Why Do Some Female Bighorn Sheep Go On Breeding Migrations, While Others Stay in Their Local Wintering Range? Inbreeding Avoidance, Tradition, and Social Transmission

KATHREEN E. RUCKSTUHL, University of Calgary, Department of Biological Sciences, 2500 University Drive NW, Calgary, Alberta, T2N 1N4, CA, *kruckstu@ucalgary.ca*
JOHN T. HOGG, Montana Conservation Science Institute Ltd., 5200 Upper Miller Creek Road, Missoula, MT, 59803, USA
MEGAN A. MAH, University of Calgary, Department of Anthropology and Archaeology, 2500 University Drive NW, Calgary, Alberta, T2N 1N4, CA

ABSTRACT: Seasonal migrations are common for many ungulate species, either to find resources, for birthing or to find mates. While breeding migrations are a means for males to find receptive females, and females migrate to lambing areas in the spring, it is less obvious why some female Rocky Mountain bighorn sheep (*Ovis canadensis*) in the Sheep River (SR) population spend rut on their natal winter range where they are likely to mate with rams also natal to the SR population, while others migrate to distant areas of alpine habitat where they are more likely to encounter rams from neighboring populations. The purpose of this study was to determine the proximate and ultimate causes of female breeding migrations in bighorn sheep and to compare these to resident females in a population of bighorn sheep in Sheep River Provincial Park, Alberta, Canada. We hypothesized that individual migratory tendency (i.e., resident or migrant) is 1) socially transmitted from mother to daughter or 2) is consistent within an individual, and/or 3) migration functions as an inbreeding avoidance mechanism. To test these hypotheses, we examined the association between the migratory tendency of mothers and subsequent migratory tendency of daughters once they were adults. We then compared the mean relatedness of resident and migrant females to the dominant males at Sheep River for each rutting season, between 2006 and 2021. The migratory tendency of daughters was not associated with the migratory tendency of mothers. Furthermore, individual migratory status was not fixed or consistent across years. We found no significant difference in the mean relatedness of resident and migrant females to the dominant males at Sheep River, and thus rejected the idea that females might migrate to avoid breeding with closely related males. To evaluate alternative ideas on why females might migrate to breed elsewhere, we are currently extending the analysis to include 1987-2001 when we collected comparable data on female fidelity to natal winter range during rut.

Biennial Symposium of the Northern Wild Sheep and Goat Council 23:4; 2022

KEY WORDS: Alberta, bighorn sheep, breeding migration, migrants, residents, seasonal migrations.