E-34 Upper Rio Grande Elk Herd Management Plan

Game Management Units 76 and 79

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Revised By

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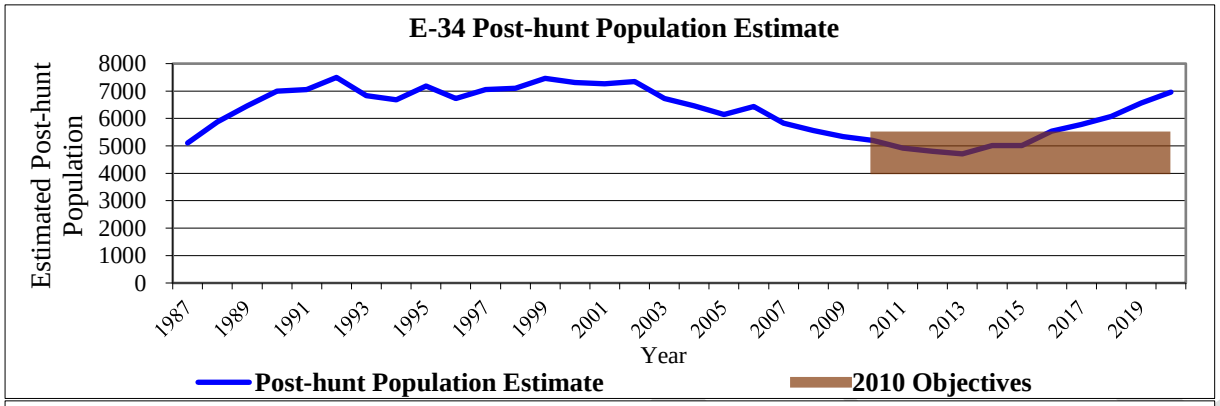
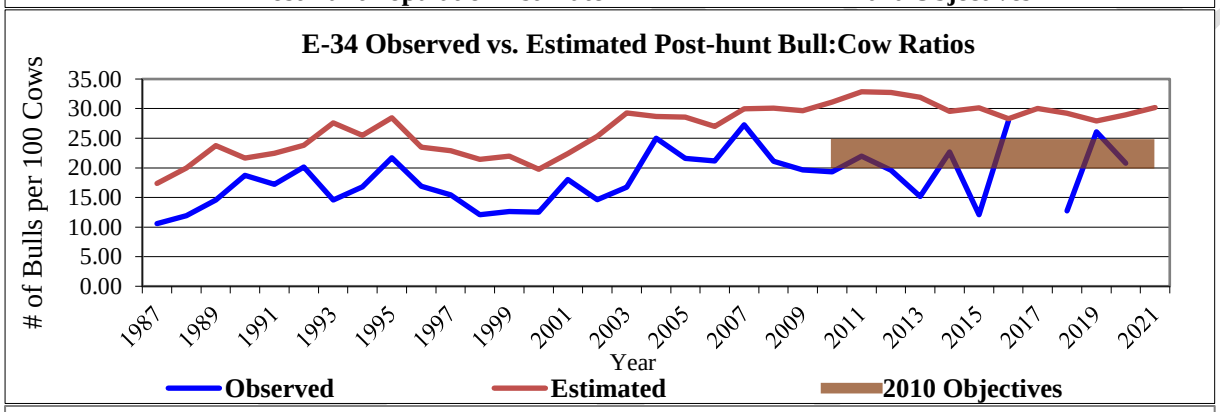
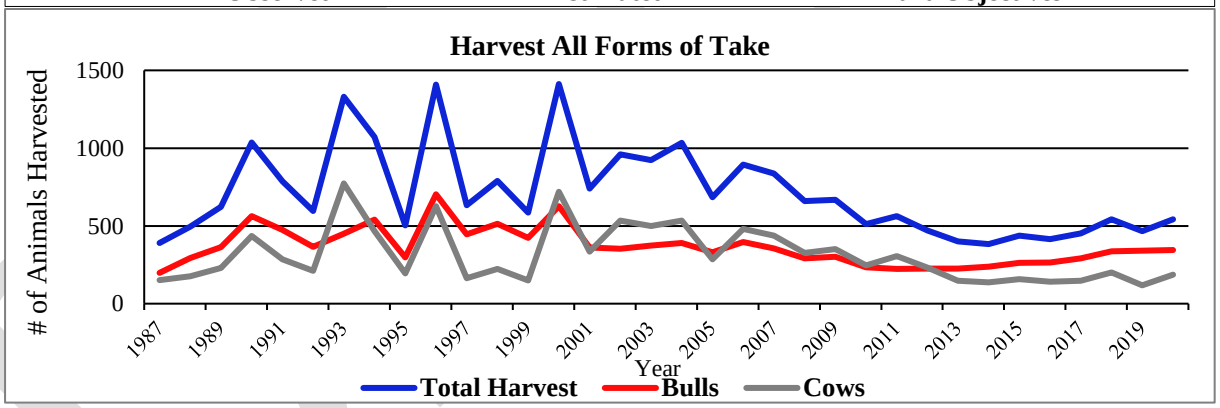
Draft

Upper Rio Grande E-34 HMP Executive Summary

GMUs: 76 and 79	**Land Ownership:** 2% BLM, <1% CO State, 81% USFS, 0% USFWS, <1% State Land Board, and 17% Private.
2020 Post-hunt Population Estimate: 7,000 elk	**Post-hunt Observed Sex Ratio (Bulls per 100 Cows):** 29 (Estimated 3-yr average)
2010-2021 (Previous Herd Plan Objectives):	4,000 to 5,500 elk; 20-25 Bulls per 100 Cows.
2022-2032 (Preferred Herd Plan Objectives):	6,000 to 8,000 elk; 20-25 Bulls per 100 Cows.







The E-34 elk herd is in the western region of the San Luis Valley. The DAU (geographic area) comprises Game Management Units (GMUs) 76 and 79, approximately 1,478 square miles. Elk winter range within the DAU includes roughly 569 square miles, whereas the summer range encompasses about 999 square miles. Portions of Hinsdale, Mineral, Rio Grande, Saguache, and San Juan counties make up the entire area. Public land constitutes about eighty-three percent of the DAU, while almost seventeen percent of the area is privately owned.

The average population size of E-34 remained relatively stable throughout the 1990s at just over 7,000 animals, continuing into the early 2000s. Subsequently, the population trend dropped to its lowest level in 2013 at approximately the mid-point of the objectives set in 2010. From 2013, the population has been on an upward trend to its current (2020) estimated level of roughly 7,000 animals, which is above the high end of the current population objective range.

The E-34 observed sex ratios fluctuated considerably since the early 1990s. Most of the variation in this DAU has been due to locating bull groups within the limited flight time. In 2016, the observed sex ratio reached its highest point since Colorado Parks and Wildlife (CPW) first recorded classification data in the late 1980s (approximately 28 bulls per 100 cows). The model-estimated sex ratio has been relatively stable, averaging roughly 29 bulls per 100 cows over the previous five years. The current sex ratio objective range remains feasible for sustaining an acceptable mature-bull population while simultaneously allowing reasonable hunting opportunities. Hunters in GMU 76 reap the majority of the mature-bull population harvested; however, as the winter conditions progress, many of

the mature bulls migrate over the Continental Divide to neighboring units or the higher elevations of GMU 79.

Bull harvest in E-34 averaged 409 animals from 1987 through 2009. Since 2010, the average bull harvest dropped to 271 animals. Comparatively, cow harvest averaged 374 animals between 1987 and 2010. From 2006 to 2012, more cows were harvested than bulls; CPW believes this contributed to the decline in population. Currently, CPW limits all hunting in GMU 76. In GMU 79, licenses are limited except during the archery either-sex over-the-counter (OTC) season and on private land east and south of Colorado Highway 112.

The OTC archery either-sex season in GMU 79, unlimited in license numbers since 2015, has been associated with an increasing number of hunters. Archery success rates in GMU 76 have been trending upward since 2005, averaging about thirty-nine percent after implementing the previous HMP. In contrast, the average archery success rate has been four percent in the same timeframe. The increasing number of archery hunters in GMU 79 likely influences success rates. The earlier rifle seasons usually have higher success in GMU 76, with the Early-October Rifle season achieving almost an eighty percent success and the First Rifle season about fifty-one percent success. Conversely, the GMU 79 rifle and muzzleloader seasons have had less than ten percent average harvest success.

The E-34 population estimate has been above the current objective range since 2016 and is currently around 7,000 animals. CPW would need to render significant effort to reduce the population to the current objectives if they were to remain; this would likely entail providing additional cow licenses in GMUs 76 and 79 for all seasons. However, local stakeholders have not favored proposals to increase cow licenses in the past. An increase in objectives would incorporate the current population estimate, although CPW may temporarily provide additional cow harvest opportunities to curtail the upward population trend.

The principal factors limiting the E-36 population are the amount of precipitation affecting the quantity and quality of forage, essential in the winter range and production areas. The winter range continues to diminish with increased development on private land and competition with domestic livestock. Similarly, summer recreational activities continue to increase throughout the DAU. The various anthropogenic impacts on the summer and winter range could alter elk distribution, reproduction, calving efforts and ultimately restrict population growth. Alternatively, the increased forage availability resulting from the 2013 West Fork Complex Fires may support a more robust elk herd, affecting elk migration.

Game damage issues continue to occur in the DAU, particularly along the Rio Grande in GMU 79. Since 2019, CPW has handled most depredation issues by providing vouchers to landowners permitting elk harvest east and south of Colorado Highway 112. The additional pressure should also help distribute the animals to hunter-accessible public land. Depredation concerns are minimal in GMU 76; however, CPW continues to evaluate and provide game damage licenses to private landowners in GMU 79 north and west of Colorado Highway 112 as needed.

Management Alternatives

In Data Analysis Unit E-34, four alternatives were considered for the **post-hunt population size** and three alternatives for the **post-hunt sex ratio** objectives:

Post-hunt Population Objective Alternatives:			Post-hunt Observed Sex Ratio Objectives	
3,500 to 5,000	**Approximately 10-12% decrease in objectives**		**18 to 23 Bulls per 100 Cows**	
4,000 to 5,500	**Remain the same**		**20 to 25 Bulls per 100 Cows**	**Preferred**
5,000 to 7,000	**Approximately 25-27% increase in objectives**		**23 to 28 Bulls per 100 Cows**	
6,000 to 8,000	**Approximately 45-50% increase in objectives**	**Preferred**		

Preferred Objectives:

Post-hunt Population

The preferred post-hunt population objective range for E-34 is **6,000 to 8,000 elk**, aiming to stabilize the population and sustain the herd at its current estimated population level. This objective range provides the best balance for managing the herd, hunting recreational opportunities, minimizing agricultural conflicts, and maintaining habitat carrying capacity.

Post-hunt Sex Ratio

The preferred post-hunt sex ratio objective range is **20-25 bulls per 100 cows** for the E-34 elk herd. Most stakeholders have been relatively satisfied with their hunting experience and the level of bull maturity observed within the herd. The preferred range creates the best balance between the desired hunting experience and harvesting a mature bull elk in the DAU.

Strategies for Achieving the Preferred Objectives:

Post-hunt Population – CPW will continue collecting annual inventory data and manage to the preferred elk population objectives. Cow hunting opportunities may initially increase slightly to curb the upward trend in population growth. Once the estimated population is stabilized within the objective range, CPW may consider conservatively providing cow licenses to maintain the population within the preferred range. The herd's ability to be maintained within the preferred objective range during the next ten years is conceivable, as long as calf recruitment and forage availability remain strong. Tools to control private land depredation issues will remain in place. CPW may consider additional cow harvest opportunities if the population estimate increases towards the upper levels of the objective range or significant deterioration in habitat conditions occur.

Post-hunt Sex Ratio – GMU 76 will remain a limited unit for all hunting seasons, whereas GMU 79 would maintain the limited muzzleloader and rifle seasons and continue the OTC archery season. Once the estimated sex ratio falls within the preferred objective range, CPW may restrict licenses based on the average sex ratio performance. Nonetheless, bull licenses would likely remain the same, allowing for the desired maturity and acceptable harvest opportunities.

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Herd Management Plans and Wildlife Management by Objectives

Figure 1. The objective process used by Colorado Parks and Wildlife to manage big game populations on a DAU basis.

Colorado Parks and Wildlife (CPW) writes Herd Management Plans (HMPs) for big game populations in specific geographic areas represented as Data Analysis Units (DAUs). A DAU comprises one or more Game Management Units (GMUs). The area also represents the year-round distribution of a specific big game herd. CPW manages big game populations using a "management by objective" approach. The management style guides a cycle of data collection, data analysis, and the resulting decision-making processes (Figure 1). HMPs establish long-range (ten-year) management objectives and describe how CPW proposes accomplishing these in a specific DAU. A significant outcome is the availability of hunting seasons for big game harvest opportunities.

CPW designed the HMP process to use big game harvest as a tool to achieve the identified objectives. The method incorporates public desires, habitat conditions, and herd biological capabilities into the final management strategy. The general public, hunters, commissioners, federal land management agencies, private landowners, and agricultural interests are involved in developing the HMP objectives. Biologists from CPW use input from all stakeholders to contemplate the preferred objectives. Finally, the HMPs go through the Colorado Parks and Wildlife Commission (PWC) approval process before implementation.

CPW manages individual herds to meet the specific HMP objectives. First, biologists compile data and transfer it into population models to derive estimates. The parameters used in the models include harvest data calculated from hunter surveys, sex and age composition collected from aerial flight inventories, and mortality factors. Mortality factors comprise roadkill reports, wounding-loss estimates, and deaths from winter severity received during field observations. Thereafter, biologists compare the computed population estimates to the herd objectives. CPW then establishes the number of hunting licenses to manage the population to the preferred objectives.

Description of the Data Analysis Unit (DAU) E-34

Location

The Upper Rio Grande elk herd (E-34) is in south-central Colorado, in the western region of the San Luis Valley (SLV). The herd comprises game management units (GMUs) 76 and 79 (Figure 2).
The Continental Divide bounds the DAU on the western side, U.S. Highway 160 on the southern side, Colorado Highway 285 on the eastern side, and the Continental Divide and Rio Grande/Saguache Creek divide to the north. E-34 is approximately 1,478 square miles in area, containing roughly 569 square miles of winter range and about 999 square miles of summer range. The DAU comprises portions of Hinsdale, Mineral, Rio Grande, Saguache, and San Juan counties. Primary drainages in the area are Alder Creek, Bear Creek, Bellows Creek, Embargo Creek, Goose Creek, Rio Grande, Squaw Creek, Trout Creek, and Ute Creek.

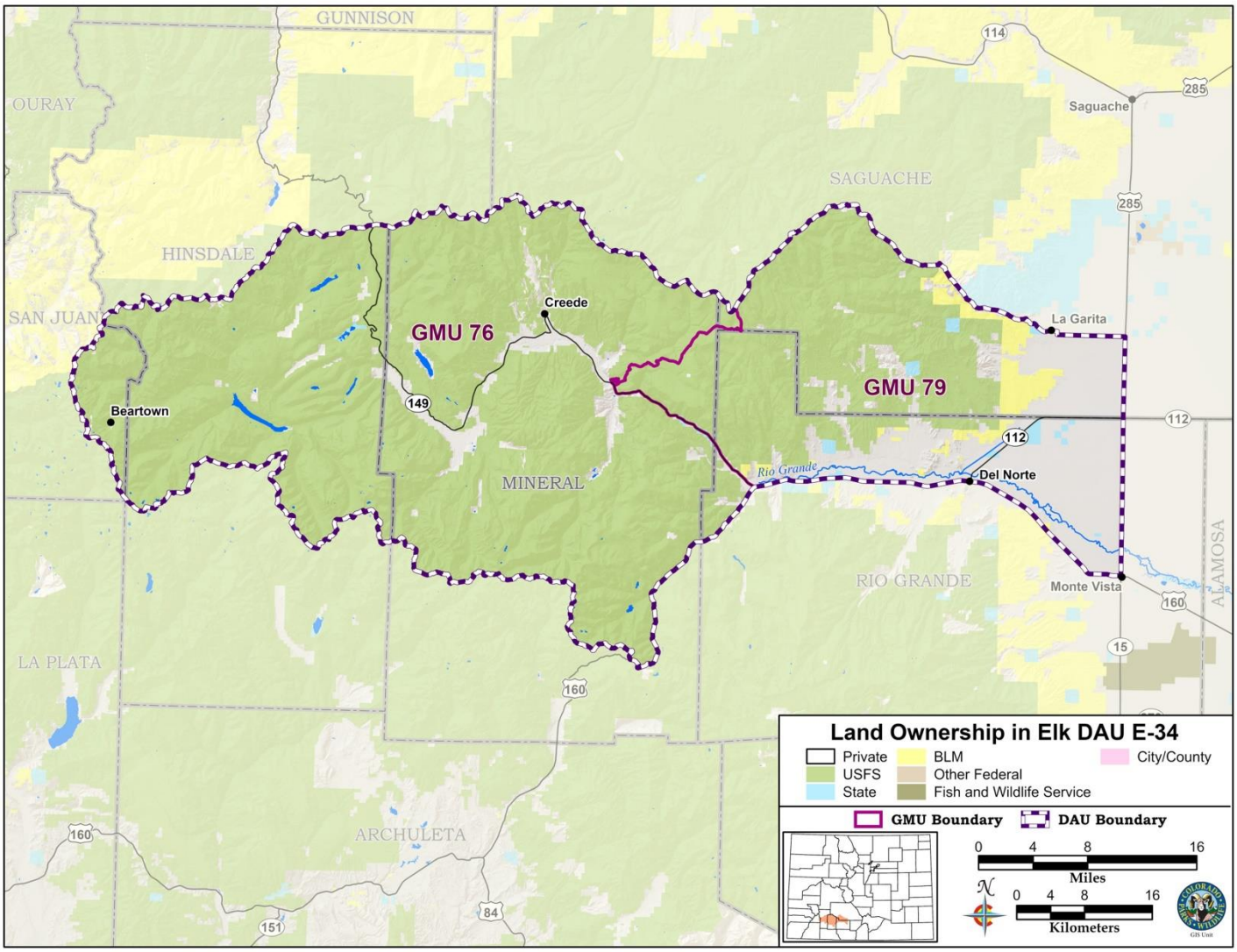

Figure 2. Geographic boundaries with landownership for the E-34 (GMUs 76 and 79) elk herd in southwestern Colorado.

Landownership, Climate, and Vegetation

The E-34 elevation ranges from approximately 7,600 ft. on the valley floor to almost 14,000 ft. along the Continental Divide. Public land comprises approximately 83% of the DAU, and roughly 17% is privately owned (Figure 2, Table 1).

At the lower elevations, grassland, shrub, and agriculture are predominant. As the elevation rises, precipitation levels increase, and the vegetation changes to oakbrush, pinyon-juniper, and ponderosa pine. After that, Douglas fir and white fir combined with extensive stands of aspen groves flourish. Engelmann spruce, lodgepole pine, and subalpine fir become predominant between 9,500 and 12,500 feet in elevation. Alpine tundra prevails above 12,500 feet in elevation.

Table 1. Land ownership in the summer range, the winter range, the winter concentration areas, and the severe winter range for the E-34 elk herd.

	Summer Range	Winter Range	Winter Concentration Areas	Severe Winter Range	Total DAU Area
Total Area within the DAU	**68%**	**39%**	**14%**	**16%**	**100%**
BLM	**<1%**	**<1%**	**<1%**	**<1%**	**2%**
Colorado State (CPW)	**<1%**	**<1%**	**<1%**	**<1%**	**<1%**
U.S. Fish and Wildlife Services (FWS)	**0%**	**0%**	**0%**	**0%**	**0%**
Private	**1%**	**9%**	**5%**	**6%**	**17%**
State Land Board (SLB)	**<1%**	**<1%**	**<1%**	**<1%**	**<1%**
U.S. Forest Service (USFS)	**66%**	**28%**	**9%**	**9%**	**81%**

E-34 has a highland or mountain climate, with cool summers and cold winters. Heavy snowfalls can occur, especially at higher elevations. The higher elevation areas of the San Juan Mountains receive approximately 50 inches of precipitation annually. Precipitation comes mainly in the form of winter snow. The foothills receive 12-16 inches, while the valley floor gets 6-8 inches annually; the valley is considered a high desert environment.

Habitat Resources

The principal limiting factor for the E-34 herd is the availability of water resources affecting the quantity and quality of forage. Quality forage is essential in winter range and production areas (Figure 3). As the winter conditions deteriorate, the need for food, water, and cover forces elk into the pinyon-juniper woodlands, lower elevation riparian areas with limited browse and understory forage, or onto agricultural fields, particularly large cow and calf groups. Smaller bull groups tend to remain at higher elevations in past-burned areas during the winter months.

In 2013, the West Fork Fire Complex (West Fork, Papoose, and Windy Pass fires), all caused by lightning strikes, burned over 109,000 acres in the western area of the DAU; the majority (West Fork and Papoose fires) occurred in GMU 76 (USDA – Forest Service, 2013). The U.S. Forest Service believes that dead spruce trees, killed by Spruce Beetles prior to the fires, were one of the most significant fuel loads that proliferated the enormity of the fires. The fires burned immense swaths of the Rio Grande and San Juan National Forest, opening extensive areas of canopy cover. Before the fires, forage availability below the mature old-growth trees was limited. Subsequently, since the fires and the lack of old-growth canopy cover, forage conditions and availability for elk have improved considerably. The enormous tracks of supplementary forage may increase carrying capacity and potentially support a more robust elk herd. However, as the winter conditions decline, there is a lack of cover for the animals during extreme winter storm events.

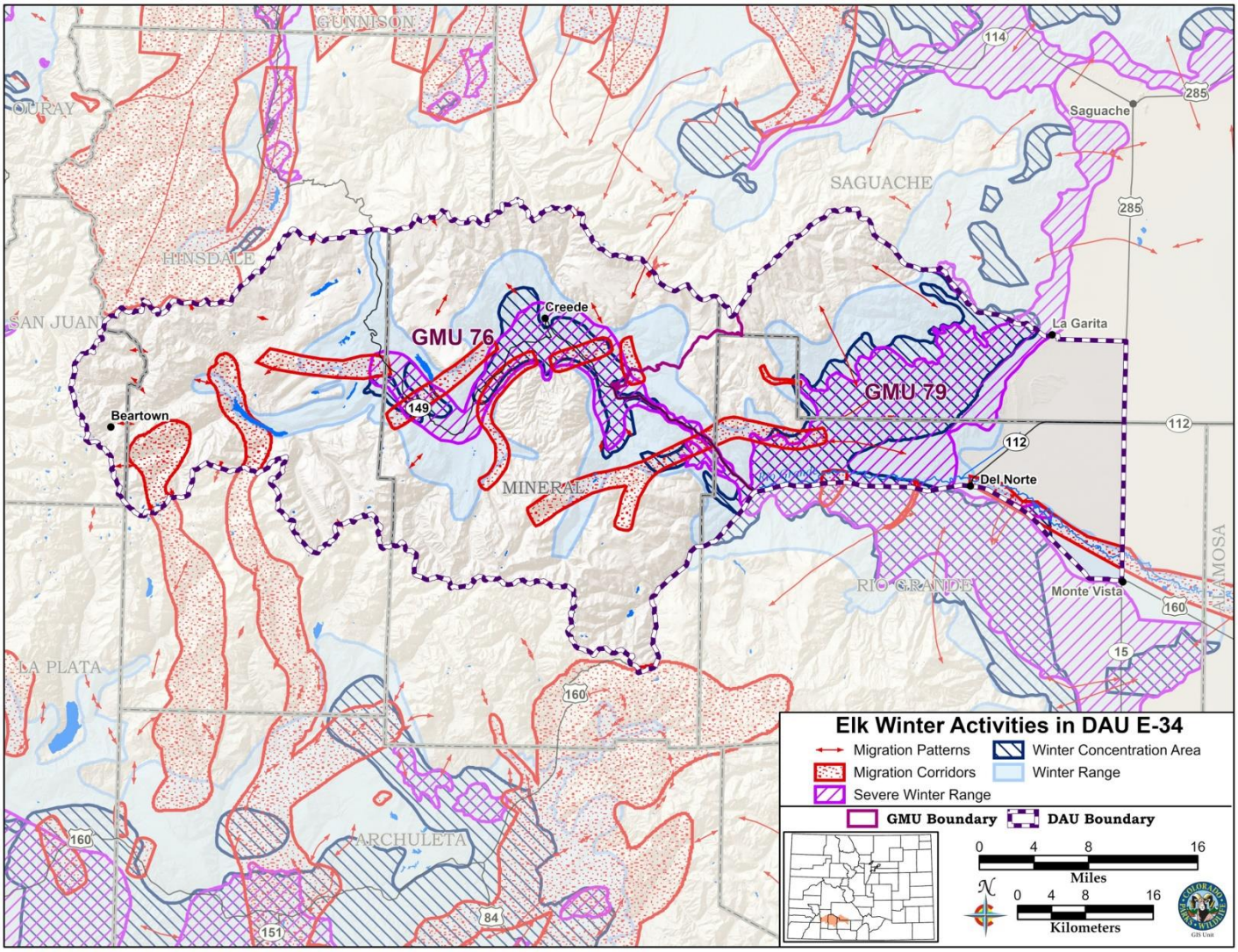

Figure 3. Winter range, severe winter range, and winter concentration areas for the E-34 elk herd. (For definitions: https://cpw.state.co.us/learn/Maps/CPW-Public-GIS-Species-Activities-Definitions.pdf#search=winter%20range%20definition).

Elk Range and Movement

Elk are usually scattered throughout the mountain range of the DAU during the late spring, summer, and early fall. The overall summer range is approximately 999 square miles. The migrational movement to the winter range is usually initiated by a combination of pressures on the elk, such as hunting, snow depth, and deterioration in forage quality. Elk typically move to the south- and west-facing slopes during the fall and winter migration. The timing depends heavily on the winter severity and availability of forage. Several groups of elk that spend the summer at the headwaters of the Rio Grande move in a southerly direction towards the Pagosa Springs area and beyond through to the Jicarilla and Southern Ute reservations. Other elk groups along the Continental Divide north of the Rio Grande Reservoir may move northerly towards the Gunnison Basin region during the winter. Significant drainages in the DAU may supply water resources most of the year, providing quality residual forage.

Elk migration to the summer range is general dispersal throughout the San Juan and La Garita mountains. Most movement typically occurs during the spring, summer, and fall months. The 2013 West Fork Fire Complex may have affected the timing of elk migratory movement depending on the prevailing winter conditions. Because of the forest canopy-cover opening, additional forage availability could delay elk migration. On the contrary, if winter conditions deteriorate rapidly, migration could be hastened because of the lack of cover.

Herd Management History

The DAU comprises two GMUs, 76 and 79; CPW has managed GMU 76 with limited licenses since 1984, providing a more favorable hunting experience. Because of the license limitation, hunters acquire elk licenses for GMU 76 through CPW's annual drawing process. Before 2002, unlimited bull licenses were valid in GMU 79 for all seasons. Since 2002, CPW has managed GMU 79 with limited bull licenses in all rifle seasons to decrease harvest on wintering bull elk moving from GMU 76. Alternatively, the statewide either-sex archery licenses have been valid in GMU 79 to provide challenging hunting opportunities, particularly at higher elevations. In addition, CPW has offered limited muzzleloader licenses in GMU 76 and 79 for supplemental harvest opportunities. For all bull-hunting seasons in both units, a four-point antler restriction has been in effect since 1986.

Post-hunt Population Size

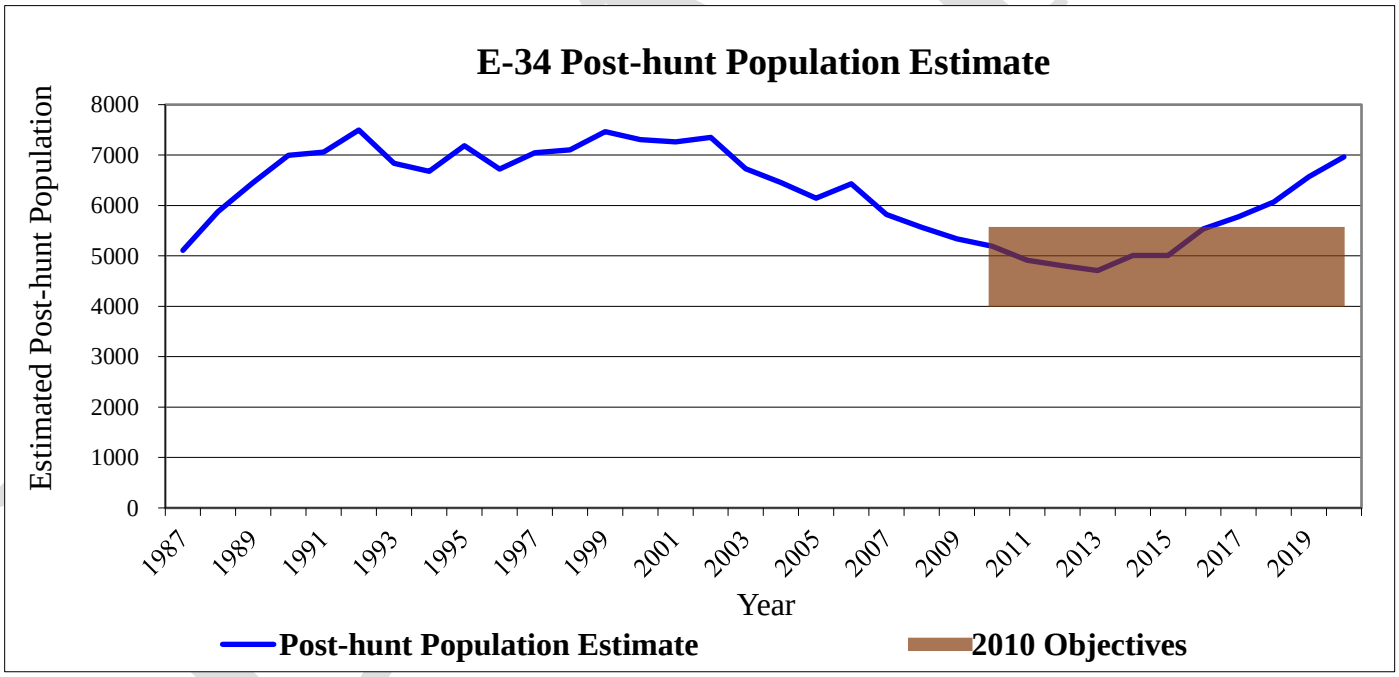

Figure 4. E-34 post-hunt population estimate from 1987 to 2020.

CPW uses a computer modeling process to estimate the size of elk populations in each DAU. The computer modeling programs used by biologists have transformed since the early 1970s. The most recent change occurred in 2006, with CPW embracing a spreadsheet model.

The average population size in E-34 remained relatively stable throughout the 1990s at just over 7,000 animals, which continued into the early 2000s. Thereafter, the population trend dropped to its lowest level in 2013 at approximately the mid-point of the objectives set in 2010. CPW believes that reduced calf recruitment and drought conditions, combined with increased cow licenses, may have been the cause. Nevertheless, from 2013, the population has been on a gentle upward trend to its current (2020) estimated level of roughly 7,000 animals (Figure 4).

In 2010, CPW set the population objective at 4,000-5,500 animals (Figure 4). During that time, the population was on a downward trend. The intent was to curb the decreasing population and sustain it at the model-estimated level; thus, reducing cow licenses. Since the establishment of the 2010 HMP, the estimated E-34 elk post-hunt population has averaged approximately 5,500 animals, but it has been on an upward trajectory since 2013. The previous five-year-average estimated population was about 6,200 animals, and the three-year average has risen to roughly 6,500 animals. Currently, the estimated population remains above the 2010 objective range.

Table 2. Approximate population averages for the E-34 elk herd through the 1990s, 2000s, and 2010s, determined from the population model for 2020.

Management Herd	1990s	2000s	2010s	2010 Post-hunt Population Management Objective
	Population Average	Population Average	Population Average	
E-34 Upper Rio Grande	7,100	6,400	5,400	4,000 – 5,500

Post-hunt Herd Composition

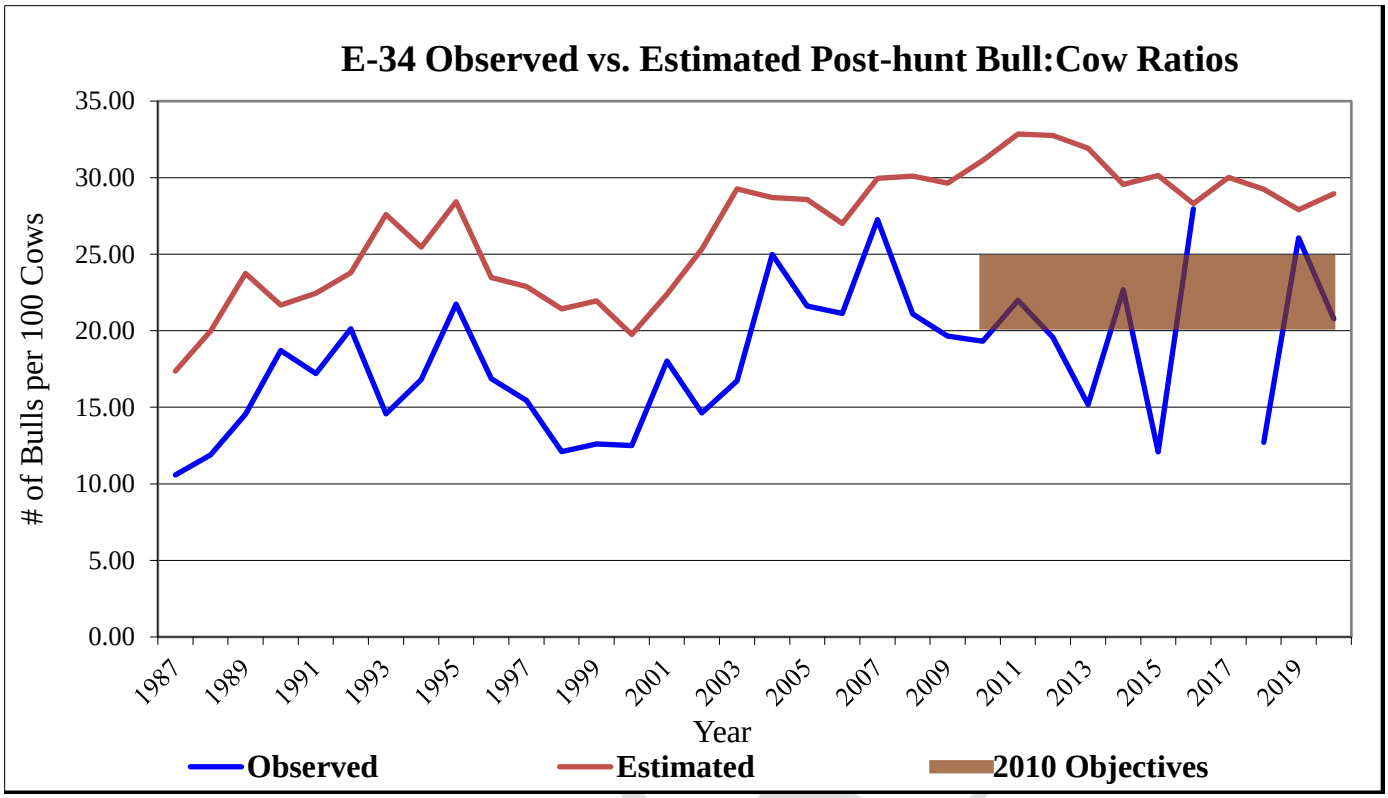

Figure 5. E-34 observed vs. estimated post-hunt sex ratios from 1987 to 2020.

CPW uses aerial classification surveys to gather observed post-hunt herd composition data. These surveys usually take place in winter, January for E-34, using a helicopter. The classification flights do not result in a population census but a sample large enough (ten to forty percent) to establish the DAUs age and sex ratios. CPW determines the objective sex ratios by comparing the post-hunt population estimate to the calculated three-year-average observed sex ratios combined with stakeholder desires. Modeled post-hunt population estimates are generated by solving the best fit between observed vs. predicted post-hunt sex and age ratio data. Biologists make changes as new or improved information becomes available. Computer modeling is not an exact science and may not produce a precise final number. Observed post-hunt sex and age ratio samples vary annually. The variance may be due to weather, snow cover, drought conditions, animal distribution, or flight-time limitations. Variation makes alignment between observed and predicted values difficult because the models work to align the ratios over time.

In E-34, biologists compare the observed and estimated sex ratio to the objective range for management actions and hunting license allocation. Since 1987, CPW has collected inventory classification data every year except for 2017, during which the area had an extremely mild early winter, and the animals remained dispersed over the summer and winter range. Nonetheless, averaging the observed sex ratios for missing years helps stabilize annual fluctuations. The mechanisms to determine the herd status relevant to the expected ratios should be consistent throughout the life of the HMP.

The E-34 observed sex ratios fluctuated considerably since the early 1990s but are currently on a gentle upward trend. Most of the variation in this DAU has been due to locating bull groups within the limited flight time. In 2016, the observed sex ratio reached its highest point since CPW first recorded classification data in the late 1980s, at approximately 28 bulls per 100 cows (Figure 5). The model-estimated sex ratio has been relatively stable, averaging roughly 29 bull per 100 cows over the previous five years. The current sex ratio objective range remains feasible for sustaining an accepted mature bull population while simultaneously allowing reasonable hunting opportunities. Hunters in GMU 76 reap the majority of the mature bull population harvested; however, as the winter conditions deteriorate, several surviving mature bulls migrate over the Continental Divide to neighboring units or the higher elevations of GMU 79.

Harvest

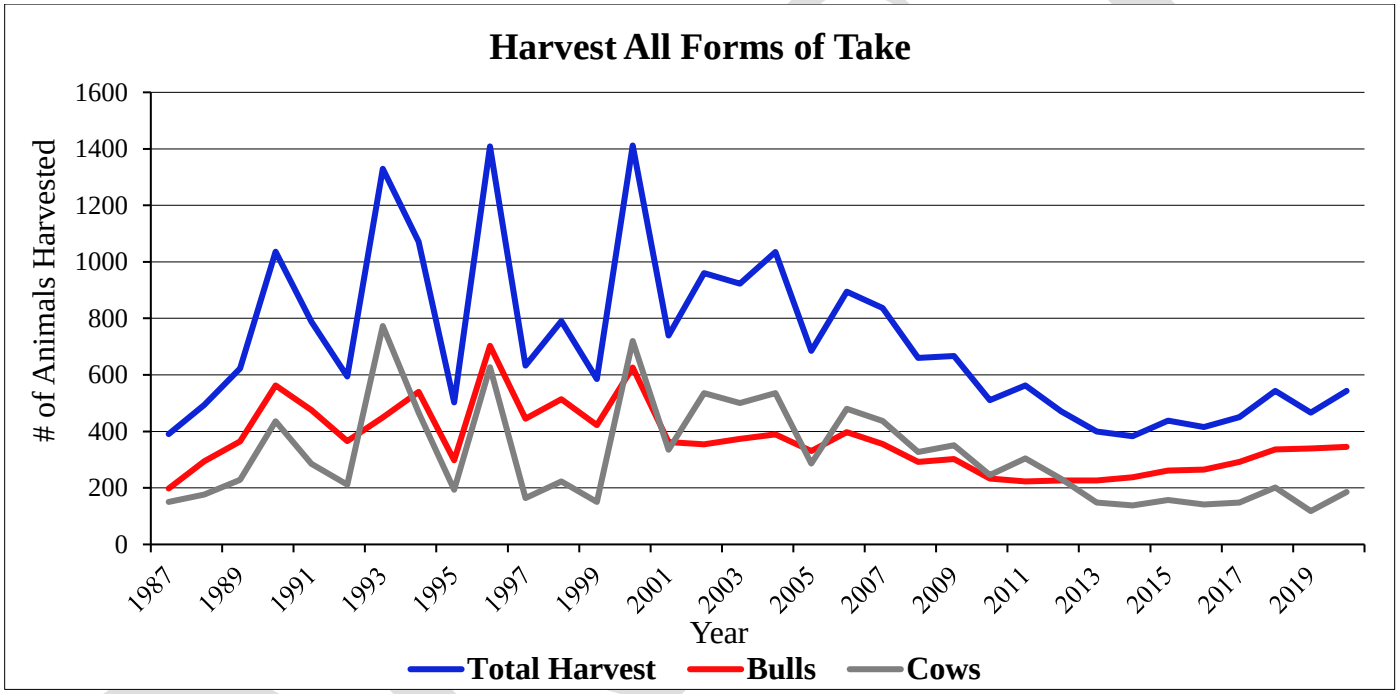

Figure 6. E-34 total harvest, bull harvest, and cow harvest from 1987 to 2020.

CPW produces harvest estimates by statistical sampling techniques received from online and phone harvest surveys, not by any attempt of a total sample or counts. Harvest depends on the number of permits issued, season structure, weather, and population size. If a population is over objective, surplus animals plus recruitment must be considered in decreasing the population. Thus, CPW typically raises the number of cow licenses to reduce the population, which increases harvest opportunities. Only annual recruitment should be removed to maintain the herd within the objective range. If a population is under objective and needs to improve, CPW may reduce cow licenses. The purpose of reducing these licenses is to decrease harvest below annual recruitment, allowing the population to grow. When adjusting licenses to meet annual harvest objectives, CPW usually makes gradual changes, enabling the population to show a response, helping hunters adjust to license availability.

Bull harvest in E-34 averaged 409 animals from 1987 through 2009 (Figure 6). Since 2010, the average bull harvest has declined to 271 animals, the highest being 345 in 2020 and the lowest at 223 in 2011. Comparatively, cow harvest averaged 374 animals between 1987 and 2010. From 2006 to 2012, there were more cows harvested than bulls; CPW believes this contributed to the decline in population to approximately the mid-point of the current objective range. Currently, CPW limits all hunting seasons for bulls and cows in GMU 76. In GMU 79, the licenses are limited except during the archery either-sex over-the-counter (OTC) season and on private land east and south of Colorado Highway 112.

The OTC archery either-sex season in GMU 79 is unlimited in license numbers, and since 2015, CPW has observed an increasing number of archery hunters (Figure 7). Archery success rates in GMU 76 have been on a gentle upward trend since 2005, averaging about thirty-nine percent since the development of the previous HMP. In contrast, GMU 79 has an average archery success rate of roughly four percent in the same timeframe. The increasing number of archery hunters, particularly in GMU 79, likely reduces harvest success rates. The earlier rifle seasons have higher success in GMU 76, with the Early Rifle season achieving an eighty percent success and the First Rifle season about fifty-one percent success. Conversely, the GMU 79 rifle and muzzleloader seasons have had an average harvest success of less than ten percent, not much higher than the archery season. Rifle success on private land east and south of Colorado Highway 112 in GMU 79 is likely higher with the availability of private land voucher licenses depending on depredation pressure. These licenses allow hunters with landowner permission to harvest animals on private land.

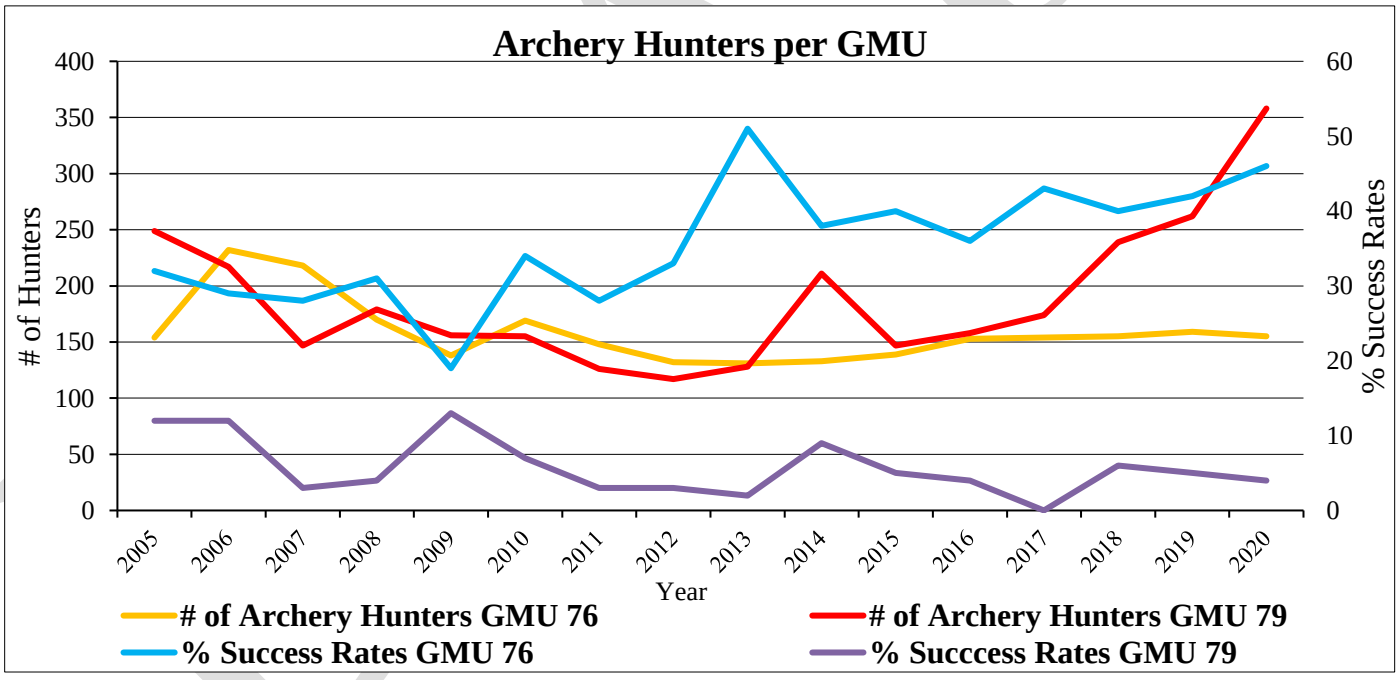

Figure 7. E-34 Archery hunters per GMU from 2005 to 2020.

Current Herd Management Status

Summary of Current Conditions

The current E-34 post-hunt elk population estimate is about 7,000 animals and has been above the 2010 objective range since 2016. The estimated population trend dropped to its lowest level in 2013 at approximately 4,700 animals; thenceforth, it has been on an upward trend to its current level. The rising population trend may have resulted from reduced cow licenses and increased calf recruitment. Many in the stakeholder community have opposed proposals to increase cow licenses.

As with all DAUs, animals do not always respect boundaries within which CPW intends to manage them. During the summer, a segment of the population that uses the higher elevations of the upper Rio Grande spends their winter in adjacent areas of Durango, Pagosa Springs, and Lake City, all in different DAUs. These animals typically move out of the DAU in the fall; thus, making them vulnerable to harvest in the adjacent DAUs with varying management objectives. The differing management intentions in adjacent DAUs, potentially involving the same animals migrating in and out, could affect the management of the total population and its sex ratios.

Game damage had been a concern in GMU 79, mainly east and south of Colorado Highway 112, where elk move onto private agricultural lands. Many of these elk have moved into the Rio Grande drainage and become year-round residence on the private lands. Subsequently, in 2019, CPW implemented additional harvest management (vouchers) licenses available for all private land in GMU 79, east and south of Colorado Highway 112. The intent was to increase elk harvest on private land, distributing the animals back to accessible public land. The additional harvest should contribute to curbing the growth of the elk population. CPW will continue offering game damage licenses in GMU 79 to minimize depredation issues.

The observed calf-to-cow ratios appear to have increased over the past few years, potentially contributing to continued herd growth. CPW management has little control over this. Variables such as weather, forage quality and availability, water resources, predation, or disease usually affect reproduction and calf recruitment more than management actions.

In 2010, CPW set the post-hunt sex ratio objective range at 20-25 bulls per 100 cows. However, since implementing the previous HMP, the annually observed sex ratios have fluctuated considerably. The most recent observed sex ratio data collected by CPW was in 2020, at almost 21 bulls per 100 cows. Conversely, the model-estimated sex ratio has been trending above the objective range before CPW implemented the previous HMP, averaging approximately 30 bulls per 100 cows. The voucher hunts on private lands have no antler restrictions. Thus, harvest from these hunts should help decrease the herd-estimated sex ratio to the desired objective range.

A portion of GMU 76 falls within the boundary of the Brunot Treaty. The Brunot Treaty is a remnant of the 1874 Brunot Agreement between the United States government and the Southern Ute and Ute Mountain Ute tribes. After discovering gold in the San Juan Mountains, the government removed the area involved in the Brunot Treaty from the tribes' reservation lands in 1874, allowing mining and settlement in the region by U.S. Citizens. Although no longer reservation land, the agreement included a provision that allowed the tribes to "hunt that area as long as the grass grew." The Ute Mountain Tribe is currently exercising these rights, and the Southern Ute Tribe began exerting their rights in 2009. Any hunting and harvest of elk by tribal members falls outside of CPW’s management and management plans.

Current Management Concerns

Significant factors limiting the E-34 elk population are the quantity and quality of forage conditions in the winter range habitat. The winter range continues to diminish, with increased development on private land and competition with domestic livestock. The South Fork area has seen an extensive conversion of private ranches to housing development and the establishment of a golf course. Reduction in winter range habitat could restrict the growth of the E-34 population. The DAU experienced severe droughts during the late 1990s and again in the early 2000s, and forage conditions declined with the lack of moisture. CPW provided additional feed resources in GMU 76 during the mid-2000s because of the limited forage availability caused by the droughts.

Summer recreational activities continue to increase throughout the DAU. Activities include camping, hiking, horseback riding, mountain biking, fishing, and the use of all-terrain vehicles (ATVs) or off-highway vehicles (OHVs). The U.S. Forest Service and Bureau of Land Management (BLM) lands receive most recreationists. These same lands are also where most of the summer range within the DAU is located. The impacts of these various forms of recreation are unknown, but CPW believes they disturb elk to some degree, affecting their distribution and, more importantly, reproduction and calving, and, in the long term, negatively impact the viability of the elk population.

Based on modeled estimates, the E-34 population trend has been above the current objective range since 2016. The elk population estimate is currently approaching 7,000 animals. CPW would need to render significant effort to reduce the population to the current objectives if they were to remain; this would likely entail providing additional cow licenses in GMUs 76 and 79 for all seasons. However, many local stakeholders have not supported proposals to increase cow licenses. The current population estimate may suffice with an increase in the management objective range. Nevertheless, CPW may temporarily need to provide enough licenses to curtail the upward population trend.

The herd's estimated sex ratio has been above the current objective range throughout the lifespan of the previous HMP. Hence, Chronic Wasting Disease (CWD) is a potential threat to the health and viability of the E-34 elk herd. Data collected throughout Colorado supports the theory that CWD is typically higher in male deer than female deer (Colorado Parks and Wildlife, 2018). To date, CPW has not had an elk test positive in the E-34 wild elk population or adjacent elk DAUs. CPW bases this information on an average of less than one elk tested per year over the previous ten years through all DAUs in the SLV. However, in August 2001, at the Anta Grande Elk Farm west of Del Norte on Hwy 160 (adjacent to the DAU), a domestic cow elk was found dead and later determined to be infected with CWD. After testing the remaining animals in the herd (approximately 200 elk), one additional elk tested positive for CWD. Eventually, the entire domestic elk population on the farm was depopulated. In the fall of 2001, after CWD was detected, CPW (DOW at the time) built a second ten-foot-high fence around the perimeter of the private elk holding pens to create a barrier between the domestic herd and wild animals. CPW continued conducting significant efforts to monitor the risk of spreading CWD into wild populations through culling and extensive testing of deer and elk in the immediate and adjacent areas. In 2020, during a mule deer mandatory testing project, the D-30 San Juan Basin mule deer herd (GMUs 75, 77, 78, 751, and 771) on the southwest side of the Continental Divide had a CWD prevalence of less than one percent of the male mule deer population tested. CPW had no animals test positive in the SLV during the same year. Over a few years of continued testing, the results should allow CPW to accurately determine the CWD status and prevalence. If any ungulates test positive for CWD from the testing, CPW may need to re-address future elk management. Management actions would depend on the CWD prevalence and risk to the elk and mule deer herds.

Game damage issues continue to occur in the DAU, particularly along the Rio Grande in GMU 79. CPW handles landowner concerns individually. Furthermore, since 2019, CPW has dealt with most depredation issues by providing vouchers to landowners permitting elk harvest, east and south of Colorado Highway 112, with landowner cooperation on private land. Harvest would come from an extension of the fall bull- and cow-hunt seasons and the early summer bull-hunt to facilitate reducing the conflict as well as the E-34 population and sex ratio to the objective range. The additional pressure should also help distribute the animals to hunter-accessible public land. Depredation issues are minimal in GMU 76. However, CPW will continue to evaluate and provide game damage licenses to private landowners in GMU 79 and vouchers north and east of Colorado Highway 112 as needed.

The development of private lands is a growing concern in the DAU; however, it is less of a threat than in other areas of Colorado. Nevertheless, there are potential impacts on the elk populations from further development:

a) Loss of limited habitat.
b) Redistribution of animals from their historic winter range.
c) Migration and movement barriers created by increasing road and fence establishment.

Given the San Luis Valley's agricultural-based economy, development occurs slowly, generally focused around current municipalities. Still, the development of private land within the winter range, calving, or production areas could be a problem throughout the DAU. The threat from low-density residential development depends on the amount and distribution of private land and the area used for ranching. Johnson et al. (2016) analyzed a forty-year relational and correlative study. Although the analysis was conducted with mule deer, the results may have implications for elk management in the area. The study looked at land-use changes from 1970 to 2010 in DAUs throughout Colorado. In E-34, the proportion of "undeveloped" private land (0 housing units/acre) has decreased from nine to three percent; the reduction has been relatively steady since 1970. From 1970 to 2010, rural land development (> 82 acres/housing unit) belonging to the private sector increased slowly but steadily from approximately 242,180 to 288,200 acres. Exurban expansion (4-82 acres/housing unit) has almost tripled over the same period from about 7,090 acres to 20,600 acres. Notable, however not significant, from 1970 to 2010, urban development (< 0.5 acres/housing unit) in E-34 increased from almost five acres to 42 acres. The continued growth of these areas into "cabins" or summer homes has caused a significant loss of winter habitat. The South Fork area has seen an extensive conversion of private ranches to housing developments and a golf course.

Oil, gas, geothermal, and solar energy development and their potential impact on wildlife are concerns throughout western states. Exploration of energy development continues in the San Luis Valley (SLV). To date, no cost-effective gas, oil, or geothermal extraction techniques are available to justify commercial expansion. Currently, the threat of oil and gas development to the elk population in E-34 remains low. Proposals for solar power development on private and public land in the SLV have increased. Fortunately, solar-panel power companies have predominantly installed their facilities away from elk habitat in greasewood vegetation-dominated areas. To date, no areas within the E-34 DAU have been proposed for energy development or solar panel installations. If the expansion of solar energy development or oil and gas extraction into the unit becomes lucrative, their impact could affect the limited elk winter range and population viability through loss of habitat, habitat fragmentation, or disturbance to population dynamics.

Public Involvement

In the summer of 2021, CPW held a local public meeting in Creede, CO. Local constituents representing different community stakeholder groups attended the meeting. The overall view from the attendees was that they were somewhat pleased with the current elk management.

CPW provided an initial draft document online to the public for 30 days. In addition, CPW sent the draft to the BLM, local county commissioners, the local Habitat Partnership Program (HPP) committee, and the U.S. Forest Service for commentary and feedback. The draft allowed all constituents to participate in the public process, including non-consumptive recreationists, hunters, landowners, local stores, or business owners.

Management Strategies

The Herd Management Plan's primary purpose is to determine the long-term (typically ten years) post-hunt population and sex ratio objectives. The objectives are a basis for setting hunting licenses and as an annual management reference. Management actions can usually manipulate sex ratios, whereas age ratios are more likely affected by environmental or biological factors.

When updating HMPs, population objectives may need to be adjusted to fit more accurately with updated model estimates. CPW provides an objective range to allow for flexibility in management. The bases for management flexibility are uncontrolled environmental or biological effects on the elk herd or the herd's habitat. These impacts could emanate from extreme weather events, droughts, severe winters, disease outbreaks, forest fires, or other agency management actions.

Habitat improvement in the DAU may be crucial for sustaining viable elk populations. The financial and physical investment effort needed for habitat improvement would likely be lower with lower population objectives. As the population increases, the investments required may be more significant. Habitat improvements may vary in labor intensity, cost, size, and life expectancy of the projects. CPW proposes habitat improvement practices such as prescribed fires, fertilization, seeding, water-retention facility implementation, fencing, timber management, travel management, or range management. Private land game-damage problems would likely decrease under lower population objectives or public-land habitat improvements.

Private-land conflict issues may intensify if the elk population size increases further or if the public-land habitat deteriorates. Conversely, increased elk numbers may benefit hunter harvest success. In addition, a greater elk population size could help satisfy hunter demand and increase fiscal benefits to state and local economies.

Private land game damage issues are usually correlated with winter severity and elk distribution. Increased elk numbers can occupy healthy landscapes, but only when their distribution minimizes conflict. CPW will retain various tools to address potential game damage issues. Public land habitat improvement and increasing water retention efforts should enable elk to withstand years of lowered precipitation levels and facilitate the distribution of animals from private land. Working with partner agencies in habitat improvement and enhancement projects should also help maintain a healthy, viable elk population.

A rising population also has the potential for increased highway motor-vehicle collisions. In 2019, the Colorado Department of Transportation and CPW completed the West Slope Wildlife Prioritization Study (WSWPS) to "improve human safety and wildlife movement needs throughout Colorado's west slope transportation system" (Kintsch et al. 2019). CPW will work cooperatively with CDOT to reduce animals involved in vehicle collisions as much as possible. Increasing signage and deploying other traffic warning mechanisms could significantly reduce animal-vehicle collisions. Furthermore, to mitigate significant prioritized areas of concern according to the WSWPS or newly rising conflict areas, there is the potential to construct highway crossing structures (overpasses or underpasses) or exclusion fencing if warranted.

Post-hunt Population 2010 Objective – 4,000-5,500 2020 Population ~ 7,000

ALTERNATIVE 1: 3,500 to 5,000 elk (approximately ten percent decrease from the current population objectives).
CPW estimated the 2020 population to be almost 7,000 animals. Alternative 1 would aim for a population below the existing levels. The estimated population for E-34 had been on a downward trend since 2006, reaching its lowest level in 2013 (about 4,700 animals), around the midpoint of the current objective range. However, the level reached in 2013 would have been at the upper end of the objective range for this alternative. Since 2013, the population has been on an upward trend, and game damage by elk in the DAU has been minimal; Alternative 1 would most likely continue to minimize problems. Cow hunting opportunities would probably increase considerably for a period until the population falls to levels within the range for this alternative. Thereafter, CPW would conservatively provide cow licenses to stabilize and maintain the population within the objective range. Alternative 1 would likely create greater hunting opportunities in the short term but significantly reduce opportunities in the long term.

ALTERNATIVE 2: 4,000 to 5,500 elk (remain the same as the current population objectives).
According to the current models, the population estimate has been above this alternative over the past five years. To manage towards the objective range in Alternative 2, CPW would need to reduce the current population estimate. As the population decreases, so would hunter opportunity, but with a reduction in game-damage potential. Demands on the resources would remain relatively stable and are not likely to impact habitat resources. Game damage at this objective range has not been a significant concern. Cow hunting opportunities would initially increase to curb the upward trend in population growth and reduce the population estimate to the objective range. Once the estimated population is within the objective range, CPW would conservatively provide cow licenses to stabilize and maintain the population within the range. Enhanced public land habitat manipulation, particularly on winter range, would continue to be encouraged; however, intense habitat management would not be necessary. Similar to Alternative 1, Alternative 2 would likely create greater hunting opportunities in the short term but reduce opportunities in the long term.

ALTERNATIVE 3: 5,000 to 7,000 elk (approximately twenty-seven percent increase from the current population objectives).
The population estimate is currently trending at the upper end of the objective range in Alternative 3. To manage towards the objectives in this Alternative, CPW would need to increase cow licenses to curb the estimated growth in population, stabilizing and sustaining it within this objective range. The range exceeds the 2010 population objectives but encompasses the current estimate at almost 7,000 animals. The models estimated the elk population was running within this range during the 1990s. At that time, the hunting community accepted the numbers; however, there was a concern for resource damage on summer and winter range habitat and private land depredation issues. Since the early 2000s, the population decreased to its lowest level in 2013, within the current objective range, and it has been increasing since then with minimal resource damage. In recent years, CPW has implemented additional tools to manage

depredation issues; thus, this has not been a significant concern with the growing population; most depredation has occurred in GMU 79, along the Rio Grande. Alternative 3 would need to curb the current growth in the estimated population to maintain it within the objectives. The ability of this herd to be held within these alternatives during the next ten years is feasible, as long as calf recruitment remains strong. Cow hunting opportunities would initially increase slightly to curb the upward trend in population growth. Once the estimated population stabilizes, CPW would conservatively provide cow licenses to maintain the population within the objective range. Encouragement of habitat improvement and water retention efforts will continue on public land. Improvements may promote distribution from private property, particularly in GMU 79, to sustain a viable elk population on public land and reduce depredation concerns. CPW will continue providing damage and dispersal licenses to address private land conflicts. Unless severe winters pushed animals onto agricultural properties, conflicts with reduced public land forage resources should remain relatively low.

ALTERNATIVE 4: 6,000 to 8,000 elk (approximately forty-four percent increase from the current population objectives). **Preferred.**
Alternative 4 maintains current management to stabilize the population and sustain it within this objective range. The population estimate is currently running around the midpoint of Alternative 4, with considerable satisfaction from many hunting community stakeholders. Throughout the 1990s into the early 2000s, CPW estimated the herd in E-34 to be trending within this range. Private land depredation issues have been minimal, occurring mainly along the Rio Grande in GMU 79. Cow hunting opportunities may initially increase slightly to curb the upward trend in population growth. Once the estimated population stabilizes within the objective range, CPW may consider conservatively providing cow licenses to maintain the population within the objective range. Nonetheless, Alternative 4 offers the ability for a slight increase in population growth. The herd's ability to be held within the objectives for this Alternative during the next ten years is conceivable, as long as calf recruitment and forage availability remains strong. Management towards these objectives allows the best balance for hunting recreational opportunities and maintaining habitat carrying capacity. If the population increased to the upper levels of the objectives, habitat conditions could be impacted, requiring an increase in cow licenses to prevent the population from rising above the higher end of the objective range. CPW also strongly suggests increased collaborative efforts to improve public-land habitat conditions from all partner agencies. CPW field personnel would likely maintain the desired bull-hunting opportunities throughout the unit. Game damage conflicts may increase with an increase in the population, particularly along the Rio Grande and other riparian zones. CPW will continue providing damage and dispersal licenses and vouchers to address private land conflicts.

Herd Composition (Bull to Cow) 2010 Objective: 20-25 bulls per 100 cows.

ALTERNATIVE 1: 18 to 23 bulls per 100 cows.
This alternative offers a slight reduction in bull maturity throughout the DAU to accommodate the average sex ratios observed over the previous three and five years. However, the model-estimated sex ratios have been trending above this objective range due to the annual fluctuations and migratory movement of many animals before the inventory period in January. This alternative would probably allow for the increased provision of bull licenses to achieve greater harvest, reducing the estimated bull maturity level to within this objective range. Alternative 1 would likely increase hunter opportunity throughout the DAU.

ALTERNATIVE 2: 20 to 25 bulls per 100 cows - **Preferred**
This Alternative would maintain the current 2010 HMP sex ratio for the following ten-year duration. This alternative's sex ratio range would maintain the desired bull-maturity level and provide adequate hunting opportunities, based on the current observed and estimated sex ratios. GMU 76 would remain a limited and desired unit. Once the estimated sex ratio falls within this objective range, CPW may restrict licenses based on the average sex ratio performance. Nonetheless, bull licenses would likely remain the same, allowing for the desired maturity and acceptable harvest opportunities.

ALTERNATIVE 3: 23 to 28 bulls per 100 cows.
This Alternative would likely result in CPW reducing bull licenses slightly, limiting hunting opportunities the most. The reduced harvest from those licenses should result in an increased observed maturity level of the bull population. However, the license restriction may increase preference point requirements further as the likely demand for these licenses rises. Also of concern, the increased maturity of the bull proportion of the population could increase CWD risk within the herd.

Post-hunt Population Objective

The preferred population objective is Alternative 4 for the E-34 elk herd. The intent is to maintain management to stabilize the population and sustain it at its current estimated population level. That would support a post-hunt population objective of **6,000 to 8,000 elk**. This objective range allows the best balance for managing the herd, hunting recreational opportunities, minimizing agricultural conflicts, and maintaining habitat carrying capacity. If the populations estimate trends towards the upper level, CPW may conservatively implement public-land cow licenses. Implementation of these licenses would depend on the population status, the herd's productivity, or other biological or landscape constraints. CPW will continue providing damage and dispersal licenses to address private land conflicts. Collaborative efforts towards habitat improvement and water retention efforts will continue on public land. Public land habitat improvements should promote distribution from private property and sustain a viable elk population.

Herd Sex Ratio Composition – (Three-year-average observed number of bull per 100 cow ratio)

GMU 76 will remain a limited unit for all hunting seasons, whereas GMU 79 will maintain the limited muzzleloader and rifle seasons with an OTC archery season. Most stakeholders have been relatively satisfied with their hunting experience and the level of bull maturity observed within the herd. Stakeholders are concerned about the risk of CWD with an increased bull population, especially at the levels CPW has observed recently. Thus, the E-34 preferred sex ratio objective range is **20 - 25 bulls per 100 cows**. Annual management would strive to maintain the sex ratio composition within this range. Currently, the three-year average observed sex ratio is at the lower end of this range; however, with the expected harvest, CPW believes the sex ratio should trend towards the mid-point of the range. The objective range creates the best balance between the desired hunting experience and harvesting a mature bull elk in the DAU.

Public Input and Preferred Objectives

CPW attempted to solicit as much stakeholder feedback and comments as possible with available resources. The local biologist analyzed all stakeholder responses to the draft plan to determine the preferred objectives. The biologist also reviewed response letters from the BLM, Hinsdale county commission, the local HPP committee, and the U.S. Forest Service. After combining all feedback from the public and partner agencies on the draft document, the biologist selected the final preferred population and sex ratio objectives. CPW field personnel continued communicating directly with recreationists, hunters, and private landowners throughout the draft process. Furthermore, the biologist evaluated biological herd capabilities, land tolerance levels, and other factors mentioned earlier.

After combining feedback from all stakeholders, the overwhelming consensus supported maintaining the elk population at its current estimated level, allowing for slight herd growth and expansion. The outcome would be reflected by managing to an increased elk population objective of 6,000 to 8,000 animals. In addition, most stakeholders wanted to keep the current elk sex ratio objective in place, maintaining an acceptable mature bull population without substantial increases in preference points. Thus, continuing to manage to the preferred sex ratio objective of 20-25 bulls per 100 cows (Alternative 2).

CPW is particularly grateful to the Bureau of Land Management (BLM), which manages a portion of the elk winter range, for their response to the draft. After thoroughly reviewing the draft document, the BLM indicated their agreement with the current and emerging ecological constraints on the E-34 herd. The agency acknowledges the upward trend in the elk population since 2013 to the current level of roughly 7,000 animals. Still, they are cautiously optimistic with the preferred population management objectives of 6,000 to 8,000 elk (Alternative 4). The BLM would prefer CPW to have a more moderate approach by managing to one of the other alternatives until multi-agency collaborative efforts can establish quantified winter range carrying capacity conditions. The BLM had no concerns regarding the sex ratio maturity levels and approved maintaining the existing objective of 20-25 bulls per 100 cows (Alternative 2). The agency notes that the interspecific competition between elk and mule deer simultaneously with reduced habitat and resources could exceed public land ungulate carrying capacity. Hence, biologists for the BLM suggest that the long-term success of the deer herd within the DAU may be contingent on the successful management of the elk herd.

CPW sincerely appreciates feedback provided by the U.S. Forest Service (USFS) on the draft E-34 HMP. The USFS expressed solid support for the preferred population objective range (6,000 to 8,000 elk). The agency acknowledges having no known conflicts with elk on Forest Service land, and they do not expect any significant disputes with the preferred objective range. The agency recognizes that the quantity and quality of winter range are critical limiting factors for the mule deer population. The DAU carrying capacity should increase by implementing collaborative habitat improvement projects on Forest Service land. The USFS also agreed with maintaining management to the preferred sex ratio range (20 to 25 bulls per 100 cows), supporting the desires of the stakeholder community and the USFS objectives for wildlife. The USFS has cautioned that license increases may result in additional recreational pressure on Forest Service land – dispersed camping, roads, and trails. The agency has emphasized its desire to work collaboratively with CPW to educate hunters and other forest users on forest etiquette.

The San Luis Valley HPP committee discussed the HMP on October 12, 2021. They fully supported the preferred population objective of 6,000 to 8,000 elk (Alternative 4) and sex ratio objective of 20-25 bulls per 100 cows (Alternative 2). The committee recognizes that the current (2020) estimated elk population is above the 2010 objective range. Updating the objectives allows for variability in the population (a slight increase or decrease) given the potential carrying capacity constraints. The committee believes that the winter habitat is constrained by topography, periodic drought conditions, ranching development, and interspecific competition with other ungulates. Despite these constraints, the committee does not expect game damage issues to increase significantly. They acknowledge CPW having resources in place should conflicts arise.

Hinsdale County provided commentary on the E-34 HMP, for which CPW is exceptionally grateful. The county recognizes that megafauna and associated recreational activities are a significant part of Hinsdale County. The county thoroughly supports CPW's preferred objectives for managing the elk herd. In addition, the county supports increased winter range projects, increased water accessibility and storage projects, continued research and monitoring impacts on elk herds (beetle-kill, drought, widescale fires, restoration work to reduce impacts and improve big game travel corridors, livestock, hunters, and recreationists), continued monitoring of CWD, enhanced monitoring of moose populations, re-assessment of predation and disease, and increased youth hunting program opportunities. Contrarily, the county has expressed opposition to increasing licenses for any species or sex.

In summation, after accumulating all input for E-34, the **Preferred Population objective is 6,000 to 8,000 elk**, and the **Preferred Sex Ratio objective is 20 to 25 bulls per 100 cows**. CPW staff re-evaluates management towards the accepted objectives annually. Under current conditions, management towards these objectives will occur for the next ten years unless they become socially or biologically unacceptable. If so, CPW may re-address the objectives in an earlier timeframe.

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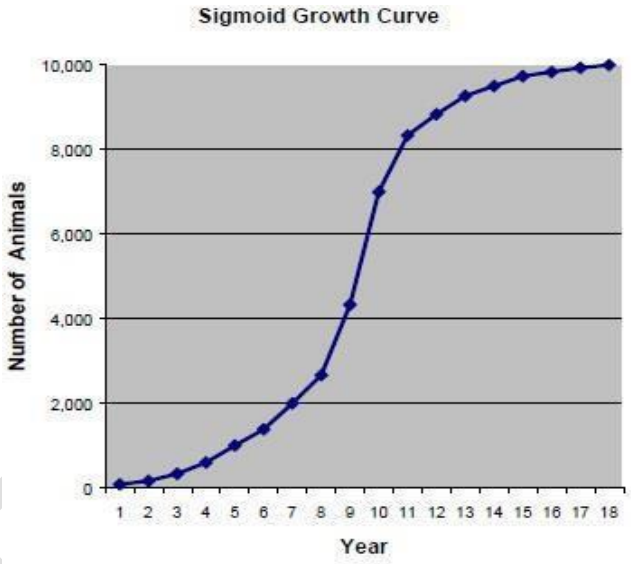
Appendix A. Population Dynamics and Managing for Maximum Sustained Yield



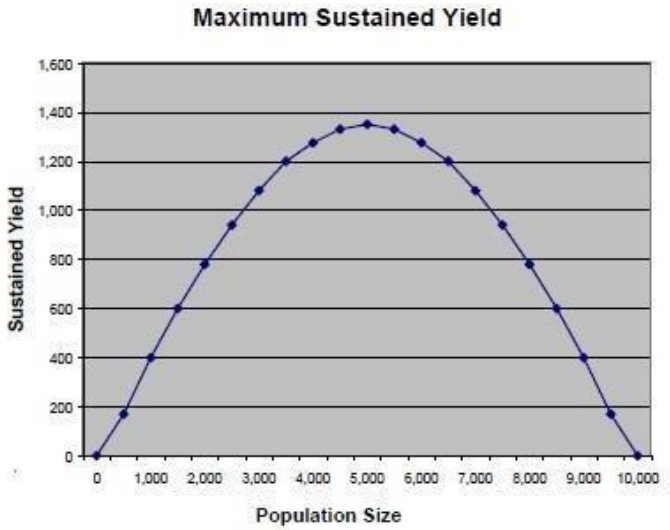
Numerous studies of animal populations, including species such as mice, rabbits, and white-tailed deer, have shown that the populations grow in a mathematical relationship referred to as the "sigmoid growth curve" or "S" curve (right). There are three distinct phases to this cycle. The first phase occurs 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 the population.

The second phase occurs when the population number is at a moderate level. This phase is characterized by a very high reproductive and survival rate. During this phase, food, cover, water, and space (habitat) is not a limiting factor. In addition, during this phase, 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 the deer (bucks, does, and fawns) are 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 scarce due to the competition with other members of the population. This phase is characterized by a decrease in reproduction and survival. In addition, during this phase, 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 the adult do. The severe winters thus affect the future buck to doe ratios by favoring more does and fewer bucks in the population. Also, since the quality of a buck's antlers is somewhat dependent upon the quantity and quality of his diet, the antlers are stunted during this phase. 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 equals the number of deaths; therefore, maintaining the population at this level would not allow for any "huntable surplus." The animals in the population would be in relatively poor condition, and when a severe winter or other catastrophic event occurs, a large die-off is inevitable. A recent example of such a population die-off occurred in the relatively un- hunted Northern Yellowstone elk herd during the severe winter of 1988-89. This winter followed the forest fires of the summer of 1988 that raged in the National Park.

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, we should attempt to hold the populations at about the middle of

the "sigmoid growth curve." Biologists call this "MSY" or "maximum sustained yield." At this level, which is exactly half the maximum population size or "K", in this example it would be 5,000 animals, the population should provide the maximum production, survival, and available surplus animals for hunter harvest. In addition, at this level, the range condition should be good to excellent, and range trend should be stable. Game damage problems should not be significant, and economic return to the local and state economy should be at the maximum. 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 become 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 since 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.

Actually, managing deer and elk populations for MSY on a DAU basis is difficult, if not impossible, due to the amount of detailed information required because of the complex and dynamic nature of the environment. In most cases, we would not desire true MSY management, even if possible, because the number and quality of bulls and bucks are minimized. However, the concept of MSY is useful for understanding how reducing densities and pushing asymptomatic 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.

United States Department of the Interior

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In Reply Refer To:
6521 (LLCOF03000, TLA)

25 October 2021

Brent Frankland,
Terrestrial Wildlife Biologist
0722 South Road 1 East
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Dear Mr. Frankland,

Thank you for the opportunity to comment on the proposed D-36 and E-34 Herd Management Plans. As the agency providing the majority of crucial winter range for big game in the San Luis Valley, we thought it important to provide comments on any changes Colorado Parks and Wildlife may implement. The Bureau of Land Management (BLM) San Luis Valley Field Office (SLVFO) has a strong commitment to providing quality wildlife habitat as one of our important "multiple uses". The BLM SLVFO has appreciated our longstanding working relationship with Colorado Parks and Wildlife (CPW) and partnership in managing wildlife habitats throughout SLVFO-managed lands.

After reviewing the draft D-36 and E-34 plans, we agree with the many current and emerging ecological constraints identified by CPW when considering elk and deer herd objectives for this area, including increasing fragmentation from development, increasing recreation pressure, limited winter range and forage availability, prolonged drought, game damage issues, disease, and competition with other wild ungulates.

The BLM agrees with CPW's proposed management objective to remain the same with a mule deer population of 2,200 to 2,800 and a sex ratio of 23 to 28 bucks per 100 does, as it provides the best balance for managing the herd, minimizing the spread of Chronic Wasting Disease (CWD), supporting hunting recreational opportunities, minimizing agricultural conflicts, and maintaining habitat carrying capacity. This position is consistent with BLM's continuing efforts to enhance or restore proper rangeland functions, in particular, by attempting to reduce the intensity and duration of collective growing season use by wild and domestic ungulates through improved livestock management, noxious weed control, carrying capacity analyses, more aggressive implementation of our Fire Management Plan, and through the development of climate change adaptation strategies. We feel that land management applied with an emphasis toward deer would continue to complement balanced management of woodland and shrubland communities across BLM lands in GMU 79. Additionally, we support the proposed management objective because it will minimize the overall financial and physical investments associated with improving habitat in the DAU—crucial for sustaining a viable deer population long-term.

In the draft E-34 HMP you state, “The principal factors limiting the E-36 population are the availability of water resources affecting the quantity and quality of forage, essential in the winter range and production areas. The winter range continues to diminish with increased development on private land and competition with domestic livestock”. Additionally, you describe the litany of anthropogenic impacts on summer and winter range that could alter elk distribution, reproduction, calving efforts, and ultimately restrict population growth. However, the population has been on a gentle upward trend to its current (2020) estimated level of roughly 7,000 animals since 2013. In light of this trend and the identification that carrying capacity is limited/decreasing in the area, the proposed population objective alternative within the E-34 plan that includes an approximate 44% increase from 2010 objectives is concerning. We recommend a more moderate approach as identified in either of the other three alternatives until studies are initiated that quantify current condition of the crucial winter range and the carrying capacity of those areas. We are aware that if increases in numbers create land health impacts, CPW can moderate heard sizes with game management tools, but land health impacts are more difficult to reverse and can take many years to see improvement, especially in times of drought.

Although not explicitly stated in the plans, the long-term success of the D-36 herd is partially contingent on the successful management of the E-34 herd objective levels. We believe that continued interspecific competition between elk and mule deer and the reduction of habitat and resources available to the respective herds could eventually lead to a partial population collapse from exceeding the carrying capacity.

The draft HMPs list winter range forage availability and quality as the limiting factors to herd size. Therefore, continued habitat partnership projects between CPW and the BLM will be critical to improve availability of browse and to ensure the long-term health and stability of both herds. To assist CPW in making management decisions within each herd area, the BLM would like to encourage CPW to gather utilization data in elk and mule deer winter concentration areas. This data would help inform the decision between alternatives identified in the Herd Management Plans. Because of the uncertainties regarding ecological constraints, we believe a program to monitor habitat conditions is warranted, particularly to determine if population objectives need to be adjusted to fit more accurately with updated model estimates and to assist in quantifying carrying capacity. However, the BLM does not have the capacity to implement a monitoring program specific to wild ungulates but is willing to partner on an effort to accomplish monitoring habitat conditions.

If you have any questions regarding this matter, please contact me at (719-239-0494).

Sincerely,

Melissa S. Garcia
Field Manager
San Luis Valley Field Office

CC: Rick Basagoitia, Area Wildlife Manager

United States Department of Agriculture
Forest Service
Rio Grande National Forest
1803 West Highway 160
Monte VistaCO81144
719-852-5941719-852-6271719-852-6250

File Code: 2600
Date: November 9, 2021

Brent Frankland
Terrestrial Wildlife Biologist
Colorado Parks and Wildlife
722 Henderson Rd
Monte Vista, CO 81144

Dear Brent,

Thank you for the opportunity to comment on the Draft DAU Plans for D-36 and E-34. The Rio Grande National Forest (RGNF) appreciates your continued commitment of involving the land management agencies within the boundaries of the DAUs.

Mule Deer
The preferred management objective for D-36 is a population of 2,200 to 2,800 mule deer, aiming to maintain population size at its current level and allowing for slight increase. This objective increases the post-hunt season objective from the previous plan and aligns it more with the post hunt observed population estimates.

The preferred post-hunt sex ratio objective for this herd is to increase the current objective to 23-28 bucks per 100 does over the previous plan. CPW acknowledges this higher sex ratio supports stakeholder desires but may increase Chronic Wasting Disease (CWD) risk.

Both the population and sex ratio objectives ranges support the desires of the stakeholder community including the RGNF. The range would continue to allow for satisfactory hunting experiences and the desired hunting opportunities while minimizing risk of CWD to the extent practicable. There are currently no known conflicts with mule deer and RGNF lands associated with the DAU. Current management appears to be adequate and can support RGNF objectives for wildlife and range.

Elk

The preferred management objective for E-34 is to raise the objective to a population of 5,800 to 7,800 elk (above previous objectives) and maintain the population at its current size.
The expected post-hunt sex ratio would remain at 20-25 bulls per 100 cows. These ranges continue to support the desires of the stakeholder communities including the RGNF. It also allows for a satisfactory hunting experience with the desired hunting opportunities while minimizing CWD risk. There are currently no known conflicts with elk regarding RGNF lands within the DAU. Current management appears to be adequate and can support RGNF objectives for wildlife and range.

The RGNF wishes to share some considerations regarding tag allocations. Increases in tag allocation without longer seasons may increase conflicts with other forest users and impact road conditions. Please consider that any future increase in tags proposed for these DAUs may result in additional use on forest, including dispersed camping, camping in campgrounds, and road and trail use. This has the potential to intensify overlap with other forest users – recreationists, livestock operators, and firewood cutters for example - and increase the intensity of use on roads and trails, particularly during short hunting seasons. The area has received increased duration and intensity of recreation in recent years and there is potential for conflict between users where high hunting and recreational pressure overlap. Compressed seasons may also encourage hunters towards riskier, more resource-damaging behavior because of the limited time for harvest. When developing future season dates and tag allocations in these DAUs, consideration of both timing and intensity of hunting pressure would be beneficial. We would welcome the opportunity to work with CPW on avenues to educate hunters on forest etiquette and to educate other forest users on hunting seasons.

Overall, the RGNF supports the approval of the 2022-2032 DAU D-36 and E-34 Management Plans with these considerations in mind. Thank you again for the opportunity to comment and we appreciate working with CPW on big game management in these DAUs.

Sincerely,

X 

Signed by: DAVID TOPOLEWSKI

David Topolewski
Wildlife Biologist
Rio Grande National Forest

Appendix D

The San Luis Valley HPP Committee has reviewed the Draft Herd Management Plans for Deer D-36 and Elk E-34. The Committee also appreciated Terrestrial Biologist Brent Frankland providing an overview of the plans at our October 12 meeting.

Upper Rio Grande Deer D-36 Herd Management Plan (GMU Units 76, 79 and 791)

The Committee supports CPW's proposed Alternative 3 regarding the *post-hunt population* objective which is an approximate increase in 10% over the 2010 objective of 2,000-2,500 to 2,200-2,800 mule deer. This objective range provides the best balance for managing the herd, hunting recreational opportunities, minimizing agricultural conflicts, and maintaining habitat carrying capacity.

Additionally, Alternative 2 *post-hunt sex ratio* as proposed, is supported by the Committee which increases the 2010 current objective of 20-25 to 23-28 bucks per 100 does. The proposed range creates the best balance between the desired hunting experience and for harvesting a mature mule deer buck in the DAU.

Upper Rio Grande Elk E-34 Herd Management Plan (GMU Units 76 and 79)

CPW is proposing Alternative 4 to maintain current management to stabilize the elk population and sustain it within the proposed *post-hunt population* objective range of 5,800 – 7,800.

The current modeled population is approximately 7,000 elk, which is over the 2010 objective of 4,000 – 5,500. Alternative 4 offers the ability for a slight increase in population growth over the current modeled population. Under this alternative, cow hunting opportunities may initially increase slightly to curb potential upward trend in population growth. The Committee is supportive of Alternative 4.

The Committee also supports CPW's proposed Alternative 2 of 20-25 bulls per 100 cows which maintains the 2010 *post-hunt sex ratio* objective. This sex ratio range would maintain the desired bull-maturity level and provide adequate hunting opportunities, based on the current observed and estimated sex ratios.

The San Luis Valley HPP Committee appreciates the opportunity to review and comment on the Draft Herd Management Plans and commends CPW personnel on their efforts to involve the public in the planning process.

/s/ Dale Gomez 10/13/2021
San Luis Valley HPP Sportsmen Representative and Chairman

STATE OF COLORADO

Comments on E-34 HMP and D-36 HMP

Kristie Borchers <district2@hinsdalecountycolorado.us> Tue, Nov 2, 2021 at 9:33 PM
To: "Frankland - DNR, Brent" <brent.frankland@state.co.us>

[*** This email originated from outside Hinsdale County - PLEASE USE CAUTION OPENING LINKS, ATTACHMENTS OR REPLYING ***]

Dear Mr. Frankland -

Thank you for your patience in allowing me these comments.

-megafauna and associated watching and hunting are a part of the fabric of Hinsdale County
-we would not like to see any licenses increase over any species or any sex
-the data is demonstrating a stabilization of herds
-we support increased winter range projects
-we support increased water accessibility and storage projects that may impact and increase water availability for foraging and vegetation
-the restoration and improvement of range following the West Fork Complex fire is noted
- we support the continued research and monitoring of impacts on deer and elk herds such as the beetle-kill, drought, and widescale fires and restoration work to reduce impacts and improve travel corridors for big game, livestock, hunters, recreationists, and safety for response to emergency or wildfire
- we support the continued attention to neighboring herds and the monitoring of Chronic Wasting Disease
- we support continued monitoring of moose populations on deer / elk
- we appreciate the ongoing re-assessment as natural predation, disease, and seasonality impacts herds; we believe this will need for assessment and corrective action may increase in importance with the reintroduction of wolves
-we understand the taking of big game in Hinsdale County provides intergenerational, shared experiences for our families and repeat hunting visitors and support youth hunting programs

Please let me know if you would like to speak further. Thank you for your work.

With much respect,
Commissioner Kristie Borchers

Kristie Borchers
Hinsdale County Commissioner
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Lake City, CO 81235
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970-596-9071