



BRIEF

on

SOUTH AMERICAN CAMELID DISEASE RISK to WILD SHEEP

by

WAFWA Wild Sheep Initiative & Wildlife Health Committee

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INTRODUCTION

There has been concern and misunderstanding regarding use of South American Camelids (SACs) (llamas and alpacas) in occupied wild sheep range. Some wildlife- and land-management agencies have prohibited or proposed to limit pack llama use based on concern that SACs can carry and/or transmit pathogens known to cause disease in wild sheep (see Appendix 1). The Western Association of Fish and Wildlife Agencies (WAFWA) Wild Sheep Initiative (WSI) and Wildlife Health Committee (WHC) provides this brief, including a suggested path forward and recommendations for use of SACs in wild sheep range.

The 2017 *Risk Assessment on the use of South American Camelids for Back Country Trekking in British Columbia*, is the most recent published risk assessment that reviews the literature on pathogens of SACs. The Centre for Coastal Health was contracted by the British Columbia (BC) Ministry of Forests, Lands, Natural Resources Operations, and Rural Development and the Alaska Department of Fish and Game to update a previous risk assessment, completed in 2003. It is acknowledged the focus of the 2017 Assessment was to assess risk of SACs used in backcountry trekking only in British Columbia and not elsewhere in western Northern America.

The 2017 Risk Assessment stated that *Mycoplasma ovipneumoniae* (M. ovi), a bacterial pathogen considered to be an initiating agent in pneumonia in wild sheep, was not detected from limited sampling of SACs kept alone or comingled with domestic sheep. The 2017 Assessment also stated that other pathogens associated with wild sheep and mountain goat disease (e.g., bovine viral diarrhea, contagious ecthyma, parapox virus, *Mannheimia haemolytica*, *Pasteurella* spp, Johne's Disease, and Bluetongue virus) are rare to uncommon in SACs. CCH found no peer-reviewed literature on disease transmission from SACs to mountain ungulates.

WSI and WHC acknowledge that populations of thinhorn sheep (i.e., Dall's, Stone's) that have been assessed are relatively naïve to domestic livestock pathogen exposure, compared to most bighorn populations in the western U.S., southern British Columbia, Alberta, and Mexico. Exposure of thinhorn sheep to novel pathogens could be catastrophic to well-connected thinhorn sheep populations in northern Canada and Alaska. Therefore, to preserve their health, all manageable disease risk to thinhorn sheep should be avoided. Lastly, the WSI and WHC recognize the inadequate sample size of SACs tested for key pathogens (e.g., M. ovi) that can result in severe pneumonia outbreaks and catastrophic declines in bighorn sheep populations. A more robust sampling of SACs is required to confirm the absence of pathogens, and to fill in knowledge gaps. Tests conducted prior to 2010 lacked adequate diagnostic technological capacity for detecting M. ovi.

To ensure reasonable and science-based decisions are made by wildlife- and land-management agencies/jurisdictions, more SAC pathogen-testing data is desirable and necessary to safeguard wild sheep. The WSI and WHC provide the following summary of the issues, current knowledge and data gaps, next steps, and recommendations for future action(s).

Issues

1. SACs are currently used as recreational pack animals in the United States (U.S.) and Canada, and have been, for at least the past 30+ years.
2. There is no comprehensive, current, and published dataset of SAC test results for pathogens considered a threat to wild sheep, particularly *M. ovi*.
3. Risk Assessments completed by independent contractors for agencies utilize data from various sources and are just that, risk assessments for agency use. WAFWA's WSI or WHC has no official position concerning disease or pathogen transfer risk from SACs to wild sheep (SACs are not addressed in the WSI's 2012 *Recommendations for Domestic Sheep and Goat Management in Wild Sheep Habitat*). The WSI and WHC encourage development of data sets and research designed to complete the knowledge around this issue.
4. Individuals and associations that use SACs as pack animals are opposed to land-management agencies developing policies, positions, or regulations limiting SAC use on public lands associated with wild sheep with no scientific basis. This opposition is largely based on dated and minimal pathogen/disease sampling.

B. Current Knowledge and Information Gaps

1. Based on limited testing to date, *M. ovi* has not been identified from a SAC.
2. Only one published experiment, nearly 30 years ago, was conducted to study pathogen transmission to bighorn sheep involving llamas, domestic goats, mountain goats, cattle, domestic sheep, and mouflon sheep. (Foreyt 1994). Bighorns only became sick and died after contact with domestic and mouflon sheep. At the time of the study, *Pasteurella haemolytica* was a pathogen of concern. It was isolated in all the study animals except llamas. However, because animal testing did not include *M. ovi* and other pathogens of current concern, results are inconclusive relative to current diagnostic methods.
3. There is no more comprehensive and current dataset of SAC pathogen exposure for those pathogens that are considered a threat to wild sheep than the 2017 Risk Assessment.

C. Recommendations

1. Support generation of a comprehensive SAC pathogen profile in western North America. Use this data to create a policy and guidelines that include recommendations for management of SACs for outdoor recreation in occupied wild sheep range, including no restrictions, if SACs are found to be void of pathogens of concern to wild sheep health.
2. Until the comprehensive pathogen dataset is created:
 - a. SACs should be segregated from other livestock known to carry pathogens of concern to wild sheep if those SACs are to be used to recreate in occupied wild sheep range.
 - b. Avoid use of SACs in thornhorn range.

D. Suggested Next Steps

1. The WSI and WHC recommend a facilitated collaborative forum (perhaps late fall 2022) with leaders from the SAC community, animal and wildlife health professionals, wild sheep and land managers, and conservation organization representatives with the goal of learning and sharing perspectives. This forum would:
 - a. Allow wild sheep managers and SAC users to find common ground and gain a greater appreciation for each other's interests/concerns, wild sheep conservation and health issues, animal husbandry, recreational use, and management practices.
 - b. Seek agreement in developing policy/guidelines for west-wide management of SACs used for trekking and hunting.
 - c. Identify funding for the recommended testing needed to improve the knowledge base on SAC pathogen profiles and potential risk to wild sheep.

APPENDIX 1 - REGULATIONS OR PERSPECTIVES VARY BY AGENCIES ON RECREATIONAL USE OF SACs IN WILD SHEEP HABITAT

1. On August 9, 2005, Alaska Department of Fish & Game (ADF&G) issued a News Release stating their concerns over use of llamas when hunting Dall's sheep, mountain goat, and/or muskox (Caprinae family).
2. Alaska Board of Game in 2013 prohibited using pack goats for hunting but not SACs.
3. National Park Service in Alaska beginning in 2015 prohibited domestic sheep and goats. SACs are prohibited except as pack animals with superintendent authorization.
4. British Columbia (BC) Ministry of Forests, Lands, Natural Resources Operations, and Rural Development has regulations for the use of pack goats and SACs for hunting, but do not apply to trekking use. BC Parks Act (through Park management Plans) prohibit the use of pack sheep, goats and SACs for trekking in Northern Provincial Parks (i.e., those overlapping thinhorn sheep range).
5. In 2019, through revision of their Wildlife Act Phase II, the Northwest Territories enacted regulations to prohibit domestic sheep, goats and SACs from the Mackenzie and Richardson Mountains, as a measure to reduce risk to wild sheep.
6. Arctic National Wildlife Refuge proposed regulations in 2020 to ban all pack goats and SACs.
7. American Association of Small Ruminant Practitioner's (AASRP) February 2020 policy opposes banning camelid pack animals on public lands.
8. Bureau of Land Management proposed regulations in 2021 in the Central Yukon Planning Area Alaska - Resource Management Plan, that the use of domestic sheep and goats would be limited, and camelids would be considered on a case-by-case basis.