



MUSKOXEN DISTRIBUTION AND ABUNDANCE IN THE AREA BETWEEN  
BATHURST INLET AND THE COPPERMINE RIVER, KITIKMEOT REGION,  
NUNAVUT (MX19 AND WEST OF MX14)

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Dumond, M. 2006. Muskoxen distribution and abundance in the area between Bathurst Inlet and the Coppermine River, Kitikmeot Region, Nunavut (MX19 and west of MX14). Government of Nunavut, Department of Environment, Status report: 25, Iqaluit, 8 pp.

**Project# 2-05-7**

Status of muskoxen in the West Kitikmeot (management zones MX/19 and MX/14)

**MUSKOXEN DISTRIBUTION AND ABUNDANCE  
IN THE AREA BETWEEN BATHURST INLET AND THE COPPERMINE RIVER,  
KITIKMEOT REGION, NUNAVUT  
(MX19 and West of MX14)**

**Interim report**

To the

**Nunavut Wildlife Management Board**

**January 2006**

By

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*The present interim report only presents progress in the project as well as preliminary results. All results can be submitted to change in the final report and should not be used for management until final report is submitted.*

**Start: Spring 2005**

**End: March 2006**

### **Summary**

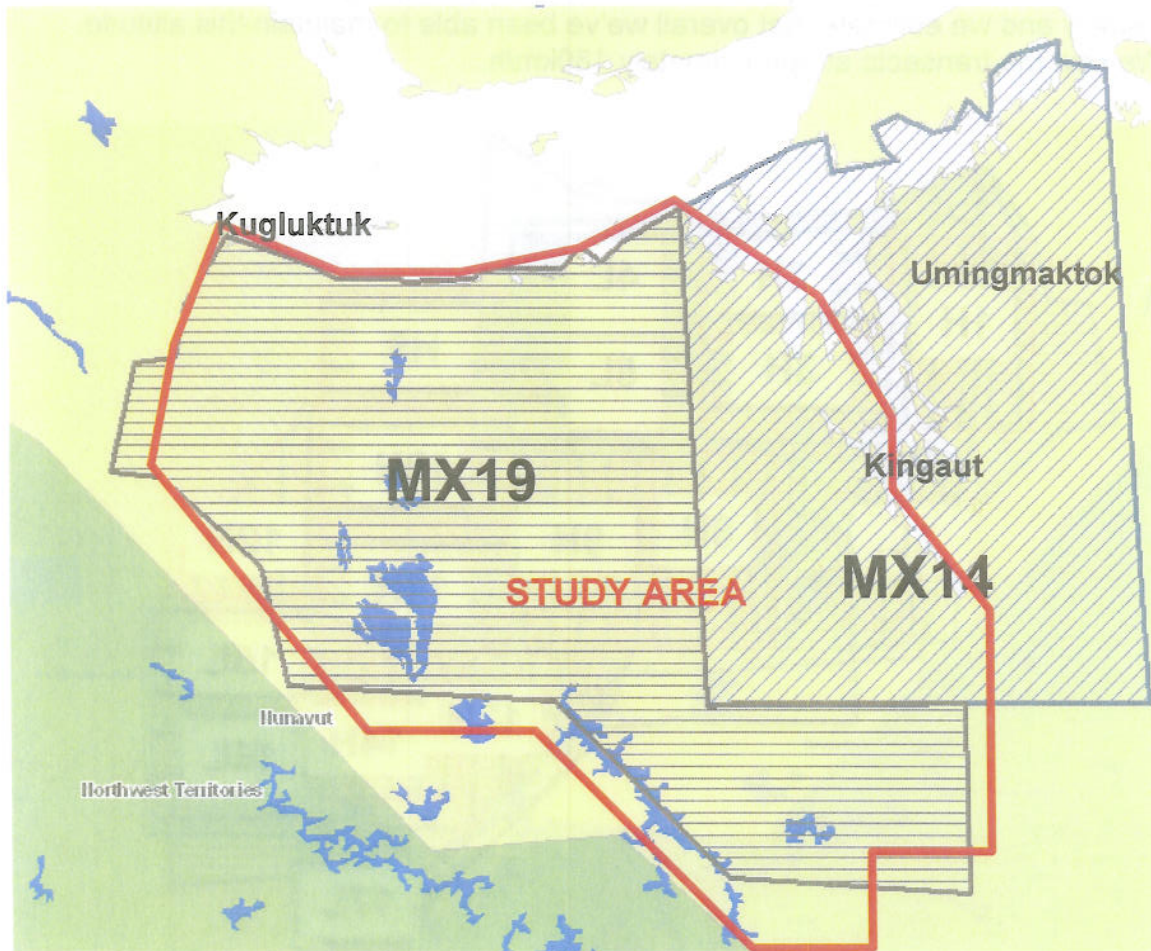
The status of muskoxen between Bathurst Inlet and the Coppermine River (Kitikmeot Region) has been a concern for Kugluktuk and Bathurst Inlet and, although more muskoxen have been observed in the west of the area, local knowledge indicates that the proportion of calves in the population has been lower in the past few years. We conducted an aerial survey in the area between Bathurst Inlet and the Coppermine River. The preliminary results confirm a good density of Muskoxen in the Western part of the study area and an overall low calf's proportion in the population. Preliminary results were showed to the impacted HTOs and more consultation will be undertaken when results are finalized. Area specific data were also provided to a mining company for there baseline study. Preliminary results seem to indicate that the population in the area increased in the western part of the study area since the 1991 survey (Gunn *in prep.*). However, muskox population has drastically declined in the Eastern part of the study area (1986 survey, Gunn 1990). The distribution pattern is of concern and management actions will have to take the current muskox population distribution into account to avoid local extirpation. Calves proportion in the population was low. When final results will be available, management actions will certainly be necessary.

### **Introduction:**

Muskox populations' status in the West Kitikmeot is outdated and our current management regime is based on data that are too old (Fournier and Gunn 1998) to ensure that the harvest is sustainable or that it doesn't remove harvest opportunities for users. MX 19 was partially surveyed in 1986 and 1991; and MX14 was last surveyed in 1986 (Gunn 1990). Muskox populations have been shown to potentially be subject to over-harvest. It is also possible that the West Kitikmeot populations have grown to a level that would allow higher quotas and thus currently our management regime would not reflect the potential harvest opportunities. Communities through their respective HTOs raised several concerns that required investigation of the current situation. Kugluktuk HTO mentioned that hunters were reporting an apparent increase in muskoxen in the west of MX19. Kingaut HTO reported that there was a low percentage in calves in muskox groups in MX14 and the east of MX19. The area between the Coppermine River and Bathurst Inlet is also the current focus of many development projects and an update of the muskox population situation in the area was required.

**Project Objectives:**

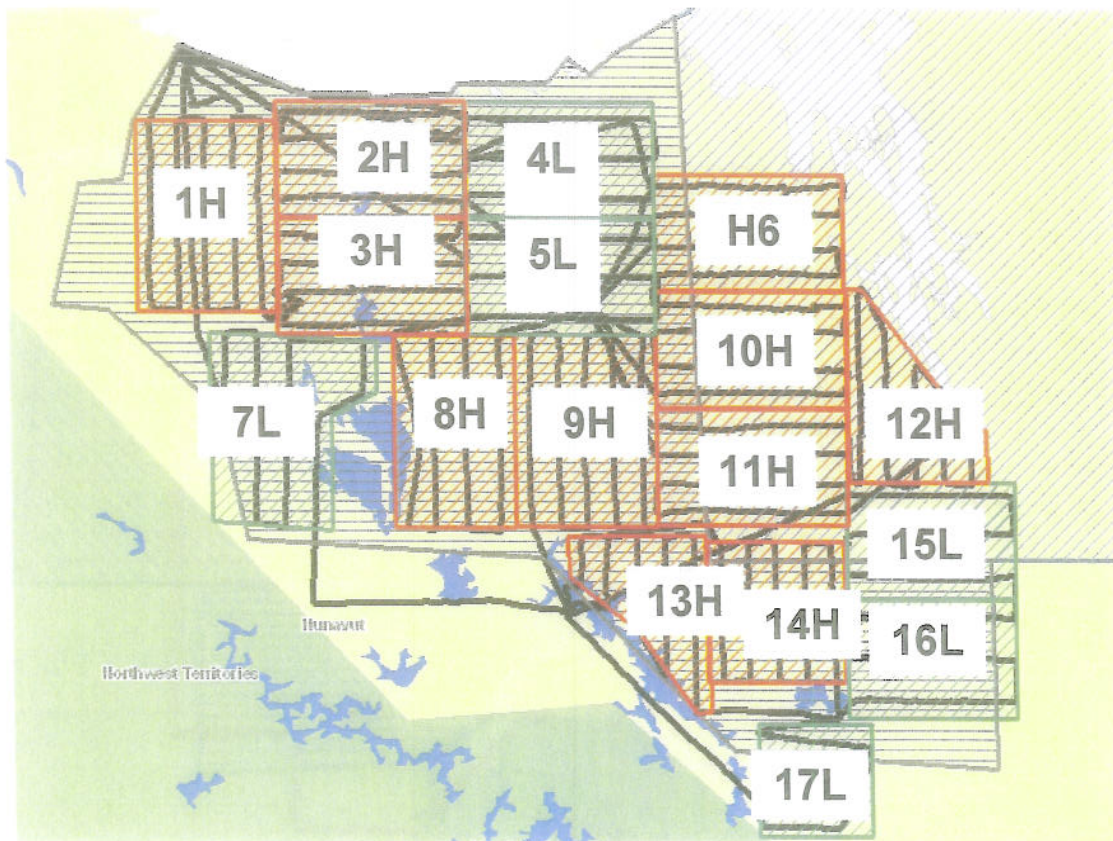
1. To estimate muskox abundance between the Coppermine River and Bathurst Inlet and determine if the muskox numbers have significantly changed since the last survey;
2. To provide a more comprehensive picture of the Muskox abundance and distribution in the West Kitikmeot;
3. To determine the proportion of muskox calves in the study area and the distribution of the variations.

**Study Area:**

**Figure 1:** Study area (red) and current muskoxen management zones in the study area.

### Materials and Methods:

We conducted an aerial survey using semi-random/systematic stratified strip transects (the first transect was randomly placed and then each sequential line was evenly spaced at a set interval within each survey block). Stratification was based on local knowledge, habitat information, and aircraft capability rather than a reconnaissance survey to reduce costs. In each surveyed blocks, transects were planned to obtain a coverage >15% - previous experience suggests that lower coverage result in coefficients of variation exceeding 30% (Gunn 1990, Fournier and Gunn 1998). Only areas where we were not expecting to see an appreciable number of muskoxen were surveyed at 17 to 22% coverage. All others surveyed areas were surveyed at 22 to 25% coverage. Each transect covers a 3 km wide strip. The field team consisted of the aircraft pilot, a navigator and 2 observers (one on each side). Strings on the wings' brackets were indicating the strip of 1.5 km of each side of the aircraft for a flying altitude of 152 m above the ground (500 feet). We used a Cessna 337 in absence of other plane available. The altitude of approximately 150 m above the ground was maintained visually and we estimate that overall we've been able to maintain this altitude. We flew the transects at approximately 180km/h.



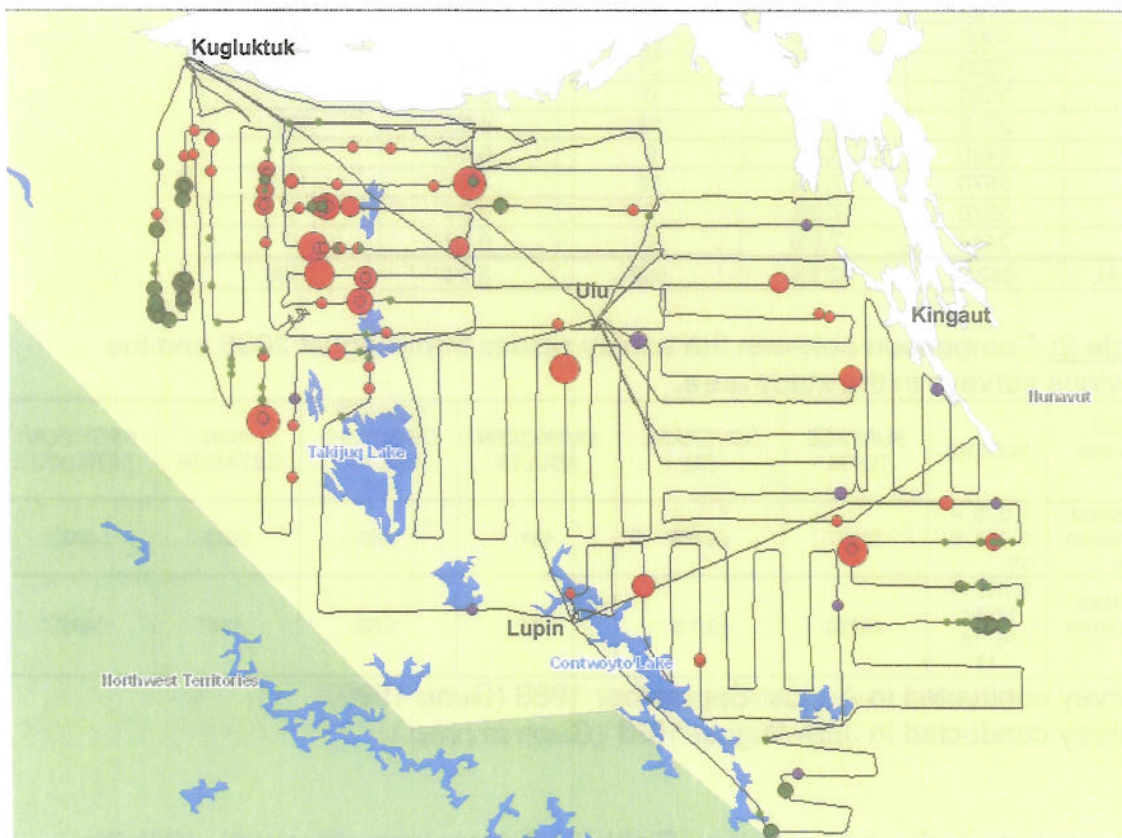
**Figure 2:** Study design with transects, stratification and intensity of coverage (the ID number and the intensity of coverage –High or Low – are indicated in each block).

**Results:**

We flew on August 11, 15, 16, 17, 18 and 19, 2005 covering 4772 km of transects (after excluding lengths too foggy to observe). Three transects had to be redone (one in block 2 and two in block 4) on August 19 because foggy conditions preventing good observation conditions on August 15.

We observed a total of 731 adult muskoxen including 169 individuals observed outside the transect width or during taxi.

Muskoxen were distributed unevenly with the highest densities observed in the Northwest of the study area (Figure 3).



**Figure 3:** Distribution and relative density of muskoxen (red), caribou (green), and Grizzly bear (purple) observed during an aerial survey, August 2005.

The population estimate has not been calculated yet and the estimates presented in tables 1 and 2 are presented for information purpose only and were calculated by simply extrapolating the densities observed to the whole block area.

**Table 1:** Number of adult muskoxen observed, estimated density, and raw estimate for each block, August 2005

BLOCK	AREA TOTAL	COVERAGE (%)	MUSKOXEN ADULTS	DENSITY OBSERVED PER 100 KM <sup>2</sup>	RAW ESTIMATE (density*area)
1	4800	25.0%	68	5.67	272
2	4000	22.1%	147	16.67	667
3	4000	23.7%	108	11.39	456
4	3840	18.7%	1	0.14	5
5	3840	18.8%	2	0.28	10
6	4000	24.0%	21	2.19	88
7	4271	19.8%	61	7.21	308
8	3904	24.7%	0	0.00	0
9	4800	25.0%	42	3.50	168
10	4000	24.1%	30	3.12	125
11	4000	24.0%	32	3.33	133
12	3030	24.7%	0	0.00	0
13	2712	23.7%	32	4.98	135
14	3420	25.4%	0	0.00	0
15	3570	17.7%	18	2.84	101
16	3570	17.6%	0	0.00	0
17	2444	17.8%	0	0.00	0
TOTAL	64201	22.1%	562	3.93	2468

**Table 2:** Comparison between the survey results from August 2005 and the previous surveys in the study area.

ZONES 1986 and 1991	BLOCKS	SURFACE TOTAL	COVERAGE (%)	MUSKOXEN ADULTS	DENSITY OBSERVED PER 100 KM <sup>2</sup>	RAW ESTIMATE	PREVIOUS ESTIMATE
Northwest Contwoyto Lake	1, 2, 3, 4, 5, 7, 8, 9, 13	36167	22.5%	461	5.68	2022	1403 <sup>1</sup>
Northeast Contwoyto Lake	6, 10, 11, 12, 14, 15, 16, 17	28034	22.1%	101	1.63	447	3400 <sup>2</sup>

<sup>1</sup>Survey conducted in August-September 1986 (Gunn 1990)

<sup>2</sup>Survey conducted in July-August 1991 (Gunn *in prep.*)

The proportion of calves was low (Table 3). Calves were observed, within the transects, in only 5 blocks out of 12 where muskoxen were observed. Overall, the calf proportion is 5.3% of the population. In the west, calves represented 5.7% of the population, while in the east they were only representing 1.9%. However, the proportion of calves in groups with calves was respectively 10.4% ( $N_W=10$ ) and 12.5% ( $N_E=1$ ), and was 10.6% for the overall surveyed area ( $N=11$ ).



**Table 3:** Observed proportion of calves in the muskox population and in groups with calves (GWC) during an aerial survey (August 2005). West is the area Northwest of Contwoyto Lake and East is the area Northeast of Contwoyto Lake.

	Total number of Adult	Total number of Calves	Proportion of Calves (%)	Adults in Groups with Calves (GWC)	Proportion of Calves in GWC
Study Area	562	30	5.3	269	10.6
West	461	28	5.7	255	10.4
East	101	2	1.9	14	12.5

### Discussion:

The preliminary results indicate some changes in the muskox population in the West Kitikmeot. However, the time between surveys was so long that any interpretation is very difficult. Nevertheless, the current situation will certainly require reviewing the current harvest management (TAH and non-quota limitations).

*Section to be completed when final results are available.*

### Management Implications:

*Section to be completed when final results are available.*

### Reporting to Communities/Resource Users:

The preliminary results were discussed with impacted HTO's Chairmen and KHTA Chairman. Area specific data were provided to WolfDen Resources Inc. for their environmental baseline data. The preliminary results were also communicated to ENR-GNWT and the EMAB. When final results are available, they will be presented to the impacted communities and co-management partners.

### References:

- Fournier, B. and Gunn, A. 1998. Muskox numbers and distribution in the Northwest Territories, 1997. DRWED Yellowknife NWT, File Report No. 121. 55pp.
- Gunn, A. 1990. Distribution and abundance of muskoxen between Bathurst Inlet and Contwoyto lake, NWT, 1986. NWT DRR File Report No.100. 28pp
- Gunn, A. *In prep.* Distribution and abundance of muskoxen Northwest of Contwoyto Lake, NWT, 1991. GNWT ENR Manuscript Report No.##. ##pp

**Expenses and projections summary:**

<b>Expense type</b>	<b>Spent as per December 31, 2005 (\$)</b>	<b>Projection January to March 2006 (\$)</b>
Fixed wing aircraft and fuel	68.7K	
Casual (1 observer) (6 days)	1.5K	
Field accommodation and landing fees	1.2K	
Freight (air, ground and maritime)	9.7K	
Instruments and supplies, safety equipment	2.4K	3.0K
Service Contract	0.2K	
Community Consultations (Travel & Accommodation)	2.2K	3.5K
<b>TOTAL</b>	<b>85.9K</b>	<b>7.5K</b>