

BIGHORN SHEEP MANAGEMENT PLAN

Data Analysis Unit RBS-21

SAN JUANS WEST

Game Management Units S-21 & S-33



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RBS-21 San Juans West EXECUTIVE SUMMARY

RBS-21 CURRENT STATUS

- *DAU includes GMUs S-21 (Cow Creek) and S-33 (Upper Lake Fork/Pole Creek Mountain)*
- *Post-hunt 2011 Population Estimate ~ 400-450 animals*
- *Tier 1 State Standing: ≥ 100 animals for $\geq 90\%$ of the years since 1986; native population comprised of one or more interconnected herds that have received few (≤ 50 animals total) if any supplemental releases of Rocky Mountain bighorn sheep in the past (George et al. 2009).*
- *Population is currently Hunted*

MANAGEMENT OBJECTIVES

Bighorn sheep management differs from other ungulate management in Colorado. A traditional DAU plan includes management alternatives that revolve around a desired population and male:female ratio objective. This plan does not rely on those types of management objectives, partly due to a lack of consistent, unit specific data, but more importantly, because of the potential influence of disease on population performance. These DAU objectives are somewhat non-traditional, but are quantifiable and realistic for future management.

Harvest Management

Ram and ewe hunting will continue throughout RBS-21 as long as population performance allows. Hunter crowding, hunter experience, and quality of animal are all factors that are to be considered when discussing bighorn harvest management. The harvest management objectives include both a desired age of ram harvested, and hunter success rate:

- ***Maintain a 3-year average age of 6 for hunter harvested rams.*** This alternative will essentially maintain the current harvest regime in the DAU. Moderate ram license increases may be possible based on population performance. This alternative should provide a quality experience, moderate levels of crowding, and diverse age-classes of rams.
- ***Maintain a 3-year average hunter success rate of 65-80%.*** This alternative provides a moderate level of flexibility for adjusting license numbers, and should allow for future license increases. This success rate is well above the statewide average of 45%.

Herd Distribution and Density

The current population estimate in RBS-21 is 400-450. 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 sheep, the following management objective was selected:

- ***Manage for a stable population and stable distribution within the DAU.*** This alternative will:
 - Maintain the current density of bighorn sheep across modeled winter ranges, index density if and when model is refined. Density should not exceed 2.0 bighorn/km²
 - Assume an expected population in RBS-21 of between 400 and 500 animals
 - Encourage managers to respond with targeted hunting licenses, non-lethal harassment, or managed culling if individual or small groups of bighorn expand their range into novel areas where the risk of contact with domestic sheep is considered too high

- Assume that the risk of contact with domestic sheep is maintained at the current level
- Require moderate license increases, and potential modifications to unit boundaries and season dates
- Assume that current watchable wildlife opportunities will be maintained

DAU Background & Issue Summary

Rocky Mountain bighorn sheep Data Analysis Unit (DAU) RBS-21 (San Juans West) consists of Game Management Units (GMUs) S-21 and S-33. The DAU is approximately 2,805 km² and includes portions of Gunnison, Hinsdale, Ouray, San Miguel, and San Juan counties. Municipalities include Lake City, Telluride, Ouray, and Ridgway. The DAU is primarily public land (74%), with 25% of the land being privately owned, 1% being owned by the State of Colorado, and <1% owned by local municipalities. The San Juans West bighorn sheep herd is indigenous to the area with very few augmentations occurring historically, meeting the criteria for Tier 1 designation. Population estimates have been inconsistently reported over time, and have varied from a high of ~1,000 in 1921 to a low near 40 animals in the mid-1980's. RBS-21 is incredibly rugged, making it difficult to coordinate effective ground surveys. Aerial surveys provide a more efficient way of searching for bighorn within this unit; however they are expensive and have not been conducted annually. Precise population estimates have been achieved in several Colorado bighorn herds by initiating mark-resight studies; however those types of projects are costly, and rely on the ability to capture and mark a reasonable sample of animals from the target population. In the absence of more rigorous management studies, biologists will continue to generate population estimates using the most current and least biased information available to them. Currently the population appears to be healthy and increasing, with a 2011 post-hunt population estimate of between 400 and 450 animals.

Habitat in this DAU is abundant and anecdotally in good condition. The bighorn population in RBS-21 has noticeably increased over the last 5-10 years, and bighorn are expanding into what were likely previously occupied areas. The DAU contains large expanses of suitable habitat that would be capable of supporting a considerably larger population of wild sheep. Over the last 100-125 years, this population likely has been reduced significantly and it is probable that many sub-herds were extirpated. Like many herds in the state, historic population declines most likely can be attributed to overharvest by unregulated subsistence and market hunting, loss of habitat resulting from human development and activity, competition for prime habitats with domestic livestock, and mortality resulting from disease(s) and parasites introduced by domestic livestock (George et al. 2009, Orear 1917). Winter range carrying capacity is a key limiting factor to consider with bighorn management, particularly in migratory herds living at high elevations. At present, winter range does not appear to be a limiting factor for this population; however future winter range inventory and assessment would likely benefit wild sheep conservation efforts throughout the DAU.

The first official hunting season for bighorn rams in S-21 took place in 1958, with four licenses issued (Bear and Jones 1973). The greatest number of licenses available in S-21 was in 1967 when 12 were issued, however, that was reduced to eight the following year. Between 1979 and 1984, eight to ten licenses were issued in the GMU. Following a die-off in 1985 and poor lamb recruitment in subsequent years, the hunting season was closed from 1986 to 1991. Beginning in 1991, the number of licenses available never exceeded two. However in 2005, ram licenses were increased to three and then increased again in 2008 to four licenses, which was the number issued in 2011. The first formal hunting season for bighorn rams in S-33 took place in 1969 with six licenses issued and one ram harvested (Bear and Jones 1973). Four to six licenses were issued annually between 1975 and 1980 with four rams harvested. From 1982 through 1985 two ram licenses were issued annually; in 1986, managers issued five licenses suddenly, and then reduced the number of licenses to three between 1987 and 1990 with an average success rate of 30%. The hunting season in S-33 was closed in 1991 following a die-off in the late 1980's that markedly reduced the population. By the mid-2000's, wildlife managers determined that sheep numbers had increased enough to begin offering some limited hunting opportunity, and a season was reinstated in 2006. Ewe licenses were not issued in this DAU until 2010, when wildlife managers determined that the population could sustain limited female harvest. RBS-21 is currently providing some of the most sought after sheep hunting opportunities in southwest Colorado.

A key management issue discussed in this DAU plan is the potential risk of contact with domestic sheep. Domestic sheep grazing has been a historical land use in RBS-21 that continues today. There are currently 14 active sheep allotments within RBS-21 that are grazed on an annual basis. Additionally, 11 vacant allotments also occur within

the DAU (Appendix A). The potential for contact between wild and domestic sheep exists within this DAU, therefore on-going and future management actions should focus on maintaining effective separation between the species. Bighorn sheep are unique among Colorado's big game species with respect to the influence that infectious diseases have on population performance. The susceptibility of bighorn sheep to pathogens originally introduced by domestic livestock is regarded as the primary factor limiting bighorn sheep populations in Colorado. Respiratory disease is by far the most important health problem in contemporary bighorn populations. 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). Population declines documented historically in RBS-21 have been attributed to respiratory disease. Following the most recent decline, this herd entered a typical post-epidemic cycle where lamb recruitment was depressed for nearly 20 years. Significant population increases across this DAU became noticeable during the mid-2000's.

Domestic sheep grazing is a complex management issue in RBS-21. In 2009, the former Colorado Division of Wildlife (CDOW) was a signatory to a Memorandum of Understanding (MOU) for Management of Domestic Sheep and Bighorn Sheep (Appendix F). The MOU was crafted over an 18 month period by the US Forest Service, Bureau of Land Management, CDOW, Colorado Department of Agriculture, and the Colorado Woolgrowers Association. The purpose of the MOU "is to provide general guidance for cooperation in reducing contact between domestic and bighorn sheep in order to minimize potential interspecies disease transmission and to ensure healthy bighorn sheep populations while sustaining an economically viable domestic sheep industry in Colorado." Domestic sheep producers in RBS-21 have made admirable contributions to recent Risk Assessment (RA) processes, GPS collar studies, and institution of Best Management Practices (BMP's) within their allotments. CPW remains interested in continued collaboration with area sheep producers and federal agency staff that works towards the mutually beneficial purpose described in the MOU.

Extensive public involvement and discussion occurred during this planning process, which continued until the plan was approved by the Colorado Parks and Wildlife Commission in April of 2012. As expected, much of the discussion revolved around wild and domestic sheep issues and future management implications. CPW recognizes that on-going collaboration with various stakeholders is paramount in this DAU, and respects the diverse viewpoints represented during this process. Many of the comments received were incorporated into the final draft plan while some were not. As the primary wildlife management agency in the state, CPW is tasked with promoting wild sheep conservation across Colorado and in RBS-21. Bighorn sheep conservation is the emphasis of this final draft management plan.

INTRODUCTION AND PURPOSE

Colorado Parks and Wildlife (CPW) manages Rocky Mountain bighorn sheep for the use, benefit and enjoyment of the people of the state and its visitors, in accordance with the CPW's Strategic Plan, the Colorado Bighorn Sheep Management Plan (George et al. 2009), and mandates from the Parks and Wildlife Commission and Colorado Legislature. Colorado's wildlife resources require careful and increasingly intensive management to accommodate the many and varied public demands and growing impacts from people. To manage the state's big game populations, CPW uses a "management by objective" approach (Figure 1). Big game populations are managed to achieve specific objectives that are outlined within Data Analysis Unit (DAU) plans**. Each DAU generally represents a geographically discrete big game herd which includes the year-round range of the population. When delineating DAU boundaries, managers assume that there is minimal interchange of animals between adjacent DAU's. A DAU may be divided into several Game Management Units (GMU's) in order to distribute hunters and harvest throughout a DAU, or to take into consideration specific local management issues.

COLORADO'S BIG GAME MANAGEMENT BY OBJECTIVE PROCESS

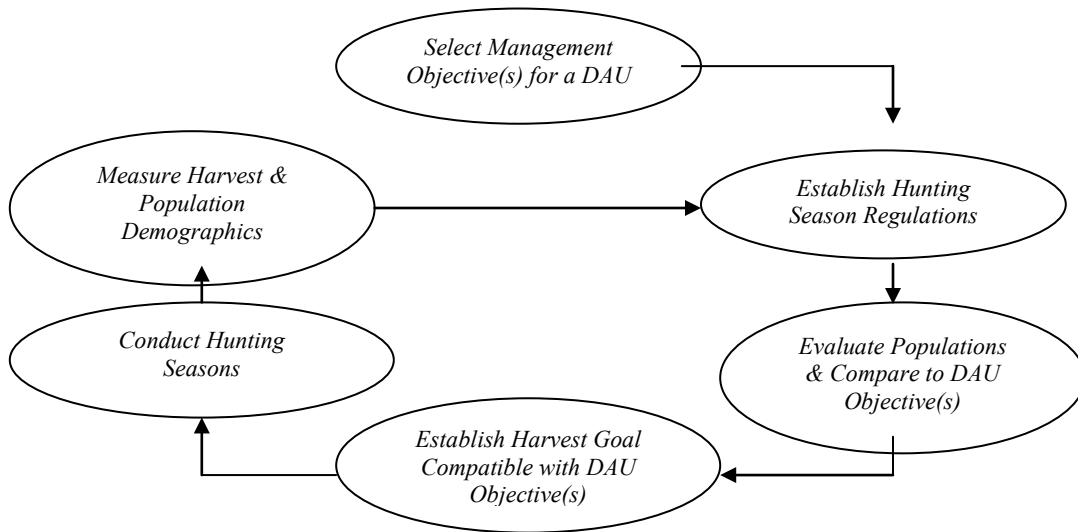


Figure 1. Management by objective process used by CPW to manage big game populations on a DAU basis.

The DAU planning process incorporates public input, habitat capabilities, and herd considerations into management objectives for each of Colorado's big game herds. The general public, sportsmen, federal land management agencies, landowners, outfitters, and agricultural interests are involved in determining DAU plan objectives through questionnaires, public meetings, comments on draft plans, and input to the Colorado Parks and Wildlife Commission. Limited license numbers and season recommendations result from this process.

Bighorn sheep management in Colorado contrasts markedly with other big game management. Sheep populations are typically much smaller and often more geographically isolated than deer, elk, or pronghorn herds. Very limited hunting opportunities exist in some herds which are closely scrutinized on an annual basis. Bighorn populations may be influenced to a greater degree by factors such as disease or severe winters that may be outside of the management influence of local biologists. Furthermore, annual monitoring of bighorn sheep in Colorado has been variable and depends exclusively on budgetary constraints. Some sheep herds are not comprehensively surveyed every year, and may only be surveyed once every three or more years. For these reasons, some sheep DAU plans may rely on objectives that are atypical of Colorado management plans and will not include male:female or population objectives. Based on the best available science and constituent input, managers will strive to establish tangible DAU plan objectives that will promote sustainable bighorn sheep populations and objective management on an annual basis.

***DAU plans are intended to provide management direction for an extended period of time (typically 10 years); however they may be amended if circumstances necessitate revision. Bighorn sheep management is a regional priority and CPW is committed to adapting management when appropriate. CPW reserves the right to amend DAU plans at its discretion based on future biological or socio-political factors. Amendments to DAU plans will entail a public process in order to provide transparency and education regarding any proposed modifications.*

DAU Description

RBS-21 consists of GMU's S-21 and S-33 (Figure 2). It is approximately 2,805 km² and includes portions of Gunnison, Hinsdale, Ouray, San Miguel, and San Juan counties. Municipalities include Lake City, Telluride, Ouray, and Ridgway. Recently, sheep GMU boundaries were revisited in order to provide clarification where boundaries were ambiguous or where unit boundaries had not yet been defined. Those revisions should account for any discrepancies with historic unit boundary descriptions. The S-21 boundary was expanded to include the "Sawpit" sub-population, which historically had not been included within a GMU. Based on recent bighorn observations, it is evident that the S-21 herd has expanded and established in the Sawpit area.

GMU Boundaries

S-21 - Bounded on the north by Colorado state highway 62, US 550, Ouray-Montrose County line and Ouray-Gunnison County line to the Uncompahgre National Forest line, and the Uncompahgre NF line to Big Blue Creek; on the east and south by Big Blue Creek to Uncompahgre Peak, the Uncompahgre-Animas River divide, the Ouray-Hinsdale County line, Engineer Mountain, the Uncompahgre-Lake Fork-Animas River divide, the San Miguel-San Juan and San Miguel-Dolores County lines, and Lizard Head Pass; and on the west by Colorado state highway 145 and US 62.

S-33 - Bounded on the north by the Gunnison-Hinsdale County line; on the east by Colorado state highway 149; on the south by North Clear Creek, USFS Trail 821 from North Clear Creek to Lost Trail Creek, and Lost Trail Creek; on the south by the Rio Grande River, Stoney Gulch, Cunningham Creek and Colorado state highway 110; and on the west by US 550, the Ouray-San Juan County line, the Uncompahgre-upper Gunnison River divide and Big Blue Creek.

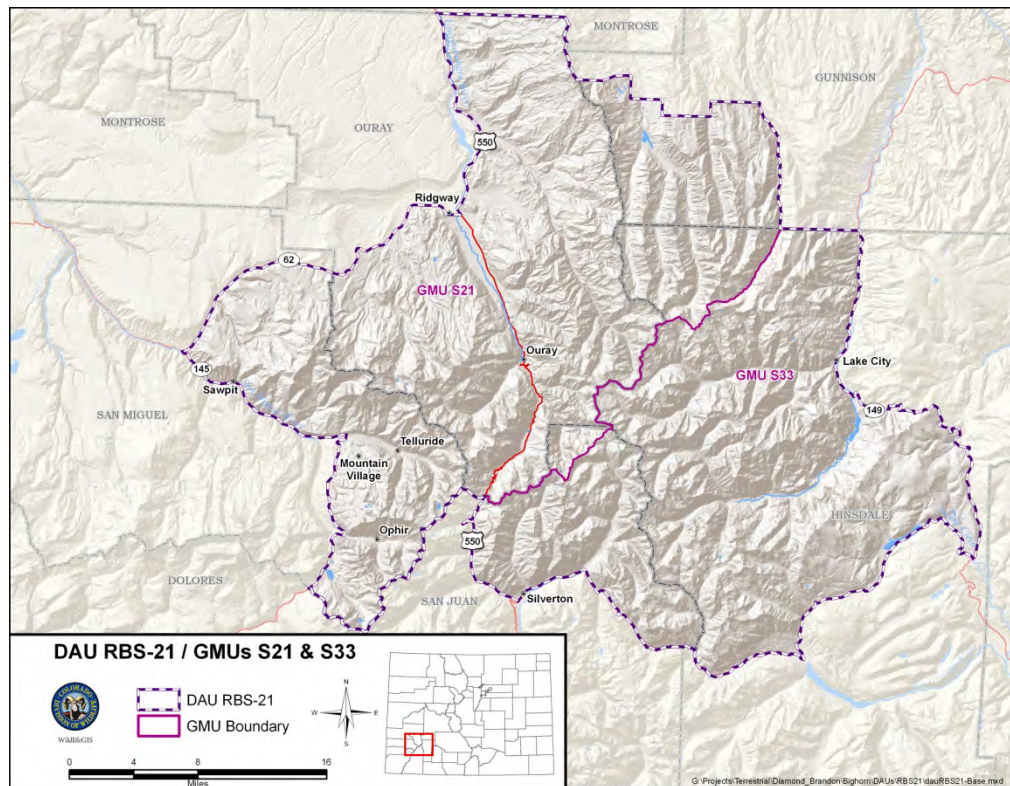


Figure 2. Geographic location of bighorn sheep Data Analysis Unit RBS-21 and Game Management Units S- 21 & S-33.

Physiography

This DAU encompasses a very large geographic area with elevations ranging from approximately 6,400 feet near the town of Colona on US 550, to over 14,000 feet in the Mount Sneffels and Big Blue wilderness areas. Some of the more prominent rivers and creeks include the San Miguel, Leopard, Dallas and Cow Creeks, the Uncompahgre River, the Cimarron River, Blue Creek, the Lake Fork of the Gunnison River, Henson Creek, the Animas River, and the Rio Grande River. The unit consists of large expanses of remote, mountainous terrain, including several designated wilderness areas. Vast expanses of alpine and subalpine ecosystems juxtaposed with lower elevation winter ranges provides excellent year-round habitat for bighorn. Elevation and season have a profound effect on climate in RBS-21. Low elevation valleys generally receive less annual precipitation, while higher elevation mountainous environments are prone to heavy snow accumulations and much shorter growing seasons. By October each year, snow generally begins accumulating which may persist until June or July of the following year.

Vegetation

Plant communities are diverse in RBS-21 and vary depending on many factors including elevation, aspect, precipitation, and soils. Like many migratory herds in the state, bighorn in this DAU use several habitat types throughout the year based on forage conditions and availability. Table 1 lists various plant species that are likely to be present in seasonal bighorn habitats across the DAU (Johnston 2001).

Table 1. Excerpt from *ECOLOGICAL TYPES OF THE GUNNISON BASIN* (Johnston 2001).

<i>Zone</i>	<i>Dominants</i>	<i>Elevation on north and east slopes, ft</i>	<i>Elevation on south and west slopes, ft</i>
<i>Alpine</i>	<i>Gravity and freeze-thaw processes, mostly very low herbaceous plants such as curly sedge, alpine avens, tufted hairgrass</i>	<i>>11,800</i>	<i>>12,200</i>
<i>Subalpine</i>	<i>Subalpine fir, Engelmann spruce, aspen, lodgepole pine, Douglas-fir, bristlecone pine, mountain big sagebrush, Thurber fescue, planeleaf and Wolf willows, Idaho fescue</i>	<i>9,700-11,800</i>	<i>10,100-12,300</i>
<i>Montane</i>	<i>Douglas-fir, ponderosa pine, lodgepole pine, aspen, Arizona fescue, big sagebrush, Saskatoon serviceberry, blue and serviceberry willows</i>	<i>9,100-10,700</i>	<i>9,400-11,100</i>
<i>Mountain Shrub</i>	<i>Douglas-fir, big sagebrush, muttongrass, Utah serviceberry, Gambel oak, yellow-Geyer-Bebb willows, narrowleaf cottonwood</i>	<i>7,600-10,100</i>	

Climate

Much of the occupied bighorn sheep habitat in RBS-21 is prone to severe winters characterized by heavy snowfall and low temperatures. The average annual snowfall in the town of Lake City has historically averaged more than 80 inches, while the town of Ouray, on the western side of the DAU has an average annual snowfall of nearly 140 inches. Snow may persist into the summer months, particularly on north and east facing slopes, impacting plant phenology and availability. Spring weather is quite variable; however strong winds and sporadic precipitation (rain, sleet, snow) are common. Summers are short at the highest elevations, with monsoon season typically occurring

from late July through September. During the monsoon season, severe thunderstorms and rapid changes in weather are frequent. By the end of September each year it is not uncommon to have had the year's first snowfall at high elevations.

Current Land Uses

Land Status

The majority (74%) of RBS-21 is public land managed by the US Forest Service & Bureau of Land Management (Figure 3). The second largest landownership category in the unit is private, which accounts for approximately 25% of the geographic area. A very small portion of the unit is administered by state and local jurisdictions.

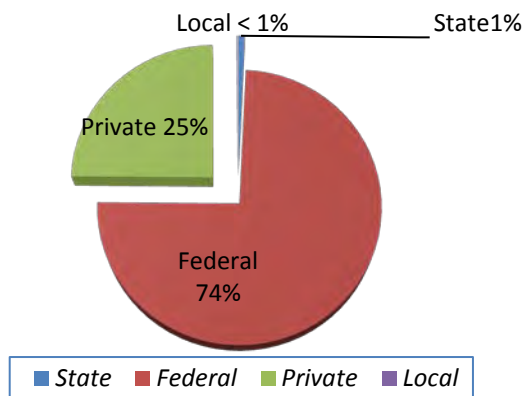


Figure 3. Landownership in RBS-21.

Development

This DAU is predominately public land and therefore development potential is relatively low. However, there are several areas where limited development is occurring that could potentially have impacts on wild sheep. Consistent with the trend throughout the west, many of the smaller communities in the DAU are appealing to second home owners and retirees. The upper Lake Fork above Lake San Cristobal, the area between Ridgway and Ouray, and between Placerville and Telluride have all experienced a buildup of houses over the last ten to twenty years, on or immediately adjacent to bighorn habitat. Development potential exists in the Henson Creek and Canyon Creek drainage as well, where historic mining claims are being marketed by area realtors. A net loss of habitat and fragmentation of habitat results from this development not only from the actual building envelope, but also from disturbances caused by more persistent human presence, including vehicle traffic and pet activities. For example, historic transplant efforts in the Sawpit area were unsuccessful primarily due to harassment and predation by dogs. From a bighorn health standpoint, if the number of year-round homeowners increases, of particular concern is the potential for contact with livestock or other pets such as llamas, goats, sheep, cattle, or horses.

Livestock grazing

Domestic livestock grazing is a historic land use in the DAU that continues today. Active grazing allotments for both beef cattle and domestic sheep occur throughout the unit. Appendix A lists active and vacant domestic sheep allotments present in RBS-21. The table includes the agency and office that administers each allotment as well as the approximate on/off dates for those that are active. Domestic sheep / wild sheep issues are discussed more comprehensively later in this management plan.

Recreation

Wildlife managers are increasingly concerned with the impacts to wildlife from recreation. Recreational demands and activity in Colorado have increased considerably over the last twenty years. The areas within RBS-21 are destinations for virtually every type of recreational activity the state offers. Those include four-wheeling, OHV riding, rock, ice, and mountain climbing, skiing, biking, camping, hunting, fishing, hiking, backpacking, horseback

riding, wildlife watching, rafting, and boating. Recreation has the potential to restrict the overall range of bighorn sheep and fragment habitats, which ultimately could lead to population level effects.

Mining

Mining activity has been extensive throughout the San Juan region since the late 1800's. Although gold and silver mining in the area has decreased significantly within the last 20 years, a potential new gold mining operation is being considered in the Uncompahgre Wilderness Area in the West Fork of the Cimarron drainage. Proposals indicate that equipment, personnel, and ore will be transported to and from the mine using daily helicopter flights. The impact of this operation on S-21 sheep in the area is unknown. Otherwise, mining and oil and gas development do not appear to be major issues for bighorn sheep in this unit. The potential for increased mining exploration does exist, especially for gold which has recently been increasing in value.

Historical Occurrence and Distribution

S-21 The Ouray-Cow Creek bighorn population is one of the few remaining indigenous herds in the state. Prior to the advent of mining and European settlement, it is assumed that significant numbers of wild sheep wintered in the present location of Ouray and to the north. Partially as a result of historic mining activities and more recent human development, winter range and the number of bighorn sheep has decreased substantially.

S-33 Information pertaining to historic numbers and distribution of this sheep herd is limited; however it is quite likely that bighorns are indigenous to this region. The unit contains great expanses of suitable habitat which likely supported a much larger herd of wild sheep prior to European settlement. The fact that bighorn have been documented in the unit since at least the 1940's prior to any translocation efforts also supports this assertion. Within S-33, there are three sub-populations of bighorn sheep mentioned in historic reports. Those sub-populations include the Pole Mountain herd, the Upper Lake Fork herd, and the Henson Creek herd, as identified by Bear and Jones (1973). The greater San Juan region includes some of the most productive bighorn habitats in the state, and it is logical to assume that bighorn populations were connected historically at a much grander scale, with exchange occurring between modern-day sheep GMU's S-33, S-21, S22, S53, S71, S28, S16, and S15.

Current Occurrence and Distribution

The population in RBS-21 has noticeably increased over the last 5-10 years, and bighorn are expanding into what were likely previously occupied areas. The DAU contains large expanses of suitable habitat that would be capable of supporting considerably larger populations of wild sheep in the absence of other limiting factors. Bighorns may be found across alpine habitats throughout the year, but typically concentrate above tree-line after winter snows have receded and succulent forage becomes available. During the winter months, many sheep migrate to lower elevations and are often seen on broken, south-facing slopes where forage is more accessible. Figure 4 illustrates the estimated overall range for bighorns in RBS-21.

S-21 Smaller patches of winter range are available to the Ouray-Cow Creek herd than what was formerly accessible. Historic wintering areas included many of the benches along the Uncompahgre River Valley near Ouray downstream to Dexter Creek, Cutler Creek, and to East Baldy Peak. Many sheep in S-21 winter above 9,000 feet, with some bighorns still wintering lower in the valley near Lake Lenore and the bottom of Canyon Creek on the west side of Ouray. Preferred areas are open, south-facing Thurber fescue slopes in close proximity to rugged volcanic tuft outcrops. These areas include the ridges above Cutler and Dexter Creeks, Winchester Gulch, Ramshorn Ridge, Sneva Mountain, and Red Creek. In addition, managers have recently observed significant winter use near the town of Sawpit on the western tip of the DAU.

Summer range in S-21 extends above timberline primarily to the east and south in the Wetterhorn Basin and headwaters of the East and West Forks of the Cimarron River. Summer concentration areas include Blackwall Mountain, the upper Amphitheater, Wetterhorn Basin, Bear Creek, Difficulty Creek, and Dexter Peak. Over the last five years, bighorns have been utilizing available habitat to the west in the Sneffels Range, with most use occurring around Whitehouse Peak and Canyon Creek, as well as the headwaters of Deep and Mill Creeks. There are currently ten bighorns equipped with GPS collars in S-21 (*see page 15*), with plans to collar at least five more in the winter of 2011. The intent of this project is to collect more detailed information on habitat use throughout the seasons.

S-33 Presently, if sub-populations were to be designated in S-33 they would include the *Pole Creek Mountain herd* and the *Upper Lake Fork/Animas herd*. Although wild sheep continue to be observed in the Henson Creek drainage, use appears to be comparatively moderate on an annual basis. Designation of sub-populations within the larger meta-population is largely based on resident ewe bands; however it does not preclude interactions between individual rams or ram groups. Furthermore, subpopulation designation does not rule out the potential for interaction between ewes; particularly as animal density increases within a particular geographic area and dispersal becomes more likely. Bighorn use many areas between the Rio Grande River and Henson Creek, and there is also considerable sheep use occurring at the headwaters of the Animas River, particularly on the eastern side of the watershed on the Animas/Lake Fork divide. Notable use areas in S-33 include the upper Lake Fork from Lake San Cristobal to Sherman, Cataract Gulch, Cottonwood Creek, Boulder Gulch, Snare Creek, Campbell Creek, Grizzly Gulch, and Sunshine Peak. The Lost Trail and West Lost Trail drainages and the Pole Creek Mountain area are also used extensively by bighorns currently. Wild sheep activity has also been documented in Henson Creek, Dolly Varden Mountain, Mill Gulch, Wager Gulch, Cuba Gulch, Maggie Gulch, Niagra Gulch, Burns Gulch, and Engineer Mountain. One report was received of ewes and lambs at Lake Emma on the west side of the Animas drainage at the head of Eureka Gulch. Another report of bighorns in the Nellie Creek drainage below Uncompahgre Peak was received in recent years, and bighorn have also been reported in the Kitty Creek drainage on the eastern periphery of S-33. This list of use areas is not intended to be all-inclusive or prioritized. Rather, it is an attempt to document some of the important geographic areas where sheep have been observed over the last five years. It is very likely that further range expansion is imminent if this population continues to grow.

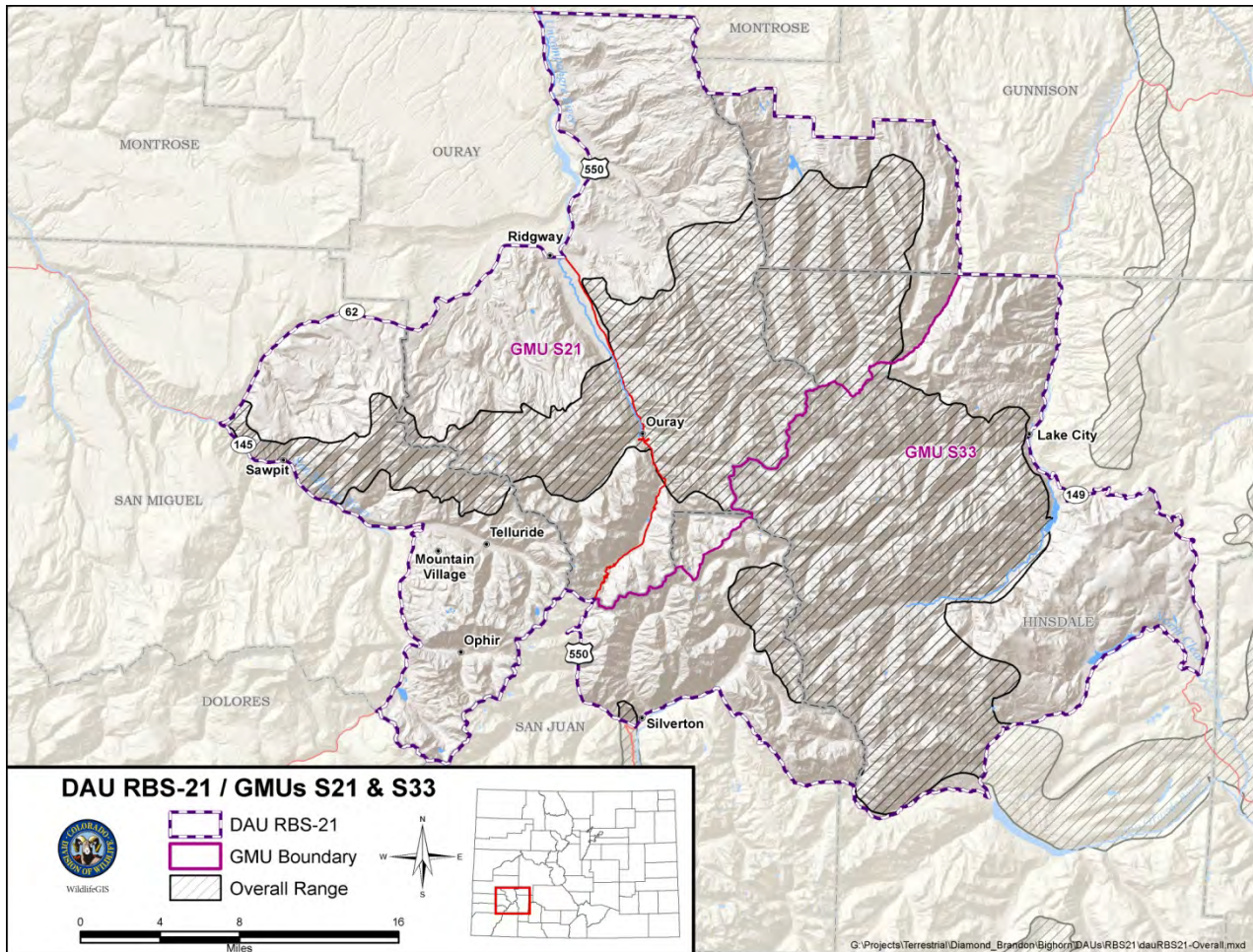


Figure 4. Estimated overall range for bighorn sheep in RBS-21.

Habitat Capability in RBS-21

In 2008, Colorado Division of Wildlife biologists finalized Colorado's Bighorn Sheep Capture and Translocation Guidelines (George et al 2008). These guidelines include a process for modeling bighorn sheep habitat using a GIS. To run these models, "habitat attributes" were defined, which were rooted in scientific literature. These models provide managers with a course filter for evaluating bighorn habitat across a geographic area. They are useful for evaluating potential transplant sites, but are equally valuable for comparing potential habitat versus occupied habitats where sheep are already present. These models will be refined as new data becomes available; however, they have proven a useful tool for biologists in Colorado and have been substantiated using radio collar data. The calculations below compare *mapped* seasonal habitats to *modeled* seasonal habitats that occur within *mapped* overall range, as delineated by CPW managers.

Habitat in this DAU is abundant and anecdotally in good condition. There is 1564 km² of modeled suitable habitat within RBS-21, which accounts for 56% of the DAU. Current CPW mapped "overall range" for bighorn is 1228 km², which equates to 78% of the modeled suitable habitat (Figure 5). For modeling iterations, *suitable habitat* includes lands with slopes equal to or greater than 60%, including the contiguous land within 300 meters and lands within 1000 meters of escape terrain on at least two sides. Areas with dense vegetation, human developments, or areas blocked by man-made or natural barriers are excluded from the model (George et al. 2008).

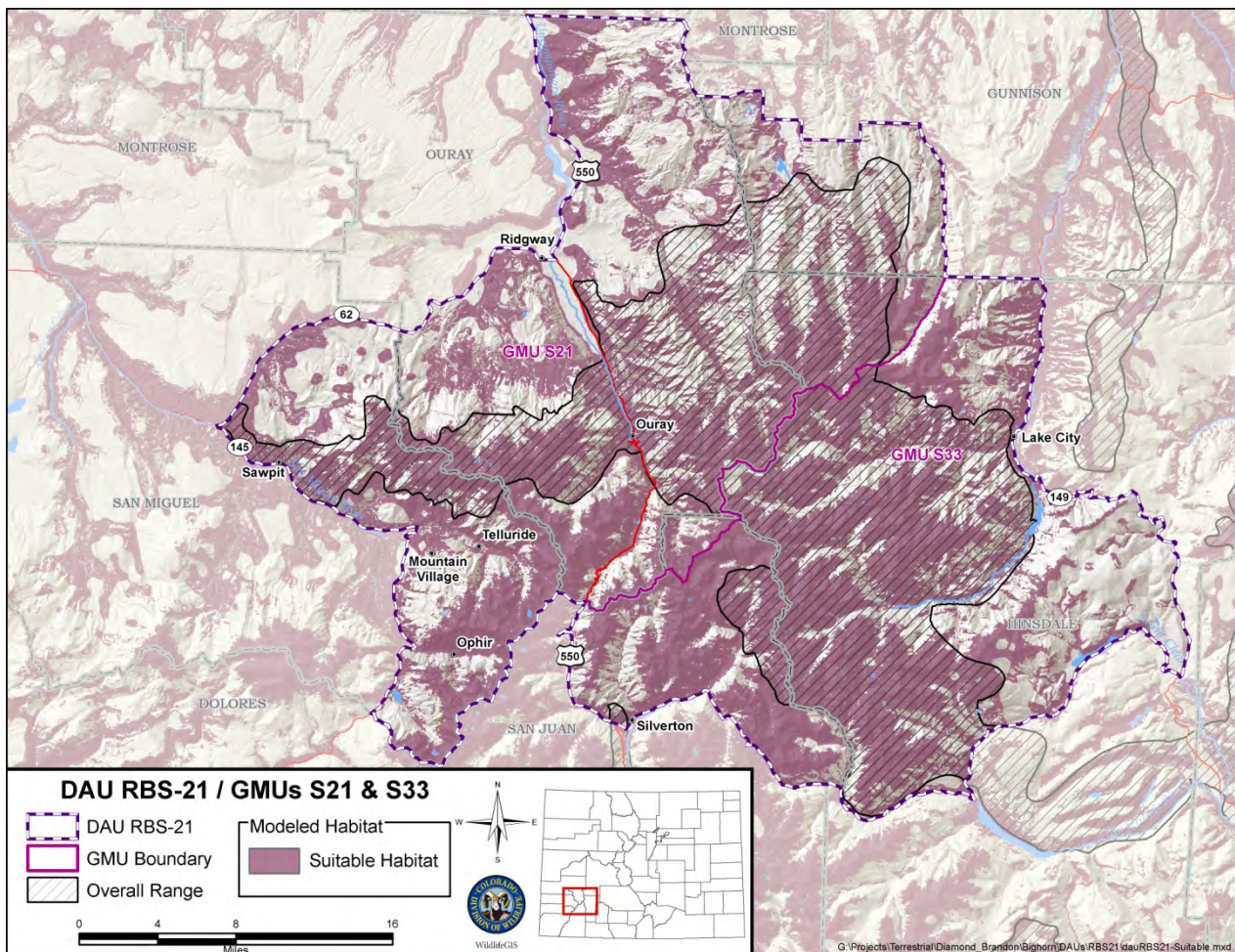


Figure 5. Modeled suitable habitat for Rocky Mountain bighorn sheep compared to occupied habitat in RBS-21.

Winter Range Winter range is a potential limiting factor for bighorn sheep in this DAU, however current animal densities would suggest the herd is well below winter range carrying capacity. Sheep typically winter on steep, south and west facing slopes, where wind and sun keep areas comparatively free of snow and escape terrain is

present. Snow accumulations restrict available winter habitat and dictate where sheep will be during any given year. Managers do not know where all of the winter range areas are within this DAU, and suspect that groups of bighorn may be wintering above tree-line in the unit in areas that are not typically surveyed or otherwise accessible during the winter months. It is not unusual in Colorado for bighorn to winter in alpine habitats, sometimes at high densities, where small patches of vegetation remain exposed as a result of high winds. In the northern Gunnison Basin, biologists have observed areas within alpine winter range where sheep manure is six to ten inches deep. These types of observations confirm that bighorn wintering in alpine habitats are capable of persevering for extended periods within very confined areas. Currently, bighorns are known to winter across only 11% (295 km²) of the DAU, which is 82% of the modeled available winter range (Appendix C). Modeled winter range includes lands with southern (SE, S, SW) aspects and < 25cm snow pack (snow pack data was not available for the GIS model), as defined by George et al. (2008).

It is known that a high proportion of these bighorn are migratory and winter at lower elevations. In S-21, those areas center on Ouray and more recently Placerville. In S-33, the most important known winter ranges occur in the Lake Fork valley above Lake San Cristobal, and on the flanks of Pole Creek Mountain on the south and southeast sides. A ram carcass was discovered by a snowmobiler during a recent winter in the Henson Creek drainage, which suggests some sheep are wintering there. During a helicopter survey in October of 2010, a ewe/lamb group was observed on the south-facing slopes of Minnie Gulch, and a ram group was observed on the east slopes of the Animas between Niagra and Burns Gulch. It is possible that these areas are also being used for winter range by sheep in the DAU.

Many of the RBS-21 winter ranges are in close proximity to humans and development, particularly in the Ouray and Placerville areas. Winter range is critical and human development and disturbance has the potential to put additive stress on sheep during an already stressful time of year. Cumulative human development has reduced the quantity and quality of available winter range in the DAU. Sheep wintering near development have been intentionally fed, sometimes next to busy highways, harassed and/or killed by domestic dogs, and disturbed by other common human activities. Winter range is paramount to the future viability of this sheep population; therefore we would make the following future management recommendations:

- ***Wildlife managers should actively participate in land-use planning and collaborate with local jurisdictions and federal land managers to conserve and improve known bighorn winter ranges across this DAU.***
- ***Additional radio collar studies, using GPS technology, would be extremely valuable for assessing habitat utilization and specific migratory corridors throughout the year.***
- ***When conditions are safe, winter helicopter or fixed-wing reconnaissance should occur in an attempt to explore potential high-elevation winter ranges that are unknown at this time.***
- ***Collaborative habitat treatments should be considered in areas where forest and/or shrub encroachment is reducing habitat suitability for bighorn, or in areas where range expansion is desirable.***
- ***Noxious weed prevalence should be monitored and eradication efforts implemented when and where necessary. Lower elevation winter ranges are perhaps most susceptible to noxious weed invasion and should be monitored closely.***
- ***If funding and resources become available, a more comprehensive winter range carrying capacity analysis could be conducted throughout this DAU in coordination with the USFS, BLM, private landowners, and CPW. At the current population level, CPW does not believe winter range is limiting the productivity of this herd. However, because of the importance of winter range, CPW would be supportive of a winter range evaluation that is intended to preserve and enhance key winter ranges, identify previously unknown winter ranges, and identify current and future threats to bighorn winter ranges. This analysis might be broken into three components: 1. A thorough***

inventory of available winter range, 2. A quantitative assessment of winter range quality and productivity and 3. An assessment of possible limiting factors or threats to those winter ranges. This type of assessment would be costly and require significant personnel commitments from each of the listed cooperators.

Lambing As discussed with winter ranges, not all lambing areas have been identified in this DAU. Potential lambing areas are difficult to access during May and June because of terrain and snow cover. During lambing season bighorn ewes tend to segregate from one another while seeking out isolated areas in extremely rugged terrain. Bighorns are exceptionally sensitive to disturbance during lambing season and it is atypical for managers to conduct helicopter surveys during this time of year. Known lambing areas are identified in Appendix D and overlaid with modeled lambing areas. Modeled lambing habitat includes all suitable habitat in > 2 ha patches with slopes $\geq 60\%$ and within 1000 meters of water, and with southern, eastern, or western aspects (George et al. 2008). Known lambing areas represent only 1% (35 km²) of the DAU, and only 8% of the modeled lambing areas. As stated previously, future radio collar studies could yield extremely valuable information on lambing and other important habitats within this DAU, while being minimally intrusive throughout the year.

S-21 Habitat Utilization Study

In 2010, a joint project between the USFS, domestic sheep producers and CPW was initiated to assess how bighorn sheep utilize the S-21 landscape in relation to domestic sheep grazing. The USFS started the first phase of the project by placing GPS (Global Positioning System) collars on two domestic sheep from two different bands. One sheep was marked from a band that grazes the Bear Creek Allotment. The other marked sheep was from a band that runs through the West Fork or Middle Fork stock driveways en route to the American Flats, and other BLM allotments. The collar in the Bear Creek band provided data on how the domestic sheep utilize that particular allotment, which is an area of high use by bighorn sheep. The other collar unfortunately failed as the domestics were being moved into allotments in close proximity to bighorn sheep. The GPS collars were refurbished and placed on domestic sheep from the same bands in the summer of 2011. Those data will be collected and analyzed in 2011.

In March 2011, CPW captured 10 bighorn sheep from three wintering areas. During capture, managers took biological samples for disease screening and placed remotely downloadable GPS collars on the bighorns. Table 2 presents information about age, gender, capture location, and results from disease testing. These bighorns are all still alive and on summer range as of August 2011. At this point, minimal data analysis has been conducted because the collars are still actively collecting data. Appendix E provides a map depicting how the bighorns have utilized the landscape as they transition from winter ranges in March, to lambing areas in May and June, to their current summer ranges. The bighorn collars are programmed to drop off during the summer of 2012. Five additional collars will be placed on bighorns in winter 2011-12 to provide another full year of utilization data. The data collected from the domestic and wild bighorn collars should be used to better manage bighorn sheep and domestic sheep grazing in the GMU and eliminate the potential for interaction between the two species. These data will not provide the answers to every question managers have on potential spatial and temporal overlap between wild and domestic sheep. However, projects like this are an excellent starting point for agency collaboration and should provide a strong foundation for future risk assessments and other land use processes.

Table 2. Biological data from bighorn sheep captured on March 29, 2011 and fitted with remotely downloadable GPS collars.

COLLAR ID	CAPTURE					NUMBER IN GROUP	PSPB	BRSV*	PI3**	Isolates
	LOCATION	SEX	AGE	SWABS	BLOOD					
DC101	Dexter Creek	M	3	Y	Y	6-7		<1:2	<1:2	<i>M. haemolytica</i> 10ac (β)
DC102	Dexter Creek	F	3	Y	Y	6-7 EWES AND LAMBS	Pregnant	<1:2	1:1024	<i>M. haemolytica</i> 10abc (β), <i>B. trehalosi</i> 2e (β)
CC103	Cow Creek	M	3.5	Y	Y			<1:2	<1:2	<i>B. trehalosi</i> 2, <i>M. haemolytica</i> Ualx, <i>B. trehalosi</i> 4
DC106	Dexter Creek	M	4	Y	Y	7		<1:2		<i>B. trehalosi</i> 4, <i>B. trehalosi</i> 2e, <i>B. trehalosi</i> 2
CC110	Cow Creek	F	6+	Y	Y	3 EWES 1 LAMB	Pregnant	<1:2	1:16	<i>B. trehalosi</i> 2, <i>B. trehalosi</i> 4ds
BC111	Bear Creek	F	4	Y	Y	8 EWES & LAMBS	Pregnant	<1:2	1:16	<i>B. trehalosi</i> 2, <i>M. haemolytica</i> Ual, <i>B. trehalosi</i> 2b
BC112	Bear Creek	F	5+	Y	Y	7	Pregnant	<1:2	1:16	<i>M. haemolytica</i> 1ae (β), <i>M. haemolytica</i> Ualx, <i>B. trehalosi</i> 4s
CC113	Cow Creek	F	3	Y	Y	5 EWES	Pregnant	<1:2	1:128	<i>B. trehalosi</i> 2e
DC114	Dexter Creek	F	5+	Y	Y	15	Pregnant	<1:2	1:2048	<i>B. trehalosi</i> 2bg, <i>B. trehalosi</i> 2b, <i>P. multocida</i>
CC115	Cow Creek	F	6+	Y	Y	2 RAMS & 8-9 EWES/LAMBS	Pregnant	<1:2	1:32	<i>B. trehalosi</i> 2
*Bovine respiratory syncytial virus										
**Parainfluenza = titer≥1:32 indicates exposure; titer ≥256 indicates vaccination or infection										

Herd Management History

History of Population Inventory

The wild sheep population in RBS-21 is native. Over the last 100-125 years, this population likely has been reduced significantly and it is probable that many sub-herds were extirpated. Historic population declines most likely can be attributed to overharvest by unregulated subsistence and market hunting, loss of habitat resulting from human development and activity, competition for prime habitats with domestic livestock, and mortality resulting from disease(s) and parasites introduced by domestic livestock (George et al. 2009, Orear 1917).

S-21 Early population estimates for the Ouray-Cow Creek herd were summarized by Wallace (1940), and Bear and Jones (1970) that go back as far as 1921 when “1000 mountain sheep” were believed to live in the “Ouray District.” This estimate was used until 1923 when the herd started to show signs of a severe decline that was attributed to a loss of winter range due to mining and housing development, as well as to disease associated with domestic livestock. Comprehensive population estimates are lacking in agency records; however, in 1956, there was reported to be approximately 140 sheep in S-21 (Moser 1962). By the late 1970’s and early 1980’s the Ouray herd was estimated to be between 150 and 200 animals. By 1983, another noticeable decline in lamb recruitment and population size occurred. Lungworm and pneumonia were speculated to be the primary factors for that decline. By 1987, the population was estimated at only 40 animals, but by the mid-1990’s the population appeared to have increased to an estimated 80 with an increasing trend. The post-hunt population estimate for S-21 in 2010 was 150. Based on recent aerial surveys the S-21 population is probably closer to 250-300 bighorns.

With regard to population inventory, it is important to point out that the effectiveness of aerial surveys is dependent on many factors including observer experience, weather, animal distribution, geography, and the number of hours available for surveying. The same is true for ground surveys, which are even less reliable and in many cases provide extremely biased estimates. Aerial and ground surveys have been conducted in S-21 with varying degrees of success. Generally, most ground surveys have not provided reliable age and sex estimates and were biased based on ease of observations. Most surveys historically relied on what animals showed up to winter around Ouray, with other winter ranges rarely surveyed. Helicopter surveys have been conducted as far back as 1968 and tend to be more thorough; however, the data collected is not without potential bias. Table 3 provides all data available for aerial surveys in S-21.

Table 3. Pre and post-hunt aerial survey data for S-21, 1968-2011.

Date	Pre/Post-Hunt	Yrling Rams	2-Year Ram (~1/2)	Adult (5/8+)	Total Rams	Yrling Ewes	Adult Ewes	Total Adults	Lambs	Unclassified	Total Sheep Classified	Lambs: 100 Ewes
2/10/1968	Post-hunt	7	7	1	15		38	53	17	9	79	44.7
3/3/1969	Post-hunt	2	3	6	11		22	33	9	32	74	40.9
3/9/1970	Post-hunt			2	2			2			2	
3/17/1972	Post-hunt		3	8	11		6	17	0		17	0.0
2/5/1974	Post-hunt			2	2		7	9	3	2	14	42.9
8/19/1976	Pre-hunt			16	16		62	78	25		103	40.3
8/16/1978	Pre-hunt				33		23	56	10		66	43.5
8/7/1979	Pre-hunt				25		20	45	7		52	35.0
4/20/1983	Post-hunt		1		1			1			1	
8/25/1992	Pre-hunt	1	1	1	3		30	33	5		38	16.7
8/25/1994	Pre-hunt		1	14	15		28	43	12		55	42.9
3/5/1997	Post-hunt		6	9	15		18	33	4		37	22.2
1/21/1998	Post-hunt				20		41	61	14		75	34.1
12/28/2005	Post-hunt		13	13	26		44	70	22	3	95	50.0
1/1/2007	Post-hunt		11	22	33		51	84	25	2	111	49.0
12/19/2007	Post-hunt		5	17	22		30	52	15	5	72	50.0
1/2/2009	Post-hunt	4	2	14	20		42	62	17	3	82	40.5
12/21/2009	Post-hunt		4	18	22		58	80	32		112	55.2
8/24/2010	Pre-hunt		6	15	21	16	65	102	47	2	151	58.0
12/12/2010	Post-hunt	2	7	21	30		61	91	33		124	54.1
8/24/2011	Pre-hunt	13	12	39	64	12	83	159	44	7	210	46.3

S-33 Bear and Jones (1973) provide crude survey information for S-33 that dates back to the 1940's. Wallace (1940) reported that the pre-1940's bighorn population on Pole Creek Mountain may have been as high as 150 animals. However, in 1969, a ground survey yielded only 4 ewes, 3 lambs and 1 yearling on the southeast side of Pole Creek Mountain. In 1971, an estimated 70 sheep were reported in the Lake Fork and Henson Creek drainages. Assuming Wallace's (1940) estimates are accurate, one might conclude that there were hundreds of wild sheep occupying what is now GMU S-33 during the mid-twentieth century. A paucity of population data exists between the 1940's and the 1980's, but apparently the population had declined during that time. In the late 1980's, wildlife managers estimated the S-33 bighorn population at 60 animals. An apparent disease related die-off took place in 1989, further reducing the population, and from 1990 through 2003 the population was estimated at 20-25 animals. A noticeable increase in the population began to occur around 2004, at which point an estimated 60 animals were

thought to reside in the unit. Based on more recent aerial survey information, the population estimate for S-33 was increased to 90 animals in 2006, and again to 150 animals in 2010 (Figure 6). Table 4 includes all data available for aerial surveys in S-33.

Table 4. Pre and post-hunt aerial survey data for S-33, 1968-2011.

Date	Pre/Post-Hunt	<3/4	≥3/4	Yrlng Rams	2-Year Ram (~1/2)	Adult (5/8+)	Total Rams	Adult Ewes	Total Adults	Lambs	Unclassified	Total Sheep Classified	Lambs: 100 Ewes
2/15/1968	Post-hunt	6	1				7	13	20	10		30	76.9
3/6/1969	Post-hunt	4	5				9	17	26	13		39	76.5
3/1/1970	Post-hunt	1	1				2	3	5	2	7	14	66.7
5/14/1970	Pre-hunt	4	4				8	3	11	3	3	17	100.0
2/27/1971	Post-hunt						5		5			5	
8/18/1976	Pre-hunt							6	6	3		9	50.0
8/14/1977	Pre-hunt								0			0	
8/20/1978	Pre-hunt							21	21	9		30	42.9
5/7/1981	Pre-hunt	4					4	8	12	6		18	75.0
2/4/1987	Post-hunt	1					1	5	6	2		8	40.0
8/10-12 1988	Pre-hunt						7	12	19	1		20	8.3
8/18/2006	Pre-hunt			1	3	22	26	40	66	16		82	40.0
8/13/2008	Pre-hunt			2	1	19	22	33	55	23		78	69.7
8/20/2009	Pre-hunt			1	5	29	35	64	99	34		133	53.1
8/25/2010	Pre-hunt			1	8	32	41	59	100	19		119	32.2
8/23/2011	Pre-hunt			2	3	19	24	51	75	27		102	52.9

Hunting and Harvest History

S-21 The first official hunting season for bighorn rams in S-21 took place in 1958, with four licenses issued (Bear and Jones 1973). The greatest number of licenses available in S-21 was in 1967 when 12 were issued, however, that was reduced to eight the following year. Between 1979 and 1984, eight to ten licenses were issued in the GMU. Following a large die-off in 1985 and poor lamb recruitment in subsequent years, the hunting season was closed from 1986 to 1991. Beginning in 1991, the number of licenses available never exceeded two. However in 2005, ram licenses were increased to three and then increased again in 2008 to four licenses, which is the number issued in 2011. Ewe licenses were never issued in S-21 until 2010, when wildlife managers determined that the population could sustain limited female harvest. Two ewe licenses were issued for the unit in 2010 and again in 2011. Ram hunter success has been 100% since 1996. Appendix B provides license numbers and the number of bighorns harvested since 1958. Since 1992, the average number of horn growth rings from harvested rams in S-21 has been 7.72, indicating the average age of harvested rams is nine years old. The more recent three-year average number of rings from harvested rams is 6.75.

S-33 Based on available records, the first formal hunting season for bighorn rams in S-33 took place in 1969 with six licenses issued and one ram harvested (Bear and Jones 1973). Four to six licenses were issued annually between 1975 and 1980 with four rams harvested. From 1982 through 1985 two ram licenses were issued annually; in 1986, managers issued five licenses suddenly, and then reduced the number of licenses to three between 1987 and 1990 with an average success rate of 30%. The hunting season in S-33 was closed in 1991 following an apparent die-off in the late 1980's that markedly reduced the population. By the mid-2000's, wildlife managers determined that sheep numbers had increased enough to begin offering some limited hunting opportunity, and a season was reinstated in 2006. As of 2010, 11 ram licenses have been issued with exceptionally high success rates (Appendix B). Since 2006, the average number of growth rings from harvested rams in S-33 has been 7.10, indicating that the average age of harvested rams has been eight years old. The more recent three-year average number of rings from harvested rams is 6.2.

History of Translocations

Few translocations have occurred in RBS-21. Records indicate two transplants were completed in S-21; one into Cutler Creek in 1992 intended to provide “genetic diversity,” that was also coincident with several habitat improvement projects, and one in 1980 intended to establish a sheep population near Sawpit (Table 5). In addition to augmentation efforts, bighorns were baited and sometimes trapped during the winter from 1979-1985 to administer antibiotics and antihelmintics. These treatments were intended to reduce lungworm loads and prevent pneumonia. During the course of these baiting/trapping efforts, two transplants out of the population were conducted, which according to records were intended to minimize the spread of lungworm, and to reduce stress and bronchial pneumonia within the herd. In 1983, 19 sheep were trapped and transplanted to Bristol Head (Creede area) and in 1984, 20 sheep were trapped and transplanted to Brown’s Canyon/Sugarloaf (near Buena Vista). Today managers have a much better understanding of the role(s) that lungworm (*Protostrongylus spp.*) play in potentially exacerbating bighorn’s susceptibility to pneumonia. It is generally recognized that the presence of endemic lungworm parasites does not compromise the overall health of bighorn at typical levels of infection (George et al. 2009).

Records also indicate that two small transplants have occurred in GMU S-33, both in the 1980’s (Table 5). No specific information exists regarding what the impetus was to move sheep into the unit at that time. There are no records of sheep from S-33 being used as a source for transplants, which is likely due to lack of access and suitable trap sites during the winter months. It is also worth mentioning that bighorns were transplanted in 2001 and 2003 to the Animas Canyon area (S-71) just out of RBS-21 to the southwest. The majority of those sheep remained in the release area; others, recognizable by their red ear-tags and/or radio collars, moved to the north and east and encountered bighorn bands living in the upper Lake Fork. There were also three Animas transplants documented in S-21. In August of 2011, a red ear-tagged ewe was observed in S-33 during an aerial survey.

Table 5. Historic bighorn sheep translocations in RBS-21.

GMU	DATE	SOURCE	RELEASE SITE	RAMS	EWES	YEARLINGS	LAMBS	TOTAL
S-21	4/8/1980	Collegiates North-Cottonwood Crk	Sawpit	1	11		8	20
S-21*	3/9/1983	Ouray- Jackass Flats	Bristol Head-Seepage Creek	3	10	1	5	19
S-21*	1/11/1984	Ouray- Jackass Flats	Browns Canyon	2	15		3	20
S-21	2/5/1992	Georgetown	Cutler Creek	4	5	3	9	21
S-33	2/10/1987	Trickle Mt	Pole Creek Mtn	1	2			3
S-33	3/13/1987	San Luis/Cebolla	Upper Lake Fork	1	1			2

*Shaded rows were transplants out of the DAU

Current Herd Management, Issues, and Strategies

Current Population Status

The former Colorado Wildlife Commission recently adopted the Colorado Bighorn Sheep Management Plan for 2009-2019 (George et al 2009). Priority was given to bighorn populations that are native, have greater than 100 animals, and have received few if any supplemental releases. RBS-21 represents one of only a few indigenous, native bighorn populations which have not been substantially supplemented with transplants. There are an estimated 6,900 bighorn sheep in the state of Colorado; the current population estimate for RBS-21 is between **400 and 450** animals. This population is a ***Tier 1, primary population***, which is the premier ranking for a Colorado bighorn population. Tier 1 populations should be given priority for inventory, habitat protection and improvement, disease prevention, and research.

Future Inventory and Monitoring

RBS-21 is incredibly rugged, which makes it very difficult to coordinate comprehensive ground surveys. Aerial surveys conducted using a helicopter are not without bias, however they provide a much more effective and efficient way of searching for bighorn within this unit. Helicopter time is expensive, therefore these types of surveys have not been conducted every year. This results in data sets that are broken up by non-surveyed years, thereby inhibiting the ability of biologists to construct reasonable population models. Another difficulty faced by biologists is that some herds winter at high elevations and may not be helicopter accessible during post-season deer and elk classification flights. This prevents biologists from obtaining winter ewe:lamb ratios which are perhaps the most important metric of population performance for wild sheep. More precise population estimates have been achieved in several Colorado bighorn herds by initiating mark-resight studies; however those types of projects are costly, and rely on the ability to capture and mark a reasonable sample of animals from the target population. In the absence of more rigorous management studies, biologists will continue to generate population estimates using the most current and least biased information available to them. Specific future management objectives shall include:

- *Attempt annually to collect winter ewe:lamb ratios during deer and elk classification flights that occur December-January.*
 - For future management in RBS-21, assessment of winter lamb:ewe ratios across the DAU will be paramount for adaptively managing harvest and evaluating population health.
 - In accordance with the statewide management plan, RBS-21 should be surveyed at least every other year, with December being the preferred month.
- *Continue to conduct late summer helicopter surveys if funding allows.* The principal reason for maintaining these surveys in RBS-21 is to allow biologists to evaluate wild sheep distribution in relation to domestic sheep grazing allotments. They also allow biologists to document important seasonal habitats, and refine minimum population estimates.
 - *If the management objective is for a stable-increasing population, managers should expect to classify between 150-200 animals during late summer aerial surveys across the DAU.* This assumes that flight conditions are favorable, and areas where bighorn are known to concentrate are systematically searched. If ≤ 150 sheep are classified in RBS-21 during late summer aerial surveys, managers should be prepared to thoroughly investigate the cause(s) of the deficit and adapt management accordingly. Because RBS-21 has Tier 1 status, it should receive priority for aerial survey hours, thereby providing at least an every-other-year measurement for gauging this performance objective.
 - *An expected range for the number of bighorn classified during winter survey flights should also be developed across the DAU.* At this point it is unknown, primarily in S-33, how effective classification flights may be during December-January. Winter flights are preferential for deriving lamb:ewe ratios and minimum population estimates.

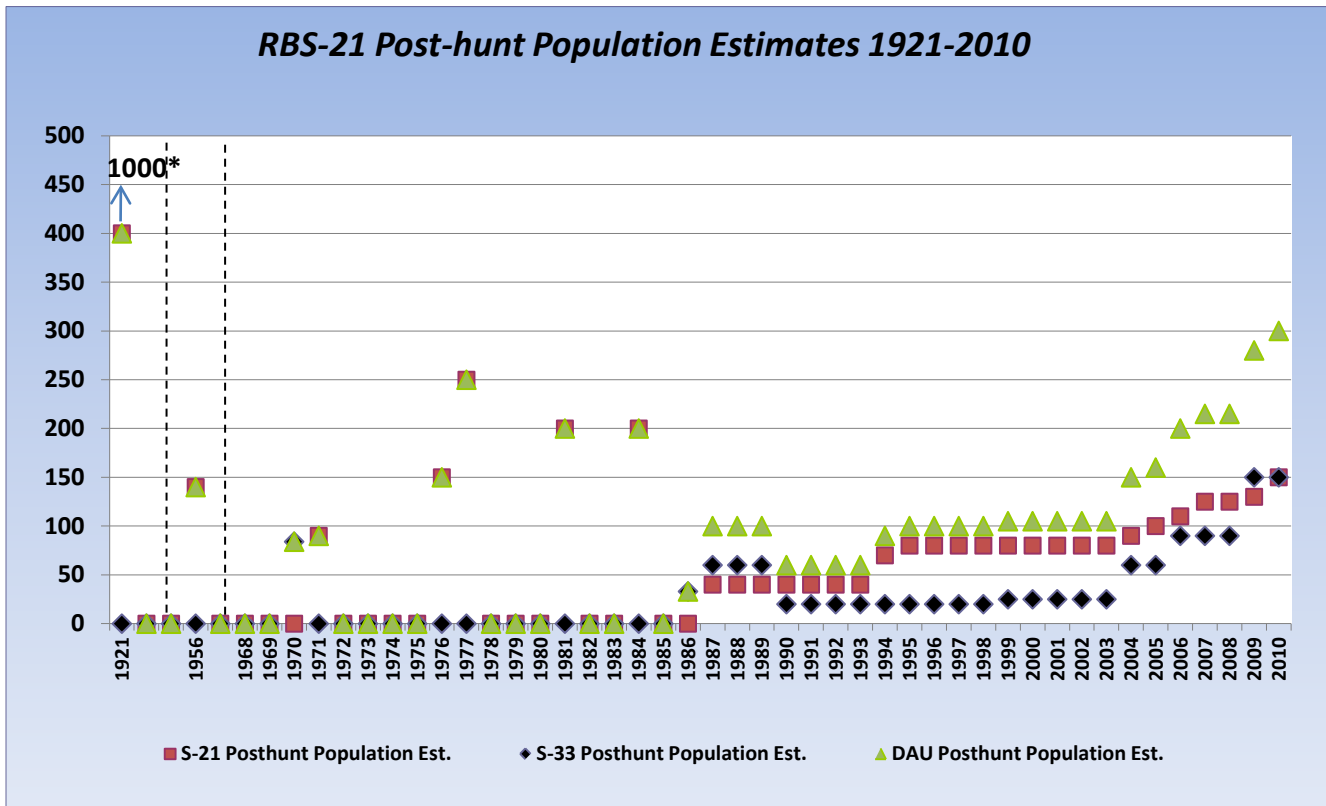


Figure 6. RBS-21 Post-hunt Population Estimates 1921-2010. (*the 1921 estimate was 1000 bighorn in S-21).

Current Harvest Objectives and Management

The RBS-21 population is currently increasing. Hunting licenses have traditionally been issued conservatively for two reasons; one is to maintain a quality hunting experience for hunters that draw licenses. In 2011, 12,664 hunters applied for 239 bighorn sheep licenses in Colorado. Hunters often wait for more than 10 years to draw licenses and the expectation is that a high quality hunting experience will be provided. More licenses may contribute to hunter crowding and diminish the experience, particularly if sheep tend to concentrate in one or two small geographic areas. The second reason for conservative license allocation is the threat of stochastic events outside of the influence of management. Pneumonia epidemics, in particular, have led to large-scale population declines which are typically followed by lengthy periods of low lamb recruitment. The frequency, intensity, and duration of any future disease events essentially will dictate hunting opportunities for bighorn sheep in RBS-21.

All sheep licenses in Colorado are issued through a limited drawing system, and an applicant must acquire three preference points before they are eligible to be included in license drawings. As the RBS-21 population has grown managers have been increasing the number of licenses available. In 2011, a total of 8 ram licenses and 4 ewe licenses were issued in units S-21 and S-33 (Table 6). In 2010, ewe licenses were added for the first time in management history across the DAU. Rams harvested in Colorado are required to have horns that are $\geq \frac{1}{2}$ curl, and ewes are required to have horns ≥ 5 inches. All sheep hunters are required to submit a mandatory check form following their hunt that includes details specific to their hunting experience and the number, locations, and composition of sheep observed. Successful hunters must personally present their animal for inspection within five days of harvest so that horn measurements can be collected and a permanent plug embedded in ram horns. Successful ram hunters are required to wait five years post-harvest before they are eligible to begin applying for a license again.

Table 6. 2011 Hunting license allocation in RBS-21.

<i>GMU</i>	<i>Ram, Resident</i>	<i>Ram, Non-Resident</i>	<i>Ewe, Resident</i>	<i>Ewe, Non-Resident</i>
<i>S-21</i>	<i>4</i>		<i>2</i>	<i>0</i>
<i>S-33</i>	<i>3</i>	<i>1</i>	<i>2</i>	<i>0</i>
<i>DAU Total</i>	<i>7</i>	<i>1</i>	<i>4</i>	<i>0</i>

Ewe Hunting

Increasing densities of bighorn create unique management ramifications, specifically with regard to disease and 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, which may potentially lead to localized habitat degradation, reduced animal body condition and vigor, and subsequent increased vulnerability to disease.

Wild sheep studies conducted on Ram Mountain in Alberta, Canada, offer some valuable insight into the role density plays in bighorn population dynamics. Results from these studies indicated that lamb mass and winter survival decreased as population density increased (Portier et al. 1998), that yearling female survival was negatively affected by density, and that age at first reproduction was also negatively correlated with population size (Jorgenson et al. 1997). In 2009, wildlife biologist Andy Holland wrote an issue paper to establish ewe hunting in the San Juan's. In it he wrote: "...establishing conservative ewe harvest may reduce intraspecific competition, increase juvenile survival, lower age at first reproduction, provide hunter opportunity, increase hunter attained herd information, encourage use of new habitats/dispersal, and possibly 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 should provide managers with the general framework for establishing ewe hunting seasons across the state (Table 7). In the plan, off-take rates revolve around a population objective and observed winter lamb:ewe ratios. It is evident that bighorn sheep populations in good health (ie. high winter lamb:ewe ratios and adult survival) are capable of sustaining relatively high levels of annual female harvest (Table 8). Because of the potential for hunter crowding, and the variability of annual winter lamb:ewe ratios, it is unlikely that these types of harvest regimes would ever be realized in RBS-21. However, managers will consider additional ewe hunting opportunity and strategies in the future if the population continues to be stable-increasing. Consideration will be given so that ewes in sub-herds that are most accessible to hunters are not overharvested, and that impacts are minimized on social structure and "legacy" movement patterns. The ewe season(s) and ram season 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 based on the best available data and information available, and whether or not the herd is at, or exceeds the expected population size objective.

Ewe harvest will be an important tool for density, and potentially, distribution management in RBS-21. Because of the proximity of active domestic sheep grazing allotments, female harvest and hunting pressure must be carefully scrutinized on an annual basis. While managers are encouraged to see wild sheep re-colonizing formerly occupied habitats, they should be prepared to react and adapt quickly to prevent bighorn from coming in contact with domestic animals. Expansion is desirable and often encouraged, but buffers must be maintained between wild and domestic sheep in this DAU. The potential for wild and domestic sheep coming into contact exists in RBS-21 whether there are 100 bighorn sheep or 500; either way, managers must design hunting seasons and unit boundaries that do not increase the potential for expansion of wild sheep into areas where there is greater potential for contact with domestic sheep. Management actions instituted by CPW, federal land management agencies, and livestock producers should maintain effective separation between wild and domestic sheep.

Table 7. Recommended ewe removal rates via hunting and translocations from Colorado's Bighorn Sheep Management Plan.

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

Table 8. Hypothetical RBS-21 ewe harvest rates at varying population levels and winter lamb:ewe ratios; uses a population estimate of 450 as a baseline; relies more on population trend rather than a specific population objective.

<i><u>Population Trend</u></i>	<i><u>Winter Lambs:100Ewes</u></i>	<i><u>Winter Lambs:100Ewes</u></i>	<i><u>Winter Lambs:100Ewes</u></i>	<i><u>Winter Lambs:100Ewes</u></i>
	No data	$\geq 40:100$	20-39:100	< 20:100
	<i>Harvest of Ewes ≥ 1 year old</i>			
<i>Declining</i>	No ewe harvest			
<i>Stable</i>	No ewe harvest	23-45 ewes	≤ 23 ewes	No ewe harvest
<i>Stable-Increasing</i>	No ewe harvest	23-45 ewes	≤ 23 ewes	No ewe harvest
<i>Increasing</i>	No ewe harvest	≥ 45 ewes		

Ram Hunting

Several strategies are outlined in Colorado's bighorn sheep management plan with regard to 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, as long as winter lamb:ewe ratios exceed 20:100. Similar to ewe hunting, ram licenses will be driven by winter lamb:ewe ratios, and hunter satisfaction. Using a 2011 post-hunt population estimate of 450, and assuming a winter lamb:ewe ratio greater than 20:100 (preferably higher) across the DAU, RBS-21 could hypothetically sustain a harvest of between 9 and 23 rams. Assuming a hunter success rate of 75%, achieving a harvest of 23 rams would necessitate issuing 31 licenses. That would equate to nearly a 380% increase from current license allocation. Based on current bighorn distribution, 31 ram licenses and upwards of 50 ewe licenses would quickly lead to reduced hunt quality and hunter satisfaction. However, there is clearly an opportunity for increasing licenses in this DAU, and license increases will be considered in the coming years depending on the management objectives that are selected. Preference will continue for resident hunters; however the potential also exists for additional non-resident hunting opportunity in the future.

Ram hunting opportunity will continue to be provided in both RBS-21 game management units as long as population performance allows. Ram hunting will be focused on providing a quality hunting experience, and to a lesser extent population management. Ram hunting will not be used to manage for a specified male:female ratio; however biologists will manage ram hunting in accordance with the alternative selected during this planning process.

Brunot Treaty

RBS-21 falls within the boundary of the Brunot Treaty Area (Brunot Area) (Figure 7). The Brunot Area results from the 1874 Brunot Agreement between the United States government and the bands of Ute Indians that were residing in Colorado at the time. Today descendants of these bands include the Southern Ute and Ute Mountain Ute Tribes. The area encompassed by the Brunot Treaty was removed from the tribes' reservation lands in 1874 after the discovery of gold in the San Juan Mountains, which facilitated mining and settlement in the region by US citizens. Although no longer reservation land, Article II of the agreement states that “the United States shall permit the Ute Indians to hunt upon said lands so long as the game lasts and the Indians are at peace with the white people.” The Southern Ute Tribe (SUIT) began to exercise their treaty rights in 2009. Any hunting of bighorn sheep by tribal members falls outside the jurisdiction of CPW management and management plans. However, since the SUIT began exercising its treaty rights they have worked collaboratively with CPW to ensure that bighorn populations falling within the Brunot Treaty area are not over-harvested or otherwise impacted. The SUIT allocated one either sex license to a tribal member in 2009 and two licenses in 2010, which were valid across the entire treaty area. One ram was harvested in each of those years (*1/4 curl, and full-curl, respectively*). Concern about overharvesting certain accessible groups of bighorn led to the Tribe voluntarily creating two separate sheep units within the Brunot Area. For 2011, one of the bighorn licenses was valid in the North Unit and the other valid in the South Unit. Under the Brunot Agreement there remains the potential for additional annual harvest by Tribal members in RBS-21. Brunot license allocation has historically been calculated as a percentage of the total bighorn licenses issued within the treaty area. Thus, as licenses increase in GMUs within the treaty area, Brunot licenses will increase correspondingly. Bighorn harvest by Tribal hunters and where those animals are taken is expected to have some influence on general public license allocation and management over time.

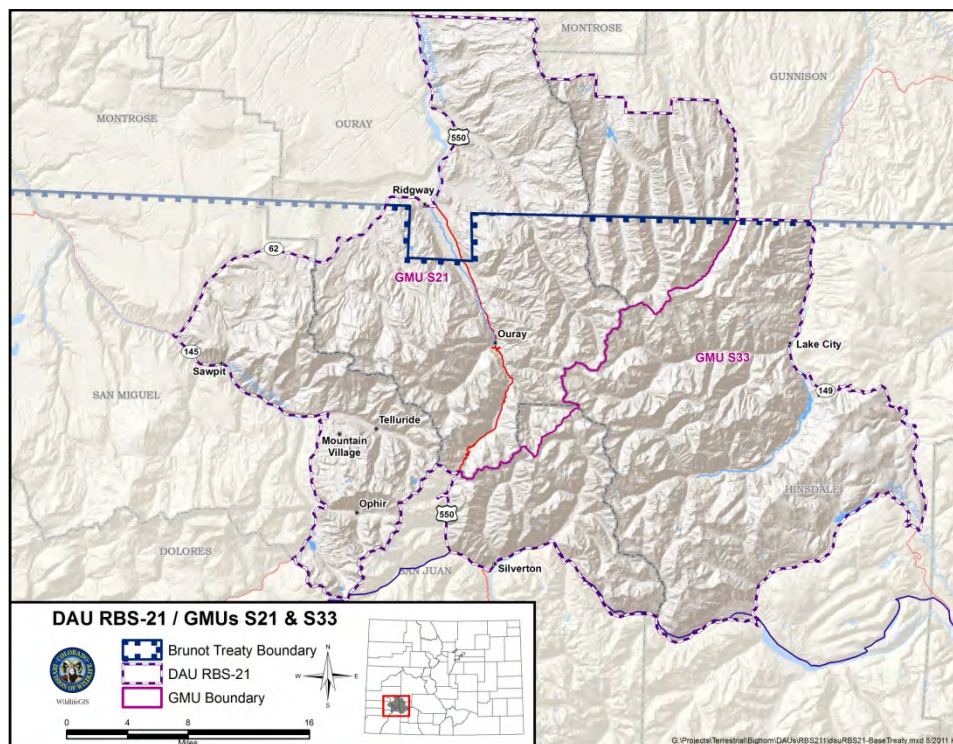


Figure 7. RBS-21 with Brunot Area boundary shown.

Management Issues and Strategies

Herd Interactions

Because of the ruggedness of this DAU, it is not possible to observe sheep on a regular basis. Outside of aerial surveys, managers must make considerable efforts to access bighorns in this unit, and even then, may observe only a small sub-sample of animals during any given day. Recent efforts to equip sheep in S-21 with GPS collars will hopefully provide insight into current habitat use; however additional work needs to be done in order to develop a more robust data set on habitat use and timing of use across the DAU. Interaction between S-21 & S-33 sheep has not been officially documented during recent years, but it is logical to assume that interactions are occurring to some degree. Bighorn sheep have been observed over the last several years at the head of Henson Creek and near Engineer Pass, which are the area's most likely serving as an interface between the 21 and 33 sub-herds. As is typical for wild sheep, young rams are most likely to be moving between populations. In 2007, a fresh two-year old ram carcass was discovered on the Alpine Plateau to the northeast of the S-33 boundary (*approximately NAD 83, 294452, 4232848*). Where this sheep came from is unknown, but it demonstrates a young ram's propensity for traveling between sheep populations, sometimes through extensive tracts of timber and other non-traditional bighorn habitat. From a disease standpoint, it is crucial to understand that what happens in one herd is likely to affect the other. Furthermore, it is important to reiterate that RBS-21 is surrounded by other bighorn sheep units, including S22, S53, S15, S16, and S28. The potential for immigration and emigration of wild sheep amongst these herds will increase if populations continue to grow. Unfortunately, there is no simple method for monitoring those movements and managers must use their best professional judgment when making land use decisions that could affect bighorn across this region.

Disease & Domestic Sheep

Bighorn sheep are unique among Colorado's big game species with respect to the influence that infectious diseases have on population performance and species abundance. The susceptibility of bighorn sheep to pathogens originally introduced by domestic livestock is regarded as the primary factor limiting bighorn sheep populations in Colorado. Respiratory disease is by far the most important health problem in contemporary bighorn populations. 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). Population declines documented historically in RBS-21 have been attributed to respiratory disease. Following the most recent decline, this herd entered a typical post-epidemic cycle where lamb recruitment was depressed for nearly 20 years. Significant population increases across this DAU became noticeable during the mid-2000's.

Interaction between bighorn sheep and domestic sheep is a significant management issue for bighorn populations in Colorado and elsewhere, which is corroborated in literature. (Wehausen et al. 2011, Lawrence 2010, WAFWA 2010, George et al. 2009, Schommer and Woolever 2008, Beecham et al. 2007). The primary concern is transmission of novel respiratory pathogens from domestic sheep to bighorns and the concomitant deleterious acute and long-term effects on bighorn populations (George et al. 2009). Native North American wild sheep species are quite susceptible to pasteurellosis, the generic term for disease (often respiratory) caused by bacteria in the family *Pasteurellaceae* (Miller 2001). Some strains of these bacteria carried by domestic sheep (and probably domestic goats, and perhaps cattle) are particularly pathogenic in bighorns (reviewed by Miller 2001, US Department of Agriculture [USDA] 2006, George et al. 2008). CPW recognizes that not all disease outbreaks and reduced recruitment in bighorn sheep can be attributed to contact between wild and domestic sheep.

Domestic sheep grazing has been a historical land use in RBS-21 that continues today. There are currently 14 active sheep allotments within RBS-21 that are grazed on an annual basis. Additionally, 11 vacant allotments also occur within the DAU (Appendix A). The potential for contact between wild and domestic sheep exists within this DAU; therefore, on-going 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 livestock. Conversely, stray domestic sheep are also likely to associate with wild sheep groups if they are separated from their primary band. Sheep are highly gregarious by nature and are likely to interact with other sheep, wild or domestic, as they encounter one another.

In 2007, Rocky Mountain bighorn sheep were designated a “Sensitive Species” by the US Forest Service. A sensitive species is defined as (www.fs.fed.us/biology/resources/pubs/tes/ss_sum_by_region_31Oct2005_fs.pdf) :

Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

- *Significant current or predicted downward trends in population numbers or density.*
- *Significant current or predicted downward trends in habitat capability that would reduce a species’ existing distribution.*
- *Objectives for sensitive species include:*
 - *Develop and implement management practices to ensure that species do not become threatened or endangered because of Forest Service actions.*
 - *Maintain viable populations of all native and desired nonnative wildlife, fish, and plant species in habitats distributed throughout their geographic range on National Forest System lands.*

The decision to designate bighorn as sensitive is commendable and hopefully will elevate their status during future planning. Subsequent to the sensitive species designation, comprehensive planning documents such as the *Final Supplement to the Forest Plan Biological Evaluation and Conservation Assessment for Rocky Mountain Bighorn Sheep on the Rio Grande National Forest* (Ghormley 2010) were drafted to help determine if the current Forest Plan was compatible with bighorn sheep conservation objectives. This particular Supplement states that “...maintaining and improving the health of bighorn populations depends on preventing respiratory disease epidemics and that preventing potential contact with domestic sheep and goats is particularly important to the success of these efforts.” With the ultimate goal of maintaining effective separation between wild and domestic sheep, the Supplement provides a set of conservation recommendations that should be “incorporated into rangeland management planning at the Forest and project-level to further the commitment to the long-term persistence and viability of Rocky Mountain bighorn sheep across the Rio Grande National Forest and the San Luis Valley Public Lands Center.” Furthermore, the Supplement states, “It is recommended that this guidance be communicated as standard operating procedures and conservation recommendations from the Forest Supervisor/Center Manager to all ranger districts and field offices with a goal of providing as much consistency as possible between the Forest Service and BLM when addressing the issues involved with maintaining effective separation between domestic and bighorn sheep (Ghormley 2010).” As a result of this analysis, consistent, collaborative management direction is now in place across the Rio Grande National Forest and San Luis Valley Public Lands Center. “The issue of potential contact and disease transmission between domestic and bighorn sheep is currently being addressed through risk analysis and adaptive management procedures being implemented at the project level (Ghormley 2010).” This process and outcome provides an excellent model for future bighorn sheep conservation efforts where domestic sheep grazing allotments and wild sheep ranges overlap.

Unfortunately, Rocky Mountain bighorn sheep currently receive no special status on lands managed by the BLM, which presents unique management challenges in areas like RBS-21 where bighorn range is shared jurisdiction between multiple agencies. However, BLM managers are not without guidance relative to bighorn sheep and domestic sheep grazing. An existing USDI Bureau of Land Management Instruction Memorandum 98-140 (1998) provides specific guidelines for managing domestic sheep and goats in wild sheep habitat. The desire for “progressive native wild sheep management” is referenced in this IM, which is also commendable. In this IM, guideline number four mentions the development of “buffer strips” between wild and domestic sheep that could range up to 13.5 kilometers (9 miles). This guideline is specific to “renewing new domestic sheep or goat grazing permit applications or proposed conversions of cattle permits to sheep or goat permits in areas with established native wild sheep populations.” This language is quite different than USDI Bureau of Land Management Instruction Memorandum 92-264 (1992) that stated, “Buffer strips surrounding bighorn sheep habitat should be encouraged, except where topographic features or other barriers prevent physical contact between bighorn and domestic sheep. Buffer strips could range up to 13.5 kilometers (9 miles), depending upon local conditions and management options.” The reason for the revision in the 1998 IM is unclear, however the concept of buffer zones might be

further evaluated in DAU's like RBS-21 where domestic/wild sheep ranges overlap. Buffers up to nine miles have been reported in the literature; however buffers of that magnitude have rarely been instituted. During a recent helicopter survey in GMU S-21, three domestic strays were observed less than one mile from three separate bighorn groups in the Deep Creek drainage. Strays aside, it is typical to see aggregated domestic bands within their allotments that are within 1-2 miles of bighorn concentration areas in RBS-21. CPW respectfully suggests that Rocky Mountain bighorn sheep receive greater consideration during land use planning, as well as receive comprehensive inclusion in future Resource Management Plan amendments and revisions, and grazing permit renewals.

The following Management Goal is established in Colorado's statewide 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 and BLM and private landowners to minimize the potential for bighorn sheep to contact domestic livestock whenever practicable.***

To this end, Colorado Parks and Wildlife advocates strict adherence to recommendations like those 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 types of recommendations and Best Management Practices (BMP's) 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."

Managing for effective separation is challenging, as it is difficult to account for every contingency that may arise "on the mountain" when developing operating plans. A recent incident in GMU S-33 illustrates this point. On September 26, 2009, an individual scouting for mountain goats observed a domestic ewe/lamb pair outside of an active allotment and within 100 yards of a group of bighorn rams. The individual recognized this as a concern and reported his observation to a Colorado Division of Wildlife biologist in Durango on September 28, 2009 (Holland, pers. comm., 2009). Subsequently, a tremendous amount of manpower went into reacting to this report, largely because it was corroborated through video documentation, and a helicopter search was conducted on October 2. Both USFS and BLM staff assisted, as did one of the local permittees and CDOW personnel. The search continued through the first week of October, but in the end, the domestic sheep were never found and it remains a mystery where the pair originated from and what ultimately happened to them. On a positive note, this incident facilitated the development of a calling tree intended to enhance response time to these types of reports, as well as the creation of additional educational materials and training for agency staff.

Domestic sheep grazing is an extremely complex management issue in RBS-21. In 2009, the former Colorado Division of Wildlife (CDOW) was a signatory to a Memorandum of Understanding (MOU) for Management of Domestic Sheep and Bighorn Sheep (Appendix F). The MOU was crafted over an 18 month period by the US Forest Service, Bureau of Land Management, CDOW, Colorado Department of Agriculture, and the Colorado Woolgrowers Association. The purpose of the MOU "is to provide general guidance for cooperation in reducing contact between domestic and bighorn sheep in order to minimize potential interspecies disease transmission and to ensure healthy bighorn sheep populations while sustaining an economically viable domestic sheep industry in Colorado." Domestic sheep producers in RBS-21 have made admirable contributions to recent Risk Assessment (RA) processes, GPS collar studies, and institution of Best Management Practices (BMP's) within their allotments. CPW remains interested in continued collaboration with area sheep producers and federal agency staff that works towards the mutually beneficial purpose described in the MOU.

CPW's statewide management plan includes additional goals and strategies related to bighorn sheep-domestic livestock disease interactions (George et al 2009):

- ***GOAL: Prevent introductions of infectious or parasitic diseases from domestic livestock that could adversely impact bighorn population performance and viability.***

- Strategy: Conduct research and surveillance to identify key pathogens of domestic sheep and other livestock species that can be managed to prevent epidemics.
- Strategy: Develop, evaluate, and use appropriate tools, management practices, and policies (e.g., species and herd segregation, education, vaccines, therapeutics, habitat management, harvest and dispersal) to prevent pathogen introductions and/or protect bighorn from select pathogens that may be introduced via interactions with domestic ruminants.

Specific future management actions in RBS-21 might include:

- ***At their request, actively assist USFS and BLM managers with Forest Plan revisions and Resource Management Plans; ensure that wild sheep are comprehensively considered***
- ***At their request, continue to actively assist USFS and BLM managers with Risk Assessments in areas where bighorn sheep range overlaps or is adjacent to active domestic sheep grazing allotments.***
 - Risk assessment processes should rely on quantitative and qualitative information. The potential for biased assessments increases when comprehensive data is lacking. Stakeholders should recognize that not everything is currently known about each wild sheep population, and agree to make logical inferences when necessary.
 - Risk assessments must be made synchronously not only between agencies, but also between Field Offices and District Offices in this DAU because of the joint-management situation that occurs with domestic sheep grazing, and the large geographic area encompassed by RBS-21. Livestock producers are integral to these processes.
 - CPW commends those involved with recent Risk Assessments and similar processes that have taken place during the last five years in portions of RBS-21. These processes create favorable venues for collaboration and discussion pertinent to the management of wild and domestic sheep where ranges overlap and the potential for contact exists. Qualitative Risk Assessments were recently completed as components of the Mountain Division Rangeland Assessment in the Norwood Ranger District, and the San Juan landscape Rangeland Assessment in the Ouray and Gunnison Ranger Districts. Additionally, a Biological Evaluation and Conservation Assessment was done for Rocky Mountain bighorn sheep as a supplement to the Rio Grande Forest Plan, as was an “Assessment of Risk of Physical Contact between Rocky Mountain Bighorn Sheep and Domestic Sheep in the Silverton Grazing Analysis Landscape” administered by the Columbine Field Office of the BLM and Columbine Ranger District of the San Juan National Forest.
 - Risk assessments should be revisited frequently to ensure management is adapted if and when necessary.
- ***Obtain biological samples from wild and domestic sheep within this DAU to establish baseline disease profiles; more should be learned from Colorado herds that are stable-increasing while overlapping with active domestic sheep grazing allotments.***
- ***Continue to use radio collar tracking (GPS preferable) of wild and domestic sheep for evaluation of spatial and temporal overlap in the DAU; seek funding sources to expand monitoring efforts.***
- ***Jointly develop more comprehensive “Response Plans” with federal agencies for promptly addressing any instances of wild sheep / domestic sheep contact. In 2011, the BLM state office in Idaho sent direction to all field offices for development of “Separation Response Plans” (USDI Bureau of Land Management Instruction Memorandum ID-2011-004, 2011) that are intended to “establish the process, protocols, and timelines to quickly address short-term or emergency management actions in response to imminent or likely contact between bighorn sheep, domestic sheep and goats.” Several sample response***

plans/Protocols are also included in the WAFWA (2010) recommendations. The incident in S-33 in 2010 essentially started this process, but more work needs to be done.

- *The use of domestic sheep or goats as pack animals by hunters, anglers, and other recreational or commercial users that travel in identified wild sheep habitat should be prohibited. Where legislation or regulations are not already in place, an effective outreach and public education program should be implemented, to inform potential users of the risks associated with that activity and recommend that individuals not use domestic sheep or goats as pack animals in occupied wild sheep habitat (WAFWA 2010).*
- *In order to maintain effective separation between wild sheep and domestic animals (sheep, goats, cattle, llamas, etc.), 4-H or other “hobby” livestock might warrant future consideration in land-use planning by individual Counties. At a County’s discretion, land use regulations could be enacted, or educational materials made available for home owners or potential home owners that live or plan on moving into bighorn sheep habitat. For example, a County could encourage double fencing as an exclusionary measure to help minimize the potential for contact between wild sheep and domestic livestock near a residence. CPW would certainly be willing to assist in the development of any future land use regulations pertinent to bighorn sheep.*

Furthermore,

- *CPW recognizes that the VACANT domestic sheep allotments in RBS-21 may provide some level of flexibility to land management agencies for adjusting and adapting grazing management across the landscape.*
 - *In some instances, VACANT allotments may provide land managers and permittees with grazing alternatives that reduce the potential risk of contact between wild and domestic sheep in currently active allotments. We recognize that VACANT allotments may also contribute to the overall management of vegetation within a permit area. However, CPW *does not* support restocking domestic sheep in VACANT allotments if it will increase the potential for contact with bighorn.*
 - *Land management agencies should consider closing VACANT allotments through standard NEPA processes, when it is collaboratively decided, in accordance with the existing MOU, that future restocking of these allotments would not be compatible with bighorn sheep conservation.*
- *No proposals will be developed for translocating bighorn sheep into RBS-21 where active domestic sheep grazing is occurring.*
- *CPW will promptly respond to reports of bighorn sheep mingling with domestic sheep. Wild sheep that have made contact with domestic sheep will be destroyed in compliance with CPW policies and administrative directives.*

Recreation

Burgeoning recreational use in this unit is of concern. Recreation is a driving economic force in local communities and occurs throughout the year. These communities continue to grow and demand for recreational opportunities and natural resources is also growing. Quality wildlife habitat includes food, water, shelter, space, *and* connectivity. 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 a diminished carrying capacity for the species across the landscape. Wildlife living within fragmented habitat is more vulnerable to stochastic population declines stemming from disease, increased rates of predation, or habitat loss or modifications. Fragmentation often leads to diminished immigration and emigration rates that are vital for promoting genetic diversity, range expansion, and recolonization in the event of localized extirpation. Most wildlife managers agree, with support from the scientific literature that recreation has the potential to impact wildlife distribution and abundance (Goldstein et al 2010, Naylor et al. 2008,

Keller and Bender 2007, Taylor and Knight 2003, Joslin and Youmans 1999, Valdez and Krausman 1999). The “zone of influence” of recreational activities for wildlife may extend for some distance beyond the actual activity and will vary depending on habitat composition, topography, and a species’ tolerance of human disturbance.

Bighorn sheep inhabit open country and are particularly 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. Animal density has been discussed in a previous section; human activity, including recreation, may perpetuate high densities of bighorn in areas where they seek refuge from disturbance. During radio collar tracking flights in the summer and fall, it is standard to see groups of hikers on many of the high peaks to the west of Lake City; it is also standard to *not* see bighorn sheep in those same areas. The “Alpine Loop” road, west of Lake City has been promoted as a recreational destination for more than 20 years and the current level of use is astounding. Agency estimates suggest that the Alpine Loop experiences upwards of 300,000 visitors per year (Japuntich, pers. comm., 2011). Assuming the majority of visitation occurs between June 15th and November 15th, 300,000 visitors would equate to nearly 1900 visitors per day. This level of human use absolutely has the potential to impact wildlife distribution across this region.

Winter range is crucial for bighorn sheep across Colorado. Winter wildlife needs should be carefully considered during all land-use and recreational planning. Disturbance from recreation is typically unnecessary and additive during the winter months when bighorn are already on a downward starvation curve. Some bighorn populations have no choice but to habituate to human activities during the winter; however, activities such as snowmobiling, dog walking (*ie. dogs off-leash harassing wildlife*), and heli-skiing all have significant potential to disturb and displace wintering sheep (Graham 1980, MacArthur et al. 1982, Etchberger et al. 1989).

Recreation has the potential to limit the overall range of bighorn, and discourage use of suitable habitats that are consumed by human activities. CPW biologists look forward to working with federal agencies, Non-Governmental Organization’s (NGO’s), and local jurisdictions in the future to ensure that recreational activities are not detrimental to bighorn sheep in RBS-21.

Mountain Goat / Bighorn Interactions

Mountain goats were first introduced into Colorado in 1948 with the intent of establishing populations that would support controlled hunting (Hibbs 1966). Two separate mountain goat transplants were done in S-33 at the head of the Lake Fork / Cottonwood Creek on June 18 & 25, 1968. Source stock was from South Dakota, and a total of 10 animals were released. Subsequent translocations occurred in several areas around the state during the next 25 years. Mountain goats provide unique wildlife viewing and hunting opportunities, and have proven to be extremely 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 (2009). Of chief management concern is the potential for resource competition within a given habitat once mountain goat populations become established, thereby reducing bighorn population vigor. 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 grants the director of Parks and Wildlife the authority to issue special licenses to hunters in order to harvest mountain goats found outside of an established mountain goat unit. Using this tool, managers may remove pioneering mountain goats preemptively, and before any significant population establishment has occurred.

Managers do not feel that mountain goats are a significant issue in RBS-21 at this time. However, goats are present in the DAU and have been for many years at low densities. Most goats observed over the last five years have appeared to be billies, and no nanny/kid groups have been officially documented. In S-33 mountain goats have been observed in various places including Burns Gulch, Grizzly Gulch, Edith Mountain, Cinnamon Pass, and Matterhorn Peak. In S-21, mountain goats have also been observed along Cimarron Ridge.

Predation

Most predators common to the southern Rocky Mountains are present across RBS-21 bighorn ranges, including mountain lions, golden eagles, coyotes, and bobcats (Figure 7). Red foxes have also been documented in high

elevation bighorn habitat during recent years. The affect(s) of predation are largely unknown, but appear to be non-significant at this time. Based on the current population trend, and observed winter lamb:ewe ratios, it appears that bighorn herds are not experiencing any additive mortality from predation. Predators in this area have a wide variety of prey species available to them including mule deer, elk, moose, and many species of small mammals and birds, reducing the potential for specialization on wild sheep. Impacts, if any, from predation will continue to be assessed and managed in accordance with the statewide management plan, which states: “the CPW will strive to prevent predation from severely impacting or extirpating introduced or established bighorn populations, but also will allow natural predation on unhealthy individuals to aid bighorn population in recovering from epidemics.” Disease and habitat capability are much more likely to be influencing population dynamics within this bighorn population.



Figure 7. Photo of bobcat on bighorn carcass in the upper Lake Fork, 2007

Illegal Take

There is no evidence that illegal take of bighorn sheep in RBS-21 is an issue. Some of these sheep are highly visible and accessible during certain times of year, and the potential for poaching exists. Illegal take of any bighorn sheep in Colorado is a serious crime with substantial penalties, and any instances of illegal take of bighorn will be investigated and prosecuted within the fullest extent of the law.

Public Involvement

This DAU planning process lasted nearly eight months, with ample opportunity provided for the general public (*hunters, NGO's, outfitters, business owners, etc.*), domestic sheep producers, federal land management agencies, and local governments to provide input on bighorn sheep management in RBS-21. To initiate the process, two scoping meetings were held prior to a draft plan being released. One meeting was held on August 31st 2011 in Lake City, where approximately 10 people attended, and the other meeting was held in Ridgway on September 1st 2011, with approximately 20 people in attendance. Those meetings were intended to explain the DAU process and timeline, as well as to gauge the level of interest in bighorn sheep management in the unit and discuss any management issues of concern. Meeting attendees were provided with a basic comment sheet and/or the opportunity to provide verbal comments directly to agency staff. No written comments were submitted following those meetings.

Wildlife managers released the first draft of the RBS-21 plan for public and agency review on September 9, 2011 with the intent of providing a 30-day comment period. This draft was removed from the CPW website after the initial 30-day period expired, however, because of the high level of interest in this process it was re-posted on October 21, 2011, with an extended comment deadline of November 1, 2011. In addition to posting the draft plan, with assistance from a human dimensions specialist in CPW, an on-line survey was developed using *Survey Monkey*. A link to the on-line survey was posted synchronously with the draft DAU plan, and was intended to provide an expeditious and less biased method for obtaining public input during this planning process. Press releases on the CPW website and in local news media informed constituents that the plan had been posted, and that an on-line survey was available. Concurrent with the plan and survey postings, formal solicitation letters were sent to various constituents, including local Boards of County Commissioners (BOCC's), federal land management agencies, local domestic sheep producers, the Colorado Woolgrowers Association, Rocky Mountain Bighorn Society, and the Colorado Outfitters Association. Additionally, postcards were mailed to all of the 2011 S-21 and S-33 sheep license applicants soliciting their participation in the DAU planning process.

CPW staff had numerous meetings and informal telephone discussions relative to the plan. Those included multiple meetings with federal agency staff, a meeting with the Hinsdale Board of County Commissioners, and a meeting with local domestic sheep producers. An additional public meeting was held in Montrose on October 21, 2011 that was hosted and facilitated by the Public Lands Partnership (PLP). CPW staff was invited to participate in the PLP meeting specifically to talk about the DAU plan and process. Other participants at the PLP meeting included staff from the USFS who discussed bighorn sheep and domestic sheep management on the GMUG (Grand Mesa, Uncompahgre, and Gunnison) National Forest, as well as local domestic sheep producers, who discussed their interest in the process and outcome. Written comments were received from the GMUG National Forest, Rio Grande National Forest, San Juan National Forest, Gunnison and Montrose BLM Field Offices, Rocky Mountain Bighorn Society, Hinsdale BOCC, Colorado Woolgrowers, local domestic sheep permittees (Western Slope Woolgrowers), Southern Ute Indian Tribe, and the general public.

In addition to written comments submitted from various stakeholders, 41 people participated in the on-line survey accessible through the CPW website (Appendix G). Of the 41 respondents, 95.1% were residents of Colorado, with 14.6% residing in RBS-21. With regard to bighorn sheep hunting, 29.3% responded that they had hunted bighorn sheep, while 85.1% had applied for a sheep hunting licenses in Colorado. Of the respondents, 90.2% stated that wild bighorn sheep are "Very Important" to them, with 7.3% indicating wild bighorns were "Somewhat important", and 2.4% stating that wild bighorn sheep were "Neither important, nor Unimportant." No one selected the alternative where bighorn sheep were "Unimportant." When asked what the "main factor limiting the number of bighorn sheep in Colorado" was, 58.5% of survey respondents indicated that disease was the main factor. A key component of the survey was to determine what the public was interested in regarding harvest and population management of bighorn sheep in RBS-21. Relative to ram harvest, 63.4% of the respondents preferred a status quo alternative that would "Maintain current hunting opportunity, which would limit crowding and encourage harvest of rams of different ages, but require longer to draw a permit." With regard to the number and distribution of bighorn sheep in RBS-21, there wasn't such a majority, with 50.0% of respondents selecting a "Stable population and distribution..." alternative, and 42.5% of respondents selecting an "Increasing population and distribution..." alternative. Only 7.5% of respondents selected a "Decreasing population and distribution..." alternative. All of the survey questions and associated responses are available in Appendix G. Appendix G includes the Survey Monkey results, as well as all constituent comments in their entirety for October-November comment period. Because of the volume of comments received during the Oct-Nov phase of this process, managers decided to compile them into a separate appendix (Appendix G) that was available upon request during a later public commenting period (December 2011 through January 2012).

Many constructive comments were received and thoroughly reviewed during the October-November phase of this planning process. Managers amended the draft DAU plan where appropriate and subsequently provided an additional 30-day public commenting period on the revised draft which extended from December 2011 through January of 2012. The revised draft was again posted on the Division of Wildlife's website, with notice provided to interested constituents through formal solicitation letters or email notification. As anticipated, a number of additional comments were submitted during the Dec-Jan comment period, which is summarized in Appendix H. Because of the strong interest in the RBS-21 planning process, managers felt it worthwhile to provide the Parks and Wildlife Commission with the survey results and comments in their entirety. Some comments were minimally censored in order to protect personal email addresses or other personal information.

A final draft plan was presented to the Colorado Parks and Wildlife Commission (PWC) on March 8, 2012. During that meeting, the PWC took the opportunity to ask questions and provide comments relative to the plan. They also provided an opportunity for public comment following the DAU plan presentation. The final RBS-21 plan was approved by the PWC on April 12, 2012.

A significant amount of public involvement and discussion occurred during this process. As expected, much of the discussion revolved around wild and domestic sheep issues and future management implications. CPW recognizes that on-going collaboration with various stakeholders is paramount in this DAU, and respects the diverse viewpoints represented during this process. Many of the comments received were incorporated into the final draft plan while some were not. As the primary wildlife management agency in the state, CPW is tasked with promoting wild sheep conservation across Colorado and in RBS-21. Bighorn sheep conservation is the emphasis of this management plan.

MANAGEMENT ALTERNATIVES

Bighorn sheep management in Colorado is complex and is, in our opinion, significantly different from other ungulate management. This document attempts to describe some of that complexity while providing specific recommendations for supporting and enhancing management in RBS-21. A traditional DAU plan includes management alternatives that revolve around a desired male:female ratio and population objective. Managers felt that those types of objectives were not appropriate for RBS-21, based partly on the lack of unit specific data accumulated for both GMU's, and historic data sets that may be highly biased; but more importantly, because of the stochastic influence of disease on population performance. RBS-21 objectives are somewhat non-traditional; however, it is critical that they be quantifiable and realistic for future monitoring. Bighorn sheep management is important to a wide array of constituents and involving the public was integral to the DAU planning process. Therefore, the following alternatives were presented that focused on objectives for harvest management, and herd distribution and density.

Harvest management

Ram and ewe hunting will continue in both RBS-21 game management units as long as population performance allows. There is clearly an opportunity for increasing licenses in this DAU, which provides managers some flexibility for future license allocation and population management. The question for aspiring hunters (which also relates to objective #2) is how much hunting *opportunity* is desired versus the desire for a high *quality* hunting experience and animal (most applicable to ram hunters) harvested. Managers currently have the ability to increase the amount of sheep hunting opportunity in this DAU; however that increase in opportunity potentially could lead to an increase in hunter crowding which could contribute to a concurrent decrease in the quality of an individual hunter's experience, and potentially a decrease in the quality of rams harvested. Ram quality would decline based on reduced age and size of animals harvested as hunter selectivity removed older aged rams over time.

Terms like "crowding," "experience," and "quality" are highly subjective; however they are factors that must be considered when discussing bighorn management alternatives. The number of years a hunter waits to draw a license and the fact that sheep distribution is sometimes limited within a GMU make these factors important considerations when selecting a management objective. It should also be acknowledged that managers have the flexibility to address some of these issues through season dates, sub-unit designations, and hunter education/outreach efforts. Ewe hunting is an important management tool and provides an outstanding hunting opportunity in the DAU. Ewe hunting will occur as long as population performance allows and will be regulated within the sideboards outlined in the statewide management plan. During planning, CPW proposed the following alternatives for harvest management, focusing on ram hunting:

Ram Age at Harvest *Average age of harvested rams is measured using a three-year average:

- 1) Maintain an average age of 4 years for rams harvested across the DAU.** In the short-term, this alternative would greatly increase hunting opportunity; however, it would likely increase crowding, diminish the experience, and reduce the average size of rams harvested
- 2) Maintain an average age of 6 years for rams harvested across the DAU.** This alternative would essentially maintain the current harvest regime in the DAU. Moderate ram license increases may be possible based on

recent population performance. This alternative should provide a quality experience, moderate levels of crowding, and diverse age-classes of rams

- 3) Maintain an average age of 8 years for rams harvested across the DAU.** This alternative might necessitate a decrease in the number of licenses available in the DAU. Since the late 1990's, the average age of rams harvested in the DAU is 7 years old. This alternative would provide the highest quality experience and the least crowded conditions in the field

It is important to managers that sheep hunter success rates are high. It must be pointed out, however, that with a relatively small number of licenses allocated on an annual basis, average hunter success rate is prone to change substantially based on one or more unsuccessful hunters. Consistently low success rates are of concern, but are not necessarily the result of animal availability; rather, they may be the result of increased animal wariness concurrent with increased hunting pressure. At this time it is unknown how modifying license allocation will impact success rates. The average success rate in RBS-21 since the late 1990's has been greater than 90%. Annual success rate will need to be evaluated synchronously with the age of harvested rams. The following alternatives were presented:

Ram Hunter Success Rate *Average hunter success rate is measured using a three-year average:

- 1) Maintain an average hunter success rate of 50-65%.** This alternative would likely provide maximum flexibility for license allocation and allow for the greatest increase in license numbers
- 2) Maintain an average hunter success rate of 65-80%.** This alternative would still allow for increases in license numbers, and is well above the statewide average of 45%. Provides moderate levels of flexibility for adjusting license numbers
- 3) Maintain an average hunter success rate greater than 80%.** This alternative would essentially maintain status quo. This alternative would not inhibit the ability to make minor modifications to license numbers, but provides the least flexibility for adjusting license allocation

Herd Distribution and Density

The current population estimate in RBS-21 is 400-450 animals. Key limiting factors for this population include winter range carrying capacity and the potential risk of disease transmission following contact with domestic sheep. These two factors warrant consideration of population density and herd distribution.

Winter range density: Winter range capability is always an important factor to consider with big game management, particularly in the Rocky Mountains. A population is only capable of growing within the bounds of its winter range, which is the situation in this DAU. Although there is much to learn about bighorn winter habitats in RBS-21, modeling exercises provide a course examination of what may be out there. Those exercises suggest that there is approximately 360 km² of potential winter range in the DAU, of which 295 km² are currently mapped as occupied. Models are only as good as the inputs that drive them, and managers strive to improve models whenever new data becomes available. One of the current limitations of these bighorn models is that they do not adequately take into account snow cover; therefore they are likely to overestimate the amount of winter range available, especially during severe winters. Related to winter range, density is also an important consideration for big game managers, and is of particular interest with bighorn sheep. Managing for maximum density is never advisable as it increases the level of intraspecific competition and stress, may contribute to habitat degradation, reduce population vigor, and increase susceptibility to disease. Because winter range represents a population bottleneck, calculating the density of bighorn on modeled winter range may provide a practical metric for future herd management. By applying the current population estimate of 400-450 animals to a modeled winter range of 360 km², a density estimate of 1.25 bighorn/km² is derived in RBS-21. Research conducted on Ram Mountain in Alberta, Canada, documented that when the local bighorn population exceeded a density of 6.2 bighorn/km² the population crashed (Jorgenson et al 1997, Festa-Bianchet 2003). This decline apparently was not disease related, which suggests that it occurred in response to some undetermined density dependent factor(s). Similar studies have not been done in Colorado, but clearly the Ram Mountain studies demonstrate the importance of maintaining a population density that is well below carrying capacity. Even if we assume that the model is overestimating the amount of suitable winter range by 50%, the density of bighorn on winter ranges in RBS-21 is still only 2.5/km². If the density threshold from Ram Mountain is applied to RBS-21, it is evident that local winter ranges may be capable of supporting a much larger population of

bighorn than what is currently present. A 6.2 bighorn/km² density, on modeled winter range in RBS-21, equates to a wild sheep population of more than 2200 animals.

Contact with domestic sheep: Although difficult to quantify, it is reasonable to assume that there is a positive correlation between population size and the risk of contact with domestic sheep. The intrinsic value of bighorn sheep in the ecosystem and the opportunities they provide for hunting and wildlife viewing cannot be overstated. An increasing bighorn population is highly desirable for many constituents, particularly in RBS-21 where so much suitable wild sheep habitat occurs. However, managers recognize that there may be a threshold in this DAU at which point the risk(s) outweigh the potential benefits of an increasing, expanding wild sheep herd.

“Expected population”: The expected population is not a population objective that is actively managed toward using female harvest; rather, it is the number of wild sheep that should be expected to reside within the DAU under different management regimes. It is based on aerial survey information, agency and public reports, and hunter attained information. In the absence of more rigorous population estimates, all available information should corroborate an “expected population” of animals. Managers working towards an expected population recognize that post-hunt population estimates are mostly qualitative, and lack a measure of precision. They are subject to change on an annual basis depending on: 1) whether or not comprehensive surveys are conducted and 2) the number of animals that are actually classified during those surveys. The best post-hunt 2011 population estimate in RBS-21 is between 400 and 450 animals. The alternatives described below include expected populations.

With consideration to bighorn distribution, winter range capability, population density/density dependence, and the potential risk of contact with domestic sheep on active grazing allotments, the following management alternatives were presented:

1) *Manage for a stable population and stable distribution within the DAU.* This alternative will:

- Attempt to maintain the current density of bighorn sheep across modeled winter ranges, index density if and when model is refined. Density should not exceed 2.0 bighorn/km²
- Assume an expected population in RBS-21 of between 400 and 500 animals
- Encourage managers to respond with targeted hunting licenses, non-lethal harassment, or managed culling if individual or small groups of bighorn expand their range into novel areas where the risk of contact with domestic sheep is considered too high
- Assume that the risk of contact with domestic sheep is maintained at the current level
- Require moderate license increases, and potential modifications to unit boundaries and season dates
- Assume that current watchable wildlife opportunities will be maintained

2) *Manage for an increasing population and increasing distribution within the DAU.* This alternative will:

- Allow the RBS-21 population to continue increasing, assuming the current population trend continues. The density of bighorn sheep across modeled winter range will be allowed to increase beyond 2.0 bighorn/km², but should not exceed 4.0 bighorn/km²
- Assume an expected population of ≥ 500 animals
- Allow bighorn to expand their range unfettered; managers may attempt to address distribution issues only if contact between individual or small groups of bighorn and domestic sheep is imminent. Expansion of subherds into active allotments will not be controlled
- Assume that the risk of contact with domestic sheep will increase as the population increases
- Not require significant changes to current license allocation, but will accommodate change if additional hunting opportunity is desirable

- Assume that watchable wildlife opportunities will be increased

3) ***Manage for a decreasing population and decreasing distribution within the DAU.*** This alternative will:

- Reduce the current population in RBS-21 through aggressive hunter harvest and/or trap/transplant. The density of bighorn sheep across modeled winter ranges should be reduced to < 1.25 bighorn/km²
- Assume an expected population in RBS-21 of ≤ 400 animals
- Attempt to prevent and discourage range expansion of individual or small groups of dispersing bighorn through lethal or non-lethal alternatives
- Assume that the risk of contact with domestic sheep will decrease as the population decreases
- Require significant license increases, and temporarily will provide maximum hunting opportunity
- Assume that watchable wildlife opportunities will be decreased

Final RBS-21 Management Objectives

Based on the biological analysis and public involvement that occurred during this DAU planning process, managers selected, and the Parks and Wildlife Commission approved, the following objectives for future RBS-21 bighorn sheep management:

Harvest management:

- ***Maintain a 3-year average age of 6 for hunter harvested rams.*** This alternative will essentially maintain the current harvest regime in the DAU. Moderate ram license increases may be possible based on population performance. This alternative should provide a quality experience, moderate levels of crowding, and diverse age-classes of rams.
- ***Maintain a 3-year average hunter success rate of 65-80%.*** This alternative provides a moderate level of flexibility for adjusting license numbers, and should allow for future license increases. This success rate is well above the statewide average of 45%.

Herd Distribution and Density:

- ***Manage for a stable population and stable distribution within the DAU.*** This alternative will:
 - Maintain the current density of bighorn sheep across modeled winter ranges, index density if and when model is refined. Density should not exceed 2.0 bighorn/km²
 - Assume an expected population in RBS-21 of between 400 and 500 animals
 - Encourage managers to respond with targeted hunting licenses, non-lethal harassment, or managed culling if individual or small groups of bighorn expand their range into novel areas where the risk of contact with domestic sheep is considered too high
 - Assume that the risk of contact with domestic sheep is maintained at the current level
 - Require moderate license increases, and potential modifications to unit boundaries and season dates
 - Assume that current watchable wildlife opportunities will be maintained

CONCLUSION

As the primary wildlife management agency in the state, CPW is tasked with managing wild sheep across Colorado and in RBS-21. Thus, bighorn sheep conservation is the emphasis of this final management plan. The plan objectives, approved by the Parks and Wildlife Commission, are intended to maintain the current population trend and productivity of this herd. The hunter harvest objectives strive to maintain high hunter success rates and accommodate for harvest of older age-class rams, while attempting to mitigate the potential for over-crowding in order to provide a quality hunting experience. Furthermore, the harvest objectives may allow for moderate increases to both ram and ewe licenses based on population performance. The herd distribution and density objective focuses on maintaining the potential risk of contact with domestic sheep at current levels, maintaining winter range densities that promote herd vigor and habitat sustainability, while maintaining current watchable wildlife opportunities.

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APPENDIX A.

Domestic Sheep Allotments Occurring Within RBS-21

Allotment Name	Agency	District or Field Office	Status	Avg. On	Avg. Off
American Flats	BLM	Gunnison	Active	11 July	5 Sept
Bear Creek	FS	Ouray			
American Lake	BLM	Gunnison	Active	10 July	15 Sept
Big Blue/Fall Ck./ Little Cimarron	FS	Ouray	Active	6 July	20 Sept.
Eureka/ California Gulch	BLM	San Juan	Active	10 July	15 Sept.
Red Mountain	FS	Columbine	Active	1/July	15 Sept.
Gladstone	BLM	San Juan			
Hero Idarado	FS	Ouray			
Henson Creek	BLM	Gunnison	Active	10 July	10 Sept.
Picayne/Mineral Point	BLM	San Juan	Active	10 July	15 Sept.
Uncompahgre Peak/ N. Henson	FS	Ouray	Active	11 July	20 Sept.
Crystal Peak/Lower Elk	FS	Ouray	Active	6 July	10 Sept.
Deer Park	FS	Columbine	Active	10 July	15 Sept.
Deer Park	BLM	San Juan			
Elk Creek	FS	Columbine	Active	10 July	15 Sept.
Stony	BLM	San Juan			
Grizzly Gulch	BLM	Gunnison	Active	10 July	15 Sept.
Rambouillet	FS	Gunnison	Active	11 July	20 Sept.
Rambouillet	BLM	Gunnison			
Ruffner	FS	Norwood	Active	11 July	25 Sept.
Cebolla-Rough	FS	Gunnison	Vacant		
Cataract-Cuba	FS	Gunnison	Vacant		
Middle Pole	FS	Divide			
Cottonwood	FS	Gunnison	Vacant		
Minnie Gulch	BLM	San Juan			
Maggie Gulch	BLM	San Juan	Vacant		
West Pole	FS	Divide			
Miner/Poughkeepsie	FS	Ouray	Vacant		
Red Cloud	BLM	Gunnison	Vacant/Closed		
Upper Burrows	BLM	Gunnison	Vacant		
Mill Creek	BLM	Gunnison	Vacant		
Ruby	FS	Divide	Vacant		
Kitty	FS	Divide	Vacant		
Lost Trail/Carson	FS	Divide	Vacant		

APPENDIX B.

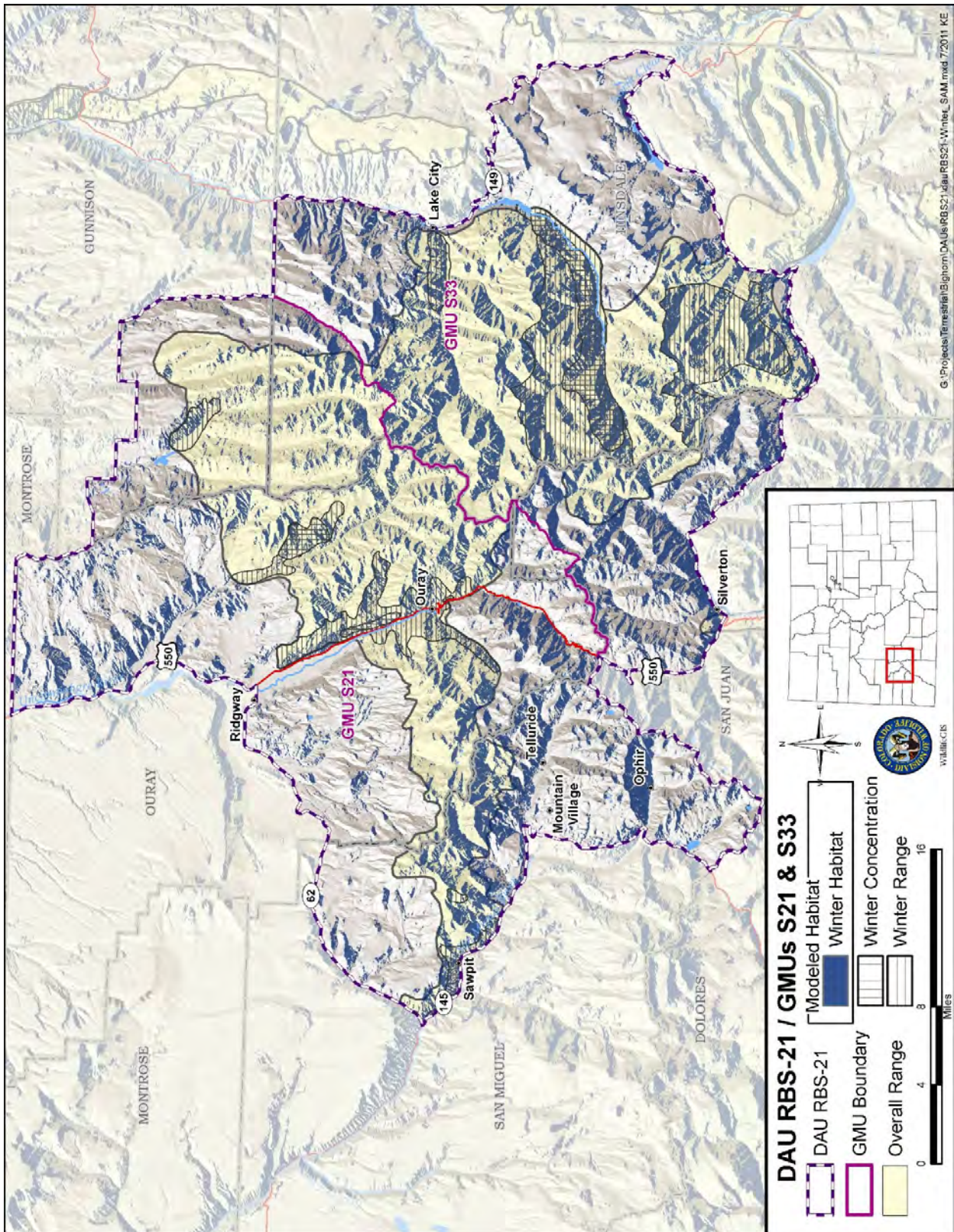
RBS-21 License allocations and harvest 1958-2010.

<i>Year</i>	<i>S-33 Total Licenses</i>	<i>S-33 Ram Harvest</i>	<i>S-33 Ewe Harvest</i>	<i>S-21 Total Licenses</i>	<i>S-21 Ram Harvest</i>	<i>S-21 Ewe Harvest</i>
1958				4	0	
1959				4	0	
1960				4	4	
1961				4	0	
1962				4	1	
1963				4	0	
1964				4	1	
1965				4	0	
1966				4	0	
1967				12	0	
1968				8	2	
1969	6	1		8	3	
1970				8	0	
1971-1974	<i>No info</i>			<i>No info</i>		
1975	6	2		8	3	
1976	6	0		8	2	
1977	6	1		8	6	
1978	7	1		8	4	
1979	4	0		10	7	
1980	<i>no info</i>			8	8	
1981	<i>no info</i>			8	5	
1982	2	1		10	7	
1983	2	1		8	3	
1984	2	1		10	6	
1985	2	0		8	3	
1986	5	2		<i>Unit Closed</i>		
1987	3	1		<i>Unit Closed</i>		
1988	3	1		<i>Unit Closed</i>		
1989	3	1		<i>Unit Closed</i>		
1990	3	0		<i>Unit Closed</i>		
1991	<i>Unit Closed</i>			<i>Unit Closed</i>		
1992	<i>Unit Closed</i>			1	1	
1993	<i>Unit Closed</i>			2	1	
1994	<i>Unit Closed</i>			1	1	
1995	<i>Unit Closed</i>			2	1	
1996	<i>Unit Closed</i>			2	2	
1997	<i>Unit Closed</i>			2	2	

1998	<i>Unit Closed</i>			2	2	
1999	<i>Unit Closed</i>			2	2	
2000	<i>Unit Closed</i>			2	2	
2001	<i>Unit Closed</i>			2	2	
2002	<i>Unit Closed</i>			2	2	
2003	<i>Unit Closed</i>			2	2	
2004	<i>Unit Closed</i>			2	2	
2005	<i>Unit Closed</i>			3	3	
2006	2	2		3	3	
2007	2	2		3	3	
2008	2	2		4	4	
2009	2	1		4	4	
2010	3	2	1	6	5	1
TOTALS	71	22	1	139	97	1

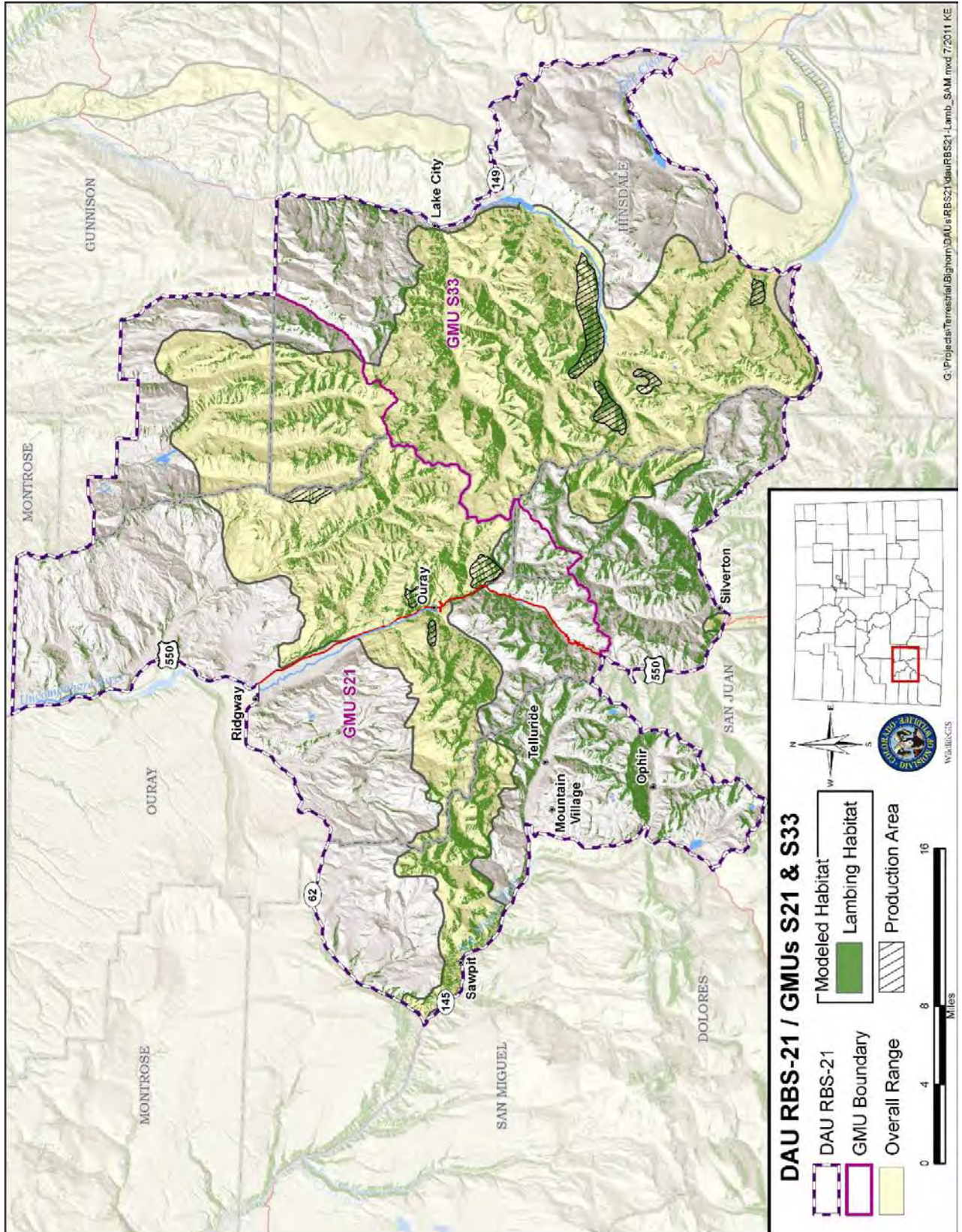
APPENDIX C.

Mapped occupied winter habitat in relation to modeled suitable habitat for Rocky Mountain bighorn sheep in RBS-21.



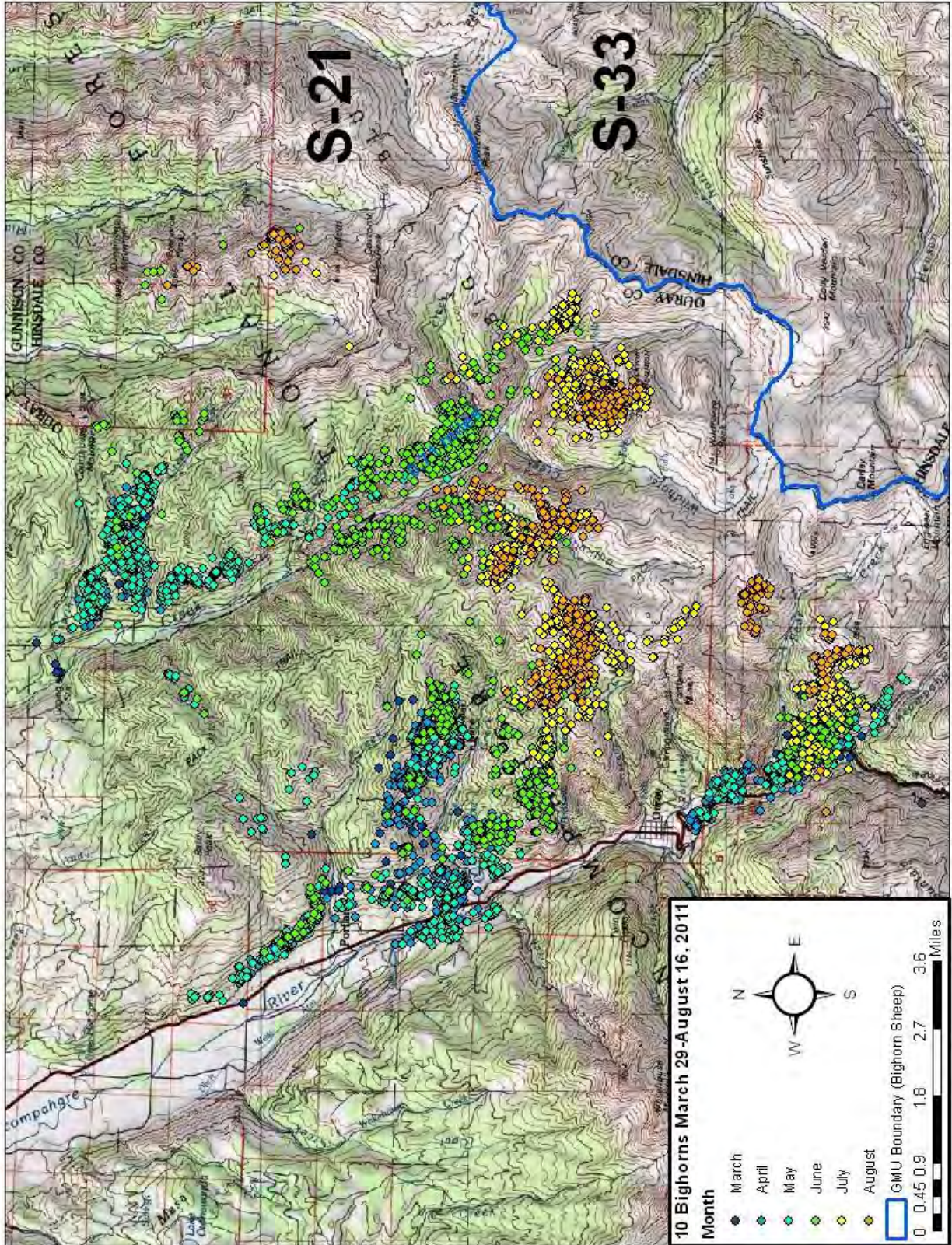
APPENDIX D.

Known bighorn lambing (production) areas & modeled lambing areas across RBS-21.



APPENDIX E.

Map illustrating S-21 collared bighorn sheep movements from capture to August 16, 2011.



APPENDIX F.

Forest Service Agreement No.	09-MU-11020000-006
Bureau of Land Management Agreement No.	BLM-MOU-CO-482

**MEMORANDUM OF UNDERSTANDING
FOR
MANAGEMENT OF DOMESTIC SHEEP AND BIGHORN SHEEP**

I. TO MINIMIZE POTENTIAL INTERSPECIES DISEASE TRANSMISSION

The purpose of this Memorandum of Understanding (MOU) is to provide general guidance for cooperation in reducing contact between domestic and bighorn sheep in order to minimize potential interspecies disease transmission and to ensure healthy bighorn sheep populations while sustaining an economically viable domestic sheep industry in Colorado.

II. STATEMENT OF MUTUAL BENEFITS AND INTEREST:

The interested parties of this MOU include the USDA Forest Service (USFS) Rocky Mountain Region, USDI Bureau of Land Management Colorado State Office (BLM), Colorado Department of Agriculture (CDOA), Colorado Woolgrowers Association (CWGA), and the Colorado Division of Wildlife (CDOW). The aforementioned parties have a mutual desire to prevent or minimize to the extent feasible direct contact between domestic sheep and bighorn sheep by developing and implementing mutually agreeable guidelines. By adhering to these guidelines, all parties should mutually benefit by maintaining healthy bighorn sheep populations while maintaining a viable domestic sheep industry as a result of reduced conflicts.

III. AUTHORITY

- a. The Act of October 21, 1976, Public Law 94-579, Federal Land Policy and Management Act (FLPMA); Section 302.

IV. ALL PARTIES AGREE THAT;

- a. Contact between bighorn sheep and domestic sheep sometimes occurs under rangeland conditions.
- b. Contact between domestic sheep and bighorn sheep increases the probability of respiratory disease outbreaks in bighorn sheep.
- c. Not all disease outbreaks and reduced recruitment in bighorn sheep can be attributed to contact with domestic sheep.
- d. Gregarious behavior of bighorn sheep and domestic sheep, as well as dispersal, migratory, and exploratory behaviors of bighorn sheep traveling between populations, increases the potential for contact.
- e. Several species of bacteria in the family *Pasteurellaceae*, other bacteria, virus and other agents can occur in apparently healthy free-ranging bighorn sheep and in apparently healthy domestic sheep.
- f. Bighorn sheep translocated to vacant or occupied bighorn ranges and domestic sheep moved onto grazing allotments should be in apparent good health, and where feasible herd health evaluations should be made for both species prior to release or turn-out to

help reduce the potential for introducing new pathogens or pathogen strains into established bighorn sheep herds.

- g. All parties will act to familiarize the public with the potential risks regarding disease transmission between bighorn sheep and domestic sheep.
- h. The goal is to minimize contact by decreasing the opportunities for domestic/bighorn sheep interaction; while still recognizing that some vacant sheep allotments are important to the domestic sheep industry as forage reserves or for other economic or management reasons.

V. CDOW AND CWGA AGREE TO THE FOLLOWING:

- a. CDOW and CWGA agree that closure of active domestic sheep allotments on public lands will not be recommended based solely on the potential for interaction between domestic and bighorn sheep. However, they recognize that the USFS and BLM will continue to follow existing regulation and direction regarding closure or modification of active domestic sheep allotments to resolve documented resource conflicts.
- b. The CDOW and CWGA may jointly or individually recommend vacant domestic sheep allotments for closure, modification, forage reserve status, activation, or management options at any time, including via standard USFS/BLM NEPA processes. The CDOW and CWGA understand that the USFS/BLM will follow current regulation and direction for closure, modification, activation, and management of vacant domestic sheep allotments to include consideration of recommendations from parties to this MOU.
- c. Individual bighorn sheep, or small groups of bighorn sheep (<5) that through dispersal or other movements come in contact with domestic sheep will be promptly removed by the CDOW using means determined appropriate by CDOW. Permittees and herders will be encouraged to operate in a manner that reduces opportunities for contact between bighorn sheep and their flocks and to notify CDOW as soon as possible if bighorn sheep appear with domestic sheep.
- d. Domestic sheep that stray into occupied bighorn sheep habitat or are not gathered and removed as specified by the allotment management plan pose a risk of interaction and will be removed by the owner as soon as possible or as otherwise specified by the land management agency. If stray domestic sheep are not claimed and reasonable attempts to locate their owner fail, then CDOW may seek remedies under existing statutory authority in cases where contact with bighorn sheep may occur.
- e. CDOW will inform land management agencies and domestic sheep industry representatives of proposals for transplants of bighorn sheep and will afford an opportunity for comment on translocation proposals prior to animals being released. Bighorn translocation proposals will include disease transmission risk and habitat evaluations consistent with existing CDOW guidelines and directives. In general, transplants will not occur in proximity (e.g., probable travel distance of dispersing bighorn sheep) to occupied domestic sheep allotments unless physical barriers to movement or other mitigating circumstances exist. Furthermore, CDOW assumes the risk of potential respiratory disease transmission from domestic sheep operations that are within proximity (probable travel distance of dispersing bighorn sheep) of the transplant location.

- f. Domestic sheep, when moved to grazing allotments in areas of potential contact with bighorn sheep, will be in apparent good health as determined by accepted best management practices for range sheep production.
- g. Bighorn sheep, when moved for translocation, will be in apparent good health as determined by accepted best management practices for bighorn sheep management.

VI. IT IS MUTUALLY AGREED AND UNDERSTOOD BY ALL PARTIES:

1. FREEDOM OF INFORMATION ACT (FOIA). Any information furnished to the Forest Service and Bureau of Land Management under this instrument is subject to the Freedom of Information Act (5 U.S.C. 552).
2. PARTICIPATION IN SIMILAR ACTIVITIES. This instrument in no way restricts the Forest Service, Bureau of Land Management or the Cooperator(s) from participating in similar activities with other public or private agencies, organizations, and individuals.
3. COMMENCEMENT/EXPIRATION/TERMINATION. This MOU takes effect upon the signature of all parties and shall remain in effect for five years from the date of execution. This MOU may be extended or amended upon written request of any of the parties and the subsequent written concurrence of the other(s). Any party may terminate this MOU with a 60-day written notice to the other(s).
4. RESPONSIBILITIES OF PARTIES. The Forest Service, Bureau of Land Management and all other parties and their respective agencies and office will handle their own activities and utilize their own resources, including the expenditure of their own funds, in pursuing these objectives. Each party will carry out its separate activities in a coordinated and mutually beneficial manner.
5. NON-FUND OBLIGATING DOCUMENT. Nothing in this MOU shall obligate the Forest Service, Bureau of Land Management, Colorado Division of Wildlife, Colorado Department of Agriculture, or Colorado Woolgrowers Association to obligate or transfer any funds. Specific work projects or activities that involve the transfer of funds, services, or property among the various agencies and offices of the Forest Service, Bureau of Land Management, Colorado Division of Wildlife, Colorado Department of Agriculture, and Colorado Woolgrowers Association will require execution of separate agreements and be contingent upon the availability of appropriated funds. Such activities must be independently authorized by appropriate statutory authority. This MOU does not provide such authority. Negotiation, execution, and administration of each such agreement must comply with all applicable statutes and regulations.
6. ESTABLISHMENT OF RESPONSIBILITY. This MOU is not intended to, and does not create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity, by a party against the United States, its agencies, its officers, or any person.

7. Conflicts between the participants concerning procedures under this MOU which cannot be resolved at the operational level will be referred to successively higher levels, as necessary, for resolution.
8. **AUTHORIZED REPRESENTATIVES.** By signature below, the cooperator certifies that the individuals listed in this document as representatives of the cooperator are authorized to act in their respective areas for matters related to this agreement.

THE PARTIES HERETO have executed this instrument.

APPROVED:

This MOU is between the USDA Forest Service, Rocky Mountain Region, USDI Bureau of Land Management Colorado State Office, Colorado Division of Wildlife (DOW), Colorado Department of Agriculture, and the Colorado Woolgrowers Association.

Randall Kasstowitz (FOR) ANTONISE L. DIXON March 2, 2009
USDA Forest Service (USFS) Date
Rocky Mountain Region

Sally Wind 3/13/09
USDI Bureau of Land Management (BLM) Date
Colorado State Office

Thomas E. Remington 2/11/09
Colorado Division of Wildlife (CDOW) Date

John R. Stupp 3-30-09
Colorado Department of Agriculture (CDOA) Date

Amelia 3/26/09
Colorado Woolgrowers Association (CWGA) Date

The authority and format of this instrument has been reviewed and approved for signature.



Monica Cordova 3/2/09
Monica Cordova DATE
Forest Service G&A Specialist

APPENDIX G.



Survey Monkey Results & Comments Received during RBS-21 Planning Process

San Juan West Bighorn Sheep Management Plan

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

	Response Percent	Response Count
Yes 	95.1%	39
No 	4.9%	2
answered question		41
skipped question		0

2. Do you live in GMU S21 or S33? See the map below, which shows the boundaries of GMUs S21 and S33. (Please check one.)

	Response Percent	Response Count
Yes 	14.6%	6
No 	85.4%	35
answered question		41
skipped question		0



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

		Response Percent	Response Count
I am interested in wildlife, BUT I don't do much that is specifically related to wildlife.	<input type="checkbox"/>	4.9%	2
I am interested in wildlife, AND I actively take part in wildlife-related activities.	<input checked="" type="checkbox"/>	95.1%	39
I am NOT very interested in wildlife AND I don't do much that is specifically related to wildlife.	<input type="checkbox"/>	0.0%	0
I am NOT very interested in wildlife, BUT for various reasons I am involved in wildlife-related activities.	<input type="checkbox"/>	0.0%	0
answered question			41
skipped question			0



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

	Yes	No	Response Count
a. Learned about wildlife by reading or watching television	92.5% (37)	7.5% (3)	40
b. Spent time watching or photographing wildlife or birds	97.5% (39)	2.5% (1)	40
c. Hiked or walked in natural areas	97.6% (40)	2.4% (1)	41
d. Rode an ATV, Jeep or dirt bike in natural areas	80.0% (32)	20.0% (8)	40
e. Worked on a ranch or farm	53.8% (21)	46.2% (18)	39
f. Camped	100.0% (41)	0.0% (0)	41
g. Hunted any wildlife	97.6% (40)	2.4% (1)	41
h. Fished any fish species	92.5% (37)	7.5% (3)	40
i. Guided or outfitted individuals to hunt in Colorado	21.1% (8)	78.9% (30)	38
j. Participated in or commented on a CPW wildlife management plan or BLM, USFS or other federal land use plan	50.0% (20)	50.0% (20)	40
k. Participated in or commented on a county, city or other local land use plan	57.9% (22)	42.1% (16)	38
		answered question	41
		skipped question	0





5. Have you hunted bighorn sheep in the past?

		Response Percent	Response Count
Yes		29.3%	12
No		70.7%	29
answered question			41
skipped question			0

6. Have you applied for a bighorn sheep hunting license in Colorado?

		Response Percent	Response Count
Yes		85.4%	35
No		14.6%	6
answered question			41
skipped question			0












7. In relation to how you value other people, pets and livestock, how do you feel wild animals should be valued by society? (Please check one.)

		Response Percent	Response Count
Wild animals should be valued the same as people.		12.5%	5
Wild animals should be valued the same as pets.		5.0%	2
Wild animals should be valued the same as livestock.		60.0%	24
I am not sure.		22.5%	9
answered question			40
skipped question			1

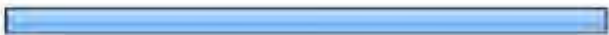


8. Who do you believe owns wildlife in Colorado? (Please check one.)

		Response Percent	Response Count
Landowners on whose land the animals live		0.0%	0
The state government		12.5%	5
The federal government		0.0%	0
Wildlife are not owned by any individual or entity		42.5%	17
The people of the state and it's visitors		45.0%	18
I am not sure		0.0%	0
answered question			40
skipped question			†



9. If you wanted to learn more about wildlife or wildlife-related issues in Colorado in the future, whom would you contact? (Please check all that apply.)

		Response Percent	Response Count
I would not contact any organization for assistance.		2.5%	1
U.S. Forest Service, U.S. Fish and Wildlife Service, NRCS, USDA, BLM or another federal agency		52.5%	21
Colorado Parks and Wildlife		82.5%	33
Colorado State University Extension Services		15.0%	6
A Colorado university or college		5.0%	2
Colorado Woolgrowers, Colorado Cattlemen's Association		7.5%	3
Wildlife conservation organizations (Rocky Mountain Elk Foundation, The Nature Conservancy, etc.)		57.5%	23
Local rod and gun club		15.0%	6
Local or municipal government		7.5%	3
Friends, family or neighbors		55.0%	22
Other (please specify)		10.0%	4
		answered question	40
		skipped question	1

10. How important are wild bighorn sheep to you?

		Response Percent	Response Count
Very Important		90.2%	37
Somewhat Important		7.3%	3
Neither Important, nor Unimportant		2.4%	1
Somewhat Unimportant		0.0%	0
Very Unimportant		0.0%	0
I am not sure.		0.0%	0
		answered question	41
		skipped question	0

11. How important is it to you that there are bighorn sheep in Colorado in the future?

		Response Percent	Response Count
Very Important		97.6%	40
Somewhat Important		2.4%	1
Neither Important, nor Unimportant		0.0%	0
Somewhat Unimportant		0.0%	0
Very Unimportant		0.0%	0
I am not sure.		0.0%	0
		answered question	41
		skipped question	0

12. To what extent do you agree with the statement below? (Please check one.) I believe that CPW is currently doing an adequate job of managing bighorn sheep in GMUs 21 and 33.

		Response Percent	Response Count
Strongly agree		29.3%	12
Somewhat agree		39.0%	16
Neither agree, nor disagree		19.5%	8
Somewhat disagree		2.4%	1
Strongly disagree		2.4%	1
I am not sure.		7.3%	3
answered question			41
skipped question			0






13. Overall, how would you rate state and federal actions to manage bighorn sheep in this area? (Please check one.)

		Response Percent	Response Count
Excellent		14.6%	6
Above Average		29.3%	12
Average		29.3%	12
Below Average		9.8%	4
Poor		2.4%	1
I am not sure.		14.6%	6
answered question			41
skipped question			0

14. To what extent do you agree with the statement below? (Please check one.) I believe that hunting, watching and other bighorn sheep-related forms of recreation contribute substantially to local economies within San Juan, San Miguel, Gunnison, Hinsdale and Ouray counties.

		Response Percent	Response Count
Strongly Agree		43.9%	18
Somewhat Agree		39.0%	16
Neither Agree, nor Disagree		9.8%	4
Somewhat Disagree		4.9%	2
Strongly Disagree		2.4%	1
I am not sure.		0.0%	0
answered question			41
skipped question			0

15. Which of the following do you believe is the main factor limiting the number of bighorn sheep in Colorado? (Please check one.)

		Response Percent	Response Count
Disease		58.5%	24
Predation		7.3%	3
Hunting		0.0%	0
Loss of habitat/Land development		22.0%	9
I am not sure.		2.4%	1
Other (please specify)		9.8%	4
answered question			41
skipped question			0



16. How would you like to see the number of bighorn sheep change in this area over the next 10 years? (Please check one.)

		Response Percent	Response Count
Increase greatly		29.3%	12
Increase somewhat		48.8%	20
Stay the same		14.6%	6
Decrease somewhat		7.3%	3
Decrease greatly		0.0%	0
I am not sure		0.0%	0
answered question			41
skipped question			0


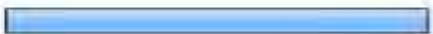


17. The following are all considerations of state and federal agencies when deciding how to use and manage land in this area. Please tell us which of these you feel should be most important in future land use decisions. (Please type a number from 1 to 8 which indicates how important you feel each item should be, where 1 is the most important item and 8 is the least important.)

	Response Average	Response Total	Response Count
Bighorn sheep populations	2.76	113	41
Deer and elk populations	2.39	98	41
Mountain goat populations	4.20	172	41
Non-motorized recreation (hiking, backpacking, skiing, etc.)	4.46	183	41
Motorized recreation (ATV riding, Off-road driving, etc.)	4.85	199	41
Livestock grazing	4.68	192	41
Mineral extraction and mining	5.85	240	41
Residential and commercial development	6.05	248	41
	answered question		41
	skipped question		0

**18. Have you reviewed the draft bighorn sheep management plan for GMUs S21 and S33?
(Please check one.)**

		Response Percent	Response Count
Yes		92.5%	37
No		7.5%	3
answered question			40
skipped question			1

**19. Which of the following alternatives would you prefer to guide CPW's decisions about
ram harvest in the next 10 years? (Please check one.)**

		Response Percent	Response Count
Increase hunting opportunity, which would increase hunter crowding and reduce the age of rams harvested, but would allow more hunters to draw a permit each year.		24.4%	10
Maintain current hunting opportunity, which would limit crowding and encourage harvest of rams of different ages, but require longer to draw a permit.		63.4%	26
Decrease hunting opportunity, which would lead to the least crowding and harvest of older rams, but require the largest number of preference points to draw a permit.		7.3%	3
I am not sure.		4.9%	2
answered question			41
skipped question			0

20. Which of the following alternatives would you prefer to guide CPW's decisions about the number and distribution of bighorn sheep in GMUs S21 and S33 in the next 10 years? (Please check one.)

		Response Percent	Response Count
<p>Stable population and distribution: Maintain current number of sheep (400-500 sheep), which will allow for small increases in the number of hunting licenses available each year, stable opportunity to view wild sheep and may lower the risk of conflict with domestic sheep.</p> 		50.0%	20
<p>Increasing population and distribution: Increase number to more than 500 sheep, which will allow for larger increases in the number of hunting licenses available each year, increased opportunities to view wild sheep, but may also increase the risk of conflict with domestic sheep as the wild sheep population increases.</p> 		42.5%	17
<p>Decreasing population and distribution: Reduce number of sheep to less than 400 sheep through increased hunter harvest and trap/relocate programs, which would temporarily increase the number of hunting licenses available and may maintain current risk of conflict with domestic sheep, but reduce the opportunity to view wild sheep.</p> 		7.5%	3
I am not sure.		0.0%	0
answered question			40
skipped question			1

21. Please use the space below to write any additional comments or observations about bighorn sheep management that you would like to share.

	Response Count
	19
answered question	19
skipped question	22

Page 5, Q9. If you wanted to learn more about wildlife or wildlife-related issues in Colorado in the future, whom would you contact? (Please check all that apply.)

1	D O W	Nov 2, 2011 9:23 AM
2	Rocky Mountain Bighorn Society	Sep 28, 2011 3:51 PM
3	C D O W	Sep 23, 2011 6:14 PM
4	Sportsmen	Sep 23, 2011 10:41 AM

Page 7, Q15. Which of the following do you believe is the main factor limiting the number of bighorn sheep in Colorado? (Please check one.)

1	Disease and Predation	Nov 2, 2011 9:29 AM
2	Disease and Loss of habitat/Land development	Nov 2, 2011 9:24 AM
3	manipulation by the DOW	Oct 8, 2011 1:46 PM
4	A combination of disease from domestic livestock, and a loss of habitat.	Sep 14, 2011 5:11 PM

Page 11, Q21. Please use the space below to write any additional comments or observations about bighorn sheep management that you would like to share.

- | | | |
|---|--|-----------------------|
| 1 | <p>As a domestic sheep rancher in the San Juans, I feel that the bighorn herd should be kept at current level or under which will help keep a viable sheep industry for the area economy plus have a good population of bighorn sheep for hunting recreational viewing ect. Growing the bighorn herd could compromise herd health because of limiting factors in the area all of which are issues to bighorns whether its domestic sheep, recreation, lack of adequate winter range, concerns of over-population densities ect. These stress factors combined with isolates of pneumonia the bighorns have which by science accounts predispose one another to bring on disease related issues to bighorns, are all challenges that bighorn management faces. It should be kept in mind that domestic livestock are only one additional issue for bighorn sheep not the only problem they have. Working together to minimize contact until better advantages in medicine for disease mitigation is all I have at the moment to keep bighorns and domestic sheep viable. Otherwise litigation is sure to cost everyone undue consequences that do little for either side. Our industry has a desire to grow in numbers but probably wont because of concerns to bighorns. Keeping bighorn populations conservative should keep chances for herd health in a better situation. Working with the MOU that all parties agreed to will provide compromise for all but yet keep viability for all too. This bighorn herd as reached historic accountable numbers while having domestic sheep around them. Lets work together to maintain both. I hope that this will be the direction we all go in. [REDACTED]</p> <p>Montrose, Colorado sheep rancher</p> | Nov 1, 2011 5:19 AM |
| 2 | <p>You have a tough job when it comes to managing bighorn sheep due to factors outside of your control ie. domestic sheep grazing. Increasing this herd substantially will increase the potential for disease transmission which could impact the herd for a very long time. Having the opportunity to hunt bighorn sheep in Colorado is a long sought out hunt. Sheep hunters accept the fact that it takes a long time to draw and because of that expect a good chance at a nice ram. Increasing licenses/hunters will take away from the specialness of hunting bighorn.</p> | Oct 31, 2011 11:08 AM |
| 3 | <p>My opinion, one of the major conveyances of disease from one herd to another is probably by young rams changing herds. Research being done by Washington State University is showing that conveyance of disease from domestic sheep to bighorn is probably by sexual contact. More research seems to be necessary before making decisions to remove domestic from bighorn habitat. Decision making meetings need to take place in the affected areas of Colorado - not on the front range. Montrose County has offered to accommodate that meeting.</p> | Oct 27, 2011 10:11 AM |
| 4 | <p>Please keep this herd growing and healthy. S33 just reopened for hunting and we'd like to see it stay open. If this herd crashes again is anybody going to be held accountable while we wait another 20 years for the herd to grow.</p> | Oct 21, 2011 8:31 PM |
| 5 | <p>I would pose the question- how many bighorn sheep lived in this DAU prior to the introduction of domestic livestock? It is wonderful that the herd is on the upswing but 400-450 is small potatoes compared to what was likely there historically. Sure wish my grandkids could see THOUSANDS of bighorn when they're old enough to get around. CPW, USFS, & BLM- please devote more resources to bighorn sheep in our state. When will they get the attention and protection they deserve? We appreciate your efforts, and please remember we</p> | Oct 21, 2011 8:08 PM |

Page 11, Q21. Please use the space below to write any additional comments or observations about bighorn sheep management that you would like to share.

are counting on you to be our voice for wildlife. Don't let the politics of this over-run the science.

- | | | |
|----|--|----------------------|
| 6 | I HAVE RECENTLY FOUND OUT THAT A PERSON THAT GOT A SHEEP TAG 4 YEARS AGO ONLY AFTER PUTTING IN 5 YEARS GOT ANOTHER TAG THE FIRST YEAR HE WAS ELGABLE TO DRAW. WHAT THE @\$**\$. A PERSON DRAWS 2 TAGS AND HARVESTED 2 SHEEP IN 4 YEARS. I HAVE BEEN PUTTING IN FOR 11 YEARS. THIS DOES NOT REPRESENT FAIR MANAGEMENT BUT WHAT DO YOU CARE. YOU GET YOUR MONEY... | Oct 8, 2011 1:54 PM |
| 7 | I am concerned that the number of ram permits in S33 will eventually cause a decrease in the average age of rams harvested, particularly in the Lost, West Lost areas of the unit. I would strongly disagree with increasing the number beyond the current level unless viable sub populations are established in other areas of the unit. I further think the more recent boundary decisions for S33 should be maintained. Having spent considerable time in the Lost, West Lost, Boulder, Snare, Cuba, Cataract, Mill, Wager parts of the unit, and having seen very few ewes in those areas, I'm concerned about the decision to harvest ewes. Even though this is apparently not range favored by ewes and lambs, and they may be more prevalent in other parts of the unit, I fail to see the point of harvesting two. | Oct 6, 2011 6:25 PM |
| 8 | Am interested in knowing the average number of years it takes to draw a license. | Oct 4, 2011 8:25 PM |
| 9 | What is the purpose of question #7 and #8? Who designed the survey and how much did it cost? Why do we not know the affects of predation on Big Horn Sheep populations while claiming they have no significant effect? Can you explain the State exemption to the Brunot Treaty? Why are Keystone species like Beaver populations in key water shed DAU not managed by the PWC? Thanks, [REDACTED] | Oct 4, 2011 12:01 PM |
| 10 | I believe there is winter range available to an increased number of sheep in unit 21. Key factor is that the sheep expand there winter range use to areas not utilized in the last 80 + years. Similar to what I am seeing in the placerville/sawpit area. Conflict with domestic sheep is sad but tough to manage especially in the Last Dollar area above the Telluride airport. The conflict that I have observed in the American Flats area above Bear creek could be easy to manage. The Forest Service has a number of vacant allotments that are NOT wild sheep habitat within a 30 mile radius of the present range used by domestic sheep. No question it would be a big change for the perittees that are runnig presently/ for even generations on those allotments that have domestic/wild shared summer pastures. The Forest Service is only being lazy if they are unwilling to offer nonuse range allotments that have been vacant for decades to domestic rangers who run in allotments with pasture conflicts. Some of these allotments are larger or can support more domestic for a longer season wiht much better access, less logistical expense, and decrease recreational conflicts presently seen in the areas in route to the 14 teeners and wild sheep. I feel it is just good business for hte DCOW and Forest Service to COOP for the long term (100-500 years) best interests of all involved (all wildlife, ranchers, recreational users, hunters of all species and local economies. | Oct 3, 2011 9:18 PM |
| 11 | One thing I would strongly recommend is to make all Ram hunting permits to be | Oct 3, 2011 8:05 PM |

Page 11, Q21. Please use the space below to write any additional comments or observations about bighorn sheep management that you would like to share.

a once in a lifetime tag. As this may give more opportunities to the hunter who has never drawn a tag. There are a lot of people who have never drawn a tag and many who have had several tags. Also for the years when you have good numbers of sheep maybe a license increase and on bad years a decrease

- 12 1. Need to consider moving the opening date of hunting season to be earlier to eliminate conflicts with archers and black powder hunters in the same areas. I was hunting elk in black powder season in the West Fork of the Cimarron and there were sheep hunters and archery hunters in the area at the same time. Too many guys in the same area. I recall that the opening of sheep season in the old S26 started in mid-August. 2. Page 10 of the plan indicates a new gold mining operation in the West Fork of the Cimarron. Could you tell me where specifically it would be located or where I can get additional information? 3. My responses would hopefully indicate to you the desire to have more sheep in more areas in S-21 and S-33. This would then equate to more hunting licenses to maintain the desired populations without increasing hunter crowding. Is this possible? You can contact me at [REDACTED] Grand Junction, CO Oct 3, 2011 3:58 PM
- 13 limit out of state hunting to Ewes only Oct 2, 2011 8:35 PM
- 14 Please eliminate the now vacant sheep grazing allotments from future activity. If there is any way possible to eliminate or decrease the now active allotments. Are they really necessary economically? I have been unsuccessful for 29 straight years in drawing a sheep tag. Maybe next year will be the one?! Sep 29, 2011 10:17 PM
- 15 Separation between wild sheep and domestic grazers on our public lands must be a top priority for all involved now that the transfer of disease(s) from domestic sheep to wild sheep is a known fact. Sep 29, 2011 1:49 PM
- 16 I have hunted deer and elk in the areas included in GMU's S21 & S33 for years and I am a resident of Ridgway. I also have applied for a sheep permit in S21 for over 10 years. I believe that based on the information in this draft, that the DOW could increase the number of ram permits in S21 from 4 to 6 and can leave the number of ewe permits at the current level, without decreasing the quality of the hunt. This might decrease the success rate but since it is currently 100%, the reduction should be minimal over time...and still greatly exceed the statewide average. I also believe that the DOW could increase the number of ram permits in S33 from 3 to at least 4 and maybe 5. This unit appears to be significantly more challenging than S21...which is supported by the lower success rate and the lower permit application rate...thus suggesting that the quality of the hunt would be minimally impacted. By the way, the draft is outstanding and very professionally done. Good job. [REDACTED] Sep 28, 2011 11:49 AM
- 17 The S-21 herd has historically been underestimated. For example, the post-hunt population estimate from 1998 shows 75 animals and I personally witnessed over 50 different rams while scouting this area. My point is, that the current counts and estimates are much more correct, but the herd size has not dramatically increased as the estimates are showing. This survey asks what my opinion is on the biggest threat to Bighorn populations with separation between habitat loss and disease. First of all, biology should be able to determine this better than my opinion. As for my opinion, habitat loss and disease are Sep 23, 2011 11:07 AM

Page 11, Q21. Please use the space below to write any additional comments or observations about bighorn sheep management that you would like to share.

essentially the same for bighorn sheep. Habitat loss comes from development, but also through encroachment by domestic sheep or recreation overuse. Anything that confines the sheep increases risk of disease. Domestic sheep are certainly a source for disease potential. One thing I have found missing in the management plan is other options to reduce the risk of disease. These include setting aside winter habitat areas for non-recreational use (either through purchase or enforcement in some way), purchase and increased retirement of the grazing allotments which have the highest risk of creating interaction and even vaccinations. Another thing not mentioned, is the source (or potential source) of any historical die-offs. The S-21 herd seems to be unique in that its winter areas are truly spread widely with only a few primary areas. It seems to me areas like S-26 and S-70 had recent problems due to herds geographically being forced together in the winter when disease hit - which S-21 has a lower risk of (?). As a hunter, I would selfishly prefer more opportunities to hunt, but sheep are special. Keep the population managed properly first of all. Secondly, provide quality opportunities.

- | | | |
|----|--|-----------------------|
| 18 | Drawing a Ram tag should be a once in a lifetime tag. Some hunters are hunting their 2nd and 3rd ram in Colorado while others have waited 20yrs and still no tag. Mountain Goat and Bighorn Sheep Tags should be once in a lifetime draw tags. | Sep 22, 2011 12:12 PM |
| 19 | I think that domestic sheep need to be removed from any area that the local Wildlife Biologist deems important bighorn habitat, as well as buffer area surrounding that habitat to eliminate contact with domestic sheep, thereby decreasing disease transmission! | Sep 14, 2011 5:14 PM |



Rocky Mountain Bighorn Society
P. O. Box 8320
Denver, Colorado 80201
720-201-3791

October 11, 2011

Brandon Diamond
Terrestrial Biologist - CPW
300 West New York Avenue
Gunnison, CO 81230

Brad Banulis
Terrestrial Biologist - CPW
2300 South Townsend Avenue
Montrose, CO 81401

Dear Mr. Diamond and Mr. Banulis:

The Rocky Mountain Bighorn Society (RMBS) welcomes the opportunity to comment on the draft management plan for Rocky Mountain bighorn sheep DAU RBS-21 prepared by Colorado Parks and Wildlife (CPW) biologists. Our organization represents approximately 850 members, with a mission to promote and enhance the well being of Colorado's state animal, the Rocky Mountain bighorn sheep.

The RMBS prefers **Alternative 3** under *Ram Age at Harvest* in the draft management plan. We prefer that hunters have the opportunity to harvest older age class rams given a reasonable hunting effort. However, we point out that some hunters only wish to fill their license, and may not choose to pass up a young ram to search for a more mature ram. We hope that CPW staff will rely more heavily on herd inventory data, if available, when considering future hunter opportunity.

The RMBS prefers **Alternative 2** under *Ram Hunter Success Rate* in the draft management plan. We acknowledge that a bighorn sheep license is often a highly anticipated, once-in-a-lifetime opportunity for hunters, and we believe that herds should be managed so that reasonably prepared and motivated hunters have a high chance of success. However, we also realize that some successful applicants are not properly motivated, prepared or physically fit to have a reasonable chance of success, and that these hunters may negatively affect success rates. We urge CPW managers to consider these factors when determining future hunter opportunity, and to rely on herd inventories whenever possible when recommending license numbers.

The RMBS prefers **Alternative 2** under *Herd Distribution and Density* in the draft management plan. We prefer that bighorn sheep are allowed to expand into historically occupied range and other suitable habitat as long as adequate winter range is available. We recognize the potential for conflicts with domestic sheep producers and hope that CPW will work closely with federal land management agencies to reduce the chance of bighorn sheep exposure to domestic sheep.

The United States Forest Service (USFS) issued a new directive to Regional Foresters on August 19, 2011 requiring a comprehensive bighorn sheep viability analysis when making forest planning decisions requiring National Environmental Policy Act (NEPA) analysis. This directive states in part: "Where viability assessments indicate a high likelihood of disease transmission and a resulting risk to bighorn sheep population viability across the forest, the goal of spatial and/or temporal separation between domestic sheep/goats and bighorn sheep is the most prudent action we can use to manage risk of disease transmission."

It is incumbent upon CPW staff to ensure that USFS managers receive accurate and timely information about bighorn sheep herd growth and range expansion. This will enable forest managers to make appropriate management decisions that reduce the likelihood of future conflicts and disease transmission to bighorn sheep. It is also important that CPW continues to work with the USFS to eliminate existing risks such as the multiple active domestic sheep allotments in the DAU. The RMBS appreciates the aggressive recommendations for reducing conflicts outlined in the draft management plan.

Thank you for giving RMBS the opportunity to comment on this draft management plan. Please do not hesitate to contact me if you have any questions or concerns about our comments. Also, please apprise us of future opportunities to comment on this plan or other bighorn sheep management issues.

Sincerely,



Terry E. Meyers
Vice President
Rocky Mountain Bighorn Society
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(970) 219-6879

San Juan National Forest

10/28/11

Comment on the draft CPW bighorn sheep management plans for RBS 20 and 21.

The draft plans were reviewed by our specialists for Range and Wildlife management. The comments are captured below and reflect comment for the San Juan National Forest. We have also reviewed and support comment submitted by the GUMG National Forest for RPS 21 in their letter of October 12, 2011 to Brad Banulis and Brandon Diamond. General comment for each individual plan is applicable to both plans. We found the draft plans well thought out and written. We thank you again for allowing us to review the drafts and offer comment which reflect the perspective of another Agency involved in the management of these herds.

Comment on RBS 20:

Columbine Ranger District

Domestic Sheep Grazing:

- Reference the latest livestock analysis decision for each GMU?
- List/briefly discuss active/vacant allotments within each GMU (lists provided by FS)?
 - Is there overlap or close proximity between active/vacant allotments and BHS overall range, summer range, summer concentration areas, etc (allotments provided by FS)?
 - Wouldn't this information really set the stage for describing the level of concern (or risk) for the potential of physical contact in the DAU? How can there be meaningful discussions about the potential for physical contact without this information?
- Are there specific areas within the DAU where there is concern about the potential for physical contact (i.e. should the draft plan highlight areas of potential concern to CP&W, then later in an inventory or monitoring section encourage all parties to consider conducting monitoring activities in those areas)?
- Are livestock grazing design criteria in place to reduce the potential for physical contact?
 - If so, what are they?
- Is there a calling tree/response plan in place in case of reports of close physical proximity or actual physical contact between bighorn and domestic sheep?
 - If so, brief description of plans?
- It would seem that if post-hunt December helicopter flights are the only monitoring tool used in this DAU, it will be very difficult to assess/monitor the potential for physical contact between domestic sheep and bighorns. As a Tier 1 primary population with disease outbreak considered "the primary concern for the Weminche herd" (page iii), some discussion about the need to develop a strategic monitoring plan geared specifically to monitoring areas and/or potential for physical contact appears both prudent and necessary. Clearly some discussion about how to address this risk factor is needed in the plan.
- In addition to discussions about management of domestic sheep, there should be at least some discussion about the issue of wandering rams.

- Have recommendations been developed for how this important aspect of bighorn ecology might be monitored in the DAU.
- Are there specific areas within the DAU where there is concern about the potential for wandering rams to contact domestic sheep, and if so, are response plans in place for protecting nearby bighorn herds from possible exposure to infected rams?

Recreation Impacts:

- The plan lists “disturbance caused by summer and winter recreationalists” as a threat second only to disease outbreak (page iii), yet the plan provides only broad generalizations about the potential impacts of recreation on animals in the DAU (pages 16-17).
 - Are there specific areas within the DAU where there is concern about the potential for recreation impacts to bighorns, such as on winter range?
 - Should the draft plan highlight specific areas or specific recreational activities that are of potential concern to CP&W, then later in an inventory or monitoring section encourage all parties to consider conducting monitoring activities targeting those areas or activities?
- Are there specific suggestions about methods to manage the potential for pack goats to come into contact with bighorns? Are there any areas in the DAU where CP&W is concerned about the potential for contact with pack goats?
- The plan states a need to provide information to the FS to better inform decision makers during policy and management decisions (page 17). Perhaps the plan could propose some form of more regular communication or meeting processes to provide more clearly defined information exchange and communication processes?

Herd Management:

- The Plan states simply that herds in this DAU cannot be modeled; therefore guidelines in the State’s management plan should be followed. Could there be a brief discussion about what this means? What methods will be used to monitor status and trends of this Tier 1 top primary population? On the basis of what type of information will herd management goals be evaluated and/or altered?
- The plan recommends conducting an intensive helicopter based survey of the DAU be conducted at least every 2 years, post hunt during the month of December. Will any other monitoring methods be recommended to monitor herd distribution, density, animal movements and/or occurrence in relation to mapped distribution (i.e. overall range, summer range, summer concentration areas, etc)?
- It seems that there are 2 primary mechanisms available for active herd management:
 1. Adjusting harvest levels (by CP&W).
 2. Managing risk factors (by FS and CP&W).
 - Improving amount/quality/access to important bighorn habitat areas (i.e., winter range habitat improvement projects). Could there be a discussion about opportunities for habitat improvement projects, including identifying areas for potential cooperative projects?
 - Reducing/eliminating potential for physical contact with domestic sheep. Could there be a discussion about opportunities to accomplish this? FS livestock

management practices, and grazing decisions to reduce potential for contact could be discussed here.

- Managing mortality factors (i.e., lion predation on winter range or lambing areas). Could there be a discussion about opportunities for reducing mortality factors such as lamb predation?

Habitat Management:

- Suggest some discussion in this section about the extent, quantity and quality of winter range in the DAU. The plan implies that winter range is the most limiting habitat feature, and is the basis for density calculations. If so, it would seem that some discussion is warranted about how to maintain and/or improve the quantity and quality of winter range.
- The plan recommends “identify critical habitats and protect it from degradation or loss” (page 18). Suggest providing a few more details on what this might mean, especially in terms of cooperative project opportunities with land management agencies. Providing some additional detail here might be helpful to land management agencies looking for habitat improvement project opportunities.
 - Is this recommendation primarily geared toward winter range habitats, or are summer concentration areas and production areas also included?
 - How does this recommendation compare to statements in several places in the plan that “most of the habitat within the DAU appears to be in good or excellent condition” (page ii)?
- In the predation section (page 19) the plan states that predation “is usually considered much less of a limiting factor for bighorn sheep populations than disease and habitat”. This statement again implies the CP&W has concerns about habitat quantity or quality, and suggests the plan should provide a bit more detail, if possible, about some concerns specific to the DAU. Additional detail here would be very helpful to land management agencies looking for habitat improvement project opportunities.
- The noxious weed discussion is important to include in this plan, and is a concern to land management agencies as well. The FS could provide a number of examples of how things discussed in the plan are ongoing. For example, the past several summers a contractor has been spraying weeds along the Pine River Trail as it passes through S-28 and into S-16.

Future Monitoring & Research Suggestions:

- Suggest adding additional discussion about monitoring/inventory efforts, with suggested areas to survey and periodicity of surveys. The plan recommends conducting a December helicopter survey at least every 2 years, but more discussion about this key aspect of managing this Tier 1 population would seem appropriate.
- As a Tier 1 primary population, the Plan recommends giving this DAU “priority for inventory, habitat protection and improvement, disease prevention, and research”, but provides little detail about what is desired in any of these categories. Clearly, periodic inventory/monitoring efforts are necessary to validate effectiveness of herd management actions and to assess sustainability of herd objectives.

- If so, suggest a more detailed discussion of monitoring methods and periodicity to allow inter-agency planning processes for cooperative projects on this Tier 1 population.
- The report states a concern by CP&W about poor population performance in S-28 (page 9). The plan states “This will need to be monitored” but provides little detail or recommendations on what is being considered or is feasible for this DAU. Certainly there is a need to develop a long term monitoring strategy that can effectively monitor population performance in S-28. For this reason, we suggest a more detailed discussion of monitoring plans/opportunities and potential inter-agency cooperative projects to address issues/concerns.
- The plan appears to rely heavily on density estimates (annual population estimate divided by amount of mapped winter range) as the basis for evaluating herd status and trends. This implies a need to validate modeled winter habitat areas, validate mapped winter ranges, and develop strategies for winter range monitoring. Will the plan discuss or recommend monitoring numbers of animals and distribution of animals on occupied winter range, or mapping the extent, condition, and capability of winter range?
- Will the Plan recommend surveys targeting areas of known bighorn occurrence to document occupied area/density, as well as areas found previously to be vacant to document bighorn herd expansion?
- Will the Plan recommend surveys targeting areas of the DAU where there is concern for the potential for physical contact to document if contact is occurring?
 - Are there any such areas in the DAU?
- Lion predation and affects on lamb/ewe survival in S-28. Is this a concern for CP&W, and if so, are there options/opportunities to address this concern?

Specific Editorial Suggestions:

- La Plata County should be added to the list of counties within the DAU (page 2).

Pagosa Ranger District

We understand this is a population management plan for managing Rocky Mountain bighorn sheep across Game Management Units (GMUs) S15, S16, and S28, encompassing Data Analysis Unit RBS-20. Our comments focus on the influences public land management practices may have on Colorado Parks and Wildlife (CPW) population management objectives described in the Draft Bighorn Sheep Management Plan.

Comment: Page iii, Significant Issues

“Several other issues occur but are relatively insignificant to the disease aspect. These include disturbance caused by summer and winter recreationists, human development and fragmentation of

habitat, a means to gather better population data, habitat management, interaction and resource competition with mountain goats, and natural predation.”

Please describe specific areas across the GMUs on San Juan National Forest (SJNF) administered lands where summer and winter recreation activities are causing disturbance to bighorn sheep. Please also describe the type of disturbance (i.e., disturbance during key periods or key habitats such as winter range, lambing areas, etc.) and degree of disturbance. Are there disturbances occurring that have appreciably influenced bighorn populations or have potential to influence population management objectives for bighorns across the DAU? If so, we would like to review these activities to determine best management practices for addressing these concerns.

Similarly, are there locations on SJNF administered lands where habitat management and habitat fragmentation are a concern? Again, we would like to review these activities to determine best management practices for addressing these concerns.

Forest Service wildlife biologists and other resource specialists have assisted CPW in conducting coordinated grounds counts to inventory and monitor bighorn sheep across the DAU. The data collected assisted with the completion of the Pagosa Sheep Grazing Environmental Analysis, and overall management of bighorn sheep, currently designated as a Forest Service sensitive species in Region 2. We would like to continue these coordinated inventory and monitoring efforts in the future so long as budgetary constraints allow.

Comment 2: Page 6, Habitat Capability

“Known lambing areas are on the southwest side of Sheep Mountain, the south faces of Hossick Ridge and Cimmarona Peak above Williams Creek Reservoir, and the ridges straddling the Los Pinos River downstream from Lake Creek.”

In 2008 and 2009 Forest Service wildlife biologists and other resource specialists on the Pagosa Ranger District conducted field reconnaissance for the Pagosa Sheep Grazing Environmental Analysis. The purpose of the reconnaissance was to evaluate rangeland health and condition, survey for bighorn sheep in vacant domestic sheep and goat allotments, and identify potential barriers that may provide separation should the allotments be stock with domestic sheep. Field reconnaissance in 2008 and 2009 revealed additional lambing activity in the DAU beyond those mention above. In 2009, lambing activity was detected on the ridge south of Puerto Blanco in S15. Lambing activity was also observed in 2008 on the southeast side of Sheep Mountain. Given the presence of lambing activity in these areas, it was determined risk of contact between domestic sheep (if grazed in the areas) and bighorn sheep would be high, and therefore the allotments were recommended for closure.

Comment 3: Inventory

This section describes inventory and monitoring efforts with emphasis on past inventories. We suggest referencing more recent inventory efforts conducted in 2009 in S16 and 2008 in S15. The data collected showed bighorns are more widely distributed across suitable habitat when compared to prior survey years. The CPW and USFS conducted coordinated ground counts in these GMUs to assess the current status and distribution of bighorns. The data collected provided valuable information for the Pagosa Sheep Grazing Environmental Analysis, and showed bighorn populations increasing and expanding their distribution.

Comment 4: Risks Involving Domestic Sheep

“Domestic sheep allotments on the US Forest Service lands in the Pagosa Ranger District became vacant from domestic sheep grazing as early as 1962. This trend continued through the 1970’s and into the 80’s (USDA Forest Service 2010). In 1990 a conflict between domestic and wild sheep was recognized. This resulted in the USFS converting the domestic sheep allotments to cattle and horse grazing, and has since eliminated domestic sheep livestock grazing in the majority of the allotments west of the Continental Divide.”

The statement “This resulted in the USFS converting the domestic sheep allotments to cattle and horse grazing, and has since eliminated domestic sheep livestock grazing in the majority of the allotments west of the Continental Divide” is incorrect. All domestic sheep and goat grazing allotments administered by the Pagosa Ranger District in GMUs S15, S16, and S28 were closed to all livestock grazing (including cattle and horse) through the Pagosa Sheep Grazing Environmental Analysis. The closure of these allotments has effectively removed the risk involving domestic sheep and goat grazing on the Pagosa Ranger District. Risks to bighorn sheep and overall effect to population management objectives from domestic sheep grazing will be dependent on future grazing analysis and decisions on the Columbine Ranger District (SJNF) and Divide Ranger District (Rio Grande National Forest).

Comment on RBS 20 and 21:

San Juan Public Lands Center Range Program

1. What is the relationship of these plans to the recently approved State-wide BH sheep plan?
2. Each plan needs to acknowledge the increasing expansions of noxious weed species into suitable habitat and further recommend federal, state and private partnerships to manage these populations including the use of local and state HPP and ORV funds.
3. Each plan should reference the existing MOU between the State, federal agencies and CO Woolgrowers, and it's guidelines followed as each plan is implemented.
4. Ongoing FS and BLM domestic sheep adaptive management should be identified and/or referenced i.e. 2009 Silverton Sheep management EA or the Pagosa High Sheep Management EA

2011, and furthermore there should be an acknowledgement that other adaptive management options may be developed and implemented through monitoring.

5. I agree with the GMUG that winter range, on both private and public lands, may be a crucial issue. What can be done to evaluate risk through different ongoing management activities?
6. The San Juan has closed vacant sheep allotments based on risk and no domestic sheep grazing demand. I do not believe that we should close vacant allotments to minimize perceived risk, but that we should do bonified risk assessments and use vacant allotments to both reduce risks to native populations as well as to increase management flexibility for domestic bands.

File Code: 2670
Date: October 12, 2011

Brad Banulis and Brandon Diamond
Terrestrial Biologists
Colorado Parks and Wildlife
2300 S. Townsend Ave.
Montrose, CO 81401

Dear Brad and Brandon:

Thank you for your willingness to sit down with us on September 28, 2011, to discuss contents of the Bighorn Sheep Management Plan for Data Analysis Unit (DAU) RBS-21. Discussions on that day were very helpful and provided some clarity concerning content and intent of the Plan. This letter is intended to provide written documentation of discussion points brought up by Forest personnel on that date.

1. The Forest will be using the state-wide source habitat maps currently being completed in a joint effort between Colorado Parks and Wildlife (CPW) and our Regional Office to complete a Forest-wide bighorn sheep-domestic sheep risk assessment this winter. Results of this effort should be used to update/modify the DAU plan through an adaptive management process. If the DAU Plan is finalized and approved by the Wildlife Commission prior to completion of the risk assessment, a mechanism to update its contents should be identified.
2. Implementation of the DAU Plan and any modifications of the plan based upon update information (see #1) must be closely coordinated with Forest personnel and livestock grazing permittees.
3. Goal on page 27 should state: "Minimize the risk of introduction of infectious or parasitic disease from domestic livestock that could adversely impact bighorn population performance and viability"
4. The DAU Plan fails to reference the MOU between Wool Growers and several States, including CPW, and federal agencies. The MOU should be incorporated by reference and its guidelines followed as the Plan is implemented.
5. The Plan is generally silent on the importance of winter range on private land and the role of these lands to accomplish herd objectives. A high percent of winter range occurs on private land – what is the quality of the habitat on these lands and what are the risks of domestic-wild sheep interaction?
6. A Winter Range capacity analysis should be conducted to determine 1) the extent of winter range, 2) the quality of the range and 3) possible limiting factors. The Forest is willing to assist in these efforts.

7. Non-native plants are increasingly impacting the quality of bighorn sheep habitat, especially winter range. While the plan briefly mentions invasive plants, perhaps a greater emphasis should be placed on their potential impact and the need to control their spread through multi-party (federal and state agencies and private landowners) efforts.
8. The Plan encourages the Forest Service and BLM to close vacant domestic sheep allotments or convert them to cattle allotments. To close an allotment requires NEPA and may eliminate its use as a management tool to move existing bands of domestic sheep from high risk areas to low or not risk areas. This objective should be re-worded to allow maximum flexibility of vacant allotments for management of domestic sheep. Keeping this management tool as an option may help achieve effective spatial and/or temporal separation and thus fulfill management goals for bighorn sheep and domestic sheep producers.
9. The Plan acknowledges increasing number and distribution of bighorn sheep in the unit and CPW inability to effectively control this expansion. While the Forest supports a robust Bighorn sheep herd, we do have concerns about un-regulated expansion of the herd and its potential affects to winter range and increasing domestic-wild sheep conflicts. We encourage CPW to identify a “core” area in which BHS would be allowed to expand to assist the Forest in addressing current and future risk of bighorn-domestic sheep interaction. This is especially important if alternative 2 (increasing population and increasing distribution within the DAU) is selected by the Wildlife Commission as the preferred alternative.
10. Existing risk assessments associated with domestic sheep grazing permit re-issuances should be incorporated into the Plan. In some cases, objectives for bighorn sheep management outlined in these assessments do not match objectives in the DAU Plan.
11. The Plan needs to better acknowledge past and ongoing collaborative efforts between CPW, federal agencies and livestock grazing permittees to manage BHS in the DAU. In particular, our livestock grazing permittees are currently using the Western Association of Fish and Wildlife Agency (WAFWA) guidelines for domestic sheep and goat management in wild sheep habitat in their everyday operations. Livestock grazing permittees have also been an active participant in our telemetry study examining bighorn-domestic use of the affected allotments.
12. Of the three management alternative discussed in the Plan, the Forest recommends the Wildlife Commission selects alternative 1 – manage for a stable population and distribution within the DAU, at least for the short-term until better information on range capacity and potential conflicts with wild-domestic sheep can be assessed.

The Grand Mesa, Uncompahgre and Gunnison National Forests look forward to continued cooperation to finalize the DAU Plan and in its implementation. Long-term success of maintaining a viable RBS-21 herd will come through continuing cooperative efforts between CPW, federal land management agencies, the public and livestock grazing permittees.

Please direct any questions to Clay Speas, Wildlife, Fish and Rare Plants Program Manager, at 970-874-6650 or email at cspeas@fs.fed.us.

Sincerely,

/s/ Charles S. Richmond
CHARLES S. RICHMOND

Forest Supervisor

cc: Marlin H Jenson

Curtis V Keetch

Tamera K Randall-Parker

Kelley Liston

Matthew G Vasquez

John R Murphy

Carmine Lockwood

Judy Schutza

Western Slope Woolgrowers

October 31, 2011

Colorado Parks & Wildlife
Gunnison Service Center
300 W. New York
Gunnison, CO 81230
Brandon.diamond@state.co.us
Brad.banulis@state.co.us

Subject: Comments on the Draft 2011 Bighorn Sheep Management Plan Data Analysis Units RBS-21
Game Management Units S-21 and S-33

Gentlemen,

Attached please find a redlined version of the changes we would like to see to your Draft DAU.

The changes we are requesting are to get the DAU in step with the 2009 MOU in both suggested guidelines and tone supporting cooperation between the governmental agencies and the local rancher and BLM and USFS Permittees.

In addition to all the redlined changes we would also like to emphasize the following concerns.

The DAU population is overstated. Using your own numbers the pre and post (Table 3) hunt numbers for S-21 is 210 and the pre and post (Table 4) hunt numbers for s-33 is 102. It imperative that these numbers which are estimated to begin with; are not over stated. We ranchers require our high country grazing permits thru the BLM and USFS to be able to have economical viability. If there is a decline in the bighorn population only because we get more accurate information the grazing permits are going to be unfairly scrutinized. As more accurate information becomes available it may look like there is a decline. Please use the most credible information that you have. Please reflect throughout the document a herd population for this DAU as estimated at 300.

We believe more real life data should be gathered about the actual use areas of winter range. It should be based upon use area, not random observations or simply suitable habitat. Suggesting any management alternative that would increase the bighorn herd size at this juncture would be a reckless way to proceed and not in the best interest of the bighorn herd. There should be no discussion around maximum herd capacities due to herd health which may result in die offs until we are certain about the quality and capacity of the winter range.

We would ask the Wildlife Commission to re- consider the importance of our grazing in the high country. There are significant we believe unintended consequences to growing the bighorn sheep herds especially adjoining vacant and active grazing permits and allotments. The BLM and USFS have worked closely with the Permittees to take into consideration the bighorn sheep and the possible interaction with the domestic sheep.

When gathering information we would ask that any sightings of bighorns include a specific location evidenced by either a GPS coordinate or a significant landmark and a signed sworn affidavit of the person making such assertion. Arbitrary unsubstantiated sightings do not do any of us any good!
Any sightings

Involving a close encounter between the bighorn sheep and domestic sheep should be handled in the same manner.

Therefore we respectfully ask the Commission to only consider the management alternative that will maintain the current population within this DAU. We believe the current population somewhere around 300 bighorn sheep is what has been documented currently in the DAU.

Thank you for your consideration.

Sincerely,

[Redacted signature]

Representing ourselves and constituent ranchers and Permittees on the Western Slope.

Hinsdale County
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Email: lkvierheller@centurytel.net
www.hinsdalecountycolorado.us



October 26, 2011

OCT 27 2011

Colorado Parks & Wildlife
Brandon Diamond
300 West New York Avenue
Gunnison CO 81230

Dear Sirs:

Per your request for comments regarding the Draft 2011 Bighorn Sheep Management Plan, Data Analysis Unit RBS-21, San Juans West, Game Management Units S-21 and S-33 (referred to as "Plan"), the comments representing the Hinsdale County Board of Commissioners follow. The supporting references can be reviewed on subsequent pages and correlate to the corresponding numbers. While the concerns stated here are far from an exhaustive analysis of this plan, most of the major issues are addressed.

1. Conflict between CPW alternative mission statements and this plan:
The two possible alternative mission statements for the Agency support recreation while there are "concerns" and negative statements regarding recreation in the Plan.
2. MOU between USFS, BLM, CDOA, CWGA and CDOW:
There is an MOU in effect between these parties until 03-30-2014. This MOU needs to be considered and honored in any decisions made.
3. Science:
This Plan includes incomplete data from which conclusions are being drawn, inflammatory language that creates a crisis that does not exist, and avoidance of the fact that the herd is healthy and increasing under current circumstances.
4. Hinsdale County is a Right to Farm and Ranch County, thereby giving preference to these activities.

Conclusion:

The deadline for the final Plan should be moved back six to nine months to allow time for CPW to complete its transition and finalize its mission statement, for a full one-year cycle of collar data to be retrieved and reviewed, and for more public input on a second draft. In other words, the Plan should be done properly in the first place rather than revised after the fact. A ten-year plan deserves a great deal of consideration before it is accepted and implemented. The Plan should be scrutinized to make sure there are no conflicts between it and the existing MOU. The science should be further scrutinized to make sure the conclusions truly reflect the data. Finally, page two of the Plan states "Currently, the population appears to be healthy and increasing, with

a 2011 prehunt population estimate of between 400-450 bighorns.” It appears that the current strategy is working well!

Sincerely,

Hinsdale Board of County Commissioners

A handwritten signature in black ink, appearing to read 'Stan Whinnery', is written over the typed name below.

Stan Whinnery, Chair

Enclosure: Supporting References

CC: Brad Banulis

Colorado Parks & Wildlife
2300 South Townsend Avenue
Montrose CO 81401

Rick Cables, Director
Colorado Parks & Wildlife
6060 Broadway
Denver CO 80216

J Wenum
Colorado Parks & Wildlife
300 West New York Avenue
Gunnison CO 81230

Supporting References:

1. Conflict between CPW alternative mission statements and this Plan:

Current Mission Statement:

"The mission of the Colorado Division of Wildlife is to perpetuate the wildlife resources of this state and provide people the opportunity to enjoy them."

Alternative 1:

"The mission of the Division of Parks and Wildlife is to perpetuate the wildlife resources of the state and to be leaders in providing outdoor recreation through the stewardship of Colorado's natural resources for the enjoyment, education and inspiration of present and future generations."

Alternative 2:

"The mission of the Division of Parks and Wildlife is to perpetuate the wildlife resources of the state and to be leaders in providing enjoyable outdoor recreation opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources."

a. Plan, p-2, Background, paragraph 3:

"Issues of concern for the San Juans West population include the risk of contact with domestic sheep, habitat fragmentation and degradation from human development, and recreation, mineral extraction, predation, and competition with mountain goats."

b. Plan, p-28, Recreation, entire section:

This entire section creates a crisis where there is none. In addition, the statement in paragraph one, "Most wildlife managers agree, with support from the scientific literature, that recreation has the potential to significantly fragment habitats" is not footnoted regarding the scientific literature. Again, the herd, with all the recreation and other activities is healthy and increasing.

c. Plan, p-28, Recreation, paragraph 1, line 5:

"...dog walking"--this discussion of winter human activities would be better served if a cycle of winter collar data could be collected from this herd prior to reaching conclusions, especially since winter range is a key limiting factor.

2. MOU

a. Plan, p-28, "Furthermore..."

"The CPW recommends that all VACANT domestic sheep allotments in RBS-21 are closed or converted to cattle grazing via standard USFS/BLM

NEPA processes. The potential for restocking VACANT allotments exists in RBS-21, several of which would have catastrophic results for wild sheep." This statement violates MOU V.a.

- b. A thorough review of the MOU and its inclusion in this Plan is necessary to insure no other conflicts exist between the two documents.

3. Science

- a. Several instances of lack of citations for statements
- b. So much research is still ongoing regarding interaction with domestic sheep, for example, the safe distance between herds is probably not 9 miles, but a much shorter distance, but the 9-mile research is cited rather than more recent data
- c. Plan, p-25, paragraph 3
"When considering the totality of circumstances across this DAU, it is logical to conclude that the overall risk of contact between wild and domestic sheep is high"---ONE occasion is cited---shouldn't it be observed often? Also, the most current risk assessment, which DOW participated in, mapped areas of low and moderate with NO high risk. Shouldn't this be included?
- d. Plan, p-25, Sensitive Species
"Those plant and animals species identified by a Regional Forester for which population viability is a concern, as evidenced by:
Significant current or predicted downward trends in population numbers or density."---This plan should point out that, while this regional FS designation exists, this particular herd is healthy and increasing at this time.
Also, in the subsequent paragraph, the idea of working with domestic livestock operators to find solutions to nose-to-nose contact is never addressed.
- e. Throughout the Plan, there is sparse data from which sweeping conclusions are drawn; also, it would be useful to include anecdotal data from those in the domestic sheep industry that work with these situations daily and for many years.
- f. Plan, p-3, Herd Density and Distribution
"Key limiting factors for this population include winter range carrying capacity and the potential for disease transmission following contact with domestic livestock." A cycle of winter collar data should be collected from this herd before forming conclusions.

4. Hinsdale County is a Right to Farm and Ranch County, meaning this county views these activities as a priority. The impact of this Plan on the domestic sheep industry will be harmful.



Colorado Wool Growers Association

*PO Box 292 ° Delta, CO 81416-0292 (970) 874-1433 ° (970) 874-4170 fax
cwgarwool@aol.com ° coloradosheep.org*

Colorado Parks & Wildlife
Gunnison Service Center
300 W New York
Gunnison, CO 81230
Brandon.diamond@state.co.us
Brad.banulis@state.co.us

October 31, 2011

RE: Comments Pertaining to the Bighorn Sheep Management Plan Weminuche Herd & San Juans West

The Colorado Wool Growers Association is opposed to any bighorn sheep herd expansion within Colorado. Our organization's unfortunate position of not supporting expansion stems from three key issues: 1) anti-grazing groups are using the bighorn/domestic sheep conflict as a means to leverage sheep ranchers off of their grazing allotments; 2) the U.S. Forest Service's litigation driven, current policy using the presence or proximity of bighorn sheep to domestic sheep grazing allotments to eliminate domestic sheep grazing; and 3) Colorado Parks and Wildlife's apparent abandonment of the principles adopted in the MOU signed with the Colorado Wool Growers Association in 2009.

While it is true that disease transmission can occur between domestic and bighorn sheep in forced enclosure situations, the degree of risk of potential disease transmission in open range situations is unknown. Furthermore, bighorns and domestic sheep would *never!* be penned together on the open range, so making the assumption that if disease transmission occurs in forced enclosure settings, then disease transmission must occur on the open range is at best, really bad science. *Contact between the two species does not automatically equate to disease transmission.* While the media and some bighorn advocacy groups sensationalize isolated cases where bighorn die-offs have occurred that may have been in contact with domestic sheep, these groups seem to ignore the many die-offs of bighorn sheep that have occurred without the presence of or contact with domestic sheep. The fact of this matter is that the BLM, U.S. Forest Service, and wildlife biologists do not know the degree of risk for potential disease transmission, nor does the domestic sheep industry know.

The 2009 MOU between the Division of Wildlife and the CWGA took ~18 months to develop. It is disappointing to read the BHS management plans for the Weminuche and San Juan West herds, and realize that the authors have totally ignored the intent of the MOU and have reverted back to the unsubstantiated position that any contact with domestic sheep is instant death for bighorns. The MOU

acknowledges that “Not all disease outbreaks and reduced recruitment in bighorn sheep can be attributed to contact with domestic sheep;” and the “DOW and CWGA agree that closure of active domestic sheep allotments on public lands will not be recommended based solely on the potential for interaction between domestic and bighorn sheep.” Furthermore, the MOU was a commitment from the DOW that the agency supports an economically viable domestic sheep industry in Colorado. Nothing in the Weminuche and San Juan West plans indicate that the CPW has any concern about the recommendations’ negative impact on domestic sheep permittees.

We have many concerns about the Weminuche and San Juan West plans, including the CPW’s mischaracterization of the viability of vacant allotments to the sheep industry; and the CPW’s risk analysis; and CPW’s suggestion that “Rocky Mountain bighorn sheep receive special consideration during land use planning, as well as receive comprehensive inclusion in future Resource Management Plan amendments and revisions, and grazing permits renewals.” The authors have made their own assumptions about the value of certain vacant sheep allotments, while apparently failing to consult with regional permittees about the value to the industry. Approximately two years ago, sheep permittees met with the Forest Service and the Division of Wildlife during the NEPA process to address concerns regarding bighorn and domestic sheep. During that process, the risk assessment for potential contact was rated at low or low-moderate. However, if you read the proposed BHS plans for the Weminuche and San Juan West herds, every conceivable situation seems to be high-risk.

The most disturbing recommendation by the authors is their request that Rocky Mountain bighorn sheep receive special consideration during land use planning, as well as receive comprehensive inclusion in future Resource Management Plan amendments and revisions, and grazing permits renewals.” Our Association recognizes this recommendation as an effort on behalf of CPW to deliberately eliminate domestic sheep grazing on USFS and BLM permits. One needs to look no further than the Forest Service’s current efforts to eliminate and reduce domestic sheep grazing because of bighorn sheep, to realize that recommendation further jeopardizes the viability of the domestic sheep industry.

The Colorado Wool Growers Association is not opposed to bighorn sheep. Like other residents of Colorado we highly value these majestic animals. Unfortunately, the bighorn sheep are being used as a mechanism to leverage sheep producers off of their federal grazing allotments. Until such a time that better science, and balance and objectivity can be incorporated into the management of bighorn herds in Colorado, the CWGA regretfully objects to any additional herd expansion that jeopardizes the viability of our industry.

Respectfully,

Mike Harper
CWGA President

CC: Ron Velarde
Dan Prenslow
Tom Spezze



UNITED STATES DEPARTMENT OF THE INTERIOR

Bureau of Land Management

Gunnison Field Office
650 S 11th St.
Gunnison, CO 81230
970-642-4940



October 27th, 2011

Brandon Diamond and Brad Banulis
Terrestrial Biologists
Colorado Parks and Wildlife
300 West New York Ave.
Gunnison, CO 81230

Brandon and Brad:

Bureau of Land Management-Gunnison Field Office would like to thank Colorado Parks and Wildlife for the amount of work you have done to include both Federal agencies and the public for your bighorn sheep DAU planning process. Our resource team has reviewed the document and finds it to be a complete, well written plan that includes a clear process for how CPW will manage populations of bighorn. We have attended several of the public meetings and are satisfied with the outreach to ensure you have heard from various stakeholders for this plan.

Bureau of Land Management Gunnison Field Office has several comments on the plan to ensure that BLM's interests are represented accurately:

1. The management plan lists several management strategies listed for decreasing interaction between bighorn sheep and domestic sheep. This document is tiered to the statewide bighorn plan that documents the inception of these strategies. The statewide plan is easily accessible on the CPW website, but clearer reference to the Bighorn MOU (BLM-MOU-CO-482) and BLM Instructional Memorandum (98-140) should be made to guide people where the management guidance originates from. The federal land management practices mentioned in the plan can be found in these two documents. Currently, when a member of the public reads the document, they may perceive that these are new actions that will be forced on federal agencies and permittees rather than practices already in place.
2. RBS-21 has been identified as a Tier 1 herd. With this designation, according to the statewide plan, these units will receive priority for planning, inventory, habitat projects, protection, disease prevention, and research efforts. BLM would like to see specifics in this DAU plan on how these actions will be prioritized and accomplished. Additional information will help land management agencies to make more informed decisions on land uses and planning efforts. The S-21 GPS collar study is a good example of data needed across the DAU and an example of a project that CPW should initiate for studying a Tier 1 herd.
3. The Gunnison Field Office recognizes that recreation has an impact on wildlife

populations as stated in the plan. Both direct disturbance and fragmentation from recreation push game into smaller areas where they can have increased impacts on the habitat. We ask that CPW continue to work with us to identify potential conflict areas and to address the effects from recreation. This includes helping to determine how to best prioritize and implement our new travel management plan in areas where bighorn may be impacted by recreation.

4. BLM Gunnison Field Office does not have a preferred alternative for the DAU plan. Our management goals are to maintain or improve habitat for wildlife while managing for multiple use. BLM recommends CPW manage this Tier 1 herd to be healthy while focusing on research that will help determine if this herd should continue to increase while weighing the risks to the herd of an increased population.

Thank you for the opportunity to comment on this plan and we look forward to the continued cooperation of our agencies on bighorn management.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. St. George', with a long horizontal flourish extending to the right.

Brian St. George
Field Manager
Gunnison Field Office



SOUTHERN UTE INDIAN TRIBE

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

October 28, 2011

Dear Mr. Weinmeister,

On behalf of the Southern Ute Division of Wildlife Resource Management I am writing to submit some brief comments on the *Draft Bighorn Sheep Management Plan: Data Analysis Unit RBS-20 Weminuche Herd*. Thank you for putting together the plan and sharing it with all interested stakeholders.

I hope I am not being too simplistic in breaking down the plan into the following relevant bullet points:

- Wild sheep population inventories are difficult; the CPW has surveyed as best it can and has shown a general increasing population trend for sheep in the DAU over the past 20 years, understandably there is not a high degree of confidence associated with estimates.
- Modeled habitat capability suggests there is room for the herd to grow, although again due to the ruggedness of the country, this idea is difficult to ground truth.
- Contact with domestic sheep is the largest threat to the wild sheep in the DAU
- Domestic sheep allotments:
 - have been eliminated on the Pagosa Ranger District (SJNF)
 - are a threat on the Columbine Ranger District (SJNF) where at least seven domestic sheep allotments are vacant, but nothing precludes them from being occupied at any time in the future
 - in portions of the Divide Ranger District (RGNF) pose a grave risk to wild sheep populations near occupied allotments

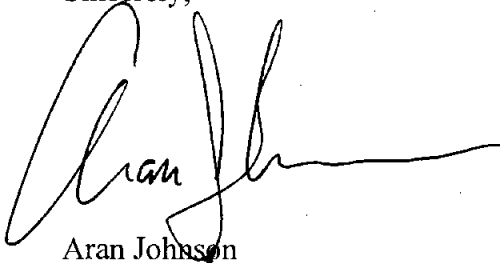
Domestic sheep and associated allotments clearly stand in the way of managing wild sheep populations to their potential in RBS-20. The Tribe believes that CPW's wild sheep management is severely compromised by domestic sheep grower interests on the National Forest, and would prefer to see a much stronger federal priority placed on wild sheep conservation. The fact that domestic sheep allotments can remain vacant but open for decades simply limits the ability of the CPW to effectively manage wild sheep populations in these areas.

Understanding that State budgets and staff time are limited, the Tribe nevertheless makes the following "perfect world" recommendations regarding the RBS-20 plan:

- 1) A more precise estimate of wild sheep numbers in the DAU is needed to make informed recommendations about population size. Any extra resources that the CPW could put toward this goal would be helpful.
- 2) The CPW should continue to work with the San Juan and Rio Grand National Forest and local sheep growers to eliminate domestic sheep allotments that have been vacant for decades.
- 3) Given the elimination of vacant allotments, wild sheep should be managed for population growth and eventually for more hunting opportunity.

I commend you for your past, present and future efforts. Please contact me directly with any questions or comments you have.

Sincerely,

A handwritten signature in black ink, appearing to read 'Aran Johnson', with a long horizontal flourish extending to the right.

Aran Johnson
Wildlife Biologist
Southern Ute Indian Tribe

APPENDIX H.

EMAIL

██████████ yesterday afternoon, I downloaded and read the 2nd draft DAU plan for RBS-21, from Brad B. and Brandon D./CPW. I'd like to commend Brad and Brandon, and CPW, for a quality document. I've read lots of these through the years, and I think this one was very well written (but I thought the 1st draft was pretty darned good, too!). Several comments/points occur to me, that I'd offer for your collective consideration, prior to the January 21, 2012 deadline for comments. Please feel free to contact me if some/any of this isn't clear. I/we appreciate the opportunity to review and comment on this BHS DAU mgt. plan.. ██████████

- * clearly, this DAU is a high-priority, Tier 1 BHS herd for Colorado, and, as noted, there is high demand for available ram licenses in these hunt areas;
- * lacking a specific, quantitative habitat assessment, it appears there is habitat available to facilitate a continued increase in BHS #s and possible expansion of BHS distribution, with clear recognition of the risk of contact w/ domestic sheep (DS);
- * with N=14 active and N=11 vacant DS allotments (as listed in Appendix A; it would really help a reader not that familiar w/ this DAU if those DS allotments could be portrayed on a map, depicting occupied (and potential) BHS distribution, to assess juxtaposition of DS and BHS distribution;
- * CPW is in the best position to gauge collaborative efforts on the part of DS permittees, and as stated, it is imperative that collaboration continues; to me, these situations are truly land allocation processes; we're all supportive of multiple use on public lands, but it must be recognized that all multiple uses cannot occur on each and every acre of public land; working collaboratively with CWGA and the DS permittees/industry and USFS and BLM should/could possibly lead to rearrangement of DS grazing on that mix of 14 active and 11 vacant DS allotments, recognizing that in any compromise, both sides have to give up something they really don't want to give up;
- * if there are similar AUMs, seasons of use, and grazing opportunities for potentially displaced/relocated DS permittees, and w/ some financial incentives (provided by wild sheep NGOs like RMBS, WSF, etc.) offered in an attempt to neutralize the fiscal impact(s) to DS permittees who would have to relocate, there are win-win opportunities here, in my view...;
- * in my mind, it's critical (and incumbent) on CPW that active/expanded (some may call it aggressive) use of ewe licenses be implemented in those portions of the DAU where BHS expansion (or current distribution) is most likely to result in contact w/ domestic sheep; if, as stated, this population is growing, and BHS distribution is expanding, targeted removal of a small # (6-20) of ewes (via hunting) is far preferable to losing a majority of such an important BHS population, in the event of contact/disease transmission with DS (i.e., "ounce of prevention vs. pound of cure"). Active intervention by CPW to maintain existing spatial and temporal separation clearly demonstrates to CWGA and DS industry that CPW takes very seriously the threat of contact, and, I believe, reinforces CPW (and RMBS, and others) stance that the state wildlife agency is willing to lethally remove BHS, to maintain separation; in my mind, this is an extension of CPW's (and other western fish & game agencies) response protocol when wandering BHS (e.g., most likely younger rams) go "walkabout" and come into contact w/ DS;
- * to me, this sort of pro-active population/distribution management meshes w/ Harvest Mgt. alternative 2 (> 6 years of age for harvested ♂) and Hunter Success alternative 2 (65-80%), and with Herd Distribution and Density alternative 1 (stable pop., stable distribution); only if some "breathing room" between DS and BHS can be made available (by possible re-arrangement of existing DS allotments), should there be any tendency toward Herd Dist./Density alternative 2;
- * we all know the classic Ram Mountain (AB) BHS history, and the importance of managing for an appropriate # and density of BHS on limiting habitat (in this case, crucial winter range); CDoW (now

CPW) has one of the best agency track records of pro-active management of BHS #s/density, via issuance of ewe licenses; CPW is to be commended for that approach, in my mind;

* we also all know how this whole DS/BHS discussion/argument is escalating, west-wide; in my view, SW Colorado is rife for another "Payette-type" standoff; pro-active management and collaborative efforts are the best way I can see to avoid another train-wreck like has happened elsewhere.

Thanks for the opportunity to share some of my thoughts... [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Cody, WY [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

EMAIL

Brandon and Brad,

These are comments regarding the bighorn sheep plans for RBS-20 and 21. I have no problem with the plan, but I do have a problem with the conclusion that domestic sheep are the cause for mortality of bighorns under range conditions. There is no conclusive evidence that this is the case. We can speculate, but we can not conclude beyond a doubt. I ask that this be stated in both plans where this subject is addressed.

It was pointed out in the public hearing in Montrose that the bighorn herd in RBS-21 is very healthy and there are more domestic sheep close to this herd than any other bighorns in Colorado. Conversely it was pointed out that huge mortality rates were recorded where there were no domestic sheep.

I want to thank Colorado Parks and Wildlife for entering into the MOU with the Colorado Wool Growers Association and I am confident together both the bighorns and domestic sheep can thrive in Colorado.

Thank you for your consideration,

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Denver, Colorado [REDACTED]
[REDACTED]



Rocky Mountain Bighorn Society
P. O. Box 8320
Denver, Colorado 80201
720-201-3791

January 18, 2012

Brandon Diamond
Terrestrial Biologist - CPW
300 West New York Avenue
Gunnison, CO 81230

Brad Banulis
Terrestrial Biologist - CPW
2300 South Townsend Avenue
Montrose, CO 81401

Dear Mr. Diamond and Mr. Banulis:

The Rocky Mountain Bighorn Society (RMBS) welcomes the opportunity once again to comment on the draft management plan for Rocky Mountain bighorn sheep DAU RBS-21 prepared by Colorado Parks and Wildlife (CPW) biologists. Our organization represents approximately 850 members, with a mission to promote and enhance the well being of Colorado's state animal, the Rocky Mountain bighorn sheep.

The RMBS prefers **Alternative 3** under *Ram Age at Harvest* in the draft management plan. We prefer that hunters have the opportunity to harvest older age class rams given a reasonable hunting effort. However, we hope that CPW staff will place more emphasis on herd inventory data, if available, when considering future hunter opportunity.

The RMBS prefers **Alternative 2** under *Ram Hunter Success Rate* in the draft management plan. We acknowledge that a bighorn sheep license is often a highly anticipated, once-in-a-lifetime opportunity for hunters, and we believe that herds should be managed so that reasonably prepared and motivated hunters have a high chance of success.

The RMBS prefers **Alternative 2** under *Herd Distribution and Density* in the draft management plan. We prefer that bighorn sheep are allowed to expand into historically occupied range and other suitable habitat as long as adequate winter range is available. We recognize the potential for conflicts with domestic sheep producers and hope that CPW will work closely with federal land management agencies to reduce potential

bighorn sheep exposure to domestic sheep. We acknowledge that CPW is bound by a Memorandum of Understanding (MOU) to not recommend closure of any vacant domestic sheep grazing allotments. However, this MOU does not preclude CPW from identifying disease transmission risks and conveying those risks to the appropriate land management agencies. The RMBS supports closing vacant allotments in occupied and historical bighorn sheep habitat that have not been grazed in recent years.

Thank you for giving RMBS the opportunity to comment on this draft management plan. Please do not hesitate to contact me if you have any questions or concerns about our comments. Also, please apprise us of future opportunities to comment on this plan or other bighorn sheep management issues.

Sincerely,

A handwritten signature in black ink that reads "Terry E. Meyers". The signature is written in a cursive style with a large initial 'T' and 'M'.

Terry E. Meyers
Vice President
Rocky Mountain Bighorn Society
meyers.terry@gmail.com
(970) 640-6892

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January 18, 2012

Colorado Parks & Wildlife
Brandon Diamond
300 West New York Avenue
Gunnison CO 81230

Dear Sirs:

Per your request for comments regarding the 2nd Draft 2011 Bighorn Sheep Management Plan, Data Analysis Unit RBS-21, San Juans West, Game Management Units S-21 and S-33 (referred to as "Plan"), the comments representing the Hinsdale County Board of Commissioners follow. While the concerns stated here are far from an exhaustive analysis of this plan, some of the major issues are addressed:

1) Conflict between CPW Final Recommendation for the Legislative Declaration as well as the Agency Mission Statement, and this plan:

--From the Legislative Declaration:

"It is further declared to be the policy of this state that there shall be provided a comprehensive program designed to offer the greatest possible **variety of recreational opportunity** to the people of this state and its visitors..."

--From the Agency Mission:

"The mission of the Division of Parks and Wildlife is to perpetuate the wildlife resources of the state, to provide a quality state park system, and to provide enjoyable and sustainable outdoor **recreation opportunities** that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources.

--In the Plan:

p-10-"Wildlife managers are increasingly concerned with the impacts to wildlife from recreation."

p-10-"Recreation has the potential to restrict the overall range of bighorn sheep and fragment habitats, which ultimately could lead to population level effects"

p-29-"Burgeoning recreational use in this unit is of concern." and "Most wildlife managers agree, with support from the scientific literature that recreation has the potential to impact wildlife distribution and abundance."

--Conclusion:

These statements, among others, point to recreation as a problem and concern rather than a core issue to support. The only recreation supported in this plan is hunting. If the other recreational opportunities are diminished, the Agency Legislative Declaration and Mission Statement will not be supported, and, the economy of this area will suffer.

2) Insufficient collar data:

p-3 states "Winter range carrying capacity is a key limiting factor to consider with bighorn management, particularly in migratory herds living at high elevations. At present, winter range does not appear to be a limiting factor for this population; however future winter range inventory and assessment would likely benefit wild sheep conservation efforts throughout the DAU."

p-4-5 states "Bighorn sheep management differs from other ungulate management in Colorado. A traditional DAU plan includes management alternatives that revolve around a desired population and male:female ratio objective. This plan does not rely on those types of management objectives, **partially due to a lack of consistent, unit specific data.**"

p-5 states "Key limiting factors for this population include winter range carrying capacity..."

p-11 states "The intent of this project is to collect more detailed information on habitat use throughout the seasons"

p-13 states "Winter range is a potential limiting factor for bighorn sheep in this DAU, however current animal densities would suggest the herd is well below winter range carrying capacity."

Conclusion: Though there are other examples throughout this Plan of the need for good winter collar data, these are a general overview. These statements beg the question, why not WAIT to finalize this Plan until a full year of collar data is obtained? Indeed, it seems that the deadline for this Plan to be finalized should be moved back to allow plenty of time for collection and evaluation of data before a final draft Plan is submitted for public comment.

3) Subjectivity:

Throughout the Plan, use of language such as "likely", "probably", "is assumed", and "it is logical to assume" lead to subjective conclusions rather than objectivity. It also appears that an agenda is being supported, due to the bias against domestic sheep. An example on p-25: "CPW recognizes that not all disease outbreaks and reduced recruitment in bighorn sheep can be attributed to contact between wild and domestic sheep". While this statement allows for another viewpoint, shouldn't this be studied for objective review? It seems that it would be useful to study die-offs in herds with and without domestic sheep interaction to quantify the results, rather than a cursory statement that has no facts backing it up.

p-25 also states "Domestic sheep grazing has been a historical use in RBS-21 that continues today". It seems that there should be some discussion of the economic impact of the sheep industry in this region. ie the families that are supported, the jobs created, etc. Instead, the "dangers" of domestic sheep are once again enumerated. Remembering that the herd is healthy and increasing, this kind of language is subjective and strives to create a crisis where none exists. The concern with including this language in the Plan is that it becomes truth over time even though it was never based on objective science to begin with.

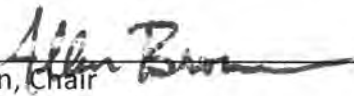
4) Hinsdale County is a Right to Farm and Ranch County, thereby giving preference to these activities. The impact of this Plan and the foundation it lays for future decisions could be harmful to the domestic sheep industry which is an activity viewed as a priority in this county.

Final Conclusions:

The deadline for the final Plan should be moved back six to nine months to allow time for CPW to complete its transition and finalize its mission statement, for a full one-year cycle of collar data to be retrieved and reviewed, and for more public input on a third draft. In other words, the Plan should be done properly in the first place rather than revised after the fact. A ten-year

plan deserves a great deal of consideration before it is accepted and implemented. The science should be further scrutinized to make sure the conclusions truly reflect the data. Finally, p-3 of the Plan states "Currently, the population appears to be healthy and increasing, with a 2011 posthunt population estimate of between 400-450 bighorn." It appears that the current strategy is working well.

Sincerely,
Hinsdale Board of County Commissioners

By: 
Allen Brown, Chair

CC: Brad Banulis
Colorado Parks & Wildlife
2300 South Townsend Avenue
Montrose CO 81401

Rick Cables, Director
Colorado Parks & Wildlife
6060 Broadway
Denver CO 80216

J Wenum
Colorado Parks & Wildlife
300 West New York Avenue
Gunnison CO 81230



United States
Department of
Agriculture

Forest
Service

Rio Grande National Forest

1803 West Highway 160
Monte Vista, CO 81144
(719) 852-5941
(719) 852-6271 TTY
<http://www.fs.fed.us/r2/riogrande>

File Code: 2670

Date: January 20, 2012

Brandon Diamond
Colorado Parks and Wildlife
300 West New York Avenue
Gunnison, CO 81230

Dear Brandon,

We appreciate the opportunity to review the final draft (December 2011 Version) of the Bighorn Sheep Management Plan for DAU RBS-21. In reviewing the final draft, is it evident that generally all of our initial comments, concerns, and/or suggestions have been addressed and/or incorporated. Overall, we consider the final draft for RBS-21 to be a high-quality document that displays and articulates the information well. We commend Colorado Parks and Wildlife for the substantive effort placed into the final version.

Specific Comments: In reviewing the final draft, we have no specific comments or suggestions to incorporate. All of the important information appears to be included and well written. We particularly appreciate the inclusion of the outcome of our Final Supplement to the Forest Plan Biological Evaluation and Conservation Assessment for Bighorn Sheep on the Rio Grande National Forest. We look forward to working with CPW to ensure that the intent of that assessment is implemented effectively on the ground.

Again, thank you for the opportunity to respond to this final draft.

Sincerely,

RANDAL W. GHORMLEY
Forest Wildlife Biologist



EMAIL

Gentlemen,

I have finished reviewing the second draft of the RBS-21 DAU. I did appreciate the tone of the second document, it felt more inclusive to trying to at least mention the needs of the domestic sheep producer.

However, after I finished reading the document I realized that I was limiting my input as to the only choices being to A. Manage for a stable population, B. Manage for an increasing population or C. Manage for a decreasing population of the big horn sheep herd in RBS-21. I believe this is the wrong approach. Big horn sheep that have migrated into or in close proximity to active USFS permits should be relocated to areas where inherent conflict between the domestic sheep and big horn is more limited and maybe even nonexistent! I believe by moving ahead with the Management plan as it currently is presented with only those 3 options mentioned above, we are setting into motion years of contention. The importance of the active USFS permits to the domestic sheep producer has been dramatically understated. We are trying to force a situation that is destined for failure. Are there areas that are more appropriate for the big horn sheep that would not adjoin active USFS permits? In the best interest of the Bighorn sheep and the domestic sheep producer I would plead with you to reconsider moving forward with this Bighorn Sheep Management Plan DAU RBS-21. Please take the time to gather information and research the possibility of a relocation plan.

The domestic livestock producers are becoming a vanishing breed and this plan will have an adverse affect on the livestock industry. I look forward to your response. I do appreciate your time and consideration.

Sincerely,

[Redacted signature]

[Redacted address]
[Redacted address]
[Redacted address]
Telluride, CO
[Redacted address]

[Redacted address]
[Redacted address] [Redacted address] [Redacted address]

January 22, 2012

Mr. Brad Banulis
Mr. Brandon Diamond
Colorado Parks and Wildlife Biologists
Montrose and Gunnison, Colorado

Dear Brad and Brandon

Your second draft Bighorn Sheep Plan for RBS-21 continues to be speculative with historical populations, supposed contact between sheep species, areas of sub-herd existence, and current population “estimates”. Conflicting data within this plan illustrates with the advancement of aircraft and improved habitat coverage techniques either aerial or ground survey only concludes a “estimated population”. We feel that attempting to blame domestic sheep for bighorn sheep die-offs under speculations and estimates are less than accurate. Keep in mind that your estimates and monitoring of RBS-21 sheep are showing population expansion, maybe even to historic estimates, while domestic sheep are currently grazing this DAU.

Page 14 of your plan explains that when a domestic sheep contacts a bighorn sheep, it may cause an all age die-off which results in a 20 year recovery period for the bighorn population to rebound. On this page it states that 1987 the population in S-21 was down to 40. By 1993 the population had doubled to 80. This directly conflicts your belief of the bighorn/domestic contact issue. This herd began rebounding in only 5-6 years as opposed to 20 years.

Transplants have occurred within domestic sheep grazing areas. When the CDOW conducted those transplants the concern for disease transmission was not an issue? CDOW made transplants fully aware that those areas were and are being used by domestic sheep. We applaud CPW decision to not do any more translocating where domestic sheep graze. The RBS-21 herd is being documented as having nine different translocation procedures. Does this not lower their status from a Tier 1 to at least a lower status? We feel this is at least worth recognizing. Nine procedures are more than “a few”.

Bighorn and domestic sheep do not actively search one another for mingling or to come into contact for interaction. Sheep are gregarious, true, but so are elk, deer, and antelope, within each to their own species. It is our experience that bighorn and domestics don't mix. In fact within domestic breeds, different breeds of sheep will segregate when say Suffolk sheep are mixed with white face breeds. Within passing close as they may encounter each other on the mountain is the most probable situation. But domestic sheep operations employ herders and guard dogs which will avoid the bighorn from interacting with domestic sheep. Your plan also states that stray sheep are likely to associate with bighorns. Our experience is that when sheep stray from the main band, coyotes usually take care of that animal. Also domestic producers will have better awareness of strays so as to minimize sheep that stray, as well as recovering strays in a timely manner as they are reported.

Page 27 also elaborates on a supposed stray sighting within 100 yards of some bighorn rams by goat hunters. It would be very important to also stipulate that this report was unconfirmed and the story is misleading because the hunter supposedly videotaped and photographed this supposed interaction. When domestic sheep producers contacted the hunter with the video and pictures the hunters response was “not to get our hopes up in identifying the sheep, the picture only shows what appears as an image of 2 domestic sheep and the video equipment was broken”. Producers wanted to see the picture but were later denied because the hunter was mad at CPW over the incident. Whether it was an actual sighting or not it was not confirmed by video documentation, and CPW claims this incident as gospel and making this part of their testimony for this plan when in fact the incident could be totally false.

Many WAFWA guidelines are unattainable for management and cause unnecessary hardship for domestic sheep ranchers, setting us up for failure. Most of those guidelines won't help at all in separation between the sheep. We will consider those guidelines in developing BMPs, that way we can have a chance to determine if some of these guidelines are achievable or not.

Page 27, top paragraph the CPW requests that Rocky Mt. bighorn sheep greater consideration in grazing permit renewal. This is in direct conflict with the MOU, which says that CPW will not actively ask for active allotment closure or permitted non renewals. Being involved in planning is acceptable but searching for any active aum elimination is contentious and unacceptable.

Page 29 Translocations have already occurred within active domestic sheep grazing allotments, causing problematic issues for domestic producers. We applaud the decision not to translocate on active allotments. Because state agencies are exempt from the NEPA process producers didn't have options or comments towards these translocations. This exemption should be addressed in the future.

The winter habitat modeling using the Ram Mountain bighorn sheep habitat for population winter habitat carrying capacity has been excluded from this draft. We feel that the Ram Mountain bighorn herd in Canada is example of how die-off of bighorns occurs in all bighorn sheep. In this particular herd, there are no domestic livestock grazing within this herd and when managed to full capacity this herd experienced all age die-offs and low recruitments. This herd is not rebounding since the die-off initiated some years ago. It isn't known the reason for the episode but respiratory disease has not been ruled out. Again no domestic sheep to associate this epizootic die-off in this area. Georgetown Colorado bighorn sheep herd is also experiencing an all age die-off with low lamb recruitments. Again, no domestic sheep to associate the die-off with.

This plan fails to fully identify how it will maintain bighorn sheep populations to the preferred management alternative of 500 or less. If populations are viewed as exceeding this threshold will CPW encourage more female or male tags to lower populations to appropriate winter capacities? Please define your plan of maintaining population levels.

Local domestic sheep producers are willing to work with CPW in keeping the two sheep species separate. But encouraging contentious actions such as using speculating scenarios for bases for management decisions and encouraging actions that conflict with the MOU make difficult the

possibilities to work together. We feel that at this point domestic sheep producers are very aware of the issues and are the best tool currently in discouraging interaction between the two sheep. By maintaining the integrity of the MOU, using best management practices, we feel will be the most beneficial to maintaining domestic sheep production and viable bighorn sheep populations.

We also ask the CPW expend resources to aid current research for vaccine for mitigating disease issues. Mike Miller had express promising research being conducted for bighorn sheep, but CWD issues seem to have placed the research aside. ASI has requested donations from domestic producers across the west to aid in this important research.

It also appears to us that the 10 bighorn sheep that were collared March of 2011 have isolates that are found in bighorn die-offs. Granted no virulent strains seemed to have been collected, but these different strains working together along with a stressing factor may develop respiratory disease within this herd.

Thank you for accepting these concerns. You may have a different view, but hopefully through collaborative efforts we can mitigate concerns for both sides to keep both sides viable. We hope that research in the near future may be able to unlock even better answers, hopefully given a true opportunity.

Sincerely,

████████████████████
██
████████████████████
Montrose, Colorado ██████████

SAN MIGUEL COUNTY

BOARD OF COMMISSIONERS

ELAINE FISCHER

ART GOODTIMES

JOAN MAY

February 1, 2012

Brad Banulis
Division of Wildlife
Colorado Parks and Wildlife
300 West New York Ave.
Gunnison, CO 81230

Re: Colorado Parks and Wildlife Proposed Bighorn Sheep Management Plan

Dear Mr. Banulis,

The San Miguel County Board of Commissioners appreciates the opportunity to comment on the proposed Bighorn Sheep Management Plan and your efforts in managing the regional bighorn sheep herd. We reviewed the proposed management plan and have the following comments.

As you may be aware, San Miguel County is substantially dependent on tourism which wildlife provides an important element.

The plan suggests the management unit, which includes the bighorn range in San Miguel County, has historically supported a much larger bighorn population than at this time. Also, habitat is not limiting at this time. Additionally, the plan states that the size of the population doesn't necessarily increase the potential for conflicts and contact with domestic sheep. As such, it would be our preference that the bighorn population be allowed to increase to provide more opportunity to observe the bighorn as a species that symbolizes our rugged mountains.

However, we defer to CPW wildlife biologists and support your preferred alternative to maintain the current bighorn population if you feel that an increase would result in untenable management challenges. We encourage you to continue your partnership with BLM and the USFS on management of the bighorns. We also encourage the retirement of vacant grazing allotments within the bighorn range to make more habitat available. We hope that many more people will have the opportunity to observe bighorn sheep in San Miguel County and throughout their range in the future.

Thank you for your consideration of our comments.

Sincerely,

SAN MIGUEL COUNTY, COLORADO
BOARD OF COUNTY COMMISSIONERS

Elaine R.C. Fischer, Chair