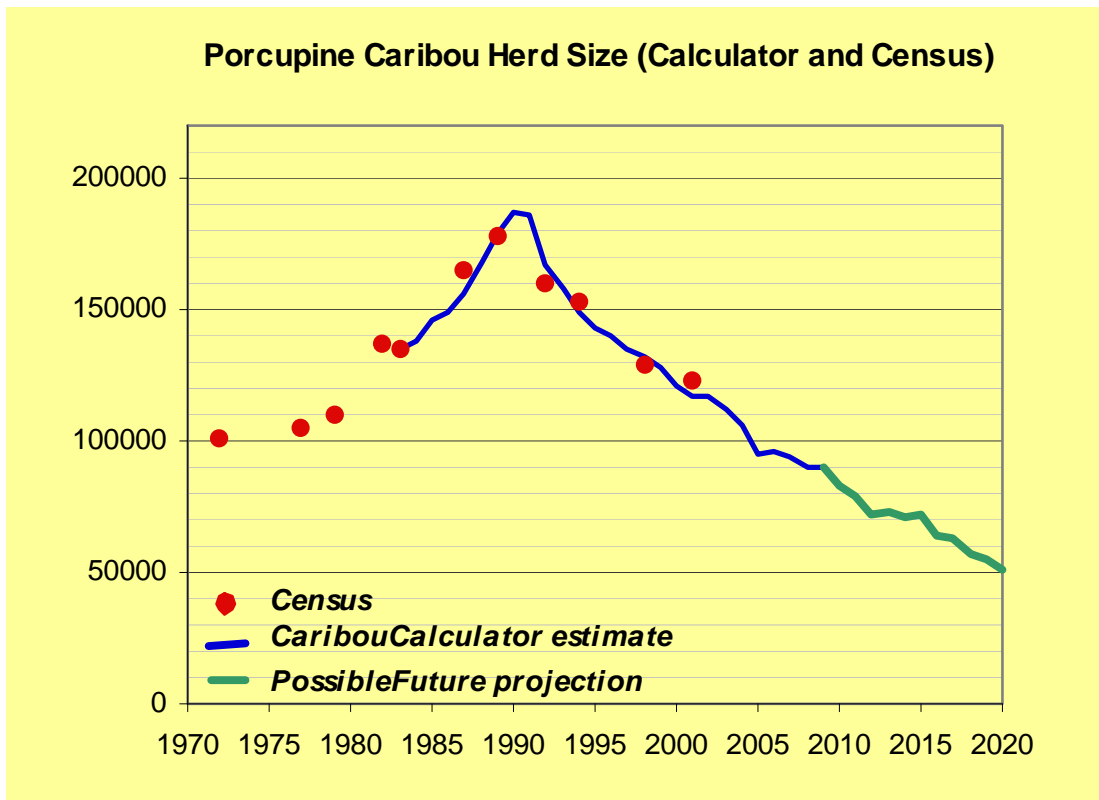


# Population Trends in the Porcupine Caribou Herd



## ***Historical and Future Population Trends***

Past - The Porcupine Caribou herd increased from about 100,000 animals in the early 1970s to 178,000 in 1989. The herd started to decline between 1989 and 1992.

The last time the herd was counted was in 2001 when there were 123,000 animals; 3 per cent of the population had been lost every year since 1989. There are no confidence intervals available for these estimates.

Present - Biologists have continued to monitor the birth rate, early calf survival and 9-month old survival every year since 2001 and have been able to estimate adult cow mortality from radio-collar data.

A model of likely population growth rates developed from the data suggests that the herd continued to decline and may now be about or lower than 100,000 animals, a level similar to the early 1970's.

It is important to realize that this model is still under development and that in its current form it was intended to be used as a discussion tool, not as a basis for decision-making.

There are limitations on its precision and that management decisions take into account the uncertainties associated with biological field data, and the significant unknowns of total herd-wide harvest totals or sex ratio.

We need to do more work on this model before we can say with confidence what the herd will do under different management scenarios.

## ***How the Population Model Was Developed***

The following outlines the model and assumptions used to estimate the current population.

The reported harvest was from the only three years (1992, 1993 and 1994) that harvest information was collected across the range of the herd.

The model incorporates:

- calves born each year (birth rate),
- population size from post-calving photo census (late June / early July),
- calf survival (first month of life, and over-winter),
- annual reported harvest (4,000),
- estimated wounding loss (15%),
- body condition,
- calving locations.

The model tracks both sexes for calves, yearlings, 2-year sub adults and adults (3-years and older).

It computes the number of calves born each year (from pregnancy rates and the number of cows) and how many of the calves survive their first month of life.

It uses input values for adult mortality (from natural causes, hunter harvest and wounding losses).

The harvest can then be varied to see a predicted effect on the population; increase in number of bulls taken; and changes in wounding loss.

The model makes several assumptions.

- Missing data estimates are based on typical historical values.
- The model trends fit the data that was available,
- Mortality varies from year to year (varies around a long term average),
- Sub adult females (2-year olds) have relatively low parturition rate ( ~4%),
- Percent of breeding females (3 years and older) varies from year to year (varies around a long term average),
- Harvest is additive to natural mortality, and
- The number of bulls in the population is not a limiting constraint on the proportion of cows conceiving in the fall.

Some limitations on the model include difficulty in measuring accurate natural mortality as sample sizes of collared animals are not large, yet herd population trends are sensitive to small changes in adult cow mortality. Also, the data related to harvest are not well documented at a herd-wide level, and wounding loss is poorly understood.

Based on historical information on productivity and natural mortality the model predicts that if harvest continues at current levels, the herd will decline to under 50,000 caribou by 2020 (11 years).

The model uses the status quo for harvest (4,000 caribou of which 40% are bulls and 60% are cows) and a 19% natural adult cow mortality, excluding harvest.

The adult cow mortality during the increasing phase (1985-1989) was 15% and during the decreasing phase (1989-2001) it was 17%.

A value of 19% is used on future projections to reflect the anticipated effects of climate change and increased disturbances due to development.

This is consistent with the precautionary principle, the Yukon government's obligations under the land claims agreements to ensure conservation, optimum long term productivity of the herd, sustainability of the herd, and a sustainable harvest.

Doing nothing or continuing with the status quo is inconsistent with the definition of conservation, the precautionary principle and the Yukon Government's management goal for the Porcupine Caribou herd: to respect conservation principles, ensure sustainability and productivity, stop the decline and promote recovery of the herd.