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PRELIMINARY DATA
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The distribution and abundance of certain mammals in the western Queen Elizabeth Islands in the summer of 1958

The observations on which this report is based were made by Dr. R. Thorsteinsson and Dr. E.T. Tozer of the Geological Survey of Canada, Department of Mines and Technical Surveys, Ottawa. They have been extracted from the geologists' notebooks and entered on a 10 mile to the inch map of the area attached to the first copy of the report. The observations were made from a Piper Super Cub aircraft on wheels, between June 24 and August 28, 1958.

The islands have been treated as composed of several differing physiographic regions, in general following Dunbar and Greenaway (1956). Those authors include in the Eastern Upland region of Prince Patrick Island no land further north than the head of Intrepid Inlet. Thorsteinsson and Tozer (1959) show Mesozoic rocks extending along the whole of the eastern fringe of the island, and I have included in the Eastern Upland region of Prince Patrick Island all the area of Mesozoic rocks as shown by the latter authors. The Lowland region is covered by sterile sands and gravels of the Beaufort formation, and is devoid of herbivores. It should be noted, however, that areas of virtual desert also occur in the northern part of the Eastern Upland of Prince Patrick Island.

The assumptions that were made for the purpose of calculating estimates of muskox and caribou populations are listed as follows:

1. Animals are evenly distributed over the area under consideration. (The chances of this being true are increased by dividing the area into homogeneous physiographic regions as has been done for the present report). If the animals are not evenly distributed, then the observers flew over like proportions of favoured and poorly populated habitat.

2. Animals are as easily seen in one habitat as in another.

3. The proportion of flights with good visibility was equal in all regions.

4. The observer searched a strip of country averaging for caribou one-half a mile in width, and for musk-oxen three-quarters of a mile in width. (In a recent report of a similar nature, but dealing with

Banks and Victoria Islands, I used an assumed track-width for caribou of one-third of a mile. The difference reflects the greater conspicuousness of the High Arctic caribou).

Population estimates were made as follows. The number of animals seen per mile was converted into the number seen per square mile by multiplying the first figure by track-width. Totals for each region were then obtained by multiplying "animals per square mile" by "area in square miles". The latter figure was obtained with the aid of a dot-area grid.

The estimate may be used for comparing the numbers in one part of the area with the numbers on another. They may also be used to assess future increases or declines in the populations, as comparable estimates could be quickly obtained from records made in a similar manner. The estimates should be used with caution for any but relative observations. They have been presented only because more objective estimates are not available. I believe that those estimates based on a coverage of ten percent or more are probably accurate within the limits ½N and 2N.

The following table shows the regions in question, their areas, and the number of miles flown over each.

Region	Area (sq. mi.)	Distance flown (mi.)
Melville Id.		
Folded Upland	7800	4270
Plateau	4300	550
Northern Lowland	2200	560
Eglinton Id.	600	115
Pr. Patrick Id.		
Eastern Upland	2400	290
Lowland	3500	90
Emerald Id.	250	30
Brock Id.	300	55
Mackenzie King Id.	1900	440
Borden Id.	1000	110
Totals	24,250	6510

Caribou

The following table shows the number of caribou seen, the number seen per square mile examined, and the estimated

size of each population. The precentage of the area examined (estimated track-width times distance) is included as a guide to the reliability of the estimate.

Region	No. of sq. mi. examined	No. seen	No. seen /sq. mi.	Estimated total pop.	% of area examined
Melville Id.					
Folded Upland	2135	341	0.159	1240	27.4
Plateau	275	105	.382	1643	6.4
Northern Lowland	280	18	.064	141	12.7
Eglinton Id.	57	0	0	0	9.5
Pr. Patrick Id.					
Eastern Upland	145	81	.559	1342	6.0
Lowland	45	0	0	0	1.3
Emerald Id.	15	10	1.5	450	6.0
Brock Id.	27	0	0	0	9.0
Mackenzie King Id.	220	102	.464	882	11.6
Borden Id.	55	66	1.2	1200	5.5

It will be noted that densities of over one caribou per square mile have been calculated for Emerald Island and Borden Island. These high densities tend to cast doubt on the accuracy of the estimate of average track-width, but I have thought it best not to amend the latter estimate in the light of the conclusions to which it leads.

The calculations give an estimate of 3024 caribou for Melville Island. The species was rare on the Northern Lowland, and only half as common on the Plateau region as on the Folded Upland. Densities of about one caribou in two square miles were calculated for the Eastern Upland of Prince Patrick Island and for Mackenzie King Island. None was seen on Eglinton Island or Brock Island.

Dr. A.H. McNair, Department of Geology, Dartmouth College, Hanover, U.S.A., has told Dr. Thorsteinsson that he estimated the caribou population of Bathurst Island to be 300 in the summer of 1959. McNair was making an intensive study of the

geology of the island with a Piper Super Cub that summer. The caribou population of Cornwallis Island has been estimated to be 30 animals, and nine have been seen on Little Cornwallis Island (Thorsteinsson, 1958).

Caribou calves were plentiful in 1958.

Muskox

The following table shows the calculated estimates and pertinent figures.

Region	No. of sq. mi. examined	No. seen	No. seen /sq. mi.	Estimated total pop.	% of area examined
Melville Id.					
Folded Upland	3203	90	0.028	218	41.
Plateau	413	8	.019	82	9.6
Northern Lowland	420	51	.121	266	19.1
Eglinton Id.	86	0	-	-	14.3
Pr. Patrick Id.					
Eastern Upland	218	3	.014	34	9.1
Lowland	68	0	-	-	1.9
Emerald Id.	23	0	-	-	9.2
Brock Id.	41	0	-	-	13.7
Mackenzie King Id.	330	0	-	-	17.4
Borden Id.	83	0	-	-	8.3

The total estimated population of muskoxen on Melville Island is 566. The species is about four times as common on the Northern Lowland region than on either the Folded Upland or the Plateau regions. This estimate may be compared with Storkerson's estimate of 4000 in 1917 (Royal Commission, 1922) and Tener's recent estimate of 200 (Tener, 1958). Dr. Thorsteinsson believes it unlikely that there are over 200 (verbal). Stefansson's party killed about 400 muskoxen on Melville Island in 1916-17, and Storkerson obviously thought that the kill had made little difference in the total number.

The estimate of 34 for Prince Patrick Island might be considered high in view of the extensive areas of desert in the

northern part of the Eastern Upland. In 1948, J.G. Dyer, U.S. Weather Bureau, while searching for a site for a weather station on southeast Prince Patrick Island, counted 149 muskoxen, (Thorsteinsson, verbal). Tener's "minimum estimate" of 200 (1958) would probably be in close agreement with Dyer's data.

The above evidence suggests a serious recent decline in the muskoxen of Prince Patrick Island. MacDonald (1954) saw a large number of muskoxen on the island in 1952 (between two and 56 on each days' travel), but I saw none there in 1954, although carcasses were abundant on the land, and a few were found on the sea-ice near Eglinton Island.

No muskoxen were seen on Emerald Island, but two old skulls testified to their former presence. No muskoxen, nor sign of former habitation by muskoxen were found on Brock, Borden and Mackenzie King Islands.

McNair has told Thorsteinsson that he estimated that there were 300 muskoxen on Bathurst Island in the summer of 1959, mostly in the broad valley between Bracebridge and Goodsir Inlets, where Thorsteinsson, on a straight flight, saw 140 muskoxen on June 24, 1958.

Muskox calves were plentiful in the herds in 1958.

Polar bear

Only one bear was seen in 1958, near Skene Bay, Melville Island.

Arctic hare

Arctic hares were seen only on Melville Island, in the Folded Upland region and on the Plateau. Fifty-nine were seen in the former region, and 25 in the latter, in flocks of between ten and 25. No hares or signs of hares were seen on Brock, Borden or Mackenzie King Islands.

Arctic fox

Foxes were numerous and tame on all the islands visited. Dead lemmings and recent sign were seen everywhere. The following winter a record catch was made at Resolute Bay, and the winter after that (1959-60) the catch was very low.

Ermine

Only one weasel was seen, at Parry's cairn on Table Hill, Dundas Peninsula, Melville Island.

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March 23, 1960.

PRELIMINARY DATA
NOT FOR PUBLICATION

TITLE

DATE LOANED	BORROWER'S NAME