San Juan Basin Elk Herd Management Plan

Data Analysis Unit E-31

Game Management Units 75, 77, 78, 751 and 771

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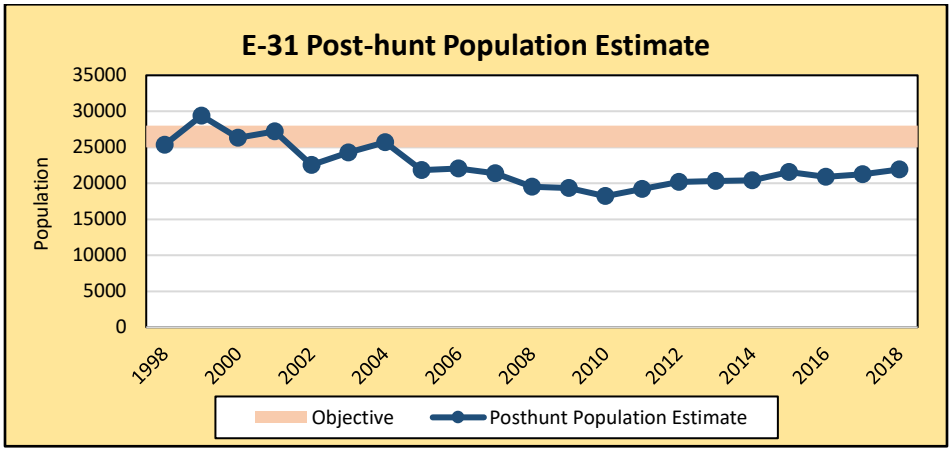
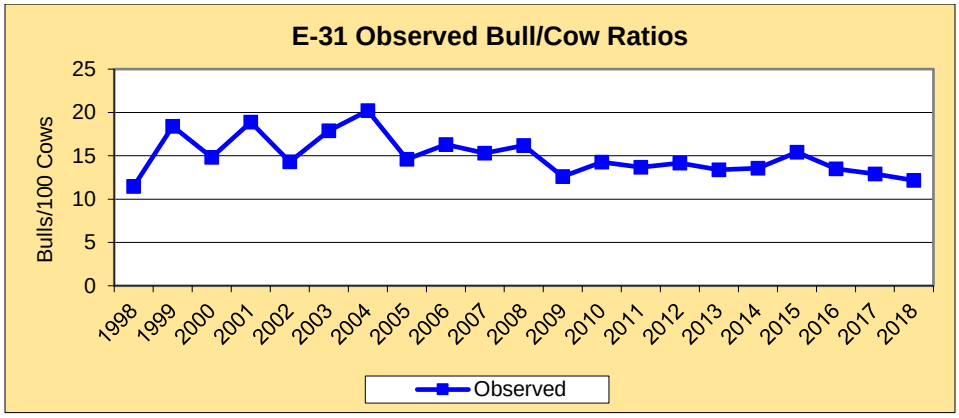
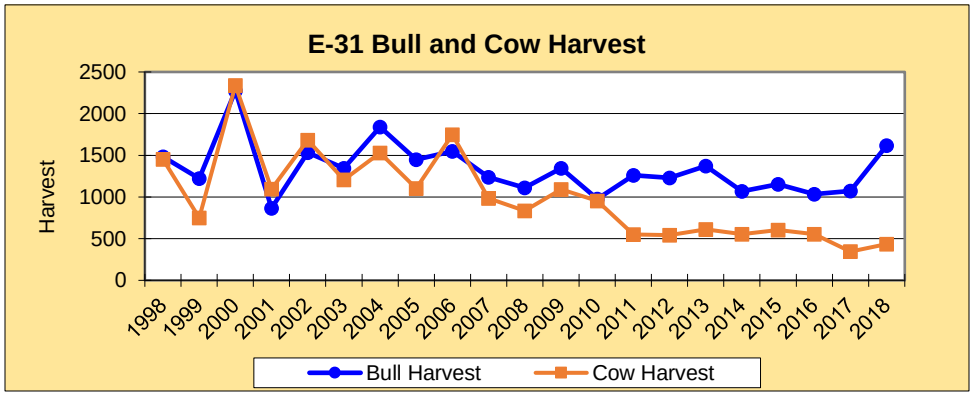
Executive Summary

GMUs: 75, 751, 77, 78, and 771
Land Ownership: 55% USFS, 30% private land, 12 % Southern Ute Tribal lands, and 2% BLM
Posthunt Population:
2018 Modeled Estimate: 22,000
Current Objective (2020): 25,000 – 28,000
Posthunt Sex Ratio:
2018 Observed: 12 bulls:100 cows
Expected Ratio (2020): 12-20 bulls:100 cows







Background
The San Juan Basin Elk Population is located in the southwest corner of Colorado and contains Game Management Units (GMU's) 75, 751, 77, 771, and 78. The DAU is 2,800 square miles and includes portions of La Plata, San Juan, Hinsdale, Mineral, and Archuleta counties. The elk population reached a high in the early 2000's and exceeded population management objectives. At that time cow harvest was increased through list "B" and "C" antlerless licenses, either-sex licenses, and late seasons to decrease the population. Since then the population has decreased and those tools to increase cow harvest have been removed.

Significant Issues
The greatest issue that the San Juan Basin Elk Herd faces is the lack of recruitment. Calf to cow ratios have steadily decreased since 2006 and have been around 30 calves per 100 cows. The long-term average prior to the decrease was 41:100. Low elk recruitment is experienced across southern Colorado and northern New Mexico. CPW is currently researching the issue with hopes of identifying the cause and possible remedies.

Cumulative impacts to critical habitat, including winter range, migration corridors, production areas, and high elevation summer range, due to human population growth is a concern in the DAU. Exurban development is occurring in Archuleta and La Plata counties and homes are replacing open lands currently supporting wintering elk. Natural gas well development has also increased in elk habitat on private and public lands. Lastly, outdoor recreation continues to grow, placing more people into areas used by elk. Increased recreational trails and recreation use is decreasing the amount of effective habitat. Managers and the public are concerned over cumulative and prolonged impacts of development and recreation disrupting migration and decreasing quality and quantity of habitat. Actions to enhance and protect important elk habitat will be essential to increase the elk population.

Management Objectives

Population Objective Alternatives

Population objective alternatives were developed around the current population estimate and based on public input received from meetings and survey. Ranges presented in each alternative allow for management flexibility to changing conditions or unknowns such as drought or disease. Any suggested increase in the population would require habitat improvement and protection to mitigate for the continual loss of habitat due to human population growth and encroachment. The following three population objectives were proposed. The Colorado Parks and Wildlife Commission adopted alternative 2 September 2020.

Alternative 1: 22,000 to 25,000 (current population)
****Alternative 2: 25,000 to 28,000 (15% increase)**
Alternative 3: 27,000 to 30,000 (25% increase)

Sex Ratio

E-31 is managed for maximum hunter opportunity with over-the-counter bull licenses in second and third rifle seasons. Because of this, the number of bulls in the populations is not dictated by a management action and sex ratio alternatives were not considered. Instead, an expected sex ratio was proposed.

Expected observed sex ratio: 12 to 20 bulls per 100 cows

Approved by the Colorado Parks and Wildlife Commission September 2020

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Introduction and Purpose

Colorado Parks and Wildlife (CPW) manages wildlife for the use, benefit and enjoyment of the people of the state in accordance with CPWs Strategic Plan and mandates from the Parks and Wildlife Commission and the Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing impacts from people. To manage the state's big game populations, CPW uses a "management by objective" approach (Figure 1). Big game populations are managed to achieve population objective ranges and sex ratio ranges established for data analysis units (DAUs).

The purpose of a Herd Management Plan (HMP) is to provide a system or process which will integrate the plans and intentions of CPW with the concerns and ideas of land management agencies and interested publics in determining how a big game herd in a specific geographic area, DAU, should be managed. In preparing a HMP, agency personnel attempt to balance the biological capabilities of the herd and its habitat with the public's demand for wildlife recreational opportunities. Our various publics and constituents, including the U.S Forest Service, the Bureau of Land Management, sports persons, guides and outfitters, private landowners, local chambers of commerce and the general public, are involved in the determination of DAU population and herd composition objectives and related issues. Public input is solicited and collected by way of questionnaires, public meetings and comments to the Parks and Wildlife Commission.

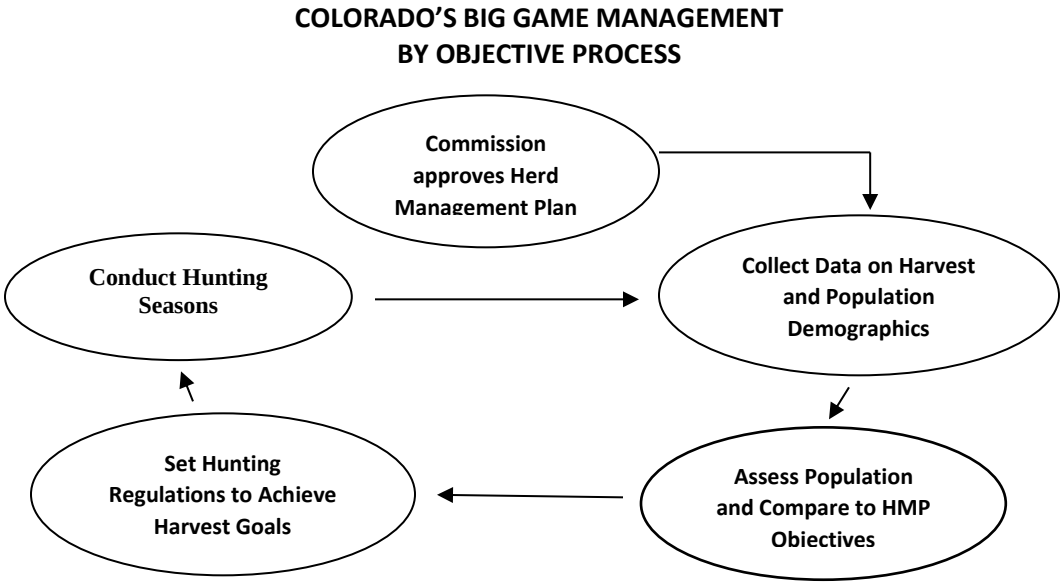


Figure 1. Management by objectives process used by the CPW to manage big game populations on a DAU basis.

A Data Analysis Unit or DAU is the geographic area that represents the year round range of a big game herd and delineates the seasonal ranges of a specific herd while keeping interchange with adjacent herds to a minimum. A DAU includes the area where the majority of the animals in a herd are born and raised as well as where they die either as a result of hunter harvest or natural causes. Each DAU usually

is composed of several game management units (GMUs), but in some cases, only one GMU makes up a DAU.

The primary decisions needed for an individual DAU plan are how many animals should exist in the DAU and what is the desired sex ratio for the population of big game animals e.g., the number of males per 100 females. These numbers are referred to as the DAU population and herd composition objectives, respectively. Secondarily, the strategies and techniques needed to reach the population size and herd composition objectives also need to be selected. The selection of population and sex ratio objectives drive important decisions in the big game license setting process, namely, how many animals need to be harvested to maintain or move toward the objectives, and what types of hunting seasons are required to achieve the harvest objective.

Description of DAU

The San Juan Basin Elk Population consists of Data Analysis Unit (DAU) E-31. It is located in the southwest corner of Colorado and contains Game Management Units (GMU's) 75, 751, 77, 771, and 78 (Figure 2). The DAU is 2,800 square miles and includes portions of La Plata, San Juan, Hinsdale, Mineral, and Archuleta counties. E-31 is bounded on the north and east by the Continental Divide, on the south by the New Mexico state line, and on the west by the Animas River and contains the towns of Durango, Bayfield, Ignacio, Allison, and Pagosa Springs.

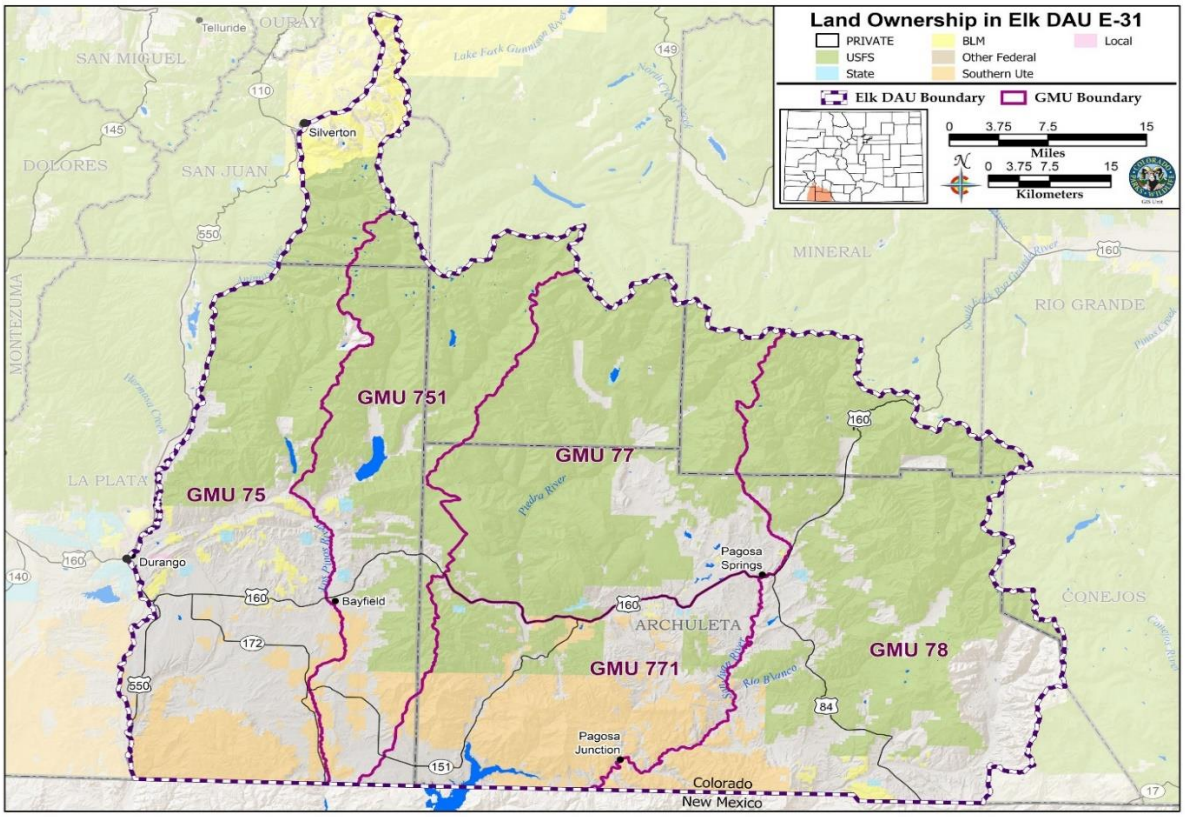


Figure 2. *The San Juan elk herd boundaries, GMUs, and Land Ownership*.

The climate is a highland or mountain climate, characterized by cool springs and falls, warm summers and moderately cold winters. Average precipitation and snowfall for Durango are 18.1 and 63 inches per year respectively. Snowfall increases dramatically to the north and east, toward the Continental Divide, approaching 250-300 inches per year. Vegetative types include: alpine over 12,000 feet elevation, spruce/fir stands down to 10,000 feet, oakbrush, serviceberry, and ponderosa pine above 7,000 feet, and pinyon/juniper/sagebrush and agricultural fields below 7,000 feet.

Land ownership is composed of U.S. Forest Service (55%), Bureau of Land Management (2%), private land (30%) and Southern Ute Tribal lands (12%) (Figure 2).

Habitat Resource and Capabilities

Elk generally summer at higher elevations found at the northern and eastern part of the DAU and winter in lower elevations in the southern portion. Winter range is limited and comprises approximately 60% of the DAU (1,687 miles^2). The areas 4-6 miles north of US 160 and continuing south to the state line are classified as winter range. Severe winter range is that part of the range where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum. In E-31 this covers 497 miles^2 (18% of the DAU) and occur in the Animas Valley, Florida Mesa, the HD's, Chimney Rock/Lake Capote area, and the Rio Blanco/San Juan River confluence areas. Winter concentration areas are that part of the winter range where elk densities are at least 200% greater than the surrounding winter range densities. These areas make up approximately 31% (874 miles^2) of the DAU and include most of the area south of US 160 and 1-3 miles north of US 160, the Animas Valley, and the area northwest of Pagosa Springs (Figure 3). Even in normal winters, the winter range of the elk herd extends onto Southern Ute Tribal Lands and into New Mexico. Breakdowns of landownership of winter ranges can be viewed in Table 1.

Drought also can play a significant role in decreasing both winter and summer habitats and forage condition, hence nutrition quality. Quality nutrition is important for elk to accrue body fat during the summer that will sustain individual animals through winter (Cook et al 2013). It can also influence reproductive success and calf survival. Southwest Colorado has been in a drought cycle for the past two decades.

Warmer temperatures have also increased mountain pine beetle and spruce beetle activity. Mature trees in subalpine forests are dying or are dead because of pine beetles. This is a large-scale impact and is influencing elk distribution and movement patterns.

Table 1. *Landownership and elk winter range, winter concentration areas, and sever winter range. (BLM = Bureau of Land Management, BOR = Bureau of Reclamation, USFS = US Forest Service, SUIT = Southern Ute Indian Reservation, SLB = State Land Board)*

	BLM	BOR	CPW	USFS	SUIT	Private	SLB
Winter Range	2%	1%	0.1%	36%	18%	43%	0.4%
Severe Winter Range	3%	0.1%	0.2%	26%	17%	53%	0.8%
Winter Concentration Areas	1%	0.1%	0.1%	33%	23%	42%	0.5%

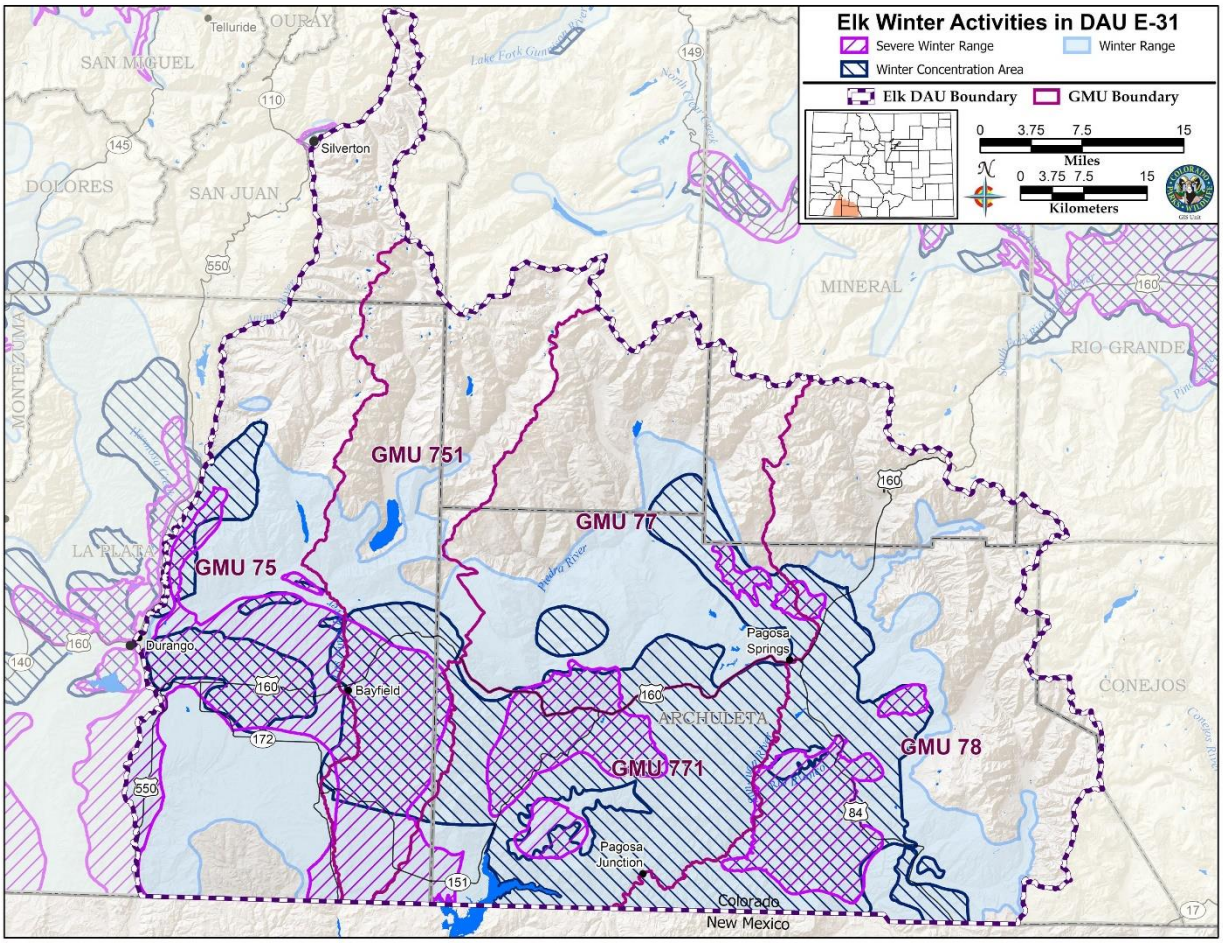


Figure 3. Elk winter activity in E-31.

Conflicts with Agriculture

Elk conflict areas are mostly south of US 160 on winter ranges. Specific conflict areas are the Animas Valley, Grandview, Allison/Arboles, south of Bayfield, areas near Pagosa Springs, and the southern San Juan River. Conflicts on lower elevation agricultural lands are addressed with Private Land Only licenses and Distribution Management Licenses. Spring conflicts also occur as elk stay on private lands as they green up, and move onto higher elevation ranges later as they green up.

Generally, game damage will decrease with fewer elk. However, many game damage situations would persist even with drastic reductions in elk numbers in the DAU and are best dealt with on each property with special seasons, distribution management hunts, and AWM kill permits, rather than on a DAU population scale.

Local Habitat Partnership committees also play an important role in minimizing wildlife/agriculture conflicts. The Habitat Partnership Program (HPP) has two purposes: to resolve big game wildlife conflicts with agricultural landowners, and to assist CPW in meeting game management objectives. The HPP committee finds innovative solutions that are agreeable with landowners to reduce concerns and problems of elk on their property. Elk benefit from this by the important habitat provided by private properties.

Habitat Loss

A combination of urban, exurban, energy and recreational development is occurring on a significant portion of important habitat in E-31. Development of all types can pose a threat to blocking or cutting off migration routes and reducing their effectiveness. Managers and the public are increasingly concerned over cumulative and prolonged impacts disrupting migration and decreasing quality and quantity of habitat. Development influences both carrying capacity and harvest management. Development is a DAU wide issue but it is a considerably larger problem near Durango, Bayfield, and Pagosa Springs. Direct and indirect loss of habitat is one of the top causes for species declines that lead to extinction.

Herd Management History

Post-hunt Population Size

The primary goal of this plan is to re-evaluate the population objective. A computer model is used to estimate the population size. Models are dependent on the quality of data used and it needs to be recognized that models are a tool that should be used accordingly. The previous post-hunt elk population objective of 17,000-21,000 was established in 2006 based on an estimated population of 19,000. The current model shows that the E-31 population peaked in 1999 at an estimated 30,000. Due to aggressive harvest in the early 2000's, the population decreased to a low of 18,200. Over the past several years, the post-hunt elk population estimate shows a slight increase (from reduction of cow harvest) and is currently at 22,000 (Figure 4). The change in population from 18,200 to 22,000 over eight years represents a 21% increase in the population. Many believe that the population has yet to see a rebound as indicated with the model.

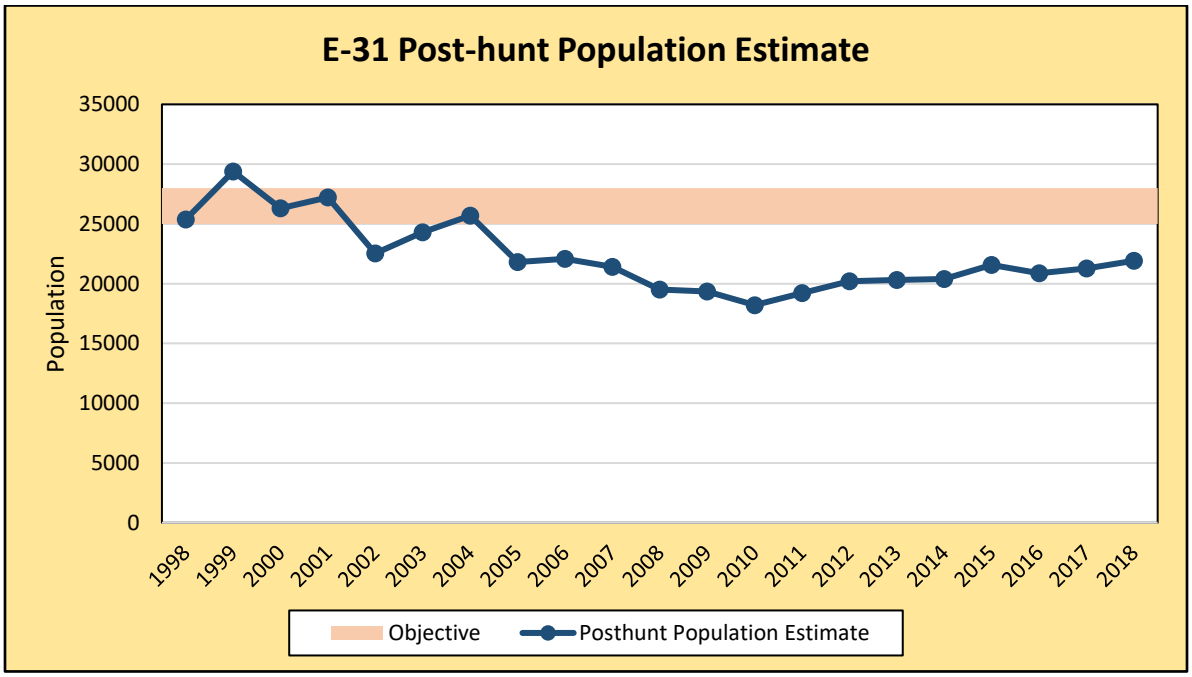


Figure 4. E-31 Post-hunt population estimate from 1998 to 2018 and proposed management objective.

Post-hunt Herd Composition

Post-hunt calf ratio estimates, observed from aerial inventory, averaged 37 calves per 100 cows from 1998 to 2018 (range of 28 to 48) (Figure 5). A mean of 31 calves per 100 cows was observed over the last five years. Calf ratios started decreasing as early as 2006 (Figure 5). Since 2010, ratios have been below 40:100, with some years dipping under 30:100. These low ratios are seen across southern Colorado and northern New Mexico and are concerning to biologists.

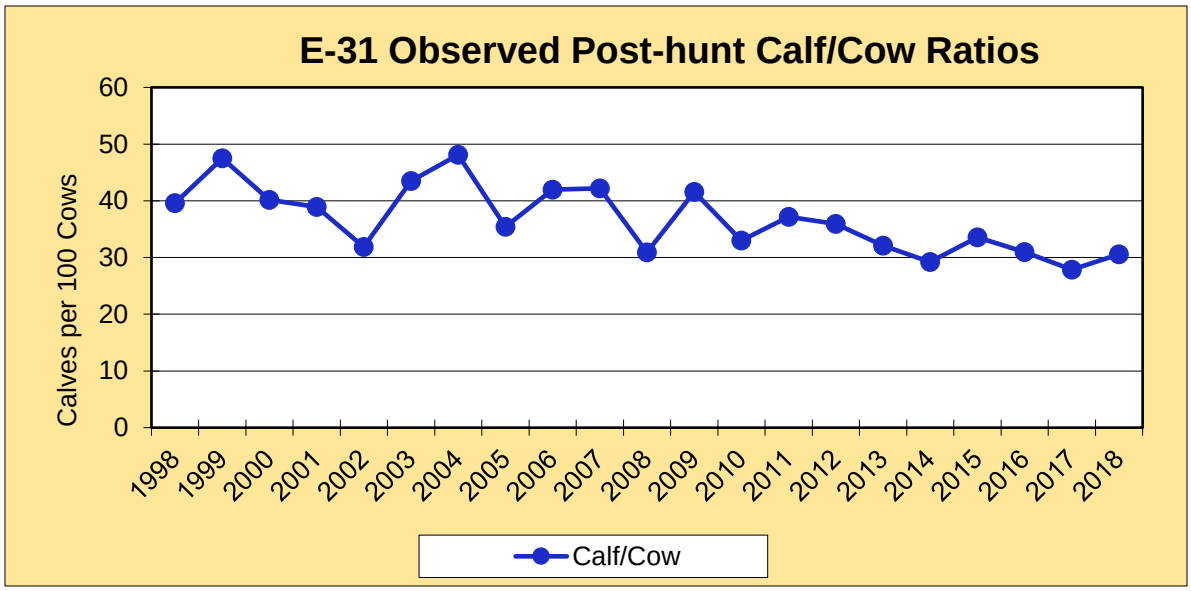


Figure 5. E-31 calf to cow ratio estimates from post-hunt helicopter inventory from 1998 to 2018.

The bull harvest regime for the San Juan Herd is for maximum hunter opportunity. Archery licenses were unlimited either-sex licenses through 2019 and bull licenses are unlimited in second rifle season and third rifle season. All muzzleloader licenses are limited. There is a four point antler restriction on bull harvest.

In 2020 the Colorado Parks and Wildlife Commission approved regulations that converted unlimited either-sex archery licenses to limited sex specific licenses. The change to limited archery cow licenses was a biological choice to address the decreasing population and mirrors rifle and muzzle loader licenses. The change to limited bull licenses was made due to hunter concerns about increasing hunting pressure and deceasing quality of hunting experience during the archery season. Participation in the archery season has increased 70% over the last ten years.

The post-hunt bull to cow ratio is gathered from winter classification flights and includes all bulls that are 1 plus years old (spike bulls) and older. These estimates are often low in E-31. This is clearly related to the unlimited nature of bull licenses, but estimates may be biased low because not all potential wintering areas are surveyed and bull groups can be difficult to observe from the air in pinyon-juniper, ponderosa pine, and oakbrush covered wintering areas. From 1998 to 2018 observed post-hunt bull to cow ratios averaged 15 bulls per 100 cows (range 11 in 1998 to 20 in 2004) (Figure 6). The 10 and 5 year bull to cow ratio means were both 14.

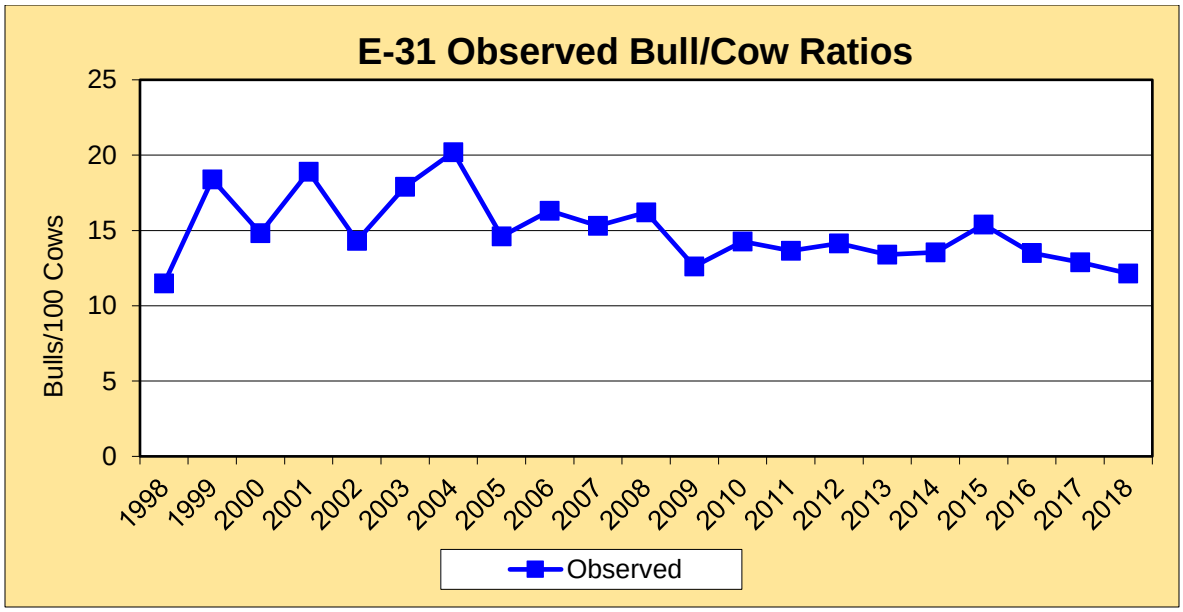


Figure 6. E-31 post-hunt bull to cow ratios estimated from helicopter inventory from 1998 to 2018.

Harvest

Harvest statistics are determined through a survey of a randomly selected sample of hunters in E-31. All antlerless licenses are limited and set annually to meet population objectives. By limiting licenses, antlerless harvest by rifle and muzzleloader hunters has been decreased substantially since 2006 in an effort to achieve population objectives (Figure 7). Bull harvest, being unlimited, is reflective of the population size and influenced by weather during hunting seasons. The 1998 to 2018 average annual bull harvest was 1,335 and average annual cow harvest was 999. Antlered harvest has ranged from 866 in 2001 to 2,275 in 2000. Cow harvest has ranged from 345 in 2017 to 2,340 in 2000.

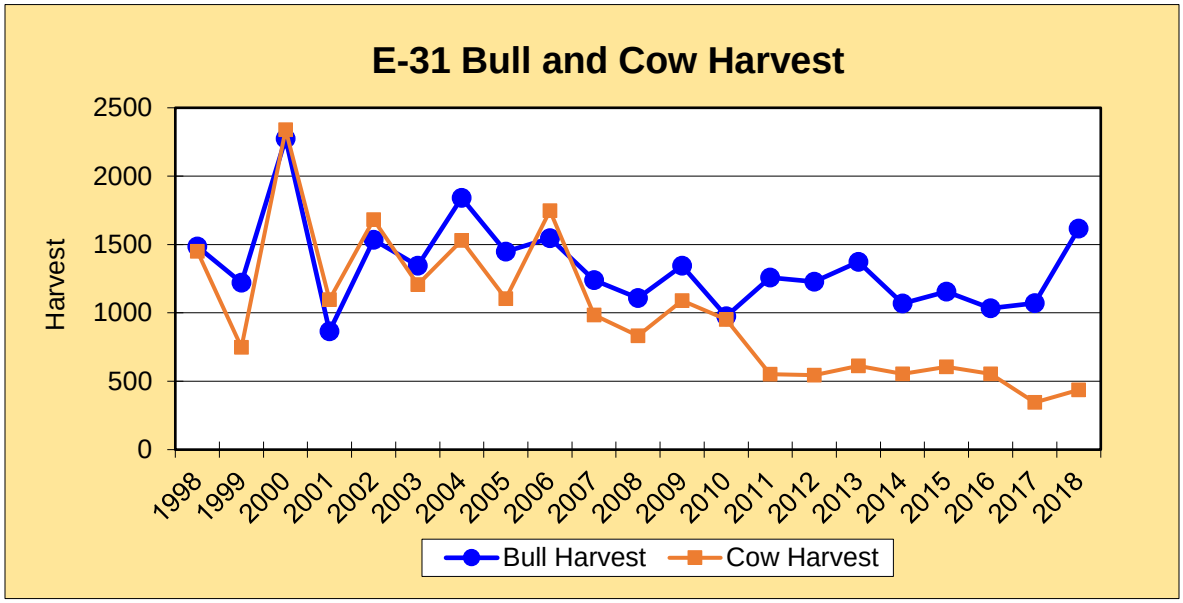


Figure 7. Bull and cow harvest estimated from E-31 from 1998 to 2018.

High elk license and hunter numbers, as well as non-hunting outdoor recreation, can shift elk distribution to private land refuges. This DAU has some public land areas without motorized access that reduces these distribution shifts. When evaluating travel management, it is important that these areas remain off limits to motorized and mechanized (ie. bicycle) travel to keep elk on the National Forest.

Herd Issues and Strategies

Issues

Predation

Black bear predation on calves can reduce recruitment and elk populations (Griffin et al 2011 and White et al 2010)). Black bears are most successful at finding calves during the first two weeks after parturition. Predation of calves then begins to decrease and after a calf is a month old, bear predation is rare.

Mountain lions influence on ungulate populations is variable. Predation by lions is more critical in ungulate populations that are small in size or struggling from other causes. Mountain lion predation on calves may be high enough to impact the population, but generally not to the degree that black bears can.

Predation is visible and dramatic which draws people's attention more so than other impacts to elk populations. Predation rates are not only a factor of the number of predators, but also influenced by attributes such as habitat quality, densities of prey, weather, and disease.

Loss of Critical Habitats

Increasing exurban, recreation, and energy development are occurring in elk habitat in E-31. Managers and the public are concerned over cumulative and prolonged impacts disrupting migration corridors and decreasing the quality and quantity of other important habitats. Development influences both carrying capacity and harvest management. Exurban development often creates refuges making harvest objectives in these areas difficult to achieve. Development is a DAU-wide issue but it is a considerably larger problem in the western portions of the DAU and around Pagosa Springs. Increased road density and human population increase the number of vehicles traveling through elk habitat and exacerbate elk mortality due to wildlife vehicle collisions. This is a concern for both herd welfare and human safety.

Johnson et al. (2016) analyzed a 40-year relational/correlative study, looking at land use changes from 1970 to 2010 and the impacts on deer populations. Although focused on deer, the same impacts may also correspond with elk and elk habitat (which overlaps extensively with deer habitat). From this analysis, for the entire D-30 DAU (which has the same boundaries as E-31), the proportion of "undeveloped" private land (0 houses) has decreased from 22% to 9%. The majority of this growth occurs in areas that overlap elk winter range. Winter range, which is already limited, is continually being lost due to residential development and will be lost at a greater rate with the expected human population growth. Already, from 1970 to 2010, the amount of mule deer winter range on private lands that remains undeveloped has decreased by 67%. With shrinkaging winter habitat, we can expect to see declining recruitment rates and a reduction in the elk population (Johnson et al 2016).

Energy Development

La Plata County has one of the largest coalbed methane reserves in Colorado. These reserves underlie elk winter range particularly in the southwest portion of the DAU (Figure 8). Wells are used to extract the gas and according to the Colorado Oil and Gas Conservation Commission website (cogcc.state.co.us) there were over 3,400 active wells in La Plata County in 2018. The average well pad is 3.5 acres in size.

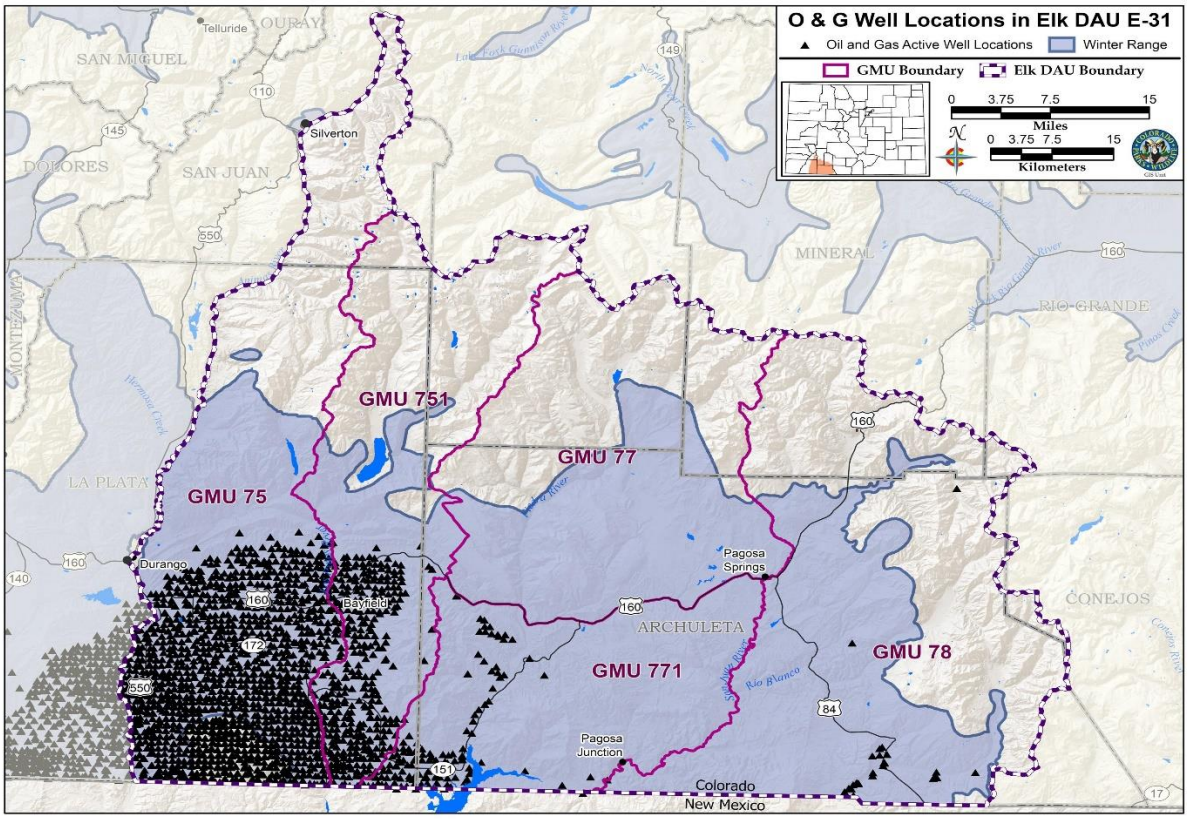


Figure 8. Colorado Oil and Gas Conservation Commission's permitted well locations mapped on elk winter range in DAU E-31.

Energy development can have an adverse impact to mule deer recruitment rates and population size (Johnson et al 2016). Habitat is lost directly from well pads, roads, gas lines and facilities. Associated activity and disturbance from well development and maintenance can lead to animal avoidance and decrease the overall quantity of effective habitat (Barber et al 2010, Sawyer et al 2006, 2009). Effective habitat is reduced further by fragmentation of habitat (Noss and Cooperrider 1994). Lastly, physiological stress often occurs in animals, which can reduce health, survival, and reproductive success (Gill et al 1996 and Frid and Dill 2002).

Recreational Development

Outdoor recreation is highly sought after locally with hundreds of miles of non-motorized and motorized trails especially around Durango and Pagosa Springs (Figure 9). These trails are popular with OHV users, hikers, runners, and mountain bikers. There is a continued and endless demand for the development of more trails. A high percentage of existing and proposed trails are on elk winter range.

Outdoor recreation associated with trails influence a variety of wildlife species and the impacts are often detrimental to wildlife. Trail use increases direct disturbance and displacement of elk from optimal habitats due to avoidance of human activities. Elk do not adapt well to trail recreation whether it is motorized or non-motorized (Montgomery et al 2013, Wisdom et al 2018). Elk increase their daily activity levels and movements in the presence of mountain biking and hiking which reduces the time spent feeding or resting (Naylor et al 2009, Wisdom et al 2004, 2018). This increased energy demand occurs simultaneous with decreased forage intake and displacement from preferred areas to areas with poorer quality forage. The net result is a decrease in body condition, which affects the chance of individual health, survival, and reproduction (Bender et al 2008). The presence of a dog with a recreationist is likely to result in a greater area of negative influence from trail use, including amplified avoidance distances moved by animals (Miller et al 2001). Elk do not become habituated to the presence of hiking or mountain biking (Wisdom et al 2004,).

Figure 9. Motorized and non-motorized trails located on elk winter range by Durango, CO, one area in the DAU that has high pressure for recreation use development. Several trails, particularly on BLM and FS, have a winter closure for wildlife. Illegal, or "social", trails are not depicted on the map.

Cumulative Habitat Loss

Any one of the mentioned forms of development (exurban, energy, and outdoor recreation) have led to a loss of elk habitat. However, the cumulative impact as shown in Figure 10 is the greatest concern.

While another subdivision, one more gas well, or an additional trail might not seem important, when combined with development that has already occurred and the continued demand for development, it does become significant and requires scrutiny.

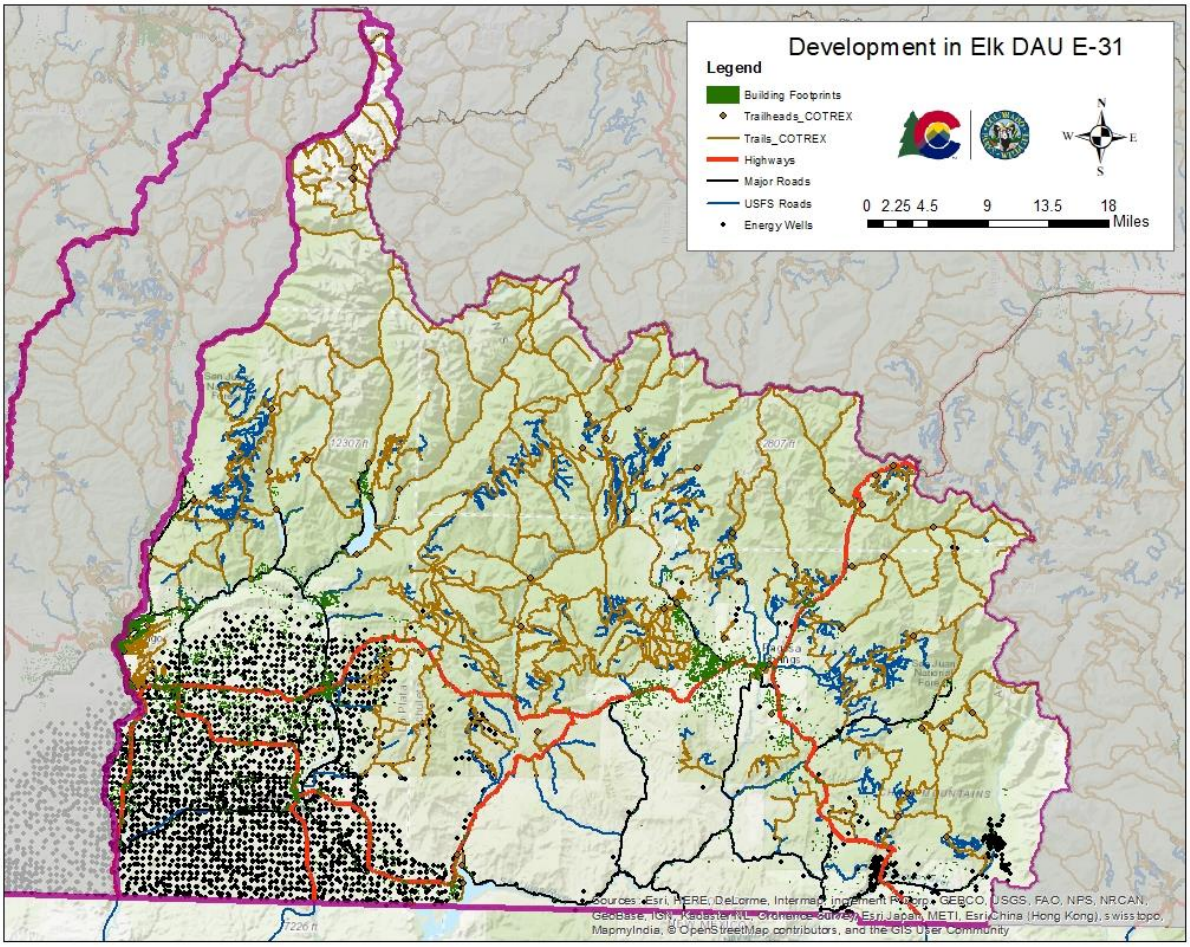


Figure 10. Development from roads, housing, energy wells, and recreation trails in E-31. (Note that not all FS roads are opened to motorized traffic, but may be used by other recreationists.)

Chronic Wasting Disease

Chronic wasting disease (CWD) is a fatal neurological disease found in deer, elk and moose. CWD has not been detected in the San Juan Basin herds, but has been found in adjacent mule deer populations to the north. Because there is overlap with animals from the San Juan Basin Herd and animals from infected populations, it can be expected that CWD is already in the population and has yet to be detected or that it will be contracted in the foreseeable future. Testing for CWD in the San Juan Herd has been minimal from voluntary hunter harvest, suspect animals (sick appearing animals euthanized by CPW), and the occasional road kill. In infected herds, the prevalence rates of CWD is much lower in elk than deer and have not reached a level of concern in elk that calls for a threshold for compulsory intervention.

Low calf cow ratios

Recruitment has been decreasing in E-31 over the last 14 years and is the greatest concern for this population. Low calf numbers are occurring across southern Colorado and CPW is studying the issue with the goal of being able to determine the cause and remedy it. There are multiple factors that might be contributing to low calf numbers including:

- In Oregon, Davidson et al (2012) concluded that high hunter numbers during the rut, nutrition, and other human disturbance contributed to low recruitment.
- In Colorado, outdoor recreation in calving areas decreased calf survival (Phillips and Alldredge 2000).
- Black bear predation on neonates was found to lower calf ratios in Idaho (White et al 2010) and Yellowstone National Park (Griffin et al 2011).

Most likely, there are several contributing factors and not one simple answer as to why E-31 is experiencing a recruitment problem.

<u>Management Strategies</u>

Predation

- Manage mountain lion and black bear populations within the parameters of current management plans maximizing harvest while maintaining healthy populations.

Development in Critical Elk Habitats

There are several ways CPW can be involved to minimize and mitigate impacts from development. Although action can be taken to lessen the effects of development, these measures won't stop the continued loss of habitat. Higher quality habitat will be required to maintain or increase elk populations. The following are actions necessary to achieve the goals of this HMP:

- Large-scale habitat treatments on FS, BLM, and SUIT lands in elk critical habitat, which includes transitional range and winter range.
- The treatment and removal of non-desirable, invasive vegetation on public and private lands to maintain quality elk habitat.
- Identification and protection of migration corridors to maintain connection between seasonal habitats.
- Closure of roads and trails on public lands in critical habitat and setting aside areas of critical habitat from recreation use.
- Identification of and support for development of recreation areas outside of critical habitat for elk that will meet the demand for trail development while minimizing the impacts to elk.
- Mitigation for proposed residential, energy and recreation development. This can come in various forms such as;
    - Timing restrictions and closures to minimize disturbance during critical time periods such as migration or elk use on winter range,
    - Habitat improvement projects on nearby or adjacent areas. Treatment areas will need to be larger than the impacted area, with a minimum of 7:1 ratio.
- Education and outreach. The public is generally unaware of the influence different forms of development have on elk. For example, trail users believed other users have a higher effect on wildlife then their user group (Taylor and Knight 2003). Most of these individuals, once they learn about their influence, were willing to change their behavior to lessen their impacts.

Through education and outreach people can learn about the impacts of development on wildlife and can make informed decisions.

- Increased law enforcement on FS and BLM lands regarding illegal recreation use (i.e. off trail use and trail use during closures).
- The closure and reclamation of illegally built recreation trails on public lands.
- The design and construction of fences that don't create a movement barrier and allow for safe crossing by elk, both adults and calves, while still being effective for livestock.
- Consideration of elk habitat throughout all, but especially early phases, of the developmental planning process at local, state, and federal levels.
- Identification of elk highway crossing areas and involvement with Colorado Department of Transportation and other partners in the design and building of wildlife crossing structures, and fences to minimize restriction of elk movements and reduce elk/vehicle collisions.
- Use of radio collar data to identify priority habitat and migration routes.
- Use of radio collar data to identify timing of migrations.
- Establishing conservation easements with willing landowners in important elk habitat.

Chronic Wasting Disease

Steps can be taken to minimize the spread of CWD and are similar to management recommendations for infected populations found in CPW's CWD response plan (December 2018). These include:

- Monitoring for CWD through testing of agency euthanized animals that are sick or show signs of CWD infection, roadkills (when practical), and voluntary testing of hunter harvested animals. Wildlife managers and biologists should submit samples from carcasses for CWD testing when possible.
- Reduce congregation of animals. Wild ungulates can be attracted to areas by illegal feeding and baiting. Animals can also be attracted to areas through common agriculture practices such as salting, and stacking hay on elk wintering areas. CPW should identify where animals congregate and work with producers and landowners to minimize the source of attractant. This might be as simple as providing fencing for a stack yard to keep elk off stacked hay. Illegal feeding and baiting should be handled appropriately through education efforts and enforcement. CPW should not congregate deer or elk by baiting or feeding.
- Minimize prion point source by excluding transportation of carcasses from infected areas. Biologists may also be able to minimize the chance of spread of CWD by identifying areas of overlap between infected herds and clean populations. Hunter harvest can be focused in these areas through license numbers, seasons, and special hunt areas to target removal of individual animals within the overlap. This will minimize the chance of an individual animal contracting the disease and introducing it to an uninfected population.

Low Recruitment

- Continue research to determine the cause and actions needed to rectify the problem.
- Implement conservative cow harvest by all methods of take.

Public Involvement

There were four public meetings on elk management and elk HMP revisions during February 2020 with participation of 400 people. These were held in Dolores (Feb 4), Pagosa Springs (Feb 6), Norwood (Feb

11), and Durango (Feb 13). At the meetings, there were copies of a survey about elk management that people could complete. This survey was also available on the CPW website from January 31 to February 26 for those who preferred to complete it on-line and for those who were not able to attend the meetings. A copy of the survey is in Appendix 2. There were 712 responses to the survey. The meetings and survey included three elk DAUs/HMPs which were E24, E30 and E31. The issues and concerns identified by participants across all three DAUs were the same. Following are the results of the survey.

- Of the three DAUs 43% of the comments were on E31, 38% on E24 and 19% on E30.
- 91% of the respondents hunted, 45% identified themselves as partaking in other outdoor recreation, 44% were wildlife watchers, 18% landowners, and 9% were livestock or agriculture producer, and 6% guide or outfitter (people were able to choose more than one).
- Hunting was the most popular activity (93%), followed by fishing (68%), non-motorized recreation (64%), wildlife watching (61%), and motorized recreation (7%) – again people could choose more than one.
- From a hunting perspective, 57% were archery hunters, 45% rifle, 14% muzzleloader, and 5% did not hunt (more than one answer could be picked).
- **77% of people thought the elk population was decreasing**, 15% thought it was stable, 8% were not sure and less than 1% thought it was increasing.
- When asked how they would like to see the elk population managed over the next 10 years, **57% wanted it to increase greatly, 35% increase somewhat**, 5% stay at the current level, and 3% felt it should decrease.
- 85% of those taking the survey were residents of Colorado.

People were able to write in comments on the survey. Most of these fell outside of the prevue of this HMP, or even CPWs authority. Some common remarks from the survey and the meetings were:

- Concerns about increased OHV and motorcycle use on public lands and their impacts to elk
- Concerns about increased non-motorized recreation including hiking, mountain biking and backpacking on public lands and their impacts to elk
- Desire to limit rifle bull licenses
- Too many hunters
- The need to decrease hunting pressure on elk during the rut
- Elk were hunted too long from the beginning of archery to the last season
- The number of mountain lions and black bears and predation on elk
- Decrease the number of elk licenses
- People want to do what is best for the elk even if it comes at an expense to them
- Too many non-resident hunters and desire to decrease their numbers
- Removing the muzzleloader season from the archery season
- Concerns about the amount of livestock grazing on public lands
- Limited archery licenses
    - Hunters supported the change
    - Hunters were unhappy with the change
    - Hunters preferred OTC with caps over limitation

Additionally, a draft of the HMP was available on CPW's website from April 3 to May 3, 2020 for public review. Anyone who was interested could review the draft and sent comments directly to me. Also, written requests for review and comments were made to the San Juan FS, Tres Rios BLM, San Juan Basin HPP Committees, the Southern Ute Indian Tribe, and the La Plata County and Archuleta County Board of

County Commissioners. Comments were received from the HPP committee, the San Juan FS, the Tres Rios BLM, the La Plata BCC, and Backcountry Hunters and Anglers (BHA). These are available in Appendix 3.

Comments recognized the importance of elk habitat and the pressures of development and recreation. Several comments also reiterated the issue of low recruitment as well as the predator prey relation. Overall, there was a mix of support for population management alternatives two (15% increase) and three (25% increase). There was not support to maintain the current population (alternative one). The San Juan HPP Committees supported population management alternative two, a 15% increase in the population, believing that the resources were available to meet this growth. However, they also noted that sportsman representatives preferred alternative three. Comments from the Tres Rio BLM and San Juan FS recognized the loss of habitat as being critical for the future of elk populations and encouraged CPW to determine elk utilization and carrying capacity on winter range through vegetation transects to determine future population management goals. The FS also expressed interest in working with CPW to improve vegetation conditions to benefit wildlife. The La Plata County BCC offered support for seasonal closures and access restrictions as needed to protect critical habitat. They also believed education was an important factor and that a balance between wildlife and recreation was important for the County. SUIT provided feedback on the plan that was valuable, but did not send an official letter.

Current Herd Status and Management Objectives

The primary goal of this plan is to review and revise current management objectives. Estimating free-ranging ungulate populations in complex landscapes is challenging. E-31 is bordered on the north by E-34, which has limited bull hunting, and complicates population estimates because of bull immigration into E-31. This DAU is also particularly problematic because it is a state line unit where animals migrate to, and are harvested in Colorado on public then private, again on Southern Ute Tribal Lands and Jicarilla Apache Tribal Lands, and finally in New Mexico. This results in incongruent harvest management and objectives across the herd's range. The San Juan Interstate Wildlife Working Group works to address communication between these entities. This group has representatives from CPW, New Mexico Game and Fish, Southern Ute and Jicarilla Apache Indian Nations, and public land management agencies.

Established population objective range alternatives heavily depend on the population estimate when revising the HMP. Population modeling is an evolving process whereby modeled estimates can change over time based on additional data or improved modeling methodology. As such, when modeled estimates change irrespective of an actual change in the population, it is reasonable to adjust population objectives relative to the new modeled estimate. The basis of harvest-based population management is to increase female harvest when a population exceeds objective, decrease female harvest when a population is below objective, and maintain female harvest when a population is at objective. Because population objectives are only meaningful in the relative context of the population estimates available at the time the objective was established, adjusting maintains the integrity of the objective based on the fundamental criteria of whether there are too many, too few, or the desired number of animals in the population. Therefore, as we improve modeled population estimates, it is important to adjust the population objectives. If HMPs are current and no other elements of the plan have changed, it is only necessary to amend the HMP executive summary through the typical two-step Parks and Wildlife Commission process to update the population objectives. The life of this plan is ten years. However, the plan may be revised prior to the 10 year timeline if conditions change such as large tracts of habitat improvement.

Population Estimate and Population Objective Setting

Previous Herd Management Plan Objectives (2006)
Population: 17,000 – 21,000
Sex Ratio: 17-23:100

Post-season 2018 estimates
Population: 22,000
Sex Ratio: 12 bulls per 100 cows

Alternative Development

Population Objective Alternatives
Population objective alternatives were developed around the current population estimate and based on public input received from the meetings and survey. Ranges presented in each alternative allow for management flexibility to changing conditions or unknowns such as drought or disease. The post-hunt population model, the E-31 population has increased by an estimated 21% over the past eight years. Based on this, all three population alternatives could be reached within the life of this plan. The following three population objectives being proposed. These alternatives were slightly adjusted from the draft that was available for public review, but still represent a 15% increase for alternative two and a 25% increase for alternative three.

Alternative 1: 22,000 to 25,000 elk post-hunt (current population)
Alternative 2: 25,000 to 28,000 elk post-hunt (15% increase)
Alternative 3: 27,000 to 30,000 elk post-hunt (25% increase)

Under alternative number one the population is within objective. Cow harvest could continue with this alternative. Required habitat treatment and protection would be minimal over the next ten years.

Alternative number two would be a 10-15% increase in the current population size. There would be a need for habitat improvement and protection. Cow harvest would be minimal until the objective was met. This objective could be reached with conservative cow harvest.

The third alternative would increase the population 20-25%. There would need to be a commitment to improve and protect elk habitats. Cow harvest would need to be minimal or none at all. Based on the population model, this objective could be reached in ten years with conservative cow harvest.

Game damage will generally decrease with fewer elk. However, many game damage situations are caused by distribution of animals instead of number of animals. Conflicts could persist even with drastic reductions in elk numbers and are best dealt with locally rather than on a DAU population scale.

Higher populations support higher harvest by hunters, and the fiscal benefits to the local economy will increase. A population objective that involves reducing the number of hunting licenses by 10% will also reduce the economic benefits to the counties involved by approximately 10%.

Proposed Population Objective: Alternative 2: 25,000-28,000

There was a strong desire by the public and by wildlife managers to attempt to grow the San Juan Basin Elk Herd. The desired amount of growth was split equally between alternative 2 and alternative 3. Alternative two was chosen as the preferred alternative because it met the wishes of managing for an increasing population and could be reevaluated if achieved. If the population does increase 15% and falls within objective within the ten-year life of this plan, there is the option of revaluating public desires and revise the HMP if needed. Based on the post-hunt population model that estimates a 21% growth in this population over the past eight years, it is realistic to achieve this objective within the life of this plan.

Sex Ratio

E-31 is managed for maximum hunter opportunity with over-the-counter bull licenses in second and third rifle seasons. Because of this, the number of bulls in the populations is not dictated by a management action and sex ratio alternatives were not considered. Instead, an expected sex ratio was presented.

Expected observed sex ratio: 12 to 20 bulls per 100 cows

Population and Sex Ratio Objectives (established 2020)

After Reviewing the San Juan Basin Elk Herd Management Plan and the proposed objectives, the Parks and Wildlife Commission adopted the following management objectives September 2020.

Population Management Objective: 25,000 - 28,000 elk

Expected Observed Sex Ratio: 12 to 20 bulls per 100 cows

Literature Cited

Barber, J. R., K. R. Crooks, and K. M. Fristup. 2010. The costs of chronic noise exposure for terrestrial organisms. Trends in Ecology and Evolution 25:180-189.

Bergman, E. J., P. F. Doherty Jr., G. C. White, D. J. Freddy and D. Euler. 2015. Habitat and herbivore density: response of mule deer to habitat management. The Journal of Wildlife Management 79:60-68.

Bishop, C. J., G. C. White, D. J. Freddy, B. E. Watkins, and T. R. Stephenson. 2009. Effect of enhanced nutrition on mule deer population rate of change. Wildlife Monographs 172, 29p.

Cook, R.C., J.G. Cook, D. J. Vales, B.K. Johnson, S.M. McCorquodale, L. A. Shipley, R. A. Riggs, L. R. Irwin, S. L. Murphie, B. L. Murphie, K. A. Schoenecker, F. Geyer, P.B. Hall, R. D. Spencer, D.A. Immell, D.H. Jackson, B.L. Tiller, P.J. Miller, and L. Schmitz. 2013. Regional and seasonal patterns of nutritional condition and reproduction of elk. Wildlife Monographs 184, 44p.

Davidson, G.A., B.K. Johnson, J.H. Noyes, B.L. Dick, and M.J. Wisdom. 2012. Effect of archer density on elk pregnancy rates and conception dates. The Journal of Wildlife Management 76:1676-1685.

Frid, A., and L. Dill. 2002. Human-caused disturbance stimuli as a form of predation risk. Conservation Ecology 6:11.

Gill, J. A., W. J. Sutherland, and A. R. Watkins. 1996. A method to quantify the effects of human disturbance for animal populations. Journal of Applied Ecology 33:786-792.

Griffin, K.A., M. Hebblewhite, H.S. Robinson, P. Zager, S.M. Barber-Meyer, D. Christianson, S. Creel, N.C. Harris, M.A. Hurley, D.H. Jackson, B.K. Johnson, W.L. Myers, J.D. Raithel, M. Schlegel, B.L. Smith, C. White, and P.J. White. 2011. Neonatal mortality of elk driven by climate, predator, phenology and predator community composition. Journal of Animal Ecology, 80:1246-1257.

Johnson, H.E., Sushinsky, J. R., Holland, A., Bergman, E.J., Balzer, T., Garner, J. & Reed, S.E. 2016. Increases in residential and energy development are associated with reductions in recruitment for a large ungulate. Global Change Biology, doi:10.11111/gcb.13385.

Miller, S. G., R. L. Knight, and C. K. Miller. 2001. Wildlife responses to pedestrians and dogs. Wildlife Society Bulletin 29:124-132.

Montgomery, R.A. G.J. Roloff, and J.J. Millspaugh. 2013. Variation in elk response to roads by season, sex, and road type. Journal of Wildlife Management 77:313-325.

Noss, R. F., and A. Y. Cooperrider. 1994. Saving nature's legacy. Island Press, Washington D. C., USA.

Phillips, G.E. and A.W. Alldredge. 2000 Reproductive success of elk following disturbance by humans during calving season. Journal of Wildlife Management 64(2):521-530.

Sawyer, H., R. M. Nielson, F. Lindzey, and L. L. McDonald. 2006. Winter habitat selection of mule deer before and during development of natural gas field. Journal of Wildlife Management 70:396-403.

Sawyer, H., R. Nielson, and D. Strickland. 2009. Sublette mule deer study (phase II): final report 2007 – long-term monitoring plan to assess potential impacts of energy development on mule deer in the Pinedale Anticline project area. Western Ecosystems Technology, Inc. Cheyenne, Wyoming, USA.

Taylor, A. R., and R. L. Knight. 2003. Wildlife response to recreational and associated visitor perceptions. Ecological Applications 13:951-963.

Walsh, N.E., G.C. White, and D.J. Freddy. 1991. Responses of bull elk to simulated elk vocalizations during the rut. The Journal of Wildlife Management 55:396-400.

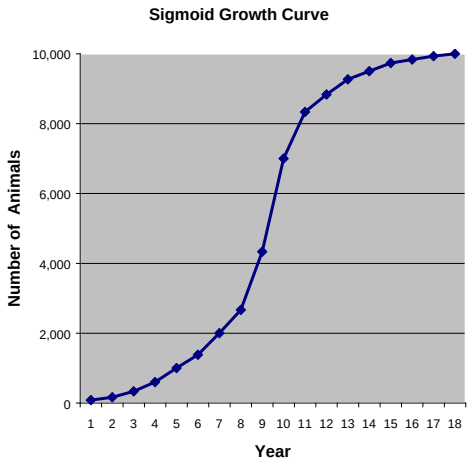
White, C.G., P. Zager, and M.W. Gratson. 2010. Influence of predator harvest, biological factors, and landscape on elk calf survival in Idaho. Journal of Wildlife Management 74(3):355-369.

Wisdom, M. J., A. A. Ager, H. K. Preisler, N. J. Cimon, and B. K. Johnson. 2004. Effects of off-road recreation on mule deer and elk. Transactions of the North American Wildlife and Natural Resources Conference 69:67-80.

Wisdom, M.J., H.K. Preisler, L.M. Naylor, R.G. Anthony, B.K. Johnson, and M.M Rowland. 2018. Elk responses to trail-based recreation on public forests. Forest ecology and management 411:223-233.

APPENDIX 1, Population Dynamics, Maximum Sustained Yield, and Density Dependence

Numerous studies of animal populations, including such species as bacteria, mice, rabbits, and white-tailed deer have shown that the populations grow in a mathematical relationship referred to as the "sigmoid growth curve" (right). There are three distinct phases to this cycle. The first phase occurs while the population level is still very low and is characterized by a slow growth rate and a high mortality rate. This occurs because the populations may have too few animals and the loss of even a few of them to predation or accidents can significantly affect population growth.

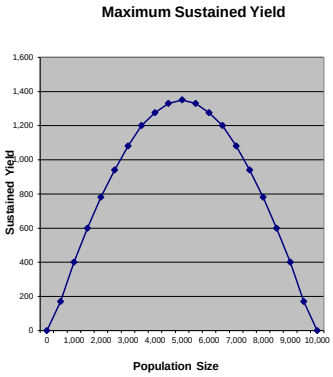


The second phase occurs when the population number is at a moderate level. This phase is characterized by high reproductive and survival rates. During this phase, food, cover, water and space are not a limiting factor. During this phase, for example, animals such as white-tailed deer have been known to successfully breed at six months of age and produce a live fawn on their first birthday and older does have been known to produce 3-4 fawns that are very robust and healthy. Survival rates of all sex and age classes are also at maximum rates during this phase.

The final or third phase occurs when the habitat becomes too crowded or habitat conditions become less favorable. During this phase the quantity and quality of food, water, cover and space become scare due to the competition with other members of the population. These types of factors that increasingly limit productivity and survival at higher population densities are known as density-dependent effects. During this phase, for example, white-tailed deer fawns can no longer find enough food to grow to achieve a critical minimum weight that allows them to reproduce; adult does will usually only produce 1-3 fawns; and survival of all deer (bucks, does and fawns) will decrease. During severe winters, large die-offs can occur due to the crowding and lack of food. The first to die during these situations are fawns, then bucks, followed by adult does. Severe winters affect the future buck to doe ratios by favoring more does and fewer bucks in the population. Also, because the quality of a buck's antlers is somewhat dependent upon the quantity and quality of his diet, antlers development is diminished. If the population continues to grow it will eventually reach a point called "K" or the maximum carrying capacity. At this point, the population reaches an "equilibrium" with the habitat. The number of births each year equal the number of deaths, therefore, to maintain the population at this level would not allow for any "huntable surplus." The animals in the population would be in relatively poor body condition, habitat condition would be degraded from over-use, and when a severe winter or other catastrophic event occurs, a large die-off is inevitable.

What does all this mean to the management of Colorado's big game herds? It means that if we attempt to manage for healthy big game herds that are being limited by density-dependent effects, we should attempt to hold the populations more towards the middle of the "sigmoid growth curve." Biologists call this point of inflection of the sigmoid growth curve the point of

"MSY" or "maximum sustained yield." In the example below, MSY, which is approximately half the maximum population size or "K", would be 5,000 animals. At this level, the population should provide the maximum production, survival, and available surplus animals for hunter harvest. Also, at this level, range habitat condition should be good to excellent and range trend should be stable to improving. Game damage problems should be lower and economic return to the local and state economy should be higher. This population level should produce a "win - win" situation to balance sportsmen and private landowner concerns.



A graph of a hypothetical deer population showing sustained yield (harvest) potential vs. population size is shown (right). Notice that as the population increases from 0 to 5,000 deer, the harvest also increases. However, when the population reaches 5,000 or "MSY", food, water and cover becomes scarce and the harvest potential decreases. Finally, when the population reaches the maximum carrying capacity or "K" (10,000 deer in this example), the harvest potential will be reduced to zero. Also, notice that it is possible to harvest exactly the same number of deer each year with 3,000 or 7,000 deer in the population. This phenomenon occurs because the population of 3,000 deer has a much higher survival and reproductive rate compared to the population of 7,000 deer. However, at the 3,000 deer level, there will be less game damage and resource degradation but lower watchable wildlife values.

Actually managing deer and elk populations for MSY on a DAU basis is difficult if not impossible due to the amount of detailed biological information about habitat and population size required. Additionally, carrying capacity is not static, the complex and dynamic nature of the environment cause carrying capacity to vary seasonally, annually, and trend over time. In most cases we would not desire true MSY management even if possible because of the potential for overharvest and the number of mature of bulls and bucks is minimized because harvest reduces recruitment to older age classes. However, the concept of MSY is useful for understanding how reducing densities and pushing asymptotic populations towards the inflection point can stimulate productivity and increase harvest yields. Knowing the exact point of MSY is not necessary if the goal is to conservatively reduce population size to increase yield. Long-term harvest data can be used to gauge the effectiveness of reduced population size on harvest yield.

Research in several studies in Colorado has shown that density-dependent winter fawn survival is the mechanism that limits mule deer population size because winter forage is limiting (Bartmann et al. 1992, Bishop et al. 2009). Adult doe survival and reproduction remain high but winter fawn survival is lower at higher population sizes relative to what the winter habitat can support. The intuition to restrict, or even eliminate, female harvest in populations where productivity is low and when populations are below DAU plan objectives is counterproductive and creates a management paradox. In that, for populations limited by density dependent processes, this “hands-off” type of management simply exacerbates and perpetuates the problem of the population being resource limited, and countermands the goals and objectives of the DAU plan. As Bartmann et al. (1992) suggest, because of density-dependent processes, it would be

counterproductive to reduce female harvest when juvenile survival is low and increase harvest when survival is high. Instead, a moderate level of female harvest helps to maintain the population below habitat carrying capacity and should result in improved survival and recruitment of fawns. Increased fawn recruitment allows for more buck hunting opportunity and a more resilient population.

Thus, the key for DAU planning and management by objective is to set population objectives in line with what the limiting habitat attributes can support. A population objective range aptly set must be below carrying capacity.

Literature Cited

Bartmann, R.M., G.C. White, L.H. Carpenter. 1992. Compensatory mortality in a Colorado mule deer population. Wildlife Monographs No. 121. 39 pp.

Bishop, C.J., G.C. White, D.J. Freddy, B.E. Watkins, and T.R. Stephenson. 2009. Effect of enhanced nutrition on mule deer population rate of change. Wildlife Monographs No. 172. 28 pp.

APPENDIX 2, Public Survey

SW Colorado Elk Herd Management Plans (HMP)

Colorado Parks & Wildlife (CPW) is interested in your input on the management of elk herds in southwest Colorado. Your input is a very important part of the planning process. The information you provide will help guide management of elk for the next 10 years.

This comment form is for each of the Data Analysis Units (DAU) below:

- Disappointment Creek - E24 (70, 71, 72, 73, and 711)
- Hermosa - E30 (74 and 741)
- San Juan Basin - E31 (75, 751, 77, 78 and 771)

Your responses will remain confidential and at no time will your name be associated with any of your responses.

Please complete this form by February 25, 2020. Your contribution to this process is vital; thank you for taking part.

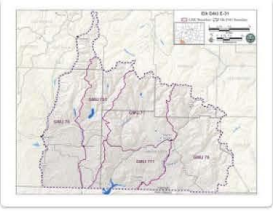
1. What Herd Management Plan (HMP) are you commenting on?

Select one. Once THIS survey is completed you are welcome to comment on another Herd Management Plan. Select "Submit another response" once this form has been submitted.

Mark only one oval.

E24 (70, 71, 72, 73, and 711)

E30 (74 and 741)



E31 (75, 751, 77, 78, and 771)

Please answer all questions below related to your selected HMP. Once THIS form is completed you are welcome to comment on another Herd Management Plan. Select "Submit another response" once this form has been submitted.

2. Which of the following best describes how you interact with elk in the above selected geographic area?

Select all that apply.

Check all that apply.

- ☐ As a viewer/wildlife watcher
- ☐ As a landowner
- ☐ As a hunter
- ☐ As a livestock/ag producer
- ☐ As an outdoor recreationist (e.g., hiker, biker, etc.)
- ☐ As a guide/outfitter

Other: ☐ _____

3. Which of the following activities do you enjoy in this DAU?

Select all that apply.

Check all that apply.

☐ Hunting

☐ Fishing

☐ Wildlife watching

☐ Non-motorized recreation (e.g., hiking, horseback riding, biking, snowshoeing)

☐ Motorized recreation (e.g., ATV, OHV, snowmobile)

☐ Livestock grazing

Other: ☐ _____

4. Elk in this DAU are important to me because elk...

Select one response for each statement.

Mark only one oval per row.

	Not Important	Slightly Important	Moderately Important	Very Important
Provide a hunting opportunity	⬭	⬭	⬭	⬭
Provide a wildlife viewing opportunity	⬭	⬭	⬭	⬭
Are a healthy part of the ecosystem	⬭	⬭	⬭	⬭
Provide an economic opportunity	⬭	⬭	⬭	⬭
Are an important part in the way I live	⬭	⬭	⬭	⬭
Are a nuisance or a safety concern	⬭	⬭	⬭	⬭

5. How important to you is each of the following reasons to hunt elk in Colorado? (Please check one response for each statement or skip this question if you do not hunt)

Select one response for each statement.

Mark only one oval per row.

	Not Important	Slightly Important	Moderately Important	Very Important
Spending time in nature	⬭	⬭	⬭	⬭
Spending time with family / friends	⬭	⬭	⬭	⬭
Physical exercise	⬭	⬭	⬭	⬭
Contributing to wildlife management	⬭	⬭	⬭	⬭
Sharing the habitat / landscape	⬭	⬭	⬭	⬭
Obtaining wild game meat	⬭	⬭	⬭	⬭
Harvesting a trophy	⬭	⬭	⬭	⬭
Contributing to the local community (e.g., financial benefits from hunters)	⬭	⬭	⬭	⬭
Other...	⬭	⬭	⬭	⬭

6. If answered, "Other" above please describe.

_____

7. During which of the following seasons do you most prefer to hunt elk in?

Check all that apply.

- [ ] I do not hunt
- [ ] Archery
- [ ] Muzzleloader
- [ ] Regular rifle
- [ ] Late season
- [ ] Private land only

8. From your experience do you believe the current elk population is...

Select one.

Mark only one oval.

- ( ) Decreasing
- ( ) Stable
- ( ) Increasing
- ( ) Not Sure

Please read the following description on one of many ways CPW may manage elk herds before answering the NEXT question.

CPW will continue to manage these elk herds for recreational opportunity, not higher bull:cow ratios.

To increase populations of elk, CPW may reduce the number of licenses in the short-term, allowing the population to grow. As the number of elk increase, CPW may choose to increase licenses in order to maintain population objectives in the long-term.

To decrease elk populations, CPW may increase the number of licenses in the short term. As the population declines, CPW may choose to decrease the number of licenses to sustain the population (within objectives), in the long-term.

9. Which option best represents how you would like to see this population of elk managed over the next 10 years.

Select one.

Mark only one oval.

- ( ) Increase greatly
- ( ) Increase somewhat
- ( ) Stay the same
- ( ) Decrease somewhat
- ( ) Decrease greatly

10. Are you a Colorado resident?

Mark only one oval.

- ( ) Yes
- ( ) No

11. How old are you?

_____

12. With what gender to you identify with?

Mark only one oval.

- ( ) Female
- ( ) Male
- ( ) Prefer not to say
- ( ) Other: _____

13. What is your current (residence) ZIP code?

14. Additional Comments

Please share any additional comments or thoughts.

Please click "Submit" below to record your responses.

Unsubmitted forms will NOT be recorded.

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APPENDIX 3, Comment Letters on Draft Plan

May 8, 2020

Brad Weinmeister
Colorado Parks and Wildlife
151 E. 16th St.
Durango, CO 81301

RE: San Juan Basin Habitat Partnership Program Comments - E31 HMP

Dear Mr. Weinmeister,

One of the initial reasons for creating the Habitat Partnership Program was to provide local landowners and other interests an opportunity to provide input into big game management in their areas. The diverse makeup of local HPP committees (3 livestock growers, Forest Service, BLM, CPW and sportsmen representatives) provide a good cross section of local interests to review DAU proposals and respond accordingly for CPW consideration.

HPP has two purposes; to resolve big game wildlife (deer, elk, pronghorn, moose) conflicts with agricultural landowners and to assist CPW to meet game management objectives for those same species. From those perspectives, the San Juan Basin HPP committee has discussed your presentation, reviewed the draft alternatives and offers these comments for consideration.

The San Juan Basin HPP committee supports the draft alternative to increase the number of animals within this DAU by 15%. While this increase returns the elk population to levels where conflicts with permittees on USFS allotments were previously reported, we believe we now have adequate resources to address conflicts should they reoccur. Additionally, sportsmen and other stakeholders have expressed the desire to expand hunting opportunity and see more elk on the landscape. Increasing the population objective will not immediately result in a greater number of hunting licenses due to the necessary continued limitation of antlerless licenses, however it should improve overall hunter satisfaction.

As stated above, HPP is also directed by statute to assist the Division to meet game management objectives. The San Juan Basin committee has worked with both public land managers and private landowners to improve the quality and quantity of the habitat in DAU E31. Adequate habitat, particularly on winter range, is critical to meeting game management objectives and we remain committed to maintaining and improving habitat in this area.

While the committee has concerns about the loss of winter range due to continued residential growth and increasing recreation demands on public lands, we are confident that CPW will be able to achieve the proposed objectives. The San Juan Basin HPP committee will support this management effort in partnership with the numerous local landowners and federal land management agencies that place a high priority on implementing valuable habitat improvement projects, and have expressed the desire to continue this work. It should be noted that the majority of sportsmen favor a larger population increase of 25%. However, with significant calf recruitment issues across southwest Colorado and particularly within this DAU, the committee believes that the proposed 15% increase within the 10-year time frame is more realistic.

Thank you for the presentation and the opportunity to provide these comments.

Sincerely,

George Malarsie, Chairman
San Juan Basin HPP Committee

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Tres Rios Field Office
29211 Highway 184
Dolores, Colorado 81323

In Reply Refer To:
6840 (LLCOS01000)
CPW Draft Elk Herd Management Plans

April 21, 2020

Mr. Brad Weinmeister
Wildlife Biologist
Colorado Parks and Wildlife
151 East 16th Street
Durango, CO 81301

Mr. Weinmeister:

Thank you for the opportunity to comment on the Colorado Parks and Wildlife Draft Elk Herd Management Plans for E-24, E-30, and E-31. The Bureau of Land Management (BLM) Tres Rios Field Office has appreciated our longstanding working relationship with Colorado Parks and Wildlife (CPW) and partnership in managing wildlife habitats in the Tres Rios Field Office.

In the draft herd management plan for E-24 you state "Loss of habitat from development influences both carrying capacity and harvest management", and CPW research shows that undeveloped lands have decreased from 20% to 11%. You then go on to state "With a shrinkage of winter habitat we can epect to see a reduction in the elk population." With the decrease in habitat we would expect to see a decrease in the carrying capacity for any given elk herd. Based on the draft Elk Herd Management Plan, elk herd populations have remained relatively constant since 1998.

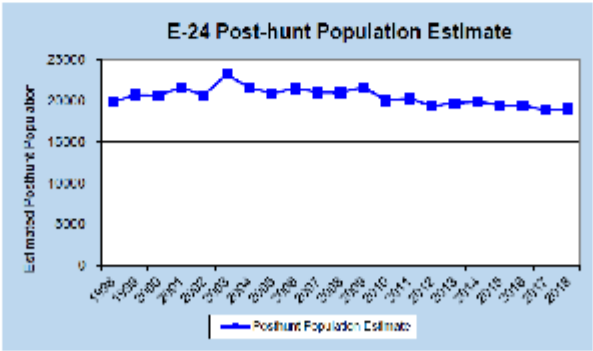

Figure 4. E-24 Post-hunt population estimate from 1998 to 2018.

In light of this information and to assist CPW in making management decisions within each herd area, the BLM Tres Rios would like to encourage CPW to gather utilization data in elk winter concentration areas. This data would help inform the decision when choosing between alternatives identified in the Herd Management Plans. Increasing the herd by 25% or maintaining the current objectives could greatly impact utilization of winter concentration areas, of which 39% is BLM and 39% is private surface. Prior to selecting an alternative that may increase objectives, CPW should demonstrate that utilization in winter concentration areas are acceptable and can support any identified increase.

We applaud the research CPW has conducted looking at the impacts of increased habitat fragmentation on big game populations.

The Tres Rios Field Office has recently completed analysis of Transportation Area 1 (Montezuma, La Plata and Archuleta counties) on BLM lands and is beginning the analysis for Area 2. We look forward to working with CPW as a cooperating agency to identify areas where management can be improved for big game in the Tres Rios Field Office.

Sincerely,

/s/ Connie Clementson

Connie Clementson
Field Manager

cc: Nathaniel West, Wildlife Biologist

USDA United States Department of Agriculture | Forest Service | San Juan National Forest

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File Code: 2610
Date:

Brad Weinmeister, Wildlife Biologist
Colorado Parks and Wildlife
151 East 16th Street
Durango, CO 81301

Dear Brad,

The San Juan National Forest (SJNF) appreciates the opportunity to comment on the Draft San Juan Basin Elk Herd Management Plans for Data Analysis Unit (DAU) E-24, E-30, and E-31. These DAUs overlap portions of the Dolores, Columbine, and Pagosa Ranger Districts. As stated in the Draft Plans, the primary decisions needed for individual Herd Management Plans (HMPs) are how many animals should exist in the DAU, and what is the desired sex ratio for the population of big game animals (e.g., the number of males per 100 females). The life of the plans are 10 years and may be revised in the 10-year timeline if conditions change.

As stated in the Draft HMPs, the following population objectives for each DAU are proposed. A preferred alternative will be proposed in the final HMPs and presented to the Colorado Parks and Wildlife Commission for adoption.

DAU E-24

Alternative 1: 17,000 – 20,000 elk post-hunt (current population)

Alternative 2: 20,000 – 23,000 elk post-hunt (15% increase)

Alternative 3: 22,000 – 25,000 elk post-hunt (25% increase)

DAU E-30

Alternative 1: 6,500 – 7,500 elk post-hunt (current population)

Alternative 2: 7,500 – 8,500 elk post-hunt (15% increase)

Alternative 3: 8,500 – 9,500 elk post-hunt (25% increase)

DAU E-31

Alternative 1: 21,000 to 24,000 (current population)

Alternative 2: 24,000 to 27,000 (15% increase)

Alternative 3: 26,000 to 29,000 (25% increase)

The Draft HMPs provide information on current herd status and management objectives, habitat resource and capabilities, herd management history, herd issues and strategies, and public involvement. As mentioned in the HMPs, NFS lands comprise 25% of DAU E-24, 42% of DAU E-30 and 55% of DAU E-31 with remaining lands consisting of Bureau of Land Management lands, private lands, Southern Ute Indian Reservation, Ute Mountain Ute Indian Reservation, National Park Service, Colorado Parks and Wildlife and State Land Board.

As described in the Draft HMPs, habitat loss through development is a significant issue across all three DAUs. A combination of urban, exurban, energy and recreational development is occurring on a significant portion of important habitat in all three DAUs and is a considerably larger problem near Durango and the Animas River valley and areas west of Pagosa Springs. Development of all types can pose a threat to blocking or cutting off migration routes and reducing their effectiveness, causes direct and indirect loss of habitat, and influences both carrying capacity and harvest management.

All three Draft HMPs describe winter range being a limiting factor for elk herds in the San Juan Basin. The HMPs also state that winter range is continually being lost due to development (residential, energy, and recreational) and will be lost at a greater rate with the expected human population growth. The Draft HMPs cite research by Johnson et al 2016, noting "with a shrinkage of winter habitat, we can expect to see declining recruitment rates and reduction in the elk population, currently the greatest issue for the San Juan Basin Elk herd."

The SJNF shares CPW's concerns with respect to population growth and habitat loss, particularly the direct, indirect, and cumulative impacts to elk winter range. As mentioned in the Draft HMPs, winter range, severe winter range and winter concentration areas occur on lands managed by the SJNF. The vegetation types present in these areas are primarily sagebrush, mixed mountain shrublands, mountain grasslands, pinyon juniper, Gambel oak, cottonwood riparian, ponderosa pine and aspen. As shown in the Draft HMP for DAU E-24, approximately 20% of the winter range, 6% of the severe winter range, and 22% of the winter concentration areas for elk occur on the SJNF. Approximately 25% of the winter range, 4% of the severe winter range, and 43% of the winter concentration areas for elk in DAU E-30 occur on the SJNF. Approximately 45% of the winter range, 53% of the severe winter range, and 42% of the winter concentration areas for elk in DAU E-31 occur on the SJNF. For all DAUs, the remaining portions of winter range occur on other jurisdictions. These percentages clearly show lands managed by the SJNF contribute important winter habitat and migration routes for the San Juan Basin elk herd. Continued loss or impact to winter range, particularly on private lands will further increase the importance of public land wintering habitat.

The SJNF recently completed a winter range habitat analysis for all three DAUs utilizing vegetation information from the Forest's Geographic Information System (GIS) database, CPW winter range GIS habitat layers from the 2015 all Species Activity Mapping database, and forage and cover values described by Towry (1987) to estimate habitat capability. The Forest's vegetation database provides information on Habitat Structural Stages (developmental stages of vegetation) as determined through stand exam surveys, field reconnaissance, satellite imagery, and other methods. The Forest's vegetation database also accounts for management activities (timber harvest, prescribed burns, road and trail construction, etc.) along with natural disturbances such as wildfires that affect structural conditions of forest vegetation, and therefore is an accurate reflection of current conditions.

As defined by Thomas (1979) "optimum deer and elk habitat is the amount and arrangement of cover and forage areas that result in the maximum possible proper use of the maximum possible area by the animals." In the Blue Mountains of Oregon, a ratio of 60 percent forage to 40 percent cover is optimum. This ratio has been widely adopted in many forested elk habitats across western states. Towry (1987) identifies the following Habitat Structural Stages (HSS) as having either forage or cover value in most habitats where forage availability in forested ecosystems is inversely related to the amount of tree over-story.

> Forage: 1) Grass-forb, 2) Shrub-seedling, and 3a) Sapling-pole <40% canopy cover (cc) 4a) Mature <40% cc, as highly valuable, and
>
> Cover: 3b) Sapling-pole 40-69% cc, 3c) Sapling-pole >69% cc, 4b) Mature 40-69% cc, 4c) Mature >69% cc, and 5) Old-growth as highly valuable.

Quantifying the ratio of forage to cover on NFS lands across each DAU was accomplished using the HSS information above. Our analysis does not distinguish which cover values provide forage and which forage values provide cover, nor does it distinguish between hiding cover and thermal cover. Additionally, the analysis represents vegetative conditions related to forage and cover, and not overall habitat quality or effectiveness. Consequently, winter range classifications that meet or exceed recommended forage to cover ratios may not necessarily meet or exceed optimum conditions for providing quality elk habitat.

As shown in Table 1, forage to cover ratio's for winter concentration and severe winter range in DAU E-24 are close to the recommended forage to cover ratios, with total winter range showing a slight inverse. Forage to cover ratios in DAU E-30 are the direct opposite of the recommended forage to cover ratios. Forage to cover ratios for total winter range and winter concentration habitat in DAU E-31 show an inverse of the recommended ratios, with severe winter range showing a ratio close to the recommended values.

Table 1. Winter Habitat on SJNF by DAU			
Winter Habitat Classification	**DAU E-24**	**DAU E-30**	**DAU E-31**
Winter range - forage	78,.77	14,970	82,490
Winter range -- cover	80,.01	43,195	130,966
Total winter range	158,278	58,165	214,456
Forage to cover ratio	**49:51**	**26:74**	**39:61**
Winter concentration - forage	26,764	4,339	50,013
Winter concentration - cover	16,734	14,787	55,866
Total winter concentration	43,498	19,126	105,879
Forage to cover ratio	**62:38**	**23:77**	**47:53**
Severe winter range - forage	10,354	987	28,227
Severe winter range - cover	6,122	2,686	25,422
Total severe winter range	16,476	3,673	53,649
Forage to cover ratio	**63:37**	**27:73**	**53:47**

The primary purpose of this analysis was to display existing elk winter range across lands managed by the SJNF in each DAU, display the Forest's contribution to elk wintering habitat across the San Juan Basin, demonstrate where management should continue to improve winter habitat for elk, and provide information for CPW consideration in determining elk population carrying capacity based on available winter range habitat capability on NFS lands. The Forest recommends CPW conduct winter range habitat analyses on other jurisdictions, by partnering with other land managers and private lands owners to gain a better understanding of winter habitat capability and carrying capacity for elk across the San Juan Basin.

Our analysis shows that habitat enhancement efforts are needed across much of the Forest's elk winter range to promote vegetative conditions that meet more desirable forage to cover ratios. Improving forage to cover ratios will help sustain elk for longer durations on public lands, thereby minimizing impacts on adjacent private lands and other jurisdictions. Improving conditions on winter range can be accomplished through continued implementation of forest restoration projects that achieve multiple resource objectives such as fuels reduction, and wildlife

habitat and watershed improvement projects. The Forest Service, CPW, and other partners have implemented habitat enhancement projects in winter range and important migration corridors. Projects have been implemented where habitat quality has declined due to forest succession and heavy forage use by big game. Some examples of these projects include prescribed burns, mechanical vegetation treatments, water developments, wildlife friendly fencing projects, and others. Numerous studies show that large ungulates benefit from the ecological impacts of fire, whether that be from prescribed fire or wildfire. We will continue expanding our use of fire on the landscape to benefit elk where and when appropriate. Additionally, when opportunities exist, the Forest will engage in land acquisitions of important big game wintering habitat consistent with the Land and Resource Management Plan (LRMP).

Where opportunities exist, the Forest will continue efforts to improve vegetation conditions in summer and transition ranges. Management actions utilized to improve summer elk ranges may include timber management focused on reducing the densities of dead and dying trees in high-elevation spruce-fir forests, thereby increasing forage potential and enhance movement and dispersal through impacted forests. Management actions utilized to improve transition ranges in mid-elevation forests may include ponderosa pine forest restoration, aspen regeneration, and managing mixed conifer forest to more closely resemble historic range of variability. Projects are ongoing and planned in summer and transition ranges through coordination with CPW, collaborative groups and other partners, and through public involvement.

The draft herd management plans state "Loss of habitat from development influences both carrying capacity and harvest management", and CPW research shows that undeveloped lands have decreased from 20% to 11% in E-24, from 22% to 9% in E-31 and from 32% to 21% in E-30. The draft plans then state "With a shrinkage of winter habitat we can expect to see a reduction in the elk population." With the decrease in habitat we would expect to see a decrease in the carrying capacity for any given elk herd. Based on the draft Elk Herd Management Plan for E-24, elk herd populations have remained relatively constant since 1998, E-30 populations have declined overall from 1998 but shown a recent increase from the lowest point, and E-31 populations have remained fairly stable since 2005.

Based on this information, the SJNF would like to encourage CPW to collect additional utilization data in elk winter range areas. These data would help inform the decision when choosing between alternatives identified in the Herd Management Plans. Increasing the herd by 25% or maintaining the current objectives could greatly impact utilization of winter range (concentrations areas, severe winter range, and overall winter range), of which the SJNF has approximately 219,000 acres. Prior to selecting an alternative that may increase objectives, CPW should demonstrate that utilization in winter range areas are acceptable and can support any identified increase.

Based on the Forest's winter range habitat analysis and anticipated loss of elk habitat in the DAUs, we recommend CPW establish herd management objectives compatible with current and projected habitat resources and capabilities in winter range. We also encourage CPW to monitor habitat loss correlated with human population growth across the DAUs. As stated in the HMPs, "managers and the public are increasingly concerned over cumulative and prolonged impacts disrupting migration and decreasing quality and quantity of habitat. Development influences both carrying capacity and harvest management." The Forest agrees with CPW's conclusions

regarding the cumulative impacts from habitat loss and their relationship to carrying capacity and harvest management. The Forest also recognizes public input is essential for helping formulate management objectives in HMPs, and while there may strong interests to increase populations for harvest opportunity, we believe increases should be compatible with the carrying capacity of available habitat. We also encourage CPW to prioritize research on recruitment in elk populations as all three DAUs show decreased cow-calf ratios over the last 14 years.

The SJNF will continue committing resources to assist CPW in managing elk populations by implementing habitat management direction in severe winter range, winter concentration areas, migration corridors and parturition areas consistent with the LRMP. The LRMP contains objectives and management direction to maintain or improve habitat quality, protect migration corridors, and minimize impacts from management actions to big game populations. These objectives and direction were developed in coordination with CPW during the LRMP revision process completed in 2013.

We appreciate the opportunity to comment on the draft elk herd management plans. In addition, we value our close working relationship with CPW and our collaborative efforts. If you have any questions on our comments, please contact Mary Hammer, Fish and Wildlife Program Lead, at 970-385-1345.

Sincerely,

KARA L. CHADWICK
Forest Supervisor

Literature Cited

Thomas, J. W. 1979. Wildlife Habitats in Managed Forests of the Blue Mountains of Oregon and Washington. USDA, Forest Service Handbook No. 553.

Towry, R. K. 1987. Wildlife habitat requirements. Pages 73-209 in Hoover, R. L., and D. L. Wills eds Managing forested lands for wildlife. Colorado Division of Wildlife in cooperation with USDA Forest Service, Rocky Mountain Region, Denver, CO

La Plata County
Colorado

Board of County Commissioners

Clerk Church, Chair • Gwen Lachelt, Vice Chair • Julie Westendorff, Commissioner

41 East 2nd Ave
Durango, CO 81301
(970) 382-6239

April 28, 2020

Colorado Parks and Wildlife
Attn: Brad Weinmeister
151 E 16th Street
Durango, Colorado 81301

RE: CPW San Juan Basin Elk Herd Management Plan

Dear Mr. Weinmeister:

La Plata County appreciates the opportunity to provide a letter of support and comment to Colorado Parks and Wildlife (CPW) for the San Juan Basin Elk Herd preliminary management plan. CPW identified the following primary areas of impact to the Hermosa elk herd as:

1. Critical habitat loss in areas of winter range, migration corridors, production areas and high elevation summer range from population increase;
2. Exurban development in areas that support winter range habitat open areas; and
3. Outdoor recreation encroaches into areas previously unused disrupting elk reproduction and migration.

This plan outlines the management steps needed to continue CPW's objectives and provides mitigation to protect this natural resource. Tourism provides economic benefits to our local economy from hunters, trail users and outdoor enthusiasts. Outdoor recreationist demands for more trails results in more big game conflicts. La Plata County continues to support seasonal closures and area access restrictions for big game in order to protect winter range activities for all wildlife.

La Plata County supports CPW working with the Living with Wildlife Advisory Board to help educate the public about impacts from recreation near critical habitats. La Plata County will continue to help educate through the Land Use Code by way of developers and how to help manage living in an area that supports big game wildlife. CPW's capacity to regionally manage a flexible plan for elk within La Plata County benefits our local community and creates economic value to our area.

CPW has noticed elk herds across the southwest landscape facing declining calf recruitment. As such, additional research is needed in order to understand the source of this decline and what management actions can be implemented to aid calf recruitment.

La Plata County staff technical comments:

1. It is recommended that the cow to calf ratio be added to this analysis, in an effort to clarify declining populations and the significance this ratio plays in herd dynamics.
2. Management Objectives. These alternatives, or an introduction to these alternatives, should address the inconsistencies between CPW's model data and the observed herd status. Detailed analysis of the inconsistencies between the contradicting data sets should be provided in the Current Herd Status and Management Objectives portion of the document.
3. Introduction and Purpose. It is recommended that the bull to cow ratio be expanded on in this section to identify what portion of the bull population is taken into consideration. Bulls, including those that have not yet reached maturity or are not legal for harvest, should be included in order to identify the significance of maturity impacts to the population as a whole.
4. Harvest. It is recommended that the factors preventing CPW from implementing mandatory hunter harvest check-in be included in this section. This is common practice in other wildlife management programs and provides an opportunity for additional data to allow for more accurate population estimates and assessments within CPW's model. Additionally, this provides an opportunity for wildlife managers to interact with and further educate the public.
5. Management Strategies:

    - Predation. It is recommended that the management strategy of implementation of black bear over-the-counter add on tags be explained and analyzed in this section. Information on anticipated impacts to elk population should also be addressed in this section.

    - Development in Critical Elk Habitats. It is recommended that CPW prioritize winter range and production area mitigation measures or restrictions when responding to required permit notices for development activities within La Plata County.

    - Chronic Wasting Disease (CWD). It is recommended that, as a part of the hunter harvest check-ins analysis (as described above under Harvest), there is consideration to provide opportunity for CWD testing. Further availability of testing will provide CPW with data that can be utilized to monitor the spread of CWD and serve as an early detection system in elk herds. Continued education about the disease is recommended.

La Plata County appreciates this opportunity to participate and comment on this plan. We recognize the importance of what CPW is trying to accomplish with elk herds and how to best

manage them. Thank you for your coordination in helping to ensure reduced conflict for elk, while working to meet everyone's best interest.

Sincerely,

LA PLATA COUNTY
BOARD OF COUNTY COMMISSIONERS

Clyde Church
Chair

Gwen Luchelt
Vice Chair

Julie Westendorff
Commissioner

BACKCOUNTRY
HUNTERS & ANGLERS
COLORADO

Via brad.weinmeister@state.co.us

Brad Weinmeister
Wildlife Biologist
Colorado Parks and Wildlife
151 East 16th St.
Durango, CO, 81301

Re: Draft Herd Management Plans for DAU E-24, E-30 and E-31

Dear Brad:

Colorado Backcountry Hunters and Anglers ("BHA") sincerely appreciates the opportunity to provide comments on the Draft Herd Management Plans ("HMP") for DAU E-30, E-31 and E-24. Generally speaking, BHA supports science-based herd management in Southwestern Colorado, as it does elsewhere in the State and the Nation. BHA also appreciates the immense difficulty in modeling and implementing successful management plans regardless of the objective.

BHA believes, however, that across all HMPs, Colorado Parks and Wildlife ("CPW") should select Objective 3. Increasing the elk population by 25% will provide significant benefits to CPWs management system and it will also accommodate potential population losses in the future from anthropogenic impacts caused by increased recreation, habitat fragmentation and predation. Indeed, 2020 Big Game Season Structure and the HMPs should work together to provide opportunity while improving herd health. Moreover, BHA agrees with each of the HMPs that selecting the highest population objective (*e.g.* increase by 25%) will require a concerted "commitment to improve and protect elk habitats." HMP E-30 at 18. For example, in DAU E-30, recreation is, and has been, putting incredible pressure on elk herds during all life stages including breeding, calving and wintering and it is essential that CPW use the HMPs to provide uniform evidence of the issues to the Bureau of Land Management ("BLM") and the U.S. Forest Service ("USFS") on motorized and nonmotorized travel plans and projects.

BHA also supports the laundry list of strategies to address development in critical habitat. This list, however, could be improved with additional details regarding the various

strategies. For example, how would migration corridors be prioritized and subsequently protected? In other states, for example, CPW holds significant say over federal land management decisions and CPW should seek similar authority through the Governor to protect big game herds. BHA also believes that CPW should identify compensatory mitigation strategies for energy development in critical winter range, recreation impacts in summer parturition areas and close coordination with local governments in planning and zoning urban and exurban development.

Chronic Wasting Disease may become a greater problem if CPW, USFS, BLM and other agencies do not map and manage migration corridors, stopover areas and bottleneck points along those migration corridors. BHA is also aware of the unique relationship between CWD prions and predation by wolves, coyotes, lions and bear. It is, therefore, that the management strategies identified also do not ignore the overlap between predator and prey on the landscape.

Lastly, each HMP would benefit greatly from an explanation of why the modeled post-hunt population estimate may be above objective while other evidence demonstrates that calf recruitment has not recovered since 2006. Significant literature explains the problems associated with aerial surveys of elk, wild horses and other wildlife and CPW could, and should, attempt to explain the errors or explain why calf recruitment is more accurate.

BHA applauds CPW for taking a hard look at a hard issue and engaging the public in managing and protecting our elk herds. We look forward to the final drafts and encourage BLM to manage for a 25% increase in elk objectives.

Cody B. Doig, ESQ
Assistant SW Chapter Director
Backcountry Hunters and Anglers