Bighorn Sheep Program Overview **(updated November 2017)**

The management objectives for the 2 subspecies of bighorn sheep New Mexico are similar but the emphasis varies. Therefore the subspecies are discussed separately. Rocky Mountain bighorn sheep have been established in nearly all available habitat in New Mexico. For herds that have not reached the asymptote of the population growth curves the objective is to increase these populations. For those populations of Rocky Mountain bighorn sheep that are at high density the objective is to maintain these populations using trapping and harvest of females.

For desert bighorn sheep, substantial vacant habitat is present such that there is no anticipation of the need to hunt female desert bighorn sheep in the near-term. The current objective is to establish and maintain populations that should not need additional demographic support via translocation. The goal is for all desert bighorn sheep herds to have a minimum of 50 ewes, prior to establishing new herds. With a desired minimum density of 2-3 bighorn sheep/km2, only the Fra Cristobal herd has met this metric. Therefore the objective is to continue management strategies including mountain lion control, habitat improvements, and augmentation to reach these density goals. Vacant habitat was ranked in 2016 using a GIS model based on slope and vegetation cover. The potential for new herds to increase the statewide desert bighorn sheep population by more than 1000 exists.

Management Plans for both subspecies have been developed in the past but are not current. Time constraints preclude the development of in-depth management plans but this Program Overview will partially fill this need. A more compelling reason for not updating them is that we have determined that Program Overviews are more action oriented, take exponentially less time to write, are easy to update, and more useful for management purposes. Therefore, we are taking a different approach.

Transplants

To maintain the 2 primary alpine Rocky Mountain bighorn sheep populations (Wheeler Peak/Pecos Wilderness) below carrying capacity will require regular removal of ewes via translocation or hunting. All alpine herds will require annual ewe hunts if trapping is not allowed in the wilderness, and may be needed as a supplemental tool even if trapping is implemented. Current populations that can use demographic support are listed in Table 1. The potential to trade Rocky Mountain bighorn sheep to other western states could be explored.

Table 1. Rocky Mountain Bighorn Sheep Transplant Options:

Herd	Source Herd	Comments
Jemez	Pecos Red River Wheeler Peak	The Jemez herd could use 1 or 2 additional augmentations. The current (winter 2017) population estimate is 100. Occupancy throughout the modeled bighorn sheep habitat and a population size >150 for 3 year may preclude the need for additional augmentations.
Turkey Creek		Previous augmentations (1998, 2005, 2006, & 2008 n=43) have failed to increase this population. Habitat needs substantial improvement and mountain lion control established if this herd is to continue as a hunted population—preference would be to use Rio Grande Gorge or Red River stock for low-elevation augmentations.
San Francisco River		Herd has experienced at least 2 large scale pneumonia dieoffs. Habitat needs substantial improvement. Elimination of domestic sheep on the Martinez Ranch in Arizona should precede any release. Potential of bighorn/bighorn disease exists. Mountain lion control, initiated in 2012 is one reason NMDGF has been able to continue a hunt in this herd.
Out of State	Pecos Red River Wheeler Peak	Should explore the demand for New Mexico Rocky Mountain bighorn sheep. If there is potential, we would bring this before the State Game Commission.

Maximizing the use of all available desert bighorn sheep from the captive Red Rock facility and wild herds with surplus bighorn should be a program priority. Removals should begin in 2017-2018. Biennial traps are preferred for budgeting purposes, acknowledging that annual traps may still occur if conditions are favorable. Although 57 desert bighorn sheep have been removed from the Fra Cristobal population in 2 translocations (2011 and 2014), this herd was not available for a translocation in 2016. The Department will remove 40 bighorn in December 2017.

Table 2. Desert Bighorn Sheep Transplant Options*:

Herd	Source Herd	Comments
Ladron	See below	An augmentation of ~45 bhs in 2017 would increase the ewe population to >50 in this herd (the greatest number observed was 23 in 2012). This is the only extant herd with fewer than 50 ewes. With lion control this herd has persisted, despite predictions of extinction. This herd consistently produces very large rams and the raffle or auction hunter has chosen this hunt every year.
Southern San Mateo Mountains	See below	A translocation of ~60 bhs could potentially link the Ladron and Fra Cristobal populations. A release into the Devil's Backbone would complete a Ladron-Devil's Backbone-Southern San Mateo metapopulation.
Cowboy Rim (Animas Mountains)	See below	A translocation of ~60 bhs would be used to start this new population. A follow-up augmentation of 60 bhs would probably be needed 2 years later. This herd could potentially link the Peloncillo and Hatchet herds (Bootheel metapopulation).
Devil's Backbone/Alamo Hueco Mountains/ Gillespie Mountains/ Sacramento Mountains/ Florida Mountains		All these mountain ranges are considered potential desert bighorn sheep habitat with specific issues that must be acknowledged including public access, sympatry with exotic ungulates, metapopulation linkage, etc.

**It is important to note that the option of transplanting into the Ladrons and Sacramentos has been vetted by the State Game Commission, no other release sites have been vetted yet.*

Table 3. Possible Options for Desert Bighorn Sheep Translocation Stock

Herd	Biennial Removal **	Comments
Red Rock	30-40	Beginning in 2014, 25 adult ewes have been left in the facility post-trap.
Fra Cristobals	40	To be removed winter 2017
San Andres	TBD	USFWS, SANWR, and NMDGF have agreed that the San Andres herd could support a transplant of sheep off of the mountain. A capture in 2017 will assess the current disease profile. The Department will also deploy GPS collars, allowing us to understand landscape use of sheep which is important to future translocations. The introgression of Kofa genetics would presumably be of value to all herds.
Caballo	~10	This herd is currently (spring 2017) estimated to be 175. Capture could just occur on Redhouse Mountain that has had an observed density of >3/km2. To capture from this herd before it gets away as has happened in the Fra Cristobal Mountains would be important. We would not pull the number of ewes below 50. The removal of ~ 5 ewes annually would still allow this herd to increase.
Little Hatchets	~10	Capture primarily from the southern end where density often is >10/km2. The low census number from May 2017 will require further assessment.

Mountain Lion Control

Mountain lion predation was responsible for ~85% of all known-cause non-hunter mortalities of radiocollared desert bighorn sheep in New Mexico prior to implementation of the cougar control program. Subsequent to implementing cougar control, mortality from mountain lion kills decreased by 63%, and overall mortality rates decreased by 43%. The Department plans to continue to conduct mountain lion control in desert bighorn sheep range to reduce mountain lion predation and allow populations to increase for population stability and potential translocation stock. Mountain lion control is currently, and will continue to be conducted in the Sierra Ladron, Caballo, Peloncillos, and Hatchets Mountains.

Mountain lion control has also been conducted in the San Francisco River, Manzano, and Dry Cimarron Rocky Mountain bighorn sheep populations where high levels of mountain lion predation have jeopardized herd stability. This management tool will continue to be important.

Habitat Improvement Projects

The focus of these projects is to reduce large woody vegetation cover, especially juniper trees, in desert bighorn and low-elevation Rocky Mountain bighorn sheep ranges. Options include hand

manipulation, mechanized manipulation, and fire. NMDGF currently is involved with 2 projects. One is in the Dry Cimarron bighorn sheep area with private landowners and state lands. The second has been initiated out of the NMDGF-NWAO for the Manzano bighorn sheep area in coordination with U.S. Forest Service. A project may be proposed for the NMDGF property on the Gila River with bighorn sheep a priority. This potential project would be developed in coordination with the Habitat Section of WMD after consultation with the WMD GIS specialist.

Population Monitoring

We have historically conducted monthly fixed-wing airplane flights to monitor mortality of radiocollared bighorn sheep. Deployment of more than 100 GPS collars since 2014 has reduced the need for aerial monitoring. This will become less important as we switch to GPS technology. The Department continues to conduct both spring and autumn helicopter population surveys. A new graduate student project using real-time GPS collars during helicopter surveys is being conducted. NMDGF will use data gathered from all sources to determine harvest regimes for each herd. We will also use GPS data to develop core-range and foray distances.

Maintain Separation from Domestic Sheep and Goats

NMDGF will assess the risk of contact with domestic sheep or goats for any new releases of bighorn sheep. In addition, NMDGF will assess the risks of contact with all extant bighorn sheep populations and determine the BMP's to minimize the risk of contact. NMDGF will continue to provide data to the WAFWA-Wild Sheep Working Group Disease Management Venture database. Develop strategies for implementation following documented commingling events. All captured bighorn sheep should be sampled and tested for *Mycoplasma ovipneumonia* (M.ovi).

Rule Development Considerations

In the next rule cycle (2019-2023), an increase in both ewe and ram permits will be proposed. Modifications to rules pertaining to the Auction and Raffle permits will be considered with input from outfitters, WSF, hunting organizations, and previous auction and raffle hunters. Consider opening a hunt in the Manzano and Jemez herds. Also would need to consider opening hunts in the new desert herds to remove translocated rams as was done in the Jemez herd to mitigate inbreeding consequences. All proposed rule changes will be coordinated with input from WSF and other interested groups. Might add language stating that you will coordinate with WSF and other interested groups regarding all aspects of proposed rule change, not just raffle and auction tags.