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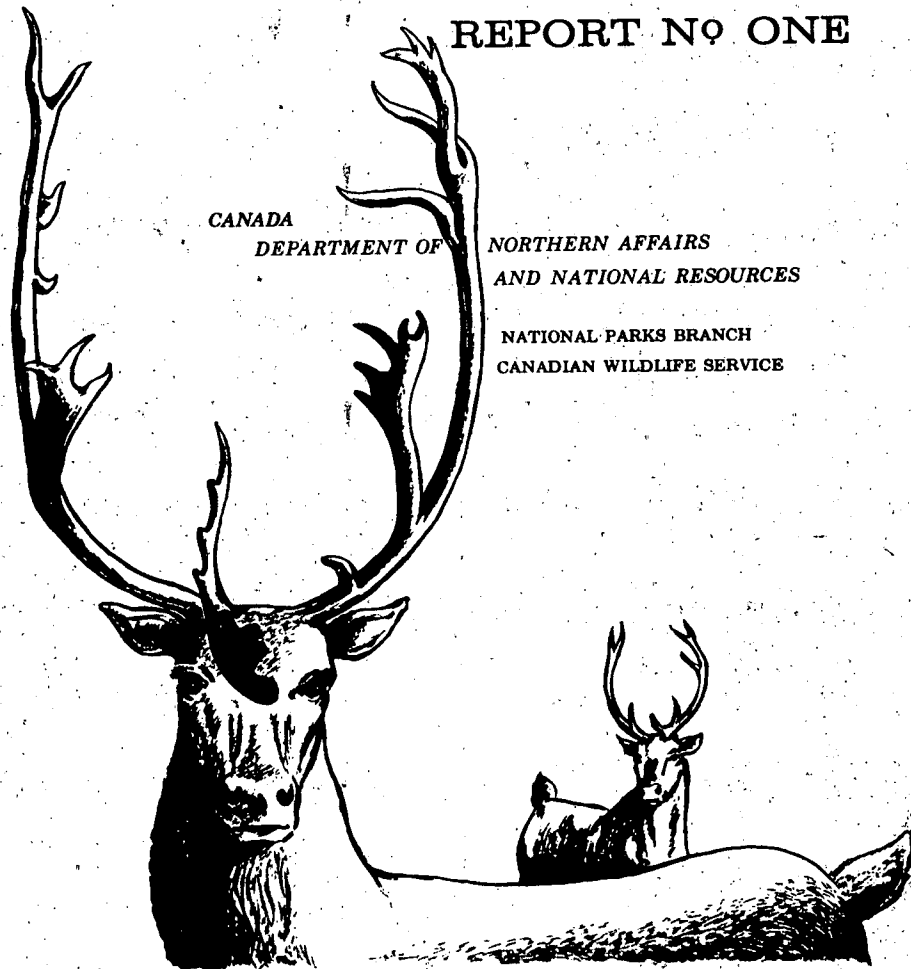
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**THE  
BARREN-GROUND  
CARIBOU**

**COOPERATIVE INVESTIGATION 1957-58**

REPORT NO ONE

CANADA  
DEPARTMENT OF NORTHERN AFFAIRS  
AND NATIONAL RESOURCES  
NATIONAL PARKS BRANCH  
CANADIAN WILDLIFE SERVICE



*Mayhew*

BARREN-GROUND CARIBOU RESEARCH PROGRAM

April 1 to June 30, 1957.

Report No. 1

by John P. Kelsall

Introduction

An eighteen-month barren-ground caribou research program commenced officially on April 1, 1957. The Technical Committee on Barren-Ground Caribou had suggested a major base of operations at Churchill, Manitoba. For financial and practical reasons, however, the location was changed to a summer base at Yellowknife, Northwest Territories, and a tentative winter base at Stony Rapids, Saskatchewan. The items of greatest importance dealt with during the winter of 1956-57 were the acquisition of necessary equipment, the location of suitable personnel, and the choice of a study herd.

Equipment. Materials and supplies for the research program were ordered during the winter of 1956. With relatively few exceptions all necessities were on hand at Yellowknife for the start of the program. Most of this tedious but necessary work was undertaken by the Ottawa office of the Canadian Wildlife Service.

Personnel. While all personnel needed for the research program have not yet been named, we are fortunate in having adequate staff for the next several months' work. Personnel in the field include the following: John P. Kelsall, Canadian Wildlife Service, Field Co-ordinator; A.G. Loughrey, Canadian Wildlife Service, Field Biologist; A.J. Wilk, Canadian Wildlife Service (under contract), Field Biologist; F.W. Terry, Saskatchewan Game Branch, Game Management Officer; D.C. Thomas, Canadian Wildlife Service (under contract), Field Assistant.

We are also sure of additional personnel as follows: E. Kuyte, Saskatchewan Game Branch, Ecologist; Harold Gibbs, Canadian Wildlife Service, Pathologist; J.A. Mills, Canadian Wildlife Service, Range Manager.

Additional field assistants can be secured as required from a number of sources. Another field

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biologist, W.A. Pruitt, will be taken on strength September 1 under contract.

Choice of Study Herd: Churchill was originally chosen as a major base of operations because the 1955 caribou re-survey indicated a greater number of caribou within range of that point than of other potential bases. In mid-winter of 1956-57 it was decided to choose a central herd if there should be one of sufficient size. Surveys and reports during the winter on a large herd wintering in northwestern Saskatchewan indicated a suitable study population. Events have proved the wisdom of that choice, as will be seen by this report.

#### Itinerary

Throughout the winter of 1956-57 F.W. Terry, residing at Stony Rapids, Saskatchewan, gathered information on the study herd. In early April he was joined by Wilk, and throughout that month the two men continued to gather information regarding human utilization, movements, and populations of the caribou involved. Considerable data were gathered during the course of wolf-bait mop-up flights during the latter part of the month, which Terry participated in.

Between April 17 and 22, a chartered ski-equipped aircraft was used to move more than 1,700 gallons of gasoline, naphtha, and aviation oil from Fort Reliance to six strategic locations in the barrens between Ennadai Lake in the south and an unnamed lake about half-way between Pelly Lake and the Thelon River. Game Warden C.E. Earl assisted. These caches are shown on Map No. 1.

During the period April 26 to 30 the author visited Uranium City and Stony Rapids and flew an eleven-hour survey to locate the study herd. On May 7 Thomas arrived in Yellowknife and for the next two weeks was occupied in studying caribou reports and gathering equipment for the coming field operations. On May 12 an extensive survey was flown by the author from Yellowknife to the Wholdaia Lake and Fort Reliance areas for the purpose of tracking the caribou in their northward migration. On May 16 Terry and Wilk arrived in Yellowknife. On May 19 the author made a long flight to Fort Reliance and Ennadai Lake for the purpose of tracking the study herd and choosing a suitable location for the first field parties. On May 23

the first field party, consisting of Wilk, Terry, and Thomas, was established on the barrens at Mosquito Lake. The locations of that and subsequent field camps are shown on Map No. 1 with numerals indicating the order of establishment. It is worth noting that the field crew started out the hard way. On arrival at the potential camp site they found a 30-mile-per-hour wind, with blowing snow almost completely obscuring visibility on the ground, and the temperature only 20° F. On May 29 the author visited the Mosquito Lake camp and later on the same day, in company with pilot Bud Marceau, lost the aircraft's undercarriage at a gasoline cache on Dubawnt Lake. On May 31 a successful radio transmission was finally made to Baker Lake. A Trans-Air Norseman moved the author and his pilot to Baker Lake until, on June 4, a Beaver aircraft from Yellowknife picked them up and returned them to Dubawnt Lake where the damaged aircraft was repaired. A return to Yellowknife via Mosquito Lake was made the same day.

Loughrey arrived in Yellowknife on June 3. On June 10 he left Yellowknife in a wheel-equipped Otter to join the field party. With him went biologist R.C. Stewart of the Canadian Wildlife Service who planned to work temporarily from the field camps on a wolf study project. After flying half-way to the camp, they were obliged to turn northwest in bad weather. They eventually landed at the Taurcanis Mine, where the Otter was equipped with skis. They arrived at Mosquito Lake on June 11, and on the same day pilot Marceau arrived with a ski-equipped Cessna aircraft to stay with the field parties. Before returning to Yellowknife, the Otter re-located the field parties in two separate camps some 30 miles north and west of Dubawnt Lake.

Between June 11 and 17 the weather permitted only sporadic flying, but good use was made of the aircraft with the field parties. During that time a start was made towards re-locating the field camps. Temporarily, Terry and Stewart with the bulk of the field equipment were moved to a lake at Longitude 102° 15', Latitude 64° 22'. Thomas and Wilk were placed at the southern extremity of Beverly Lake on Longitude 101° 30'. On landing at the old camp site at Longitude 102°, Latitude 63° 41', to pick up the last remaining load of gear, the aircraft again broke a ski leg and was seriously damaged. Loughrey and Marceau were thus left stranded. They were able to advise the Yellowknife office of their position on June 18, and on June 19 the author, with a mechanic and supplies, went out

to them in a ski-equipped Otter aircraft. Ice conditions were bad, and we were fortunate in being able to pick up Loughrey and Marceau with their gear and take them down to Beverly Lake, where Loughrey will remain for break-up with the two men already there. It was not possible to land the Otter at the camp site where Stewart and Terry were located but a message was dropped advising them of the existing circumstances.

At the time of writing it is planned to send in a float-equipped Beaver aircraft as soon as break-up permits. This should be some time during the first week in July.

#### The Study Herd

During the migration southward in October and November, 1956, it was apparent that a major group of caribou was entering northern Saskatchewan and extreme northeastern Alberta. Reports gathered through the winter indicated that large groups were wintering south of central Lake Athabasca and smaller numbers north of Stony Rapids and Black Lake. During flying in late April the animals were observed in full northward migration. That movement and subsequent movements of the herd are shown on Map No. 1. On April 28 more than 14,000 caribou were tallied crossing Lake Athabasca between Stony Rapids and Campsell Portage, and it was known that the herd extended south from the Lake for more than 50 miles. It was apparent that a major herd was being dealt with, and a tentative estimate of numbers was set at between 50,000 and 100,000. The movement progressed to the northeast on a front more than 150 miles wide. It was interesting to note that that front very closely followed the disappearance of snow from the ground in the spring thaws. On May 12 the animals were still moving strongly northeasterly and had reached tree-line. By June 7 the movement had proceeded nearly 200 miles farther and had changed direction to the north. At that time and later a split, shown on Map No. 1, was noted in the herd. The smaller group proceeded directly north to the west of the Thelon River and east of Artillery Lake. The movements of that group after June 7 are unknown. The larger group proceeded into the high country between Dubawnt Lake and the Thelon River.

Between June 11 and 17 the caribou continued to move strongly, although calving was actually taking

place. Movements at that time were toward Beverly Lake and the Dubawnt River between Beverly Lake and Dubawnt Lake. Transportation problems since then have made it impossible to re-locate the main body of the herd and it can now be found only by extensive survey flying in early July with float-equipped aircraft. On June 20 caribou were still present and widely scattered in small numbers south of the Thelon River between eastern Beverly Lake and Lookout Point. It seems possible (for the moment this is mere speculation) that the animals have dispersed over a very wide area and no longer form a herd as such.

Observations until June 11 strengthened the supposition that a very large herd of caribou was involved. Perhaps most significant is the fact that more than 13,600 caribou were seen on the ground moving through the Mosquito Lake camp during the first ten days the field party was there. It now seems unlikely that the herd totalled less than 100,000 animals.

While the study herd clearly wintered in northern Saskatchewan and Alberta in 1956-57, it is certain that no such numbers were in Saskatchewan, or indeed anywhere in the western Arctic, in the previous winter. In 1955-56 the majority of caribou wintered in northern Manitoba and the northeastern corner of Saskatchewan. There can be little doubt that the study herd includes large numbers that wintered in 1955-56 far to the east of their position a year later. Reports of the past few years have indicated a strong west to east population shift of nearly all western caribou herds. It is interesting to speculate that the recent data may indicate the beginning of a reverse population shift from east to west. Only time will tell.

#### Herd Statistics

For the past two years there have been indications that the herds of caribou wintering in Saskatchewan have not included a normal number of adult males. In 1955-56 in particular, natives, game officers and others reported very few bulls in the province. The same conditions prevailed in Manitoba. During surveys by the author and others, from February 18 to 22, 1956, bulls were seen in Saskatchewan but they appeared to make up less than 10 per cent of the total number of animals.

During the current work no large numbers of adult bulls have been noted. This does not necessarily mean that there are not more of them somewhere in the study herd, but their absence makes a difference in the percentages of other classes. During flying on April 26 to 28, 1957, more than 1,500 caribou were segregated. It was not possible to separate adult bulls from other classes but it was apparent that they made up less than 10 per cent of the total number. During the first two weeks on the ground at Mosquito Lake very few adult males were seen. Among 2,917 animals segregated only 138 were adult males. During a period in which a total of 14,442 caribou were seen only 189 were identified as adult males. It was not possible to classify many of the animals, but adult males are likely to be the most readily recognizable of any class.

The absence of males at Mosquito Lake is, of course, not surprising, since almost complete segregation of adult males and females is expected on the calving grounds. In 1951 the author saw only three adult males among 5,000 caribou on calving grounds at Bathurst Inlet. It does appear, however, that we would be justified in spending some money for the specific purpose of trying to find more adult males in the study herd.

In both 1955-56 and 1956-57, the calf crop among caribou wintering in Saskatchewan has been low, as it has been elsewhere. During flights in February, 1956, only 46 calves were seen in a total of 815 animals, i.e. 5.6 per cent. While the number of animals segregated was not large, it included a fairly good random sampling from the total area occupied by the caribou at that time.

The picture in the spring of 1957 has been somewhat confusing. Widely variable percentages were secured during individual calf counts in April. Percentages ranged from as low as 2 per cent in a sampling of 6,000 massed and migrating caribou to a high of more than 15 per cent in a much smaller sampling. Between April 26 and 28, the author ranged widely over the migrating herds and attempted to secure random and significant calf percentages. The results are believed to be fairly indicative, although the absence of mature bulls would tend to increase the calf ratio. Among 1,566 animals segregated there were 127 calves, i.e. 8.1 per cent.

The author is inclined to believe that a



further factor may have been operative to increase the calf percentage. Autumn and winter utilization by humans was high in Saskatchewan and humans almost invariably take adults in preference to calves. A close study of that factor in a herd of caribou near Yellowknife some years ago showed the ratio of calves to total number of animals increasing through the winter. The increase was directly attributable to selective shooting of mature animals by humans. It seems likely that the calf ratio of 8.1 per cent, is higher than it would have been had human utilization not been heavy.

At the Mosquito Lake camp site between May 24 and June 9, after the animals were beyond range of the spring hunt, which took place in early May in Saskatchewan, there were 447 calves among 5,230 segregated animals for a ratio of 8.6 per cent.

A calf ratio of 8.1 per cent (or 8.6 per cent as at Mosquito Lake) is poor. It is distressing to consider that even that figure is probably too high an estimate, because of selective human utilization and the absence of normal numbers of adult males. Similar disastrous figures have been secured on a country-wide basis in six of the past seven years. Indications are (see below) that the crop in 1957 will be no better.

To provide a surplus over natural mortality the calf crops should be between 5 and 10 per cent. This is admittedly a guess, but it is based on observation and deduction by a number of experienced field biologists. Human utilization is a variable factor, but has been seen to run as high as 50 per cent in extreme cases. Probably close to 7 per cent of the study herd were taken in Saskatchewan last winter. In order that the herds might merely hold their own, therefore, the calf crop would have had to be between 13 and 17 per cent.

The only ray of hope is the fact that high calf crops may occur in future. In 1952-53 calf crops were high and ranged from 20 to 29.9 per cent.

The field men have also attempted segregation of two-year-old animals (the calves born in the spring of 1955). The results are rather curious. Among 3,297 animals segregated there were 432 two-year-olds for a percentage of 13.1. This figure apparently does not agree with the percentage of 5.6, determined

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in February, 1956, or with other uniformly low calf ratios determined across the whole range that winter. It is possible that the segregations were not very accurate - they are indeed difficult to make. It also seems possible that there may be unusually high survival in that particular age-class. Some further investigation of this question is warranted and will be undertaken.

#### Human Utilization

In a letter dated May 1, addressed to the Chairman of the Senior and Technical Committees on Caribou Conservation, the author reported on the alarming human utilization among the study herd in Saskatchewan. The herd appears to be somewhat larger than was thought when the letter was written, but the situation reported on is still believed to be of prime importance in caribou management.

As long as human utilization of caribou approaches or surpasses the proved annual increment, human utilization is the factor of greatest importance in management. Until such time as human utilization can be brought well below annual increment, even such successful projects as our predator-control program are of secondary importance. No research program is needed to demonstrate that human utilization across the caribou range is too great and must be reduced. Until a reduction can be clearly seen, the value of the caribou ground research program, and in fact all other research programs on caribou, might very properly be questioned.

At the present time human utilization figures are not complete for the winter 1956-57, but they are sufficiently complete to give a fairly accurate idea of the over-all take. The known figures are shown in Table 1.

Table 1 - Recorded Caribou Utilization by Humans in Northern Saskatchewan and Alberta in Early Winter and Spring, 1956-57.

Settlement	October-November 1956	Late April-May 1957
Fort Chipewyan	300	?
Camsell Portage	) 500	200*
Uranium City		
Fond du Lac	400	250
Stony Rapids	534	) 900
Black Lake	640	
Totals	2,374	1,350

\* Personal estimate based on observation and interrogation.

The October-November kill shown is thought to be very accurate. The April-May kill is thought to be accurate as far as shown. However, the kill for five winter months was not reported.

The known kill is 3,724 animals. During the five months, for which human utilization figures are unknown, the kill probably was much reduced. It is difficult to assess the extent of that kill and the associated crippling loss, but the total of the two is believed to have been about 3,000 animals. The percentage of the total human take must have been very close to the calf percentage in the study herd; and an overall decrease in numbers for 1956-57 is probable.

Table 1 indicates that the final figures on the spring hunt may well equal those of the hunt in the previous October and November. Because pregnant cows were in the forefront of the migration that class of animals was most frequently shot. In the Stony Rapids and Black Lake area our field personnel did an

excellent job of sampling the spring kill. Despite a natural reluctance on the part of all the hunters concerned to report the shooting of pregnant cows, 65 adult cows were reported killed as against 46 adult bulls.

A further fact gathered by our field men in the same area is revealing, also. In a sampling of 18 hunters, 174 caribou were reported taken. However, of these hunters only 6 were treaty Indians. The other 12 hunters, who took 119 caribou among them, were either Metis or had white status. It is often argued that treaty Indians, by treaty, cannot be subjected to Provincial game regulations. However, there appears to be no reason why the regulations should not be applied to the Metis and whites when the need arises. This has long been the policy in the Northwest Territories and elsewhere. Persons other than treaty Indians should be obliged to set an example in conservation, even if they are not inclined to do so. If there are not existing regulations in Saskatchewan and elsewhere to stop the hunting of pregnant cows in spring, they should be enacted without delay.

It seems certain that Metis and whites were involved in the spring hunts at both Uranium City and Camsell Portage. At Fond du Lac, however, treaty Indians were the sole participants. Here 35 families took 250 caribou. Our field men are convinced that that take would have been much greater if the caribou had moved through that settlement in greater numbers. According to information received, a large part of the hunt at Fond du Lac was for the purpose of filling the Indian Affairs reefer with a supply of meat for summer use. If it was not possible to fill that reefer during the previous autumn and early winter, it should not have been filled at all. Presumably, someone with authority must have encouraged the Indians in their spring hunt to fill the reefer. This is very poor conservation.

In view of the known critical condition of the caribou population, it is apparent that the October-November kill in northern Saskatchewan was excessive. The number of animals taken then and during the winter months should have been more than adequate to feed the human population until well into the following summer provided meat was not wasted, abandoned or fed to dogs. Even if it were not sufficient, the point has long since been reached when the welfare of the caribou herds is

more important than the immediate desires of the hunters. If the caribou is to be maintained as a renewable natural resource, which it should be, the human population must be fed from other sources during such critical periods.

Further reports on human utilization will be forthcoming as the ground research program proceeds. Meanwhile, it is hoped that the above, in conjunction with the previously-referred-to letter of May 1, will be sufficient to stimulate the Administrative Committee to action. It is perhaps unfortunate that Saskatchewan should be the only province dealt with in this report; but no discrimination is intended. Comparable situations have been encountered in recent years in both Manitoba and the Northwest Territories. In all those areas, we believe that the necessary legislation already exists, and sufficient personnel are available to take care of any such situation if it should arise. However, careful instructions should be issued to enforcement personnel, throughout the caribou range for the prevention of abuses in future.

#### General Field Results

At the time of writing it is not possible to give a comprehensive report on the data gathered by the men in the field camps, as they have not yet been able to submit written reports. The following random bits of information are mostly based on conversations which the author has had with them.

Since the first field camp was established at Mosquito Lake, all the men have been in daily contact with caribou and the first calf was seen on May 31. Large numbers of calves have been seen since that time. It is reported that there has been very heavy mortality among young calves, probably due in large measure to violent weather and associated factors. A number of dead young calves have been collected and autopsied. Mortality has doubtless been aggravated because the caribou did not pause during the calving period, as they were expected to, but rather migrated continuously. A number of older caribou, with some pathological specimens and data, have been collected.

The field crews have been fortunate in securing data on predation. Wolves have been seen with greater frequency than that recorded by previous field workers. For the first time wolves have been seen

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killing caribou. Two or three wolf dens have been discovered, and it is clear that young calves have featured largely in the wolf diet at the den sites. It is not known at the time of writing whether the calf remains found at den sites were from animals killed or from the many animals which it would be possible to find dead.

Some data have also been gathered on the activities of wolverine and grizzly bear. The parties have been fortunate in seeing two groups of the rare barren-ground grizzly. A female with two cubs was seen on June 11, and a female with one cub was seen near a gasoline cache on the Clark River at a later date. It is interesting to note that the bear at the Clark River cache chewed open and apparently drank 11 quarts of No. 80 aviation oil.

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The barren-ground caribou  
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