Chasm Bighorns: 2019-2020 Selective Removal Trial

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Project Background

In 2013 the Chasm bighorn sheep herd experienced a decline from ~100 to 25. Co-mingling with domestic sheep was directly observed on a farm within their home range and further validated through a GPS collaring project. Health sampling as part of the collaring project determined that 2 out of 4 Chasm bighorns had been exposed to *Mycoplasma ovipneumoniae* (M.ovi antibodies were detected in blood serum samples). Since the 2013 decline, lamb recruitment within the Chasm population has been very poor. The domestic sheep on the farm where contact was suspected have now been sold and no sheep remain on this particular farm.

Aerial and ground counts estimate the current Chasm bighorn population is comprised of 17 ewes and young rams. This population estimate has been stable to declining for 5 years. Low lamb recruitment has been documented with very few lambs surviving from birth to yearling age. Bighorn herds suffering from this form of mass mortality typically have poor lamb survival for years and may never recover to former numbers. Research on this disease syndrome recognizes that ewes surviving all age pneumonia die-offs can continue to harbour the bacteria in their nasal passages yet not be ill (Cassirer *et al* 2017). However, any lambs they produce die within 6 to 8 weeks of birth from a M.ovi associated pneumonia process. This picture has been seen repeatedly, in an annual pattern or one that can skip years, in multiple herds in the USA (HCBSRC 2004).

In an effort to reduce exposure and transmission of M.ovi and boost lamb survival several researchers developed a new mitigation method that follows classic livestock disease management - identify and remove the source of disease (HCBSRC 2004). Termed "Selective Removal", this method includes the testing of ewes (nasal swabs and blood), removal of all M.ovi positive ewes, either to a captive laboratory setting or by humane euthanasia. Removal of ewes that carry M.ovi has resulted in improvement in the survival of lambs and eventual population increase. Some herds have continued this positive pattern for up to 4 years following the application of this method after decades of lamb mortality. Currently, we see this test and remove option as the only viable solution to recovery of the Chasm herd and for the protection of the health of other nearby bighorn herds.

The goals of this project are to:

1. Stop pathogen (M.ovi) transmission to lambs from surviving Chasm ewes
2. Prevent pathogen transmission to adjacent herds
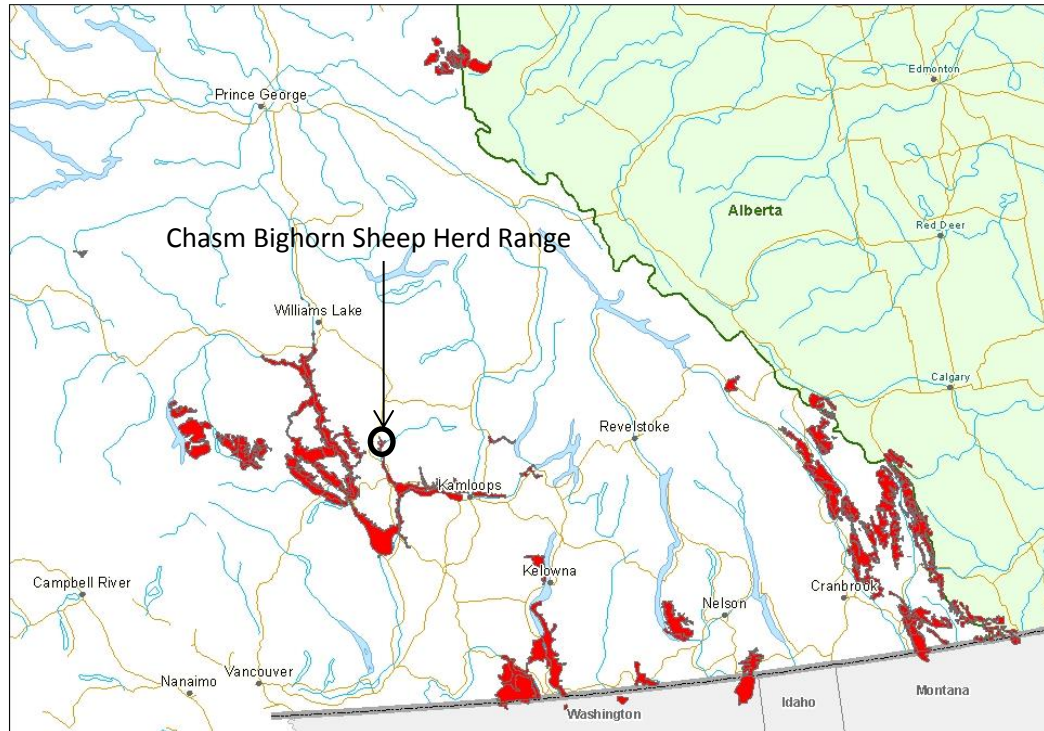3. Recover population of Chasm bighorns

Study Area

Figure 1. BC Bighorn Sheep Range (red) with Chasm bighorn sheep herd range circled.

Methods

An agreement was developed with a local landowner to use their field near escape terrain where the Chasm bighorns are often located for the corral trap. Significant upgrades were made to the 12 ft high corral trap and sampling chute. Baiting began immediately after the first significant snow fall in December 2019. Several panels were left off the corral trap to aid in habituation of the bighorns to entering the trap. Bait material included alfalfa, apples, and molasses. A trail camera confirmed that most of the remaining Chasm bighorns were feeding inside the corral trap. Unfortunately deep snow conditions did not persist, the bighorns dispersed across winter range and after several failed attempts to trip the trap with sheep inside, the decision was made to abandon trapping and fall back to helicopter capture.

A Biomeme real-time PCR thermocycler was purchased with funds from the Wild Sheep Foundation. Cost per unit and ancillary equipment and supplies was over $10,000 per unit. With the decision to

helicopter capture the remaining Chasm sheep, we were unable to use the Biomeme animal-side PCR for this project, but it was critically important to have this second Biomeme for the nearby Fraser River Bighorn Selective Removal project. Instead of the animal-side test, duplicate nasal swab samples collected from each of the Chasm bighorns that were helicopter netgunned, were analyzed at the Animal Health Center Lab (Abbotsford), and the WADDL (Washington).

Results

A total of 11 Chasm bighorns were captured and sampled over 2 days. We deployed 5 more GPS collars to track movements, potential connectivity with nearby herds, and to assist with locating animals during survey flights. Five other collars were also recently deployed on the Chasm herd in the spring of 2018. Only 1 ewe was confirmed as a chronic shedder of M.ovi (sampled twice and positive both times, AHL and WADDL confirmed). This ewe and 1 other that had been previously sampled and confirmed as M.ovi shedding were removed.

The key measure of success for this project will be an increased lamb recruitment (lamb:ewe ratio) following the selective removal. We are currently evaluating this measure through lamb surveys conducted in early spring and late summer. During these spring-summer survey seasons, Chasm bighorns predictably occupy range that is relatively easily viewable from the ground. We will also incorporate aerial surveys planned for late summer 2020 and for the following 3 years.

This project has also provided an opportunity to develop a working relationship with Whispering Pines First Nations on an important wildlife conservation project.

References:

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Personal Communication:

Helen Schwantje. Provincial Wildlife Veterinarian, Conference call February 5th, 2018.