



Session 3:

Declining Populations

XVI. Disease complexity in a declining Alaskan Muskox (*Ovibos moschatus*) population

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The muskox population inhabiting the eastern North Slope (ENS) of Alaska declined dramatically during 1999-2006, a period when populations in western Alaska (WA) were stable or increasing. To understand morbidity and mortality factors contributing to the decline, Alaska Department of Fish and Game initiated pathological investigations of carcasses in 2005 and continued investigations until 2008. In addition, archived sera from both ENS and WA muskoxen collected during 1984-1992, before the documented beginning of the ENS decline; sera collected during 2000, near the beginning of the decline; and contemporary sera (from live-capture-released adult females) collected during 2006, 2007, and 2008 were analyzed to determine if sero-prevalence of potential pathogens differed in the two areas or changed over time. The pathogens selected for investigation were those that were believed to be able to cause lameness or poor reproduction or to adversely impact general health. Furthermore, trace mineral levels, hemograms, and gastrointestinal parasites were evaluated in live adult females captured 2006-2008. Since 2008, available carcasses and enhanced sampling of live-capture release as well



has hunter harvested muskox has continued. Pathological investigations identified several comorbid conditions including predation, polyarthritis caused by or consistent with *Chlamydophila* spp. infection, hoof lesions, copper deficiency, contagious ecthyma, verminous pneumonia, hepatic lipidosis suggestive of negative energy balance, and bacterial bronchopneumonia due to *Arcanobacterium pyogenes* and *Pasteurella trehalosi*. Pathogens suspected to be newly introduced in the ENS muskox population, based on serological detection, included bovine viral diarrhea, respiratory syncytial virus, *Chlamydophila* spp., *Brucella* spp., *Coxiella burnetti*, and *Leptospira* spp., while parainfluenza virus-3 antibody prevalence has increased in the WA population. While multiple disease syndromes were identified that contributed to mortality and, in combination, likely limited the ENS muskox population, further more holistic investigations of disease agents, trace minerals status, and nutritional factors in conjunction with intensive demographic and environmental analyses would provide a better understanding of factors that influence Alaskan muskox populations.

MUSKOX HEALTH ECOLOGY SYMPOSIUM



ABSTRACTS