

**Bluenose-West and Cape Bathurst Caribou Herds  
Calving Ground Classification Surveys  
June 2000, 2001**



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**Bluenose-West and Cape Bathurst Caribou Herds  
Calving Ground Classification Survey  
June 2000, 2001**

## INTRODUCTION

The purpose of this report is to present the results of 2 spring calving ground surveys for the Bluenose-West and Cape Bathurst caribou herds. The objectives of these surveys were as follows:

- to determine the distribution of calving caribou, yearlings and bulls on and near the calving ranges of the Bluenose-West and Cape Bathurst barren-ground caribou herds
- to obtain estimates of calf production for each herd

Previously, Brackett et al. (1979), Hawley et al. (1979), Brackett et al. (1982), Latour and Heard (1985), Latour et al. (1986) recognized one “Bluenose caribou” herd in the area between the Mackenzie Delta in the Northwest Territories (NWT), Kugluktuk in Nunavut, and Great Bear Lake NWT. Satellite tracking and DNA studies done between March 1996 and March 1999 (Nagy et al. 1999) indicate that at this time there are 3 separate herds of barren-ground caribou (*Rangier tarandus groenlandicus*) within the area previously recognized as the range of the “Bluenose” caribou. These 3 herds include Cape Bathurst, Bluenose-West, and Bluenose-East, and the ranges of these herds have been defined (Nagy et al. 1999). The Bluenose-west caribou herd calves in Tuktut Nogait National Park and adjacent areas in the NWT, the Cape Bathurst herd calves on and near Cape Bathurst Peninsula in the NWT, and the Bluenose-East herd calves east of Bluenose Lake in Nunavut.

Current estimates of productivity for the Bluenose-West and Cape Bathurst caribou herds are required by co-management boards in the Inuvialuit Settlement Region (ISR), Gwich'in Settlement Area (GSA), the Sahtu Settlement Area (SSA), and by the Department of Resources Wildlife and Economic Development (RWED) and Parks Canada Agency (Tuktut Nogait National Park) for management purposes. Bluenose-West and Cape Bathurst caribou are harvested by subsistence and resident hunters in the Inuvialuit Settlement Region and in the Gwich'in and Sahtu settlement areas in the NWT. Some Hunters and Trappers Committees (HTC) lead guided sport hunts for non-resident hunters. Within Tuktut Nogait National Park, the Bluenose-west herd provides wildlife viewing opportunities for the local tourism industry. Population estimates are currently being established for each of these geographically and genetically distinct herds. The Sahtu Renewable Resource Board and Nunavut Wildlife Management Board are presently responsible for undertaking research on the Bluenose-East herd. RWED and Parks Canada Agency are currently conducting research on the Bluenose-West and Cape Bathurst herds.

Productivity estimates of the “Bluenose” herd were obtained in 1981 (Latour and Heard 1985) and 1983 (Latour, et al. 1986). The number of calves born per 100 females, 2 years old and older, were 92 and 82 respectively.

In this paper, the results of 2 post calving classification surveys are presented for the spring of 2000 and 2001. The 2000 survey was conducted between June 9 and June 11. In 2001,

a reconnaissance survey to locate post-calving caribou was completed between June 12 and 15. The post calving classification survey was conducted from June 23 to 26.

## METHODS

### Study Area:

The study area included:

- a) the calving grounds of the Bluenose-West herd which are in the following regions:
  - the southeast and west portions of Tuktut Nogait National Park referred to in this report as “TNNP”
  - areas in Nunavut (Bluenose Lake) and the Sahtu Settlement Area (SSA) east and south of TNNP referred to in this report as “South”
  - the Inuvialuit Settlement Region (ISR) adjacent to the western boundaries of TNNP to the Horton River referred to in this paper as “West”
- b) and the calving grounds of the Cape Bathurst herd which are on the Cape Bathurst Peninsula in the ISR (Figure 1).

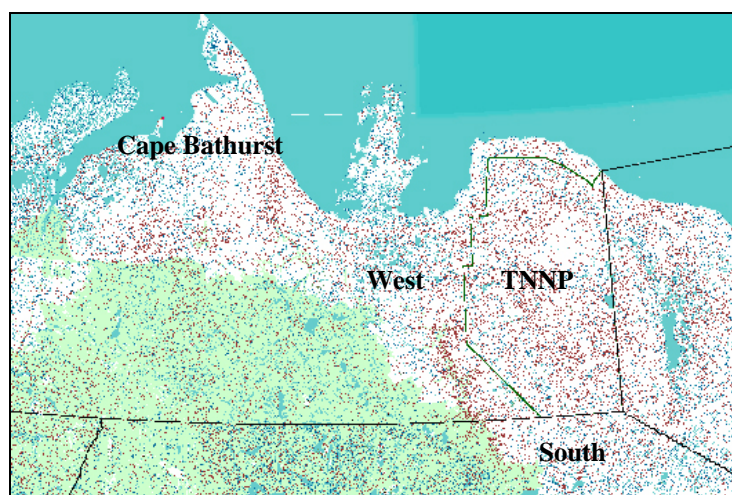


Figure 1: The 4 regions included in the Bluenose West caribou study area

### Caribou Locations:

Caribou were located by tracking radio and satellite collared caribou in the study area (Nagy et al. 1999) and by visual observation. In 1999 and 2000, 45 Bluenose-West (35 female and 10 male) and 14 Cape Bathurst (11 female and 3 male) caribou were collared with VHF radio collars. Satellite collars were also deployed on 13 Bluenose-West and 2 Cape Bathurst adult females. The locations for satellite collared caribou were obtained from ARGOS and were mapped every 4 days. These mapped locations were used to determine when the cows had arrived on the caribou grounds. Caribou equipped with VHF radio collars were tracked during the survey to obtain information on the distribution of caribou in the study area.

## 2000 survey

The 2000 survey included a fixed wing and a helicopter flying simultaneously between June 9 and 11. The survey area included TNNP, the region West of TNNP, and Cape Bathurst.

### *Fixed wing survey*

A telemetry-equipped Cessna 206 fixed wing aircraft was used to document the distribution of caribou with calves. The plane was flown 1000 to 1300m above ground level. Two observers were seated in the back of the aircraft and an observer/recorder was seated in the right front seat. The observer/recorder located the VHF collared caribou with radio-telemetry equipment. Also equipped with a Garmin 12XL GPS, a waypoint was created and recorded for sightings of each caribou, muskox, grizzly bear, wolf, wolverine and golden eagle. Two rear observers also visually located caribou groups and this information was relayed to the observers conducting the helicopter survey.

### *Helicopter survey*

A Bell Jet 206 helicopter was used for low altitude (30 to 50 m) classifications of the caribou groups. For large groups, the helicopter landed approximately 0.5 km away and the animals were counted and classified with a spotting scope. When small groups were located, the helicopter dropped in elevation near the group and the animals were classified from the air. The front observer called out the classification while the rear observer recorded the information. Caribou were classified as: adult non-antlered cows; adult antlered cows; calves; yearlings; and bulls. The yearlings were distinguished from the adults by their smaller size and shorter snouts. The bulls were larger in size and generally darker than the females. The location of each group of caribou was recorded with a Garmin III+ GPS. All other wildlife encountered was also recorded.

## 2001 surveys

The 2001 surveys included of a fixed-wing reconnaissance survey from June 12 to 15, and a helicopter classification survey from June 23 to 26, 2001. Preferably, these 2 survey flights are conducted simultaneously, but this year, the reconnaissance survey indicated that calving had not yet peaked, so the classification survey was delayed.

### *Fixed-Wing Reconnaissance Survey*

The reconnaissance survey was flown with a Helio Courier to document the distribution of caribou with calves using the same method as in 2000. The search included lines flown in an approximately north south direction through the calving grounds of the Bluenose-West and Cape Bathurst caribou herds (Figure 2).

Caribou were classified as cows, calves, yearlings, bulls, or unknown. Observers used binoculars to help ensure that counts and classifications were done accurately. If identification was difficult, the pilot flew the aircraft in a tight circle around the caribou so they could be accurately counted and classified. Muskoxen were classified as adults and calves.



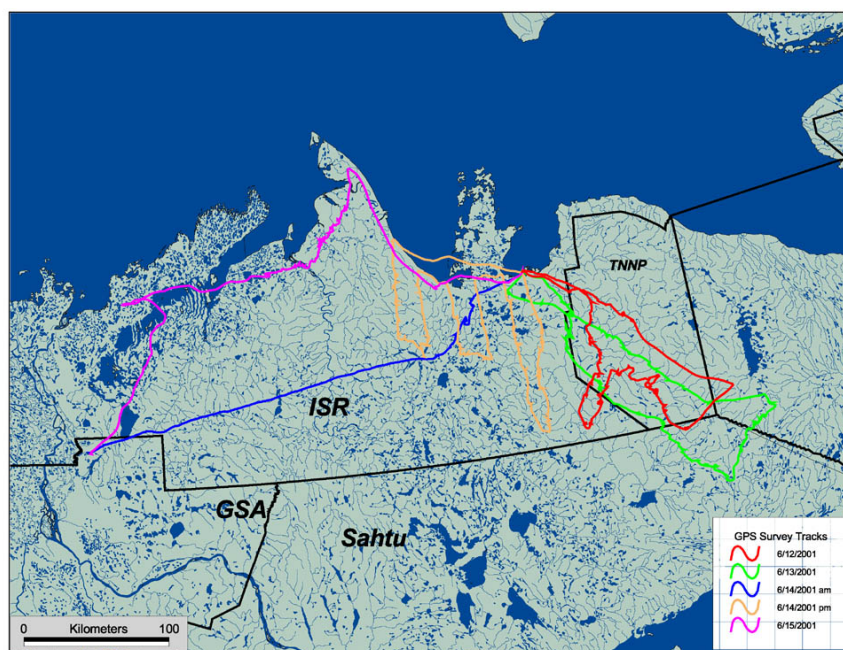


Figure 2: Transects flown during reconnaissance survey conducted during June 12 to 15, 2001

At the end of each day the waypoint files were downloaded from the GPS to a computer using Ozi Explorer (GPS mapping software Des and Lorraine Newman ©). A map of the study area was created in ArcView using digital NTS maps and imported into Ozi Explorer. The waypoints were then imported into Microsoft Excel and the observation data were appended to each waypoint description (number, co-ordinates, date and time). The survey flight path was documented using the track back function on the GPS (programmed to record a location every 30 seconds). The track files were down loaded at the end of each flight.

#### *Helicopter Classification survey*

The helicopter classification survey was conducted from June 23 to 26, 2001 using a similar method as in 2000 except, without the assistance of the fixed wing, caribou were located solely by the helicopter observers. The flight lines flown and location of each group of caribou was recorded with a Garmin III+ GPS and downloaded to a computer using the same methods as the reconnaissance survey. All other wildlife encountered was also recorded.

## RESULTS

### 2000 Survey

In the 2000 survey, a total of 2370 caribou were surveyed in and near Tuktut Nogait National Park, and 870 at Cape Bathurst (Table 1 and 2, Figure 3). The total ratio of calves per 100 cows for the park was 38.73 (Table 3), and for Cape Bathurst was 64.40 (Table 4). A greater ratio of calves to cows was evident on the east side of TNNP (52.97 calves to 100 cows) than on the west side (16.96 calves to 100 cows) (Table 2). The majority of the cows in TNNP still retained their antlers (722 antlered cows per 100 non-antlered cows) (Table 3), whereas on Cape Bathurst, non-antlered cows outnumbered antlered (88 antlered cows per 100 non-antlered cows) (Table 4). During the survey period, snow cover persisted on 50 to 70% of the areas surveyed but the majority of the caribou were spotted in the snow-free areas.

On June 10, 3 cows (1 non-antlered and 2 antlered) were encountered in TNNP giving birth. The observers noted that the calves at Cape Bathurst were considerable larger and more mobile than those near TNNP.

Other wildlife seen on the entire survey included 11 grizzly bears, 83 muskoxen, 1 wolf and 1 wolverine (Table 5, Figure 4).

Table 1: The number of Bluenose West caribou by location recorded during the classification survey flights from June 9 to 11, 2000

<b>Location</b>	<b>Non-antlered cows</b>	<b>Antlered cows</b>	<b>Calves</b>	<b>Yearlings</b>	<b>Bulls</b>	<b>TOTAL</b>
<i>West</i>	109	463	97	115	13	797
<i>East</i>	67	807	463	235	1	1573
<i>TOTAL</i>	176	1270	560	350	14	2370

Table 2: The number of Cape Bathurst caribou recorded during the classification survey flight on June 11, 2000

<b>Location</b>	<b>Non-antlered cows</b>	<b>Antlered cows</b>	<b>Calves</b>	<b>Yearlings</b>	<b>Bulls</b>	<b>TOTAL</b>
<i>Cape Bathurst</i>	203	179	246	224	18	870

Table 3: The classification of Bluenose West caribou recorded during the classification survey flight from June 9 to 11

<b>Location</b>	<b>Calves per 100 cows</b>	<b>Antlered Cows per 100 non- antlered cows</b>	<b>Bulls per 100 cows</b>
<i>West</i>	16.96	424	2.27
<i>East</i>	52.97	1204	0.11
<b>Total</b>	<b>38.73</b>	<b>722</b>	<b>0.97</b>

Table 4: The classification of Cape Bathurst caribou recorded during the classification survey flight on June 11

<b>Location</b>	<b>Calves per 100 cows</b>	<b>Antlered Cows per 100 non-antlered cows</b>	<b>Bulls per 100 cows</b>
<i>Cape Bathurst</i>	64.40	88.00	4.70

Table 5: Wildlife encountered on the reconnaissance and classification surveys from June 9 to 11, 2000.

<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Number</b>	<b>Wildlife</b>	<b>Type</b>
TNNP East	68.7	122.1667	2	grizzly	1 adult, 1 jev
TNNP East	68.53333	121.8667	1	grizzly	adult
TNNP East	68.33333	121.75	1	wolf	
TNNP East	68.3	125.65	1	grizzly	jev
West of TNNP	69.78333	127	4	grizzly	1 f 1m
Cape Bathurst	69.46667	127.8667	1	grizzly	
Cape Bathurst	69.2	128.25	2	grizzly	
Cape Bathurst	69.78333	127	14	muskoxen	13 adults 1 calf
Cape Bathurst	69.95	127.4667	69	muskoxen	55 adults 14 calves
Cape Bathurst	69.38333	127.95	1	wolverine	

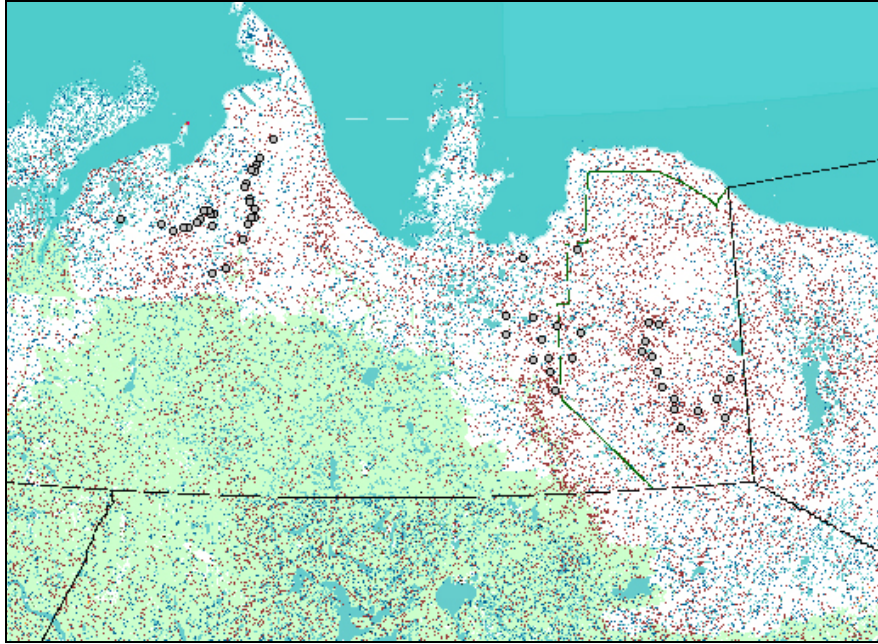


Figure 3: The distribution of caribou observed during the classification survey flown from June 9 to 11, 2000

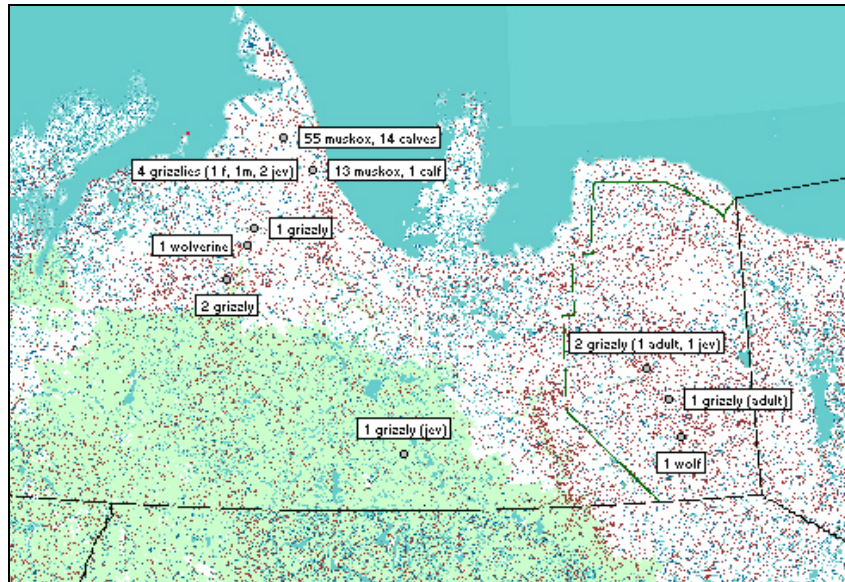


Figure 4: The distribution of grizzly bears, muskox, wolves and wolverines observed during the classification survey flown from June 9 to 11, 2000

## 2001 Survey

In 2001, 2 complimentary surveys were conducted: a reconnaissance survey with a fixed wing aircraft; and a classification survey with a helicopter.

### *Reconnaissance Survey*

On June 12 and 13 transects were flown primarily over the calving grounds of the Bluenose-West herd in and around Tuktut Nogait National Park (Figure 2). On June 12, much of the area flown had nearly 100% snow cover, but by June 13, snow cover in the area surveyed was approximately 50%. Caribou were dispersed through the area and many cows were observed lying down and appeared to be preparing to give birth. On June 12, there were approximately 9.6 calves per 100 cows. This increased to 17.3 by June 13 indicating that calving was under way (Table 6). Surveys west of the main calving range of the Bluenose-West herd were conducted on June 14. In this area, there were 6 calves to 100 cows although the majority of caribou observed were bulls and yearlings (Table 6). The Cape Bathurst Peninsula area was flown on June 15 with 19.6 calves to 100 cows (Table 6 and 7). The distributions of all caribou, cows, calves, yearlings and bulls documented during the survey are shown in Figures 5, 6, 7 and 8.

The highest cow-calf ratios and group sizes were observed for Bluenose-West caribou calving in TNNP (20.2 per 100 cows) and for the Cape Bathurst herd (19.6 calves per 100 cows) (Table 7). Similarly, the largest group sizes for cows were observed for Bluenose-West caribou in TNNP (4.3 range 1 to 40, on June 13) and Cape Bathurst caribou (3.5 range 1 to 17, on June 15) (Table 7). In TNNP the cow calf ratio increased from 9.6 per 100 cows on June 12 to 20.2 on June 13. Since calving was underway the classification survey was delayed.

Other wildlife encountered included grizzly bears and muskoxen (Table 5, Figure 9).

Table 6: Number of Bluenose West and Cape Bathurst caribou recorded during the reconnaissance flights by date from June 12 to 15, 2001.

Date	Cows	Calves	Yearlings	Unknown	Males	Calves per 100 cows	Cows		
							Mean Group Size	Number of groups	Range in group size
<i>Jun-12</i>	313	30	0	0	0	9.58	3.26	96	1 to 15
<i>Jun-13</i>	514	89	22	14	28	17.32	3.84	134	1 to 40
<i>Jun-14</i>	119	7	102	50	308	5.88	2.64	45	1 to 7
<i>Jun-15</i>	148	29	15	6	70	19.59	3.52	42	1 to 17
<b>Total</b>	<b>1094</b>	<b>155</b>	<b>139</b>	<b>70</b>	<b>406</b>	<b>14.16</b>			

Table 7: Number of Bluenose West and Cape Bathurst caribou recorded during the reconnaissance flights by location of from 12 to 15, June 2001.

Location	Dates Flown	Cows	Calves	Yearlings	Unknown	Bulls	Calves per 100 cows	Cows		
								Mean Group Size	Number of groups	Range in group size
<i>TNNP</i>	12 June	313	30	0	0	0	9.58	3.26	96	1 to 15
	13 June	391	79	0	6	0	20.20	4.25	92	1 to 40
<i>West of TNNP (ISR)</i>	13 June	10	0	0	3	28	0	2.5	4	1 to 5
	14 June	119	7	102	50	308	5.88	2.64	45	1 to 7
<i>South (SSA) and east (Nunavut) of TNNP</i>	13 June	113	10	22	5	0	8.85	2.97		1 to 13
<i>Cape Bathurst Peninsula</i>	15 June	148	29	15	6	70	19.59	3.52	42	1 to 17
<b>Total</b>		<b>1094</b>	<b>155</b>	<b>139</b>	<b>70</b>	<b>406</b>	<b>14.16</b>			



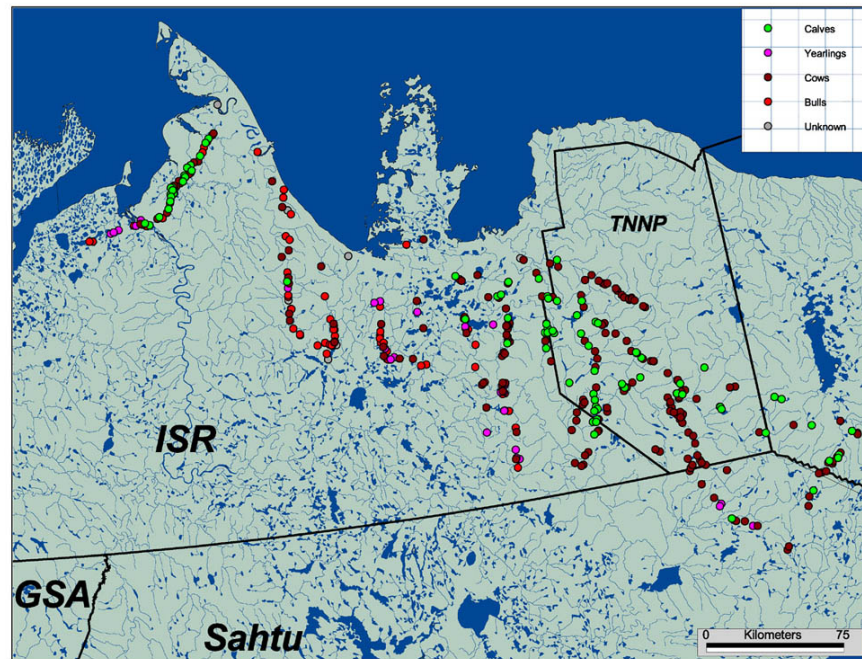


Figure 5. Distribution of all caribou observed during the reconnaissance survey flown from June 12 to 15, 2001

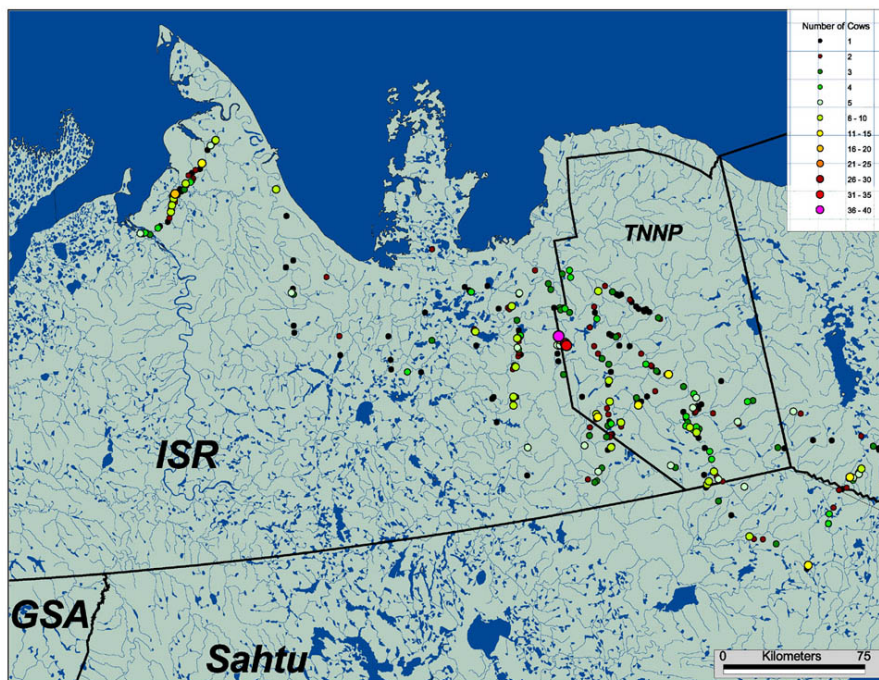


Figure 6: Distribution of cow caribou observed during the reconnaissance survey flown from June 12 to 15, 2001

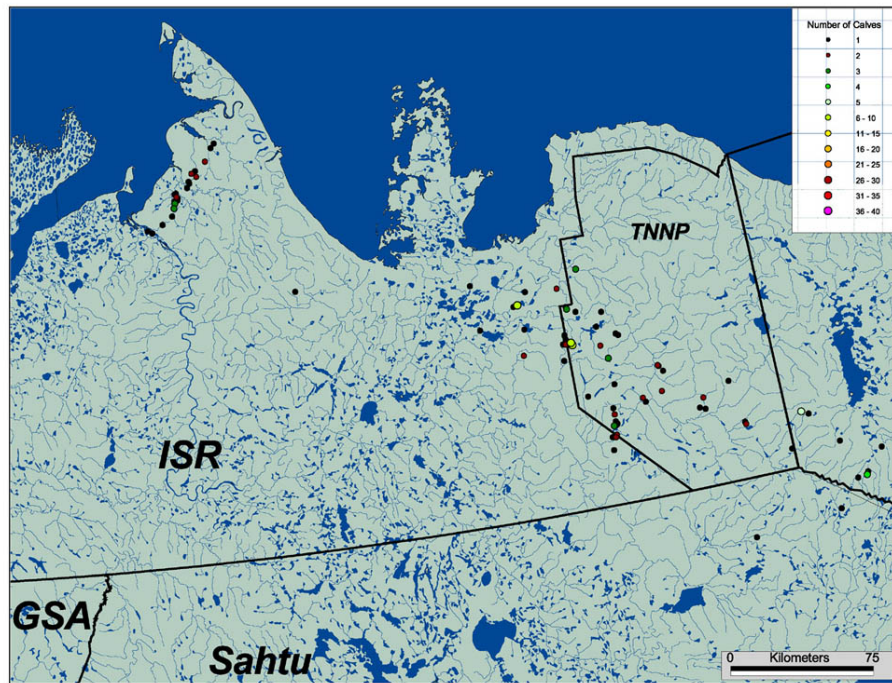


Figure 7: Distribution of calf caribou observed during the reconnaissance survey flown from June 12 to 15, 2001

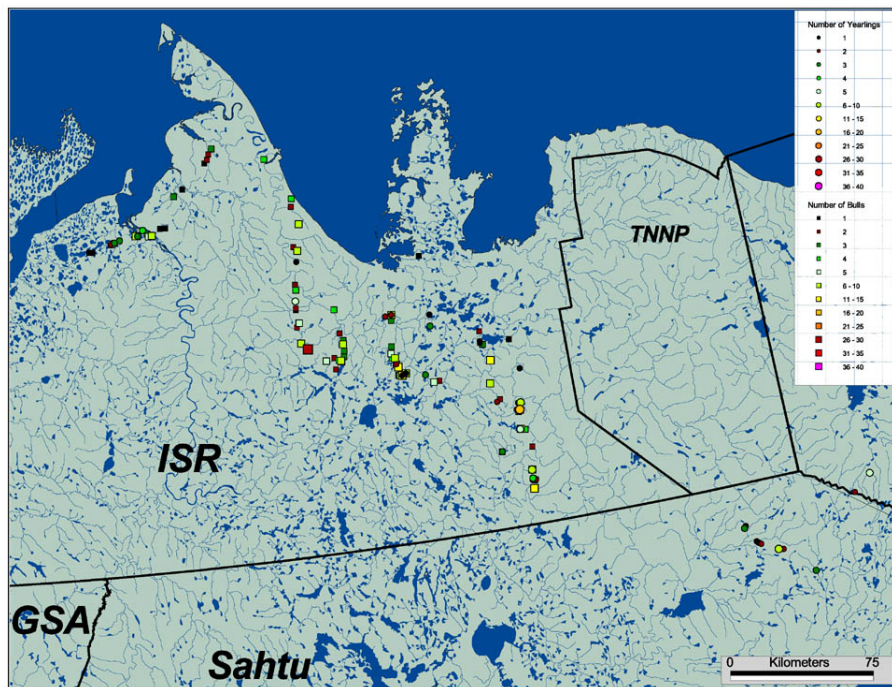


Figure 8: Distribution of yearling and bull caribou observed during the reconnaissance survey flown from June 12 to 15, 2001



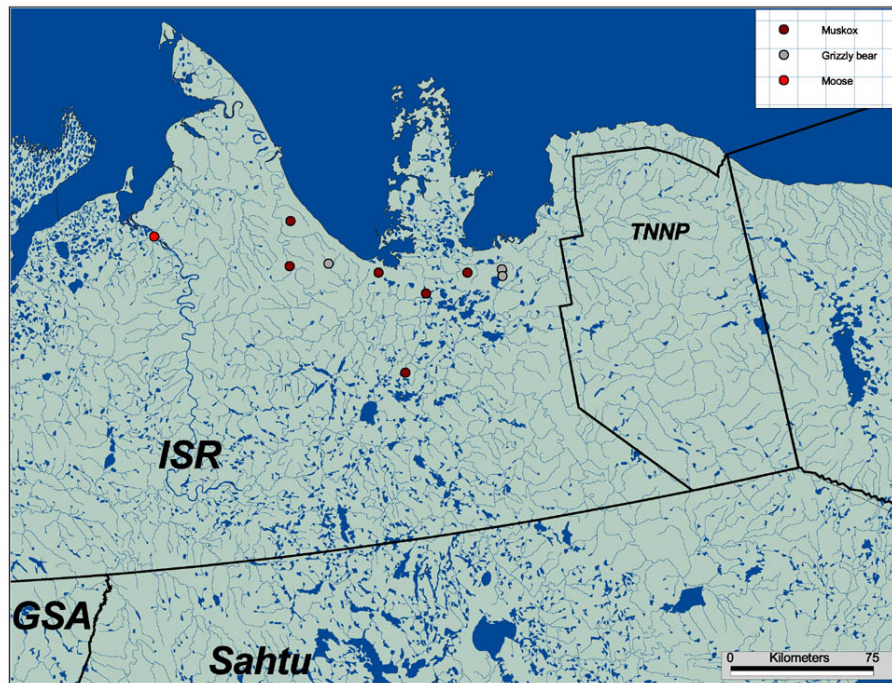


Figure 9: Distribution of muskoxen, grizzly bears, and moose observed during the reconnaissance survey flown from June 12 to 15, 2001

### *Classification survey*

The classification survey was flown between June 23 and 26, 2001. The area surveyed included the west and south sections of Tuktut Nogait National Park (TNNP), the Sahtu region adjacent to the park (South), and the region west of the park to the Horton River (West) (Figure 10). During this survey period, snow cover was less than 5%.

A total of 3877 caribou were classified (Table 8, Figure 11). The overall cow and calf ratio was 54 calves to 100 cows. The highest cow and calf ratio in the study area was within Tuktut Nogait National Park (56.9 calves per 100 cows). There was also a high cow and calf ratio of 47.9 in the region west of the park (Table 8). However, in this region most of the cows and calves recorded were found within very close proximity to the park border. The locations of all caribou classified are shown in Figures 12, 13, 14, 15 and 16. In the West and South region, bulls were more abundant than in TNNP (Figure 11, 12) with 50.3 and 58.8 bulls per 100 cows respectively (Table 9).

In the classification survey, the groups of animals were larger and more distinct than recorded in the reconnaissance survey. Other wildlife encountered were grizzly bears, muskoxen and wolves (Table 10, Figure 17).

Table 8: Classification of Bluenose West caribou recorded on the classification survey from June 23 to June 26.

<b>Location</b>	<b>Non-antlered cows</b>	<b>Antlered cows</b>	<b>Calves</b>	<b>Yearlings</b>	<b>Bulls</b>	<b>TOTAL</b>
<i>South</i>	15	2	0	22	82	121
<i>TNNP</i>	1496	134	927	132	15	2704
<i>West</i>	574	46	297	66	69	1052
<b>Total</b>	<b>2085</b>	<b>182</b>	<b>1224</b>	<b>220</b>	<b>166</b>	<b>3877</b>

Table 9: Classification of Bluenose West caribou recorded on the classification survey from June 23 to June 26.

<b>Location</b>	<b>Calves per 100 cows</b>	<b>Antlered cows per 100 Non-antlered cow</b>	<b>Bulls per 100 cows</b>	<b>Cow</b>		
				<b>Mean Group Size</b>	<b>Number of groups</b>	<b>Range in group size</b>
<i>South</i>	0	11.76	58.82	2.83	6	1 to 8
<i>TNNP</i>	56.87	8.22	1.83	28.10	58	1 to 95
<i>West</i>	47.9	7.42	50.29	28.18	22	1 to 104
<b>TOTAL</b>	<b>53.99</b>	<b>8.73</b>	<b>7.32</b>		<b>86</b>	<b>1 to 104</b>

Table 10: All other wildlife recorded on the reconnaissance and classification surveys.

<b>Location</b>	<b>Date</b>	<b>Wildlife</b>	<b># of animals</b>
West	14-Jun	Grizzly	1
West	14-Jun	Grizzly	2
West	14-Jun	Grizzly	1
West	14-Jun	Grizzly	1
West	14-Jun	Muskox	13 + 1 calf
West	14-Jun	Muskox	2
West	14-Jun	Muskox	10
West	14-Jun	Muskox	3
West	14-Jun	Muskox	4
TNNP	23-Jun	Grizzly	1
TNNP	24-Jun	Muskox	3
TNNP	24-Jun	Grizzly + cub	2
TNNP	24-Jun	Grizzly	1
TNNP	24-Jun	Grizzly+2 cubs	3
West	25-Jun	Wolf	1
West	25-Jun	Grizzly	1
West	25-Jun	Grizzly	1
West	25-Jun	Grizzly	1
South	26-Jun	Muskox	3

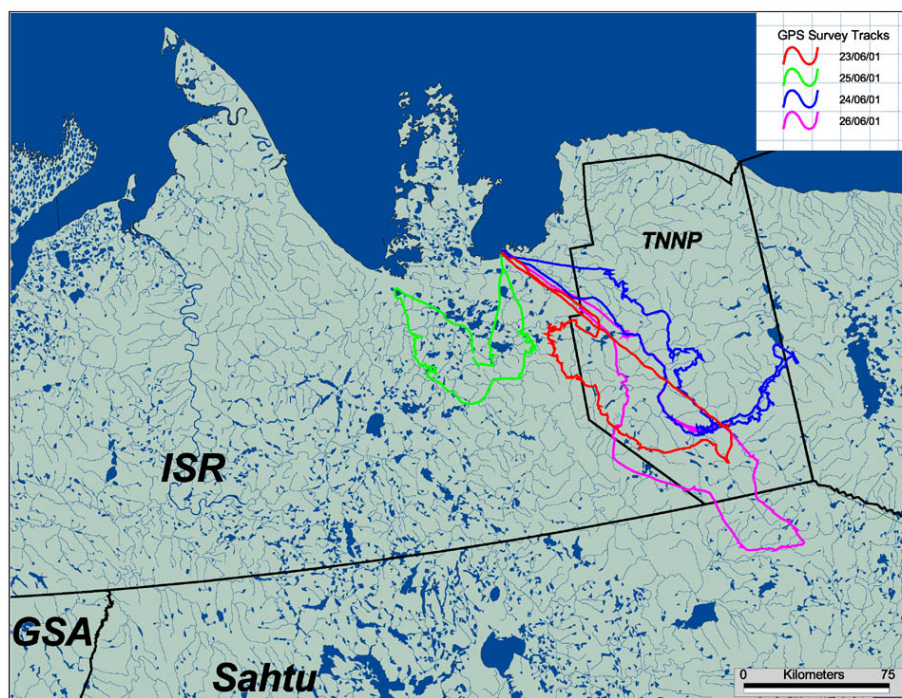


Figure 10: Transects flown during caribou classification survey conducted from June 23 to 26, 2001

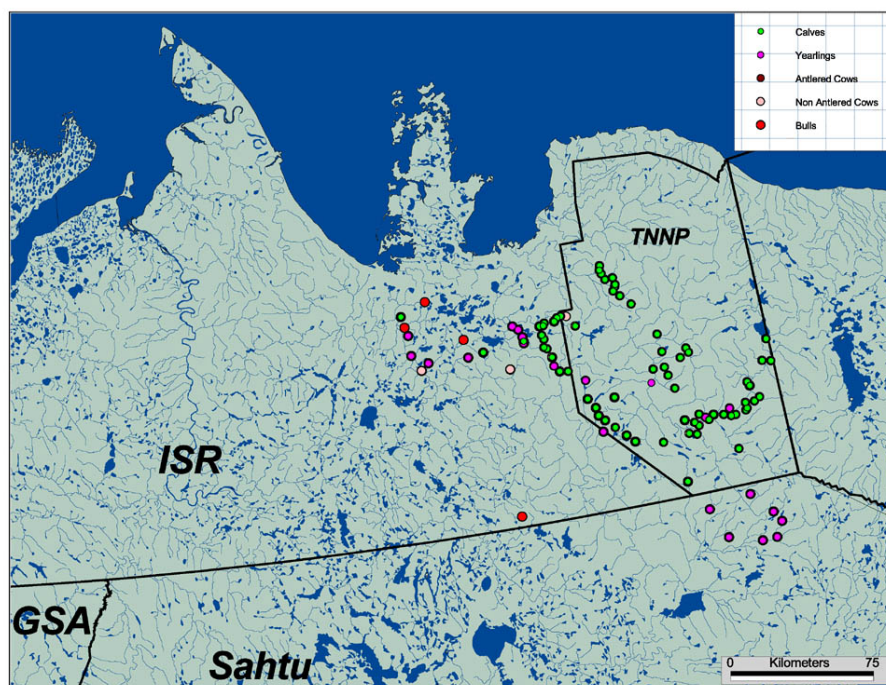


Figure 11: Distribution of all caribou observed during the classification survey flown from June 23 to 26, 2001



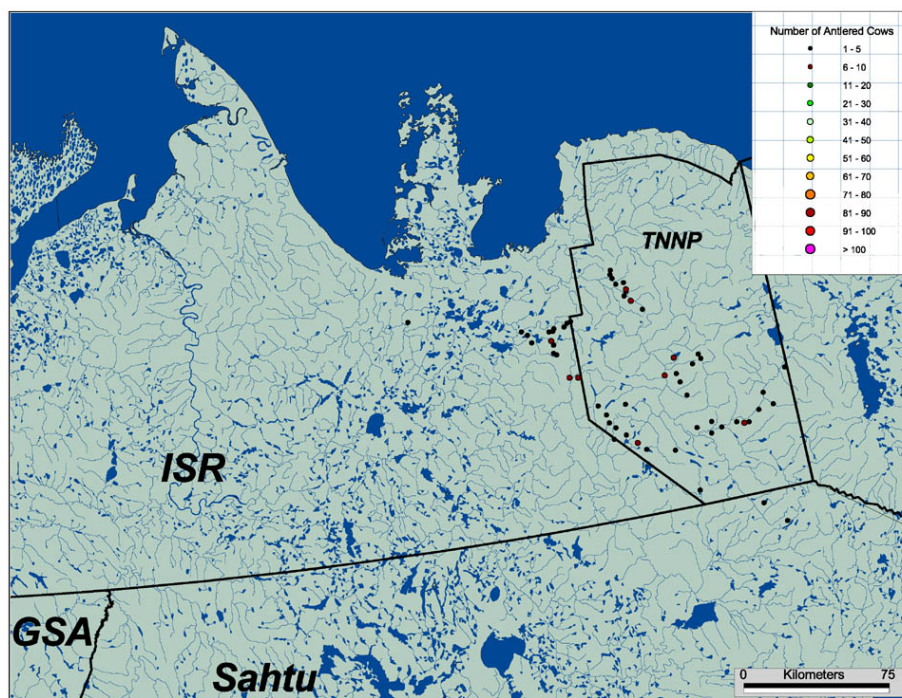


Figure 12: Distribution of antlered cow caribou observed during the classification survey flown from June 23 to 26, 2001

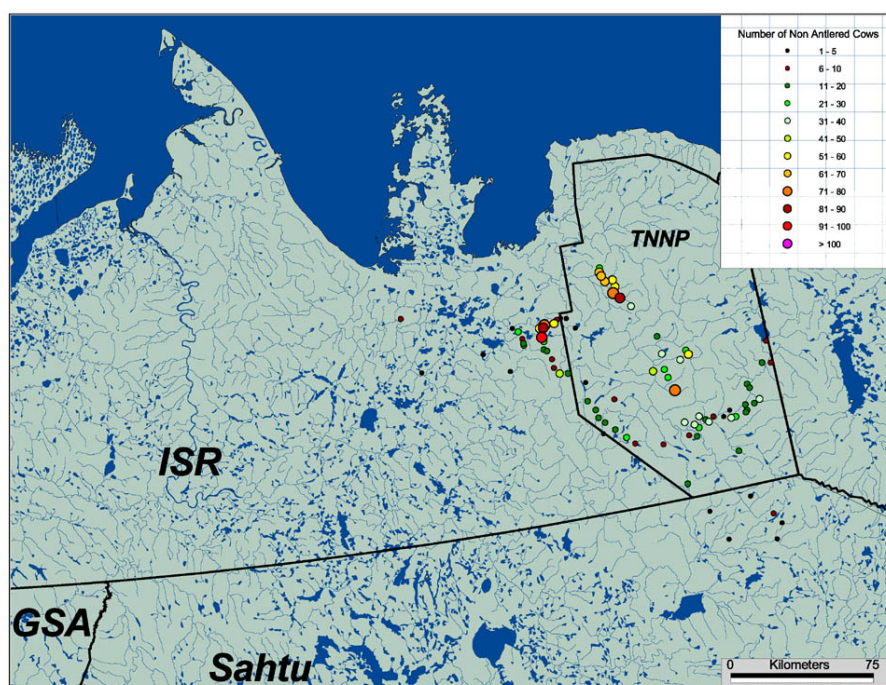


Figure 13: Distribution of non antlered cow caribou observed during the classification survey flown from June 23 to 26, 2001

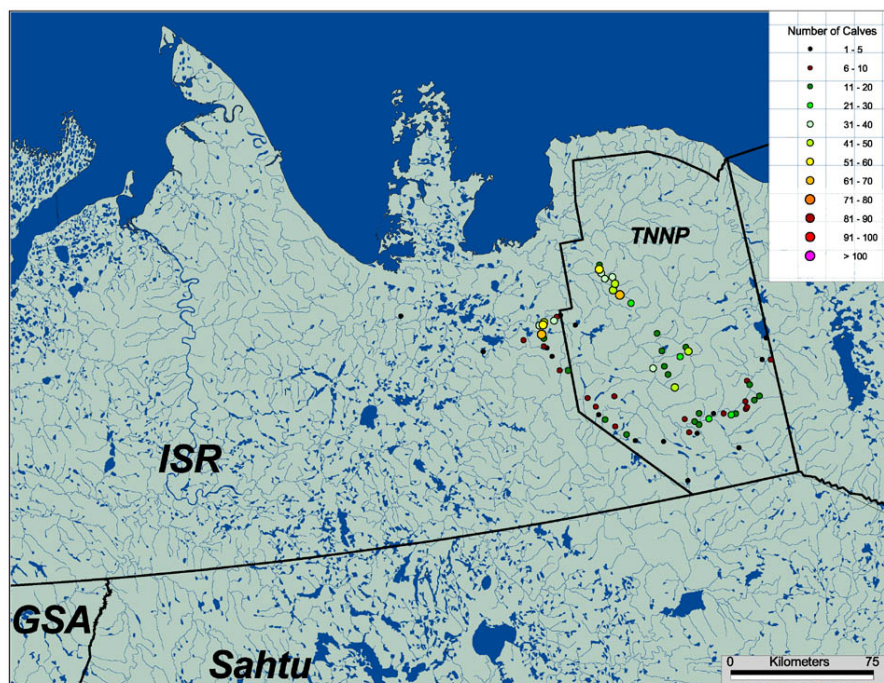


Figure 14: Distribution of calf caribou observed during the classification survey flown from June 23 to 26, 2001

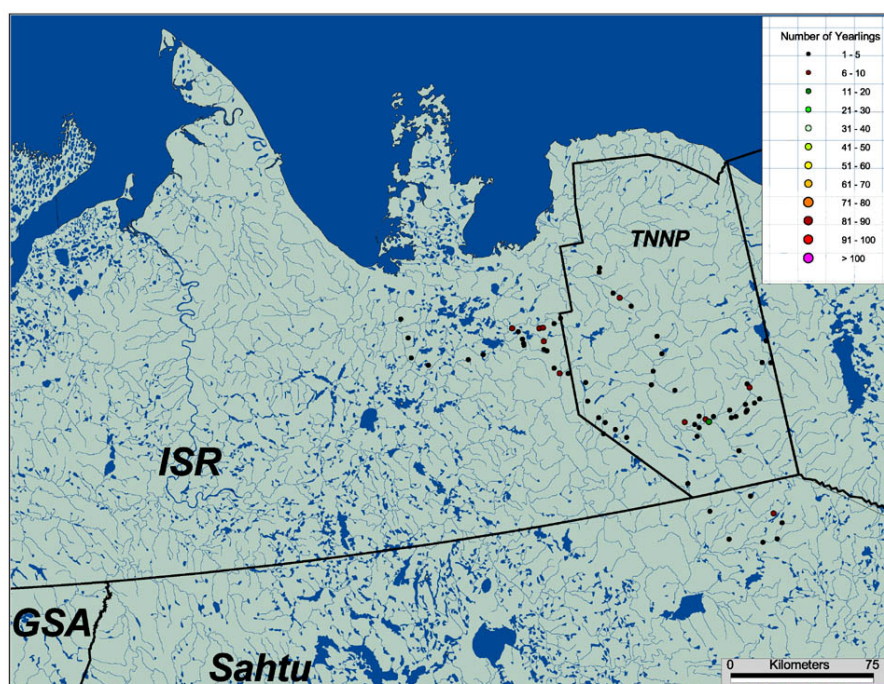


Figure 15: Distribution of yearling caribou observed during the classification survey flown from June 23 to 26, 2001



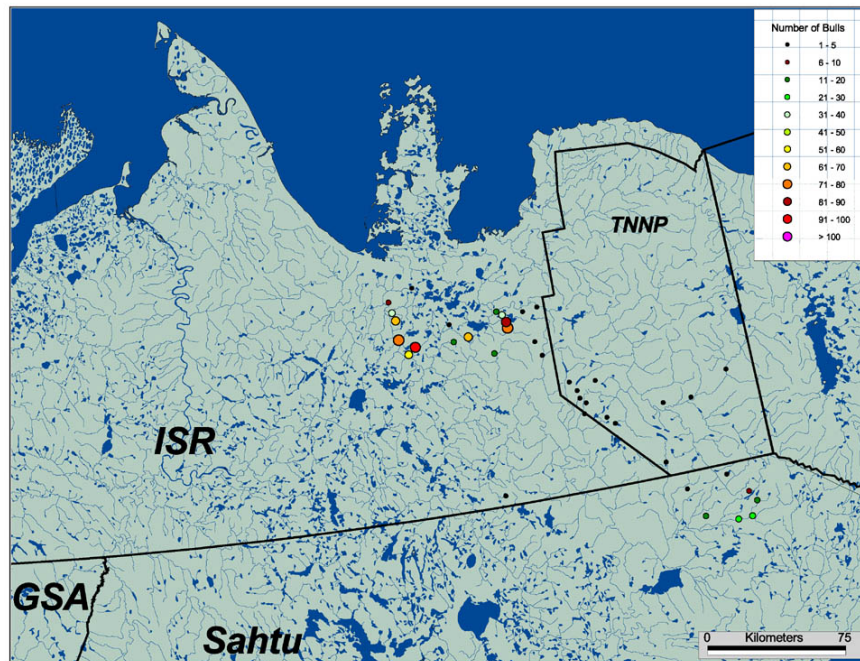


Figure 16: Distribution of bull caribou observed during the classification survey flown from June 23 to 26, 2001

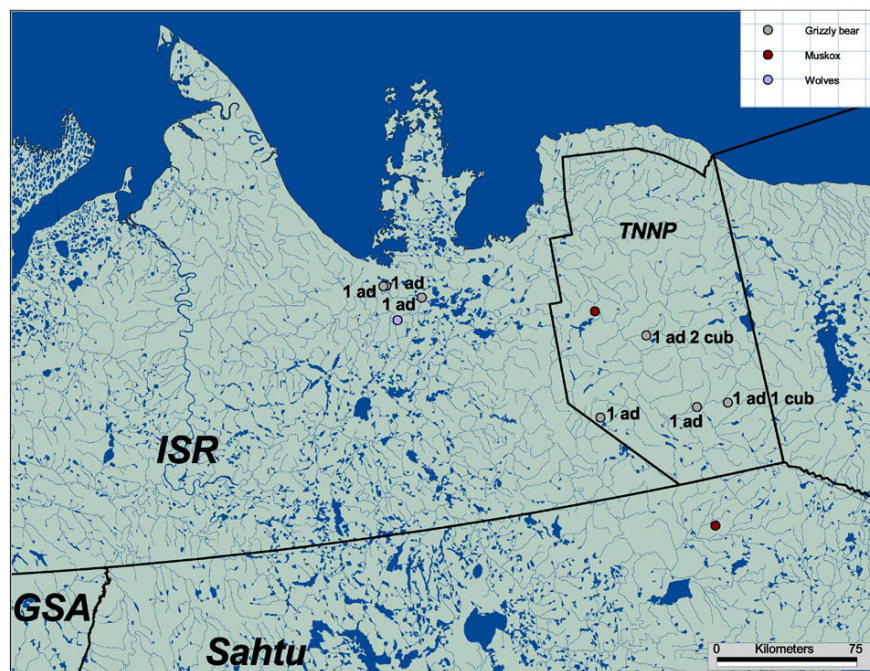


Figure 17: Distribution of grizzly bears, muskoxen, and wolves observed during the classification survey flown from June 23 to 26, 2001

## DISCUSSION

A summary of results from the 2000 and 2001 helicopter caribou classification survey are displayed in Table 11.

Table 11: Summary Table of caribou Classification Surveys for 2000 and 2001

Date		Location	Total caribou counted	# of calves per 100 cows	# of antlered cows to 100 non-antlered cow
2000	June 9 - 11	TNNP	2370	38.73	722
	June 11	Cape Bathurst	870	64.40	88
2001	June 23 - 26	TNNP	3877	54.00	8.73

The ratio of calves to cows varied between locations and years. These differences may be attributed to the timing of the surveys with the actual caribou calving. In 2000, the survey was conducted slightly before the calving had finished, although calving appeared to be further ahead at Cape Bathurst than in TNNP. The calf and cow ratio was much higher in Cape Bathurst (Table 6), and observers also noted that the Cape Bathurst calves were larger in size and more mobile than the TNNP calves. Within the park, calving was still underway since several caribou were observed giving birth. The ratio for antlered cows to non-antlered cows also indicates the progression of calving. Latour and Heard (1983) stated that antlers are shed soon after parturition. Therefore, the large numbers of antlered cows in TNNP suggested that many of the females had not yet given birth.

In 2001, the number of calves to 100 cows was higher in TNNP than in the previous year (54.00). This survey more accurately depicts the calf and cow ratio since the timing of the survey was more appropriate than in 2000. The results of the reconnaissance survey indicated that calving had not yet finished by June 11 (14.16 calves to 100 cows). By late June, the results of the classification survey showed that the majority of cows had lost their antlers suggesting that calving had already occurred. Of the 3 regions surveyed (TNNP, West, and South) the majority of the cows and calves were found within TNNP.

Both years, the surveys began slightly before calving had finished. Given variations in yearly environmental conditions, it is often difficult to determine the exact period of calving. For future studies we recommend that reconnaissance flights be conducted to pinpoint the precise time of calving in order to obtain accurate productivity estimates.



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