



CARIBOU PENETRATIONS OF THE REINDEER GRAZING RESERVE, N.W.T.; WINTER 1969-70

by

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Caribou for purposes of this report, are assumed to be all animals of the species Rangifer tarandus, whether on or off the Reindeer Grazing Reserve, which were sighted during the search flights and were not under the direct and immediate control of the reindeer herders. The difficulties of distinguishing domestic reindeer and wild caribou were superficially discussed in previous reports (Hawley 1967).

That caribou utilize a portion of the Reindeer Grazing Reserve in winter has been well documented in years past by verbal reports from trappers and airplane pilots and by incidental observations by Dr. T.W. Barry and myself.

Some quantitative information was obtained during an extensive systematic search for caribou north of Great Bear Lake in March 1966 (Hawley 1966).

Although the limited number of transects on the Reserve did not yield conclusive figures, the density of caribou appeared very low and they were only seen in the south and east portions. A much more intensive aerial survey of the entire Reindeer Grazing Reserve in October 1967 showed dense concentrations of caribou in that portion east of 130°W. and south of 69°N. (Hawley 1967). No attempt was made to determine the exact area occupied by the herd or the total number of caribou involved. The north and west limits of the herd in the Reserve were roughly delineated. On one transect through that area, over 2000

caribou were sighted. Mr. R. Ruttan had noted small groups of caribou along the Anderson River that summer when he made a limited aerial search in July 1967 (Ruttan 1967).

The Canadian Wildlife Service assumed responsibility for the management and research investigations of the reindeer in April 1968. In May 1969, Dr. W.E. Stevens requested I document the incursion of caribou onto the Reindeer Grazing Reserve during their fall and winter migration. A sum of \$3,000 was allotted for aerial reconnaissance to determine caribou distribution and approximate densities on the Reserve. It was recommended that the main search be coordinated with the annual systematic aerial reindeer survey.

METHODS

Preliminary general determinations of caribou incursions or residency, as the case may be, were attempted by recording reports of observations made by persons (almost exclusively commercial aircraft pilots) travelling over the Reserve. Since pilots and planes of Reindeer Air Service Ltd. were most frequently over the area where caribou were expected and since their facility was frequently used by visitors or pilots of private aircraft, a map and a self-register observation record were posted at that hangar.

A cache of aviation gasoline was established at Crossley Lakes (63°40'N. 128°30'W.) to provide a refueling site in close proximity to a habitable cabin in the usual caribou winter range.

In November, when reports indicated deer were present and when ice and snow conditions were favorable, a preliminary aerial reconnaissance to determine the approximate area occupied and the relative density of the herd was conducted. The crew for the flights consisted of the pilot and myself as observer-navigator-recorder. A Cessna 135 aircraft was used after an aborted attempt to rapidly fly the area with a faster Piper Comanche to offset the extremely limited daylight period. The plane was flown at an elevation of approximately 200 meters above the ground surface when cloud ceilings and visibility permitted. The air speed varied from 89 m.p.h. on 26 November, because of improperly installed skis, to 135 m.p.h. on 1 December. We attempted to fly along lines approximately 10 to 20 kilometers apart until caribou concentrations were encountered. We then flew a zig-zag course tracing the outer limits of the herd. The flight paths and number and location of all caribou sighted were recorded on 1:500,000 scale maps to show the occupied area and the relative density.

Because caribou were not encountered in large numbers and because caribou tracks and marten trappers' reports indicated the caribou were still moving westward onto the Reserve, a more intensive survey was delayed. In March 1970 when increased length and intensity of daylight made aerial surveys more reliable and efficient, a repeat reconnaissance was made of the area. The procedure was altered in that two observers (Julian Inglis and Norman McDonald) were added to the crew in rear seat positions. I confined my duties to navigation, supervision and note-keeping. The survey generally

was conducted as previously but an additional record of caribou occurring in a belt transect 200 meters to each side of the aircraft was included to give more comparative information on densities. Another alteration was that the flight elevation was 150 meters above the ground. To assure that the transect widths were accurately determined, markers were put onto the struts and windows of the aircraft by flying at 150 meters over markers placed 200 meters apart on the ground. A Cessna 180 aircraft was used on the flight of 11 March because the Cessna 185 used on 8 March was diverted to other work. Information on flight paths and caribou seen in and out of the transects were recorded on 1:250,000 scale topographic maps during the March surveys.

RESULTS

The self-register observation record was not successful.

A total of 1,615 kilometers was flown on 26 November and 1 December 1969 and 2,295 kilometers on the second survey of 8 and 11 March 1970. The reconnaissance flights covered areas of 18,963 and 20,441 square kilometers, respectively, with variable intensity. The flight routes are shown on Figure 1 and Figure 2, respectively.

Aircraft rentals were: 26 November 1969, a Cessna 185 for 3 hours 50 minutes, costing \$325.83; 1 December 1969, a Cessna 185 for 5 hours costing \$425 (Total 8 hrs. 50 mins. and \$750.83 = $\frac{46}{223}$ /km. for the fall 1969 survey); 8 March 1970, a Cessna 185 for 7 hours costing \$595; 11 March 1970, a Cessna 180 for 6 hours 25 minutes costing \$429 (Total 13 hrs. 25 mins. and \$1,024 = 45¢/km. for the March 1970 survey).

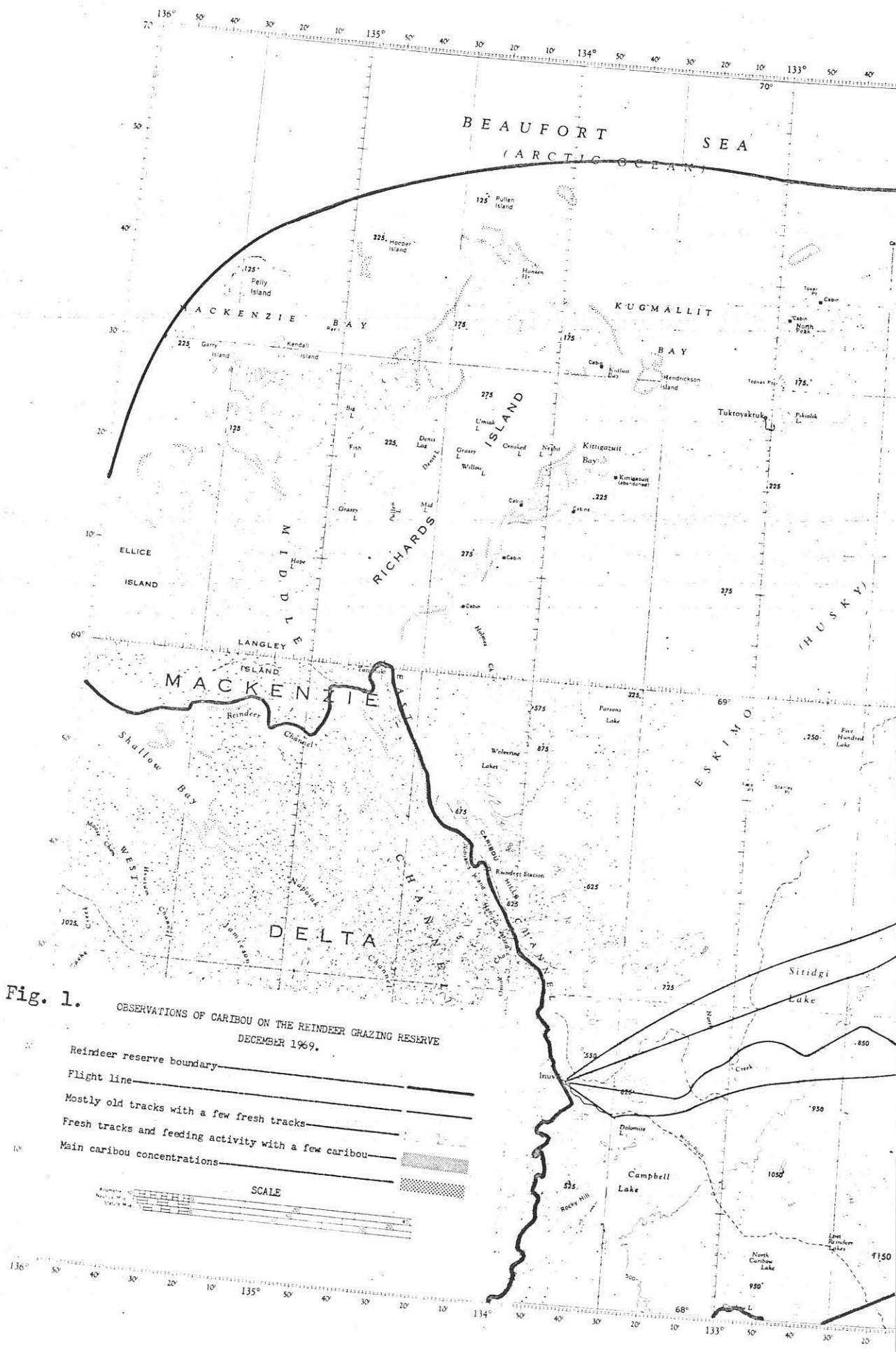
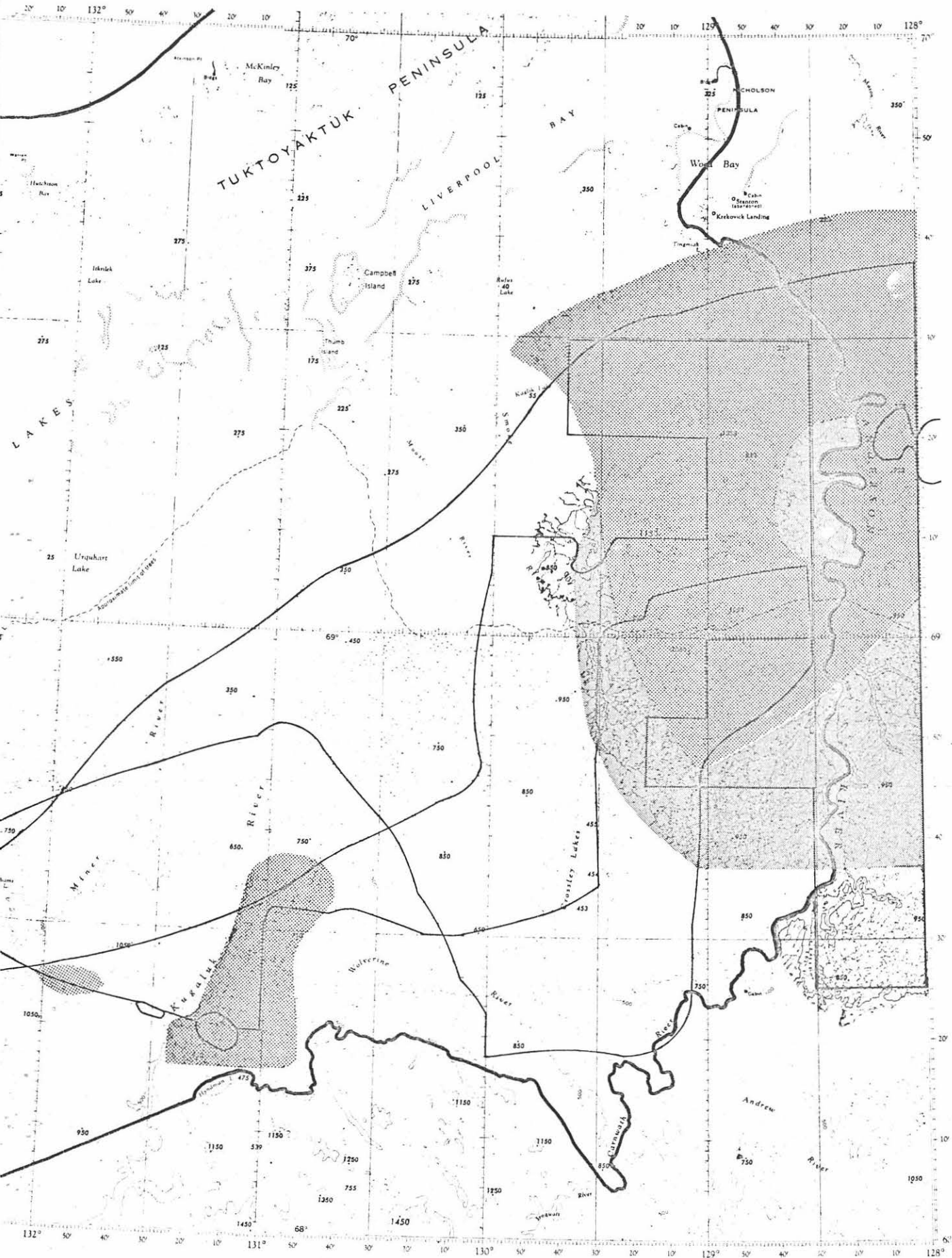
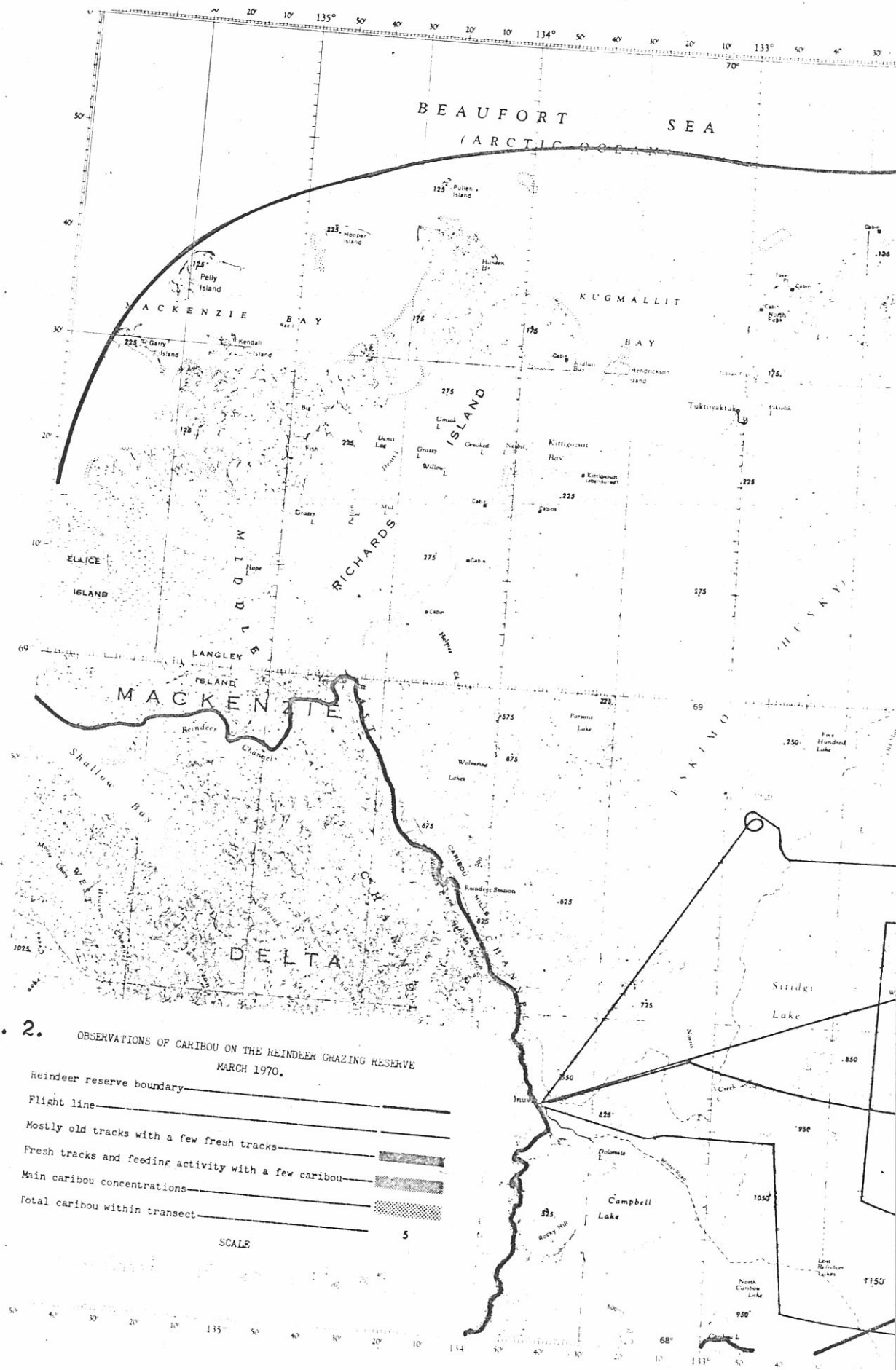


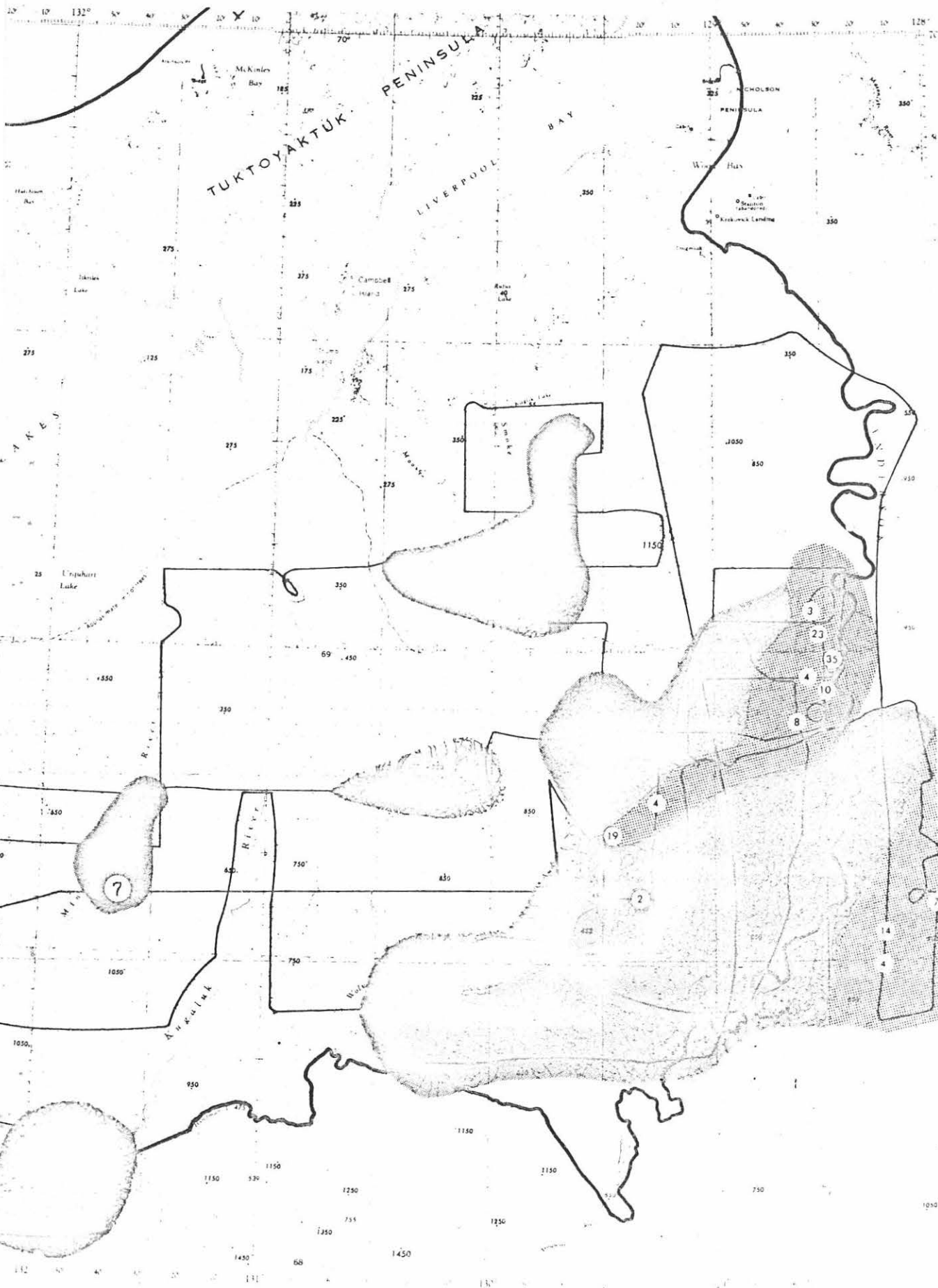
Fig. 1. OBSERVATIONS OF CARIBOU ON THE REINDEER GRAZING RESERVE
DECEMBER 1969.

- Reindeer reserve boundary _____
- Flight line _____
- Mostly old tracks with a few fresh tracks _____
- Fresh tracks and feeding activity with a few caribou _____
- Main caribou concentrations _____









The number of caribou seen were 1,110+ and 526 in each respective period. The observations are broken down by geographic area and by areas of different density in Tables 1 and 2 for each survey.

The areas of different caribou abundance are delineated on the maps (Figures 1 and 2). Figure 2 also shows the number and location of caribou seen within the 400 meter wide transect.

DISCUSSION

Sight Reports.

A few pilots reported caribou sightings to me but they did not cover the area completely, were not frequent enough and were not objective enough to be of great help in determining caribou movements or densities. The reports did provide information on the occurrence of caribou in definite locations at specific times. An idea of probable density could often be obtained by personally interviewing the observers. Most of those reports will be incorporated into the discussion of caribou movements and occurrence in specific localities on the Reserve. However, the few reports from pilots of oil exploiters' aircraft involving a few small herds on the outer islands, Tuktoyaktuk Peninsula and the northwest shore of Eskimo Lakes will not be discussed. I assume they are, without much doubt, remnants or escapees of the main reindeer herd. They lie outside the area searched during the winter.

Table 1. Results of aerial caribou search on the Reindeer Grazing Reserve, N.W.T.; 26 November and 1 December 1969.

	Mackenzie R. to Kugaluk R.	Kugaluk R. to 129° 30'W.	129° 30'W. to Anderson R.	Anderson R. to 128° 00'W.	Total
Low density ^a					
Area	0	165 sq. km.	0	627 sq. km.	792 sq. km.
Distance flown		5 km.		60 km.	65 km.
Caribou seen		1		0	1
Medium density ^b					
Area	0	180 sq. km.	1,310 sq. km.	700 sq. km.	2,190 sq. km.
Distance flown		30 km.	110 km.	50 km.	190 km.
Caribou seen		0	9	15	24
High density ^c					
Area	45 sq. km.	995 sq. km.	3,510 sq. km.	1,292 sq. km.	5,842 sq. km.
Distance flown	10 km.	115 km.	285 km.	90 km.	500 km.
Caribou seen	9	63	511+	502+	1,085+
Entirety ^d					
Area	3,612 sq. km.	6,755 sq. km.	5,977 sq. km.	2,619 sq. km.	18,963 sq. km.
Distance flown	485 km.	430 km.	500 km.	200 km.	1,615 km.
Caribou seen	9	64	520+	517+	1,110+

a - Portion with old or few fresh tracks

b - Portion with few caribou or abundant fresh sign

c - Portion with caribou concentrations

d - Entire portion within boundary flight lines

Table 2. Results of aerial caribou search on the Reindeer Grazing Reserve, N.W.T.; 8 and 11 March 1970.

	Mackenzie R. to Kugluk R.	Kugluk R. to 129° 30'W.	129° 30'W. to Anderson R.	Anderson R. to 128° 00'W.	Total
Low density ^a					
Area	650 sq. km.	1,842 sq. km.	0	0	2,492 sq. km.
Distance flown	60 km.	140 km.			200 km.
Caribou seen	0	0			0
Area within transect	24 sq. km.	56 sq. km.			80 sq. km.
Caribou in transect	0	0			0
Computed population estimate	0	0			0
Medium density ^b					
Area	250 sq. km.	1,312 sq. km.	2,665 sq. km.	557 sq. km.	4,784 sq. km.
Distance flown	35 km.	245 km.	325 km.	50 km.	655 km.
Caribou seen	7	6	2	0	15
Area within transect	14 sq. km.	98 sq. km.	130 sq. km.	20 sq. km.	262 sq. km.
Caribou in transect	7	0	2	0	9
Computed population estimate	125	0	41	0	166
High density ^c					
Area	0	0	727 sq. km.	740 sq. km.	1,467 sq. km.
Distance flown			180 km.	95 km.	275 km.
Caribou seen			383	128	511
Area within transect			72 sq. km.	38 sq. km.	110 sq. km.
Caribou in transect			106	25	131
Computed population estimate			1,071	195	1,266
Entirety ^d					
Area	7,032 sq. km.	6,362 sq. km.	5,412 sq. km.	1,635 sq. km.	20,441 sq. km.
Distance flown	725 km.	685 km.	675 km.	210 km.	2,295 km.
Caribou seen	7	6	385	128	526
Area within transect	290 sq. km.	274 sq. km.	270 sq. km.	84 sq. km.	918 sq. km.
Caribou in transect	7	0	108	25	140
Total computed pop. estimate ^e	125	0	1,112	195	1,432

Table 2 continued.

a - Portion with old or few fresh tracks.

b - Portion with few caribou or abundant fresh sign

c - Portion with caribou concentrations

d - Entire area within boundary flight lines

e - Total estimates are the sums of the estimates computed from discrete strata.

The voluntary self-register observation record was not successful. The map and record sheet was first posted at the hangar in early fall. Few observations were recorded during the first two months. The map and record disappeared before snow and ice conditions were suitable for a preliminary reconnaissance in November. A new map and sheet were posted during the first week in December and disappeared sometime in January. Persons working at the hangar suggested that some unnamed pilot was in need of a map so took it from the wall.

A record of caribou observations made on the many flights occurring over the area would greatly assist the documentation of caribou movements and occurrence. The flights are not designed for caribou observation and enumeration so would not replace specific objective surveys. However, knowledge of the general occurrence of deer on the Reserve between surveys would be extremely helpful in planning and interpreting the results of the surveys especially since the Canadian Wildlife Service budgets for aircraft rental are so severely restricted. However, we need to get much more of the available information before it will be very useful. Therefore, attempts to make the self-register observation record operative will be continued. It will probably only be necessary to stop the thefts since many pilots were recording sightings.

Surveys.

The caribou search was not coordinated with a fall reindeer population and distribution survey covering the entire Reindeer Grazing Reserve since none

was conducted in 1969. Therefore the caribou surveys were not designed to systematically cover, at five kilometer intervals, the entire portion of the Reserve east of the Kugaluk River as initially proposed. Without similar information from the area west of the Kugaluk River and north of Eskimo Lakes, detailed distribution and abundance data on small groups of caribou would be incomplete and would not be meaningful. The extra money to obtain it would be wasted. The \$3,000 allotment was not sufficient to make a total survey of the entire Reserve and permit any preliminary reconnaissance flights or follow-up searches to document movements throughout the winter. An early fall survey alone would almost certainly not reveal the deepest penetrations, highest densities, or length of residency of the caribou on the Reserve. Limited flights were made in the area west of the Kugaluk River to check out reports of large numbers of caribou in the area of Lost Reindeer Lakes and the mid-portion of the Miner River.

Fall 1969 surveys. - Reconnaissance flights commenced when the snow cover was complete so that information from tracks and signs of feeding activity could be utilized to determine caribou activity, abundance and movements. Because snowfall was scant, that did not occur until late November. By that time, the hours of daylight were very limited. Under ideal conditions, there were approximately three hours per cloudless day with sufficient light to distinguish caribou tracks from 200 kilometers in the air. I attempted to take off from Inuvik about one hour before light conditions were suitable

and utilize that time for ferrying to the work area so that all available time could be spent searching the far eastern portion of the Reserve. However, pilot lateness and aircraft servicing caused over two hours delay daily. Needless to say we did not need to refuel from the Crossley Lake cache in November or December although it was done in very foul weather on 26 November for safety.

On both of those two days, the weather was marginal with fog, ground blizzards and low cloud cover over much of the area. In the area west of the Kugaluk River, the Fall 1969 surveys were not reliable because it is certain that tracks, sign and, possibly, animals present were not seen even directly below the aircraft on occasion. However, signs of caribou feeding on muskrat pushups in lakes were observed at seven kilometers distance on 1 December. The visual limit at a nearby sparsely forested location under low cloudy skies was five kilometers and caribou could be seen on lakes at that distance. The survey limit, except for those sights on lakes and treeless terrain, was recorded as two to two and one-half kilometers. A distance of one kilometer was recorded as the limit in more heavily forested terrain immediately south of Crossley Lakes. Caribou could routinely be seen over much greater distances.

The distribution of caribou as shown in Figure 1 is considered to be fairly accurate and complete. Small groups were probably scattered throughout the area as noted previously during the survey of October 1967. A concentration, reportedly to 1200 animals, was rumored to be in the Miner River area but the

observer could not be identified. Other reports suggest the group (or groups?) consisted of no more than 100 animals. There was considerable oil exploration activity in the area and a large concentration of caribou would not be missed. Trappers travelling throughout the area reported only scattered small groups of caribou. A herd of 17 animals was the largest definite count reported by pilots. The group immediately east of the Kugaluk River was probably larger since tracks were dense and covered almost all of the area. I guess there were 100 to 300 animals in that area although I only counted 26 in seven groups.

However, the normal fall immigration of caribou onto the Reserve was much delayed. Trappers reported that the caribou did not cross the Anderson River until late November just before we commenced our search flights. Normally, caribou are west of Crossley Lakes in late October. The late freezeup and late limited snowfall may have delayed migration. The caribou were mainly concentrated on the barren grounds north of the tree line in late November and early December. It is possible that the caribou extended north to the coast at Liverpool Bay and westward of Kaglik Lake. The determination of that did not seem worth the cost of a return flight especially in view of the sparse sign noted on the outer flight lines. The density of caribou was much less than seen in former years and only a small fraction of that noted during the survey of October 1967.

Outside the Reserve, pilots reported that caribou extended eastward beyond the Horton River and continuously southward in great numbers to Colville

Lake. The prevalence of tracks south and east of the forks of the Anderson River suggested that the main herd had in fact turned southward before entering the Reserve as the aircraft pilots and marten trappers theorized. Because caribou were present in the north but not in the area of dense old sign further south along the Anderson River, I believe the caribou sighted were a disjunct group of stragglers.

Because the caribou were still entering the Reindeer Grazing Reserve and moving westward, the conditions for survey flights and observations were poor, and the major caribou distributions on the Reserve apparently were adequately delineated; further surveys were scheduled for later in the winter.

March 1970 surveys. -- In case the caribou covered a large area of the Reserve in concentrations sufficient to warrant a systematic census attempt, two observers were added to the crew for the express purpose of enumerating caribou within a belt transect 200 meters to each side of the aircraft. The observers were included in the reconnaissance flights so that information could be included in the major survey and thus save time and rental monies. The more intensive survey was not deemed necessary because the reconnaissance flights, with a little expansion, appeared to provide adequate information on the caribou distribution on the Reserve. The enumeration of animals occurring within the transect did provide information on densities a bit more objective and quantitative than a pure estimation of numbers.

The distribution shown in Figure 2 and density data of Table 2 is an adequate summary of the information obtained during the search. Prior to making any calculations from the transect data, we had variously estimated the number of caribou as between 1000 and 2000 animals. All sources are in reasonable agreement. Again, we did not attempt to enumerate or locate all caribou scattered in small groups within the central portion of the area. We assumed that our flight pattern was such that obvious evidence from tracks would have indicated the presence of any significant concentrations of caribou.

The reader must realise, however, that those flights do not show the area covered by the entire Bluenose herd (Paulatuk portion?). Those search flights were arbitrarily limited to the immediate area of the Reindeer Grazing Reserve. Sign indicated it was probable that a large number of animals were south of our southernmost transect. Caribou were obviously present to the east of the area surveyed. Tracks and feeding sign on the east were more numerous than most areas where concentrations were encountered.

During the March flights, the weather varied considerably. Visibility on the eighth was very poor except for an area south of Crossley Lakes. Tracks were certainly overlooked throughout the area especially in the north. Caribou could easily have been overlooked in the timbered area and on the northeast outside the Reserve. The numbers missed would not likely be large

and almost surely no large concentrations would be completely overflowed. On the eleventh, visibility was excellent. A few caribou were seen just north of Crossley Lakes which weren't noted on the eighth and caribou tracks were seen more frequently in areas duplicated on the eleventh.

However, it is certain that considerable movement had occurred between the two dates. On the eleventh, caribou were moving rapidly to the northeast out of the timber, onto the barrens and across the Anderson River in areas where none were present on the eighth. The caribou in the vanguard of that movement were mostly yearlings and adult females.

Conclusions. - The searches indicated that the caribou entered the Reserve late in November in fewer numbers and later than normal. They were concentrated outside the timberline on the northeast side in November and apparently represented a group separated from the main herd which turned southward east of the Anderson River. In March, they were in the timber further south but began to move northeastward onto the barrens on the eleventh. The caribou did not travel as far westward into the Reserve as I have seen in previous years. They apparently did not penetrate much farther than to $129^{\circ}30'W.$ and then only in small numbers. In 1967, they were to $130^{\circ}W.$ in dense concentrations. Trappers have reported them in quantity as far west as $130^{\circ}50'W.$ (1968) along the coast of Liverpool Bay and inland (1966). Before about 1963 and 1964, caribou were rarely reported as

migrants onto the Reindeer Grazing Reserve. In 1969-70, the caribou apparently travelled further westward south of the Reserve boundary but I have no definite information on that.

It appeared that there were approximately 1500 caribou on the Reserve in March and probably about twice that many in the fall. Those figures are informed estimates only and not definite population counts.

Recommendations. - The reconnaissance flights should be continued to document annual variations in the use of the Reserve by caribou, to determine whether the trend is for an increasingly westward extension of the winter range, and to predict the probability of intermingling with the reindeer herd.

The aerial caribou search should be coordinated with an annual survey of the entire Reindeer Grazing Reserve to determine total populations and exact distribution of the small, apparently semi-resident, groups of deer scattered throughout the area as well as of the main migratory herd of caribou. The presence and movements of those small groups cannot be properly evaluated without related information for other parts of the Reserve. The October 1967 survey indicated that the total number of animals in the small herds may be considerable. That survey suggested the animals travelled southward out of the Reserve very rapidly in October. It is not likely that the \$3,000 allotted this year would pay for a survey of the Reserve only. Hourly aircraft rental rates have doubled in the Inuvik area since the 1967 survey which cost approximately that amount. Canadian Wildlife Service

aircraft rental budgets have not reflected that increase. It is not realistic to put exact monetary limitations on surveys which can be so influenced by flying conditions. Approval of surveys, methods and standards automatically set costs which can only be roughly estimated.

Investigations of the status of the small herds should be emphasized. We should know whether the animals are caribou (barren ground or woodland), escaped reindeer, descendants of escaped reindeer, hybrids or whatever. The movements of those deer should be documented as they could interfere with or influence the management of the reindeer. The possibility that they are reindeer is of special concern. The emphasis on marking all reindeer annually should be continued but, in view of the continued occurrence of untagged adult reindeer and unexplained disappearance of tagged adult reindeer from the herd, a permanent tattoo should be used to check ear tag retention. The high visibility collars should be applied to many more animals. More observation and sampling of the small free roaming deer herds should be done to determine if marked animals are present indicating that reindeer are still escaping unnoticed. The application of collars visible from the air would be most compatible with the annual Reservewide surveys recommended.

If possible, the small herds of summer residents should be followed to determine their movements. I have noted that deer are seen and reported moving through the area east of Sitidgi Lake much more frequently in the

fall than in the spring and question whether many of them return at all. A flight along the south shore of Eskimo Lakes in July 1969 revealed deer but not in the large numbers I would expect from numbers present further south the previous fall. Determination of that movement would involve a marking program to be used in conjunction with observations from these surveys.

Detailed information on the movements and status of the Bluenose Herd (Paulatuk segment?) should be obtained so the information from the Reserve surveys would be more meaningful.

The coordination of reindeer management observations with data from the caribou surveys should be formalized. Data procurement methods and detail should be standardized. The crew, composition and duties, transect widths and flight altitude used in March are recommended.

A greater proportion of information from persons working on the Reserve should be obtained. In that regard the self-register at the Reindeer Air Service hangar and similar methods in other areas should be developed.

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