

Winter Tick Infestation and Associated Hair Loss on Stone's Sheep in Northern British Columbia

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Abstract: Stone's sheep (*Ovis dalli stonei*) at low elevations along the Williston Reservoir in northern British Columbia exhibit hair loss in late winter similar to that seen in moose (*Alces alces*) affected by winter ticks (*Dermacentor albipictus*). We conducted 80 examinations of 43 Stone's sheep in the Dunlevy and Schooler herds, 63 on sheep wintering at low-elevation (700–1,200 m) and 17 on sheep wintering at high-elevation (1,400–1,900 m) in March/April between 1999 and 2004. We classified tick-associated hair loss into five categories based on affected proportion of the torso: None (<1%), Very Low (1-5%), Low (6-15%), Moderate (16-30%), and High (>30%). We found the incidence and degree of winter tick infestation and tick-associated hair loss in late winter varied by Stone's sheep migratory type, showing a relationship with seasonal elevation use by Stone's sheep during the critical tick life stages. The probability of tick-induced hair loss in sheep decreased with increasing elevation, with late winter hair loss generally highest in Low Resident sheep (year-round residents at low elevation), lower in Migratory sheep (those that descended from high elevation habitat to low elevation winter ranges after 31 October), and absent in High Resident sheep (year-round alpine residents). Lambs were more affected by ticks than adult sheep. Rocky Mountain elk (*Cervus elaphus*) introduced to the area in the mid-1980's are the most abundant ungulate in the area, and likely the primary host for winter ticks. Spatial overlap of sheep and elk occurred in both spring, when engorged adult female winter ticks drop off their ungulate hosts to lay eggs on the ground, and fall, when winter tick larvae are seeking new hosts. The common use of grassland and deciduous habitat classes by elk and sheep during these seasons likely results in ticks being shared between species. Although it appears that both sheep and elk are perpetuating the winter tick cycle in the area, given the degree to which Stone's sheep are tied to specific localized escape terrain features it is possible that the sheep/tick cycle could now be self-supporting without secondary hosts. While our study confirmed the presence of winter ticks and tick-associated hair loss in sheep using low elevation winter ranges, we did not find evidence of direct mortality or serious population level impacts resulting from tick infestation.

Key words: *Dermacentor albipictus*, hair loss, low elevation, mortality, *Ovis dalli stonei*, Stone's sheep, winter range, winter ticks

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