

Status and trends of *Rangifer tarandus* and *Ovibos moschatus* populations in Canada

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Abstract: We identified 97 *Rangifer tarandus* and 17 *Ovibos moschatus* populations in Canada. In July 1991, the Canadian populations totalled 1.9 to 2.6 million caribou, 13,600 reindeer and 108,600 muskoxen. Seven barren-ground caribou populations contributed about 75% to Canada's total number of caribou. Most population trends of these barren-ground caribou had shifted from increasing in the early 1980s to stable or decreasing in the late 1980s. The George River herd of Quebec and Labrador has been decreasing since 1987, but remains the largest Canadian caribou population. The ecological factors driving barren-ground caribou population dynamics are not well understood. Arctic islands caribou are about 17% of all Canadian caribou. Over 60% of Arctic islands caribou occurred on Baffin Island. Most Arctic islands populations were decreasing with the exceptions of Southampton, Bathurst, Victoria and Baffin islands. Movements within and between islands are not well understood, and probably limit the usefulness of small surveys for indicating long-term trends of Arctic islands caribou populations. Woodland caribou form about 7% of all Canadian caribou, with about 40% of these occurring on the island of Newfoundland. Most Canadian woodland caribou have not been well studied or censused. In many areas, they were faced with an increasing rate of habitat loss. Exceptions included: some eastern Yukon populations and most Newfoundland populations which were increasing. Over 70% of the Canadian muskox population occurred on Banks and Victoria islands. Almost all muskox populations were increasing, especially those on Banks, Victoria, Melville and Bathurst islands. Muskoxen on the mainland Northwest Territories are re-colonizing southern portions of their historical distribution.

Keywords: *Rangifer tarandus*, *Ovibos moschatus*, caribou, reindeer, muskox, Canada.

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Introduction

Williams and Heard (1986) and Case *et al.* (1989) summarized the status of most Canadian populations of *Rangifer tarandus* in 1985 and *Ovibos moschatus* in 1987, respectively. Case *et al.* (1989) also described the muskox harvest management system of the Northwest Territories (NWT). Our paper summarizes the current status and trends of these two ungulate species in Canada. We also briefly discuss some implications of recent population trends.

Methods

The term "population" is used for the various groupings of *Rangifer* as described by the many sources. As a result, a given "population" may be a calving herd, demographic or genetic group, survey unit or a group within jurisdictional boundaries. Because of limited information on muskoxen movements and distributions, the delineation of these populations is also rather arbitrary (Case *et al.*, 1989), and usually represents survey units.

Estimates from surveys conducted after July 1991 were not included. Sources of population estimates and distributions are indicated as footnotes to Tables 1-7. "Unpubl data" indicates that we received survey data and/or reports, while "pers comm" indicates that we received only limited verbal or written information. If available, published references were used; but most estimates were based on unpublished surveys or guesses.

Estimation methods (Tables 1-5 and 7) were lumped into five categories. "Total" indicates either visual or photographic counts of seasonal aggregations which probably represent an entire population. "Minimum" or "min" includes any survey(s) which does not allow estimation of a confidence interval, and probably does not represent a count of the entire population. "Sample" includes visual and photographic, transect and block surveys, as well as mark-recapture and mark-resighting surveys, which could lead to calculation of a confidence interval. Confidence intervals were listed if provided by the source. "Guess" refers to estimates based largely on incidental observations, anecdotal information, local knowledge and gut-feelings. We categorized each estimate's method after reviewing information from its source. "Unknown" indicates that we did not receive sufficient information to categorize the estimation method.

Where a caribou population overlapped two maps (Fig. 1-4), the second listing (Tables 3 and 4) refers the reader back to the first listing (Tables 1 and 2, respectively). Like Williams and Heard (1986), we attempted to avoid double counting any population. Based on new information, we updated and/or corrected some population distributions previously indicated by Williams and Heard (1986).

Results

The total number of *Rangifer* in Canada was estimated at 1.9 to 2.6 million animals (Table 6); similar to that estimated by Williams and Heard (1986). Of the 57 populations for which recent trends were indicated, 39% were increasing; 37%, stable; and 24%, decreasing. This compares to 49%, 33% and 18%, respectively, for 57 populations in 1985 (Williams and Heard 1986).

About 98% of Canada's *Rangifer* population occurred within the NWT, Quebec and Labra-

dor, the Yukon, and the island of Newfoundland which held 58%, 28%, 9% and 3%, respectively.

Based largely on survey estimates from 1985 to 1991, the total Canadian muskox population was estimated at about 108,600; up from 58,500 based on available 1961-86 estimates (Table 7). The vast majority of the increase was caused by actual population increases, although some previously unidentified populations were included. Of the 13 populations for which recent trends were known, 11 were increasing while two were apparently stable.

Of the four Arctic islands where both species had been surveyed recently (Tables 2 and 7), the muskox populations were increasing on three where caribou were decreasing. On Bathurst Island, both caribou and muskox populations were increasing.

We identified 97 *Rangifer tarandus* populations in Canada (Tables 1-5); compared to 77 identified by Williams and Heard (1986). This increase was largely due to new populations being identified and greater detail being provided by many sources (Table 1-6, "No previous information" and "Different boundaries", respectively). As a result, it was difficult to numerically assess trends in caribou population sizes since 1985 in British Columbia, Alberta, Manitoba and Ontario, although all sources suggested that overall provincial numbers were not increasing. In the NWT, we subdivided Williams and Heard's Peary caribou population in the Queen Elizabeth Islands into five in order to present recent survey results (Table 2, Populations 23-42). We also added three reindeer herds not identified by Williams and Heard (1986) (Tables 2, 3 and 4; Populations 22, 58 and 74, respectively). Other changes in the delineation of *Rangifer* populations are relatively minor.

We identified 15 muskox populations in the NWT (cf. 9 populations in Case *et al.*, 1989), one introduced population in Quebec, and one experimental captive herd in Saskatoon, Saskatchewan (Table 7, Fig. 7). Most of the latest NWT muskox estimates are from surveys completed since 1986. Two populations estimates predating 1986 were presented by Case *et al.* (1989) (Table 7; Populations 7 and 12); another was available to Case *et al.* (1989) but not reported by them (Table 7; 2); and another was presented with different boundaries (Table 7; 3).

Discussion

Rangifer tarandus

Barren-ground caribou

For our purpose, Canadian barren-ground caribou populations are those which usually migrate between treed winter habitats and Arctic tundra calving areas, and are found in the Yukon, the NWT, Quebec/Labrador and Man/Ont (Fig. and Tables 1-5; Populations 1, 23, 25, 26, 27, 62, 63, 75 and 76). The seven largest barren-ground populations made up 75% of all Canadian caribou. However, their numbers may have decreased somewhat from about 1.83 million during 1983-84 (Williams and Heard, 1986) to about 1.66 million during 1988-91 (Tables 1, 2 and 5). Williams and Heard (1986) indicated that six of the seven increased between 1979 and 1984, while the Bluenose herd (Fig. 2; 23) was stable. Although the trend of the Bluenose herd shifted from stable to increasing, the trends of the three other NWT herds (Table 2; populations 25, 26 and 27) changed from increasing to stable. As well, the George River herd (Table 5; 76) has been decreasing from a peak of about 680,000 since 1987 (M. Crête, pers comm).

"...The great days of the caribou on the barren lands..." (Bergerud, 1985 Arctic 38: 156, in Williams and Heard, 1986) may now be starting to fade. Why have these trends been changing? An understanding of both the functional relationships of the forage-herbivore-predator system and the effects of these relationships on population dynamics is required for the predictive capability allowing future proactive management (G. Caughley, pers comm). Perhaps censuses of barren-ground caribou populations should be deemphasized in favour of comprehensive assessment of their functional ecological interrelationships.

Arctic Islands caribou

Arctic islands caribou occupy Arctic tundra year-round. For our purposes, these caribou include all island populations from Coats and Baffin islands in the southeast, north to Ellesmere Island, and west to Banks Island (Fig. 2; populations 28-42); plus those on the northeast mainland of the NWT (Fig. 2; 30 and 35).

As of July 1991, these caribou represented 17% of all Canadian caribou. Over 60% of

Arctic islands caribou occurred on Baffin Island; with another 33% on the northeast mainland of the NWT. Recent survey estimates were insufficient to suggest an overall trend for these caribou. Nevertheless, severe declines apparently have occurred on Coats and Banks islands (Table 2; 28 and 37); while the introduced Southampton Island population probably has shown the greatest rate of increase (Table 2; 29). Recently the status of Peary caribou on the Queen Elizabeth Island (QEI) (Fig. 2; 38 - 42) was changed from threatened to endangered.

The ecology of Arctic islands caribou differs from that of barren-ground caribou because the former can not use relatively productive and extensive treed winter habitats, which may lead to distinctive long-term dispersal strategies. Ongoing studies on southern Baffin Island suggest that these caribou undertake occasional dispersal movements en masse (Ferguson and Labine 1991; Ferguson, unpubl data). Resident Svalbard caribou have also undertaken unexpected dispersal movements during a recent severe winter (Tyler and Øritsland, 1989).

Peary caribou on the QEI may also undertake occasional winter range shifts between island groups over the long term. Reportedly, one such movement by Peary caribou occurred during winter 1989-90 from Ellesmere Island to northwestern Greenland, resulting in a harvest of over 100 caribou by Greenlanders during May-November 1990 (A. Rosing-Asvid, pers comm). Previously, Roby *et al.* (1984) had concluded that the caribou population on northwestern Greenland probably had been extirpated by the late 1970s.

Such dispersal movements between island groups would limit the usefulness of surveying portions of the Peary caribou's range to assess overall long-term population trends of the subspecies. Although caribou on the western QEI have declined since the 1970s (Table 2; 38), caribou in the adjacent Bathurst Island area (Table 2; 39) have increased over the same period. Given the inherent difficulties of estimating such populations (Ferguson, 1987; Miller, 1991), the combined estimates from both the western QEI and Bathurst Island groups show little, if any, overall change in number between 1974 (i.e., 2570) and the late 1980s (i.e., 2320). Has the overall status of Peary caribou changed significantly since the mid-1970's?

Woodland caribou

Woodland caribou utilize treed and/or alpine tundra habitats year-round, and contributed only 7% to the total number of Canadian caribou. In many areas, recent increases were largely due to counting of previously unknown or unsurveyed populations. The trends of caribou populations on the island of Nfld (Table 5) are perhaps the best known. This relatively small island held about 40% of Canada's woodland population at probably the highest overall density. The Yukon held another 19% of the woodland population.

As Williams and Heard (1986) pointed out, the few large herds of barren-ground caribou would not compensate for the distinctive genetic pools represented by populations of woodland caribou (Røed, *et al.*, 1991). Genetic studies of the isolated remnant populations of woodland caribou may provide useful insights for future conservation of the heterozygosity of Peary caribou, if that subspecies declines in the future.

As a whole, woodland caribou have been subjected to increasing hunting pressure and increasing predation. Apparently, the major overriding factor is habitat loss and change due to human activities. With the apparently increasing rate of development within their caribou range in Canada, time to reverse these trends among woodland caribou populations may be very limited.

Ovibos moschatus

About 43%, 28% and 13% of the Canadian muskox population occurred on Banks, Victoria and other Arctic islands, respectively (Table 7). Historical evidence suggests that the commercial muskox trade during 1860–1916 may have caused the local extermination of populations on the southern mainland tundra of the NWT (Barr, 1991). Recent surveys have indicated that mainland populations are re-colonizing the southern portion of their historical distribution (Fig. 7; 14 and 15).

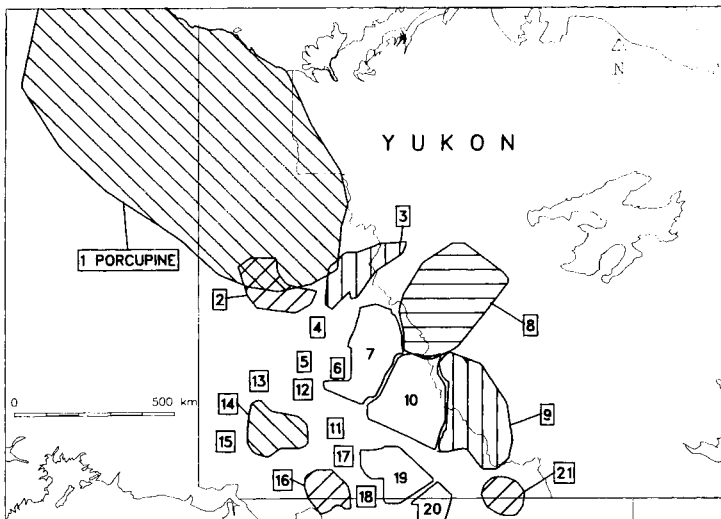


Fig. 1. Distribution of *Rangifer tarandus* populations in the Yukon Territory, Canada.

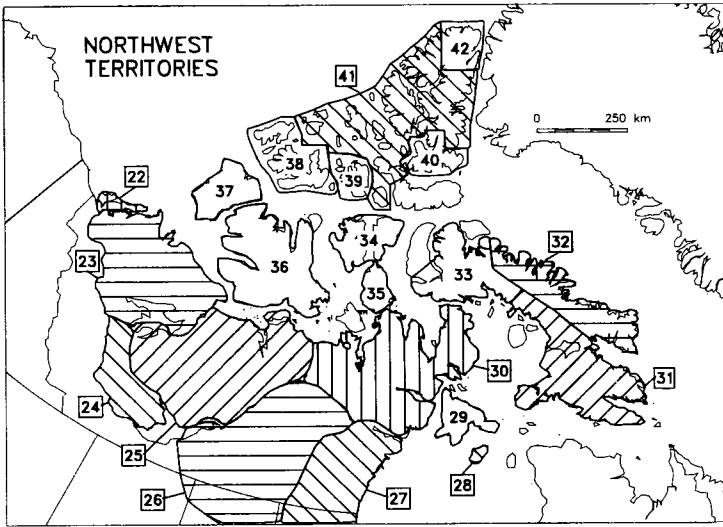


Fig. 2. Distribution of *Rangifer tarandus* populations in the Northwest Territories, Canada.

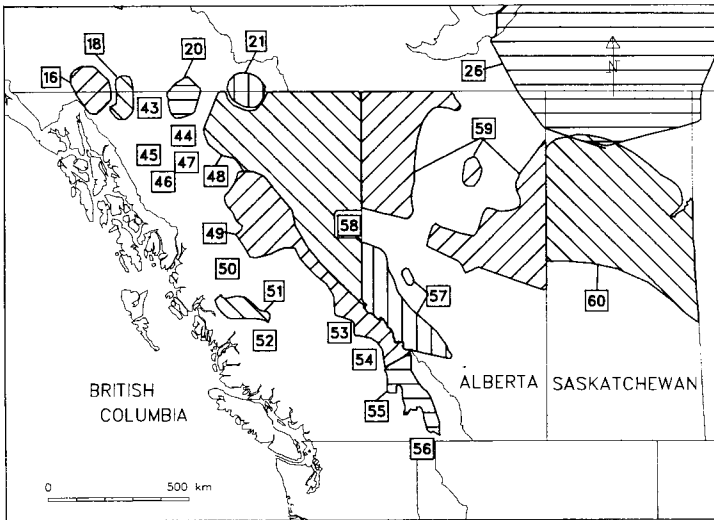


Fig. 3. Distribution of *Rangifer tarandus* populations in British Columbia, Alberta and Saskatchewan, Canada.

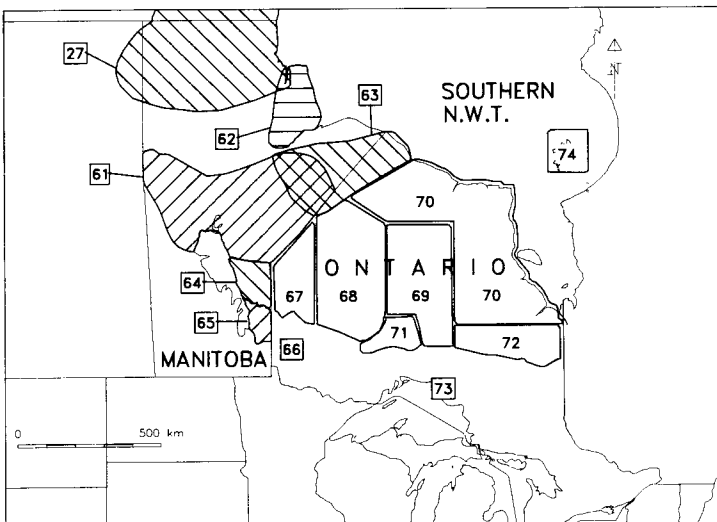


Fig. 4. Distribution of *Rangifer tarandus* populations in Manitoba, Ontario and southern Northwest Territories, Canada.

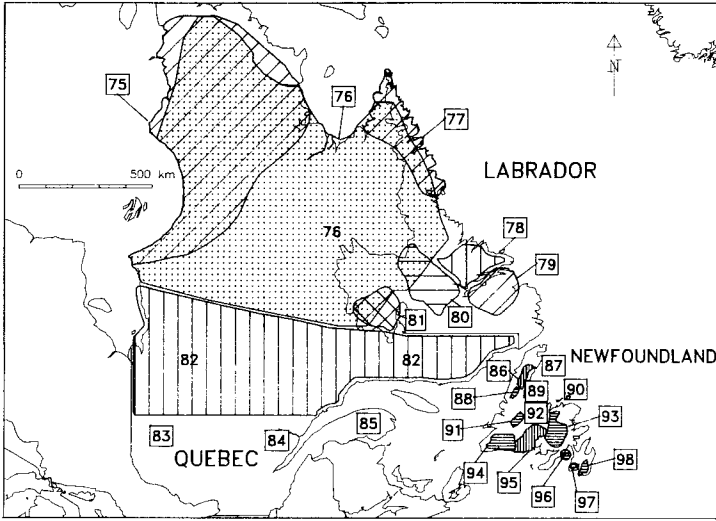


Fig. 5. Distribution of *Rangifer tarandus* populations in Quebec and Newfoundland/Labrador, Canada.

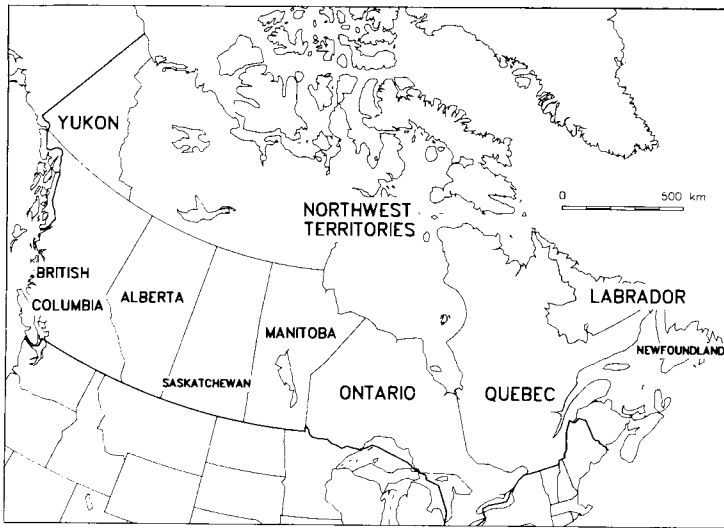


Fig. 6. Provinces and territories of Canada.

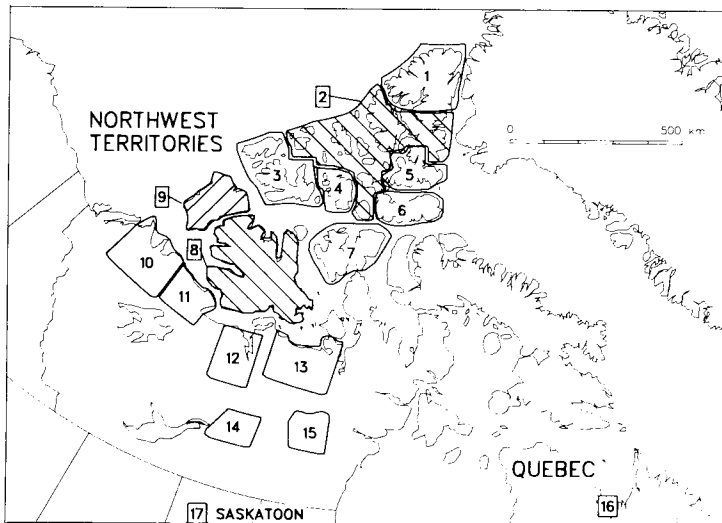


Fig. 7. Distribution of *Ovis montanus* populations in Canada.

Table 1. Status of *Rangifer tarandus* populations in the Yukon Territory, Canada.

| Population Number/Name | Recent information | | | Previous information | | | |
|------------------------|--------------------|-----------------------|-----------------------|-------------------------|-----------|-------------------------|-----------------------------------|
| | Estimate | Year | Method | Trend | Estimate | Year | Method |
| 1. Porcupine | 178,000 | 1989 | Total | Increasing ¹ | 150,000 | 1983 | Total ² |
| 2. Hart River | | No recent information | No recent information | | 1200 | 1978 | Sample ² |
| 3. Bonnet Plume | | No recent information | No recent information | | 5000 | 1982 | Guess ² |
| 4. Mayo | | No recent information | No recent information | | | No previous information | |
| 5. Ethel Lake | | No recent information | No recent information | | 200 | 1977 | Guess ² |
| 6. Moose Lake | 87 | 1991 | Total | Unknown ¹ | 300 | 1985 | Guess ² |
| 7. Tay River | 3200-4300 | 1991 | Sample | Increasing ¹ | 300 | 1985 | Guess ² |
| 8. Redstone | | No recent information | No recent information | | 5K-10K | 1982 | Guess ² |
| 9. Nahanni | | No recent information | No recent information | | 2000 | 1981 | Guess ² |
| 10. Finlayson | 4900-7000 | 1990 | Sample | Increasing ¹ | 2500 | 1984 | Total ² |
| 11. Pelly | | No recent information | No recent information | | 1000 | 1977 | Guess ² |
| 12. Glenlyon | | No recent information | No recent information | | 350 | 1977 | Guess ² |
| 13. Klaza | 440 | 1987 | Total | Unknown ¹ | 250 | 1985 | Guess ² |
| 14. Aishihik | 785 | 1991 | Total | Decreasing ¹ | 1500 | 1981 | Total ² |
| 15. Burwash | 200 | 1990 | Total | Decreasing ¹ | 400 | 1982 | Total ² |
| 16. Carcross | 400 | 1980 | Sample | Stable ¹ | | | Different boundaries ² |
| 17. Squanga | 300 | 1980 | Guess | Unknown ¹ | | | No previous information |
| 18. Teslin | 400 | 1978 | Guess | Unknown ¹ | | | No previous information |
| 19. Wolf Lake | 530-800 | 1987 | Sample | Stable ¹ | 500 | 1985 | Guess ² |
| 20. Little Rancheria | 550-820 | 1988 | Sample | Stable ¹ | 450 | 1985 | Guess ² |
| 21. Smith River | 200 | 1991 | Guess | Unknown ¹ | | | No previous information |
| Most recent total | 205K-213K | 1977-91 | | | 172K-177K | 1977-85 | |

¹ B. Gilroy, pers comm.

² Williams and Heard, 1986.

Table 2. Status of *Rangifer tarandus* populations in the Northwest Territories, Canada.

| Population Number/Name | Recent information | | | Previous information | | | |
|-------------------------------------|--------------------|-----------------------|---------|-----------------------------|-----------------------------------|-----------|----------------------|
| | Estimate | Year | Method | Trend | Estimate | Year | Method |
| 22. Tuktoyaktuk Reindeer | 13,000 | 1986 | Total | Stable ¹ | No previous information | | |
| 23. Bluenose | 120,000 | 1987 | Total | Increasing ² | 50K-80K | 1983 | Sample ³ |
| 24. MacKenzie Woodland | | No recent information | | | 2000-5000 | 1985 | Guess ³ |
| 25. Bathurst | 274K-430K | 1990 | Sample | Stable ⁴ | 320K-450K | 1984 | Sample ³ |
| 26. Beverly | 120K-260K | 1988 | Sample | Stable ⁵ | 250K-420K | 1984 | Sample ³ |
| 27. Kaminuriak | 148K-292K | 1988 | Sample | Stable ⁶ | 180K-280K | 1983 | Sample ³ |
| 28. Coats Island | 540 | 1991 | Sample | Decreasing ⁷ | 2100 | 1984 | Sample ³ |
| 29. Southampton Island | 4270-6530 | 1986 | Sample | Increasing ⁷ | 1100 | 1978 | Sample ³ |
| 30. Northeast Mainland | | No recent information | | | 110K-130K | 1983 | Sample ³ |
| 31. South Baffin | 60K-180K | 1991 | Guess | Stable ⁸ | >60,000 | 1984 | Sample ³ |
| 32. Northeast Baffin | >10,000 | 1991 | Guess | Stable ⁸ | >10,000 | 1985 | Guess ³ |
| 33. North Baffin | 50K-150K | 1991 | Guess | Stable ⁸ | >30,000 | 1985 | Guess ³ |
| 34. Somerset-Prince of Wales | | No recent information | | | 4400-5800 | 1983 | Sample ³ |
| 35. Boothia Peninsula | 4830 | 1985 | Sample | Unknown ⁹ | Different boundaries ³ | | |
| 36. Victoria Island | N/A | 1991 | Guess | Increasing ¹⁰ | 7000-9000 | 1980 | Sample ³ |
| 37. Banks Island | 740-1040 | 1989 | Sample | Decreasing ¹¹ | 5000 | 1985 | Sample ³ |
| 38. Western Queen Elizabeth Islands | 1290 | 1986-87 | Sample | Decreasing ^{12,13} | 2340 | 1974 | Sample ¹⁴ |
| 39. Bathurst Island | 1030 | 1988 | Sample | Increasing ¹⁵ | 230 | 1974 | Sample ¹⁶ |
| 40. Southern Ellesmere Island | 89 | 1989 | Sample | Decreasing ¹⁷ | 145 | 1973 | Sample ¹⁸ |
| 41. Central Queen Elizabeth Islands | 850-1150 | 1987 | Guess | Decreasing ¹⁹ | 6700-6900 | 1961 | Sample ²⁰ |
| 42. Northern Ellesmere Island | 45 | 1987 | Minimum | Unknown ²¹ | 13 | 1961 | Min ²⁰ |
| Most recent total | 932K-1,621K | 1983-91 | | | 1,045K-1,501K | 1961-8522 | |

¹ Godkin, 1986. ² McLean and Russell, unpubl. data. ³ Williams and Heard, 1986. ⁴ J. Bourque, pers comm. ⁵ Heard and Jackson, 1990a. ⁶ Heard and Jackson, 1990b. ⁷ D. Heard, pers comm. ⁸ M. Ferguson, pers comm. ⁹ Gunn and Ashevak, 1990. ¹⁰ A. Gunn, pers comm. ¹¹ B. McLean, pers comm. ¹² Miller, 1987. ¹³ Miller, 1988. ¹⁴ Miller, *et al.* 1977. ¹⁵ Miller, 1991. ¹⁶ Fischer and Duncan, 1976. ¹⁷ Case and Ellsworth, unpubl. data. ¹⁸ Riewe, unpubl. data. ¹⁹ Miller's (1990) estimate of 3300-3600 Peary caribou, minus other estimates for populations 38-40 and 42. ²⁰ Tener, 1961. ²¹ Wissink, unpubl. data. ²² Using only Williams and Heard (1986).

Table 3. Status of *Rangifer tarandus* populations in British Columbia, Alberta and Saskatchewan, Canada.

| Population Number/Name | Recent information | | | Previous information | | | |
|-----------------------------------|--------------------|--|---------|-------------------------|-----------|-----------------------------------|--------------------|
| | Estimate | Year | Method | Trend | Estimate | Year | Method |
| 16. Atlin West | | See Yukon, 16. Carcross | | | | No previous information | |
| 18. Atlin East | | See Yukon, 18. Teslin | | | | Different boundaries ¹ | |
| 20. Blue River | | See Yukon, 20. Little Rancheria | | | | Different boundaries ¹ | |
| 21. Smith River | | See Yukon, 21. Smith River | | | 125 | 1978 | Total ¹ |
| 43. Jennings | 400 | 1991 | Unknown | Unknown ² | | No previous information | |
| 44. Horse Ranch | 340 | 1983 | Minimum | Increasing ³ | 300 | 1982 | Total ¹ |
| 45. Kaudy/Level | 770 | 1983 | Minimum | Decreasing ³ | 800 | 1983 | Total ¹ |
| 46. Edziza | 100 | 1991 | Unknown | Unknown ² | | No previous information | |
| 47. Spatsizi/Lawyers | | No recent information | | | 1260 | 1982 | Total ¹ |
| 48. Northeastern British Columbia | > 5000 | 1991 | Guess | Stable ⁴ | | No previous information | |
| 49. Omincea | 1900-2400 | 1991 | Minimum | Increasing ⁵ | | No previous information | |
| 50. Telkwa | 75 | 1991 | Unknown | Unknown ² | 40 | 1977 | Total ¹ |
| 51. Tweedsmuir | 400-500 | 1991 | Unknown | Unknown ² | 200 | 1978 | Total ¹ |
| 52. Itcha/Ilgachuz/Rainbow Mtn. | 1550 | 1990 | Total | Stable ⁶ | 700 | 1982 | Total ¹ |
| 53. Quesnel | 100 | 1991 | Total | Decreasing ⁶ | | No previous information | |
| 54. Kamloops | 500 | 1990 | Total | Increasing ⁷ | | No previous information | |
| 55. Kootenay | 620 | 1991 | Minimum | Stable ⁸ | | No previous information | |
| 56. Selkirk | 50-60 | 1990 | Total | Decreasing ⁸ | 25-30 | 1980 | Total ¹ |
| 57. Western Alberta | 300-400 | 1980-81 | Total | Stable ⁹ | | Different boundaries ¹ | |
| 58. Peace Reindeer | 140 | 1991 | Total | Unknown ¹⁰ | | No previous information | |
| 59. Northern Alberta | 2700-3100 | 1991 | Guess | Unknown ⁹ | | Different boundaries ¹ | |
| 60. Saskatchewan | 2500 | 1985 | Guess | Unknown ¹¹ | 2500 | 1985 | Guess ¹ |
| 26. Beverly | | See Northwest Territories, 26. Beverly | | | | | |
| Most recent totals | | | | | | | |
| British Columbia | 13K-14K | 1983-91 | | | 5250 | 1977-85 ¹² | |
| Alberta | 3000-3500 | 1980-91 | | | 1500-3000 | 1985 ¹ | |
| Saskatchewan | 2500 | 1985 | | | 2500 | 1985 ¹ | |

¹ Williams and Heard, 1986. ² R. Marshall, pers comm. ³ Bergerud and Elliot, 1986. ⁴ R. Thompson, pers comm. ⁵ D. King, pers comm. ⁶ T. Smith and D. Langin, pers comm. ⁷ D. Low and D. Jury, pers comm. ⁸ G. Woods, pers comm. ⁹ J. Edmonds, pers comm. ¹⁰ B. Rutley, pers comm. ¹¹ T. Rock, pers comm. ¹² Williams and Heard (1986), less Atlin population.

Table 4. Status of *Rangifer tarandus* populations in Manitoba, Ontario and southern Northwest Territories, Canada.

| Population Number/Name | Recent information | | | | Previous information | | | |
|------------------------------|---|---------|---------|-------------------------|----------------------|----------------------|-----------------------------------|--|
| | Estimate | Year | Method | Trend | Estimate | Year | Method | |
| 27. Kaminuriak | See Northwest Territories, 27. Kaminuriak | | | | | | | |
| 61. Central Manitoba | 1000-2000 | 1991 | Guess | Unknown ¹ | | | Different boundaries ² | |
| 62. Cape Churchill | 1800-2200 | 1988 | Sample | Increasing ¹ | | | Different boundaries ² | |
| 63. Pen Islands | 4800 | 1986 | Total | Unknown ^{1,3} | | | Different boundaries ² | |
| 64. Eastern Manitoba | 350-450 | 1991 | Guess | Unknown ¹ | | | Different boundaries ² | |
| 65. Happy Lake | 50 | 1990 | Total | Decreasing ¹ | 200 | 1980 | Total ¹ | |
| 66. Kenora | 37 | 1983 | Minimum | Unknown ³ | | | Different boundaries ² | |
| 67. Red Lake | 570 | 1978 | Unknown | Unknown ³ | | | Different boundaries ² | |
| 68. Sioux Lookout | 1750 | 1978 | Unknown | Unknown ³ | | | Different boundaries ² | |
| 60. Geraldton | 2710 | 1978 | Sample | Unknown ³ | | | Different boundaries ² | |
| 70. Northeast Ontario | 3500-5600 | 1981-84 | Sample | Unknown ³ | | | Different boundaries ² | |
| 71. Nipigon | 285 | 1978-87 | Minimum | Unknown ³ | | | Different boundaries ² | |
| 72. Southeast Ontario | 130-820 | 1983-84 | Unknown | Unknown ³ | | | Different boundaries ² | |
| 73. Lake Superior | 530 | 1986 | Minimum | Unknown ³ | | | Different boundaries ² | |
| 74. Belcher Islands Reindeer | 500 | 1989 | Total | Stable ⁴ | 287 | 1982 | Sample ⁴ | |
| Most recent totals | | | | | | | | |
| Manitoba | 8000-9500 | 1986-91 | | | 5000 | 1985 ² | | |
| Ontario | 9500-12,300 | 1978-87 | | | 8400 | 1984-85 ² | | |
| Southern NWT | 500 | 1989 | | | 287 | 1982 ² | | |

¹ C. Elliot, pers comm. ² Williams and Heard, 1986. ³ Darby *et al.*, 1989. ⁴ Arragutainaq, Hudson and Poole, unpubl data.

Table 5. Status of *Rangifer tarandus* populations in Quebec and Newfoundland/Labrador, Canada.

| Population Number/Name | Recent information | | | Previous information | | | |
|-----------------------------------|--------------------|---------|-----------------------|---------------------------|-------------------------|----------------------|----------------------|
| | Estimate | Year | Method | Trend | Estimate | Year | Method |
| 75. Leaf River | > 100,000 | 1990 | Sample | Increasing ^{1,2} | 65K-75K | 1983 | Unknown ³ |
| 76. George River | 500,000 | 1990 | Sample | Decreasing ^{1,4} | 600,000 | 1984 | Sample ³ |
| 77. Tornat Mountains | 5K-10K | 1991 | Guess | Increasing ⁴ | 5K-10K | 1985 | Guess ³ |
| 78. White Bear Lake | 0 | 1991 | Guess | Extinct(?) ⁴ | < 100 | 1977 | Total ³ |
| 79. Mealy Mountains | 1900-2200 | 1987 | Sample | Stable ⁴ | 660-740 | 1981 | Total ³ |
| 80. Red Wine Mountains | 600-700 | 1988 | Sample | Stable ⁴ | 720-780 | 1981 | Total ³ |
| 81. Lac Joseph | 300-400 | 1986 | Sample | Stable ⁴ | < 600 | 1978 | Total ³ |
| 82. Boreal Quebec | 6K-18K | 1991 | Guess | Unknown ⁵ | 6000-7000 | 1977-82 | Unknown ³ |
| 83. Val d'Or | 30 | 1991 | Unknown | Decreasing ¹ | 50 | 1985 | Total ³ |
| 84. Grand-Jardins | 100 | 1991 | Unknown | Increasing ¹ | 67 | 1982 | Total ³ |
| 85. Gaspesie | 200 | 1991 | Unknown | Decreasing ¹ | 250 | 1980 | Total ³ |
| 86. Northern Peninsula | 2000-3500 | 1986 | Sample | Increasing ⁶ | 1500 | 1982 | Total ³ |
| 87. Grey Islands | 500-700 | 1989 | Total | Increasing ⁶ | No previous information | | |
| 88. Humber | 1500 | 1989 | Sample | Increasing ⁶ | 450 | 1982 | Total ³ |
| 89. Hampden Downs | 400 | 1989 | Sample | Stable ⁶ | 400 | 1982 | Total ³ |
| 90. Fogo Island | 150 | 1988 | Total | Stable ⁶ | No previous information | | |
| 91. Buchans | | | No recent information | | 2000 | 1982 | Total ³ |
| 92. Gaff Topsails | 4700 | 1988 | Sample | Increasing ⁶ | 1000-2100 | 1982 | Sample ³ |
| 93. Mt. Peyton/Totr/Middle Ridge | 15,000 | 1989 | Sample | Increasing ⁶ | 4600-9600 | 1982 | Sample ³ |
| 94. LaPoile | 11,200 | 1988 | Sample | Increasing ⁷ | 7K-12K | 1982 | Sample ³ |
| 95. Grey River/Sandy Lake/Pothill | 20,000 | 1987 | Sample | Increasing ⁶ | 3200-9000 | 1982 | Sample ³ |
| 96. Merasheen Island | 150 | 1990 | Total | Stable ⁷ | No previous information | | |
| 97. Cape Shore | 840 | 1991 | Sample | Increasing ⁶ | No previous information | | |
| 98. Avalon | 5000-6500 | 1990 | Sample | Increasing ⁷ | 3300-6900 | 1982 | Sample ³ |
| Most recent totals | | | | | | | |
| Quebec | 606K-618K | 1990-91 | | | 676K-682K | 1977-85 ⁸ | |
| Nfld/Labrador | 71K-80K | 1986-91 | | | 31K-56K | 1977-82 ³ | |

1 M. Crête, pers comm. 2 Couturier *et al.*, 1990. 3 Heard and Williams, 1986. 4 S. Luttich, pers comm. 5 Based on a mean density of 1-3 caribou/100 km² (M. Crête, pers comm). 6 S. Mahoney, pers comm. 7 B. Tucker, pers comm. 8 Populations 75, 76 and 82-85, plus Koroc population (Williams and Heard, 1986).

Table 6. Status of *Rangifer tarandus* in Canada.

| Province or Territory | Recent information ¹ | | Previous information ¹ | |
|-----------------------|---------------------------------|---------|-----------------------------------|---------|
| | Estimate | Years | Estimate | Years |
| Yukon Territory | 205,000 - 213,000 | 1977-91 | 172,000 - 177,000 | 1977-85 |
| Northwest Territories | 933,000 - 1,622,000 | 1980-91 | 1,050,000 - 1,507,000 | 1961-85 |
| British Columbia | 13,200 - 13,800 | 1978-81 | 5,300 | 1977-85 |
| Alberta | 3,000 - 3,500 | 1980-91 | 1,500 - 3,000 | 1985 |
| Saskatchewan | 2,500 | 1985 | 2,500 | 1985 |
| Manitoba | 8,000 - 9,500 | 1986-91 | 5,000 | 1985 |
| Ontario | 9,500 - 12,300 | 1978-87 | 8,400 | 1984-85 |
| Quebec | 606,000 - 618,000 | 1990-91 | 676,000 - 682,000 | 1977-85 |
| Newfoundland/Labrador | 71,200 - 79,900 | 1986-91 | 30,500 - 56,200 | 1977-82 |
| Canada | 1,850,000 - 2,573,000 | | 1,951,000 - 2,446,000 | |

¹ Sources given in Tables 1 - 5.

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Table 7. Status of *Ovibos moschatus* populations in Quebec and Newfoundland/Labrador, Canada.

| Population Number/Name | Recent information | | | Previous information | | | |
|------------------------------------|--------------------|---------|---------|---------------------------|-------------------------|------|-------------------------|
| | Estimate | Year | Method | Trend | Estimate | Year | Method |
| 1. Northern Ellesmere | 240 | 1989 | Minimum | Unknown ¹ | 180 | 1961 | Minimum ² |
| 2. Central Queen Elizabeth Islands | 3400 | 1961 | Sample | Unknown ² | No previous information | | |
| 3. Western Queen Elizabeth Islands | 5900 | 1986-87 | Sample | Increasing ^{3,4} | 4240 | 1974 | Sample ⁵ |
| 4. Bathurst Island | 520 | 1988 | Sample | Increasing ⁶ | 230 | 1981 | Total ⁷ |
| 5. Southern Ellesmere | 2000 | 1989 | Sample | Increasing ⁸ | 1200 | 1973 | Sample ⁹ |
| 6. Devon Island | 370 | 1990 | Minimum | Stable ¹⁰ | 400 | 1981 | Minimum ¹¹ |
| 7. Prince of Wales/Sommerset | 1130 | 1980 | Sample | Stable ¹² | 910 | 1975 | Sample ¹³ |
| 8. Victoria Island | 30,650 | 1988-90 | Sample | Increasing ¹⁴ | 11,020 | 1983 | Sample ^{15,16} |
| 9. Banks Island | 46,600 | 1989 | Sample | Increasing ¹⁷ | 27,500 | 1985 | Sample ¹⁸ |
| 10. North of Great Bear Lake | 3040 | 1987 | Sample | Increasing ¹⁹ | 2020 | 1983 | Sample ²⁰ |
| 11. Rae/Richardson | 1800 | 1988 | Sample | Increasing ¹⁴ | 1300 | 1983 | Sample ²⁰ |
| 12. Bathurst Inlet | 3420 | 1986 | Sample | Increasing ²¹ | No previous information | | |
| 13. Queen Maud Gulf | 7600 | 1985-88 | Sample | Increasing ²² | 8500 | 1982 | Sample ²³ |
| 14. Artillery Lake | 560 | 1989 | Sample | Unknown ²⁴ | No previous information | | |
| 15. Baker Lake | 1050 | 1991 | Sample | Unknown ²⁵ | 840 | 1986 | Sample ²⁶ |
| 16. Northern Quebec | 290 | 1986 | Total | Increasing ²⁷ | 150 | 1983 | Total ²⁷ |
| 17. Saskatoon | 17 | 1991 | Total | Increasing ²⁸ | No previous information | | |
| Most recent totals | 108,600 | | | | 58,500 | | |

¹ Wissink, unpubl data. ² Tener, 1961. ³ Miller, 1987. ⁴ Miller, 1987. ⁵ Miller *et al.*, 1977. ⁶ Miller, 1991. ⁷ Ferguson, 1987. ⁸ Case and Ellsworth, unpubl data. ⁹ Riewe, unpubl data. ¹⁰ Case, unpubl data. ¹¹ Decker, unpubl data. ¹² Gunn and Decker, 1984. ¹³ Fisher and Duncan, 1976. ¹⁴ Gunn, unpubl data. ¹⁵ Jingsfors, 1984. ¹⁶ Jingsfors, 1985. ¹⁷ Fraser and Gunn, unpubl data. ¹⁸ McLean *et al.*, 1986. ¹⁹ McLean, unpubl data. ²⁰ Case and Poole, 1985. ²¹ Gunn, 1990. ²² Gunn and Case, unpubl data. ²³ Gunn and Case, 1984. ²⁴ Graf and Shank, 1989. ²⁵ Mulders, unpubl data. ²⁶ Graf *et al.*, 1990. ²⁷ Le Henaff and Crête, 1989. ²⁸ P. Flood, pers comm.

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