Project Report for the Yukon Wild Sheep Foundation

Surveillance for *Mycoplasma spp.* in Yukon Wildlife (2015-2023)

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July 2024

Yukon

Background

- The bacterium *Mycoplasma ovipneumoniae (M. ovi)* is a concern in the Yukon. It has caused fatal outbreaks of pneumonia in wild sheep and mountain goats in other parts of North America.
- In 2015, the Government of Yukon began sampling Yukon thinhorn sheep to test for *M. ovi*. This sampling effort is ongoing (Figure 1).
- In 2018, Alaska reported detection of *M. ovi* in wild ungulates. This finding led to the expansion of *M. ovi* surveillance to include other species of wild ungulates in the Yukon.
- Over 1,700 wild Yukon ungulates have been tested since 2015 (Figure 2).
- Samples are sent to the Animal Health Centre laboratory in British Columbia and Prairie Diagnostic Services laboratory in Saskatchewan.
- Financial support for testing from the Yukon Wild Sheep Foundation (YWSF) has made the expanded and ongoing surveillance possible.

Outcomes

- Samples for *M. ovi* testing have been collected from live captured, found dead and harvested wildlife (Table 1).

Animal capture/collection type	Number of animals
Live capture	746
Found dead (including road-killed)	107
Harvested	925
Data unavailable	15

Table 1: Number of wildlife tested for Mycoplasmas by capture type.

- Samples from thinhorn sheep collected by hunters in the field initially increased over the first three years of sample kit distribution but has remained at a similar level since 2018 (Table 2). Work with the YWSF to increase hunter harvested samples and samples collected in other Department of Environment field offices is ongoing.

Year	Number of thinhorn sheep samples collected by hunters
2016	6
2017	13
2018	42
2019	24
2020	25
2021	36
2022	13
2023	30

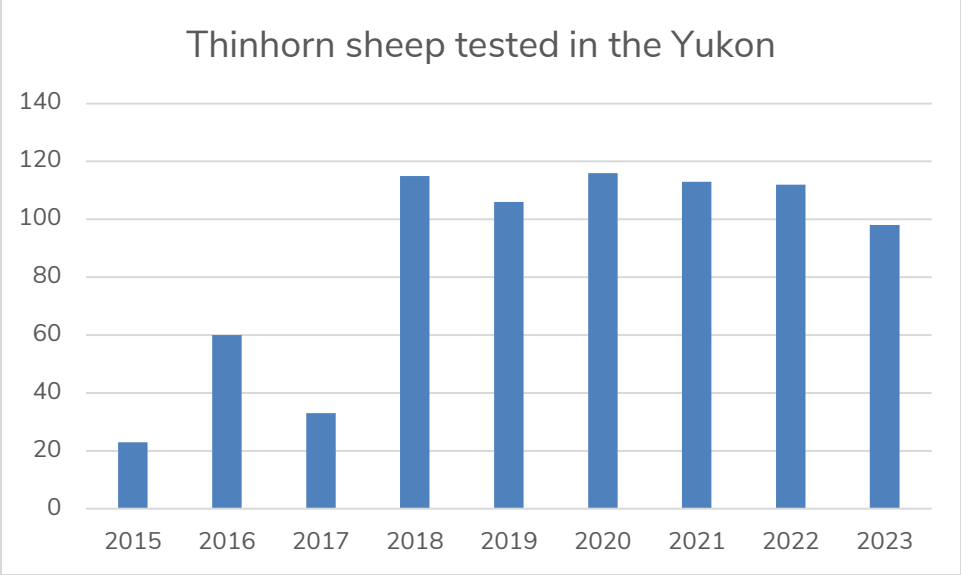
Table 2: Number of nasal swab samples collected from thinhorn sheep by hunters in the field, by year.

- Between 2015 and 2023, all wildlife samples were negative for *Mycoplasma* spp. except for:
    - One caribou from the Fortymile herd captured near the Alaska border in 2018. Approximately 10 per cent of the samples from the Fortymile herd tested by Alaska have been positive for *M. ovi*; therefore, this was not an unexpected finding. To date, no pneumonia outbreaks in wildlife have been associated with the positive samples in Alaska.
    - Four caribou from the Porcupine herd – one harvested in 2020, and three captured in 2021. Genetic sequencing of these positive samples determined that the *Mycoplasma* detected was not *M. ovi*, but likely a closely related bacterium. *Mycoplasmas* can adapt to specific host species and not cause disease in those species, so it is not surprising to find a unique strain of *Mycoplasma* in healthy caribou.
    - One additional caribou from the Porcupine herd, captured in Alaska in 2022, tested positive for M. ovi. Although this is the first positive sample detected in this herd, we expect that, like the Forty Mile herd, there is a low level of *M. ovi* or similar *Mycoplasma* spp. present in Porcupine caribou. Further testing showed that the strain of *M. ovi* detected is very similar to the strain of *M. ovi* detected in other wildlife in Alaska. To date, the caribou that tested positive appear healthy and no outbreaks of pneumonia have been detected in Porcupine caribou or in any other wildlife in the Yukon.
    - One female moose captured in 2022 near the Blow River in northern Yukon. Further analysis of the sample revealed that the bacteria detected was closely related to *M. ovi* but was genetically distinct. Although this was the first positive *Mycoplasma* spp. sample detected in a moose in the Yukon, we expect that, like the findings in moose in Alaska, there is a low level of *Mycoplasma* spp. present in moose in the Yukon. This moose appeared healthy at the time of capture.
    - One female moose captured near the Little Fish River in northern Yukon in 2023. Like the findings in the moose sampled in 2022, the bacteria

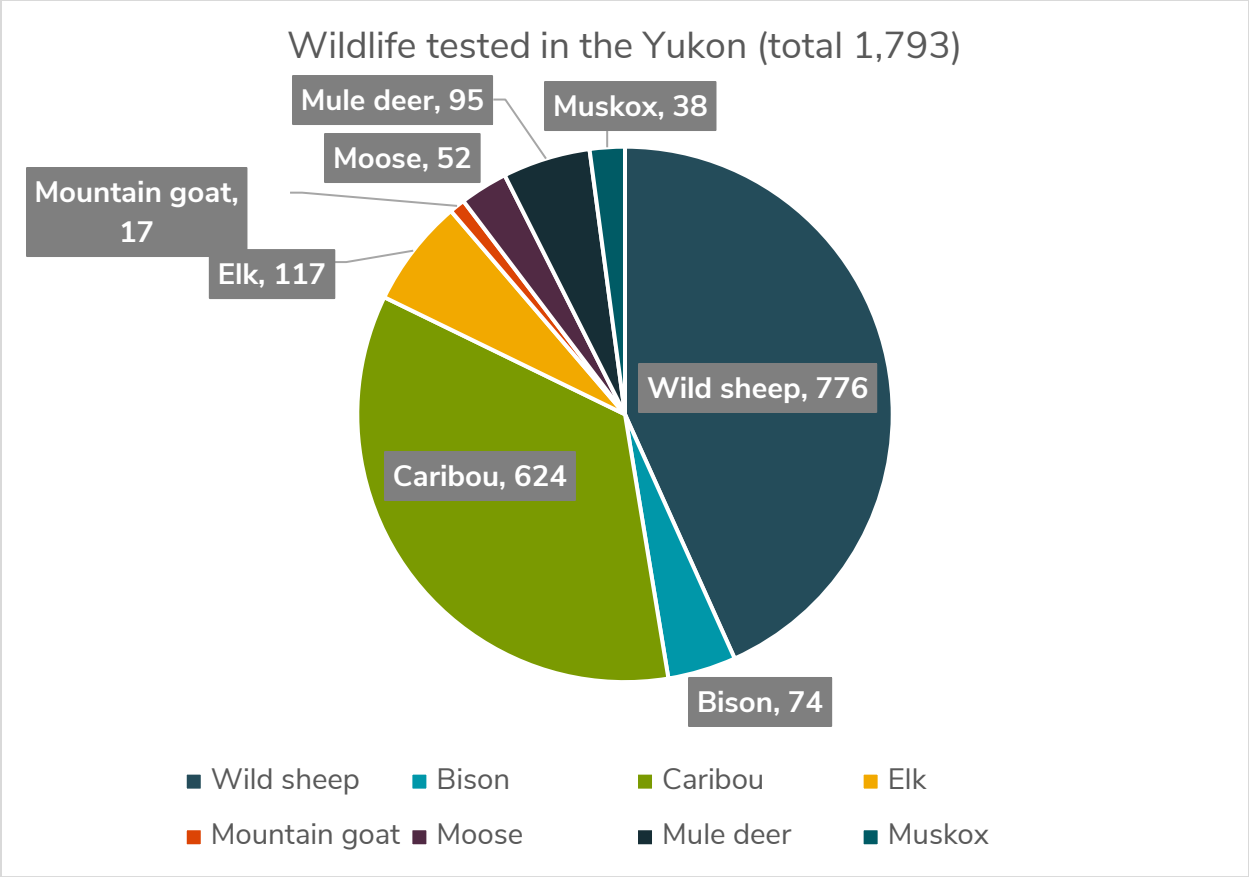
detected was closely related to *M. ovi* but was genetically distinct. This moose appeared healthy at the time of capture.

- One male moose harvested near Snafu Lake in 2023. This was the first detection of *Mycoplasma* spp. in a sample from a moose from southern Yukon, although our sample size from moose in this region is limited. This moose was reported to be healthy at the time of harvest. Further analysis of this sample is underway.

- In 2023, 289 individual animals were tested, the majority being thinhorn sheep (98) and caribou (107). All samples were negative except for the moose noted above.



- **Figure 1:** The number of individual thinhorn sheep tested for *M. ovi* in the Yukon per year since 2015.



- **Figure 2:** The number of individual free-ranging wildlife tested for *M. ovi* by the Animal Health Unit for *M. ovi* between 2015 and 2023.

Conclusions

- Surveillance of *M. ovi* in wildlife is ongoing. Nasal samples are collected by thinhorn sheep hunters in the field, by laboratory technicians during compulsory and voluntary submissions from the regulated hunt, and from wildlife found dead. When possible, biologists and veterinarians collect nasal swab samples in the field during collaring of wild ungulates.
- Thinhorn sheep hunters throughout the territory will be encouraged to collect nasal swabs from harvested animals in the field. As with previous years, sample kits for hunters are available for pick up at Department of Environment offices. Support from YWSF in providing hats to hunters who submit complete sample kits is an important motivating factor in increasing this sample type.

- Efforts are ongoing to support nasal swab sample collection from harvested rams submitted for measuring at Department of Environment office in communities outside Whitehorse.
- Two swabs per animal are collected to enable further analysis (i.e. genotyping) of any *Mycoplasmas* found in wildlife.
- By monitoring wildlife for specific respiratory pathogens, the Animal Health Unit is better able to manage wildlife health issues. Monitoring the presence of *Mycoplasma* spp. in wild ungulates in addition to thinhorn sheep and mountain goats is needed to better understand the dynamics of these organisms and how they may affect wildlife health.
- The *Mycoplasma* positive results found in caribou and moose in the Yukon are suggestive that, like in Alaska, strains of *M. ovi* and other *Mycoplasma* spp. that are different from strains found in domestic animals are found in wildlife. To date, it appears that these strains are not associated with disease.
- Continued efforts to monitor for *M. ovi* in wild sheep and goats is an important component of this program. Surveillance in other wildlife species supports our understanding of the overall picture of *M. ovi* in Yukon wildlife.
- Ongoing support from the YWSF for *M. ovi* testing in wildlife ensures that this program continues at its current level.