

*Summary report by Montana Fish, Wildlife and Parks to the Environmental Quality Council addressing statutory reporting requirements relative to bighorn sheep health sampling (87-2-702, MCA).*

*March 13, 2024*

**Before September 1 of each even-numbered year, the department shall report to the environmental quality council information on:**

**(A) mountain sheep harvested pursuant to this subsection (4) from the Tendoy Mountain herd;**

The Tendoy bighorn sheep herd was depopulated with a combination of an unlimited hunt and MFWP management removals in 2015 and 2016. Thirty-four bighorn sheep were removed; public hunters harvested most of the bighorn sheep herd, accounting for 23 in 2015 and five in 2016. About 360 hunters participated in the depopulation hunts. MFWP management removals accounted for another six bighorn sheep over the two-year period. The last management removals were in December 2016 when the removal portion of that project was concluded.

MFWP began restoration efforts through translocation of bighorn sheep into this historical habitat during February 2021. MFWP captured 26 bighorn sheep (19 ewes, two lambs, and five rams) from Wildhorse Island, and all were marked with GPS radiocollars.

The bighorn sheep on Wildhorse Island have a long history of biological sampling without detection of important pathogens. Most recently, in winter 2020–2021, twenty-six bighorn sheep were captured for health evaluation. All captured animals appeared healthy upon examination, and all tested negative for exposure to *Mycoplasma ovipneumoniae* via PCR and serology. Only one animal tested positive for Leukotoxin A on PCR. *Bibersteinia trehalosi* and *Mannheimia haemolytica* were detected and are commonly detected in bighorn sheep herds in the absence of respiratory disease.

Since being released in February 2021, the ewe and lamb group has shown high fidelity to high quality sheep habitat primarily at the south end of the Hidden Pasture Wilderness Study Area (WSA). The ram group also has spent most of their time in the Hidden Pasture WSA, but through the summer also ranged into the northern Tendoy, briefly reaching north of Bell Canyon 16.3 miles north of the release site.

During this first year, bighorn sheep have remained in predicted high quality habitat. They have also used the area where the previous extirpated herd were most frequently observed. However, there is a much larger area of high-quality bighorn sheep habitat that the former herd used that has remained unexplored by the bighorn sheep released last year. In and around the area used by the bighorn sheep, there have been habitat improvements in the form of conifer removal.

To date only four mortalities of radiomarked bighorn sheep have occurred since the release in February 2021. These bighorn sheep were all ewes; two from mountain lion predation and two from vehicle collisions.

As of April 2023, 39 bighorn sheep at a minimum occupied the Tendoy Mountains. After birthing in June 2023, 51 bighorn sheep (18 ewes, 14 yearlings, 13 lambs, and six rams) were observed. Survival rates remain high ( $>0.9$ ) for females and males and lamb recruitment has increased to 0.74 this past year.

**(B) efforts to collect tissue samples and other biological information from mountain sheep harvested from the Tendoy Mountain herd to determine the immunity of surviving herd members to pneumonia outbreaks; and**

Because no bighorn sheep have been harvested from the Tendoy Mountains since December 2016, there is no new information to report regarding any tissue samples or biological information from harvests.

Risk of commingling with domestic sheep in the Tendoy landscape has been substantially reduced since the 1980s–early 2000s. There remains a single domestic sheep operation  $<14$  miles from the release site. Domestic sheep are confined to the fenced deeded ground and several livestock protection guard dogs are used. This area is separated from the Tendoy Mountains by very flat open terrain. Other bighorn sheep herds in the Beaverhead Mountains are located  $<14$  miles away.

Procedures are in place with domestic owners to allow quick identification and action (including lethal removal of wild bighorn sheep) if commingling is expected. Testing of bighorn sheep released in February 2021 indicated no exposure to any respiratory pathogens. Monitoring of bighorn sheep in the 13 months following release do not indicate any evidence of disease exposure.

In January 2024, 10 bighorn sheep were captured as part of a new adaptive management investigation involving eight populations of bighorn sheep across the state to investigate risk of comingling. This investigation involves collaboration among Montana Wild Sheep Foundation, Montana Woolgrowers, MFWP, Montana State University, and University of Montana staff. None of the 10 bighorn sheep captured in the Tendoy Mountains have tested positive for exposure to the primary respiratory pathogens to date. Eight of these bighorn sheep were radiomarked, which adds to the remaining five radiomarked bighorn sheep in the population, bringing the total number of radiomarks to 13 in the population.

**(C) attempts by the department to share tissue samples and other biological information collected from the Tendoy Mountain herd with Washington State University, other public entities, and private entities that research the interaction between mountain sheep and domestic sheep.**

Samples (lung and swabs) collected from previously (before December 2016) harvested bighorn sheep were submitted to WADDL (Washington Animal Disease Diagnostic Laboratory) for testing, and genetic sequencing was attempted on any *Mycoplasma ovipneumoniae* PCR-positive samples. This data was subsequently used in an analysis of the genetic structure of *Mycoplasma ovipneumoniae* across western bighorn and domestic sheep (Kamath, P.L., Manlove, K., Cassirer,

E.F., Cross, P.C. and Besser, T.E., 2019. Genetic structure of *Mycoplasma ovipneumoniae* informs pathogen spillover dynamics between domestic and wild Caprinae in the western United States. *Scientific reports*, 9(1), pp.1-14.)

MFWP entered into a data sharing agreement with U.S. Department of Agriculture-Agricultural Research Station (ARS) in January 2017. The title of the ARS project was: *Identification of Host Factors and Immunopathogenesis of Pneumonia in Domestic and Bighorn Sheep*. This project was funded for 5 years and requested that FWP collect and share bighorn sheep samples from herds handled across Montana during this time. FWP collected and shared samples over three capture seasons (Feb-March 2017, Jan-March 2018, and Dec 2018) from 6 herds. No additional sheep from the Tendoy Mountain herd were removed during that time. Samples were processed according to ARS instructions and shipped to the ARS lab. In addition, lab results for nasal swabs submitted by MFWP to WADDL for *Mycoplasma ovipneumoniae* PCR were shared with the ARS lab. The original data sharing agreement has expired, and ARS staff finalized their analyses.

Additional samples have been collected from captured bighorn sheep in January 2024. No positive detections of *Mycoplasma ovipneumoniae* have been reported following these procedures from this capture.