

The 12<sup>th</sup> North American Caribou Workshop,  
Happy Valley/Goose Bay, Labrador, Canada,  
4–6 November, 2008.

## Limiting factors for barren-ground caribou during winter – interactions of fire, lichen, and snow

Tara Barrier & Chris Johnson

University of Northern British Columbia, Prince George, BC, Canada (first author: ebyrulz@gmail.com).

Numbers of barren-ground caribou across the Canadian central Arctic have declined since the late 20<sup>th</sup> century. For example, the Bathurst herd has decreased in abundance from 472 000 ( $\pm 72\ 900$ ) caribou in 1986, to 128 000 ( $\pm 27\ 300$ ) animals in 2006. Traditional ecological and scientific knowledge suggests that the Bathurst herd may be in the downward phase of a 30 to 60 year cyclic trend; however, the mechanisms that drive and limit this population are not well understood. While we cannot dismiss forage limitations to caribou during summer, studies suggest that the supply and accessibility of forage on the winter range can markedly affect population dynamics. Considering the high numbers of Bathurst caribou during the 1990s and the above average burn rates during the same period, a deficiency of winter forage may have contributed to the current decline. I will use Resource Selection Functions (RSF) to investigate the influence of fire on the distribution of Bathurst caribou during winter. A RSF is a statistical model that allows one to quantify the large-scale selection strategies of animals and calculate the relative probability that an individual or group will use a resource unit. I will use satellite collar data from Bathurst cows (1996 to 2008) and habitat attributes such as vegetation cover, age of burn, snow conditions, and sources of human disturbance to generate RSF models. These models will allow me to identify important winter range habitats and develop quantitative relationships between recent burns and the distribution of caribou. Habitat relationships derived for the Bathurst caribou may have application to other central arctic herds experiencing similar dynamics and possibly increases in fire frequency resulting from climate warming.