

Estimating Abundance and Trend of the Qamanirjuaq Mainland Migratory Barren-Ground Caribou Subpopulation - June 2017.

Government of Nunavut
Department of Environment
Technical Summary – No: 01-2018

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1st June 2018



ABSTRACT

We set out to obtain a current abundance estimate and trend of the number of females in the Qamanirjuaq herd of barren ground caribou then extrapolate that estimate using fall composition studies to a whole herd estimate. In June 2008 the Government of Nunavut estimated 344,078 (95% CI=56,870; CV=8.1) adults and yearlings. A second survey flown in June 2014 estimated 264,718 (95% CI=44,084; CV=8.3) adults and yearlings. The reduction in abundance between June 2008 and June 2014 tested positive for significance (DF=71.3; T=-2.23; P=0.029) suggesting a 23% decline over the 6 years between estimates. The most recent abundance estimate, flown in June 2017, estimated 288,244 (95% CI= 46,123; CV=7.8) adults and yearlings. Total number of caribou estimated on the calving ground, however, was 262,272 (SE=16,746) in June 2014 and 252,060 (SE=15,493) in June 2017. Weighted log-linear regression of the adult female estimates from 2008, 2014, and 2017 estimates suggest a non-significant decreasing trend with a yearly λ estimate of 0.98 (CI=0.94-1.01) suggesting a longer term declining trend of 2% (CI=-6% to +1%) per year. A simulation approach was used to further explore potential trends. Random estimates were generated based on the confidence intervals for the 2008, 2014, and 2017 surveys. Regression lines were then fit to the randomly generated estimates for 1000 iterations. The resulting distribution of trend estimates demonstrates that the majority of trend estimates suggested a negative trend ($\lambda < 1$). The mean λ estimate in this case is 0.975 (percentile 95% CI=0.95-1.00) which is similar to that obtained from regression analysis.

Past calving ground photo surveys have relied on the assessment of breeding females to estimate and track abundance in mainland migratory barren-ground caribou subpopulations such as the Qamanirjuaq subpopulation. An examination of the reliability of breeding female status has indicated a between year variability within the Qamanirjuaq subpopulation that could reduce estimate reliability and thus accuracy and precision. The use of the annual core calving area by female caribou has been found to be a much more reliable metric, as past surveys of the Qamanirjuaq subpopulation have indicated strong affiliation of females, regardless of their breeding condition, to the core calving area.