

Dry Cimarron Rocky Mountain Bighorn Sheep Management Strategy

**New Mexico Department of Game and Fish
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GOAL

To establish a viable, self sustaining herd of Rocky Mountain bighorn sheep in the Dry Cimarron.

Objectives

- 1) Management actions for this herd will strive to increase population numbers until the herd is large enough to be self-sustaining without requiring additional transplants.
- 2) Increase population size so that it eliminates need for predator control except during documented declines.
- 3) The population should support a limited hunt in the future.

Concurrence with other Planning Documents

This management goal and objectives are consistent with the *Strategic Plan - New Mexico Department of Game and Fish FY 2008 through 2012* Goals 1 and 2. They are also consistent with the goal, objective, and many of the strategies in the *Long-Range Plan for the Management of Rocky Mountain Bighorn Sheep in New Mexico 2005-2014*.

BACKGROUND

Bighorn Transplant to the Dry Cimarron

In August 2007, the New Mexico Department of Game and Fish (Department) transplanted 34 Rocky Mountain bighorn sheep from the Pecos Wilderness to the Dry Cimarron, south of Wedding Cake Butte, to start a new herd. Radiocollars were deployed on 26 adults and 2 lambs to monitor survival and dispersal. Bighorn were monitored by Department biologists and district wildlife officers from approximately monthly fixed-wing flights, and weekly ground surveys. Monitoring continued following a second transplant in August 2008 of 27 bighorn from the Wheeler Peak Wilderness to augment the Dry Cimarron herd. Radiocollars were deployed on 10 adults and 3 lambs.

During the year following the first release, 1 ewe (4% of the radiocollared adult population) was killed by a cougar, and 3 ewes and 1 lamb were killed from other or unknown causes (12% of the radiocollared adult population). During the 5 months following the second release, 8 ewes and 1 lamb died in an approximately 6 week period between mid-August and late September 2008 (25% of the radiocollared adult population). Causes of death could not be determined although they were likely due to a disease outbreak. Two additional bighorn was killed by cougars (8% of the radiocollared adult population) subsequent to the disease outbreak. Based on the number of bighorn released, the number of documented mortalities, field observations, lamb recruitment, and a ground census, the population is approximately 60 bighorn.

Economics

The 2007 bighorn transplant cost an estimated \$59,000, and used approximately 45 Department personnel for 1 week. The 2008 transplant cost an estimated \$55,000, and used approximately 25 Department personnel for 1 week. These estimates include salaries and benefits for Department staff. Approximately \$20,000 per year has been spent on employee and airplane expenses for ground and aerial monitoring of the herd.

Public involvement and cougar control

Prior to releasing bighorn in the Dry Cimarron, the Department met with local ranchers to discuss the possibility of cougar control. The ranchers indicated that cougar predation was generally not a problem for livestock, and the amount of cougar sign observed was low. It was agreed that using a snareman to remove cougars could be a possibility, but this strategy was ultimately not employed as it was deemed unnecessary. A local houndsman was contracted to hunt in the area, and harvested 2 cougars 4-5 months prior to the initial release. Three months after the initial release, he harvested a third cougar that was likely responsible for preying on a ewe several days earlier. No cougars have been harvested to protect bighorn in the Dry Cimarron since December 2007.

Cougars harvest is regulated within sustainable mortality limits as designated in the Cougar Population Assessment and Harvest Management Matrix which specifies the total harvest allowed to maintain stable cougar populations. These numbers were derived based on cougar ecology, and does not include other considerations. Cougars killed from other causes included road kill, private land harvest, and cougars killed to protect bighorn. The number of cougars taken to protect bighorn sheep will be within the guidelines established in the Matrix. In the event that harvest limits are met, then a harvest limit increase may be considered (as provided for in the Matrix) if cougar predation is negatively impacting the bighorn herd.

Table 1. Cougar Harvest Management Matrix for Cougar Zone P which includes the Dry Cimarron

Year	Total sustainable mortality	Sport harvest limit	# sport harvested	# killed from other human causes
2006-7	N/A	5	0	1
2007-8	8	4	0	8
2008-9	8	4	0	2

Potential limiting factors for the Dry Cimarron bighorn herd

Cougar predation - Desert bighorn and low-elevation Rocky Mountain bighorn sheep in New Mexico have been documented to sustain high cougar predation rates (NMDGF 2003). Cougar predation has been the principal mortality factor during the extinction of at least 3 desert herds, and has been the primary factor limiting population recovery (NMDGF 2003). Following implementation of a cougar removal program in designated desert bighorn habitat in 2001, desert bighorn numbers have increased from <170 to

>400, with a concurrent 75% decrease in cougar predation rates (Rominger and Goldstein 2008). In areas where cougar predation has been identified as a mortality factor, cougar removal may be an effective management tool in decreasing predation rates.

Other predators, particularly for lambs, include golden eagles and coyotes. It is illegal to remove golden eagles, and impractical to reduce coyote levels sufficiently to impact predation rates on bighorn lambs.

The presence of supplemental feeders causes bighorn to congregate in specific areas, potentially attracting predators such as cougars. Feed sites are located in exposed areas away from escape terrain, which may make them more vulnerable to predation (Kohlmann 2003).

Disease – Disease outbreaks are a source of concern for all bighorn populations. The most severe problems arise when bighorn sheep contact domestic sheep and goats, as they are carriers of several diseases that can be fatal to bighorn. Bacterial pneumonia poses the greatest threat as it often results in large-scale bighorn dieoffs. A minimum of 9 miles separation between bighorn and domestic sheep or goats is recommended to reduce the likelihood of disease transmission.

In general, disease transmission risk increases when ungulates congregate in small areas (Williams et al. 2002, Rolley 2005). Supplemental feed sites are a source of concern as they may increase severity of disease outbreaks. Supplemental feed sites have been correlated with increased prevalence of tuberculosis in white tailed deer in Michigan (Miller et al. 2003), brucellosis in elk in Wyoming (as reviewed by Smith 2001), and is recommended as a strategy to reduce chronic wasting disease transmission in the *Management Plan for Assisting States, Federal Agencies, and Tribes in Managing Chronic Wasting Disease (CWD) in Wild and Captive Cervids* (2002) developed by an interagency task force at the request of Congress. It is unknown the role that supplemental feed stations played in the 2008 bighorn sheep population decline in the Dry Cimarron.

Habitat – The Dry Cimarron is characterized by plains-mesa grassland, interspersed with juniper savanna (Dick-Peddie 1993). Bighorn sheep spend the majority of their time in the juniper savanna on the slopes and tops of the mesas where juniper densities are lower, due in part to wildfires in the early 2000s that cleared vegetation and increased visibility. Bighorn sheep need good visibility in order to detect predators in time to reach escape terrain to avoid predation.

Habitat size and quality are 2 important factors in determining bighorn population size, however it is difficult to estimate the maximum sustainable population size (carrying capacity) for the Dry Cimarron herd. Department biologists estimated approximately 28 km² of bighorn habitat surrounding the release site south of the highway, 85 km² of bighorn habitat surrounding the release site north of the highway, and an additional 22 km² of habitat north of the highway near Jesus Mesa where no release has occurred. However, it is unknown if bighorn will occupy all habitat, or if they will colonize areas

that were not included as bighorn habitat. Nor do we have a good understanding of the sustainable number of bighorn this particular habitat can support. We hypothesize that the herd will expand to colonize habitat in Colorado and Oklahoma and may form a metapopulation with both the Purgatorie and Carrizo herds. Ultimately, carrying capacity will be determined once bighorn have expanded into all available habitat, and reached the maximum sustainable number the habitat can support.

Habitat improvement projects could be implemented in bighorn range. The land is predominantly privately owned, therefore the Department does not have the authority to implement such projects. However, the Department would consider partnering with private land owners who are interested in improving habitat for bighorn sheep, and for other wildlife species.

MANAGEMENT STRATEGY

Rocky Mountain bighorn sheep in the Dry Cimarron will be managed based on the size of the ewe component of the bighorn herd. The number of ewes in the population will be assessed in an annual ground survey. Helicopter surveys may be added in some years.

Radiocollared bighorn will be monitored from approximately monthly fixed-wing flights, and weekly ground surveys. This level of monitoring will continue until the herd has reached a minimum of 50 ewes. The need for recollaring and desired level of monitoring will be evaluated annually, and actions will be taken when appropriate.

Cougars may be snared in bighorn habitat according to the standards listed below. The Department will be responsible for obtaining landowner permission before setting foot snares or pursuing cougars with hounds on their property. Snares will be checked a minimum of once every 48 hrs.

≤ 30 ewes in the Dry Cimarron bighorn sheep population

Blind-set snares may be placed in cougar travel corridors to capture and subsequently euthanize any cougar that enters core bighorn range. Current core bighorn range includes Elk, Ambush, and Echo Canyons. To reduce the risk of snaring bears, blind sets will only be placed from 15 Dec. – 1 April when bears are hibernating (Costello 2001). Snares may be placed at or near cougar-kill sites or fresh cougar sign year-round.

31-75 ewes in the Dry Cimarron bighorn sheep population

Snares may be set at or near the kill site of any bighorn preyed upon by a cougar. Snares may be set in cougar travel corridors within occupied bighorn range if the annual cougar predation rate on bighorn exceeds 0.05 in any consecutive 12 month period. These snares may remain in operation no longer than 3 months. In the absence of an exact population count, herd predation may be extrapolated from a 0.05 predation rate on radiocollared bighorn. The 0.05 threshold is based on a modeling exercise that predicted increased extinction probabilities for bighorn populations similar to the Dry Cimarron when cougar predation exceeds 0.05 (Fisher et al. 1999).

≥ 76 ewes in the Dry Cimarron bighorn sheep population

Snares may be set only if cougar predation is causing a negative annual growth rate for the bighorn herd.

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