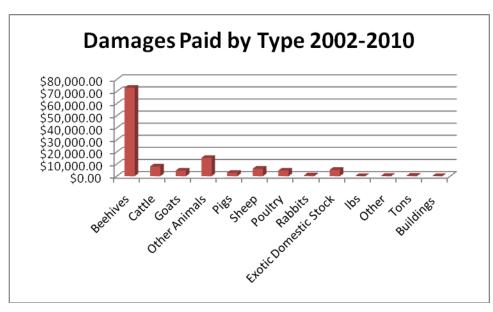lowed by a cool wet summer may decrease the occurrence of conflicts while a dry summer period followed by a mast crop failure may explain an increase in human conflicts. During normal years, bear conflicts usually occur during the mid summer as the grasses and forbs mature and decline in palatability and the fall mast crops have yet to mature. This period usually occurs between mid to late July through mid to late August. If the fall mast crops are prevalent human conflicts begin to slow down dramatically once the apple trees and choke cherries mature. There have been years of high human/bear conflicts over the last 25 years with the most recent occurring in 1995, 2001 and 2002. All of these years were preceded by a hard freeze in late May-early June. These freezes almost completely destroyed the fall mast crops and left the bear populations with largely human related foods. The large number of conflicts and the associated higher human caused mortality resulted in a lower bear density/population and decreased hunter harvest in the following years.

The methods to deal with human conflicts have centered on education with trap and transplant being a last resort. Each situation is dealt with on an individual basis utilizing the DOW bear policy guidelines as a guiding principle. These include no action, information and education, proper storage of food and/or garbage, repellents, electric fencing, aversive conditioning, translocation and lethal removal.

Education has centered on coexisting with the bear population, removal of attractants, human safety, protecting livestock and bear biology. Each officer has their own method of disseminating bear information but some common methods are: Bear Aware teams, children's classroom education, door hang tags, Bear Aware magnets, division brochures, face to face conversations, educational TV programs, and Bear Aware DVD's.

In an effort to decrease human bear conflicts, new hunter management areas are proposed around suburban population areas in the DAU where a higher license density will be established in an attempt to utilize hunters to reduce the local bear density. These management areas were established with the existing commission approval utilizing the approved 3 step process. Areas are bounded with hard boundaries and may be limited to Private Land Only licenses. Licenses for these special management areas will be set based on historical conflicts and manager experience. Hunters with a regular license valid for the GMU may also hunt within these management areas.

Current Hunter Harvest and Total Mortality Objectives
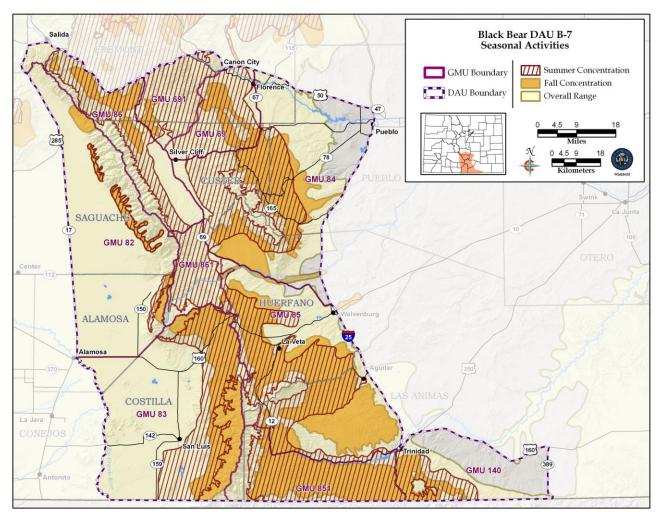The last DAU planning effort in B-7 was accomplished in January of 1999. These documents were limited

in scope and consisted of 2 pages per DAU (Appendix G). Hunter harvest objectives were set for B-07, B-08 and B-09 separately and are summarized as a total here for comparison for the newly combined DAU. The combined hunter harvest objectives were set at 150 animals along with management prescriptions should the hunter harvest exceed these levels. A total mortality level was not expressed in the plans so the total mortality objectives were set as the hunter harvest objectives. These objectives have been modified several times since the mast crop failure years of 2001 and 2002. The objectives were dropped to 72 hunter harvested and 89 total mortality in 2005 and remained there until the 2008 season. In 2008, they were raised to 89 hunter harvested and 107 in total mortality. In 2009 the objectives were raised to the 1999 plan level of 150 and remain there today.

MANAGEMENT CONSIDERATIONS

Habitat and Habitat Models

The habitat resources within the DAU are related to elevation and their use by bears depends on the time of year and plant morphology that best meets the bears foraging needs (Figure 15). Being omnivores, bears can utilize a diverse variety of food resources that allows them to exist at elevations of less than 5,000 ft, on the juniper breaks along and east of I-25, to the alpine interface that extends above 12,000 ft. Bears adjust to changes in plant morphology by moving either in elevation or restricting their movements to areas with increased production near water sources.

Figure 15. Black Bear Seasonal Activities in B-7

Lower elevation food sources are at times limited and heavily influenced by drought, but during certain

periods of time may be very productive. The main vegetative foods available at lower elevation include: juniper berries (*Juniperus* spp.), cactus flowers (*Opuntia* spp.), skunkbrush sumac (*Rhus* spp.) and oaks (*Quercus* spp.).

Mid elevation habitat types are dominated by ponderosa pine (Pinus ponderosa) and Juniper (*Juniperus* spp.) forests along with gambles oak (*Quercus gambelli*). These habitats are often interspersed with irrigated hay meadows and other human manipulated habitats. These areas provide fair early spring forage along with excellent fall food sources and would be considered primary habitats in the area.

High elevation habitat types are dominated by spruce-fir (*Picea* and *Abies* spp.) forests interspersed with aspen (*Populus tremuloides*) and willow (*Salix* spp.). This area often has a very good forb and grass understory and provides good year-round bear habitat.

Habitat in the DAU can be considered fair for spring food sources which consist of forbs and grasses along with carrion and young of the year ungulates. Poor for summer food sources as the grasses and forbs mature and prior to the maturity of the fall mast crops. Fall food sources which include soft mass such as choke cherry, apples and skunk brush sumac and hard mass such as acorns can be excellent if moisture and temperature fall within normal ranges.

Often the maturity of the summer foods causes a shift in bear foraging to human associated foods types and the level of human conflicts increase during this timeframe.

In 2008, using the DOW Basinwide GIS Vegetation Classification project data, we ranked each vegetation type for its utility as basic bear habitat (use/occupancy) (appendix A) and relative forage value. This classification resulted in a two tiered habitat ranking system. Use/occupancy was defined with 4 levels (primary, secondary, edge and out). Relative forage value was rated for primary, secondary, and edge habitat with 3 levels (high, moderate, or low) based upon the perceived potential of those habitats to provide forage for black bears. Use/occupancy terms were defined as follows:

Primary – cover types that bears typically and normally are found 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 result of this analysis was the quantification of bear habitat and relative use and state of occupancy. For those habitats with varying levels of use, we quantified their potential relative forage value. This work 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 can be incorporated into population modeling or used as a comparison to independent population model runs.

Applying these criteria to the B-07 DAU, we determined that within the 9,932 mi^2 (17,958 km^2) DAU we had 2,403 mi^2 (6,224 km^2) of Primary Habitat, 232 mi^2 (600 km^2) of Secondary Habitat, 1,132 mi^2 (2,932 km^2) of Edge Habitat and 3,167 mi^2 (8,203 km^2) of Non-habitat.

Density Extrapolation

Beginning in June 2009 the DOW conducted a survey to non-invasively collect DNA samples of black bears in an attempt to establish a population density of the black bear habitat in GMU 85. The study area was located NW of Trinidad in Las Animas county. Using the protocols described by Woods et al. (1999) for grizzly bears (*Ursus arctos*) a study area was selected based on high quality bear habitat that included most of the habitat types present in the area that would be utilized by black bears. We modified the protocols slightly to account for differences in bear heights and home range sizes to better adapt the study to black bears, using a smaller 5 by 5 kilometer grid and a wire height of 18 inches to try and capture hair for the smaller black bears. Based on the modified protocols we established a 23 grid study area in portions of GMU 85 in Las Animas and Huerfano Counties surrounding the East and West Spanish Peaks. We collected samples from the grids on a weekly basis beginning the second week of June 2009 to the second week of August 2009. We collected 656 unique hair samples, which were used to genetically identify 149 individual bears within the study area in 2009.

We analyzed the results using three different mark recapture analysis methods; spatially explicit mark recapture, maximum likelihood mark recapture, and a jackknife mark recapture.

Spatially explicit method. This method uses the distance between captures to estimate movement. With sufficient recapture events this method would provide a strong representation of the size area that bears are moving within during our sampling time frame. The paucity of recaptures we have to work with severely weakens this analysis. Because there are so few recapture events we are not confident that they are representative of the actual area of use by bears in either survey location.

Maximum likelihood method. This method applies assumed home area values to the analysis, in this case we used small and large annual home area estimates from Idaho research (Beecham and Rohlman 1994) and mean annual primary home areas found in the northern study area in New Mexico (Costello 2001). The primary home area in New Mexico doesn't include the long distance movements that bears occasionally embark upon, but subsequently return from (Costello 2001, Baruch-Mordo personal comm. 2010) This method also assumes that there is no difference in detection probability among individuals (except by sex which can be analyzed separately).   This assumption is known to result in low biased results when compared to known densities. This may be evident in our results as well.

Jackknife method. This method applies home areas in the same manner as the maximum likelihood method. This method does assume that there is variation in the detection probability among individual bears, but doesn't presume any specific cause for the variation. This assumption seems reasonable.

This mark-recapture survey indicated higher densities than those found by most studies, analyses, or management reports in the western US, which were estimated at 44-52 bears/100 km^2 (Table 2). It's important to note that the high end of this density estimate differs from the original estimate derived in 2010 as a mistake was found and corrected in the data analysis. 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 unpublished hair snag survey report); overall habitat quality in the study area is probably better than that found in most other study areas. It should also be noted that survey area, while representative of the bear habitats in the region, was selected in large part because it was considered among the highest overall quality habitat in Colorado and the exact survey grid areas were structured to include the highest quality cover and forage value habitat for the survey season. Although the density results are limited to one year, surveys will continue in this and several other locations to improve our understanding of bear densities in different habitats.

Table 2. Reported black bear densities from research, analysis, or management reports in diverse locations and habitat types.

Location	Source	Per 100 km^2
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
Idaho	Beecham and Rohlman 1994	31 - 77
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
New Mexico	Costello et al. 2001	9.4 - 17
Colorado - Middle Park	Beck 1997 Unpublished Fed Aid Rpt	8.1
Utah	Utah Division of Natural Resources 2000	7.7
Arizona	LeCount 1987	6
Wyoming	Grogan and Lindzey 1999	2.1 - 3.0
Colorado - RMNP	Baldwin and Bender 2007	1.35

Since the study area was selected because of the high habitat quality it provided, applying the resulting densities to the remaining habitat in the DAU would result in an overestimate of the areas bear population. We chose to apply the resulting densities to only the primary habitat in the DAU and chose to use other densities from literature to apply to the other habitat types. We broke the population estimates into both a liberal designation, using liberal densities, and also a conservative designation using more conservative densities. Resulting population estimates ranged from 3,078 bears for the conservative designation to 3,950 for the liberal designation (Table 3). While the densities that we found within the two study areas in Colorado are higher than most areas within the inter-mountain west it does not mean that we have any more bears than we have had at different timeframes in the past. It only means that we have a number or density to apply to the bear population within these areas. As our research continues we will strive to improve our knowledge of this bear population.

Table 3. Estimates of habitat by type (primary, secondary and edge), population densities and population extrapolations in B-7. Population densities were obtained from Literature generated in Colorado or surrounding states.

Habitat type	Area (KM^2)	Conservative Pop. Densities	Liberal Pop. Densities	Conservative Pop. Est	Liberal Pop. Est
Primary	6224	44*	52*	2793	3236
Secondary	600	17**	36***	102	216
Edge	2932	8.1****	17**	237	498
Total	9756			3078	3950

*Apker et al. (2010 unpublished data), SE Colorado Study area, 44-52 bears/100 km2
**Costello et al. (2001), New Mexico study area, 94.-17 bears/100 km2
***Beck (1995 unpublished Federal Aide Report), Uncompahgre Plateau, Colorado, 36 bears/100 km2
****Beck (1997 unpublished Federal Aide Report), Middle Park, Colorado, 8.1 bears/100 km2

Population Models

Deterministic population models were developed to test assumptions and project population estimates. Two models were created for the B-7 DAU and in each model, the starting population size of 1,250 bears was based on habitat density extrapolations from work by Beck on the Uncompahgre Plateau in 1997 (Beck 1997). Both models projected the population estimates to 2014. In both models 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 and 2009 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 is adjusted upward since we know that our records do not document all non-hunt mortality. The amount by which non-hunt mortality is adjusted varies depending on the model type, any known reporting biases, and geographic area.

Population models can be used to examine divergent assumptions and project future population outcomes with varying amount of off-take through harvest. For the B-7 bear DAU, we ran two different models, one projects a liberal population with liberal, but plausible model parameters, the other is a conservative population projection with more conservative parameters.

Conservative Model

Start Population size is 1,250, Sex Ratio at Birth 50%, Age of adult male and female = 5+, Litter size 2,Survival: Cub– poor = 35%, average = 55%, good = 80%. Yearling female 92%, subadult female 94%, adult female 94%, Yearling male 91%, subadult male 93%, adult male 91%. Non-hunt mortality multiplier 1.5, increases actual reported non-harvest mortality. Since not all non-hunt mortality will be detected, it makes sense to assume some greater value. (Note: cub survival more variable between years due to forage quality & availability variability)

Assumptions used in the Conservative B-7 model; Age specific survival & age of primipatry unaffected by human food sources and are reasonable values compared to studied populations. Survival rates and age of primipatry are reasonable values compared to studied populations. Population is stabilized at approximate 2009 Levels (Note adult males make small component of population with these assumptions)

Using the above conservative model constraints yield a total post hunt 2009 black bear population estimate of 2,169 bears consisting of 587 males, 1,025 females and 558 cubs. The population of independent bears is estimated at 1,612 (587 males, 1,025 females). This model represents what the population could be under optimal conditions of habitat and reproduction. If current harvest levels remain at the current 3-year average then the population is expected to grow to a population level of slightly less than 2,900 bears by 2014. In order to constrain

the population at a stable level, harvest of black bears would need to increase to 250 bears. This model likely predicts a lower population in the DAU than actually exists because it reflects conservative conditions which do not occur every year.

Liberal Model

Start Population size is 1,250, Sex Ratio at Birth 50%, Age of adult male and female = 5+, Litter size 2.1, Survival: Cub– poor = 35%, average = 65%, good = 78%. Yearling female 93%, subadult female 95%, adult female 95%, Yearling male 92%, subadult male 94%, adult male 92%. Non-hunt mortality multiplier 2.0, increases actual reported non-harvest mortality. Since not all non-hunt mortality will be detected, it makes sense to assume some greater value.

Assumptions used in the Liberal B-7 model; Average Litter size 5% greater than Conservative Model. Age specific survival & age of primipatry improved 1 percentage point due to high quality habitat & human food sources. Age specific survival rates and age of primipatry are reasonable values compared to studied populations. Population is stabilized at approximate 2009 Levels (Note: cub survival more variable between years due to forage quality & availability variability)

Using the above conservative model constraints yield a total post hunt 2009 black bear population estimate of 3,435 bears consisting of 1,039 males, 1,614 females and 782 cubs. The population of independent bears is estimated at 2,653 (1,039 males, 1,614 females). If current harvest levels remain at the current 3-year average then the population is expected to grow to a population level of slightly less than 4,585 bears by 2014. This model represents what the population could be under optimal conditions of habitat and reproduction. In order to constrain the population at a stable level harvest of black bears would need to increase to 325 bears. This model likely predicts a population closer to what we think exists in B-07 at the current time (Table 3), although population changes in the future are more variable because it reflects liberal conditions which do not occur every year.

As stated before the population models are deterministic and based on numerous assumptions, albeit plausible assumptions. While they add another tool to think of in the management of black bears, the trends and mortality levels that they produce are perhaps more important than the actual precise values portrayed by the models.

Population Estimate Developed for Mortality Calculations

We then compared the density extrapolations to the population model developed by Costello et al. (2001) to refine our estimate.   We found that the liberal population model was close to the midpoint of the projected population estimates, which was 3,500 bears, so we chose to use this midpoint as our presumptive population estimate, which we used to derive harvest objectives for this plan.

As additional information on population density is collected in future years, it will be used to refine this estimate. This may result in a lower or higher population estimate that could have the effect of changing the estimated off-take rates to better fit the new information, but the strategic goal and the management criteria of the population will remain the same.

Mortality Density and Rates

B-7, with 9,756 km^2 of mapped bear habitat and an average of about 142 bears killed per year over the past 10 years equals a mortality density of 1.46 bears/100km^2. Then assuming that the bear population is about 3,500 bears, which is approximately the habitat and population model projections, then the median bear population density in the DAU is about 35.9 bears/100km^2. Using these figures to calculate a mortality rate yields 1.49/35.9 = 4%.

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:

Miller (1990) demonstrated that under optimal conditions of reproduction and survival, maximum sustainable 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%. This range may be useful in gauging current human-caused mortality levels. If we assume a prolonged 10-15% harvest is possible for the above density estimates then it should be possible to project possible ranges of mortality density for the DAU for different management objectives. The actual value of the mortality thresholds will vary based upon the habitat quality within the DAU and results from the habitat model analysis, but the following guidelines could be used to develop threshold levels.

Table 4. Off-take rates for the B-07 bear population to achieve management goals

Manangement Goal	Offtake Rate	Total Mortality level for 3,500 Bears
Increasing Population	<7%	245
Stable Population	7-13%	245-455
Decreasing Population	>13%	>455

As shown in Table 4 a population estimate of 3,500 bears would result in the removal of less than 245 bears annually to have an increasing population, removal of between 245-455 bears for a stable population and any mortality above 455 animals to decrease the population.
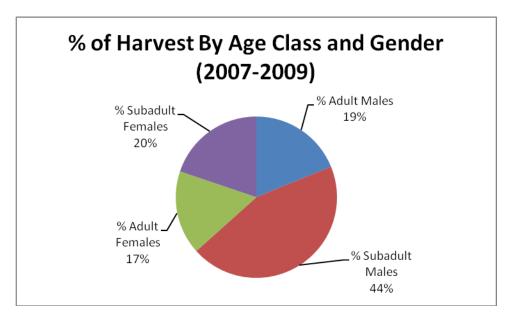
Forage Condition – Mast Production Surveys

In the fall of 2008, DOW began inventory of mast production conditions. Following survey protocols developed by Costello et al. (2001), we made only slight modifications to provide a basic 5 point matrix of fall mast fruit productions for gambel oak, juniper spp., chokecherry, and serviceberry. Forage condition results within DAUs can then be represented numerically to reflect annual forage conditions. These results can provide managers objective information about relative forage conditions over time and in conjunction with their professional judgment, can influence management recommendations. In addition, the results can be used as population model inputs, because forage conditions influence bear reproductive success as well as vulnerability to mortality (Beck 1991, Costello et al. 2001).

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, and 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-3, it appears that current harvest levels could be high, as adult males only comprise 19% of the total harvest (Figure 16).

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 females 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-7 appears to be at the lower end of the stable range using this indicator, with a 30% female harvest rate over the last 3 years (Figure 16). 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.
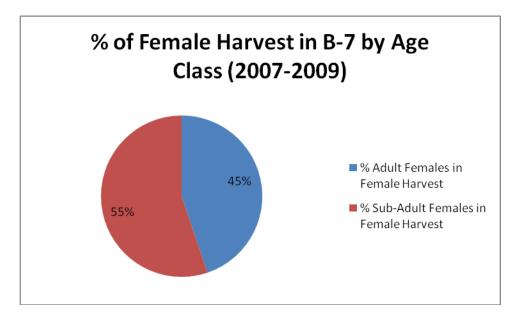

Figure 16. Bear harvest in B-7 by proportion of age class and gender

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-7, adult females comprised 45% of the female harvest from 2007-2009, indicative of a stable population under this criteria (Figure 17).

Figure 17. Proportion of female harvest, by age class in B-7.

     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

There are several main social factors influencing bear management strategies in B-7. The first and most important is public safety and human conflicts. The second is bear hunting opportunity and can be closely tied to strategies to help reduce agricultural damage claims. Urban bear issues and human/bear conflicts that are non-agricultural related are important in local bear management but do not generally impact the overall bear populations except in extreme food failure years that lead to an inordinate number of bears being killed.

Since most of the DAU consists of private land, an increase in bear harvest to meet management goals is totally dependent on landowner access to habitats the bears utilize during the hunting season. Most of the bear harvest that occurs in this DAU is currently coming from private land. The tolerance for landowners to allow hunters on their property will be monitored by the CDOW's District Wildlife Managers (DWM's) during their normal job duties.

As a management experiment a bear management area was set up within GMU 84. This area was created to try and increase harvest of bears that are within a known conflict area. It encompasses the towns of Beulah, Colorado City, Rye and Wetmore along with private lands that have had a history of human bear conflicts. License densities will be increased in the area to try and harvest a higher percentage of the bears in the area. Human bear conflict and game damage reports will be monitored to see if the additional harvest has any effect. The additional harvest will be included within the mortality thresholds to maintain the desired management prescription for the DAU.

Other human conflicts will be managed in accordance with CDOW management directive W-2, and handled by the local DWM's.

STRATEGIC GOALS AND MANAGEMENT OB JECTIVES

Process for Developing Strategic Goals and Management Objectives

Public Process

Public meetings were used to gather public input on bear management strategies and were held in Trinidad –November 15, 2010, Colorado City-November 17, 2010 and in Walsenburg-November 18, 2010. The goal of these meeting was to provide basic information regarding black bear management at the state and local level as well as to provide the public an opportunity to ask questions and provide comment regarding the B-7 DAU plan. Attendees were given a presentation on the management alternatives, along with the harvest and mortality rates required to obtain those objectives. Announcements for the meetings were published in the newspapers, as well as being posted on the CDOW website 2 weeks prior to the meeting (Appendix D). A total of 49 members of the public attended the meetings and 44 questionnaires (Appendix E) were filled out and submitted by attendees.

On the subject of management of the bear population 3 attendees wanted to increase the bear population, 19 attendees wanted to keep the bear population stable at current levels, 17 attendees wanted the bear population decreased from current levels and 4 attendees did not answer the question.

A summary of comments received on the questionnaires can be found in Appendix F.

Following the initial public meetings a draft B-7 DAU plan was written and posted on the DOW website http://www.wildlife.state.co.us for a 30 day public comment period. Additionally local government agencies and organizations including the Bureau of Land Management (BLM), United States Forest Service (USFS), Colorado Woolgrowers Association, Colorado Cattleman's Association, Alamosa, Chaffee, Costilla, Custer, Fremont, Huerfano, Las Animas, Pueblo and Saguache County Commissioners, and participants in the public process that supplied an email address were sent written notice of the draft plan and asked for their input regarding bear management in B-7. Three people filled out the questionnaire that was supplied on the website and of those three: one corrected typographical errors within the plan, one requested that the population remain stable at the post-hunt

2009 levels and the third requested that the population remain stable or decrease for 5 years, or 15% from the post-hunt 2009 levels.

Strategic Goals

   Population models for black bear are built on assumptions that are difficult to verify with actual data. Therefore, the DOW first sought public input about what they desired for an overall DAU management strategy. 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, hair snag survey density/structure results, and annual mast production survey results are all incorporated into population modeling efforts. However, the models and their results have not been validated. Moreover, data collected for model inputs are relatively new efforts. We anticipate that models will change and be improved over time and at present must be viewed as fluid. Therefore, although the plan identifies mortality and age and gender objectives in a range of values, these are initial values. Specific annual objectives will be set based on any new information and license numbers presented to the Wildlife Commission for their approval.

   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, 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 Wildlife Commission. These objective sheets will also govern annual license levels to achieve the DAU strategic goals.

Three alternative strategic goals were considered for B-7:

Population Alternative #1:
Maintain a stable bear population in B-7. Based on current models and density extrapolations in order to achieve the DAU strategic goals, it is estimated that the average total mortality should be in the range of 7-13% of the current bear population annually to achieve this objective.

Based on current models, in order to achieve the DAU strategic goals, it is estimated that the 3-year running average proportion of age and gender structure in hunter harvest should meet the criteria for managing for a stable bear population (Table 5).

Table 5. Criteria for managing for a stable bear population under alternative #1.

Criteria	Proportion of Harvest
Percent Adult Males in Total Harvest	25 – 35
Percent Females in total Harvest	30 – 40
Percent Adult Females in Female Harvest	45 – 55

If the percent of all females in total harvest exceeds 40% for more than 3 years in a row, annual hunting licenses will be reduced 25% for a minimum of 2 years to allow a recovery of adult females in the population.

Population Alternative #2:

Suppress the population of bears in B-7 by 15% before maintaining a stable population at the suppressed level. To achieve this objective, we may need to suppress the population for a period of 5 years before managing for a stable population.

Based on current models and density extrapolations in order to achieve the DAU strategic goals, it is estimated that for the first 5 years of the management plan the average total mortality should be in the range of 13-18% of the bear population annually and then for the remaining years of the management plan harvest 7-13% of the resulting bear population annually.

Based on current models, in order to achieve the DAU strategic goals, it is estimated that for the first 5-years of the management plan the running average proportion of age and gender structure in hunter harvest should meet the criteria for managing to suppress the population in years 1-5 of the management plan and manage for a stable population in years 5-10 of the management plan (Table 6).

Table 6. Criteria for managing to suppress the population in years 1-5 and for managing for a stable population in years 5-10.

Criteria	Proportion of Harvest	
	Years 1-5	**Years 5-10**
Percent Adult Males in Total Harvest	< 25	25 – 35
Percent Females in Total Harvest	> 40	30 – 40
Percent Adult Females in Female Harvest	> 55	45 – 55

Once the objective of suppressing the population by 15% is reached, the percent of total females in the harvest should be monitored and if the percent of all females in total harvest exceeds 40% for 3 consecutive years, annual hunting licenses will be reduced 25% for a minimum of 2 years to allow a recovery of adult females in the population.

Population Alternative #3:

Suppress the population of bears in B-7 by 25% before maintaining the population at the suppressed level. To achieve this objective, we may need to suppress the population for a period of 7 years before managing for a stable population.

Based on current models and density extrapolations in order to achieve the DAU strategic goals, it is estimated that for the first 7 years of the management plan the average total mortality should be 13-18% of the bear population annually for the first 7 years of the management plan and then for the remaining years of the management plan harvest 7-13% of the bear population annually.

Based on current models, in order to achieve the DAU strategic goals, it is estimated that for approximately the first 7-years of the management plan the running average proportion of age and gender structure in hunter harvest should meet the criteria for managing to suppress the population and manage for a stable population in years 8-10 of the management plan (Table 7).

Table 7. Criteria for managing to suppress the population in years 1-7 and for managing for a stable population in years 8-10.

	Proportion of Harvest	
Criteria	Years 1-7	Years 8-10
Percent Adult Males in Total Harvest	< 25	25 – 35
Percent Females in Total Harvest	> 40	30 – 40
Percent Adult Females in Female Harvest	> 55	45 – 55

Once the objective of suppressing the population by 25% is reached, the percent of total females in the harvest should be monitored and if the percent of all females in total harvest exceeds 40% for more than 3 consecutive years, annual hunting licenses will be reduced 25% for a minimum of 2 years to allow a recovery of adult females in the population.

Monitored Data to Inform Management
All known dead black bear, from both harvest and non-harvest sources, are checked by DOW staff to obtain biological information. The quality of these data is being improved by further training of service center staff that may check bears. 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. We will annually review total mortality information prior to license setting operations in late March. If the population trends point to us reaching our population goals we will adjust license numbers as required or extend the timeframe we reduce the population.
In 2009 and 2010, a hair snag survey area was established within GMU 85. Data gathered from the 2009 survey effort was utilized to establish population estimates and mortality rates for this population. Funding has been acquired to continue this survey effort through the 2013 survey season. We will use this information to monitor management changes and mortality rates to document any population level effects.
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 reduced, stable, or increasing black bear numbers

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-7. Results of these surveys are incorporated into population modeling efforts, as are mortality, age and gender structure data.

Game Damage & Human Conflict
Even though game damage and human conflict have a big influence on management strategies in B-7 there are no specific triggers for game damage or human conflict. Standard DOW management approaches are used to address these issues.

Within a portion of GMU 84 a bear management area has been set up to evaluate the effectiveness of an increased license density will decrease human bear conflicts in a sub-urban conflict area. The number of conflicts will be monitored on an annual basis to evaluate three things: if an increased bear harvest can be obtained within the constraints of Colorado's season structure; If an increase in bear harvest decreases the amount of damage complaints; and if bear complaints within the developed portions of the management unit decline. Effectiveness of this philosophy will be monitored on an annual basis to document any developments.

All other urban bear management will be handled by local law enforcement officers including DWMs for the DOW, municipal police departments and/or animal control officers, and county sheriff's departments. Many efforts have been made to educate urban residents about how to coexist with bears in the urban environment and minimize conflicts such as ways to keep bears from getting into garbage. Occasionally urban bears are captured and relocated or killed if they have been causing property damage or if they are habitual offenders. Colorado has a "Two Strike" policy where any conflict bear is caught and ear tagged and subsequently found and captured a second time is euthanized.

A Colorado State University/DOW/USDA Research Center graduate research project began in 2006; examining bear behavior, movement patterns, and use of human altered landscapes in the Roaring Fork Valley. Results of this research is not yet published but will, along with results of other relevant research, be incorporated in DOW management for black bear in this and other DAUs in the future.

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 Wildlife Commission during annual regulation cycles.

Historically, off take rates in B-7 were derived by quantifying the amount of available habitat within the DAU and extrapolating density estimates to estimate the population. These historic density estimates ranged from 8.1 to 36 bears/100 km^2 (Beck 1997 and Beck 1995). For this DAU plan, both habitat and population models were developed to provide estimates for the predicted bear population within the DAU. Density estimates for this plan were derived from a bear hair snagging density study that was initiated in the DAU in 2009. Density estimates from this study (44 to 52 bears/100km^2) indicate that the number of bears within the DAU exceeds historic density estimates. Extrapolations from these density estimates suggest that there were approximately 3,000-4,000 bears in the B-7 DAU post hunt 2009. This population extrapolation will be refined in future years as additional density estimates are derived. It is important to note that although we believe this population has been increasing since the high mortality levels in 2002-2003, the primary factor in the higher estimate of bears in this DAU can be attributed to the use of better methodologies to estimate bear density within the DAU.

SELECTED MANAGEMENT OPTION

Based on input from external and internal publics the CDOW has selected Alternative #2, Suppress the bear population in B-7 for a period of up to 5 years, or 15%, and then hold the population stable at the suppressed level for the period covered by this DAU plan. In the event that mortality is elevated because of mast crop failures, we acknowledge that it may not take the full 5 years of suppression to obtain a decrease of 15% of the population. We will monitor the population parameters listed below to determine if further reductions need to be made or if the population has reached the desired population level prior to the full 5 years of suppression.

Mortality Objectives – 3 year running average

Total Mortality Objective

In order to achieve a DAU strategic goal of decreasing the population for a period of up to 5 years or 15%, then managing as a stable population, it is estimated that the average total mortality should be greater than 455 bears annually while meeting the age and gender criteria listed below for the first 5 years of the DAU plan then managing the lower population level as stable for the remainder of the DAU plans timeframe.

Hunter Harvest Objective

        Annual hunter harvest objectives are determined by deducting the 3-year running average amount of non-hunter mortality, three year average (2007-2009) of 36 bears, from the total mortality objective. If the strategic goal is to Decrease the population for a period of up to 5 years, 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 objective of greater than 455 bears, for the first 5 years of the plan, the hunter harvest objective will be approximately 415 bears. When it is determined that the population has reached the approximately 15% decrease from post-hunt 2009 levels these off take rates will be reevaluated to maintain a stable population in B-7 for the remaining period of the plan.

        These off-take rates were developed with the best knowledge of bear population levels and population dynamics at the time that the plan is being written in the spring 2011. As the DOW's knowledge of the various population parameters increases, the management of the population is likely to change to better reflect the actual bear population. These removal rates are not set in stone but may be modified to fit our increasing knowledge of this population.

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:

Criteria	Proportion of Harvest	
	Years 1-5	Years 5-10
Percent Adult Males in Total Harvest	< 25	25 – 35
Percent Females in Total Harvest	> 40	30 – 40
Percent Adult Females in Female Harvest	> 55	45 – 55

        Several methods will be combined to monitor when the appropriate population level is achieved. Beginning with the mast surveys to determine constraints to population recruitment, we will work to monitor mast crop production to gather information to populate the developed population models. Using this information as a parameter we will annually update the population models to assess hunter harvest effects and population swings to see if we are reaching the desired population level. This information will be in addition to a continuation of the black bear hair snag operations for as long as funding is available.

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Appendix A

Black Bear Habitat Quality Assessment: Please review the vegetation and cover types. Using your knowledge and experience I would like to receive your assessment of black bear habitat from three aspects. First is an assessment of use/occupancy, second is an assessment of general habitat quality or forage value for black bear, finally a general season of use. Try not to over-analyze – I'm most interested in your gut feeling. I intend to combine assessments from a wide variety of DOW folks to help formulate a black bear habitat model. The model will help formulate a population extrapolation from densities documented in different States and cover types. We will also be incorporating hunter harvest and road kill locations to help model fall densities (derived from harvest density) in different cover types and potential movement corridors (derived from road kill locations).

As an aid please use the following keys:

<u>**Use/Occupancy**</u>

1 = Primary – cover types that bears typically and normally are found at various times of year.
2 = Secondary – cover types that bears occasionally use but is not preferred.
3 = Edge – cover types infrequently or rarely used and might be found in mostly when adjacent to Primary cover types.
4 = Out – cover types that are not black bear habitat or those in which bears would only travel through.

<u>**Season of Use – Assess Only with Primary, Secondary, and Edge Use Types**</u>

S = Spring & Summer – places bears use mainly after den emergence until fall hyperphagia.
F = Fall – places bears use or appear to concentrate in mainly during fall hyperphagia.
Y = Yearlong – places bears use or regularly regardless of season or foraging status.

<u>**Habitat Quality – Assess Only with Primary, Secondary, and Edge Use Types**</u>

H = High forage value potential
M = Moderate forage value potential
L = Low forage value potential

Jot some notes in the Rating space if you have any comments. I completed a couple as examples, but please replace these with your own.

Basinwide Vegetation – Bear Habitat Model Characteristics

DESCRIPTION	Use – Occupancy	Season of Use	Forage Quality	Comments
11 RESIDENTIAL: High density residential areas, consisting of homes, lawns, and planted trees, or parks and golf courses.	3	Y	H	Used up to 1 km from edge and if within 5 km of primary veg. type
12 COMMERCIAL: High density urban areas with little vegetation, parking lots, buildings, etc.	3	Y	H	Used up to 1 km from edge and if within 5 km of primary veg. type
21 DRYLAND AGRICULTURE: Dryland crops and fields.	4			
22 IRRIGATED AGRICULTURE: Irrigated crops and fields.	3	F	H	Only corn if it can be distinguished from other irrigated ag. crops; then used up to 1 km from edge and if within 5 km of primary veg. type
23 ORCHARD: Agricultural areas consisting of orchards.	3	F	H	Used up to 1 km from edge and if within 5 km of primary veg. type.
31 GRASS/FORB RANGELAND: Perennial and annual Grasslands. Low elevation (< 6,000') species include Blue Gramma, Needle & Thread, Sand Drop Seed, and brome species. Mid elevation (> 6000' and < 9500') species include Wheatgrass, Smooth Brome, Blue Gramma, Cheatgrass, dandelion, Spearleaf Buckwheat, and clover. In the southeast plains region of Colorado, grasslands are often associated with yucca and various cacti species, such as cholla, and prickly pear.				See specific veg. types below
3101 (310) SNAKEWEED/SHRUB MIX: Desert and low elevation shrubland dominated by Snakeweed but heavily associated with Greasewood, sagebrush, and saltbush.	4			
3102 (311) GRASS DOMINATED: Rangeland dominated by annual and perennial grasses. Example species include: Needle & Thread, Western Wheatgrass, Crested Wheatgrass, Kentucky bluegrass, Bluebunch wheatgrass (POPR), or Galleta grass.	4			
3103 (312) FORB DOMINATED: Rangeland dominated by forbs. Example species include: arrowleaf balsamroot (BASA3), ligusticum (LIGUS), meadowrue (THALI2), false hellebore (VETE4), and mulesears wyethia (WYAM).	3	S	M-L	Used up to 1 km from edge and if within 5 km of primary veg. type
3104 (313) GRASS/FORB MIX: Rangeland codominated by grasses and forbs. Example species include: Arrowleaf balsamroot (BASA3), Gumweed (GRIND), Mule's ear-wyethia) WYAM, Prairie junegrass (KOMA), Western wheatgrass (PASM), lupine, or Kentucky bluegrass.	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
3105 (314) TALL-GRASS PRAIRIE: Grassland present in the eastern plains region. Species include Big Bluestem (ANGE), Indian	4			

grass (SONU), Little bluestem (SCSC) and Switchgrass (PAVI).				
3106 (315) MID-GRASS PRAIRIE: Grassland present in the eastern plains region. Species include Sideoats grama (BOCU), Galleta (HIJA), Foxtail barley (HOJU), Western wheatgrass (PASM), Bluebunch wheatgrass (PSSP), Little bluestem (SCSC), New Mexico feathergrass (STNE), Green needlegrass (STVI) and Needle-and-Thread (STCO).	4			
3107 (316) SHORT-GRASS PRAIRIE: Grassland present in the eastern plains region. Species include Blue grama (BOGR) and Buffalograss (BUDA).	4			
3108 (317) SAND DUNE COMPLEX: Grassland present in the eastern plains region. Species include Prairie sandreed (CALO), Sand bluestem (ANHA), Sand dropseed (SPCR), Sandhill muhly (MUPU), and Common reed (PHAU), Blowoutgrass (REFL) and Lemon scurfpea (PSLA).	4			
3109 (318) FOOTHILL/MOUNTAIN GRASSLANDS: Grassland present primarily on the western slope. Species include Parry oatgrass (DAPA), Arizona fescue (FEAR), Idaho fescue (FEID), Thurber fescue (FETH), Slimstem muhly (MUFI), Mountian muhly (MUMO), Bluebunch wheatgrass (PSSP), Needle-and-Thread (STCO), Junegrass (KOMA), wildrye (ELYMU) and Slender wheatgrass (ELTR).	4			
3110 (319) DISTURBED RANGELAND: Disturbed or overgrazed rangeland in the NW region. Species include Broom snakeweed (GUSA2), Cactus (Opuntia spp.), Yucca (Yucca spp.), Cheatgrass (BRTE), Medusahead rye (TAAS), Halegeton (HAGL), Russian thistle (SAKA), and tumble mustard (SIAL2).	4			
3111 (320) SPARSE GRASS/BLOWOUTS: Sparsely vegetated grasslands, 10 – 40% vegetation, indicative of blowouts**.**	4			
32 SHRUB/BRUSH RANGELAND: Consists primarily of sagebrush (ARTR2), saltbrush (ATCA2), greasewood (SAVE4), and snakeweed (GUSA).				See specific veg. types below
3201 (321) SAGEBRUSH COMMUNITY: Shrubland principally dominated by ARTR2, ARNO4, and/or ARFI2. Often associated with Rabbitbrush (CHNA2), Bitterbrush (PUTR2), Broom Snakeweed (GUSA2), various grasses, and mixed cacti. Greasewood (SAVE4), Serviceberry (AMAL2 or AMUT), Snowberry, or Winterfat (KRLA2) may also be present as secondary species.	4			
3202 (322) SALTBUSH COMMUNITY: Shrubland found on upland, alkaline soils, principally dominated by Shadscale (ATCO), Four-Wing Saltbush (ATCA2), and Mat Saltbush (ATCO4). Community sometimes codominated by Basin or Wyoming Big sagebrush	4			

(ARTRT or ARTRW8). Often associated with Snakeweed, Bud Sagebrush (ARSP5), Spiny Hopsage (GRSP), Spiny or Spineless Horsebrush (TESP2 or TECA2), and Gardners/Nuttalls Saltbush (ATGA). Greasewood may occur here, but in some basins it may just be a minor component.				
3203 (323) GREASEWOOD: Desert and low elevation shrubland dominated by SAVE4. Associated with ATCA2, ATCO, GUSA2, ARTR2, various rabbitbrush species and various grasses.	4			
3204 (324) SAGEBRUSH/GAMBEL OAK MIX: Shrubland co-dominated by Big Sagebrush and Gambel Oak. Patchy distribution of both species, with mixed grass/forb understory.	3	F	M-H	Used up to 1 km from edge and if within 5 km of primary veg. type
3205 (325) SNAKEWEED: Desert and low elevation shrubland dominated by GUSA2. Associated with ATCA2, SAVE4 and various grasses in low densities.	4			
3206 (326) SNOWBERRY: Deciduous shrubland dominated by Mountain Snowberry (SYOR2).	3	F	M-H	Used up to 1 km from edge and if within 5 km of primary veg. type
3207 (327) SNOWBERRY/SHRUB MIX: Mountain deciduous shrubland dominated by Mountain Snowberry. Often associated with Saskatoon Serviceberry, sagebrush, Squawbush, Rabbitbrush and Gambel Oak.	3	F	M-H	Used up to 1 km from edge and if within 5 km of primary veg. type
3208 (328) BITTERBRUSH COMMUNITY: Shrubland principally dominated by Bitterbrush (PUTR2). Often associated with Rabbitbrush, Sagebrush, Greasewood, various grasses, and mixed cacti.	4			
3209 (329) SALT DESERT SHRUB COMMUNITY: Low-elevation shrublands found on alluvial salt fans or flats. Component species may include: saltbushes, greasewood (SAVE4), sagebrushes, horsebrushes, and spiny hopsage (GRSP).	4			
3210 (330) SAGEBRUSH/GREASEWOOD: Shrubland codominated by sagebrush and greasewood. Secondary species may include rabbitbrush,	4			
33 SHRUB/GRASS/FORB MIX: Mixed grass/forb and shrub/grass rangeland. Example species include:				See specific veg. types below
3301 (331) SAGEBRUSH/GRASS MIX: Codominant sagebrush shrubland and perennial Grassland. Principal shrub species include Big Sagebrush, 3-winged Sage, and Black Sage. Principal grass species include Crested Wheatgrass, Bluebunch Wheatgrass, and Blue Gramma.	4			
3302 (332) RABBITBRUSH/GRASS MIX: Co-dominant Rabbitbrush	4			

and perennial Grassland. Principal shrub species include Rubber Rabbitbrush (CHNAN3), Sticky Rabbitbrush (CHVI8), and Small Rabbitbrush (CHDE2). Grassland species are the same as cover type Sagebrush/Grass.				
3303 (333) SAGEBRUSH/MESIC MOUNTAIN SHRUB MIX: Co-dominant sagebrush Mesic mountain shrubland consisting of Mountain Big Sagebrush (ARTRV) and any combination of Mountain Snowberry (SYOR2, SYRO), Service Berry (Utah AMUT or saskatoon AMAL2), Squaw apple (PERA4) or bitterbrush (PUTR2), often with a grass/forb understory. Understory species may include, among others, Elk Sedge (CAGE2), Bluegrass, Needlegrass, arrowleaf balsamroot, lupines, penstemons, Indian paintbrush, and Mariposa lily. Often found at the higher elevations of the sagebrush zone, on north facing slopes, in basins, or on other mesic sites.	3	F	M-H	Used up to 1 km from edge and if within 5 km of primary veg. type
3304 (334) GRASS/MISC. CACTUS MIX: Low elevation perennial Grassland codominate with cacti shrubland. Grass species include Blue Gramma, Needle & Thread, Sand Drop Seed, and brome species. Cholla cactus dominant, but other species and shrubs present in low density include Prickly Pear Cactus, Yucca, and Hairy Sage. No Cholla cactus is present north of the Palmer Divide. Prickly Pear and Yucca become dominate in the NE region.	4			
3305 (335) WINTERFAT/GRASS MIX: Codominant shrubland and perennial Grassland. Eurotia species of winterfat mixed with Blue Gramma. Rabbitbrush often present.	4			
3306 (336) BITTERBRUSH/GRASS MIX: Codominant shrublamd and perennial grassland. Principal shrub species include Bitterbrush with some Rabbitbrush. Sagebrush and Greasewood present. Principal grass species include Crested Wheatgrass, Bluebunch Wheatgrass, and Blue Gramma.	4			
3307 (337) GRASS/YUCCA MIX: Codominant perennial grassland and cactus shrubland. Principal grass species include Crested Wheatgrass, Bluebunch Wheatgrass, and Blue Gramma. Principal cactus species include Yucca potentially mixed with Prickly Pear.	4			
3308 (338) SAGEBRUSH/RABBITBRUSH MIX: Co-dominant Sagebrush and Rabbitbrush shrubland. Principal shrub species include Basin Big Sagebrush (ARTRT), Wyoming Big Sagebrush (ARTRW8), Rubber Rabbitbrush (CHNAN3), Sticky Rabbitbrush (CHVI8), or Small Rabbitbrush (CHDE2).	4			
41 CONIFEROUS WOODLAND: Woodlands of pinyon/juniper (PIED/JUSC2).				See specific veg. types below
4101 (411) PINYON-JUNIPER: Coniferous woodland principally co-dominated by Pinyon Pine (PIED) and Utah juniper (JUOS) or Rocky	3	F	M-L	Rating shown left is for P-J type west of I-25 and this rule applies: Used up to 1 km from edge and if within 5 km of primary veg. type. East of I-25 rating is 1,Y, M-L.

Mountain Juniper (JUSC2). Understory is sagebrush, mixed mountain shrubs, or grasses, usually at less than 25% cover.				
4102 (412) JUNIPER: Woodland principally dominated by Utah Juniper (JUOS) or Rocky Mountain Juniper (JUSC2). Understory may be sagebrush, grass, or bare soil.	3	S	L	Rating shown left is for Juniper type west of I-25 and this rule applies: Used up to 1 km from edge and if within 5 km of primary veg. type. East of I-25 rating is 1,Y, L.
42 DECIDUOUS WOODLAND: Woodlands of Gambel oak (QUGA) and mountain shrub mix. Example species include:				See specific veg. types below
4201 (421) GAMBEL OAK: Deciduous woodland (or tall shrubland) dominated by Gambel Oak. Primary associated shrub species include Mountain Mahogany (CEMO2), Utah Serviceberry (AMUT), Saskatoon Serviceberry (AMAL2), Big Sagebrush, and to a lesser extent, Mountain Snowberry (SYOR2).	1	F	H	
4202 (422) XERIC MOUNTAIN SHRUB MIX: Deciduous woodland (or tall shrubland) dominated by Mountain Mahogany (CEMO2) or Curlleaf Mountain Mahogany (CELE3). Associated species may include sagebrush, rabbitbrush, Mormon tea, or scattered Pinyon pine or Utah juniper.	3	F	L	
4203 (423) MESIC MOUNTAIN SHRUB MIX: Deciduous woodland (or tall shrubland) codominated by Gambel Oak, Serviceberry, and/or Mountain Mahogany. Primary associated shrub species include Snowberry, sagebrush, or chokecherry. Secondary shrub species may include Skunkbush sumac (RHTR), Antelope bitterbrush (PUTR2), and Squawapple (PERA4).	2	F	M-H	
4204 (424) SERVICEBERRY/SHRUB MIX: Deciduous woodland (or tall shrubland) dominated by Utah and Saskatoon Serviceberry (AMAL2). Primary associated shrub species include Big Sagebrush, Mountain Snowberry, and Gambel Oak.	1	F	M-H	
4205 (425) UPLAND WILLOW/SHRUB MIX: High elevation shrubland (>11,500') dominated by willow species such as Snow, Arctic and Montane Willow. Associated shrubs include Common Gooseberry, and Common Juniper. Occasionally Plane-Leaf Willow is present boggy areas and may function more as a riparian site than an upland site.	3	S	L	
4206 (426) MANZANITA: Deciduous shrubland dominated by Manzanita. Often associated with sagebrush, rabbitbrush, or various grasses and forbs.	2	F	M-L	
43 MIXED WOODLAND: Woodlands of PJ/oak mix or PJ/mountain shrub mix. Example species include:				See specific veg. types below
4301 (431) PJ-OAK MIX: Codominant deciduous/coniferous woodland. Conifer species are Pinyon Pine and Utah or Rocky Mountain Juniper. Deciduous tall shrubs are dominated by Gambel	1	F	H	

Oak.

4302 (432) PJ-SAGEBRUSH MIX: Codominant woodland and shrubland. Woodland consists of Pinyon Pine and Utah Juniper or Rocky Mountain Juniper at densities just above 25%. Big Sagebrush grows in the interspaces between the trees and may comprise at least 25% cover.	3	F	L	Used up to 1 km from edge and if within 5 km of primary veg. type
4303 (433) PJ-MNT SHRUB MIX: Codominant deciduous/coniferous woodland. Conifer species are Pinyon Pine and Utah or Rocky Mountain Juniper. Deciduous tall shrubs are dominated by Gambel Oak, Mountain Mahogany, Serviceberry, and sagebrush.	2	F	M	
4304 (434) SPARSE PJ/SHRUB/ROCK MIX: Open canopy coniferous woodland co-dominated by Pinyon Pine (PIED) and Utah Juniper (JUOS) or Rocky Mountain Juniper (JUSC2) at less than 25% cover. Understory is mixed, often bare soil, or less than 25% sagebrush, Gambel Oak, Serviceberry, Mountain Mahogany or grass.	4			
4305 (435) SPARSE JUNIPER/SHRUB/ROCK MIX: Open canopy woodland dominated by Utah Juniper (JUOS) at less than 25% cover. Understory is mixed, often bare soil, or less than 25% sagebrush, mountain mahogany, Mormon tea (EPHED), or bitterbrush (PUTR2).	4			
4306 (436) JUNIPER/SAGEBRUSH MIX: Codominant woodland and shrubland. Woodland consists of Utah juniper (JUOS) at densities around 25%. Big sagebrush grows in the interspaces between the trees and may comprise 25% cover or more.	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
4307 (437) JUNIPER/MTN SHRUB MIX: Codominate Juniper species and Oak, Mtn Mahogany, or other deciduous shrubs.	3	F	M	Used up to 1 km from edge and if within 5 km of primary veg. type
51 DECIDUOUS FOREST LAND: Forests of aspen (PRTR5) or aspen/oak mix.				See specific veg. types below
5101 (511) ASPEN: Deciduous Forest dominated by Quaking Aspen (POTR5). Associated shrubland understory species include Snowberry, Serviceberry, and Common Juniper.	1	S	H	
5102 (512) ASPEN/MESIC MOUNTAIN SHRUB MIX: Codominant deciduous forest and shrubland. Primary forest species is Quaking Aspen with Serviceberry, Snowberry, Mountain Big Sagebrush, or Gambel Oak as the primary shrubland species.	1	Y	H	
52 CONIFEROUS FOREST LAND: Forests consisting of one or more evergreen tree species. Example species include: Ponderosa Pine (PIPO), Douglas Fir (PSME) and spruce/fir mix.				See specific veg. types below
5201 (521) PONDEROSA PINE: Coniferous forest dominated by Ponderosa Pine (PIPO). Associated conifer species include Pinyon	1	Y	M	

Pine and Utah or Rocky Mountain Juniper at the lower elevations, and Douglas Fir/Blue Spruce at the higher elevations.				
5202 (522) ENGLEMANN SPRUCE/FIR MIX: Coniferous forest dominated by Englemann Spruce (PIEN) and Sub-Alpine Fir (ABLA). Associated conifers include Douglas Fir and Lodgepole Pine.	1	Y	L	
5203 (523) DOUGLAS FIR: Coniferous forest dominated by Douglas Fir (PSME). Associated conifers may include White Fir, Engelmann Spruce and Ponderosa Pine.	1	Y	M-L	
5204 (524) LODGEPOLE PINE: Coniferous forest dominated by Lodgepole Pine (PICO). Associated trees include Sub-alpine Fir, Douglas Fir, Englemann Spruce, and Aspen.	1	Y	L	
5205 (525) SUB-ALPINE FIR: Coniferous forest dominated by Sub-Alpine Fir (ABLA). Associated trees include Aspen, Lodgepole Pine, and Englemann Spruce.	1	Y	L	
5206 (526) SPRUCE/FIR REGENERATION: Harvested PIEN/ABLA sites, in regeneration.	1	Y	M-L	
5207 (527) SPRUCE/LODGEPOLE PINE MIX: Coniferous forest codominated by Englemann Spruce and Lodgepole Pine.	1	Y	L	
5208 (528) BRISTLECONE PINE: Coniferous forest dominated by Bristlecone Pine (PIAR). Associated conifers include Ponderosa Pine, Limber Pine, Douglas Fir and Englemann Spruce.	2	Y	L	
5209 (529) PONDEROSA PINE/DOUGLAS FIR MIX: Coniferous forest codominated by Ponderosa Pine and Douglas Fir. Community may include Pinyon pine.	1	Y	M	
5210 (530) PONDEROSA PINE/BLUE SPRUCE MIX: Coniferous forest codominated by Ponderosa Pine and Blue Spruce.	1	Y	M-L	
5211 (537) LIMBER PINE: Coniferous forest dominated by Limber Pine (PIFL). Associated conifers include Ponderosa Pine, Limber Pine, Douglas Fir and Englemann Spruce.	2	Y	L	
5212 (538) SPRUCE/FIR/LIMBER PINE MIX: Mixed forest land codominated by PIEN/ABLA and PIFL. Associated conifers include Ponderosa Pine and Douglas Fir.	1	Y	L	
5213 (539) LODGEPOLE/SPRUCE/FIR MIX: Coniferous forest codominated by Lodgepole Pine, Engelmann Spruce, and Subalpine Fir.	1	Y	L	
5214 (540) FIR/LODGEPOLE PINE MIX: Coniferous forest codominated by Sub-Alpine Fir and Lodgepole Pine.	1	Y	L	

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5215 (541) DOUGLAS-FIR/ENGELMANN SPRUCE MIX: Coniferous forest codominated by Douglas-Fir and Engelmann Spruce.	1	Y	M-L	
53 MIXED FOREST LAND: Forests consisting of a mixture of coniferous and deciduous trees or tall shrub species. Example mixes include: pine/oak, fir/aspen, or pine/aspen mix.				See specific veg. types below
5301 (531) SPRUCE/FIR/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Englemann Spruce/Sub-alpine Fir and Quaking Aspen. Associated conifers include White Fir and Douglas Fir.	1	Y	M	
5302 (532) P. PINE/GAMBEL OAK MIX: Codominant coniferous forest and tall shrubland. Dominant species are Ponderosa Pine and Gambel Oak.	1	Y	M-H	
5303 (533) PONDEROSA PINE/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Ponderosa Pine and Quaking Aspen. Associated shrubland species are mesic mountain shrubs.	1	Y	M-H	
5304 (534) DOUGLAS FIR/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Douglas-Fir and Quaking Aspen. Associated conifers include Ponderosa Pine and Englemann Spruce.	1	Y	H	
5305 (535) P.PINE/ASPEN/GAMBEL OAK MIX: Codominant mixed forest and tall shrubland. Ponderosa Pine dominates, with various densities of Aspen and Gambel Oak equaling > 25% crown cover.	1	Y	H	
5306 (536) LODGEPOLE PINE/ASPEN MIX: Mixed deciduous/coniferous forest codominated by Lodgepole Pine and Quaking Aspen.	1	Y	M-H	
5307 (542) SPRUCE/FIR/LODGEPOLE/ASPEN MIX: Mixed coniferous/deciduous forest codominated by Engelmann Spruce, Subalpine Fir, Lodgepole Pine, and Quaking Aspen.	1	Y	M-H	
5308 (543) P. PINE/MOUNTAIN SHRUB MIX: Codominant coniferous forest and shrubland. Primary forest species is Ponderosa Pine. Primary shrub species may include Serviceberry, Snowberry, Buckbrush(CEANO),Sagebrush or Mt. Mahogany in more xeric sites. Gambel Oak may occur here, but is generally a minor component.	1	Y	M-H	
5309 (544) P.PINE/ASPEN/MESIC MOUNTAIN SHRUB MIX: Codominant mixed forest and tall shrubland. Ponderosa Pine and Aspen are the dominant forest species with mesic mountain shrubs	1	Y	M-H	

comprising > 25% canopy cover.				
61 ROCK: Less than 10% vegetation, rock outcrops, red sandstones, etc.				
6101 (611) TALUS SLOPES & ROCK OUTCROPS: Talus and scree slopes, nearly 100% rock. Could include rock outcrops that may be lichen covered.	4			Possible denning sites if adjacent to primary habitat types.
62 SOIL: Less than 10% vegetation, dominated by bare soil.	4			
6201 (622) DISTURBED SOIL: Areas where human activities have created bare ground. Examples include: mine tailings, quarries, mill tailings disposal sites.	4			
71 ALPINE MEADOW: High elevation areas above treeline (> 11,000 ') where alpine tundra vegetation includes grasses, forbs, and sedges. Principal species may include Alpine Timothy (PHAL2), Alpine Bluegrass (POAL2), Spike Trisetum (TRSP2), Alpine Sagebrush (ARSC), Yarrow, Alpine Avens (GERO2), American Bistort (POBI6), Sticky Polemonium (POVI), Wild strawberry (FRAGA), and/or sedge species.	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
7101 (711) ALPINE FORB DOMINATED: >11,500 ft. meadow dominated by alpine forbs. Example species include:	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
7102 (712) ALPINE GRASS DOMINATED: >11,500 ft. meadow dominated by alpine grasses. Example species include:	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
7103 (713) ALPINE GRASS/FORB MIX: >11,500 ft. mixed meadow codominated by alpine grasses and forbs. Example species include:	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
72 SUBALPINE SHRUB COMMUNITY: Upper montane elevation (7,000-11,500 ft) shrubs consisting primarily of Shrubby Cinquefoil, Mountain Gooseberry, and with subalpine meadow species in the understory.	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
73 SNOW: Perennial snow fields.	4			
74 SUBALPINE MEADOW: Below timberline, high elevation (approx 9,000-11,500') herbaceous vegetation.				See specific veg. type below
7401 (741) SUBALPINE GRASS/FORB MIX: High elevation meadows (approx 9,000-11,500 ft) codominated by grasses and forbs. Commonly occurring species include: Cinquefoil (POTEN), Larkspur (DELPH), Groundsel (SENEC), Edible Valerian (VAED), Vetch (VICIA), Thurber's Fescue (FETH), Richardson's Geranium (GERI), and California brome (BRCA5).	3	S	L	Used up to 1 km from edge and if within 5 km of primary veg. type
				See specific veg. types below

81 FORESTED RIPARIAN: Wooded riparian areas consisting primarily of poplars. Example species include:				
8101 (811) COTTONWOOD: Wooded riparian area dominated by Common Cottonwood (POFR2), Narrowleaf Cottonwood (POAN3), or Plains Cottonwood (POSAR) or Eastern Cottonwood (PODE3).	2	Y	L	Rating shown left is for east of I-25 and used if within 5 km of primary veg. type.
8102 (812) BOX ELDER: Wooded riparian area primarily dominated by Box Elder (ACNE). Can be mixed with Common Cottonwood (POFR2), Narrowleaf Cottonwood (POAN3), or Plains Cottonwood (POSAR) or Eastern Cottonwood (PODE3).	2	Y	L	Used if within 5 km of primary veg. type
8103 (813) CONIFER RIPARIAN: Wooded riparian area dominated by Doug Fir, Blue Spruce (Pipu) and/or Engelmann Spruce (PIEN), or codominated by Spruce, Aspen (POTR5), and Narrowleaf Cottonwood (POAN3). Associated species include: Rocky Mountain Juniper (JUSC2), Thinleaf Alder (ALINT), or willows.	2	Y	M-L	
82 SHRUB RIPARIAN: Shrub riparian areas consisting primarily of shrubs. Example species include: willows, Red-osier dogwood (COSE16), Skunkbush Sumac (RHTR), Wood's Rose (ROWO), Bog birch (BENA), water birch (BEOC2), or currant (RIBES).	2	Y	M-L	
8201 (821) WILLOW: Shrub riparian or wetland area dominated by shrub willow. Example species include:	3	Y	L	
8202 (822) EXOTIC RIPARIAN SHRUBS: Shrub riparian area dominated by Salt Cedar (TARA) or Russian Olive (ELAN). Often associated with willows or cottonwoods.	4			
83 HERBACEOUS RIPARIAN: Non-woody riparian areas consisting primarily of sedges. Example species include:				
8301 (831) SEDGE: Herbaceous riparian or wetland areas dominated by sedges. Example species include: water sedge (CAAQ), beaked sedge (CAUT), Nebraska sedge (CANE2), Baltic rush (JUBA), and bulrush (SCIRP). Common wetland grasses include: tufted hairgrass (DECE), redtop (AGGI2), and reedgrass (CALAM).	2	Y	M-L	

Summary of black bear season dates, Colorado; 1979-2010

1979 – 1991   Concurrent with Archery and Muzzleloading deer & elk seasons: Statewide

1979 – 1991
1993 – 2001   Concurrent with Rifle deer & elk seasons: Statewide

1979   1 April – 30 June: Statewide (105 GMUs)
       1 July – 29 August: 59 GMUs

1980   1 April – 30 June: Statewide
       1 July – 29 August: 62 GMUs

1981   1 April – 30 June: Statewide
       1 July – 28 August: 35 GMUs

1982   1 April – 30 June: Statewide
       1 July – 3 September: 2 GMUs

1983   1 April – 30 June: Statewide
       1 July – 4 September: 2 GMUs

1984   1 April – 30 June: 73 GMUs
       1 April – 17 June: 34 GMUs

1985   1 April – 30 June: 56 GMUs
       1 April – 16 June: 51 GMUs

1986   1 April – 15 June: Statewide 2,299 Limited Licenses (Valid Statewide)

1987   1 April – 15 June: Statewide 2,280 Limited Licenses (Valid Statewide)

1988   1 April – 15 June: Statewide 2,232 Limited Licenses (Valid Statewide)

1989   1 April – 31 May & 26 September – 9 October: Statewide 2,073 Limited Licenses valid in both seasons (Valid Statewide)

1990   1 April – 15 May & 1 September – 30 September: Statewide 2,038 Limited Licenses valid in both seasons (Valid Statewide)

1991   1 April – 15 May & 1 September – 30 September: Statewide 2,004 Limited Licenses valid in both seasons (Valid Statewide)

1992   1 April – 31 May & 1 September – 30 September: Statewide 2,082 Limited Licenses split 50%/50% between the two seasons (Valid Statewide). <u>No other seasons</u>.

1993   2 September – 30 September: Statewide 991 Limited Licenses (including RFW) (Valid Statewide).

1994   2 September – 30 September: Statewide 1,144 Limited Licenses (including RFW) (Valid Statewide)

1995   2 September – 30 September: Statewide 2,026 Limited Licenses (including RFW) (Valid Statewide)

1996   2 September – 30 September: Statewide 3,249 Limited Licenses (including RFW, PLO, Archery, Muzzleloader) (Valid Statewide)

1997   2 September – 30 September: Statewide 3,250 Limited Licenses (including RFW, PLO, Archery, Muzzleloader) (Valid Statewide), declare manner of take, unsuccessful hunters may hunt in any combined deer/elk season but restricted to declared manner of take

1998   2 September – 30 September: Statewide 3,177 Limited Licenses (including RFW, PLO, Archery, Muzzleloader) (Valid Statewide), declare manner of take, unsuccessful hunters may hunt in any combined deer/elk season and not limited to declared manner of take

1999   2 September – 30 September: 2,780 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs), Archery & Muzzleloader licenses unlimited, unsuccessful September hunters may hunt in any combined deer/elk season not limited to manner of take but must have deer/elk license for that season and restricted to unit or PLO if deer/elk license is so restricted

2000   2 September – 30 September: 2,955 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs), Archery & Muzzleloader licenses unlimited, unsuccessful September hunters may hunt in any combined deer/elk season not limited to manner of take but must have deer/elk license for that season and restricted to unit or PLO if deer/elk license is so restricted

2001   2 September – 30 September: 2,711 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs), Archery & Muzzleloader licenses unlimited, unsuccessful September hunters may hunt in any combined deer/elk season not limited to manner of take but must have deer/elk license for that season and restricted to unit or PLO if deer/elk license is so restricted

2002   2 September – 30 September: 2,849 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs), Archery & Muzzleloader licenses unlimited, unsuccessful September hunters may hunt in any combined deer/elk season not limited to manner of take but must have deer/elk license for that season and restricted to unit or PLO if deer/elk license is so restricted

2003   2 September – 30 September: 3,983 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs), Archery & Muzzleloader licenses unlimited in most DAUs but limited in DAUs 1, 5, 6, 9, 13, 17, and 18, unsuccessful September hunters may hunt in any combined deer/elk season not limited to manner of take but must have deer/elk license for that season and restricted to unit or PLO if deer/elk license is so restricted. DAU B-20 merged with B-9. Plains bear

season, all units east of I-25 except 133, 134, 136, 141, 142, 143, 147, Sept 2 – Nov 4, unlimited and no season participation restrictions. Units 133, 134, 136, 141, 142, 143, 147 unlimited but subject to participation restrictions by having a valid deer/elk license, Oct 18 – Nov 4.

2004   2 September – 30 September: 3,863 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs), Archery & Muzzleloader licenses unlimited in most DAUs but limited in DAUs 1, 5, 6, 9, 13, 17, and 18, unsuccessful September hunters may hunt in any combined deer/elk season not limited to manner of take but must have deer/elk license for that season and restricted to unit or PLO if deer/elk license is so restricted. Plains bear season, all units east of I-25 except 133, 134, 136, 141, 142, 143, 147, Sept 2 – Nov 4, unlimited and no season participation restrictions. Units 133, 134, 136, 141, 142, 143, 147 unlimited but subject to participation restrictions by having a valid deer/elk license, Oct 18 – Nov 4.

2005   2 September – 30 September: 3064 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs). Archery, Muzzleloader and concurrent licenses Over-the-Counter with a Cap. Total cap = 8845 licenses available. Caps by season = Archery-1625, Muzzleloader-707, Concurrent Seasons: 1st-1584, 2nd-2567, 3rd-1432, 4th-550, One DAU (B-11) allowed 380 possible licenses available to float across the four rifle seasons. Eastern plains GMUs in B-9 had limited licenses. All other Eastern plains GMUs licenses were OTC w/ cap but cap was set so high as to be essentially unlimited. Participation restrictions as in 2004 applied to high powered rifle hunters but not archery or muzzleloader.

2006   2 September – 30 September: 2739 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs). Archery, Muzzleloader and concurrent licenses Over-the-Counter with a Cap. Total cap = 7982 licenses available. Caps by season = Archery-1455, Muzzleloader-592, Concurrent Seasons: 1st-1480, 2nd-2455, 3rd-1445, 4th-540. Eastern plains GMUs in B-9 had limited licenses. All other Eastern plains GMUs licenses were OTC w/ cap but cap was set so high as to be essentially unlimited. Participation restrictions applied to high powered rifle hunters but not archery or muzzleloader.

2007   2 September – 30 September: 2723 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs). Archery, Muzzleloader and concurrent licenses Over-the-Counter with a Cap. Total cap = 7667 licenses available. Caps by season = Archery-1420, Muzzleloader-592, Concurrent Seasons: 1st-1440, 2nd-2465, 3rd-1350, 4th-385. Eastern plains GMUs in B-9 had limited licenses. All other Eastern plains GMUs licenses were OTC w/ cap but cap was set so high as to be essentially unlimited. Participation restrictions applied to high powered rifle hunters but not archery or muzzleloader.

2008   2 September – 30 September: 3126 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs). Archery, Muzzleloader and concurrent licenses Over-the-Counter with a Cap. Total cap = 7545 licenses available. Caps by season = Archery-1375, Muzzleloader-590, Concurrent Seasons: 1st-1415, 2nd-2420, 3rd-1340, 4th-390. Eastern plains GMUs in B-9 had limited licenses. All other Eastern plains GMUs licenses were OTC w/ cap but cap was set so high as to be essentially unlimited. Participation restrictions applied to high powered rifle hunters but not archery or muzzleloader.

2009 2 September – 30 September: 3317 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs). Archery, Muzzleloader and concurrent licenses Over-the-Counter with a Cap. Total cap = 7860 licenses available. Caps by season = Archery-1400, Muzzleloader-635, Concurrent Seasons: 1st-1455, 2nd-2555, 3rd-1395, 4th-405. Eastern plains GMUs in B-9 had limited licenses. All other Eastern plains GMUs licenses were OTC w/ cap but cap was set so high as to be essentially unlimited. Participation restrictions applied to high powered rifle hunters but not archery or muzzleloader. PLO season structure defined to two periods: Sept PLO and Late PLO (Late PLO is with Concurrent Seasons).

2010 2 September – 30 September: 3870 Limited Licenses (including RFW, PLO) (Valid only in specific DAUs). Archery, Muzzleloader and concurrent licenses Over-the-Counter with a Cap. Total cap = 8110 licenses available. Caps by season = Archery-1635, Muzzleloader-725, Concurrent Seasons: 1st-1440, 2nd-2545, 3rd-1355, 4th-395. Eastern plains GMUs in B-9 had limited licenses. All other Eastern plains GMUs licenses were OTC w/ cap but cap was set so high as to be essentially unlimited. Participation restrictions applied to high powered rifle hunters but not archery or muzzleloader. PLO season structure defined to two periods: Sept PLO and Late PLO (Late PLO is with Concurrent Seasons).

APPENDIX C

B-07 GAME DAMAGE CLAIMS BY COUNTY 2002-2010

Costilla County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
2	beehives	$130.00	Costilla	B9	83	03-Sep-02	24-Sep-02
5	beehives	$971.25	Costilla	B9	83	05-Oct-06	10-Oct-06
188	beehives	$35,932.10	Costilla	B9	83	18-Jun-07	29-Sep-07
6	beehives	$1,186.30	Costilla	B9	83	12-Oct-09	14-Oct-09
2	cattle	$888.00	Costilla	B9	83	12-Jul-08	18-Jul-08
1	goats	$75.00	Costilla	B9	83	20-Sep-02	20-Sep-02
2	goats	$140.00	Costilla	B9	83	06-Aug-08	06-Aug-08
1	goats	$50.00	Costilla	B9	83	17-Aug-08	17-Aug-08
1	sheep	$50.00	Costilla	B9	83	05-Jun-08	07-Jun-08

Total Claims   208 $39,422.65

Custer County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
5	beehives	$1,843.52	Custer	B7	69	16-Jul-05	16-Jul-05
5	beehives	$690.00	Custer	B7	84	06-Sep-07	06-Sep-07
3	beehives	$258.00	Custer	B7	69	18-Sep-09	24-Sep-09
1	cattle	$435.00	Custer	B7	69	29-Sep-06	
2	pigs	$200.00	Custer	B7	84	10-Aug-02	10-Aug-02
5	sheep	$200.00	Custer	B7	84	10-Jul-02	12-Jul-02
1	cattle	$490.00	Custer	B8	86	08-Sep-07	08-Sep-07
1	pigs	$640.00	Custer	B8	86	15-May-04	15-May-04
1	pigs	$120.00	Custer	B8	86	23-Jul-04	24-Jul-04
8	poultry	$76.66	Custer	B8	86	09-Jul-07	

Total Claims   32 $4,953.18

Fremont County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
8	beehives	$1,109.40	Fremont	B7	69	01-Jun-02	02-Sep-02
2	beehives	$661.93	Fremont	B7	69	08-Jun-02	02-Sep-02
11	beehives	$2,875.67	Fremont	B7	69	18-Jun-02	20-Jun-02
4	beehives	$981.12	Fremont	B7	69	18-Jun-02	20-Jun-02
3	beehives	$742.44	Fremont	B7	69	27-Jun-02	28-Jun-02
40	beehives	$14,294.00	Fremont	B7	69	04-Sep-04	05-Sep-05
5	beehives	$4,043.18	Fremont	B7	69	01-Aug-05	04-Aug-05
8	beehives	$3,525.63	Fremont	B7	69	26-Aug-05	
6	beehives	$2,469.24	Fremont	B7	69	01-Sep-06	12-Sep-06
2	beehives	$464.00	Fremont	B7	69	23-Jul-07	02-Aug-07
3	cattle	$325.00	Fremont	B7	691	13-Jul-08	13-Jul-08
1	cattle	$162.80	Fremont	B7	691	28-Sep-08	28-Sep-08
2	goats	$60.00	Fremont	B7	69	16-Jun-08	30-Jun-08
5	goats	$340.00	Fremont	B7	69	08-Jul-09	
2	goats	$180.00	Fremont	B7	69	27-Aug-09	27-Aug-09
3	pigs	$195.00	Fremont	B7	84	23-Jun-07	24-Jun-07
17	poultry	$130.00	Fremont	B7	69	18-Sep-03	27-Sep-03
11	poultry	$79.58	Fremont	B7	69	06-Oct-04	07-Oct-04
14	poultry	$175.00	Fremont	B7	69	13-Jul-08	14-Jul-08
10	poultry	$100.00	Fremont	B7	69	15-Jul-08	18-Jul-08
27	poultry	$377.59	Fremont	B7	691	20-Jul-08	30-Jul-08
1	sheep	$135.00	Fremont	B7	69	07-Aug-08	07-Aug-08
1	beehives	$165.00	Fremont	B8	86	12-Aug-08	12-Aug-08
11	poultry	$75.00	Fremont	b8	86	13-Jun-04	13-Jun-04
2	poultry	$60.00	Fremont	B8	86	02-Jul-04	02-Jul-04
7	poultry	$470.00	Fremont	B8	86	31-Jul-05	02-Aug-05
28	poultry	$176.19	Fremont	B8	86	30-Jul-07	01-Aug-07
25	poultry	$69.75	Fremont	B8	86	20-Oct-09	24-Oct-09

Total Claims 259 $34,442.52

Huerfano County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
1	cattle	$300.00	Huerfano	B7	84	16-May-04	17-May-04
1	goats	$100.00	Huerfano	B7	84	23-Jul-07	23-Jul-07
2	pigs	$176.00	Huerfano	B7	84	14-Jul-09	15-Jul-09
2	rabbits	$600.00	Huerfano	B7	84	31-Jul-08	31-Jul-08
2	sheep	$790.81	Huerfano	B7	84	02-Aug-02	02-Aug-02
3	sheep	$220.00	Huerfano	B7	84	10-May-07	10-May-07
1	cattle	$468.00	Huerfano	B8	85	01-Aug-09	03-Aug-09
1	cattle	$873.00	Huerfano	B8	861	05-Aug-09	09-Aug-09
1	exotic domestic stock	$1,000.00	Huerfano	B8	861	16-Jul-07	16-Jul-07
5	exotic domestic stock	$1,250.00	Huerfano	B8	861	09-Jul-09	25-Jul-09
7	goats	$475.00	Huerfano	B8	861	05-Aug-09	05-Aug-09
6	sheep	$940.00	Huerfano	B8	861	27-May-05	
1	cattle	$373.90	Huerfano	B9	85	01-Oct-02	03-Oct-02
1	cattle	$525.00	Huerfano	B9	85	05-Jun-05	
1	cattle	$499.00	Huerfano	B9	85	29-Apr-08	19-May-08
1	cattle	$404.00	Huerfano	B9	85	16-May-10	16-May-10
1	exotic domestic stock	$750.00	Huerfano	B9	85	26-Oct-07	26-Oct-07
2	exotic domestic stock	$1,000.00	Huerfano	B9	85	29-Apr-08	19-May-08
1	pigs	$91.50	Huerfano	B9	85	29-Aug-06	29-Aug-06
70	poultry	$450.00	Huerfano	B9	85	30-Sep-02	03-Oct-02

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
14	poultry	$112.00	Huerfano	B9	85	11-Sep-06	11-Sep-06
72	poultry	$120.00	Huerfano	B9	85	21-Jun-09	21-Jun-09
1	sheep	$120.00	Huerfano	B9	85	31-Jul-05	
1	sheep	$150.00	Huerfano	B9	85	29-Apr-07	30-Apr-07
2	sheep	$250.00	Huerfano	B9	85	04-Jul-07	19-Jul-07
7	sheep	$910.00	Huerfano	B9	85	11-Jun-08	21-Jul-08
1	sheep	$175.00	Huerfano	B9	85	13-Jun-10	13-Jun-10

Total Claims 208 $13,123.21

Las Animas County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
1	buildings	$145.00	Las Animas	B9	85	29-Jul-03	03-Aug-01
2	cattle	$475.00	Las Animas	B9	85	15-Jun-02	20-Jun-02
1	cattle	$250.00	Las Animas	B9	85	03-Jul-02	04-Jul-02
1	cattle	$225.00	Las Animas	B9	85	24-Jul-03	
1	cattle	$412.50	Las Animas	B9	85	06-Jun-04	09-Jun-04
1	exotic domestic stock	$241.60	Las Animas	B9	85	08-Sep-06	08-Sep-06
1	exotic domestic stock	$500.00	Las Animas	B9	85	29-Sep-06	29-Sep-06
1	exotic domestic stock	$500.00	Las Animas	B9	85	06-Oct-09	06-Oct-09
6	goats	$690.00	Las Animas	B9	85	18-Jul-03	21-Jul-03
2	goats	$300.00	Las Animas	B9	85	08-Sep-06	08-Sep-06
3	goats	$310.00	Las Animas	B9	85	18-Jul-09	18-Jul-09

3	lbs	$121.50	Las Animas	B9	851	24-Apr-03	26-Apr-03
1	other	$80.86	Las Animas	B9	85	07-Sep-06	07-Sep-06
1	other	$149.64	Las Animas	B9	851	12-Aug-08	15-Aug-08
2	other animals	$10,000.00	Las Animas	B9	85	28-Aug-02	31-Aug-02
600	other animals	$995.00	Las Animas	B9	851	31-Aug-02	01-Sep-02
1	pigs	$900.00	Las Animas	B9	851	24-Jul-08	24-Jul-08
1	pigs	$100.00	Las Animas	B9	851	26-Jul-09	26-Jul-09
3	pigs	$150.00	Las Animas	B9	85	16-Aug-09	16-Aug-09
22	poultry	$360.00	Las Animas	B9	85	15-May-02	16-May-02
43	poultry	$106.00	Las Animas	B9	85	18-Jul-02	20-Aug-02
10	poultry	$124.00	Las Animas	B9	85	25-Aug-02	27-Aug-02
7	poultry	$70.00	Las Animas	B9	851	04-Sep-02	04-Sep-02
30	poultry	$150.00	Las Animas	B9	85	30-Jun-03	
24	poultry	$189.00	Las Animas	B9	85	07-Sep-06	07-Sep-06
23	poultry	$345.00	Las Animas	B9	85	01-Jul-07	12-Jul-07
90	poultry	$565.28	Las Animas	B9	85	01-Jul-07	13-Jul-07
14	poultry	$52.50	Las Animas	B9	851	06-Jul-07	08-Jul-07
15	poultry	$165.00	Las Animas	B9	851	18-Jul-07	18-Jul-07
10	poultry	$45.00	Las Animas	B9	85	21-Jul-07	21-Jul-07
9	poultry	$40.50	Las Animas	B9	85	17-Jun-08	18-Jun-08
3	sheep	$120.00	Las Animas	B9	85	28-May-02	02-Jun-02
1	sheep	$750.00	Las Animas	B9	851	04-Jul-02	05-Jul-02

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
2	sheep	$600.00	Las Animas	B9	85	14-Aug-05	
1	sheep	$150.87	Las Animas	B9	85	11-Aug-09	11-Aug-09

Total Claims   936 $20,379.25

Pueblo County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
2	beehives	$452.93	Pueblo	B7	84	20-Jul-02	21-Jul-02
1	cattle	$150.00	Pueblo	B7	84	14-Jun-02	23-Jun-02
2	cattle	$761.00	Pueblo	B7	84	27-Jul-03	04-Aug-03
1	goats	$300.00	Pueblo	B7	84	28-Jun-02	28-Jun-02
2	goats	$300.00	Pueblo	B7	84	Jun-07	
4	goats	$360.00	Pueblo	B7	84	29-Jun-07	29-Jun-07
1	goats	$300.00	Pueblo	B7	84	07-Jul-07	
1	goats	$100.00	Pueblo	B7	84	08-Jun-08	08-Jun-08
1	goats	$300.00	Pueblo	B7	84	19-Jul-09	19-Jul-09
1	goats	$250.00	Pueblo	B7	84	09-May-10	09-May-10
1	other animals	$3,000.00	Pueblo	B7	84	20-Jun-02	20-Jun-02
300	other animals	$1,158.00	Pueblo	B7	84	27-Jul-02	02-Aug-02
2	pigs	$250.00	Pueblo	B7	84	14-Jul-09	14-Jul-09
1	rabbits	$75.00	Pueblo	B7	84	Jun-07	
4	sheep	$600.00	Pueblo	B7	84	14-Jul-09	14-Jul-09

Total Claims   324 $8,356.93

Saguache County

# damaged	Damage Unit	Claim Paid	County	DAU	GMU	Start date	End date
1	beehives	$356.75	Saguache	B8	82	25-Sep-03	26-Sep-03
2.6	tons	$400.00	Saguache	B8	82	05-Jun-02	30-Sep-02

Total Claims   3.6 $756.75

APPENDIX D

 News from the Colorado Division of Wildlife

Contact Name: Michael Seraphin
Contact Phone: 719.227.5211

SOUTHERN FRONT RANGE BEAR MANAGEMENT MEETINGS

PUEBLO, Colo. - The Colorado Division of Wildlife is seeking public input to help guide management of black bear populations along the Southern Front Range. The DOW will hold three public meetings to gather feedback in Trinidad, Walsenburg and Colorado City.

The specific bear populations under consideration are in areas west of I-25 and south of Highway 50 including portions of Alamosa, Costilla, Pueblo, Fremont, Las Animas, Custer, Chaffee and Huerfano Counties.

"The Division is gathering input from landowners, livestock operators, hunters, homeowners and recreationists," said terrestrial biologist Allen Vitt of the DOW. "Public input can assist the Division in formulating long-term black bear management plans similar to the plans currently being used for management of other big game species such as deer and elk."

The meetings will focus on black bear population and hunting management in Game Management Units 69, 82, 83, 84, 85, 86, 140, 691, 851 and 861.

The Trinidad meeting is Mon., Nov. 15, in the Leone Room at the Sullivan Student Center at Trinidad State Junior College.

The Walsenburg meeting is Wed., Nov. 17, at the Huerfano County Community Center, 928 Russell Ave.

The Colorado City meeting is Thurs., Nov. 18, at the Colorado City Recreation Center, 5000 Cuerna Verde Blvd.

All meetings start at 6:30 p.m.

Persons interested in black bear management along the southern Front Range who cannot attend but would like to provide input, may receive a copy of the draft management plan and provide written comments by contacting Allen Vitt, in Pueblo at (719) 561-5306 or at allen.vitt@state.co.us.

For more information on black bears in Colorado, visit our species profile page at:

http://wildlife.state.co.us/WildlifeSpecies/Profiles/Mammals/BlackBear.htm.

To learn more about black bear hunting in Colorado, please see our Big Game Regulations at:
http://wildlife.state.co.us/NR/rdonlyres/6E977561-C613-466D-BCFC-2CA9C9C91CD9/0/Ch02.pdf

For more news about Division of Wildlife go to:
http://wildlife.state.co.us/news/index.asp?DivisionID=3

For more information about Division of Wildlife go to: http://wildlife.state.co.us.
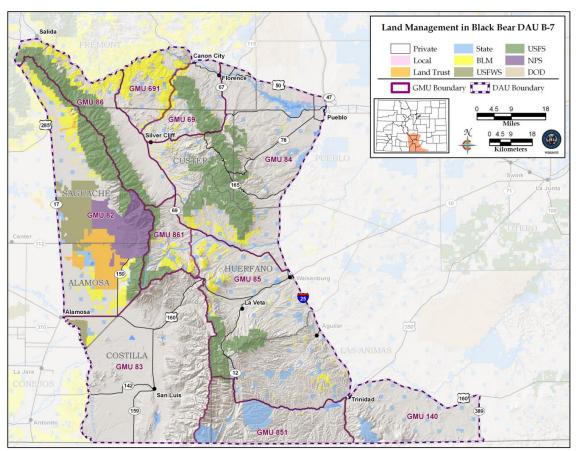
Appendix E.

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Sangre de Cristo Black Bear Data Analysis Unit B-7

Game Management Units 69, 82, 83, 84, 85, 86, 140, 691, 851 and 861

Trinidad, Walsenburg and Rye public meetings -November 2010

COMMENT FORM

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The Colorado Division of Wildlife is beginning the updating process on the black bear management plan for the southern Front Range. The Division of Wildlife has a responsibility to manage bear populations for long term sustainability. This planning process helps us define population targets so we can set hunting license numbers and implement other appropriate management actions. Getting written input from the diverse spectrum of stakeholders is the first part of this process.

Bear Data Analysis Unit (DAU) B-7 (Custer county and Portions of Las Animas, Fremont, Alamosa, Costilla, Saguache, Pueblo, and Huerfano Counties) is a diverse mix of bear habitat types, land ownership and human densities (see map below).

The Division strives to manage big game populations within both the biological and social carrying capacity of the herd. The biological carrying capacity is the number of animals that can be supported by the available habitat. The social carrying capacity is the number that will be tolerated by the people who are impacted by the herd (hunters, wildlife viewers, landowners). The population objective is set at a number which attempts to balance these two carrying capacities. Setting bear population objectives is an experimental/adaptive process. Unlike deer/elk management, we don't have a lot of data on bear

populations. Therefore, we need to set targets based on cautious interpretation of the best scientific data, collect additional data as possible, and be flexible in modifying our targets later. A bear management plan must be flexible enough to balance hunting and non-hunting bear mortality sources with long-term population goals over the entire DAU while also addressing localized damage issues.

The following questions will help DOW managers understand your desires regarding black bear population management in Game Management Units (GMUs) 69, 82, 83, 84, 85, 86, 140, 691, 851 and 861. Please write any other comments you may have at the end of this form. If you have any questions contact Allen Vitt, Terrestrial Biologist at allen.vitt@state.co.us or 719-561-5306.

Black Bear Population Strategic Goals (please select preferred)

New population estimation procedures have been utilized within the area and population levels are higher than previously estimated. While the total population estimate has changed the actual number of bears on the landscape remains the same, we just have improved the information utilized to create the population estimate. Our estimated population for the region is believed to be more than 3,000 bears. We estimate that it will take a mortality level of less than 300 bears to have an increasing population, 300-460 bears to have a stable population and a mortality level of greater than 460 bears to reduce the population. Historical mortality levels have averaged approximately 140 bears with mortality increasing to 325 in years of a food crop failure. With this harvest level we have been managing for an increasing population since 1990 and any other management goal will result in an increase in harvest levels. The bear population will be monitored on an annual basis and if these levels need to be adjusted we will have the flexibility to do that within the management framework. Given the information presented above which strategic goal would you like to see for the B-07 DAU?

_____Stable: Maintain current bear population numbers. Bear hunting opportunity would be set at an offtake rate necessary to obtain a stable population at current densities. However, hunting opportunity may fluctuate in response to mortality from other sources such as bear-vehicle collisions. Small localized bear management areas within the DAU would be managed for minimizing bear conflicts.

_____Increased: Allow the bear population to increase. Bear hunting opportunity would be set at an off take rate necessary to obtain an increasing population and the number of hunting licenses may be modified based on other sources of mortality. In the long term, increased bear numbers may result in an increase in bear/human interactions. .

_____Decreased: Allow bear numbers to decrease to a lower, but sustainable level. Hunting licenses would likely increase, at least in the short term and/or in portions of the DAU.   Small localized bear management areas within the DAU would be managed for minimizing bear conflicts.

Please comment on the reasons that you would like to see the bear population managed in this manner. (Like having the bears around, watchable wildlife, increased opportunity of harvest, concerns of human safety, Hassles of having bears around, trash management, Livestock damage, personal property damage, others…)

What town/city do you live in? _____

Do you consider yourself a bear hunter? _____

Have you ever hunted black bears? _____

Have black bears caused any damage to your property? _____

If so, what type of damage was caused by black bears? _____

Is any of your income derived from agriculture? _____

Do you own property within the DAU boundary (see map above)? _____

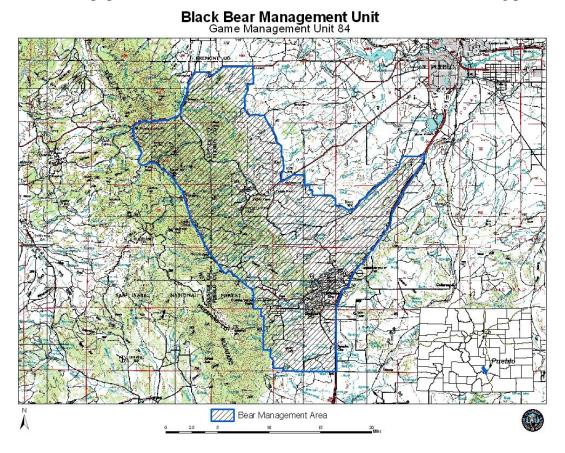If you answered yes to the above question, how many acres? _____

We realize that human conflicts are important to the community and as such we try to minimize conflict through public education efforts. However we realize that there may be opportunities through black bear harvest management to address bear/human conflict. The Division of Wildlife would prefer that a hunter get the opportunity to take a conflict bear instead of the Division having to kill these conflict animals. Therefore, the Division is proposing two different harvest management strategies in an effort to reduce conflict and increase hunter opportunity. The Division realizes that neither strategy in its own will alleviate bear/human conflict, but recognizes harvest management as one tool to possibly reduce human conflicts.

First, within GMU's 83, 85, 140 and 851 we propose to change the current way that hunting licenses are allocated. We propose to allocate the Private Land only (PLO) licenses as over the counter with caps (OTCWC) as a way to allow local landowners within the area a method to purchase a PLO license without having to participate in the drawing process. These licenses would be sold over the counter until the predetermined cap was met and could be purchased after the second week in July. The number of licenses offered would be based on the population level strategic goals outlined above. The addition of this hunting season could result in increased hunter density on private land, increased demand on landowners for hunting permission, and increased demand for non-PLO licenses.

Second, within GMU 84 we propose to set up a bear management unit within the boundary of GMU 84 that encompasses the lands surrounding the towns of Wetmore, Colorado City, Beulah and Rye (see map below). In this area we propose to have OTCWC and PLO bear licenses that would go on sale after the

second week of July. The goal of these licenses is to concentrate the harvest of black bears around these population centers and conflict areas to see if localized harvest increases contribute to a decrease in human conflicts. The addition of this hunting season in this area could result in increased density of hunters near populated areas and increased demand on landowners for hunting permission.

Black Bear Management Unit
Game Management Unit 84

Under both of the scenarios current conflict management would continue (such as trash management, education, game damage payments, etc) and the licenses currently available would be valid within the management areas.

What are your feelings on these two management changes?

Other comments on bear management along the Southern Front Range:

Thank you for your participation.
Please return the questionnaire by December 1, 2010 to:
Colorado Division of Wildlife
Attn: Allen Vitt, Terrestrial Biologist
600 Reservoir Road
Pueblo, Colorado 81005

Appendix F: Public Meeting Questionnaire results

Results

Results are presented in two sections. "Survey Highlights" summarizes the important results of this survey, particularly as they apply to the DAU plan objectives. The "Summary of Open-ended Comments" categorizes the additional comments received and provides insight into the main issues that people thought were important for the CDOW to consider.

The actual results of the survey may be reviewed at the Pueblo Service Center by contacting Allen Vitt, Terrestrial Biologist at 719-561-5306.

SURVEY HIGHLIGHTS

ABOUT THE RESPONDENTS

X   Of the 44 respondents 39 own land in the DAU

X   Of 39 people that own land in the DAU 27 own between 0.25 and 160 acres, 3 own between 161 and 640 acres, and 6 own between 641 and 14,000 acres.

X   Of the 44 respondents 20 derive a portion of their income from agriculture

X   Twenty-three respondents indicated that they had experienced some kind of damage caused by black bears
          Seven indicated that the damage was related to trash or dumpsters
          Ten indicated that the bears depredated livestock or livestock feed
          Nine indicated that they had suffered property damage
          Four indicated damage to fruit trees

SUMMARY OF OPEN-ENDED COMMENTS

At the end of the questionnaire, people were asked to provide additional comments they would like to make about bears. Numerous comments were received. These comments provide insight into the main issues that are important to people in bear management.

X   The bears were here first and deserve to stay.
X   We don't have problems with bears
X   People need to learn to keep trash contained.
X   It would be nice to have an extended season for unfilled tags.
X   It would be nice to hunt in July and August.
X   Current populations appear to be stable and accurate.
X   Allow depredating licenses to ranches.
X   Do we need to prepare for a drought, we may be in a drought now.
X   There seems to be enough bears for watchable wildlife without a concern for safety.
X   I live in Colorado because I love the wildlife, thanks for working hard to keep Colorado wild.
X   I have concerns about human safety, the hassles of having bears around and damage to my beehives.
X   Present numbers produce interaction stress across the landscape as well as much increased conflict during bear food shortages.
X   My personal experience and that of my neighbors has been property and livestock damage, I like bears just reduce their numbers, I think we should allow hunters to bait bears and have a spring season.
X   I enjoy seeing bears but they are a risk to human safety, are a hassle to have around and damage personal property.
X   I am concerned about carrying capacity, ecological and social, we have too many bears.
X   There are just too many bears, with too many conflicts in our community, even though I am a bear hunter and like the opportunities for more bears during the hunting season, it is not worth the risk.
X   I would like to see an ordinance in all communities for bear proof dumpsters.

X   Too many bears and so few deer and elk.
X   I would wish that the bears caught by the fish and game from Colorado Springs and Pueblo would not be brought into Las Animas County, bad bears teach other bears.
X   I love them, we are in their territory- we are taking their land away from them.
X   This is their land.
X   I hope there is a penalty for people who habitually leave out food sources.
X   Increased number of bears cause an increase with human conflicts as well as injury to people and greater property damage.
X   I would like to see landowner vouchers and the season begin earlier.
X   You know there are a lot of bears around if you can see 5 in one afternoon.
X   I am concerned with the San Isabel area, we are at or above the "social" carrying capacity, and conflicts seem to be increasing.

BLACK BEAR MANAGEMENT GUIDELINES
FOR
GAME MANAGEMENT UNITS
69, 84, AND 691

BEAR DAU B-7

Prepared for:
Colorado Division of Wildlife
Southeast Region
By:
Stan Abel
Terrestrial Wildlife Biologist
Pueblo, Colorado

January 1999

INTRODUCTION

This management area plan will establish management guideline objectives for Black Bear populations in the Wet Mountain Valley management area. Bear hunting and harvest will be adjusted when necessary in an effort to achieve the unit objective.

The goal of the CDOW is to maintain a healthy, self-sustaining population of Black Bear that is in balance with available habitat, minimize nuisance complaints in the developed areas, minimize game damage complaints and also maintain an environment that supports a rich, vegetative and wildlife community that will maintain a self-sustaining bear population.

DESCRIPTION OF MANAGEMENT AREA AND HABITAT

This bear unit is located in the Wet Mountain Valley of southeast Colorado. It is composed of three Game Management Units (GMU) that include GMU's 69, 84, and 691. The CDOW designation of this bear Data Analysis Unit is B-7.

It is bounded on the north by US Highway 50; on the east by I-25; on the south and west by Colo. 69. Drainages include portions of the Arkansas River, Grape Creek, St. Charles River, and Texas Creek.

Large portions of this unit are considered to be good to excellent bear habitat and this DAU generally supports on of the highest bear harvests in the Southern Colorado. The vegetation varies in relation to altitude and aspect, but is typical mountain shrub land, montane conifer, mountain meadow, tundra, and plains grassland. Some pinon-juniper woodland occurs in lower elevations but does not dominate. Gambel's Oak is the predominant shrub species below 8,500 feet and provides a large quantity of fall food supply for bears.

Agriculture is the predominant land use in B-7, primarily as cattle grazing on private and public lands and growing hay and alfalfa. Significant housing development continues throughout the DAU with large blocks of oakbrush and other nut/berry producing plants being lost.

SPORT HARVEST OBJECTIVE:

The sport harvest should not exceed 40 animals on a 3-year floating average basis.

PRESCRIPTIONS:

If sport harvest exceeds the 3-year floating average;
- Reduce September limited licenses by DAU.
- Reduce the number of Private Land Only licenses.
- Inform the public of DAU's where there is a need to increase harvest.

DAMAGE OBJECTIVE:

Damage caused by bears should not exceed $4,000 per year on a 3-year floating average basis.

PRESCRIPTIONS:

If damage caused by bears exceeds the annual objective;
- Focus on individual bear(s) causing damage.
- Direct Private Land Only harvest if possible.
- Hire a game damage investigator and /or an adjustor.
- Direct Wildlife Services to remove bears in significant livestock depredations.
- Follow Division Directive W-2 to guide decisions on individual cases.
- Consider a 1-strike policy if damage situations fall under the parameters of W-2.

HUMAN/BEAR CONFLICT OBJECTIVE:

There has been an average of 100 human/bear conflicts reported in this DAU over the past 4 years. Reporting has been very good in B-7 and an objective of no more than 75 reports per year is recommended.

PRESCRIPTIONS:

- Continue to provide workshops for the public, land use agencies, and law enforcement agencies.
- Use temporary employees to conduct public relations efforts.
- Continue to cooperate with U.S.F.S on campground presentations to visitors.
- Adjust seasonal priorities of employees. Form teams to resolve concentrated problems.
- Push for better disclosure of potential wildlife conflict areas by county planners, Realtors, and developers. Provide the necessary information to these entities.
- Conduct site inspections of affected properties, offer professional advice.

BLACK BEAR MANAGEMENT GUIDELINES
FOR
GAME MANAGEMENT UNITS
82, 86, AND 861

BEAR DAU B-8

Prepared for:
Colorado Division of Wildlife
Southeast Region
By:
Stan Abel
Terrestrial Wildlife Biologist
Pueblo, Colorado

January 1999

INTRODUCTION

This management area plan will establish management guideline objectives for Black Bear populations in the northeastern San Luis Valley, Wet Mountain Valley, and Sangre de Cristo Mountains. Bear hunting and harvest will be adjusted when necessary in an effort to achieve the unit objective.

The goal of the CDOW is to maintain a healthy, self-sustaining population of Black Bear that is in balance with available habitat, minimize nuisance complaints in the developed areas, minimize game damage complaints and also maintain an environment that supports a rich, vegetative and wildlife community that will maintain a self-sustaining bear population.

DESCRIPTION OF MANAGEMENT AREA AND HABITAT

This bear unit is located in the northeastern San Luis Valley, western Wet Mountain Valley, and Sangre de Cristo Mountains of southern Colorado. It is composed of three Game Management Units (GMU) that include GMU's 82, 86, and 861. The CDOW designation of this bear Data Analysis Unit is B-8.

It is bounded on the north by US Highway 50; on the east by Colo. 69 south to its intersection with Pass Creek Road; Pass Creek Road to the Sangre de Cristo Divide; on the south by the Sangre de Cristo Divide and the Alamosa-Costilla Co. Line and US Highway 160; on the west by Colo. 17 and US Highway 285. Drainages include the Arkansas River, Huerfano River, Grape Creek, Texas Creek, and San Luis Creek.

The vegetation in this unit varies from alpine tundra, sub-alpine conifer, montane conifer, montane shrub, and mountain meadows. The montane shrub component provides significant berry and nut producing plants that are heavily utilized during the fall feeding period. Increased land development and human activity has reduced the shrub land habitats and/or displaced bears to other habitats.

SPORT HARVEST OBJECTIVE:

The sport harvest should not exceed 30 animals on a 3-year floating average basis.

PRESCRIPTIONS:

If sport harvest exceeds the 3-year floating average;
- Reduce September limited licenses by DAU.
- Reduce the number of Private Land Only licenses.
- Inform the public of DAU's where there is a need to increase harvest, provide successful limited license applicants with the brochure "How to hunt bears in September".

DAMAGE OBJECTIVE:

Damage caused by bears should not exceed $3,300 per year on a 3-year floating average basis.

PRESCRIPTIONS:

If damage caused by bears exceeds the annual objective;
- Focus on individual bear(s) causing damage.
- Direct Private land Only harvest if possible.
- Hire a game damage investigator and/or an adjustor.
- Direct Wildlife Services to remove bears in significant livestock depredations.
- Follow Division Directive W-2 to guide decisions on individual cases.
- Consider a 1-strike policy if damage situations fall under the parameters of W-2.

HUMAN BEAR CONFLICT OBJECTIVE:

An objective of no more than 30 "reported" complaints per year is recommended.

PRESCRIPTIONS:

- Continue to provide workshops in local communities, for land use agencies, and law enforcement agencies (including dispatchers, officers, and administrators).
- Continue to cooperate with other agencies on campground presentations to visitors.
- Adjust seasonal priorities of employees, form teams to resolve concentrated problem areas
- Conduct site inspections, offer professional advice and literature.
- Push for disclosure of potential wildlife conflict areas by county planners, Realtors, and developers. Provide necessary information to these entities.

BLACK BEAR MANAGEMENT GUIDELINES
FOR
GAME MANAGEMENT UNITS
83, 85, 140, AND 851

BEAR DAU B-9

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January 1999

INTRODUCTION

This management area plan will establish management guideline objectives for Black Bear populations in southeastern San Luis Valley, southern Sangre de Cristo Mountains and Mesa de Maya. Bear Hunting and harvest will be adjusted when necessary in an effort to achieve the unit objective.

The goal of the CDOW is to maintain a healthy, sel-sustaining population of Black Bear that is in balance with available habitat, minimize nuisance complaints in the developed areas, minimize game damage complaints and also maintain an environment that supports a rich, vegetative and wildlife community that will maintain a self-sustaining bear population.

DESCRIPTION OF MANAGEMENT AREA AND HABITAT

This bear unit is located in the southeastern San Luis Valley, southern Sangre de Cristo mountains (including the Culebra Range), Mesa de Maya, and the grasslands in Unit 140. It is composed of four Game Management Units (GMU) that include 83, 85, 140, and 851. The CDOW designation for this bear Data Analysis Unit is B-9.

It is bounded on the north by US Highway 160, the Alamosa-Costilla Co. Line, Pass Creek Road, and Colo. 69; on the east by I-25, US Highway 160, and Colo. 389; on the south by the New Mexico line; on the west by the Rio Grande River. Drainages include the Rio Grande River, Huerfano River, Cuchara River, and Purgatoire River.

Large portions of this unit are considered to be excellent bear habitat and the DAU supports one of the highest bear harvests in the state. Predominant vegetative communities include alpine tundra, sub-alpine conifer, montane conifer, montane shrub, Great Basin desert shrub and plains grassland. Bears inhabit all communities but the montane shrub land is critical to fall feeding bears.

Due to poor economic conditions, many large land holdings are being developed for country living. These developments degrade much of the bear habitats and are occurring throughout the DAU.

SPORT HARVEST OBJECTIVE:

The sport harvest objective should not exceed 80 animals on a 3-year floating average basis.

PRESCRIPTIONS:

If sport harvest exceeds the 3-year floating average;
- Reduce September limited licenses by DAU.
- Reduce the number of Private Land Only licenses.
- Inform the public of DAU's where there is a need to increase harvest. Provide successful limited license applicants with the brochure "How to hunt bears in September".
- It must be noted, and the public should be informed, that this DAU has a very high percentage of private property and finding a place to hunt can be difficult.

DAMAGE OBJECTIVE:

Damage caused by bears should not exceed $6,500 per year on a 3-year floating average basis.

PRESCRIPTIONS:

If damage caused by bears exceeds the annual objective;
- Focus on individual bear(s) causing damage.
- Direct Private Land Only harvest if possible.
- Hire a game damage investigator and/or an adjustor.
- Direct Wildlife Services to remove bears in significant livestock depredations.
- Follow Division Directive W-2 to guide decisions on individual cases.
- Consider a 1-strike policy if damage situations fall under the parameters of W-2.

HUMAN/BEAR CONFLICT OBJECTIVE:

An objective of no more than 85 "reported" human/bear conflict complaints per year is recommended.

PRESCRIPTION:
- Continue to provide workshops in local communities, for land use agencies, and law enforcement agencies (including dispatchers, officers, and administrators).
- Continue to cooperate with other agencies on campground presentations to visitors.
- Adjust seasonal priorities of employees, form teams to resolve concentrated problems.
- Push for better disclosure of potential wildlife conflict areas by county planners, Realtors, and developers. Provide the necessary information to these entities.
- Conduct site inspections of affected properties, offer professional advice and literature.