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Progress Notes contain *interim* data and conclusions and are presented as a service to other wildlife biologists and agencies. The notes will appear in a summary volume at the end of the calendar year.

POPULATION ESTIMATES OF BARREN-GROUND CARIBOU ON THE CANADIAN MAINLAND FROM 1955 TO 1967

by D.C. Thomas, Department of Zoology, University of British Columbia, Vancouver 8, British Columbia;
G.R. Parker, Wildlife Biologist, Canadian Wildlife Service, P.O. Box 175, Churchill, Manitoba;
J.P. Kelsall, Supervisor, Mammalogy Research, Canadian Wildlife Service, Western Region, 10015 - 103 Avenue, Edmonton, Alberta; and
A.G. Loughrey, Superintendent, Canadian Wildlife Service, Eastern Region, 293 Albert Street, Ottawa 4, Ontario.

This progress note compares the latest estimates of the barren-ground caribou population with the results of earlier surveys.

It was not possible to make reliable estimates of the total barren-ground caribou population until aerial survey methods were developed and refined in the late 1940's. In 1949 Banfield (1954) estimated there were 668,000 barren-ground caribou on the mainland of Canada between the Mackenzie River and Hudson Bay. In 1955 Kelsall and Loughrey (1955) estimated the population in the same area to be 278,900 animals. While the explanation for this drastic decline is not complete, it is believed that excessive human utilization, poor calf survival, and forest fires on the winter range were the major causes. Research and management were intensified when the decline was revealed.

In 1967, D.C. Thomas and G.R. Parker estimated the population of barren-ground caribou to be 357,500 animals in the same area as in previous surveys, but excluding northern Keewatin. In April, D.C. Thomas surveyed caribou west of 102 degrees longitude (District of Mackenzie, northern Saskatchewan, and northern Manitoba) as they gathered to migrate to the summer range. Counts were made by aerial transect, total count, and aerial photographs. G.R. Parker surveyed caribou east of 102 degrees longitude (Manitoba-Keewatin herd) in June, July, and October of 1967, using aerial transect, aerial photographic, and total count methods, respectively. Both Thomas and Parker used the ratio method to estimate the number of adult bulls outside the area surveyed.

Results of the 1955 and 1967 surveys are listed in Table 1. Kelsall and Loughrey divided the range into seven geographical areas; Thomas and Parker divided the caribou into four populations related to calving regions. Thomas and Parker omitted the Thelon Game Sanctuary,

where no caribou were found, and did not survey northern Keewatin. Caribou tend to return to the same calving areas, although winter ranges may vary considerably. Shifts of whole herds or portions of herds from one calving area to another do occur. On the basis of distribution, composition, and movements, the Beverly and Bathurst populations were further divided into several herds during late winter of 1967. Figure 1 shows the distribution of caribou surveyed by Thomas in March 1967, together with the estimated population in each herd.

Table 1 Comparison of 1955 and 1967 population estimates of barren-ground caribou in comparable areas

Area	Population	1955	1967
North of Great Bear Lake	Bluenose	5,000	19,000
East of Great Bear Lake North of Great Slave Lake	Bathurst	59,500	144,500
Northern Saskatchewan Southern Mackenzie	Beverly	32,400	159,000
Northern Manitoba Southern Keewatin	Kaminuriak	151,400	35,000
Northern Keewatin	_____	21,200	_____
Thelon Game Sanctuary	_____	9,400	0
Total		278,900	357,500

It is apparent from Table 1 that in 1955 the animals were mainly distributed in northern Manitoba and southern Keewatin, with the remaining herds well scattered throughout the District of Mackenzie. In 1967, most of the Manitoba-Keewatin herd appeared to have moved into Mackenzie. Kelsall (in press) suggests that with high population numbers irregular east-west shifts may occur. These may include a change from one calving ground to another. Because of these shifts, a comparison of the totals is more meaningful than a herd to herd comparison.

Further observations on aspects of the 1967 population survey in the District of Mackenzie are as follows:

1. In March the main component of each population was distributed in the forest-tundra zone near tree line, with the mature bull segment located deeper in the forested zone.

2. Herds in more northern latitudes wintered closer to the tundra and migrated earlier, as indicated in Table 2 and Figure 1. It is believed that the March-April distribution and time of migration were influenced by snow depth and density. Snow depth was observed to be less in the northwestern portion of the range than in the southeastern portion. In those areas where there was little snow the caribou did not seem to venture deeply into the forests in search of food.

Table 2 Movement of caribou herds in relation to winter distribution

Population	Degrees of latitude, March 1967	Miles from tree line, March 1967	Approx. date one-half the herd reached the tundra
Bluenose	68	0	April 10
Bathurst herd 2	67	0	April 25
Bathurst herd 1	66	10-20	April 25
Beverly herd 1	62	40	May 9
Kaminuriak	60	80	May 15

3. Forest fires have destroyed a large proportion of former caribou winter range. In Thomas' opinion, the best winter range is within 100 miles of the tree line.

4. Herd composition counts were obtained by aerial photographs. After adjusting the estimates for the absence of adult bulls, the percentage of calves ranged from 9.0 per cent of total animals in Bathurst herd 1 to 14.1 per cent in the Bluenose population. The over-all percentage of calves was 11 per cent. This figure refers to calves born in 1966 which had survived their first winter.

5. Autumn and winter hunting mortality accounted for about 10,000 animals. Kelsall (1960) estimated the harvest in 1955 at 73,000 animals.

6. Wolves were not numerous among any of the herds except Bathurst herd 1. It was estimated that in March and April at least 200 wolves were associated with this herd.

7. Barren-ground caribou have increased in numbers since the 1955 range-wide survey. Based on survey estimates the average annual increase for the 12 years between 1955 and 1967 has been 2.1 per cent.

8. Based on a recruitment rate of 11 per cent, and an estimated adult mortality of 9 per cent, it is believed that caribou in the survey region increased about 2 per cent in 1966-67.

The July 1967 census of the Manitoba-Keewatin caribou provided an estimate of 31,578 animals, which was the highest of three counts. It is believed that a realistic estimate of the Manitoba-Keewatin or Kaminuriak population is 30,000 to 35,000 plus a calf crop of over 5,000. The 1967 calf increment was estimated at 23 per cent of the total population in June and at 16 per cent in October. By November 1, 1967, the calf increment was estimated at 16.9 per cent. This slightly higher figure is probably due to a partial segregation of adult bulls from the main cow-calf bands.

The number of animals estimated for the Manitoba-Keewatin or Kaminuriak population is considerably lower than the 1955 estimate. It is believed that many animals may have joined the Beverly population some time between 1955 and 1967. This situation may well be reversed in the future.

In summary, the total population of barren-ground caribou on the mainland of Canada is conservatively estimated to be 357,500 animals. Given a good calf increment throughout the range, a reduction in human kill, and a reduction in forest fire damage, a slight continuing average annual increase can be predicted.

Literature cited

Banfield, A.W.F. 1954. Preliminary investigation of the barren-ground caribou. Canadian Wildlife Service, Wildlife Management Bulletin, Series 1, No. 10A and 10B.

Kelsall, J.P. and A.G. Loughrey. 1955. Barren-ground caribou resurvey - 1955. Manuscript report on file, Canadian Wildlife Service, Ottawa. 38p.

Kelsall, J.P. 1960. Co-operative studies of barren-ground caribou. Canadian Wildlife Service, Wildlife Management Bulletin, Series 1, No. 15.

Kelsall, J.P. The migratory barren-ground caribou of Canada. Canadian Wildlife Service, Monograph Series No. 3. In press.