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Aerial surveys of Peary caribou and muskoxen on western Queen Elizabeth Islands, Northwest Territories, 1973.

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Abstract

Aerial surveys of Peary caribou (*Rangifer tarandus pearyi*) and muskoxen (*Ovibos moschatus*) were flown over 20 of the western Queen Elizabeth Islands during March-April 1973. The surveys of Melville, Bathurst, Eglinton, Byam Martin and Emerald were repeated in July-August 1973. A standard strip survey was flown at 150 m above ground level along strips 1.6 km wide. Aerial coverage of the islands was 25% or more, except for the Prime Minister group where it was 12.5%.

Results from the 1973 surveys on Melville Island relative to 1961 estimates by Tener (1963) indicated that Peary caribou had decreased by a factor of four and muskoxen had increased by the same factor.

In March-April a total of 1,517 caribou was seen on 15 of 20 islands surveyed, and the population estimate was 3,914. In July-August 2,624 caribou were seen on the five islands surveyed a second time; the estimated population was 4,372. Differences in numbers seen during spring and summer surveys may suggest a pattern of inter-island movement or that caribou were unobserved against a snow background in spring. No yearlings (1972 calves) were seen in March-April; in July-August percentages of calves among caribou segregated ranged from 10.7 to 17.0%.

A total of 3,269 muskoxen was seen on 9 of 20 islands in March-April, and 2,566 on 4 of 5 islands surveyed July-August. The population estimate was 3,938 for the spring, and 3,650 for the summer survey. Percentages of short yearlings (1972 calves) were 2.2 to 16.7% and of calves (July-August) 18.7 to 23.6% among muskoxen groups segregated.

Opposing trends in seasonal distribution of caribou and muskoxen were observed in relation to distance from sea-coasts and group size. More caribou were found on coastal sites in July-August and they were in larger groups than in March-April. Group size of muskoxen decreased from March-April to July-August in association with an inland movement and redistribution along river drainages. Caribou were located at lower elevations during July-August than in March-April, but the distribution of muskoxen by elevation changed little between seasons.

Résumé

En mars et avril 1973, les dénombrements aériens du caribou de Peary (*Rangifer tarandus pearyi*) et du boeuf musqué (*Ovibos moschatus*) ont eu lieu dans 20 des îles occidentales Reine-Elisabeth. Au cours de juillet et août 1973, on a répétés ceux des îles Melville, Bathurst, Eglinton, Byam Martin et

Emerald. On a employé la méthode ordinaire de dénombrement par virée transversale et les vols ont été effectués à une altitude de 150 m sur des bandes de 1.6 km de largeur. Cette opération s'est déroulée sur 25% ou plus de la superficie des îles excepté pour le groupe Premier Ministre ou elle a été de 12.5%.

En comparant les résultats des dénombrements effectués dans l'île Melville en 1973, aux évaluations faites en 1961 par Tener (1963), on a pu constater que le nombre de caribous de Peary avait diminué d'un facteur de quatre et que celui des boeufs musqués avait augmenté du même facteur.

Sur 15 des 20 îles survolées, en mars et avril, on a observé un total de 1,517 caribous et la population en a été évaluée à 3,914 sujets. Au cours des mois de juillet et août, 2,624 caribous ont été aperçus sur les cinq îles où les dénombrements ont été effectués une seconde fois; la population a alors été évaluée à 4,372 sujets. Les différences entre les chiffres des dénombrements du printemps et ceux de l'automne peuvent laisser supposer que les caribous se déplacent d'une île à l'autre ou bien qu'ils n'ont pu être aperçus à cause de la couche de neige qui recouvre le sol au printemps. Aucun caribou d'un an (veaux nés en 1972) n'a pu être observé en mars et avril; par contre, en juillet et août, la proportion de jeunes parmi les caribous isolés variait entre 10.7 et 17%. Sur 9 des 20 îles dénombrées en mars et avril, 3,269 boeufs musqués ont été aperçus et 2,566 sur 4 des 5 îles survolées en juillet et août. La population a été évaluée à 3,938 sujets lors du dénombrement du printemps et à 3,650 sujets lors de celui de l'automne. La proportion d'animaux de près d'un an (veaux nés en 1972), parmi les troupeaux isolés, variait entre 2.2 et 16.7% tandis que la proportion des veaux (juillet et août) était de 18.7 à 23.6%.

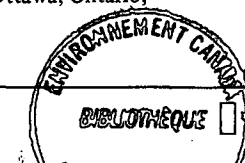
On a pu observer des tendances opposées dans la distribution saisonnière des caribous et des boeufs musqués en ce qui a trait à la grosseur des troupeaux et à leur distance par rapport à la côte. En juillet et août, les caribous observés sur des sites près de la côte étaient plus nombreux et en hardes plus grosses qu'en mars et avril. De mars-avril à juillet-août, les troupeaux de boeufs musqués diminuaient à mesure qu'ils avançaient à l'intérieur des terres et qu'ils se répartissaient le long des bassins hydrographiques. En juillet et août, les caribous ont été observés dans des régions moins élevées qu'en mars et avril, mais la distribution des boeufs musqués par niveaux d'élevation a peu varié d'une saison à l'autre.

Introduction

The Canadian Wildlife Service conducted preliminary surveys of Peary caribou (*Rangifer tarandus pearyi*) and muskoxen (*Ovibos moschatus*) on Melville, Eglinton, and Byam Martin islands, Queen Elizabeth Islands, Northwest Territories during March-April and August 1972. Results from the 1972 surveys on Melville Island relative to 1961 estimates by Tener (1963) indicated that Peary caribou had decreased by a factor of four and muskoxen had increased by the same factor. Because sound management decisions could not be drawn from the preliminary data, the Northwest Territories, Game Mana-

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gement Service asked the CWS to continue the study of the ecology of caribou and muskoxen on Melville and adjacent islands. Also, as the construction of a natural gas pipeline from the Queen Elizabeth Islands is probable, the possible detrimental impact of such a pipeline on arctic ungulates must now be considered by the CWS. This paper will report on the March-April and July-August 1973 aerial surveys of western Queen Elizabeth Islands.

Study Area

The Queen Elizabeth Islands included in our surveys are given in Tables 1 and 2 by descending order of size. The islands surveyed lie between latitudes 74° and 78° North and longitudes 95° and 124° West (Fig. 1). Geographical descriptions of the islands are given in Dunbar and Greenaway (1956). Thorsteinsson and Tozer (1960) summarize the structural history of the Queen Elizabeth Islands since Precambrian times. The geology of the western Queen Elizabeth Islands has been studied by Tozer and Thorsteinsson (1964). Savile (1961) has reported botanical information for northwestern Queen Elizabeth Islands. All of the islands surveyed except western Melville are low-lying and mainly below 150 m elevation. Western Melville is mostly mountainous terrain with many sites from 300 m to 1,000 m above sea level.

Methods

The islands were surveyed by use of a standard strip survey method. Parallel flight lines were drawn on 1:250,000 scale, topographical maps. Flight paths were at 6.4 km intervals, except on Mackenzie King, Borden, and Brock islands where they were 12.8 km apart, and 3.2 km apart on Eglinton Island during the July-August survey. Melville Island was divided into major land units, which provided convenient strata for surveying. The flight lines were oriented either east-west or north-south in each stratum to provide maximum contact with the coast for accurate navigation. Flight lines were oriented east-west on all other islands although on Byam Martin and Eglinton islands, north-south surveys were added to provide double coverage in March-April. A Helio-Courier fixed-wing aircraft was used for both the March-April and July-August surveys.

A 1.6 km strip was surveyed: 0.8 km on each side of the aircraft. The 0.8 km strips were divided into two 0.4 km strips. This was done in order to determine the efficiency of observing within the 1.6 km strip. Sightings were recorded as being within the first 0.8 km strip (closest to the aircraft), within the second 0.8 strip, or outside both strips (off transect).

To mark the boundaries of each strip on the Helio-Courier, wires were strung from an eye-bolt on the wing to one on the fuselage. Lines marked on each observer's window were aligned with corresponding tabs on the wires. At an altitude 150 m above ground, these tabs were checked against fuel drums located at 0.4 and 0.8 km intervals from a reference point on the ground. Allowance was made for the blind spot beneath the aircraft so that an entire 0.8 km strip was visible on each side of the aircraft.

All survey flights were flown 150 m above ground level at speeds ranging from 110 to 190 kmph, depending on the

numbers of animals encountered. Observations were located on the survey maps and recorded on tape. At the end of each day the sightings were transcribed and located on a second map.

An attempt to identify short-yearling caribou in March-April was made but none were identified. Caribou calves of the year were segregated in July-August whenever feasible. Short-yearling muskoxen (1972 calves) and 1973 calves were segregated during the March-April and July-August periods, respectively.

The population of each geographic unit was estimated by extrapolating from the number of animals tallied within the survey strips in that unit. Group sizes were determined for animals both on and off survey strips.

The first survey began on March 19, and full coverage of the western Queen Elizabeth Islands was concluded on April 15, 1973 (Table 3). Observers were F.L. Miller and R.H. Russell, CWS. The pilot, P. Linton, assisted as third observer. Bathurst, Loughheed, Byam Martin, Vanier, Cameron, Alexander, Massey, Little Cornwallis, Helena, Edmund Walker, and Marc islands, and Strata I-IX of Melville Island were surveyed from Rea Point (Fig. 1). Prince Patrick, Mackenzie King, Borden, Eglinton, Brock, Emerald, Fitzwilliam Owen, and Eight Bears islands and the remainder of Melville (Strata X-XIII) were completed from Mould Bay (Fig. 1).

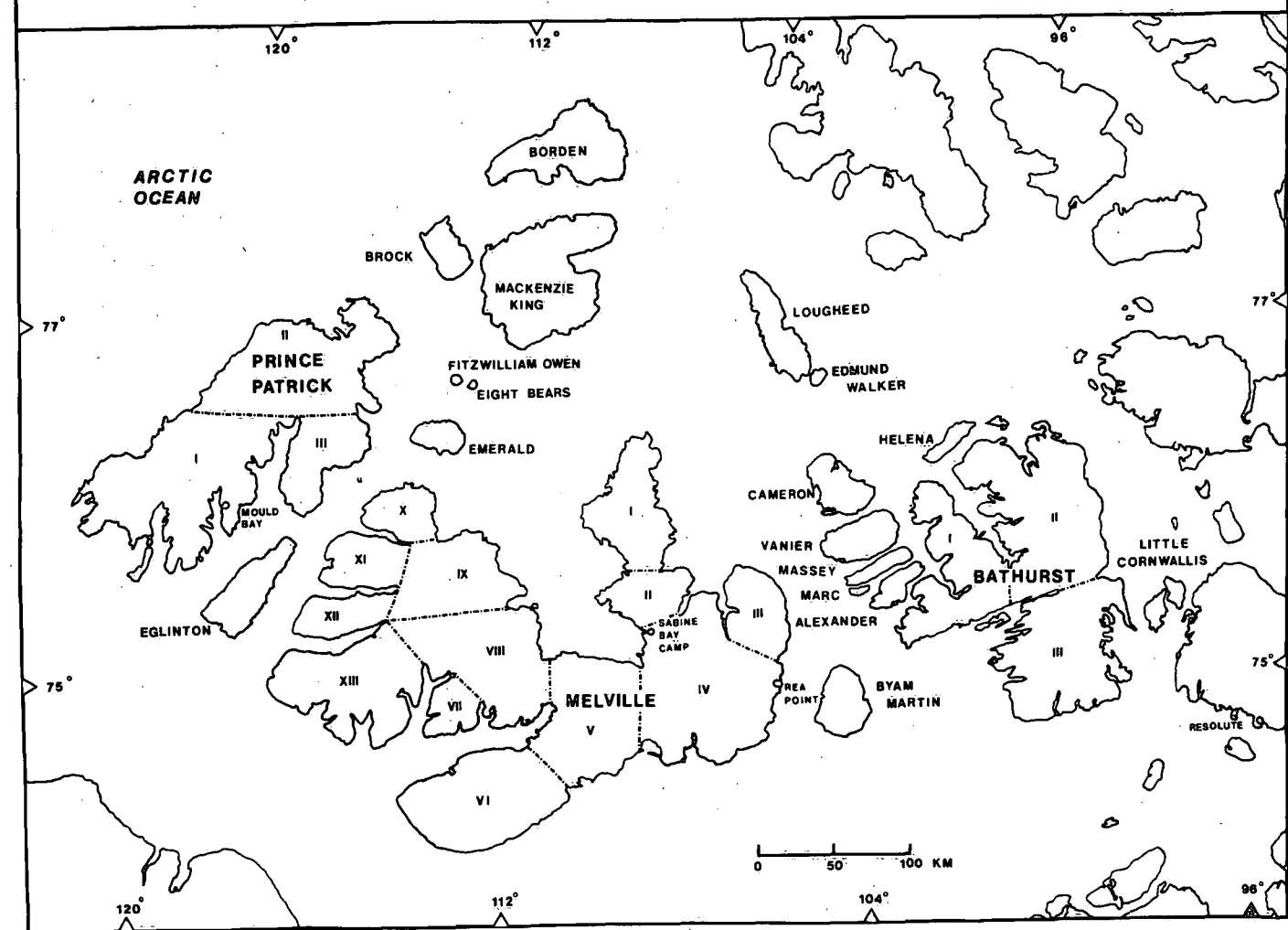
A summer survey began on July 5 and was completed August 21 (Table 3). The number of islands surveyed was reduced because of unfavourable weather conditions. Observers were R.H. Russell and J. Maxwell, CWS, assisted by G. Rezac, Nahanni Air. Byam Martin and Strata I-VIII of Melville were surveyed out of a CWS field camp, (75°41'N, 108°42'W) near Sabine Bay, Melville Island (Fig. 1). Prince Patrick, Eglinton and Emerald islands and the remainder of Melville (Strata IX-XIII) were completed from Mould Bay (Fig. 1). Sources of error inherent in this type of aerial survey were outlined by Tener (1963) and Miller, Russell, and Urquhart (1973). In March-April caribou were not as visible as muskoxen against the background of snow.

Results and Discussion

A summary of the linear kilometers flown, square kilometers surveyed, locations, and total areas of the strata and islands surveyed in 1973 is given in Tables 1 and 2. The March-April survey flights were flown on 20 of 28 days between March 19 and April 15, inclusive (Table 3). Temperatures ranged from -43°C to -22°C. Snow cover was 100% in most regions, although in many areas the accumulation did not appear as great as in March-April 1972. Surveys were conducted under generally good conditions with clear skies, low winds, and little ice fog being encountered. Summer surveys were flown on 19 of 48 days between July 5 and August 21, inclusive (Table 3). Temperatures ranged from -4°C to 18°C. Snow remaining from the previous winter was almost completely absent from all but mountainous terrain. Survey conditions were good with the exception of the period over Prince Patrick Island where frequent storms, fog, overcast skies and patchy fresh snow prevailed throughout August.

Estimated numbers of Peary caribou (Table 4) and muskoxen (Table 10) are given by island and survey period. Comparisons of densities of caribou (Table 6) and muskoxen

Figure 1
Western Queen Elizabeth Islands, Northwest Territories, surveyed by air during March-April and July-August 1973



(Table 11) are made by width of transect strips for each survey period. Percentages of calves to total caribou seen during the July-August period are given in Table 5. Percentages of short yearlings (1972 calves) and 1973 calves to total muskoxen observed are given in Table 12. Distributions of Peary caribou and muskoxen are given for Melville and Bathurst islands by distance from the seacoasts (Table 7) and by elevation (Table 8). The distributions of Peary caribou (Table 9) and muskoxen (Table 13) are given by group size for the two survey periods.

Peary caribou were observed on 15 of the 20 islands surveyed in March-April 1973 (Table 4). No caribou were seen on Emerald, Alexander, Helena, Edmund Walker, and Eight Bears islands during March-April. Caribou were observed on all five islands surveyed in July-August 1973 (Table 4).

Muskoxen were seen on 9 of the 20 islands surveyed in March-April 1973 (Table 10). No muskoxen were observed on Mackenzie King, Borden, Loughheed, Brock, Emerald, Massey, Helena, Edmund Walker, Marc, Fitzwilliam Owen,

and Eight Bears islands during March-April. Muskoxen were seen on Melville, Prince Patrick, Byam Martin, and Eglinton islands during July-August 1973. There were no muskoxen seen on Emerald Island in July 1973.

Islands surveyed in both March-April and July-August

Peary caribou

Melville Island The numbers of Peary caribou observed on Melville varied considerably between the March-April and July-August 1973 surveys (Table 4). Observed numbers were four times greater and estimates twice as large in July-August. Greater numbers of caribou in July-August were seen within each stratum, with exceptional increases in Strata III and XIII (Table 4). Although causes of the disparity could not be determined two possibilities should be considered:

1. There may be regular inter-island movements of Peary caribou (Miller *et al.*, 1973). Apparently, such movements do occur to and from Eglinton Island, but whether move-

ments consisting of many animals occur periodically throughout the Queen Elizabeth Islands is unknown.

2. The observers may have missed a large number of caribou against the background of snow in March-April. Although survey conditions were excellent, the possibility that many caribou went undetected cannot be dismissed. Low contrast pelage make Peary caribou difficult to spot in winter under certain light conditions.

There was a marked seasonal change in the maximum group size for caribou: from 13 in March-April to 60 in July-August. The mean group size doubled during the same period from 4.0 to 8.0 (Table 9).

In contrast to the absence of calves in August 1972 (Miller *et al.*, 1973), 17% of the caribou segregated in July-August were calves (Table 5). In 1961 Tener (1963) observed 19% calves. Better foraging conditions during the apparently lower snow accumulation of March 1973 compared to March 1972, may explain the higher productivity of caribou.

In 1973 Peary caribou occurred in greatest numbers on eastern Melville (Strata I-VI): 82% of total caribou observed in March-April and 80% in July-August (Table 4).

There was a shift in distribution of both species from the interior to certain portions of the coast between April and July 1973 (Tables 7 and 8). Reports from personnel of Panarctic Oils Ltd. suggest that a spring movement occurs annually in May. By mid August 1973 Peary caribou were moving inland, and returned to areas occupied in mid August 1972 (Miller *et al.*, 1973; D.C. Thomas, pers. comm.).

In March-April 1972, 76% of Peary caribou were located on the Sabine Peninsula (Strata I and II) (Miller *et al.*, 1973) but only 4% were found in a comparable survey in 1973. Instead caribou were found principally in east central Melville and the Dundas Peninsula (Strata IV and VI) (Table 4). The reasons for occupation of different wintering grounds in the two years are not known. However, there appeared to be less accumulation of snow over most regions of Melville in 1973, which could have influenced the selection of the wintering area.

Our surveys suggest that substantial numbers of Peary caribou and muskoxen are found in close proximity to one another from May through July during which time caribou occur nearer to the coast (Table 7). Muskoxen however, occupy mainly sedge meadows of low coastal plains and river bottoms, and caribou seem to favour the drier adjacent hillsides and ridges.

Prince Patrick Island The observed and estimated numbers of Peary caribou on Prince Patrick Island were 40% less in July-August than in March-April 1973 (Table 4). This reduction was a reversal of the trend on Melville Island and suggests a spring movement of caribou from Prince Patrick to Melville. However, unfavourable weather caused lengthy delays between survey flights (Table 3), and movements of caribou from unsurveyed to surveyed areas could have taken place. The tracks of approximately 50 caribou leading north from Wilkie Point along the shores of Intrepid Inlet were evidence that such a movement may have preceded our survey of Stratum III on August 21. Sightings of caribou were hindered by patches of fresh snow on the ground after August 8, and may have caused us to miss some animals.

The production of calves in 1973 was lower on Prince Patrick than on Melville (Table 5) which may have been the result of a more severe winter on Prince Patrick. Approximately 100 carcasses of winter-killed caribou were observed during survey flights on Prince Patrick while no more than 50 were seen on Melville Island. The 10.7% of calves segregated was about half the percentage observed by Tener (1963) in 1961.

The distribution of caribou on the island and in groups (Table 9) was not markedly different between surveys. Approximately 85% of caribou were found in Stratum I in each survey (Table 4). While some caribou had moved to coastal areas, especially on the two peninsulas on either side of Mould Bay, the proportion was not as great as on Melville. Prince Patrick was surveyed in late July and August, and caribou may have already begun moving away from the coast. The number of caribou tracks encountered in Stratum III suggested that more caribou had summered in the area than were observed on August 21.

Eglinton Island There was a considerable reduction in the total numbers of caribou observed and estimated in 1973 (Table 4) compared to 1972 (Miller *et al.*, 1973). Although the proportion of the island surveyed was increased from 25% in April 1972 to 44% in April 1973, the actual sightings were 50% less and estimates were only 19% as great in 1972. Similarly, there were fewer caribou in August 1973 (Table 4) than the previous year (Miller *et al.*, 1973). The decrease in summer was also reflected in group size (Table 9). There was no evidence of mortality high enough to account for the decline in numbers of caribou on the island in 1973 compared with 1972, or for the discrepancies between April and August surveys during both years.

No caribou calves were observed on Eglinton Island in 1972 (Miller *et al.*, 1973) or in 1973. Tener (1963) saw four calves in 1961.

Most caribou in April 1973 were located on ridges and plateaus on the southern two thirds of Eglinton. The few caribou seen in summer were on lower ground near the coast.

On the basis of four surveys flown in April and August of 1972 and 1973 we conclude that Peary caribou leave Eglinton Island in summer and return in varying numbers after the autumn freeze-up. This is probably a regular annual movement, but more observations are needed. As both Prince Patrick and Melville are only 25 km from Eglinton, and the ice between is relatively smooth, there are no serious barriers to movements between those islands and Eglinton. The large number of caribou observed on Stratum XIII on Melville in August 1973 where few had been observed in April 1972 and 1973 suggests that it is possibly the summer range for caribou that winter on Eglinton (Table 4).

Byam Martin Island Three times as many caribou were counted on the July survey as were seen in March 1973 (Table 4). The causes of the disparity may be similar to those given for Melville. The seasonal trend in group size followed the pattern on Melville (Table 9).

Calves totalled 11.4% of caribou segregated in 1973. The previous year no calves had been seen (Miller *et al.*, 1973).

In March 1973, 23 of 24 caribou were found on a 6-km-wide strip between Kay and Langley points. The strip ap-

pears as a geologically distinct zone in aerial photographs. In mid July, 77 of 79 caribou were observed within 3 km of the south coast near Cape Gillman.

Emerald Isle No Peary caribou or feeding craters were observed on Emerald Isle in April, but 15 caribou were tallied in July 1973. The estimate totalled 40 (Table 4).

No calves were observed on Emerald Isle, though in 1961 Tener (1963) saw four calves.

Thirteen of 15 caribou were within 2 km of the coast. The island's proximity to Melville and Prince Patrick (25 km) makes it likely that caribou travel back and forth across the sea ice.

Muskoxen

Melville Island The numbers of observed and estimated muskoxen for Melville were similar for the March-April and July-August surveys (Table 10). Nine per cent more muskoxen were seen in March-April, but that percentage could be accounted for by the higher contrast of muskoxen against a background of snow. Estimated numbers of muskoxen based on the March-April survey in 1972 (Miller *et al.*, 1973) were close to 1973 results (Table 10). The non-random distribution of muskoxen lowers the reliability of our estimates but the results suggest a population of 3,000 to 4,000 muskoxen on Melville. The data show a 200 to 300% increase in the number of muskoxen on Melville since Tener's (1963) survey in 1961 (Miller *et al.*, 1973) (Table 10).

The number of short yearlings among those muskoxen segregated in March-April 1973 (Table 12, 2.2%) was considerably lower than the 13.3% found in March-April 1972 by Miller *et al.* (1973). The lower increment in March-April 1973 probably reflects the relatively few calves (10.5%) observed in August 1972 (Miller *et al.*, 1973). Calves in July-August 1973 totalled 18.7% of all muskoxen observed (Table 12). Tener (1963) found that calves represented 17.2% of muskoxen seen in July 1961.

Muskoxen occurred in greatest densities on western Melville (Strata VII-XIII) in 1972 and 1973: 72% of all muskoxen tallied in March-April 1972 and 1973 and 60% in July-August 1973 (Tables 10 and 11) (Miller *et al.*, 1973). Although the numbers of muskoxen were similar for both surveys, the distribution by group size varied noticeably (Table 9). The magnitude of the trend for smaller groups in summer was greatest on Melville, which had the largest groups in winter compared to the other islands.

Unlike Peary caribou, muskoxen were found in the same general areas in July-August as in March-April 1973 (Table 10). However, their distance from the seacoast changed with the season (Table 7). The number of muskoxen located within 2.5 km of the coast decreased from 1,369 in March-April to 894 in July-August. The decrease was less marked within 15 km of the coast where 2,514 were seen in March-April and 2,289 in July-August. About 16 and 74% of the landmass of Melville are within the 2.5 and 15 km strips respectively. The number of muskoxen within the coastal strips in both 1972 (Miller *et al.*, 1973) and 1973 greatly exceeds the expected occurrence had the muskoxen been randomly distributed.

Although muskoxen moved inland in summer, they did not occupy appreciably higher ground (Table 8). The number of muskoxen located at elevations less than 150 m above sea level varied little between March-April and July-August 1973 (Table 8, 77.9% vs. 79.3%). Very few muskoxen occupied ground higher than 300 m above sea level in either survey period (Table 8). Although 16% of the total landmass of Melville is more than 300 m above sea level, only 1.6% of muskoxen were found within that zone in both surveys.

Apparently there are no large scale seasonal movements of muskoxen to and from Melville (Table 10), although some movement between islands undoubtedly occurs. In early June 1973, personnel of Panarctic Oils Ltd. reported observing 30 muskoxen on the sea ice about 25 km southwest of Lougheed and travelling on a bearing toward the Sabine Peninsula, Melville Island, 100 km from Lougheed (D. Connally, pers. comm.).

Prince Patrick Island Similar numbers of muskoxen were observed on Prince Patrick during the March-April and July-August surveys (Table 10). Tener (1963) did not see any muskoxen on Prince Patrick in 1961, and he concluded that the species probably did not inhabit the island at that time. It appears, therefore, that Prince Patrick has been repopulated, probably by dispersion from neighbouring Melville. Increments for short yearlings and calves in March-April and July-August (3.4 and 16.0% respectively) were comparable to those observed on Melville (Table 12). All muskoxen were observed south of 76°50'N and east of 119°30'W, on approximately 20% of the landmass.

Byam Martin Island As on Melville and Prince Patrick, the total numbers of muskoxen observed were similar between surveys, 51 in March-April and 55 in July-August (Table 10). These counts are also close to the surveys of March-April and May 1972 (Miller *et al.*, 1973). It appears, therefore, that Byam Martin has a permanent resident population of 50 to 60 muskoxen. Tener (1963) did not survey Byam Martin in 1961.

No short yearlings were observed in March-April 1973 but 23.6% of muskoxen seen in July were calves (Table 12). This percentage was substantially greater than the increment observed in August 1972 which was only 4.8% (Miller *et al.*, 1973).

As on other islands, muskoxen were located on or near the coast on low ground. No muskoxen were seen on the north end of the island.

Eglinton Island Almost twice as many muskoxen were seen on both surveys in 1973 as in 1972 (Table 10) (Miller *et al.*, 1973). It is possible that in the interval one or more groups of muskoxen moved to Eglinton from Melville which lies only 25 km to the east. No muskoxen were encountered on Eglinton in July 1961 by Tener (1963). The island has probably been repopulated by an influx of muskoxen from Melville.

The increments of short yearlings and calves for March-April and July-August 1973 were 4.4 and 13.5% respectively (Table 12). In 1972, 9.1 and 7.1% of muskoxen were respectively short yearlings and calves in comparable surveys (Miller *et al.*, 1973).

Muskoxen were found on coastal sedge meadows on the southern half of the island.

Emerald Isle No muskoxen were seen in either of two surveys of Emerald in 1973. Tener (1963) did not observe muskoxen on Emerald in July 1961.

Islands surveyed in March-April only

Preliminary aerial surveys were made of 15 islands in March-April (Table 3). A comparison of Tener's (1963) 1961 results with data obtained in 1973 (Tables 4 and 10) suggests a drastic reduction of 93% in overall caribou numbers and a marked decrease of 33% in the number of muskoxen.

Differences between the 1961 and 1973 surveys of the Prime Minister Group (Borden, Brock and Mackenzie King) suggest that the estimated population of 4,012 caribou in 1961 has declined to about 1% of its former size. The current estimate of 619 caribou on Bathurst and its satellite islands as compared to Tener's (1963) 1961 estimate of 3,565 caribou suggests a decline of 83%.

Distribution of muskoxen in 1973 indicates a recolonization of small islands adjacent to Bathurst, although the current estimate of muskoxen numbers on Bathurst is low compared to 1961. Observations in 1973 also indicate that muskoxen have not yet recolonized the Prime Minister Group.

Aerial surveys during the snow-free months will be necessary before we can truly evaluate the apparent changes in numbers of caribou and muskoxen on islands surveyed only in March-April 1973.

Bathurst Island Over 60% of the caribou occurred on the southeast third of the island (Stratum III). The remaining caribou were nearly equally distributed on the northeast (Stratum II, 19%) and northwest (Stratum I, 21%) thirds of the island. A similar pattern of frequency of occurrence was observed for muskoxen; southeast, 59%; northeast, 17%; and northwest, 24%. Eighteen caribou and 109 muskoxen were seen within a strip 20 km wide, running east and west, through the lowlands of the Bracebridge-Goodsir Valley.

The distribution of caribou in 1961 (Tener, 1963) was a reversed pattern of the 1973 occurrence. Over 60% of the caribou were on the northeast third, and 39 and 0.4% on the northwest and southeast thirds, respectively.

Almost 55% of the caribou seen during June and July 1961 (Tener 1963) were within 1.6 km of the seacoast. In March and April 1973 only about 13% were within 2.5 km of the seacoast.

Most of the muskoxen (61.9%) observed in 1961 (Tener, 1963) were on east central sites. Muskox distribution over the remainder of the island in 1961 was similar to that observed in 1973.

Differences between 1961 (Tener 1963) and 1973 observations suggest that the numbers of caribou (Table 4) and muskoxen (Table 10) have decreased by 85 and 40%, respectively. The reduction in caribou numbers fits the overall pattern of a declining caribou population on the western Queen Elizabeth Islands. The reduction in numbers of muskoxen, however, is in contrast to the observed increase throughout the rest of the survey area. An ecological study of muskoxen on the island suggests that many muskoxen

may have succumbed during the winter of 1967-68 (Gray, 1973: 35). Subsequent evidence indicates that there were no calves produced during 1968, 1969 or 1970 (Gray, 1973: 45). The compounded effects of increased mortality of adults and no or minimal calf production during consecutive years have apparently caused the observed population decline.

Cameron Island Six caribou were seen in two groups on east central sites. One group of five muskoxen was observed on a northeastern coastal site. Tener (1961) saw 21 caribou and three muskoxen on the island.

Tener (1963) estimated that there were 235 caribou on the island in 1961. The difference in observed caribou numbers between 1961 and 1973 (Table 4) suggests that only 3% of the caribou population survived the interim.

Tener (1963) estimated 25 muskoxen on Cameron, Vanier, Massey, and Alexander based on the three muskoxen observed on Cameron in 1961 (Tener 1961). The total estimate for these four islands in 1973 was 56 muskoxen (Table 10). The apparent increase in muskoxen numbers may reflect immigration from Bathurst or Melville rather than successful reproduction and survival of muskoxen present in 1961.

Ile Vanier Only five caribou on a west central site were seen on the island. Tener (1963) estimated 396 caribou on the island in 1961. The difference between the two surveys indicates a decrease of 95% of the caribou population during the interim 1961-73.

A group of six muskoxen was seen on the south central coast of the island. Muskoxen were not seen on the island in 1961 (Tener, 1961). Interchange of muskoxen between Bathurst and Vanier is likely though it is also possible that muskoxen emigrated from eastern Melville.

Massey Island Eleven caribou were seen in one group on a south central coastal site. Tener (1963) estimated 13 caribou, and the 1973 estimate (Table 4) suggests an increase of 31 caribou on the island. No muskoxen were seen in 1973, nor were any seen in 1961 (Tener, 1961).

Ile Marc Nine caribou were seen in two groups on north central coastal sites. No muskoxen were observed on the island. Tener (1963) did not survey the island in 1961.

Alexander Island No caribou were seen on the island. Tener (1963) estimated that 198 caribou were on the island in 1961.

The nine muskoxen observed on central Alexander were in a large river valley that bisects the south of the island on an east-west course. Tener (1963) treated Alexander Island as part of Bathurst because the former had not been named at the time of the 1961 survey. He saw only one muskoxen on Alexander in 1961 (Tener, 1961).

Little Cornwallis Island Four caribou were seen: two on a west central site and two on a northwestern coastal site. Tener (1963) saw no caribou on the island. The 10 muskoxen seen were on the east central coast; in 1961 Tener (1963) had not seen any muskoxen. The nearest source of colonists is Bathurst.

Lougheed Island A total of 30 caribou was seen in seven groups: five groups on south central sites and two groups on southeastern sites. Tener (1963) estimated that there

were 1,325 caribou on the island in 1961. Observations in 1973 (Table 4) suggest that the island population of caribou has declined to about 4% of its former size. No muskoxen were seen on the island in 1973, nor were any seen in 1961 (Tener 1963).

Borden Island Only two caribou on a southeastern site were seen on the island. Tener (1963) saw 100 caribou and estimated a population of 1,630 on the island in 1961. The 1973 estimate (Table 4) suggests that the population has declined to 1% of its former size. No muskoxen were seen in 1973, nor were any seen in 1961 (Tener 1963).

Brock Island Seven caribou were seen in three groups on eastern coastal sites. Tener (1963) did not complete his survey of Brock in 1961 because of fog, but he estimated that there were 190 caribou on the island. Observations in 1973 (Table 4) suggest that the population of caribou is now only 13% of its former size. No muskoxen were seen in 1973, nor were any seen in 1961 (Tener 1963).

Mackenzie King Island Only three caribou on a southwestern site were seen on the island. Tener (1963) saw 111 caribou and estimated a population of 2,192 caribou on the island in 1961. Observations in 1973 suggest that the island population of caribou is virtually extinct. No muskoxen were seen in 1973, nor were any seen in 1961.

Fitzwilliam Owen Island Only one caribou and no muskoxen were seen on the island. Tener (1963) did not survey the island in 1961.

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References

- Dunbar, M. and K.R. Greenaway. 1956. Arctic Canada from the air. Can. Defence Res. Board. 541p.
- Gray, D.R. 1973. Social organization and behaviour of muskoxen (*Ovibos moschatus*) on Bathurst Island, N.W.T. Ph.D. thesis, Univ. Alberta, 212p.
- Miller, F.L., R.H. Russell, and D.R. Urquhart. 1973. Preliminary surveys of Peary caribou and muskoxen on Melville, Eglinton, and Byam Martin islands, Northwest Territories, 1972. Can. Wildl. Serv. Progress Note No. 33: 1-9.
- Savile, D.B.O. 1961. The botany of the northwestern Queen Elizabeth Islands. Can. J. Bot., 39: 909-942.
- Tener, J.S. 1961. Queen Elizabeth Islands game survey. Can. Wildl. Serv., Rpt. CWSC 972, 94p.
- Tener, J.S. 1963. Queen Elizabeth Islands game survey, 1961. Can. Wildl. Serv. Occas. Paper No. 4: 1-50.
- Thorsteinsson, R., and E.T. Tozer. 1960. Summary of account of structural history of the Canadian Arctic Archipe-

Table 1
Stratification, location, size, and coverage of the three major islands surveyed in the Queen Elizabeth Group, Northwest Territories, March-April 1973 and July-August 1973*

Island/Stratum	Location (lat./long.)‡	Area (km ²)	Area surveyed (km ²)	Distance flown (km)
Melville				
I	Upper Sabine Peninsula	2,940	730	450
II	Lower Sabine Peninsula	1,730	440	270
III	Domett Point	1,940	480	300
IV	Rea Point	7,260	1,820	1,130
V	Central Melville	4,560	1,150	710
VI	Dundas Peninsula	5,100	1,300	810
VII	Savage Head	1,030	260	160
VIII	South McCormick	5,100	1,290	800
IX	North McCormick	3,330	850	540
X	Sandy Point	1,390	350	230
XI	Canrobert Peninsula	1,670	410	250
XII	Stevens Head	1,400	350	220
XIII	Cape Russell	4,770	1,210	770
I-VI	Eastern Melville	23,530	5,920	3,670
VII-XIII	Western Melville	18,690	4,720	2,970
I-XIII	Melville	42,220	10,640	6,640
Bathurst				
I	Northwest Bathurst	4,080	1,010	630
II	Northeast Bathurst	6,650	1,660	1,030
III	South Bathurst	5,360	1,350	840
I-III	Bathurst	16,090	4,020	2,500
Prince Patrick				
I	South Prince Patrick	7,740	1,950	1,210
II	North Prince Patrick	5,980	1,470	910
III	Wilkie Point	2,110	540	340
I-III	Prince Patrick	15,830	3,960	2,460

*Bathurst Island surveyed only in March-April 1973.

‡Location of stratum or island is given as median intercept of north-south/east-west axes by latitude and longitude to the nearest 10'.

‡The last digit equals minutes when multiplied by 10, e.g. 762/1093 = 76°20'N/109°30'W.

Table 2
Location, size, and coverage of secondary islands surveyed in the Queen Elizabeth Group, Northwest Territories, March-April 1973 and July-August 1973*

Island	Location (lat./long.)‡	Total area (km ²)	Area surveyed (km ²)	Distance flown (km)
Mackenzie King	774/1113‡	5,100	640	390
Borden	783/1110	2,790	350	220
Eglinton	755/1183	1,550	680‡	480
Lougheed	773/1052	1,300	320	200
Byam Martin	751/1042	1,160	510‡	360
Vanier	761/1033	1,130	280	180
Cameron	763/1035	1,060	270	170
Brock	775/1141	790	100	64
Emerald	765/1141	550	140	88
Alexander	755/1024	490	120	80
Massey	760/1031	440	110	64
Little Cornwallis	753/962	410	100	64
Helena	764/1010	330	88	55
Edmund Walker	771/1041	82	26	16
Marc	755/1034	56	25	14
Fitzwilliam Owen	771/1135	34	15	9
Eight Bears	771/1132	18	10	6

*Only Eglinton, Byam Martin, and Emerald Islands were surveyed in July-August 1973.

‡Location of island is given as median intercept of north-south/east-west axes by latitude and longitude to the nearest 10'.

‡The last digit equals minutes when multiplied by 10, e.g. 774/1113 = 77°40'N/111°30'W.

‡Coverage for Eglinton and Byam Martin Islands in July-August 1973 was 780 and 290 km² surveyed respectively.

Table 3
Flight dates and coverage of islands surveyed in the Queen Elizabeth Group, March-April and July-August 1973*

Island	March-April		July-August	
	Flight dates	Percentage surveyed	Flight dates	Percentage surveyed
Melville	March 19, 20, 21, 22, 24, 25, 26, April 6, 7	25.0	July 5, 6, 7, 8, 11, 12, 13, 14, 27, 29, August 2	25.0
Bathurst	March 29, April 1, 2, 3	25.0	—	—
Prince Patrick	April 8, 12, 13, 15	25.0	July 28, 30, August 1, 9, 20, 21	25.0
Mackenzie King	April 15	12.5	—	—
Borden	April 14, 15	12.5	—	—
Eglinton	April 8	44.0	August 8	50.0
Lougheed	April 3	25.0	—	—
Byam Martin	March 27	44.0	July 15	25.0
Vanier	April 4	25.0	—	—
Cameron	April 3	25.0	—	—
Brock	April 15	12.5	—	—
Emerald	April 15	25.0	July 30	25.0
Alexander	April 4	25.0	—	—
Massey	April 4	25.0	—	—
Little Cornwallis	April 1	25.0	—	—
Helena	April 3	25.0	—	—
Edmund Walker	April 3	30.0	—	—
Marc	April 4	45.0	—	—
Fitzwilliam Owen	April 14	45.0	—	—
Eight Bears	April 14	55.0	—	—

*Only Melville, Prince Patrick, Eglinton, Byam Martin and Emerald Islands were surveyed in July-August 1973.

Table 4
Estimate of Peary caribou numbers obtained from two aerial surveys of islands in the Queen Elizabeth Group, Northwest Territories, 1973*

Island and stratum	Total caribou obs.	March-April				July-August				
		0.8 km strip census†		1.6 km strip census†		Total caribou obs.	0.8 km strip census†		1.6 km strip census†	
		Caribou obs.	Est. caribou	Caribou obs.	Est. caribou		Caribou obs.	Est. caribou	Caribou obs.	Est. caribou
Melville										
I	21		‡	15	60	4		‡	2	8
II	0					24	13	104	13	52
III	29	7	56	20	80	438	90	720	148	592
IV	190	88	704	147	588	521	72	576	209	836
V	52	16	128	38	152	202	28	224	82	328
VI	176	74	592	133	532	559	86	688	173	692
VII	3	1	8	3	12	11	5	40	5	20
VIII	51	9	72	40	160	126	16	128	48	192
IX	19		‡	2	8‡	80	4	32‡	29	116
X	22	6	48	11	44	38	12	96	34	136
XI	0					18	14	112	14	56
XII	7		‡	3	12	24	2	16‡	3	12‡
XIII	3		‡	3	12	149	45	360	104	416
I-VI	468	185	1480	353	1412	1748	289	2312	627	2508
VII-XIII	105	16	128	62	248	446	98	784	237	948
I-XIII	573	201	1608	415	1660	2194	387	3096	864	3456
Prince Patrick										
I	459	171	1368	295	1180	283	67	536	177	708
II	77	10	80	45	180	32	18	144	28	112
III	13	11	88	11	44	14		‡		‡
I-III	549	192	1536	351	1404	329	85	680	205	820
Bathurst										
I	43	19	152	29	116	—	—	—	—	—
II	38	19	152	24	96	—	—	—	—	—
III	122	45	360	81	324	—	—	—	—	—
I-III	203	83	664	134	536	—	—	—	—	—
Eglinton	90	13	59‡	46	105	7	5	20	6	12
Byam Martin	24	4	18‡	13	30	79	11	88	11	44‡
Lougheed	30	5	40	14	56	—	—	—	—	—
Emerald	0					15	2	16	10	40
Massey	11	5	40	11	44	—	—	—	—	—
Marc	9		‡	2	3‡	—	—	—	—	—
Brock	7	3	48	3	24	—	—	—	—	—
Cameron	6	2	16	2	8	—	—	—	—	—
Vanier	5		‡	5	20	—	—	—	—	—
Little Cornwallis	4		‡	2	8	—	—	—	—	—
Mackenzie King	3		‡		‡	—	—	—	—	—
Borden	2		‡	2	16	—	—	—	—	—
Fitzwilliam Owen	1		‡		‡	—	—	—	—	—

*Only Melville, Prince Patrick, Eglinton, Byam Martin, and Emerald Islands were surveyed in July-August 1973.

‡Both sides of aircraft.

‡Calculated estimates were less than total numbers of Peary caribou observed on and off transect strips.

Table 5

Percentages of calves in singles and groups of Peary caribou in which age classes were identified on Melville, Prince Patrick, Byam Martin, Emerald, and Eglinton islands, Northwest Territories, July-August 1973*

Island and stratum	Total# caribou	Percentage calves
Melville		
I-VI	1,101	17.8
VII-XIII	338	14.7
I-XIII	1,489	17.0
Prince Patrick	307	10.7
Byam Martin	79	11.4
Emerald	15	0.0
Eglinton	7	0.0

*No short yearlings were identified in the March-April survey.

‡Deletion of solitary animals would change the percentages of calves as follows: (Melville, I-VI, 18.0%) (VII-XIII, 15.0%) and (I-XIII, 17.2%); (Prince Patrick, 11.4%) and (Byam Martin, 11.5%).

Table 6

Densities of Peary caribou estimated from two aerial surveys of islands in the Queen Elizabeth Group, Northwest Territories, 1973

Island and stratum	March-April, caribou/100 km ²		July-August, caribou/100 km ²	
	0.8 km strip	1.6 km strip	0.8 km strip	1.6 km strip
Melville				
I	—	2.1	—	0.3
II	—	—	5.9	3.0
III	2.9	4.2	37.5	30.8
IV	9.7	8.1	7.9	11.5
V	2.8	3.3	4.9	7.1
VI	11.4	10.2	13.2	13.3
VII	0.8	1.2	3.8	1.9
VIII	1.4	3.1	2.5	3.7
IX	—	0.2	0.9	3.4
X	3.4	3.1	6.9	9.7
XI	—	—	6.8	3.4
XII	—	0.9	1.1	0.9
XIII	—	0.2	7.4	8.6
I-VI	6.3	6.0	9.8	10.6
VII-XIII	0.7	1.3	4.2	5.0
I-XIII	3.8	3.9	7.3	8.1
Prince Patrick				
I	17.5	15.1	6.9	9.1
II	1.4	3.1	2.4	1.9
III	4.1	2.0	— [§]	— [§]
I-III	9.7	8.9	4.3	5.2
Bathurst				
I	3.8	2.9	—	—
II	2.3	1.4	—	—
III	6.7	6.0	—	—
I-III	4.1	3.3	—	—
Eglinton	3.8	6.8	1.3	0.8
Byam Martin	1.6	2.5	7.6	3.8
Lougheed	3.1	4.4	—	—
Emerald*	—	—	2.9	7.1
Massey	9.1	10.0	—	—
Marc	—	8.0	—	—
Brock	6.0	3.0	—	—
Cameron	1.5	0.7	—	—
Vanier	—	1.8	—	—
Little Cornwallis	—	2.0	—	—
Mackenzie King‡	—	—	—	—
Borden	—	0.6	—	—
Fitzwilliam Owen‡	—	—	—	—

*No caribou seen during March-April survey.

‡Only 3 caribou seen, all off transect

‡Only 1 caribou seen, and was off transect.

§Only 14 caribou seen, and all were off transect.

Table 7

Percentage distribution from seacoast of all Peary caribou and muskoxen observed during survey flights on Melville and Bathurst islands*, Northwest Territories, 1973

Island	kilometers from seacoast					No. observed
	<2.5	2.5-5	5-10	10-15	>15	
Melville						
Land area	16.1	13.6	24.8	19.8	25.7	
Caribou						
March-April	5.7	11.0	22.2	19.4	41.7	573
July-August	25.9	21.8	25.6	12.2	14.5	2,194
Muskoxen						
March-April	52.6	24.8	15.3	3.9	3.4	2,602
July-August	37.6	27.4	22.5	8.7	3.8	2,380
Bathurst						
Land area	25.0	18.7	29.3	16.0	11.0	
Caribou						
March-April	13.3	14.8	23.1	22.7	26.1	203
Muskoxen						
March-April	47.8	14.8	22.0	15.4	-	446

*Bathurst Island surveyed only in March-April 1973.

Table 8

Percentage distribution by elevation of all Peary caribou and muskoxen observed during survey flights on Melville and Bathurst Islands*, Northwest Territories, 1973

Island	Elevation above sea level			No. observed
	<150 m	150-300 m	>300 m	
Melville				
Land area	55.5	28.5	16.0	
Caribou				
March-April	52.4	46.6	1.0	573
July-August	71.0	23.8	5.2	2,194
Muskoxen				
March-April	77.9	20.5	1.6	2,602
July-August	79.3	19.1	1.6	2,380
Bathurst				
Land area	63.2	36.5	0.3	
Caribou				
March-April	50.7	49.3	-	203
Muskoxen				
March-April	91.3	8.7	-	446

*Bathurst Island surveyed only in March-April 1973.

Table 9

Ranges and means of group sizes, for Peary caribou on western islands in the Queen Elizabeth Group, Northwest Territories, 1973*

Island	March-April			July-August		
	No. groups	Group sizes		No. groups	Group sizes	
		Range	Mean‡		Range	Mean‡
Melville	144	1-13	4.0	274	1-60	8.0
Prince Patrick	108	1-18	5.1	81	1-18	4.1
Bathurst	69	1-6	2.9	-	-	-
Eglinton	17	2-17	5.3	2	1-6	3.5
Byam Martin	6	1-8	4.0	8	1-28	9.9
Lougheed	7	1-9	4.3	-	-	-
Emerald	0	-	-	4	1-9	3.8
Massey	1	11	11.0	-	-	-
Marc	2	2-7	4.5	-	-	-
Brock	3	2-3	2.3	-	-	-
Cameron	2	2-4	3.0	-	-	-
Vanier	1	5	5.0	-	-	-
Little Cornwallis	2	2	2.0	-	-	-
Mackenzie King	1	3	3.0	-	-	-
Borden	1	2	2.0	-	-	-
Fitzwilliam Owen	1	1	1.0	-	-	-

*Only Melville, Prince Patrick, Eglinton, Byam Martin, and Emerald islands were surveyed in July-August 1973.

‡Mean includes solitary caribou.

Table 10
Estimate of muskox numbers obtained from two aerial surveys of islands in the Queen Elizabeth Group, Northwest Territories, 1973*

Island and stratum	March-April					July-August				
	Total muskoxen obs.	0.8 km strip census‡		1.6 km strip census‡		Total muskoxen obs.	0.8 km strip census‡		1.6 km strip census‡	
		Muskoxen obs.	Est. muskoxen	Muskoxen obs.	Est. muskoxen		Muskoxen obs.	Est. muskoxen	Muskoxen obs.	Est. muskoxen
Melville										
I	45		‡	23	92	57		‡		‡
II	82		‡	26	104	107	26	208	31	124
III	10	10	80	10	40	16	2	16	12	48
IV	166		‡	66	264	305	44	352	70	280‡
V	129		‡	47	188	102	17	136	40	160
VI	301	15	120‡	97	388	374	40	320‡	53	212‡
VII	95		‡	37	148	73	31	248	34	136
VIII	349	19	152‡	51	204‡	406	81	648	144	576
IX	115	7	56‡	33	132	112	46	368	71	284
X	44	11	88	11	44	37	6	48	17	68
XI	139	36	288	45	180	89	13	104	22	88‡
XII	66	15	120	23	92	48	16	128	25	100
XIII	1,061	85	680‡	291	1,164	654	171	1,368	279	1,116
I-VI	733	25	200‡	269	1,076	961	129	1,032	206	824‡
VII-XIII	1,869	173	1,384‡	491	1,964	1,419	364	2,912	592	2,368
I-XIII	2,602	198	1,584‡	760	3,040	2,380	493	3,944	798	3,192
Bathurst										
I	109	15	120	48	192	—	—	—	—	—
II	74	27	216	40	160	—	—	—	—	—
III	263	35	280	82	328	—	—	—	—	—
I-III	446	77	616	170	680	—	—	—	—	—
Prince Patrick										
I	58	8	64	8	32‡	39		‡	18	72
II	2	2	16	2	8	0				
III	35	3	24‡	12	48	55	21	168	21	84
I-III	95	13	104	22	88‡	94	21	168	39	156
Byam Martin										
	51		‡	4	9‡	55	16	128	30	120
Eglinton										
	45	11	50	11	25‡	37	1	4‡	13	26‡
Little Cornwallis										
	10		‡	10	40	—	—	—	—	—
Alexander										
	9	6	48	9	36	—	—	—	—	—
Vanier										
	6		‡		‡	—	—	—	—	—
Cameron										
	5		‡	5	20	—	—	—	—	—

*Only Melville, Prince Patrick, Byam Martin and Eglinton islands were surveyed in July-August 1973.

‡Both sides of aircraft.

‡Calculated estimates were less than total numbers of muskoxen observed on and off transect strips.

Table 11
Densities of muskoxen estimated from two aerial surveys of islands in the Queen Elizabeth Group, Northwest Territories, 1973

Island and stratum	March-April, muskoxen/100 km ²		July-August, muskoxen/100 km ²	
	0.8 km strip	1.6 km strip	0.8 km strip	1.6 km strip
Melville				
I	0.0	3.2	—	—
II	0.0	5.9	11.8	7.0
III	4.2	2.1	0.8	2.5
IV	—	3.6	4.8	3.8
V	—	4.1	3.0	3.5
VI	2.3	7.5	6.2	4.1
VII	—	14.2	23.8	13.1
VIII	2.9	4.0	12.6	11.2
IX	1.6	3.9	10.8	8.4
X	6.3	3.1	3.4	4.9
XI	17.6	11.0	6.3	5.4
XII	8.6	6.6	9.1	7.1
XIII	14.0	24.0	28.3	23.1
I-VI	0.8	4.5	4.4	3.5
VII-XIII	7.3	10.4	15.4	12.5
I-XIII	3.7	7.1	9.3	7.5
Bathurst				
I	3.0	4.8	—	—
II	3.3	2.4	—	—
III	5.2	6.1	—	—
I-III	3.8	4.2	—	—
Prince Patrick				
I	0.8	0.4	—	0.9
II	0.3	0.1	—	—
III	1.1	2.2	7.8	3.9
I-III	0.7	0.6	1.1	1.0
Byam Martin				
	—	0.8	11.0	10.3
Eglinton				
	3.2	1.6	0.3	1.7
Little Cornwallis				
	—	10.0	—	—
Alexander				
	10.0	7.5	—	—
Vanier				
	—	—	—	—
Cameron				
	—	1.9	—	—

Table 12

Percentages of short yearlings (March-April) and calves (July-August) in singles and groups of muskoxen in which age classes were identified in the western Queen Elizabeth Islands, Northwest Territories, 1973*

Island and stratum	March-April		July-August	
	Total muskoxen	% short yearlings	Total† muskoxen	% calves
Melville				
I-VI	606	4.6	944	19.4
VII-XIII	1,592	1.3	1,225	18.1
I-XIII	2,198	2.2	2,169	18.7
Bathurst	446	7.4	—	—
Prince Patrick	95	3.2	94	16.0
Byam Martin	51	0.0	55	23.6
Eglinton	45	4.4	37	13.5
Little Cornwallis	10	0.0	—	—
Alexander	9	0.0	—	—
Vanier	6	16.7	—	—
Cameron	5	0.0	—	—

*Only Melville, Prince Patrick, Byam Martin, and Eglinton Islands were surveyed in July-August 1973.

†Deletion of solitary bulls would change the percentages of calves as follows: July-August (Melville, I-VI, 20.1%) (VII-XIII, 18.8%), and (I-XIII, 19.4%); (Prince Patrick, 16.3%), (Byam Martin, 25.5%) and (Eglinton, 14.7%). No solitary bulls were observed during the March-April survey. No solitary cows were observed during either survey.

Table 13

Ranges and means of group sizes, for muskoxen on western islands in the Queen Elizabeth Group, Northwest Territories, 1973*

Island	March-April			July-August		
	No. groups	Group sizes		No. groups	Group sizes	
		Range	Mean‡		Range	Mean‡
Melville	147	2-110	17.7	309	1-38	7.7
Bathurst	32	2-39	13.9	—	—	—
Prince Patrick	7	2-32	13.6	8	1-22	11.8
Byam Martin	5	4-17	10.2	10	1-15	5.5
Eglinton	3	11-21	15.0	5	1-22	7.4
Little Cornwallis	1	10	10.0	—	—	—
Alexander	1	9	9.0	—	—	—
Vanier	1	6	6.0	—	—	—
Cameron	1	5	5.0	—	—	—

*Only Melville, Prince Patrick, Byam Martin and Eglinton islands were surveyed in July-August 1973.

‡Mean includes solitary muskoxen.