SANGRE DE CRISTO
BIGHORN SHEEP
HERD MANAGEMENT PLAN

DATA ANALYSIS UNIT RBS-10

GAME MANAGEMENT UNITS
S-08, S-09, S-68, and Portions of S-65

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EXECUTIVE SUMMARY

GMUs: S-08 (Mt Blanca), S-09 (Sangre de Cristo), S-68 (Northern Sangres), and portions of S-65 (Costilla),
Tier Status: 1 (≥ 100 animals for ≥ 90% of the years since 1986; population composed of one or more interconnected herds that have received few (≤ 50 animals total) supplemental releases of Rocky Mountain bighorn sheep in the past)
Land Ownership: Private 42%, USFS 23%, NPS 11%, BLM 9%, Other 15%
Post-hunt 2020 Age and Sex Ratio Estimate: 49 rams:100 ewes, 35 lambs:100 ewes
Post-hunt 2020 Population Estimate: 375-425; Approved Population Target 375-450
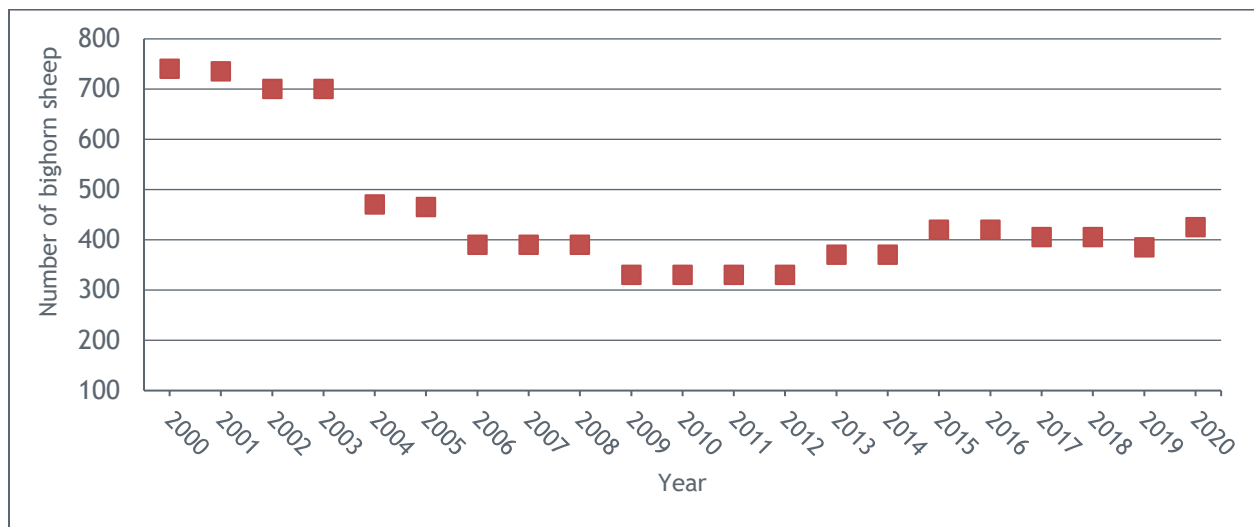**3-yr Average Age of Harvested Rams: 2018-2020 Estimate** 6.0 years; Approved Objective 6-8

Figure 1. RBS-10 post-hunt population estimates from 2000-2020.

Figure 2. Three-year rolling average age of rams harvested in RBS-10 from 2003-2020.

BACKGROUND & ISSUE SUMMARY

Rocky Mountain bighorn sheep Data Analysis Unit (DAU) RBS-10 consists of Game Management Units (GMUs) S-08 (Huerfano), S-09 (Sangre de Cristo), S-68 (Northern Sangres), and the northern portion (north of Hwy 160) of S-65 (Costilla). The DAU is 1,875 mi^2 and includes parts of Alamosa, Costilla, Custer, Huerfano, and Saguache counties. The RBS-10 bighorn sheep herd is one of the largest in Colorado, meeting the criteria for Tier 1 designation (George et al. 2009). CPW estimates the 2020 population for RBS-10 to be approximately 375-425 bighorns (Figure 1). Habitat in this DAU is abundant and anecdotally in good condition. However, due to high elevations and heavy annual snowfall, winter range is likely a limiting factor for this population. Bighorns generally summer on the alpine biome of the high elevation peaks in this DAU. Most animals spend the entire year on the alpine, but a few descend to lower elevations in the winter.

The first official hunting season for bighorn rams in RBS-10 occurred in 1953 (Bear and Jones 1973). In 2021, CPW offered two rifle ram licenses for GMU S-08; nine archery ram, nine rifle ram, and five rifle ewe licenses for GMU S-09; one rifle ram license for S-68. Additionally, two rifle ram licenses were allocated through the Bighorn Sheep Access Program (BSAP) within the boundaries of the Trinchera Ranch in S-65. The three-year average age of ram harvested in the DAU has been at or above six years of age for the last 10+ years (Figure 2).

MANAGEMENT OBJECTIVES

Population Size Objective Range: The RBS-10 bighorn sheep herd has been stable at approximately 375-425 animals for over 15 years (Figure 1). Key limiting factors for this population include winter range carrying capacity and the potential for disease transmission following contact with domestic livestock. Considering bighorn distribution, winter range capability, population density/density dependence, and the potential risks of contact with domestic livestock, the approved management objective is: ***Population target 425 sheep (range 375-450)***

Ram and Ewe Harvest Objective: ***Maintain a 3-yr average age of rams harvested of 6-8 yrs old***. CPW will maintain the current harvest regime in the DAU with this objective. Moderate ram license increases may be possible based on population performance. This objective should provide a quality experience, average levels of crowding, and diverse age classes of rams. ***Ewe harvest: Maintain low levels of ewe harvest for hunter opportunity, which is the current ewe harvest strategy in the DAU***.

Strategies for achieving objectives and addressing significant issues: Both preferred alternatives are consistent with CPW's current management in RBS-10. Therefore, we do not expect a change in harvest management with this plan. CPW proposes two boundary changes in this plan (the additions of GMUs S-68 and the northern part of S-65 into RBS-10) to align the DAU boundaries with the overall range of bighorns in the Sangre de Cristo mountain range. These changes will not affect license allocation in S-65, which is managed through the Bighorn Sheep Access Program (BSAP). The most significant issue for RBS-10 is the potential for disease transmission from domestic livestock, particularly from domestic sheep and goats (George et al. 2009). There are numerous hobby livestock operations in the DAU, and pack goats are increasingly utilized within the wilderness. Therefore, the potential for interaction is a continual threat. CPW will continue to work with stakeholders and land management agencies to mitigate and address these issues.

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INTRODUCTION AND PURPOSE

Colorado Parks and Wildlife (CPW) manages big game for the use, benefit, and enjoyment of the people of the state according to CPW's Strategic Plan (2015), with bighorn sheep management directed under the Colorado Bighorn Sheep Management Plan (George et al. 2009). Bighorn sheep management is also determined by mandates from the Colorado Parks and Wildlife Commission (PWC) and the Colorado Legislature. Colorado's wildlife species require careful and increasingly intensive management to accommodate varied public demands and growing human impacts. CPW uses a "Management by Objective" approach to manage the state's big game populations (Figure 3).
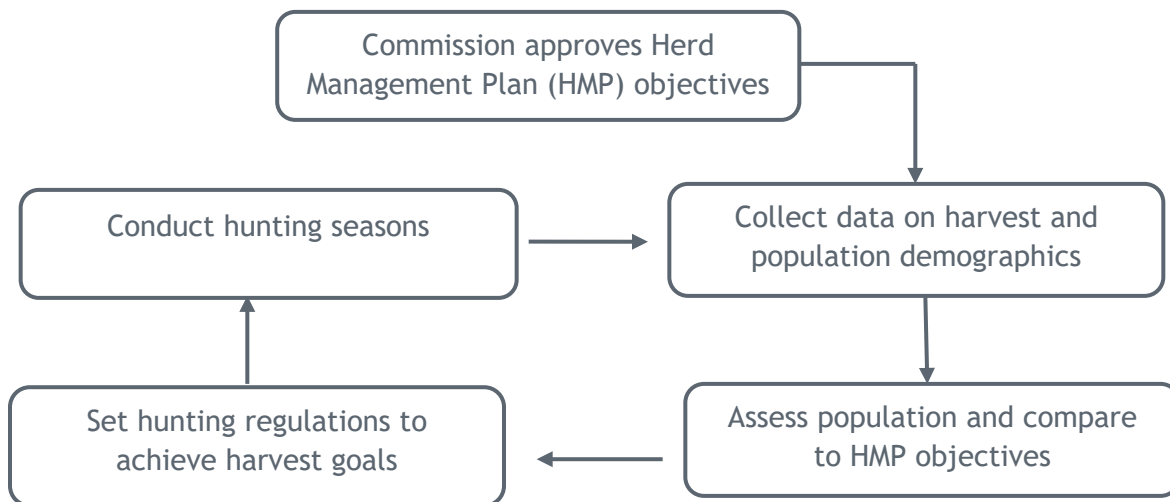
Figure 3. The "Management by Objective" process used by Colorado Parks and Wildlife to manage big game populations by Data Analysis Unit.

With the Management by Objective approach, CPW manages big game populations to achieve the population objective established for a Data Analysis Unit (DAU). A DAU is a geographic area that includes the year-round range of a big game herd. For a given herd, most animals are born, live, and die within the geographic boundaries of their DAU. DAU boundaries are delineated to minimize the interchange of animals between adjacent DAUs. A DAU may be divided into several Game Management Units (GMUs) to distribute hunters and harvest within a DAU.

CPW bases management decisions within a DAU on a herd management plan (HMP). The primary purpose of an HMP is to establish management objectives for the DAU. Management objectives for bighorn sheep HMPs may include population size, the ratio of rams per 100 ewes, or the average age for harvested rams. In an HMP, we also describe the strategies and techniques used to reach these objectives. During the HMP process, public input is solicited and collected through questionnaires, public meetings, and comments to CPW staff and the PWC. CPW's intentions are integrated with the concerns and ideas of various stakeholders, including the United States Forest Service (USFS), the Bureau of Land Management (BLM), city and county governments, hunters, guides and outfitters, private landowners, local chambers of commerce and the public. In preparing an HMP, agency personnel attempt to balance the biological capabilities of the herd and its habitat with the public's demand for wildlife

recreational opportunities. The PWC approves herd management plans, and they are reviewed and updated approximately every 10 years.

The HMP serves as the basis for the annual herd management cycle. In this cycle, the herd's size and composition are assessed and compared to the objectives defined in the HMP. CPW sets removal goals. Based on these goals, specific removal strategies are made for the coming year to either maintain the population or move it towards the established objectives (e.g., license numbers are set, translocation plans are made). Hunting seasons or translocations are then conducted and evaluated. The annual management cycle then begins again (Figure 3).

The purpose of this herd management plan is to set target population and harvest objectives for the Sangre de Cristo bighorn sheep herd (RBS-10; GMUs S-08, S-09, S-68, and the portion of GMU S-65 north of HWY 160). The HMP will be in place starting in 2022 with the expectation that CPW will review and update the HMP in approximately 2032.

DESCRIPTION OF DAU

Location, Boundaries, Land Management, and Physiography

Rocky Mountain bighorn sheep DAU RBS-10 consists of GMUs S-08, S-09, S-68, and the portions of S-65 north of US Hwy 160. The DAU is bounded on the north by the South Arkansas River and the Arkansas River along US Hwy 50; on the east by Fremont County Road 6, USFS 6 (Hayden Creek/Pass Road), Fremont-Saguache and Fremont-Custer county lines, CO Hwy 69, and Huerfano County Roads 550 and 572 (Pass Creek Road); on the south by Alamosa-Costilla and Huerfano-Costilla county lines and US Hwy 160; and on the west by CO Hwy 17 and US Hwy 282. It includes portions of Alamosa, Chaffee, Costilla, Custer, Huerfano, and Saguache counties. Nearby municipalities include Alamosa, Hooper, Moffat, Poncha Springs, Salida, and Westcliffe. RBS-10 encompasses 1,875 mi^2. Primary land managers include private landowners (42%), USFS (23%, Rio Grande National Forest, San Isabel National Forest, and Sangre de Cristo Wilderness), National Park Service (11% Great Sand Dunes National Monument, Wilderness, and Preserve), BLM (9%), USFWS (7%), land trust (4%), State Land Board (2%), and <1% CPW and city municipalities (Figure 4).

In this plan, CPW proposes boundary modifications to DAUs RBS-9, RBS-10, and RBS-18. These changes are recommended to better align the DAU boundaries with the overall range and movements of bighorn sub-herds in the Sangre de Cristo mountain range (Figure 5). The first proposed change is to move GMU S-68 from RBS-9 into RBS-10. Besides S-68, DAU RBS-9 currently includes several lower elevation bighorn sheep GMUs along the Arkansas River Canyon. Game Management Unit S-68, however, is a high elevation unit at the northern end of the Sangre de Cristo range. Bighorns move between GMUs S-68 and S-9 to the south. However, exchange between bighorns in S-68 and the Arkansas River GMUs is rare. Therefore, CPW recommends including GMU S-68 in the RBS-10 DAU.

The second proposed change is to extend the southern boundary of DAU RBS-10 to include the portion of GMU S-65 north of Hwy 160. Currently, GMU S-65 is entirely in DAU RBS-18. This change addresses the Rocky Mountain Bighorn Society's (RMBS) feedback on our draft plan (see comment letter in Appendix A). In their comment letter, RMBS noted that the overall bighorn range is contiguous between the southern end of GMU S-08 and the portion of GMU S-65 north of US Highway 160 (Figure 6). Therefore, changing the DAU boundary to include the

northern part of GMU S-65 is appropriate since DAU boundaries are delineated to incorporate the year-round range of a big game herd.

CPW is not changing the S-08 or S-65 GMU boundaries. The bighorn sheep habitat in the portion of S-65 north of US Hwy 160 consists entirely of private property belonging to the Trinchera Ranch, which has historically allowed public and private bighorn hunting through a mutual agreement with CPW (previously Colorado Division of Wildlife) since 1990. Because this portion of the GMU is included in RBS-10 solely for biological data analysis purposes, management decisions for the entirety of S-65 both north and south of US Hwy 160 will be predicated upon biological conditions and bighorn management needs in S-65 alone.
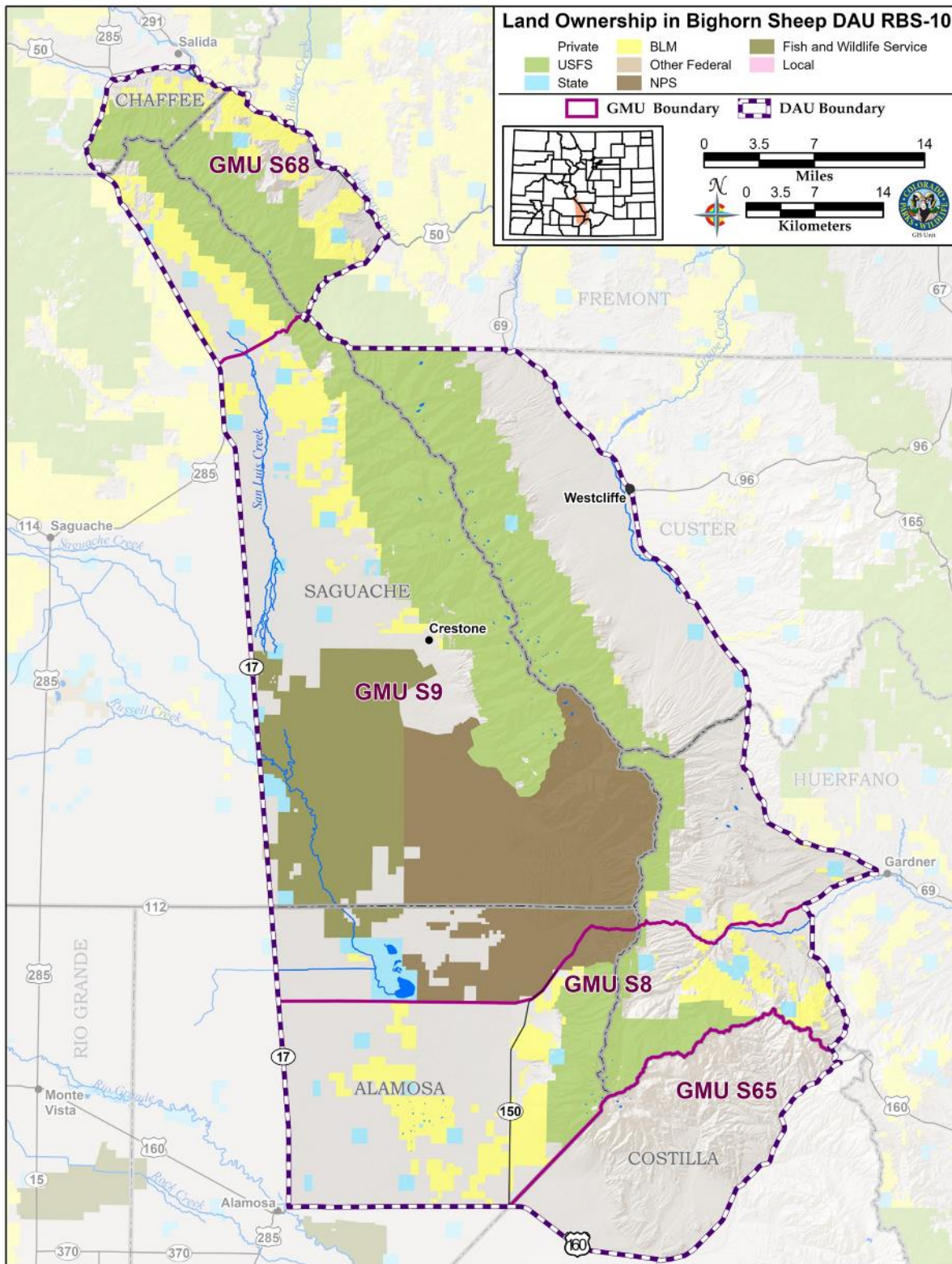
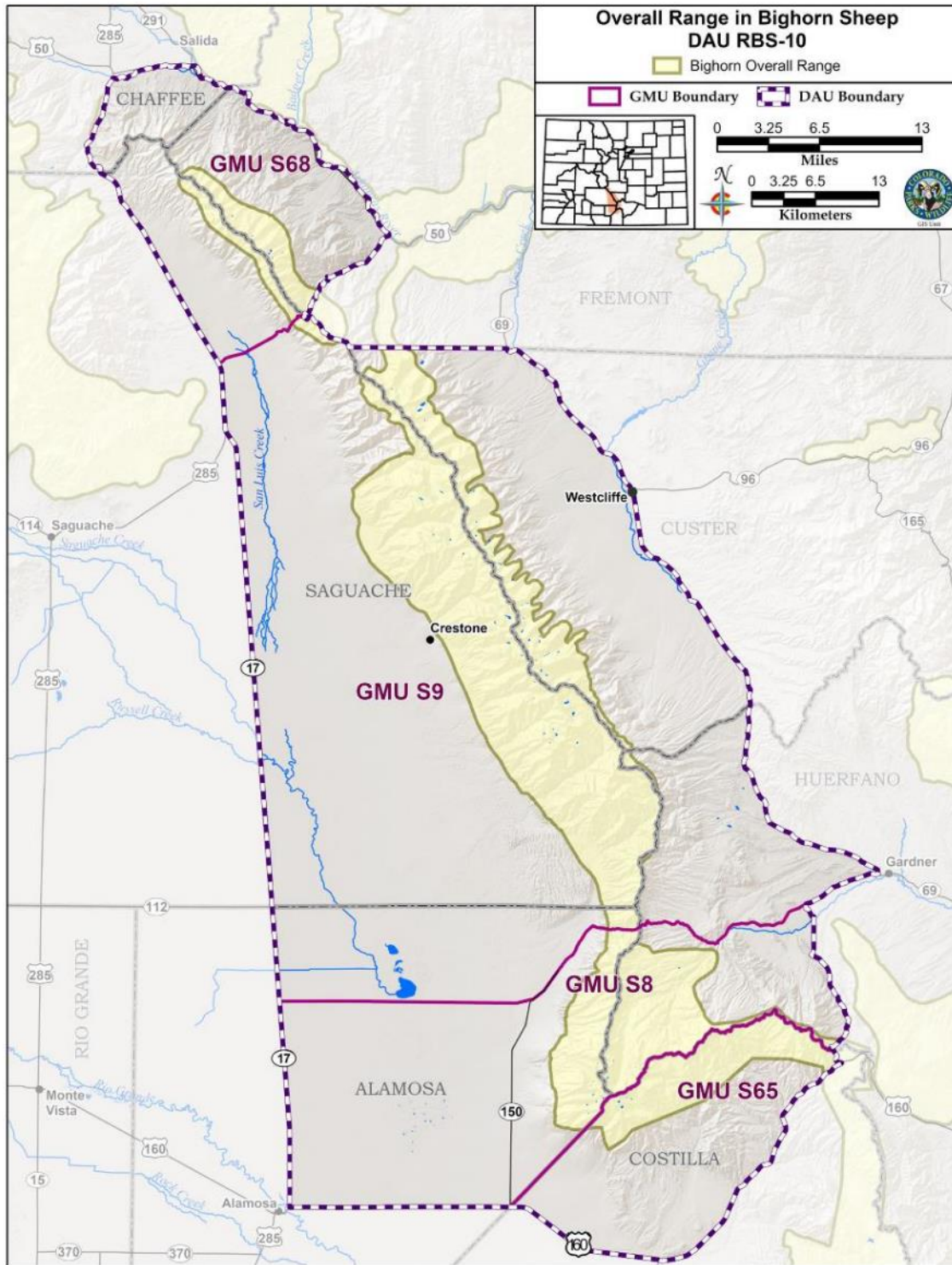**Figure 4.** RBS-10 geography and land ownership.

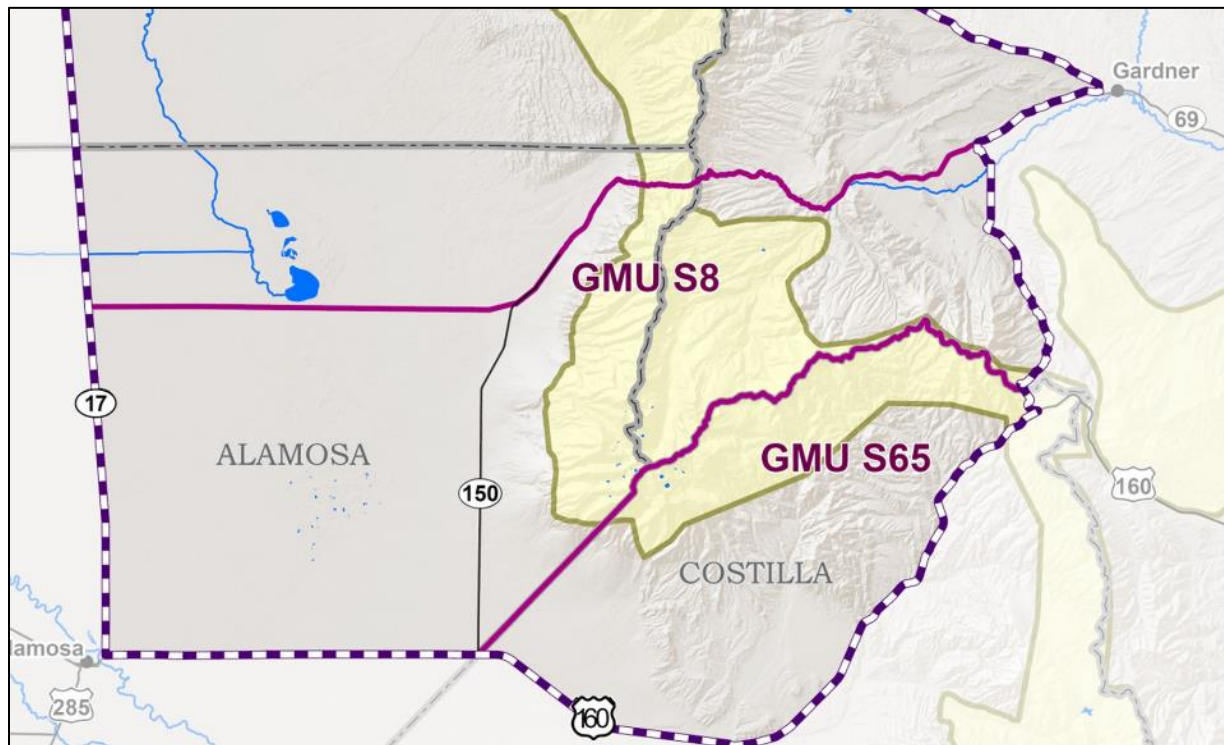**Figure 5.** Overall range for bighorn sheep in RBS-10.

Figure 6. Bighorn overall range in GMU S-08 and the portion of GMU S-65 North of US Hwy 160.

General Physiography

Elevations in RBS-10 range from the highest point of Blanca Peak at 14,353 ft to approximately 7,000 ft along Muddy Creek at the furthest eastern tip of S-09. Topography ranges from relatively flat valleys to steep mountain slopes and peaks. Vegetation varies from grassland/shrub and agriculture at lower elevations through oak brush, pinion-juniper, ponderosa pine, Douglas fir/aspen, spruce/fir, and an extensive alpine zone above 12,000 ft. Major drainages in the DAU include Medano Creek, Cold Creek, Sand Creek, Deadman Creek, Cottonwood Creek, Willow Creek, Crestone Creek, San Luis Creek, Bear Creek, Ute Creek, San Isabel Creek, Brush Creek, and Jones Creek. The climate is characteristic of Colorado mountains, with cool, dry summers and frigid winters with heavy snow. The Sangre de Cristo mountain range is in the rain shadow of the San Juan Mountains and is, therefore, somewhat drier. Higher elevations in the Sangre de Cristos receive 30 - 40 in of precipitation per year. Some precipitation results from frequent afternoon showers in the summer, but the majority comes as snow. Annual precipitation in the foothills is about 12 in, while the valley floor gets only 7 in per year and is considered a high desert.

BIGHORN SHEEP POPULATION HISTORY

Historic and current population monitoring

The RBS-10 bighorn sheep herd is indigenous to the region and one of Colorado's highly valued populations. Due to the inherent difficulties with estimating the population size of high-elevation bighorn populations, we do not know precisely how many animals historically inhabited the RBS-10 geographic area. Estimates have ranged from 740 animals in the mid-

1980s to perhaps fewer than 100 animals during the 1970s (Bear and Jones 1973). However, since accurate aerial surveys were difficult to obtain during those decades, the precision of historic estimates is unknown. In 2004, CPW began periodic helicopter surveys in the DAU. Based on results from those surveys, we revised the population estimate from approximately 700 animals in 2003 to 450 in 2004. The bighorn population has been stable at 375-425 animals since that time (Figure 7). We estimate there to be 50 bighorns in S-08, 270 in S-09, 40 in S-68, and 35 in the northern portion of S-65.
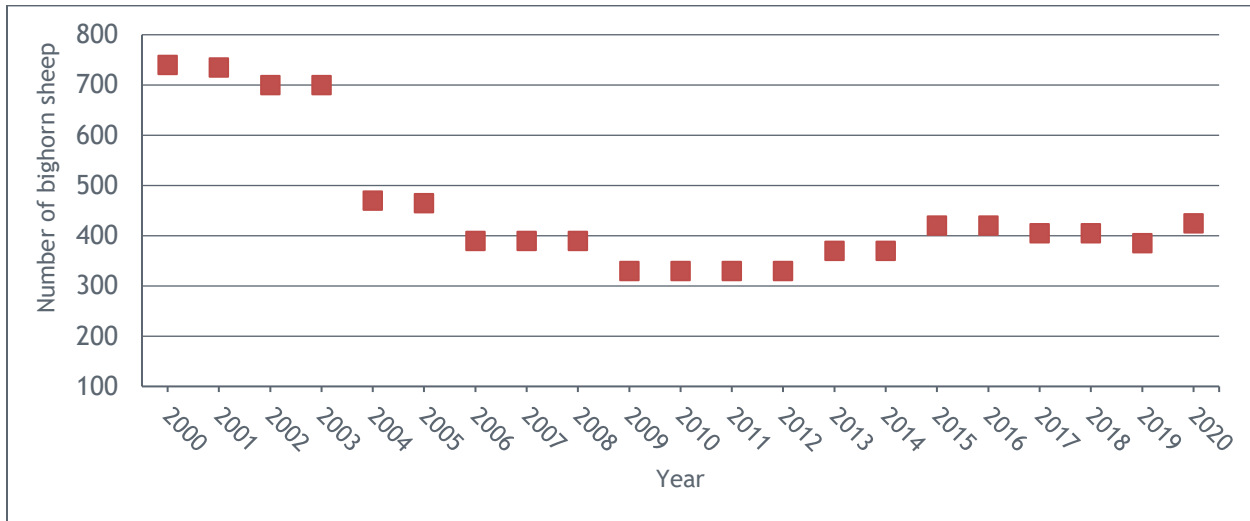
Figure 7. RBS-10 Post-hunt population estimates from 2000-2020.

CPW collects periodic inventory data for this DAU during the winter (December through April) to monitor lamb recruitment and post-season ram to ewe ratios. We report the total number of sheep observed from these surveys and the ratio of lambs and rams per 100 ewes. Winter ratios average approximately 45 lambs per 100 ewes and 50 rams per 100 ewes (Table 1).

Table 1. Winter aerial surveys conducted in GMUs S-08, S-09, S-68, and the northern portion of S-65 since 2011.

GMU S-08				
Winter	Ewes	Lambs	Rams	Total	Date of Survey
2013/2014	14	1	6	21	12/20/2013
2014/2015	20	6	8	34	1/16/2015
2019/2020	20	16	14	50	12/22/2019

GMU S-09				
Winter	Ewes	Lambs	Rams	Total	Date of Survey
2010/2011	52	23	42	123	1/7/2011
2014/2015	111	52	66	234	12/20/2014
2018/2019	78	37	37	153	12/12/2018
2019/2020	85	21	37	143	12/21/2019

Northern Portion of GMU S-65				
Winter	Ewes	Lambs	Rams	Total	Date of Survey
2018/2019	14	2	6	22	12/17/2018

GMU S-68				
Winter	Ewes	Lambs	Rams	Total	Date of Survey
2018/2019	7	2	7	16	12/9/2018

Translocations (to and from the DAU)

The remote location of the GMUs and the recent designation of most of the bighorn sheep habitat in the DAU as a wilderness area has precluded most translocations within the unit. There are four records of translocations for RBS-10 (Table 2). The first translocation occurred in 1945 when 14 bighorns were moved from the Tarryall Range to Cottonwood Creek on the Baca Land Grant in the Sangre de Cristo range (S-09). The bighorns were released in ponderosa pine trees below the Crestone Needles. The second translocation followed a respiratory disease-related complete die-off of bighorns in the early 1980s. In 1986, 20 bighorns were moved from Cottonwood Creek in the North Collegiates to Mount Blanca in Huerfano County (S-08). In 2010 and 2011, CPW captured sheep using helicopter net-gunning in the alpine areas of S-09, between Hermit Peak and Music Mountain by Crestone. These sheep were released in the Hunts Peak area of the Northern Sangre range in S-68. The purpose of the S-08 and S-09 transplants was to supplement the existing herds and expand bighorn distribution. The purpose of the S-68 transplant was to reestablish the sub-herd in the northern part of the Sangre de Cristo range.

Table 2. RBS-10 bighorn sheep capture and release sites, 1945-2016.

Date	Capture Location	Release Site	Rams	Ewes	Lambs	Total
1945	Tarryall Range	Sangre de Cristo Range (Cottonwood Cr.)	1	7	6	14
1986	Collegiates North (Cottonwood Cr.)	Huerfano (Mt. Blanca)	4	7	9	20
2010	Southern Sangre de Cristo Mts. (Crestone)	Northern Sangre de Cristo Mts. (Hunts Peak)	4	8	1	13
2011	Southern Sangre de Cristo Mts. (Crestone)	Northern Sangre de Cristo Mts. (Hunts Peak)	0	7	2	9

Hunting and harvest history

Traditionally, bighorn sheep hunting licenses have been conservative for several reasons. The first is to maintain a quality experience for hunters who draw licenses. For example, in 2020, over 38,000 hunters applied for 312 bighorn sheep licenses in Colorado. Hunters often wait for more than 10 years to draw licenses with the expectation of a high-quality hunting experience. More licenses may contribute to hunter crowding and diminish the experience, particularly if bighorns concentrate in a few small geographic areas. The second reason for conservative license allocation is the threat of stochastic events outside of the influence of management. Pneumonia epidemics have led to large-scale population declines, typically followed by lengthy periods of low lamb recruitment. The frequency, intensity, and duration of any future disease events will impact bighorn sheep hunting opportunities in RBS-10.

RBS-10 has been open to hunting since 1953 in GMU S-09. Historically, S-09 was the sole unit in RBS-10 and included the bighorn range and populations of current day S-08 and S-68. In 1997 and 1999, managers divided S-09 into the three GMUs (S-08, S-09, and S-68). In GMU S-09, ewe hunting was first offered through rifle licenses in 1985 and continues to this day.

Current bighorn sheep license numbers for 2021 are listed in Table 3. The licenses available in S-65 are allocated through the BSAP agreement between CPW and the Trinchera Ranch and are valid anywhere within the ranch boundaries, including properties to the north and south of US Hwy 160.

The average age of rams harvested in the DAU has fluctuated between 6-8 years of age over the past 10+ years (Figure 8). We graphed available licenses by GMU in Figure 9. Hunter success rates have averaged 55% for rifle ram licenses since 2003 and 26% for archery ram licenses in S-09 (Figure 10).

Table 3. 2021 Hunting license quotas in RBS-10.

GMU	Ram	Ewe
S-08	2 Rifle	0
S-09	9 Archery/9 Rifle	5 Rifle
S-68	1 Rifle	0
S-65 BSAP	2 Rifle	0
DAU Total	23	5
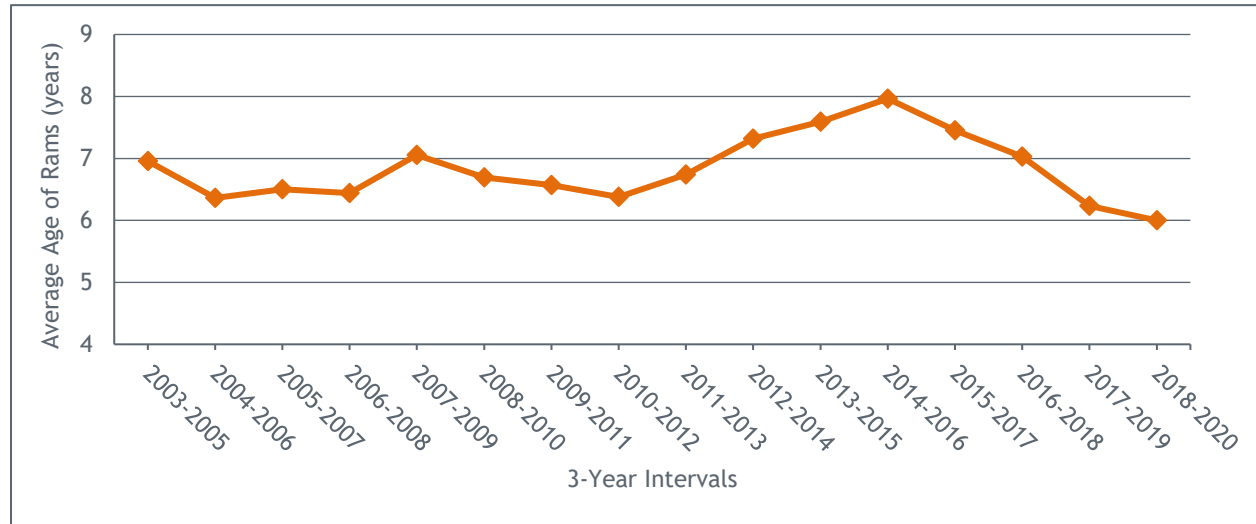
Figure 8. Three-year rolling average age of rams harvested in RBS-10 from 2003-2020.
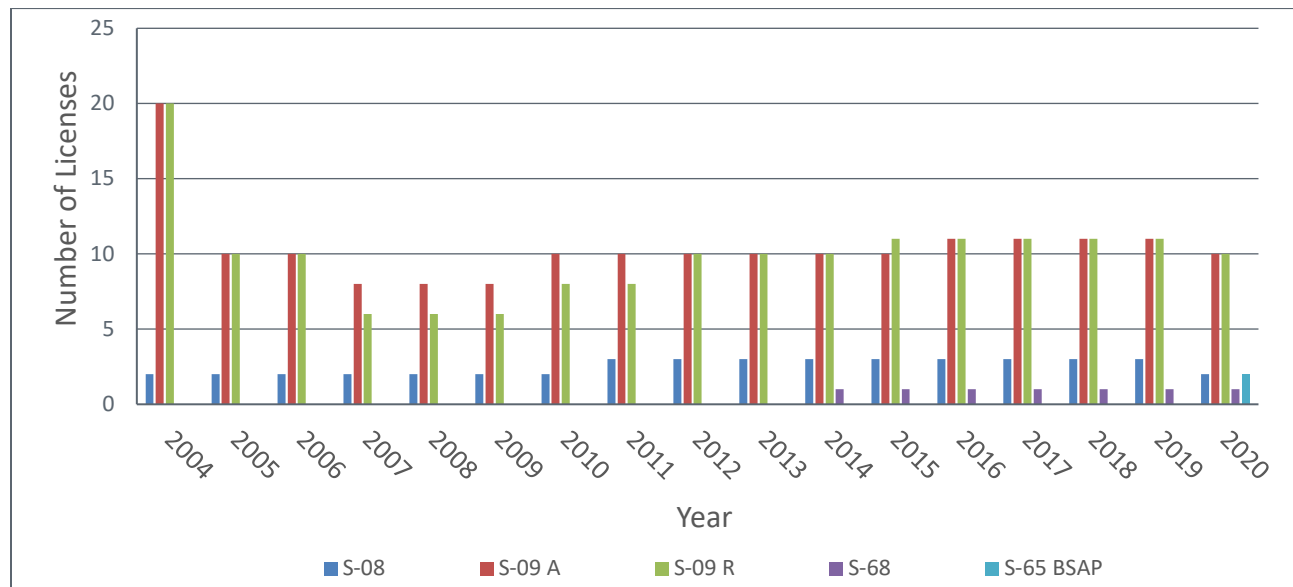
Figure 9. Ram license numbers by GMU for RBS-10 from 2004-2020. (A = Archery Licenses. R = Rifle Licenses. BSAP = Bighorn Sheep Access Program.).

Figure 10. Hunter success rates for ram license holders in RBS-10 from 2003-2020.

CURRENT HERD BIOLOGY & MANAGEMENT ISSUES

Available habitat and bighorn densities

CPW uses two general methods to delineate and calculate suitable bighorn sheep habitat: 1) mapping by local agency personnel with expertise in the herd, and 2) modeling in Geographic Information Systems (GIS). CPW maps bighorn sheep habitat based on observations collected during systematic aerial and ground surveys, other general agency observations, and reports from hunters and other stakeholders (for example, Fi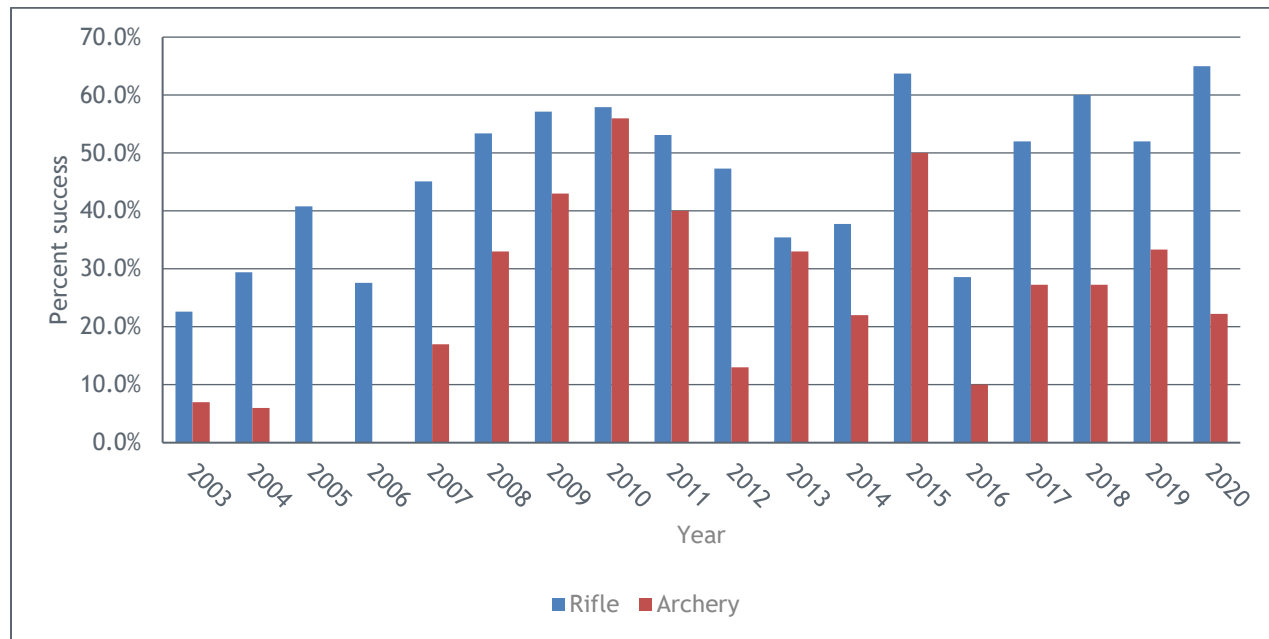gures 5 and 13). We base GIS models on physical habitat attributes that affect bighorn sheep distribution, including the steep slopes used for escape terrain and vegetation density (George et al. 2009). The quality of the GIS models is cross-referenced with location data collected from radio-collared bighorns, including data generated from VHF and GPS radio-collared animals (for example, Figures 11 and 12).

Based on maps generated through these two approaches, we estimate that approximately 21% or 398 mi^2 of RBS-10 is bighorn sheep habitat (Figure 5), with 83% of that area classified as summer range (Figure 11). Suitable lambing habitat (Figure 12) is approximately 7% of the total available area, while winter range is about 16% of the 398 mi^2 (Figure 13). Given the current post-hunt 2020 population estimate of 375-425 animals, the bighorn sheep density is approximately 1.0 sheep/mi^2 on available winter range. The most limited habitat feature is severe winter range, with only 4% of the DAU (15 mi^2) available to bighorns during the worst two winters out of 10. It is during these winters that available forage could be a limiting factor for the population. Densities of sheep on severe winter range likely approach >25 sheep/mi^2. CPW has documented groups of sheep moving to lower elevations if snow conditions allow. This movement has the potential to lower the actual severe winter range density on the alpine habitats. These densities are higher than documented winter densities currently observed in other high elevation, alpine bighorn populations in Colorado, ranging

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from 3.2 sheep/mi^2 in the San Juan herds (RBS-21 and RBS-22) to 7.0 sheep/mi^2 in the Georgetown herd (RBS-03). Research conducted on Ram Mountain in Alberta, Canada, documented a population crash when the local bighorn population exceeded a density of 16.0 sheep/mi^2 (Jorgenson et al. 1997, Festa-Bianchet et al. 2003). This decline was not disease-related, suggesting it occurred in response to some undetermined density-dependent factor(s). Few other density studies have been performed on bighorns and none in Colorado. Though sheep densities in the Ram Mountain studies exceed current documented densities in RBS-10, the Ram Mountain studies demonstrate the importance of maintaining a population density below carrying capacity.
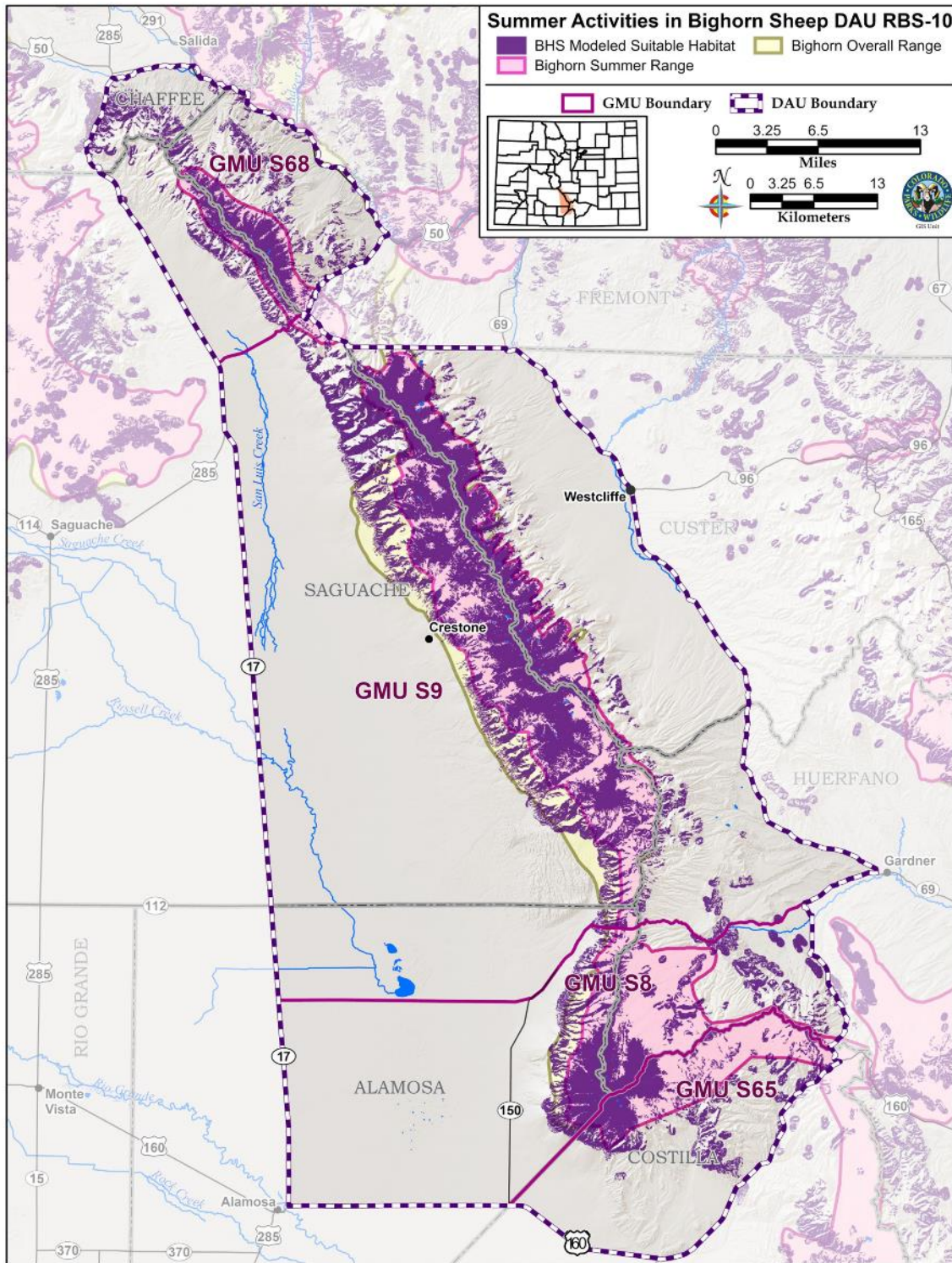
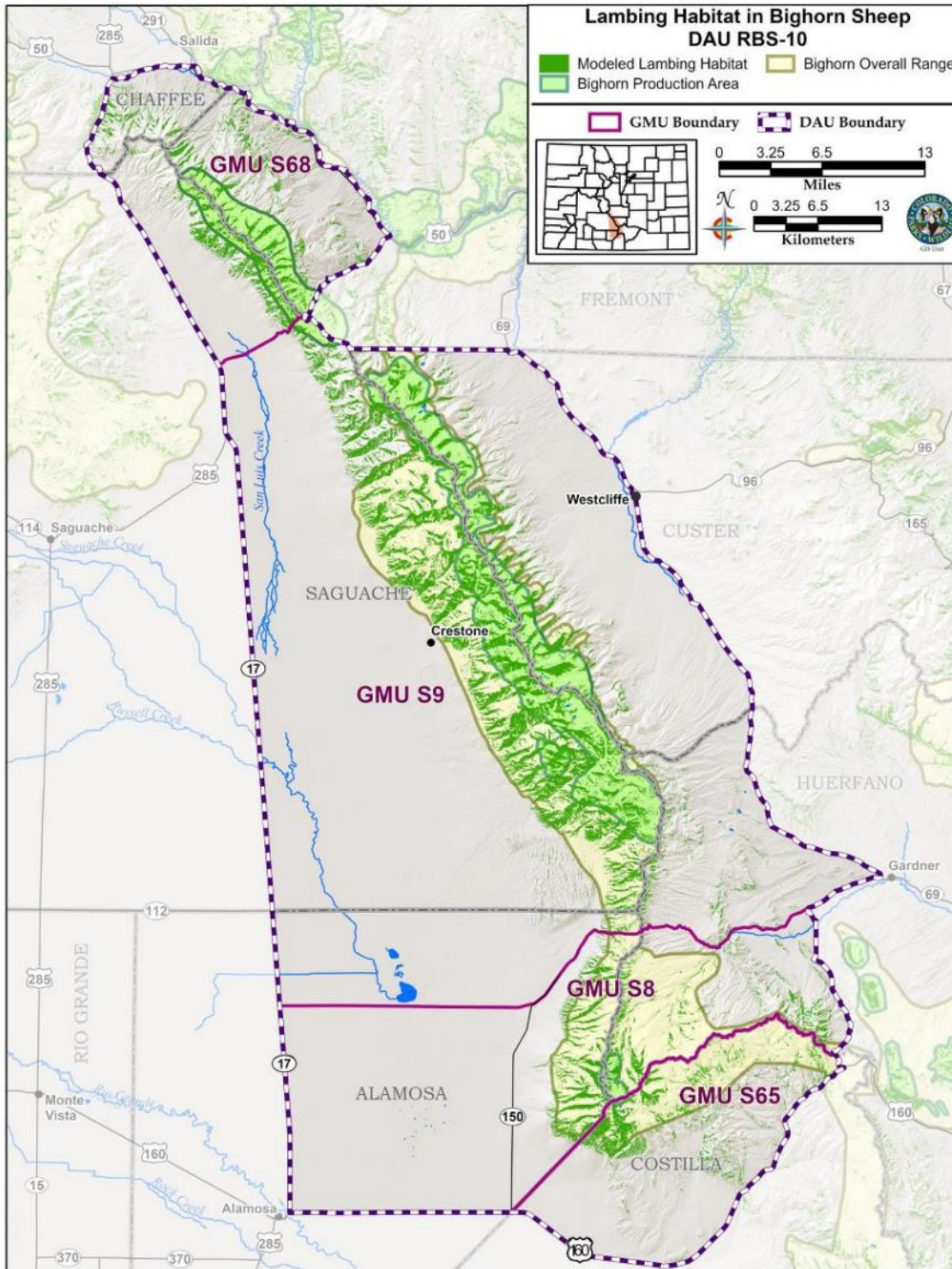**Figure 11.** Suitable habitat, overall range, and summer range for bighorn sheep in RBS-10.

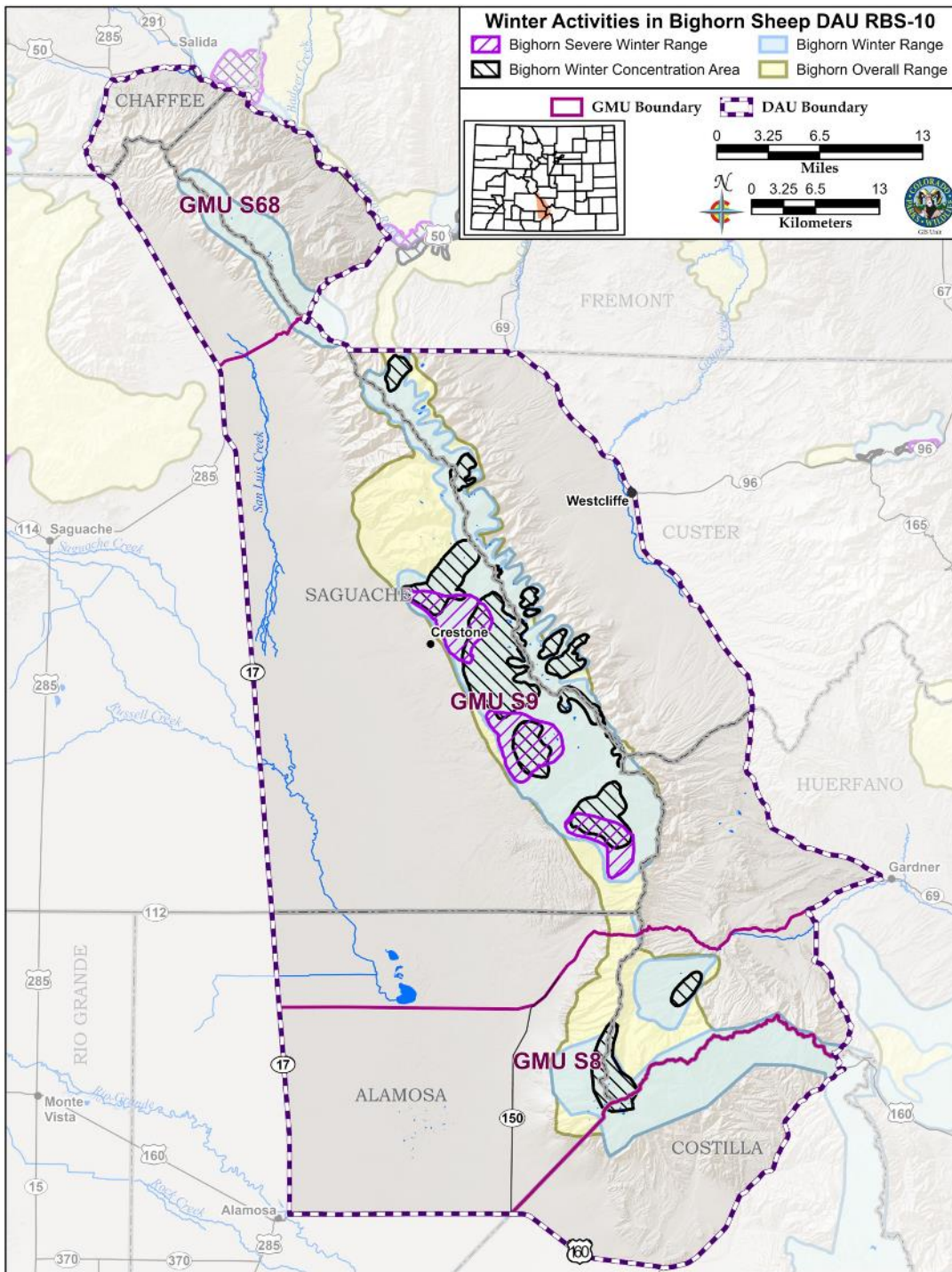**Figure 12.** Lamb production areas for bighorn sheep in RBS-10.

Figure 13. Bighorn sheep winter range, winter concentration areas, and severe winter range in RBS-10.

Disease and interactions with domestic livestock

Bighorn sheep are unique among Colorado's big game species regarding the influence of infectious diseases on population performance and species abundance. The susceptibility of bighorn sheep to pathogens and respiratory disease introduced by domestic livestock is the primary factor limiting bighorn sheep populations in Colorado and is our primary concern for the species. In addition to initial all-age die-offs, pneumonia epidemics in bighorn sheep can lead to long-term reductions in lamb survival and recruitment, resulting in stagnant or declining populations over many years (George et al. 2009). Interaction between bighorn sheep and domestic sheep and goats is a significant management issue for bighorn populations in Colorado and elsewhere, which is corroborated in the existing literature (Beecham et al. 2007, Schommer and Woolever 2008, George et al. 2009, Lawrence et al. 2010, WAFWA 2010, Wehausen et al. 2011, Grigg et al. 2017). Native North American wild sheep species are susceptible to polymicrobial induced pneumonia, the generic term for a respiratory disease caused by bacteria in the family Pasteurellaceae (Miller 2001) and *Mycoplasma ovipneumoniae* (Cassirer et al. 2018). Some strains of these bacteria carried by domestic sheep and goats are particularly pathogenic in bighorns (reviewed by Miller 2001, US Department of Agriculture [USDA] 2006, George et al. 2008).

No active domestic sheep grazing allotments exist on public lands in RBS-10, but numerous hobby sheep and goat livestock operations are associated with subdivisions adjacent to the bighorn overall range. The potential for contact between wild and domestic sheep continues to exist within this DAU; therefore, ongoing and future management actions should focus on maintaining effective separation between the species (WAFWA 2010). Pioneering bighorn sheep, particularly young rams, are most likely to co-mingle with domestic sheep and goats. Conversely, stray domestic sheep or goats are also likely to associate with wild sheep groups if separated from their primary band. Sheep, wild or domestic, are highly gregarious and are likely to interact with other sheep as they encounter one another.

Recreational impacts

Perpetually increasing recreational use, mostly from hikers, backpackers, and backcountry skiers, is another primary concern for bighorn sheep in RBS-10. Recreation is a driving economic force in local communities and occurs throughout the year. These communities continue to grow, resulting in rising demands for recreational opportunities, higher impacts on natural resources, and potential increases in habitat fragmentation. Quality wildlife habitat, including food, water, shelter, space, and connectivity, is imperative to maintaining healthy wildlife populations. Large blocks of contiguous habitat are most likely to promote the long-term viability of a species. Habitat becomes fragmented as land-use changes break the landscape into smaller, more distinct "patches." These patches may not provide fundamental habitat requirements resulting in diminished carrying capacity for the species across the landscape. Wildlife living within fragmented habitats are more vulnerable to stochastic population declines stemming from disease, increased predation rates, habitat loss, or habitat modification. Most wildlife managers agree, with support from the scientific literature, that recreation has the potential to impact wildlife distribution and abundance (Joslin and Youmans 1999, Valdez and Krausman 1999, Taylor and Knight 2003, Keller and Bender 2007, Naylor et al. 2008, Goldstein et al. 2010, Courtemanch 2014). The "zone of influence" of recreational activities for wildlife may extend for some distance beyond the actual activity being performed. The zone varies depending on habitat composition, topography, and a species' tolerance of human disturbance.

Bighorn sheep inhabit open country and are vulnerable to disturbance from recreation. For example, sheep will often flee at the sight of humans on a distant ridge, even when they are a considerable distance away (Holl and Bleich 1983). Ewes with young lambs are particularly flighty, and every effort should be made to document and protect lambing and nursery areas from excessive disturbance. Human activity, including recreation, may perpetuate higher densities of bighorn sheep in areas where they seek refuge from disturbance, resulting in unintended impacts on the population. In the summer and fall, many people hike the high peaks in RBS-10; bighorns avoid human intrusion in those areas. Approximately 340,000 people climb Colorado's 58 14'ers each year, nine of which occur in RBS-10. These peaks draw high levels of recreational interest, increasing potential or unintended impacts, such as a higher level of disturbance on alpine bighorn sheep populations in RBS-10 and elsewhere by users.

Winter range is also crucial for bighorn sheep across Colorado, and a significant portion of the animals within RBS-10 winter above timberline. The needs of wildlife in the winter should be carefully considered during all land-use and recreational planning. Disturbance from recreation is typically additive during the winter months when bighorn are already using more energy than they can get from their winter diet. Some bighorn populations habituate to human activities during the winter; however, activities such as snowmobiling, dog walking (i.e. dogs off-leash harassing wildlife), and backcountry skiing all have significant potential to disturb and displace wintering sheep (Graham 1980, MacArthur et al. 1982, Etchberger et al. 1989, Courtemanch 2014).

Recreation could limit the overall range of bighorn and discourage the use of suitable habitats impacted by human activities. CPW will continue working with federal agencies, non-governmental organizations (NGOs), and local jurisdictions to evaluate recreational activities and mitigate or discourage those detrimental to bighorn sheep in RBS-10.

Recreation with domestic goats

As previously discussed, contact between bighorn sheep and domestic sheep/goats poses a threat to the health and welfare of bighorn sheep. The utilization of goats as pack animals has been around for decades, with non-profit advocacy groups existing since 1999.

Pack goats used by recreationists also often go unnoticed. Domestic goats can transmit diseases such as Pasteurella (as discussed previously regarding domestic livestock), contagious ecthyma, and infectious keratoconjunctivitis (*Mycoplasma conjunctivae*). Keratoconjunctivitis and contagious ecthyma infected a population of bighorn sheep in the Silver Bell Mountains in Arizona. The disease source was purportedly from domestic goats. The result of the disease on the bighorn population was a 23% abrupt decline. Half of the diseased animals that were marked died, with predation being the proximate cause in 50% and starvation as secondary in 33% of the cases (Jansen et al. 2007). Pack goats are used within RBS-10, but the San Isabel and Rio Grande National Forests do not have records on the extent of use. Avoiding contact between domestic goats and bighorns is necessary to prevent disease transmission to wild sheep that could have population-level impacts. A temporary area closure to domestic goat use on National Forest Service lands within the Shoshone National Forest was issued to "protect the health and viability of bighorn sheep, a Region 2 sensitive species, on their core habitat..." on November 14, 2011. CPW will work closely with the USFS and other interested parties to develop travel management, recreational, and other plans ensuring adequate human access while providing for secure, undisturbed areas for all wildlife and resource protection. This may include prohibiting domestic dogs and pack goats on some trails in

occupied bighorn sheep habitat (George et al. 2009). CPW needs to identify and document any conflicts that occur between bighorn and recreationists in RBS-10. Since the initial draft of this plan, the Rio Grande National Forest has prohibited recreational pack goats within their portion of the Sangre de Cristo Wilderness.

Mountain Goat/Bighorn Interactions

Mountain goats were introduced into Colorado in 1948 to establish huntable populations (Hibbs 1966). Subsequent translocations occurred in several areas during the next 25 years. Mountain goats provide unique wildlife viewing and hunting opportunities. They are highly effective at pioneering into new areas. Issues related to sympatric bighorn and mountain goat populations are comprehensively discussed in the Colorado Bighorn Sheep Management Plan (George et al. 2009). Our chief management concern is the potential for resource competition within a given habitat once mountain goat populations become established. The statewide plan is clear on mountain goat management in bighorn habitat: "The DOW will strive to manage mountain goat populations and distribution via the DAU planning process to limit their expansion into Tier 1 and Tier 2 bighorn sheep DAU's." Furthermore, CPW Commission Regulation #230 (Chapter W-2) grants the Director of CPW the authority to issue special mountain goat management licenses so hunters can harvest mountain goats found outside of an established mountain goat unit. Using this tool, managers may remove pioneering mountain goats preemptively before any significant population establishment has occurred.

Several pioneering mountain goats have wandered into S-09 over the years. CPW will use hunters to remove pioneering mountain goats from RBS-10 when discovered, preventing mountain goat population establishment within the DAU.

Hunter Harvest Objectives and Management

Ewe Hunting

Increasing densities of bighorn create unique management ramifications, including the potential for increased susceptibility to disease and disease transmission. Bighorns, particularly ewe groups, are often slow to pioneer into vacant habitat, and therefore tend to congregate in the same places year after year. As the population grows, densities increase in these traditional use areas, leading to localized habitat degradation, reduced animal body condition, and increased vulnerability to disease.

Studies of wild bighorn sheep conducted on Ram Mountain in Alberta, Canada, offer valuable insight into the role density plays in bighorn population dynamics. These studies indicated that lamb mass and winter survival decreased as population density increased (Portier et al. 1998), yearling female survival was negatively affected by density, and age at first reproduction was also negatively correlated with population size (Jorgenson et al. 1997). Conservative ewe harvest may reduce competition for limited resources, increase juvenile survival, lower age at first reproduction, provide hunter opportunity, improve hunter-attained herd information, and encourage dispersal or the use of new habitats. Additionally, ewe harvest could reduce the risk and severity of disease outbreaks.

Recommendations for ewe harvest are presented in the Colorado Bighorn Sheep Management Plan (George et al. 2009). These recommendations provide CPW with the general framework for establishing ewe hunting seasons across the state (Table 4). In the plan, off-take rates are based on a population objective and observed winter lamb:ewe ratios. Healthy bighorn sheep populations (i.e., high winter lamb:ewe ratios and adult survival) can sustain relatively high

levels of annual female harvest. For example, in a population at the objective with an observed winter lamb:ewe ratio of 25:100, the recommendation is for an off-take of <12% of the pre-hunt ewe population. That would equate to a harvest of ~25 ewes in a bighorn population of 400 animals with a ram:ewe:lamb ratio of 50:100:25. In RBS-10, we currently lack sufficient data to recommend this level of harvest. However, we will consider additional ewe hunting opportunities and strategies in the future if the population continues to stabilize or increase. We will also account for the accessibility of ewes to hunters so that ewes from the most accessible sub-groups are not overharvested. Ewe seasons and ram seasons may overlap, but the hunting of ewes should not interfere with the quality of the hunt experienced by ram hunters. In the absence of a specified population objective, managers will adapt harvest on an annual basis. We will base decisions on the best available data and information and whether the herd is at, or exceeds, the target population size objective.

Table 4. Recommended ewe removal rates via hunting and translocations from Colorado's Bighorn Sheep Management Plan (George et al. 2009).

Estimated Population in Relationship to Objective	Observed Winter Lamb:Ewe Ratio	Ewe Removal or Harvest Rate as a Percentage of Total Population	Comments
≥25% below	NA	No ewe removals	Exceptions allowed for disease management
<Objective, but within 25%	≥40:100	Up to 5% of total post-hunt population ≥1-year-old	Or up to 12% of pre-hunt ewe population
At Objective	≥40:100	5-10% of the total post-hunt population ≥1-year-old	Or 12-24% of pre-hunt ewe population
	20-39:100	<5% of the total post-hunt population ≥1-year-old	Or <12% of pre-hunt ewe population
	<20:100	No ewe removals	Exceptions allowed for disease management
Over Objective		≥10% of the total post-hunt population > 1-year-old	≥24% of pre-hunt ewe population

Ram Hunting

Several strategies are outlined in Colorado's Bighorn Sheep Management Plan regarding ram harvest (George et al. 2009). Ram harvest rates of 2-5% of the post-hunt population and/or 4-10% of the total post-hunt ram numbers are recommended if winter lamb:ewe ratios exceed 20:100. Similar to ewe hunting, ram licenses will be driven by winter lamb:ewe ratios, sheep densities on winter ranges, and the average age of harvested animals. Using a 2020 post-hunt population estimate of 375-425 and assuming a winter lamb:ewe ratio greater than 20:100 (preferably higher) across the DAU, RBS-10 can sustain a harvest between 8 and 20 rams, which is congruent with the current ram harvest in the DAU. CPW will consider opportunities for increasing licenses in this DAU in the future.

CPW will provide ram hunting opportunities in DAU RBS-10 as long as population performance allows. Ram hunting will primarily be offered for a quality hunting experience but, to a lesser extent, for population management. For GMUs S-08, S-09, and S-68, CPW will manage ram hunting to achieve the average age of harvest ram objective selected during this planning process. In GMU S-65, bighorn sheep licenses will be allocated according to current and future BSAP agreements between CPW and the Trinchera Ranch.

ISSUE SOLICITATION PROCESS

Stakeholder Input and 30-Day Comment Period

CPW sent the draft plan to county commissioners, federal land management agencies, and other stakeholders for review. We posted the draft plan on the CPW website for a 30-day comment period in January 2021. To solicit hunter input, we mailed postcards to 600 randomly selected individuals who had applied for bighorn sheep licenses in S-08, S-09, or S-68 from 2018-2020. Postcards included the website address for the RBS-10 draft plan and an email address to submit comments.

CPW received comments from the Rio Grande National Forest, the Pike San Isabel National Forest, the Great Sand Dunes National Park, and the Rocky Mountain Bighorn Society. Additionally, several hunters and country commissioners provided comments. Stakeholders generally supported our preferred management alternatives. As noted previously, RMBS asked us to address or provide additional explanations in several places in the plan, including the DAU boundary and calculations of suitable habitat. We updated the plan to address their comments in the relevant sections. Letters of support from land management agencies and NGOs and a summary of the other stakeholder comments are in Appendix A.

MANAGEMENT RECOMMENDATIONS AND FUTURE NEEDS

Herd Management

CPW will manage RBS-10 as a primary (Tier 1) core population. Primary core populations are defined as those that are large ($\geq$100 for $\geq$ 90% of the years since 1986), native populations comprising one or more interconnected herds that have received few (i.e., $\leq$ 50 animals total) if any supplemental releases in the past. RBS-10 meets those criteria.

The management strategy for the bighorn sheep herd in RBS-10 is to maintain the population at a stable level and reduce the potential for catastrophic disease outbreaks, which cause mortality and subsequent suppressed lamb recruitment. Currently, CPW's primary management tools are hunting, habitat manipulations and improvements, and disease monitoring.

Domestic Sheep and the Potential for Disease Transmission

Regarding domestic sheep and disease transmission, we have established the following Management Goal in Colorado's statewide Bighorn Sheep Management Plan (George et al. 2009):

- *CPW will strive to prevent introductions of infectious or parasitic diseases from domestic livestock that could adversely impact bighorn population performance*

and viability. The CPW will work cooperatively with the USFS, BLM, and private landowners to minimize the potential for bighorn sheep to contact domestic livestock whenever practicable.

CPW advocates adherence to recommendations presented in the Western Association of Fish and Wildlife Agencies (WAFWA), *Recommendations for Domestic Sheep and Goat Management in Wild Sheep Habitat* (2010), and U.S. Animal Health Association's, *Recommendations on best management practices for domestic sheep grazing on public land ranges shared with bighorn sheep (2009)*. These recommendations and Best Management Practices (BMPs) are only effective if consistently implemented and rigorously enforced. WAFWA managers emphasize the goal of "*effective separation,*" which they define as "spatial and/or temporal separation between wild sheep and domestic sheep or goats resulting in, at most, minimal risk of potential association and subsequent transmission of respiratory disease between animal groups."

Population target objective range

The current population estimate in RBS-10 is stable at approximately 375-425 animals. The current ewe harvest in RBS-10 provides hunting opportunities but is not expected to control population growth within the DAU. Therefore, the key limiting factors in the past and present population growth are winter range carrying capacity and the potential for disease transmission following contact with domestic livestock. We selected the following management objective, considering bighorn distribution, winter range capability, population density/density dependence, and the potential risks of contact with domestic livestock:

> ***Approved alternative: Population target 425 sheep (range 375-450)***
>
> - This objective:
>   - Maintains the current population size.
>   - Equates to an available winter range density of ~1.0 to 1.3 sheep/mi^2 and a severe winter range density of 10.3 to 13.2 sheep/mi^2.
>   - Assumes that the risk of contact with domestic livestock is maintained at the current level.
>   - Allows for current watchable wildlife opportunities to be maintained.

Alternative 2: Population target 350 sheep (range 300-400)

This alternative would result in an available winter range density of ~0.85 to 1.1 sheep/mi^2 and a severe winter range density of 8.8 to 11.8 sheep/mi^2.

Alternative 3: Population target 550 sheep (range 500-600)

This alternative represents an available winter range density of ~1.1 to 1.4 sheep/mi^2 and a severe winter range density of 11.8 to 14.7 sheep/mi^2.

Ram and Ewe Harvest Objective Alternatives

Ram and ewe hunting will continue throughout RBS-10 as long as population performance allows. Hunter crowding, hunter experience, age of harvested rams, and maintaining watchable wildlife opportunities are all factors to be considered when discussing bighorn harvest management. The harvest management objectives in this DAU will focus on the

average age of harvested rams. In contrast, ewe harvest provides hunting opportunities but is not used to manage population size and winter range densities.

> *Approved alternative: Maintain a 3-year average age of 6-8 for hunter-harvested rams.*
>
> - This objective will maintain the current harvest regime in the DAU. Moderate ram license increases may be possible based on population performance. This objective should provide a quality experience, moderate levels of crowding, and diverse age classes of rams.
>
> *Approved alternative: Maintain ewe harvest to allow for hunter opportunity.*
>
> - This objective allows for low levels of ewe harvest, primarily for hunter opportunity.

Alternative 2: Maintain a 3-yr average age of rams harvested of 5-7 years old.

Under this alternative, ram license allocation may increase, which is expected to decrease the age of harvested rams. This alternative would increase hunter crowding, especially within those easily accessed hunting areas

Alternative 3: Maintain a 3-yr average age of rams harvested of 7-9 years old.

Under this alternative, ram license allocation would decrease, and it would take longer to draw a license, but hunter densities would decrease across the hunting areas.

Strategies for Achieving Objectives

The current management supports the selected preferred alternatives for both rams and ewes within RBS-10. Therefore, we do not expect that significant changes will be needed to achieve the approved objectives. To maintain the ram and ewe harvest objectives, CPW will base annual license number allocations on the age of harvested rams, survey data, general agency observations, and hunter reports.

Strategies for Addressing Management Concerns

This plan identifies three significant issues in managing bighorn sheep in RBS-10, including disease transmission, recreational impacts, and bighorn sheep/mountain goat interactions. Here are our strategies to address these issues:

- o CPW will actively comment on land-use proposals that involve domestic sheep and goat grazing and recreation. To the extent possible, CPW will align comments with the conservation of bighorn sheep.
- o CPW recognizes the fiscal impact of recreation on nearby communities. CPW will work with land management agencies and other stakeholders to mitigate the recreational impacts to bighorn sheep populations.
- o CPW will use special management licenses to remove pioneering mountain goats from RBS-10 to prevent the establishment of mountain goats in the DAU (per CPW Regulations Chapter W-2, Article IV, #230).

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APPENDIX A: STAKEHOLDER COMMENTS

Hello, Allen. I appreciate the opportunity for the USFS to provide comments to your proposed Sangre de Cristo Bighorn Sheep Management Plan. We have gone through the document and find it a very solid plan and are supportive of your preferred alternative. The Rocky Mountain bighorn sheep is considered a Region 2 sensitive species. The management objectives outlined in the plan align with those of Region 2 of the USFS and those of the San Carlos Ranger District.

We thought it was good to see mention of the potential impact of high recreation use and recreational goats in your plan.

Please let me know if you have any questions or need additional information. If you need for me to put this into a formal letter, I certainly can do that.

Thanks again.

Destiny Chapman
District Ranger
Forest Service
Pike/San Isabel National Forests &
Cimarron/Comanche National Grasslands
San Carlos Ranger District

United States Department of Agriculture	Forest Service	Rio Grande National Forest	Divide Ranger District 13308 West Highway 160 Del Norte, CO 81132 (719) 657-3321 TDD 657-6038

Date: January 28, 2021

Allen Vitt
Terrestrial Wildlife Biologist
Colorado Parks and Wildlife

Thank you for the opportunity to comment on the Draft Sangre De Cristo Bighorn Sheep Herd Management Plan - DAU Plan RBS-10 (Game Management Units S08, S09 and S68).

The management strategy and preferred alternative in the Draft DAU plan is a population target of 400 bighorn (range 350-450) which essentially maintains the current population size. Ram and ewe harvests are maintained at current levels. CPWs primary management tools are hunting, habitat manipulations and improvements, and disease monitoring.

The Draft DAU Plan recognizes that disease and interactions with domestic sheep is one of the biggest potential threats to bighorn sheep. The plan also recognizes that there are no active domestic sheep grazing allotments in RBS-10, but there are numerous hobby sheep and goat livestock operations associated with subdivisions adjacent to bighorn overall range.

We would like to point out that our revised Forest Plan (2020) contains several Desired Conditions (DCs) and Standards for Species of Conservation Concern (SCC) including bighorn sheep, which are applicable in those areas in which domestic sheep grazing does occur. These include:

DC-SCC-8: Improve or maintain habitat for bighorn sheep. (Forestwide).

DC-SCC-9: Maintain effective separation to reduce the likelihood of interaction and risk of disease transmission between domestic sheep and bighorn sheep on active grazing allotments. (Forestwide).

S-SCC-1: Maintain effective separation of domestic sheep and bighorn sheep on active grazing allotments to reduce the likelihood and risk of disease transmission. Effective separation is defined as spatial or temporal separation between bighorn sheep and domestic sheep, resulting in minimal risk of contact and subsequent transmission of respiratory pathogens between animal groups. (Forestwide).

S-SCC-2: Do not authorize projects that will result in displacement of bighorn sheep during their reproductive period (generally April 15 to July 1). Forestwide.

The Draft DAU Plan also identifies recreation pack goats as a potential issue in the Sangre de Cristos. Our revised Forest Plan (2020) plan contains a standard designed to limit potential interactions between pack goats and bighorn sheep.

S-SCC-3: Prohibit the use of recreational pack goats in the Sangre de Cristo Wilderness Area to eliminate potential interactions between pack goats and bighorn sheep. (Forestwide).

Our Land Management Plan is new to the public. There is a need for greater public awareness and education regarding the prohibition of recreational pack goats in the Sangre de Cristos. We are open to your ideas and help with signing trailheads at entry points and in improving the message regarding potential disease transmission between recreational pack goats and bighorn sheep.

Please note that it appears that there are several discrepancies regarding landownership acres as described in the yellow box in the Draft DAU Plan's Executive Summary compared to the acres on page 5 under Description of DAU.

Thank you for the opportunity to review the Draft DAU Plan. The RGNF supports the approval of the Draft RBS-10 Herd Management Plan and appreciates CPW's continued commitment of involving land management agencies within the boundaries of the DAUs.

Sincerely,

Dale Gomez
Dale Gomez
RGNF acting Wildlife Program Lead

Cc: Brent Frankland

Rocky Mountain BIGHORN SOCIETY

P.O. Box 8320 • Denver, CO • 80201-8320

March 25, 2021

Allen Vitt
Terrestrial Biologist
Colorado Parks and Wildlife
600 Reservoir Road
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Dear Mr. Vitt:

Please accept the following comments on the Draft Sangre de Cristo Bighorn Sheep Herd Management Plan (HMP). The Rocky Mountain Bighorn Society (RMBS) exists to promote the science-based management of the bighorn sheep, educate the public about their life and habitat, and assure the sportsman's rights in proper opportunities. We appreciate the efforts of Colorado Parks and Wildlife (CPW) staff to complete herd management plans for all bighorn sheep herds in Colorado and respect considerable effort put forth in this draft plan.

**Ram and Ewe Harvest Objectives**

We support the proposed management objective to maintain a 3-year average age of rams harvested of 6-8 years old. We believe this strikes a good balance between hunter opportunity and trophy quality. Historical harvest statistics reveal that older age class rams are regularly harvested in the unit. Likewise, we support limited ewe hunting opportunity as long at the estimated herd population is near or above objective.

Population Objective and Historical Population

The RBS-10 population estimate 600-800 sheep for at least 18 years from the late 1980s to early 2000s based on CPW data (Figure 1). The current estimate is only 390 sheep (2020, post-hunt) and the HMP does not identify or address the cause of this decline nor show the longer term population trend. We understand that historical population estimating methods may not have reliable, but we believe it would be beneficial to explain this decline in the HMP for the casual reader.

Winter Range

The HMP does not explain how winter range and severe winter range is modeled/calculated. Historical population estimates suggest enough winter range to support much higher populations, yet the plan indicates winter range is a limiting factor for growing the population beyond the current level. It may be beneficial to identify areas where historical winter range is no longer functional due to land management practices and consider habitat treatment such as prescribed fire to improve the quality and quantity of winter range.

Figure 1. RBS-10 Population History
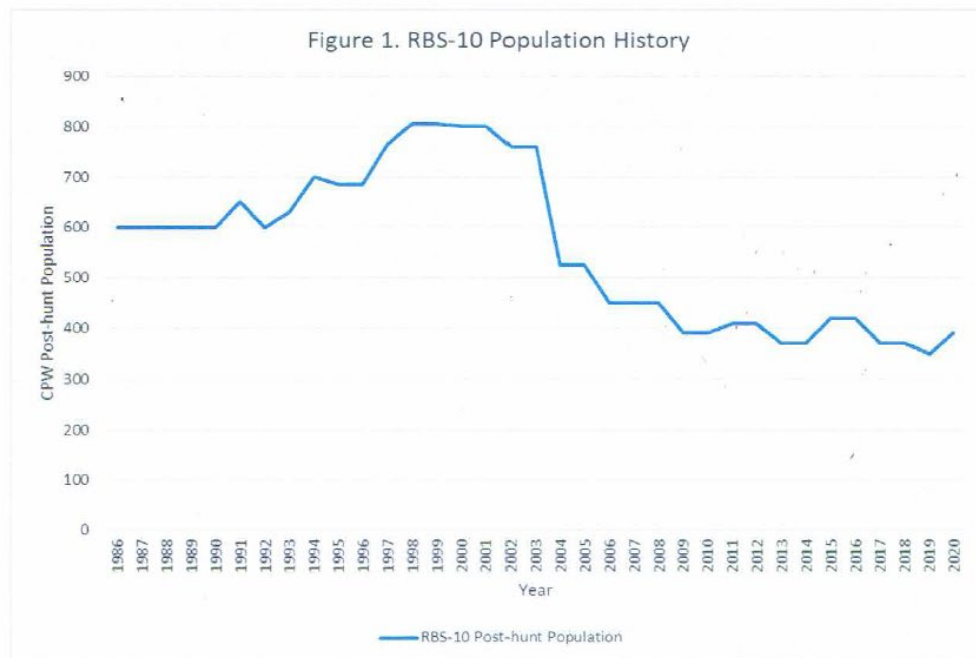
Disease and Interactions with Domestic Livestock

The HMP identifies potential contact with domestic sheep and goats as a primary concern for RBS-10, as it is with nearly every bighorn sheep herd in Colorado. Although there are no federal domestic sheep grazing allotments in the DAU, the use of pack goats by recreationists is a concern. The Rio Grande National Forest recognized this risk in their new Land Management Plan which was finalized in 2020, and banned the use of pack goats on lands managed by them in the Sangre de Cristo Mountain range. Unfortunately, the east side of the range is managed by the San Isabel National Forest which has no such pack goat ban in place. A worthwhile goal in this HMP would be to work with the San Isabel National Forest, and with Bureau of Land Management managers if pertinent, to expand this restriction to all federally managed occupied bighorn sheep range in the DAU.

The HMP acknowledges numerous hobby sheep and goat livestock operations associated with subdivisions adjacent to bighorn overall range in the DAU. Clearly this poses a high risk for the wild sheep herd due to the possibility of stray domestic animals and foraying wild sheep. In our experience, hobby flock owners are often not aware of the risks their domestic animals pose to wild sheep. There would appear to be an opportunity to develop an education campaign to inform these owners of that risk and to provide best management practices for how to reduce that risk, and the RMBS would welcome the opportunity to support and participate in such a program.

As an example, in 2019 a consortium of NGOs and state agencies in the Hells Canyon region of Washington, Oregon, and Idaho launched the Bighorn Sheep Health Program (BSHP). It is administered by the Asotin County Conservation District (ACCD) located in Clarkston, WA. The ACCD is not a regulatory entity but rather a landowners assistance entity. The BSHP is funded by the Wild Sheep Foundation (WSF) chapters for WA, ID, and OR, and the fish and game agencies of each state. The BSHP educates hobby flock owners of the potential risk to wild sheep populations and offers testing of livestock for *Mycoplasma ovipneumoniae* (Movi), paid for by the BSHP. Landowners are encouraged to go Movi-free with their flocks to reduce the risk to wild sheep. You can read more about the BSHP at https://asotincd.org/bighorn-sheep. An educational brochure has been made for each of the three states. The Washington state brochure is attached an example.

DAU Boundary Delineation

Figure 10 of the HMP depicts overall range, summer range, and summer concentration areas for the RBS-10 bighorn sheep herd. The map indicates that the southern boundary of the DAU cuts follows the Alamosa-Costilla county line and cuts through the heart of the bighorn sheep range of GMU S8. A clip of this portion of Figure 10 is shown below.

Figure 10. Overall range, summer range, and summer concentration areas for bighorn sheep in RBS-10.
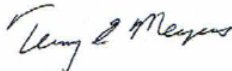
The Introduction and Purpose section of the HMP defines a DAU as follows:

> A DAU is the geographic area that includes the year-round range of a big game herd. A DAU includes the area where most of the animals in a herd are born, live, and die. DAU boundaries are delineated to minimize interchange of animals between adjacent DAUs. A DAU may be divided into several Game Management Units (GMUs) to distribute hunters and harvest within a DAU.

Based on this definition of a DAU, it would seem more appropriate for the southern boundary of the DAU to follow US 160 between CO 150 and La Veta Pass. While we recognize the difficulty that comes with managing big game populations across multiple jurisdictions and public and private lands, we are concerned that the HMP is incomplete without considering management actions occurring within the herd but outside of the existing DAU boundary.

Thank you for the opportunity to provide feedback on the draft RBS-10 management plan. Please do not hesitate to reach out if you have questions or if we can be of assistance in any way.

Sincerely,

Terry E. Meyers
Executive Director

United States Department of the Interior
NATIONAL PARK SERVICE

Great Sand Dunes National Park and Preserve
11500 State Hwy. 150
Mosca, CO 81146

February 12, 2021

Colorado Parks and Wildlife
600 Reservoir Road
Pueblo, CO 81005

Dear CPW Colleagues,

I am writing on behalf of Great Sand Dunes National Park and Preserve to comment on the Colorado Parks and Wildlife Data Analysis Unit RBS-10 bighorn sheep herd management plan.

Great Sand Dunes National Park and Preserve supports CPW's population objective of 350-450 for the RBS-10 Rocky Mountain bighorn sheep management unit. Robust bighorn sheep populations are an important wildlife resource at Great Sand Dunes National Park and Preserve. The plan thoroughly addresses issues pertaining to persistence of bighorn sheep on the landscape with the best available science. The majority of bighorn sheep habitat within Great Sand Dunes lies within the preserve where hunting is allowed in accordance with state regulations. The ram and ewe harvest called for in the plan are well supported by past data and should allow for a sustainable and healthy population of Rocky Mountain bighorn well into the future.

Great Sand Dunes resource managers appreciate the opportunity to comment on the plan and look forward to continued collaboration with Colorado Parks and Wildlife on Rocky Mountain bighorn sheep conservation in the future.

Sincerely,

Dewane Mosher
Biologist

Pamela Rice
Superintendent

STATE OF COLORADO

Stiver - DNR, Julie <julie.stiver@state.co.us>

Fwd: RBS10 / Trinchera Ranch

1 message

Frankland - DNR, Brent <brent.frankland@state.co.us>   Tue, Nov 2, 2021 at 2:35 PM
To: Jamin Grigg - DNR <jamin.grigg@state.co.us>, "Stiver - DNR, Julie" <julie.stiver@state.co.us>, Allen Vitt - DNR
<Allen.Vitt@state.co.us>
Cc: Rick Basagoitia - DNR <rick.basagoitia@state.co.us>, Conrad Albert - DNR <conrad.albert@state.co.us>

FYI....from the Trinchera Ranch pertaining to the RBS-10 HMP.

---------- Forwarded message ---------
From: **Shane Lancaster** <Shane.Lancaster@trincheraranch.com>
Date: Tue, Nov 2, 2021 at 9:53 AM
Subject: RBS10 / Trinchera Ranch
To: rick.basagoitia@state.co.us <rick.basagoitia@state.co.us>, conrad.albert@state.co.us <conrad.albert@state.co.us>,
Brent Frankland <brent.frankland@state.co.us>
Cc: Aaron Swallow <Aaron.Swallow@trincheraranch.com>

Hello,

I wanted to reach out regarding the Draft Sangre De Cristo bighorn sheep herd management plan RBS-10.

We do not oppose the northern portion of GMU 65 north of Hwy 160 being included to DAU RBS-10. After looking
through the last draft that Brent Franklin forwarded to us, we feel that there is enough language included in the plan that
license setting will remain flexible and done based solely upon Trinchera Ranches BSAP agreement with CPW.

" In GMU S-65, bighorn sheep license will be allocated according to current and future BSAP agreements between CPW
and the Trinchera Ranch."

I appreciate the fact that this has been addressed in the Executive Summary page ii, page 3 under the "Description of
DAU", and page 20 under "Ram Hunting".

Thanks again for keeping us in the loop on progress related to the plan.

Shane

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In addition to the letters above from Land Management Agencies, NGOs, and the Trinchera Ranch above, CPW received comments from other stakeholders and county commissioners, summarized below:

- Eight of the 10 comments supported the plan alternatives.

- One individual mentioned that the age of harvested rams needs to be higher.

- Another was disappointed that this is only a hunting management plan and other needs, including habitat improvement, need to be addressed.

- All 10 constituents were concerned about the risk of bighorn sheep to disease and suggested the land management agencies need to do more to address that issue.

- Several mentioned the increased recreation within RBS-10 and asked about ways to mitigate the issue.

- Additional comments:
  - One constituent questioned whether the large elk population within the San Luis Valley was a disease threat to bighorns.
  - One or some individuals questioned the effect of predation on the bighorn population.
  - One individual wanted to see additional ram licenses, while another wanted a reduction in ram licenses.