A. Poster on value of wolf observations from caribou surveys as an index of wolf abundance. Frame and Cluff, presented at 13th Arctic Ungulate Conference in Yellowknife, Aug. 2011.

How Many Wolves?

Can we use observations from caribou surveys as an index?

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ABSTRACT

Recent declines of northern caribou herds have raised concern about the impact of predation by wolves. Recent caribou management plans have recommended that wolf abundance be monitored. One such approach is a winter wolf sighting index derived during surveys of caribou distribution and composition.

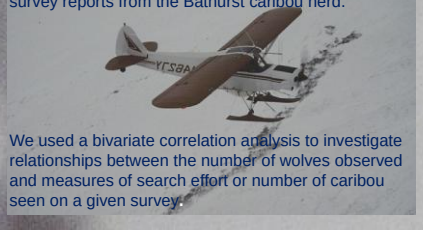
We conducted a meta-analysis of wolves sighted during 17 late winter caribou surveys to investigate whether these sightings can be used to monitor trends in wolf abundance. The number of wolves observed from year to year was variable with no apparent pattern. Search effort and number of caribou seen did not influence the number of wolves observed.

Detectability of wolves likely contributed to the variation in wolf sightings among surveys.

Sightings must also be calibrated against wolf abundance estimates before this technique can be used as an acceptable index of abundance. We suggest the use of a random stratified survey for estimating wolf abundance in migratory caribou range.

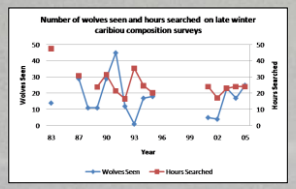
METHODS

Wolf observations, the number of caribou seen, and the hours or distance searched were extracted from survey reports from the Bathurst caribou herd.

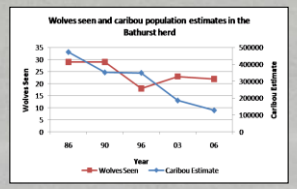


We used a bivariate correlation analysis to investigate relationships between the number of wolves observed and measures of search effort or number of caribou seen on a given survey.

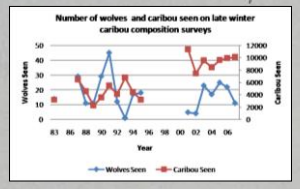
RESULTS



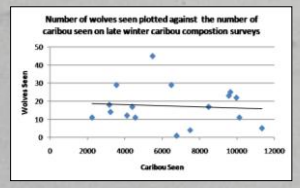
No relationship between wolves observed and search distance.
(Pearson correlation= 0.39, R^2= 0.15, P= 0.119)



Interestingly, wolves observed during aerial caribou surveys appear not to be influenced by caribou population numbers.



The lack of a pattern suggests the number of wolves observed is not related to the number of caribou seen.



No significant relationship between the number of wolves seen and number of caribou seen on a given survey.
(Pearson correlation= -0.19, R^2= 0.035, P= 0.39)

DISCUSSION

Because search effort or the number of caribou seen was not correlated with the number of wolves sighted, some other factor must be influencing the number of wolves seen.

While we do not know if the number of wolves observed during caribou surveys is representative of wolf abundance, it is still possible that changes in the number of wolves observed do represent wolf population changes.

Although we are unable to confirm whether observations made during caribou surveys accurately represent wolf abundance, with adjustments (detectibility, survey design) combining wolf and caribou surveys could still be a viable tool to track relative wolf abundance.

However, combining wolf survey design requirements within caribou survey designs may be problematic. Separate surveys may be best.

Sightings of wolves need to be first calibrated against abundance estimates.

Once calibrated, wolf sightings during caribou surveys could be a possible index of change in abundance with measurable confidence.

Because migratory wolves do not exhibit fidelity to winter ranges as territorial wolves do, the same aerial survey techniques used to estimate population size of other non-territorial species should work. Becker et al. (1998) described the difficulty of stratifying landscapes for wolves and suggested considering harvest records and prey distribution when doing so.

Frame et al. *(in prep.)* demonstrated that, at a habitat scale, migratory wolves select for areas near caribou, in winter. Therefore, the stratification for a wolf survey should be based on the relative abundance of caribou, the wolf survey could be done immediately following a caribou survey when their distribution and relative abundance is known. A grid based stratified random survey as used by Matson et al. (2009) could be conducted within days of a caribou survey and would produce estimates of wolf and caribou density.

LITERATURE CITED

Becker, E. F., et al. 1998. A population estimator based on network sampling of tracks in the snow. *Journal of Wildlife Management* 62:968-977.

Mattson, I. J. K., et al. 2009. Winter survey of Bathurst caribou and associate wolf distribution and abundance. Manuscript Report. Government of the Northwest Territories, Environment and Natural Resources.