Determining Cause-specific Mortality, Disease Prevalence and Survival Rates of Bighorn Sheep Inhabiting the Elk Mountain Region of South Dakota and Wyoming

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ABSTRACT Between March 2012 and July 2014, we investigated cause-specific mortality, survival rates, and disease prevalence in the bighorn sheep (*Ovis canadensis*) herd occupying Elk Mountain, located in the Black Hills of South Dakota and Wyoming. We captured adult bighorn sheep (n = 38) via drop net and helicopter net-gunning and fitted them with Very High Frequency or Global Positioning System collars. Pregnant ewes (n = 43) were fitted with vaginal implant transmitters. Nasal swabs, blood and fecal samples were collected for disease testing. Lambs (n = 32) were captured by hand and fitted with expandable VHF collars. Predation accounted for 42.9% (n = 3) of adult and 43.8% (n = 8) of lamb mortalities. Unknown causes claimed 57.1% (n = 4) of adult mortalities; unknown and other causes claimed 56.3% (n = 9) of lamb mortalities. *Mannheimia haemolytica* was documented in 52.6% (n = 20) of adults and 9.4% (n = 3) of lambs; *M. glucosida* was found in 6.3% (n = 2) of lambs, while *Bibersteinia trehalosi* was documented in 100% (n = 38) of adults and 15.6% (n = 5) of lambs. Overall, annual adult survival was 88.0%, 2013 lamb survival was 25.6% and 2014 lamb survival was 37.5%. The population is considered healthy relative to pneumonia and this, coupled with minor predation loss, shows population growth.

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