

Contact Zones Between Expanding Muskox Populations And Dall's Sheep – An Emerging Disease Issue

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Abstract: Emerging diseases often result from changes in the ecology of a host, pathogen, or both. In wildlife, these are frequently anthropogenic in origin - e.g., host and/or pathogen translocation, habitat alteration, contact with domestic species, or climate change. In northern Canada, however, we may soon observe disease emergence resulting from natural movements of native and introduced wildlife populations. During the last 20yr mainland muskox populations have expanded their range into regions they have not occupied in recent history. We anticipate that continued expansion in the next few years will result in contact between: a) an introduced muskox population west of the Mackenzie River, and a native one east of the river; and b) the native muskoxen and Dall's sheep populations in the Mackenzie and Richardson Mountains. Native muskoxen, introduced muskoxen, and Dall's sheep each have their own characteristic parasite faunas. Some of their parasite species are transmitted between hosts, e.g., range overlap between the introduced muskoxen and Dall's sheep recently resulted in emergence of the sheep lungworm, *Protostrongylus stilesi*, in muskoxen. *Umingmakstrongylus pallikuukensis*, a common lungworm of native muskoxen, is currently absent from introduced muskoxen and Dall's sheep. We predict that, with contact, it will establish in introduced muskoxen and possibly in Dall's sheep. Other gastrointestinal and tissue parasites are also likely to be transmitted among the different host populations. Introduction of 'new' and resultant disruption of 'normal' parasite faunas in these host species may have detrimental effects. To evaluate the risk of disease emergence following contact among these host populations we are using field and laboratory studies. From historical parasite collections and ongoing post mortems we are identifying the parasite fauna and assessing the effects on hosts. Monthly or bimonthly fecal examinations are defining seasonal patterns of parasite shedding and providing insight into the epidemiology of various parasites. Future research includes experimental infections of thinhorn sheep to determine susceptibility to *U. pallikuukensis* and to *Teladorsagia boreoarcticus*, an abomasal parasite of muskoxen. Results from these studies will be used to assess the risk of parasite transmission between hosts, to predict the consequences of such an introduction, and to provide the basis for management decisions regarding preventing contact between the different host populations.