Why Bighorn Sheep and Domestic Sheep or Goats Should Never Mix

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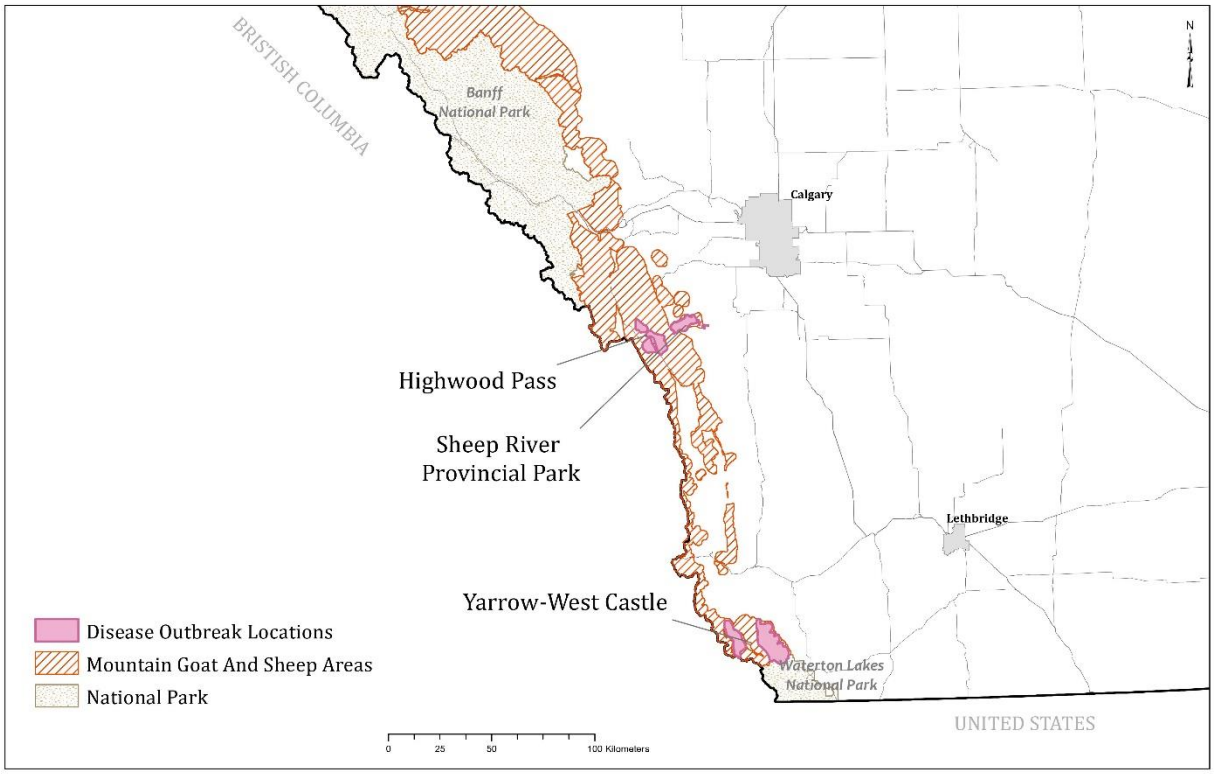
Not So Harmless Bacteria

Wild sheep share many obvious similarities with domestic sheep (and goats) in appearance and habits. They can even successfully produce young together. However, there is one particularly important difference between wild sheep and domestic sheep and goats - their susceptibility to some disease agents.

A prime example of this is a bacterium, *Mycoplasma ovipneumoniae* (commonly referred to as M. ovi), that is especially concerning to governments across North America. Domestic sheep and goats are known carriers of M. ovi. Most infections in these species go undetected, with individuals often showing little to no signs of infection (though weight loss and poor fibre quality have been reported). In contrast, M. ovi can lead to fatal pneumonia in wild sheep. In fact, M. ovi has been associated with most pneumonia die-offs in wild sheep in North America.

Alberta's wild sheep, the bighorn sheep, is an icon mountain animal and the designated Provincial mammal. Records of pneumonia outbreaks in provincial bighorn sheep start as far back as the 1930s, with six known die-offs having occurred since that time. Each outbreak led to losses of 10-75% of the herd (totaling more than 6500 bighorns) and took 5-10 years or more for herds to recover. In other provinces or States, whole herds have succumbed to the disease and recovery times have been much longer. Several factors may influence the severity and duration of a pneumonia outbreak. These include the strain of M. ovi present, overall herd health before infection, environmental stressors (e.g. extreme weather), and the presence of sinus tumors. The number of animals that survive the initial disease outbreak and continue to infect others within the herd will affect how long an outbreak persists.



Locations of past pneumonia outbreaks in bighorn sheep in Alberta (1930s-2000)

Alberta is one of only two of 15 jurisdictions in North America that has not had a pneumonia die-off in wild sheep since 2000. We hope that through increased awareness and working collaboratively with all stakeholders to minimize disease risk that Albertan bighorns will continue to remain M. ovi-free.

Why the Concern about Bighorn Sheep and Domestic Sheep and Goats Mixing?

Domestic sheep and goats can transmit M. ovi to other animals, including bighorn sheep, through nose-to-nose contact or airborne droplets.

Domestic sheep and goats can transfer M. ovi to bighorn sheep (photo credit Darryn Epp)

There is no evidence that other livestock transmit *M. ovi* to wild sheep, or vise-versa (research is ongoing with respect to llamas and alpacas).

Strong scientific evidence indicates increased risk of pneumonia in bighorn sheep following contact with domestic sheep or goats, including a single encounter with an infected domestic sheep or goat. Most, but certainly not all, pneumonia die-offs in wild sheep, including those in Alberta, occurred after confirmed or probable contact with domestic sheep or goats.

Bighorn lamb showing nasal discharge, 1 of the signs of pneumonia in wild sheep. Other signs or symptoms include coughing, weakness, diarrhea and labored breathing. (Photo credit Darryn Epp).

Bighorn sheep may come into close proximity with domestic sheep or goat herds at various times during the year. For example, bighorns undergo long distance migrations from low to high elevations between winter and summer in some parts of Alberta. Male and female bighorns may also undertake exploratory movements at other times of the year. The largest movements (e.g. 80 km or more), and perhaps the most likely time for contact with domestics, is just before and during the fall rut when male bighorns are in search of breeding females (wild or domestic). A large-scale collaring project is presently underway in south-western Alberta to enhance our understanding of bighorn movements and ways to minimize risk of disease transmission. This is a collaborative endeavor between the University of Alberta, Wild Sheep Foundation Alberta, Alberta Environment and Protected Areas and National Parks.

Bighorn ram in search of females during the breeding season (Mid-Oct to late November) (photo credit Gord Court).

What about Vaccines or Treatments?

There are no vaccines or treatment for pneumonia in bighorn sheep. With at least 15 strains of M. ovi in wild sheep, finding an effective vaccine is very challenging. Once infected with M. ovi, the only options to reduce spread to other wild animals are to either cull the entire bighorn sheep herd, or repeatedly test then remove infected individuals.

M. ovi cannot easily be eliminated with antibiotics in domestic sheep or goats. Preliminary research trials on treatments to clear the bacterium are promising and ongoing. If you suspect your flock or herd has M. ovi, we recommend contacting your veterinarian to discuss testing and treatment.

M. ovi cannot survive in the environment outside a host (unlike the prions that cause chronic wasting disease in members of the deer family).

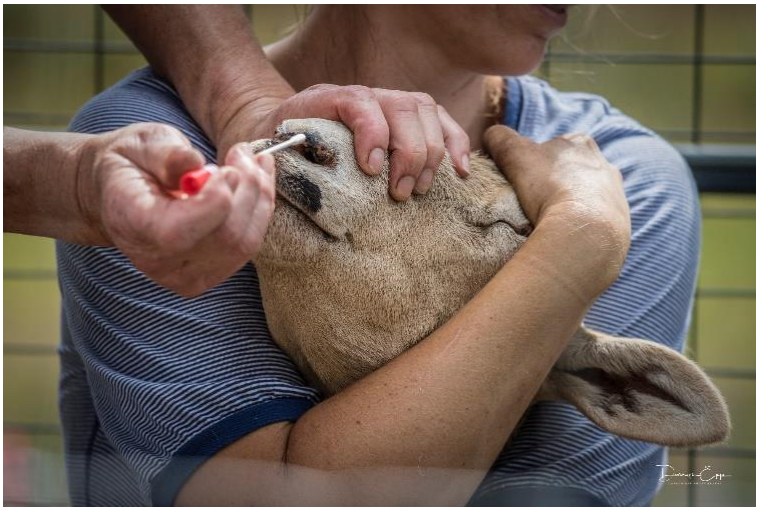
How Can you Help?

Maintaining physical separation between bighorn sheep and domestic sheep and goats is key.

Domestic sheep and goat producers can help protect bighorn sheep from M. ovi by:

- Avoiding taking domestic sheep or goats on public lands in or near bighorn sheep range.
- Reporting sightings of bighorn sheep near your domestic sheep or goats to a local Alberta Parks and Protected Areas biologist (call 310-0000).
- Reporting sick bighorn sheep to your local biologist (310-0000).
- Helping us increase awareness of M. ovi. Please tell a friend or collegue of the risk.
- Undertaking measures to prevent close contact with bighorn sheep (e.g. double fencing, etc.). Funding is available to cover costs for preventative actions.
- Having your animals tested for M. ovi.

Data from British Columbia indicates that approximately 30% of domestic animals tested were M. ovi positive. The percentage of domestic sheep and goats in Alberta that harbour M. ovi is not known. Funding is available to cover costs of equipment, veterinarian and laboratory costs.



Collecting nasal samples to test for *M. ovi* in a domestic sheep (photo credit Darryn Epp)

Please refer to the accompanying article for further details on the testing and incentive programs, and available funding.