# COMPOSITION OF THE BEVERLY CARIBOU HERD IN THE FALL OF 1980

D.C. HEARD

N.W.T. WILDLIFE SERVICE

1982

File Report No. 26

## ABSTRACT

The objective of this work was to determine the sex ratio and calf to female ratio in the Beverly caribou herd in October 1980. Of the 1,580 caribou over one year old classified from the ground, 56.7% were female - slightly less than observed during the last classification count conducted in 1978. From the ratio of 51 calves per 100 females, I estimated that 72% of the calves born in June 1980 were still alive during these counts. This calf to female ratio is identical to the mean value observed in other populations in other years but greater than observed in the Beverly herd in 1978. The number of caribou estimated on the 1980 calving ground was extrapolated to a total pre-calving herd estimate of 97,000 caribou.

# TABLE OF CONTENTS

# LIST OF TABLES

# INTRODUCTION

The size of the Beverly barren-ground caribou (Rangifer tarandus groenlandicus) population (Bergerud 1978) is extrapolated from an estimate of the number of breeding females on the calving ground (Heard 1980). This calculation requires an estimate of the herd's sex ratio. Sex ratio is best determined during the rut in mid-October when both sexes are most likely to be together in representative proportions.

The number of breeding females on the Beverly herd's calving ground dropped from around 68,000 in 1971 (Heard and Decker 1980) to about 31,000 in 1980 (Gunn and Decker 1982). A major contributing factor to the decline was excessive hunting, most notably the killing of over 14,000 caribou in northern Saskatchewan during the winter of 1979/80 (Caribou Management Group 1980). Although no data were available, Saskatchewan biologists felt that the 1979/80 kill was biased toward females (Kowall pers. comm.). If they were correct, the decline may accelerate.

The size of the Beverly herd could be increased if wolf numbers were reduced (Caribou Technical Committee 1979). An expected effect of wolf control would be an increase in calf survival. The effect of wolf control could be tested by comparing calf survival before and after control.

The objectives of this project were therefore:

1. To determine the sex ratio so that size of the Beverly herd in 1980 could be estimated and compared (one-tailed test) with herd composition in 1978; and

## METHODS

On 21 and 22 October 1980, I flew in a Cessna 337 aircraft with 3 observers to find large groups of Beverly herd caribou which were accessible by helicopter from Stony Rapids, Saskatchewan. There were 5 days between the end of reconnaissance and 5 November 1980 when the weather was suitable for flying. On those days, myself and Cam Elliott (and on 3 Novemver, Ed Kowall) flew from Stony Rapids to areas of caribou concentration in a Bell 206 helicopter. Within those areas I chose sampling locations where the number of caribou and the rate and predictability of their movements would maximize sample size.

From observation points on the ground we identified the sex and age of each caribou as the animals moved past. Unless the penis was visible, sex identification was based on the presence or absence of a vulva. Age categories were calves, yearlings, adult cows, mature bulls and young bulls. Calves were distinguished by their small body size and rounded skull profile. Yearlings were larger animals with a straight skull profile. Young bulls were males carrying antlers less than 90 cm long.

When necessary, caribou were viewed through binoculars or a 20 or 25 power spotting scope. Results were recorded in a notebook or on cassette tape.

Because daily sample sizes differed by more than one order of magnitude, I computed estimates as weighted means and estimated variances after Snedecor and Cochrane (1967) and Heard and Decker (1980).

Table 1. Composition of the Beverly caribou herd in fall 1980.

| Date | Location | Cows | Calves | Bulls | Yearlings | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | | | | males | females | unknown | |
| 26 Oct. | Coventry L. | 16 | 9 | 8 | 1 | 1 | 2 | 37 |
| 29 Oct. | Labyrinth L. | 164 | 106 | 137 | 11 | 11 | 12 | 441 |
| 31 Oct. | Selwyn L. | 239 | 145 | 211 | 31 | 22 | 21 | 669 |
| 3 Nov. | Flett L. | 308 | 177 | 189 | 22 | 34 | 23 | 753 |
| 4 Nov. | Moss L. | 56 | 17 | 39 | 8 | 14 | 0 | 134 |
| Total | | 783 | 454 | 584 | 73 | 82 | 58 | 2034 |

# DISCUSSION

## Distribution and Movements

In 1980, caribou migrated along the same routes as in 1978 and 1979 but they were about 2 weeks and 180 km behind their 1978 schedule and about 3 weeks and 270 km behind 1979 (R. Decker pers. comm.). Caribou reached the N.W.T.- Saskatchewan border by the third week in October 1978 (Heard and Decker 1980), by mid-October 1979 (Kowall pers. comm.) and by 5 November 1980.

The Beverly herd apparently remained further north throughout the summer than in previous years. The herd is usually near Lynx Lake in late August (Hunnisette pers. comm.) but in 1980 the caribou were at Dubawnt Lake 200 km to the northeast (unconfirmed pilot report).

When I was in the field in August 1980, they did not appear to have passed Lynx Lake or the Talston River as stated by Cooper (1981).

## Classification Counts

The sex ratio observed in 1980 (76 bulls per 100 cows) was similar to the 1978 estimate of 70 bulls per 100 cows (Heard and Decker 1980). The change in sex ratio was in the expected direction but the difference between years was not significant ($t=0.66$, $df=11$, one-tailed test, $p>.1$). These data provide weak support for the suggestion that the 1979/80 hunter kill was biased slightly toward females. Using the 1980 sex ratio, the 1980 calving ground census (Gunn and Decker 1982) was extrapolated to a total herd population estimate of 97,000.

Table 2. Fall calf and yearling ratios from selected caribou herds.

| Herd | Calves:100 $1^{+}$ year old females | Yearlings:100 cows | Source |
|---|---|---|---|
| Beverly 1980 | 51 | 27 | This study |
| Beverly 1978 | 30 | 28 | Heard and Decker 1980 |
| Kaminuriak 1977 | 63 | 17 | Heard 1980 |
| Bathurst 1977 | 62 | 20 | Heard field notes |
| Bathurst 1978 | 40 | 19 | Heard field notes |
| Porcupine 1977 | 48 | 31 | Davis 1978 |
| Western Arctic 1961-78 | 43 | 20 | Davis et al. 1980 |
| Mean | 51 | 23 | |

## RECOMMENDATIONS

The success of fall classification counts is related to the accessibility of caribou. Helicopters can go only a relatively short distance before refuelling. It is therefore essential to cache fuel along the traditional caribou migration routes. I was fortunate this year in being able to buy fuel cached by Polar Gas. Many hours were spent commuting from Stony Rapids. This was expensive and used up precious hours of daylight. Future work should be done out of a well equipped field camp such as the one at Forestry Lake.

If money is allocated for periodic, not just initial, fixed-wing reconnaissance flights, the quality of the results would be increased. Larger samples could be obtained and more importantly, a wider variety of locations could be sampled.

Classification counts should commence by 16 October to be sure of classifying animals during the peak of the rut. One cannot rely on caribou being evenly mixed once the rut is over.

## PERSONAL COMMUNICATIONS

Decker, Robert, Arctic Land Use Research Technician, Department of Renewable Resources, Yellowknife, Northwest Territories.

Hunnisette, Gary, Biologist, Renewable Resources Training Program, Fort Smith, Northwest Territories.

Kowall, Ed, Biologist, Department of Northern Saskatchewan, Prince Albert, Saskatchewan.