

Klaczek, M. R., C. J. Johnson, and H. D. Cluff. 2015. Den site selection of wolves (*Canis lupus*) in response to declining caribou (*Rangifer tarandus groenlandicus*) density in the central Canadian Arctic. *Polar Biology* (in press).

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Abstract

Wolves (*Canis lupus*) that den on the tundra of the central Arctic prey primarily on migratory barren-ground caribou (*Rangifer tarandus groenlandicus*). Prey densities in the vicinity of den sites are low, however, for a period each summer when caribou migrate to their calving and post-calving ranges. Eskers provide substrate where wolves can excavate den sites, but these landforms make up only a small proportion of the tundra landscape. We investigated the factors that influenced den site selection for wolves on the summer range of the Bathurst caribou herd, Northwest Territories, Canada. We used a long-term data set (1996–2012) of wolf den locations to develop a series of resource selection function (RSF) models representative of broad land-cover types, esker density, and annual variation in seasonal prey availability. We compared a temporal sequence of RSF models to investigate whether wolves altered selection patterns in response to a 90 % decline in caribou abundance (1996–2012). Eskers were selected denning habitat; the distribution of eskers may be limiting when wolf density is high. Covariates representing the seasonal distribution of caribou from early (5–18 July) and late (19 July–22 August) summer were the best predictors of den occurrence; these areas represented reliable availability of caribou over the greatest portion of the denning period. As the caribou herd declined, the seasonal summer ranges contracted northward towards the calving ground. Wolves did not exhibit a similar response. As such, the period of spatial separation between breeding wolves at den sites and the main distribution of caribou increased when herd abundance was low. The lack of a behavioural response is consistent with wolf–prey dynamics observed in other studies that suggest wolves strive to maintain consistent territories even following large decreases in resource availability. Such behaviours reduce fitness and have implications for pup survival and population growth.