

Census Results for Cape Bathurst, Bluenose-West, and Bluenose-East Barren- ground Caribou Herds, July 2005

**Prepared for Sahtu Renewable
Resources Board**

**Fort Good Hope
14 Sep 2005**

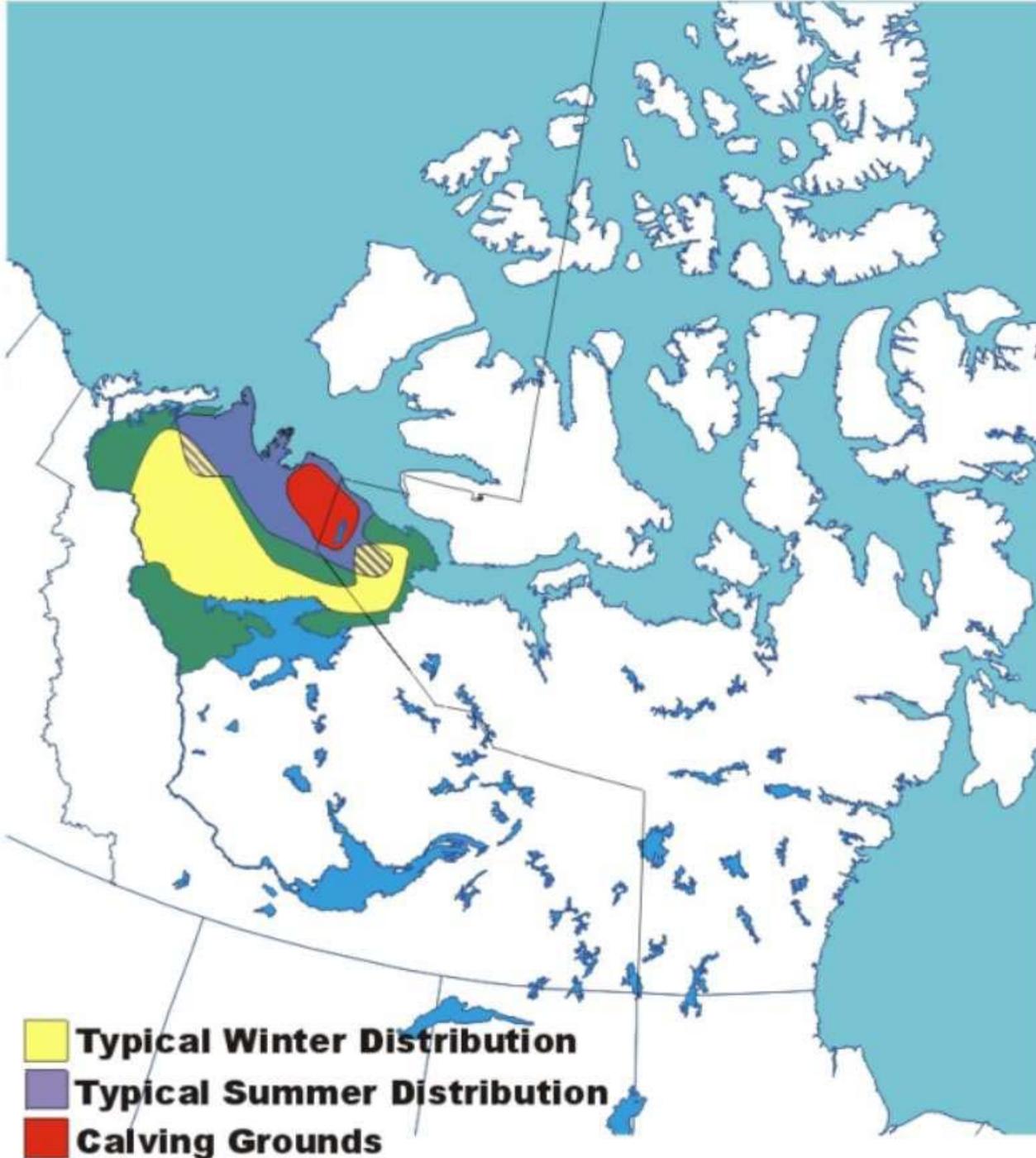


Background



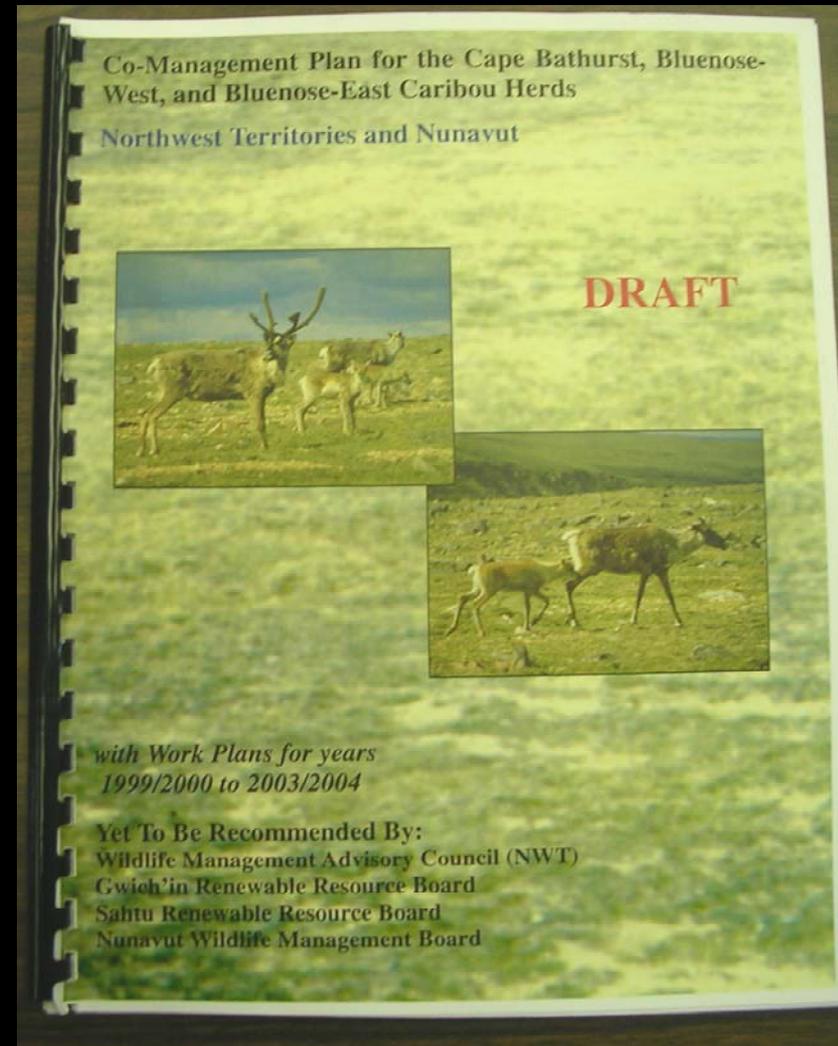
The Range of the Bluenose Herd

Animals south & east of the lake –
Bathurst Caribou



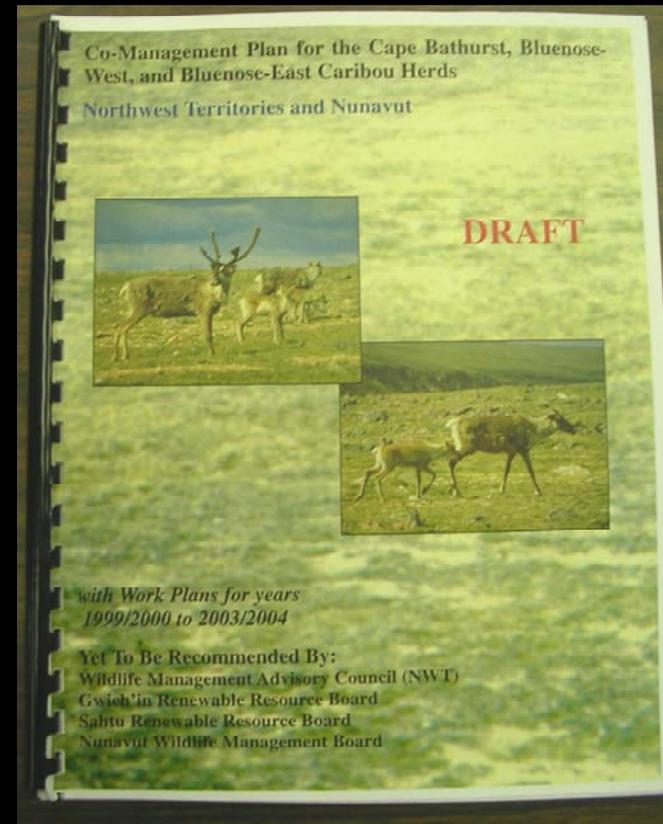
Bluenose Caribou Co-management Plan

- Developed with 4 wildlife co-management boards and 14 communities



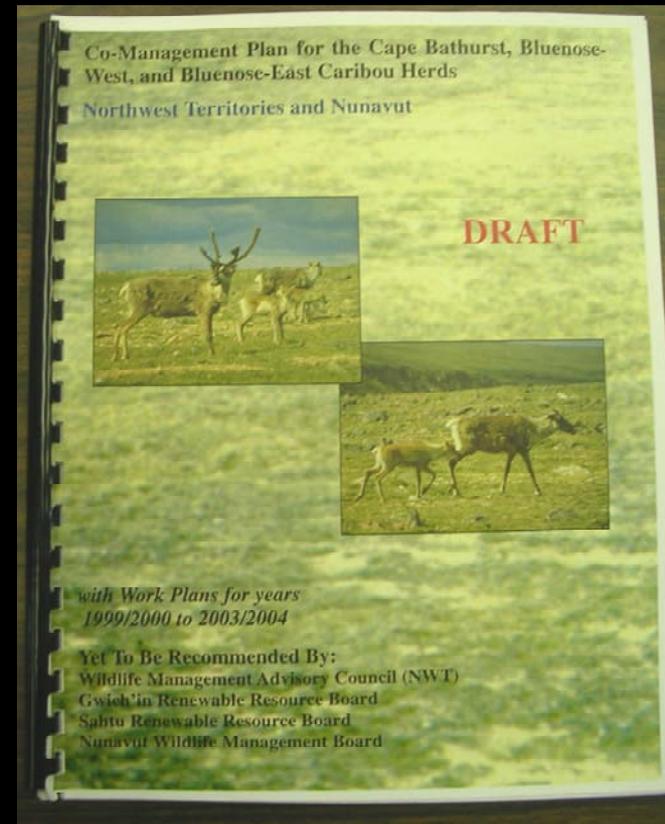
Bluenose Caribou Co-management Plan

- Developed with 4 wildlife co-management boards and 14 communities
- Outline for surveys, census, and management



Bluenose Caribou Co-management Plan

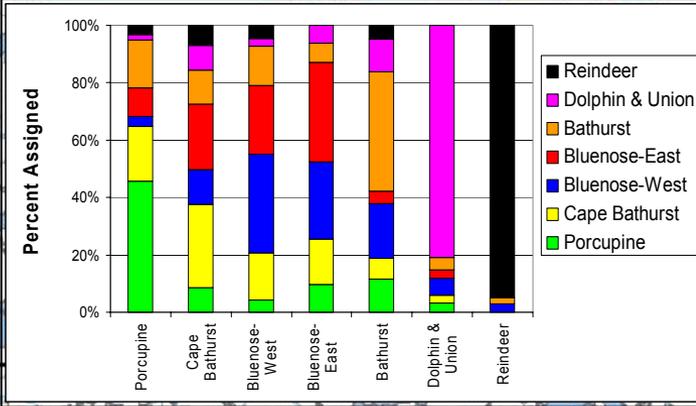
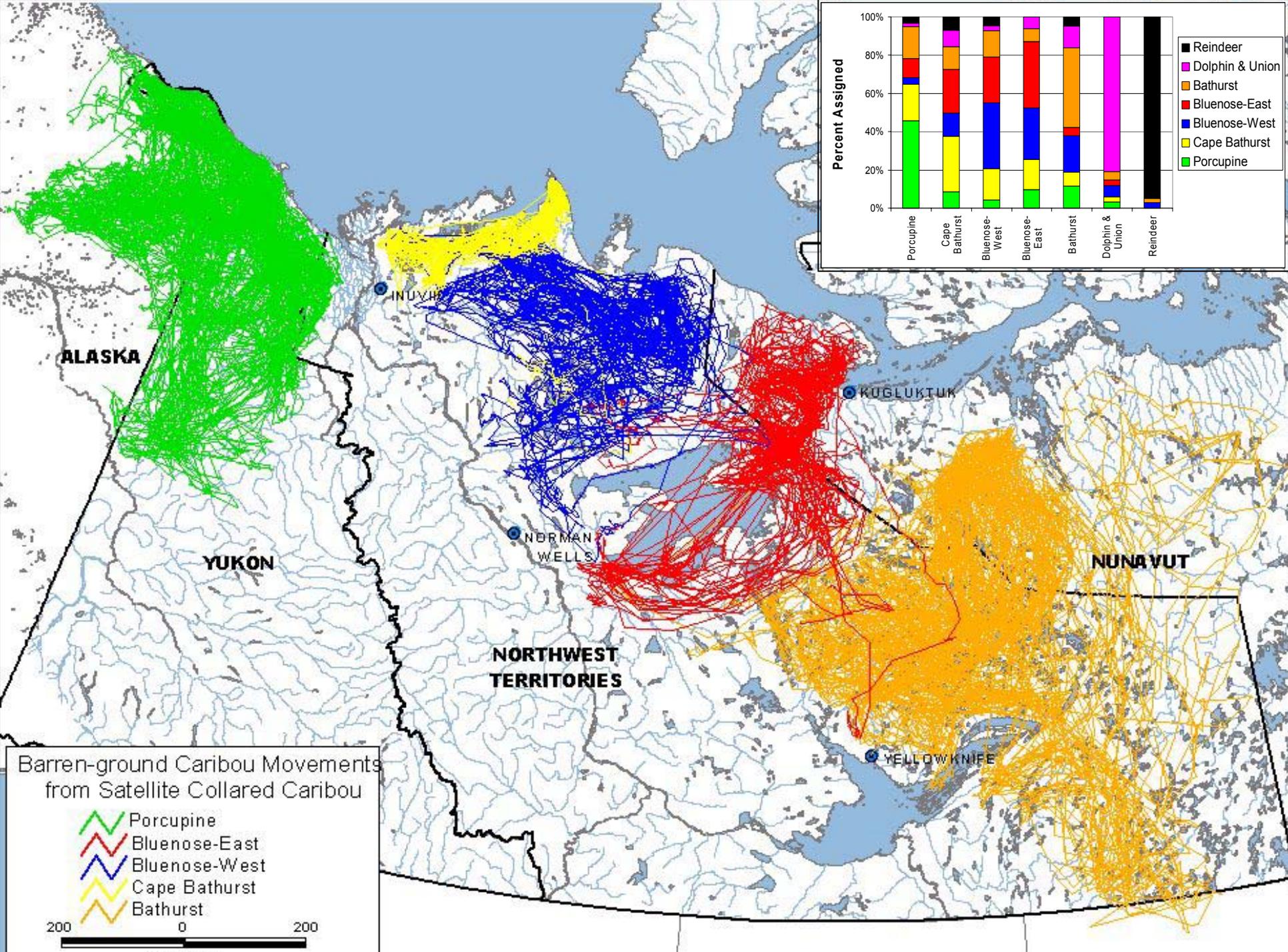
- Developed with 4 wildlife co-management boards and 14 communities
- Outline for surveys, census, and management
- Time frame: 1999/2000 to 2003/2004



Herd Identification Study

- 1996 to present: tracking radiocollared caribou by satellite
- Genetic analyses of samples from across range of 'Bluenose', Bathurst, Porcupine, and other 'herds'





Barren-ground Caribou Movements from Satellite Collared Caribou

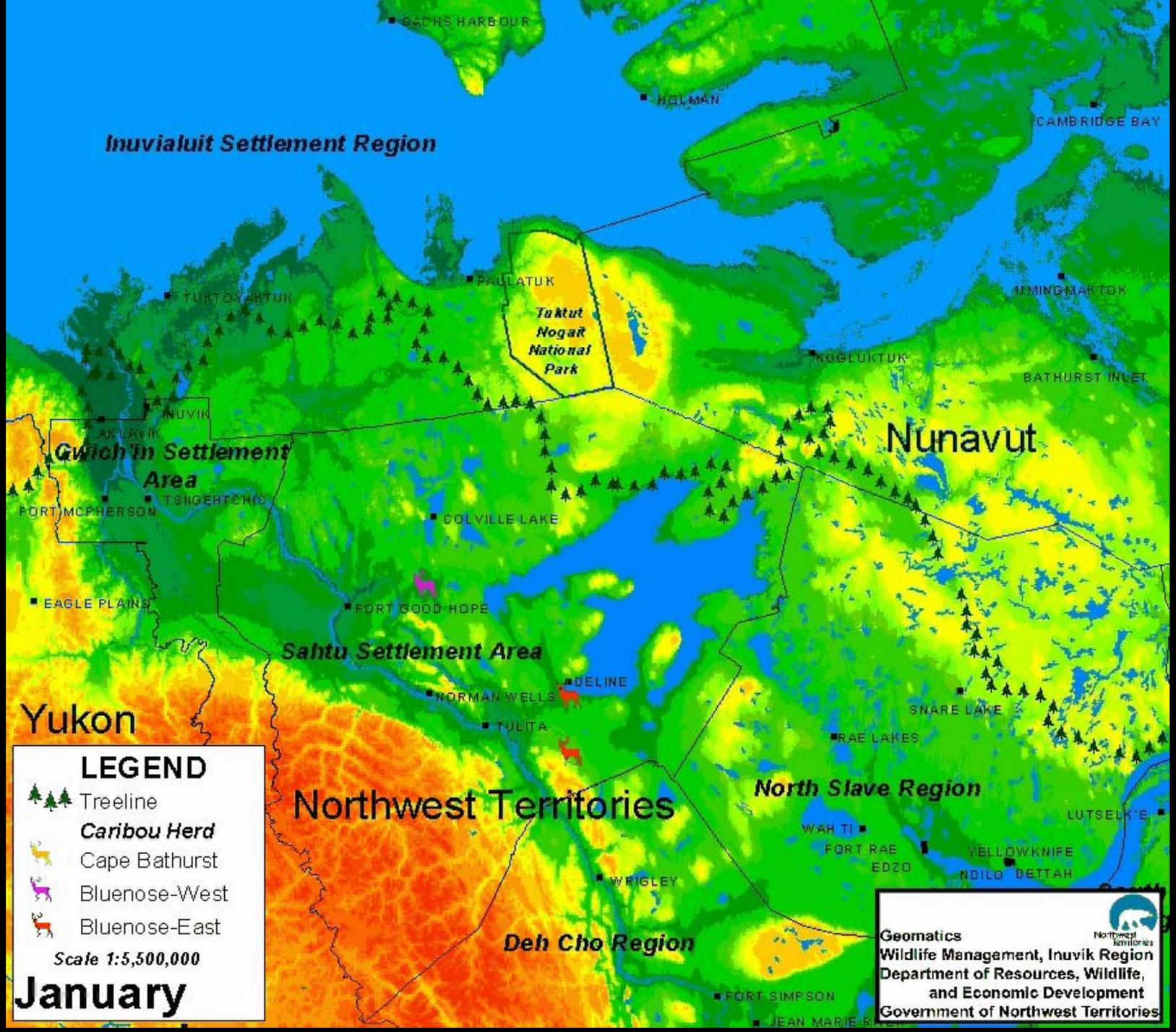
- ↗ Porcupine
- ↗ Bluenose-East
- ↗ Bluenose-West
- ↗ Cape Bathurst
- ↗ Bathurst



**Two *genetically different* herds in the
Sahtu use *different annual ranges***

- Bluenose-West Herd**
- Bluenose-East Herd**

**Bathurst herd caribou also come into Sahtu
during parts of some years.**



LEGEND

- Treeline
- Cape Bathurst
- Bluenose-West
- Bluenose-East

Scale 1:5,500,000

January

Geomatics
Wildlife Management, Inuvik Region
Department of Resources, Wildlife,
and Economic Development
Government of Northwest Territories



Harvest



Subsistence Harvest of Barren-ground Caribou By Sahtu Dene & Metis

<u>Year</u>	<u>Harvest</u>	<u>Estimated Value*</u>
1999	3098	\$3,098,000
2000	2793	\$2,793,000
2001	2561	\$2,561,000
2002	1895	\$1,895,000
2003	1100	\$1,100,000
Total	11,447	\$11,447,000

Sahtu Settlement Harvest Study Data

* Assume 50 kg/caribou@ \$20/kg

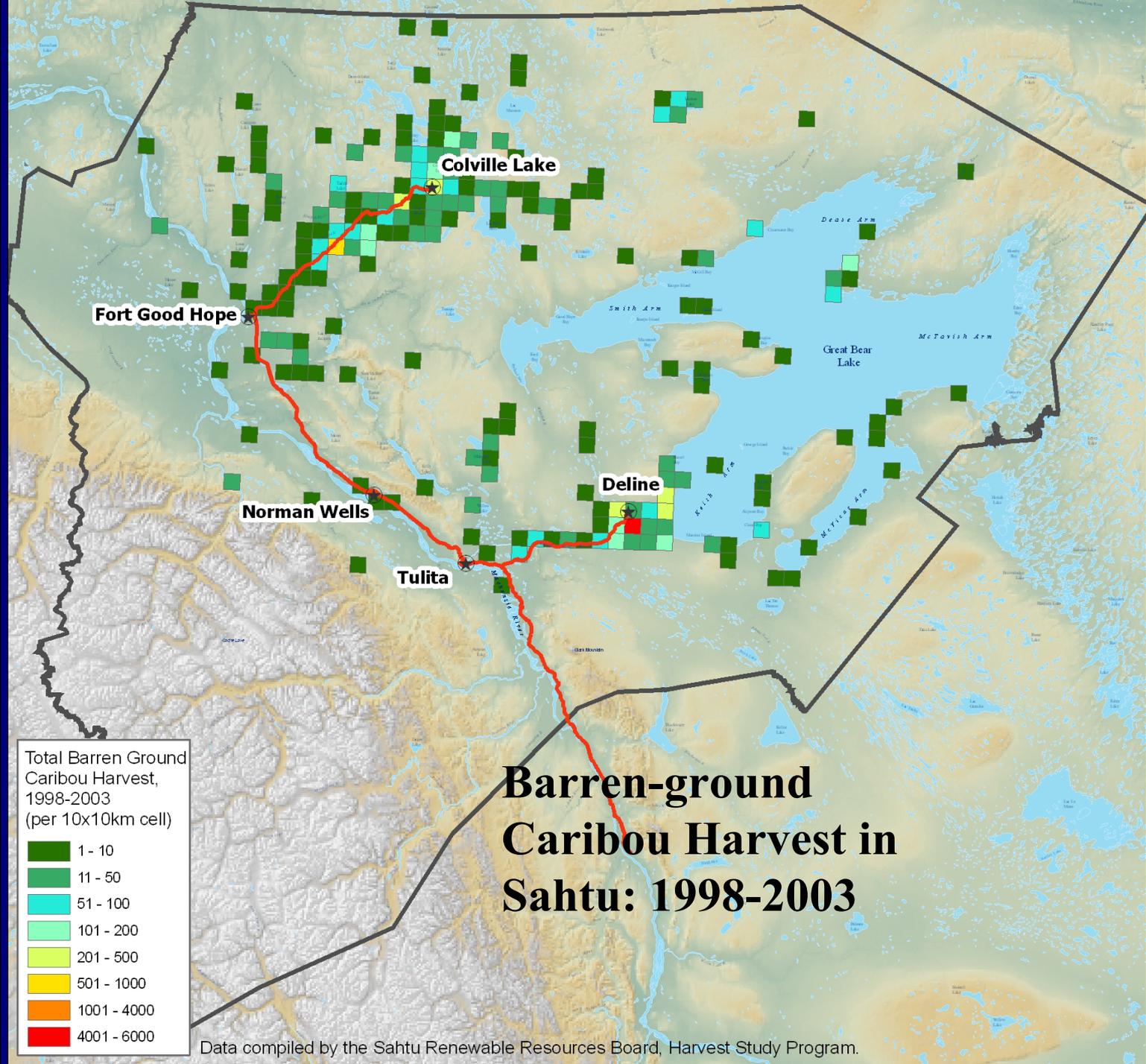




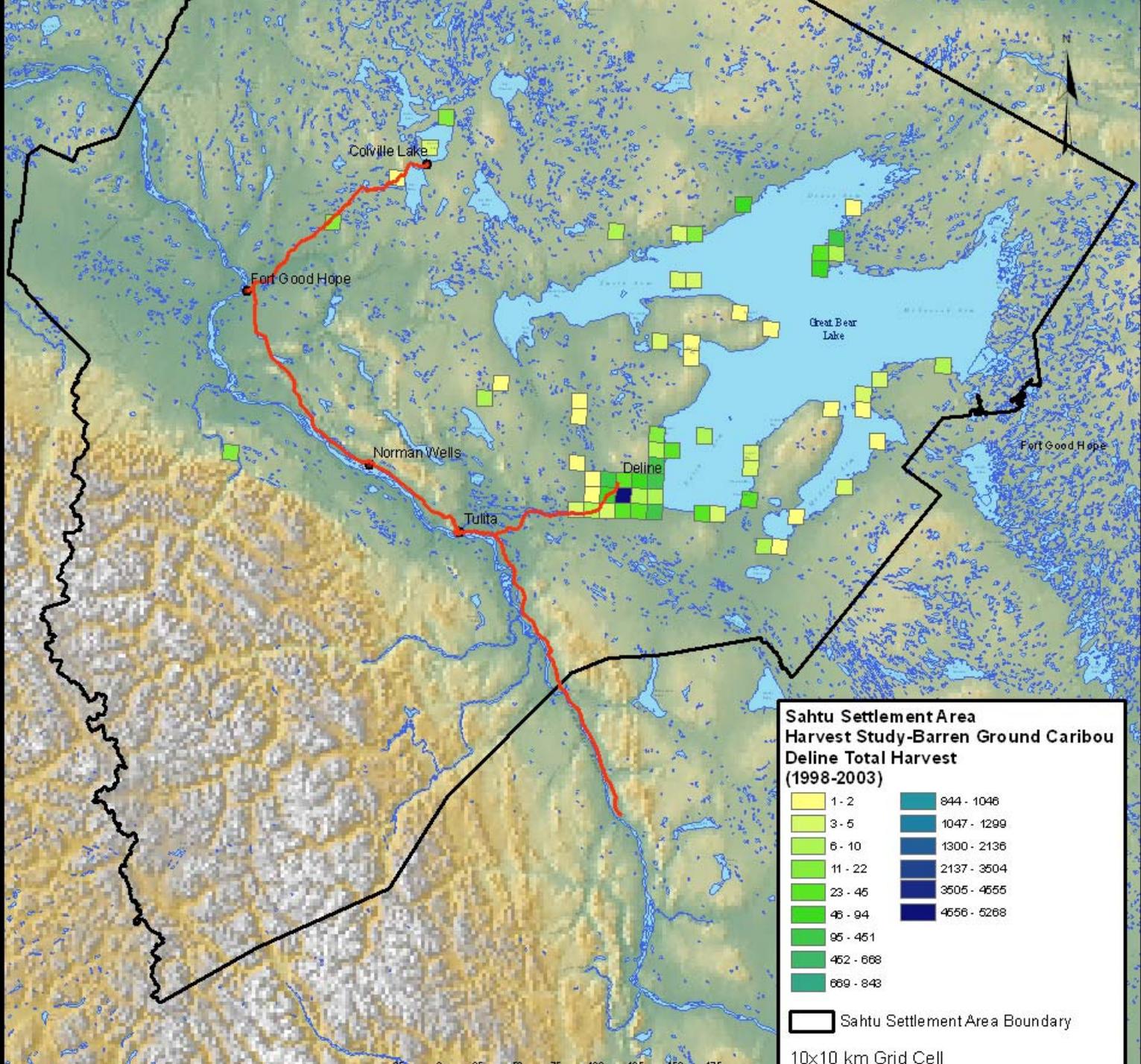
Harvest of Barren-ground Caribou Harvest as Reported in Sahtu Harvest Study 1998-2003

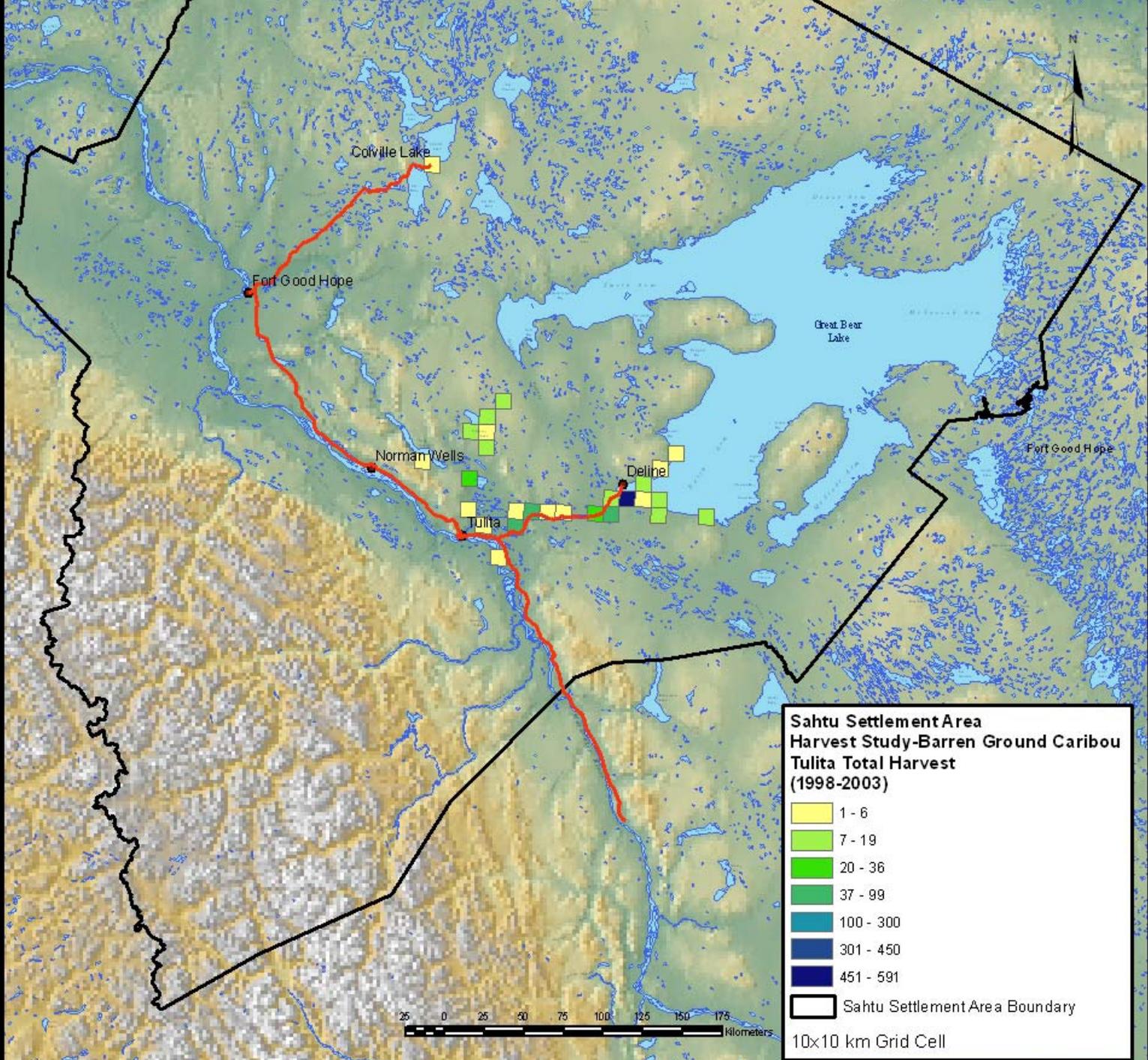
Year	Harvest	Report Rate	% Female
1998*	779	75	42.3
1999	3098	72	47.2
2000	2793	95	54.0
2001	2561	93	64.8
2002	1895	93	67.9
2003	1100	93	71.4

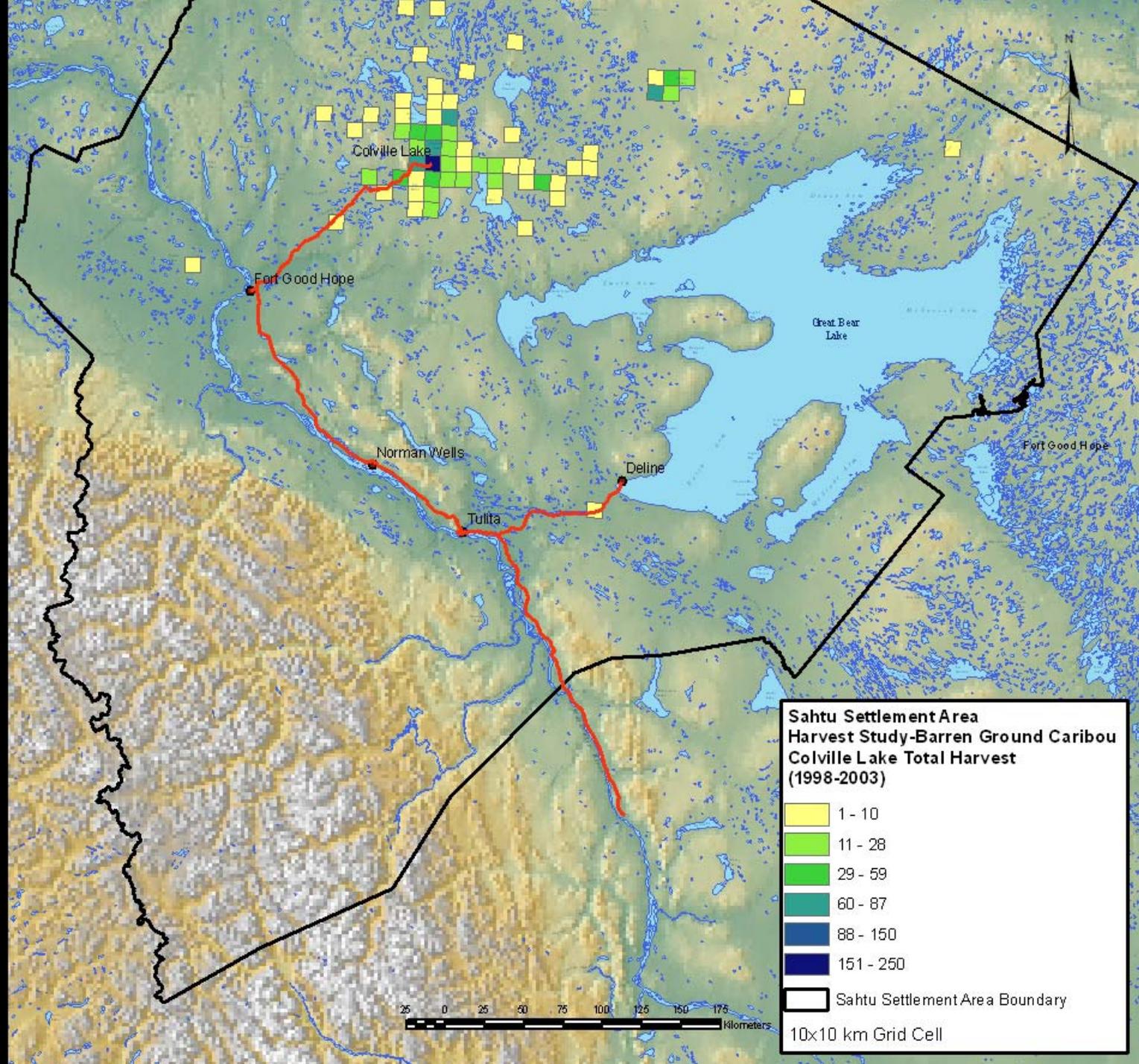
* only Apr-Dec; does not include Deline

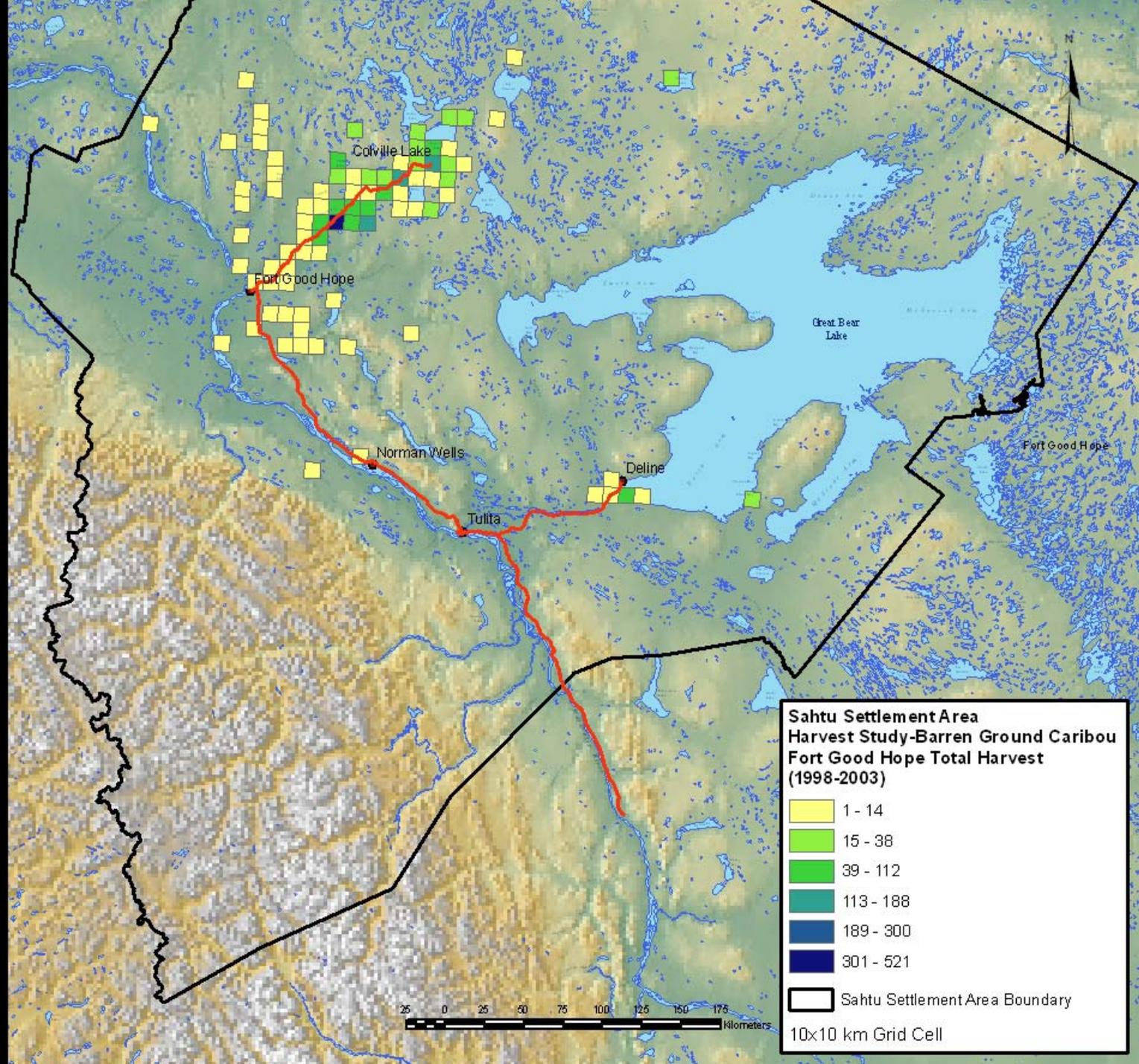


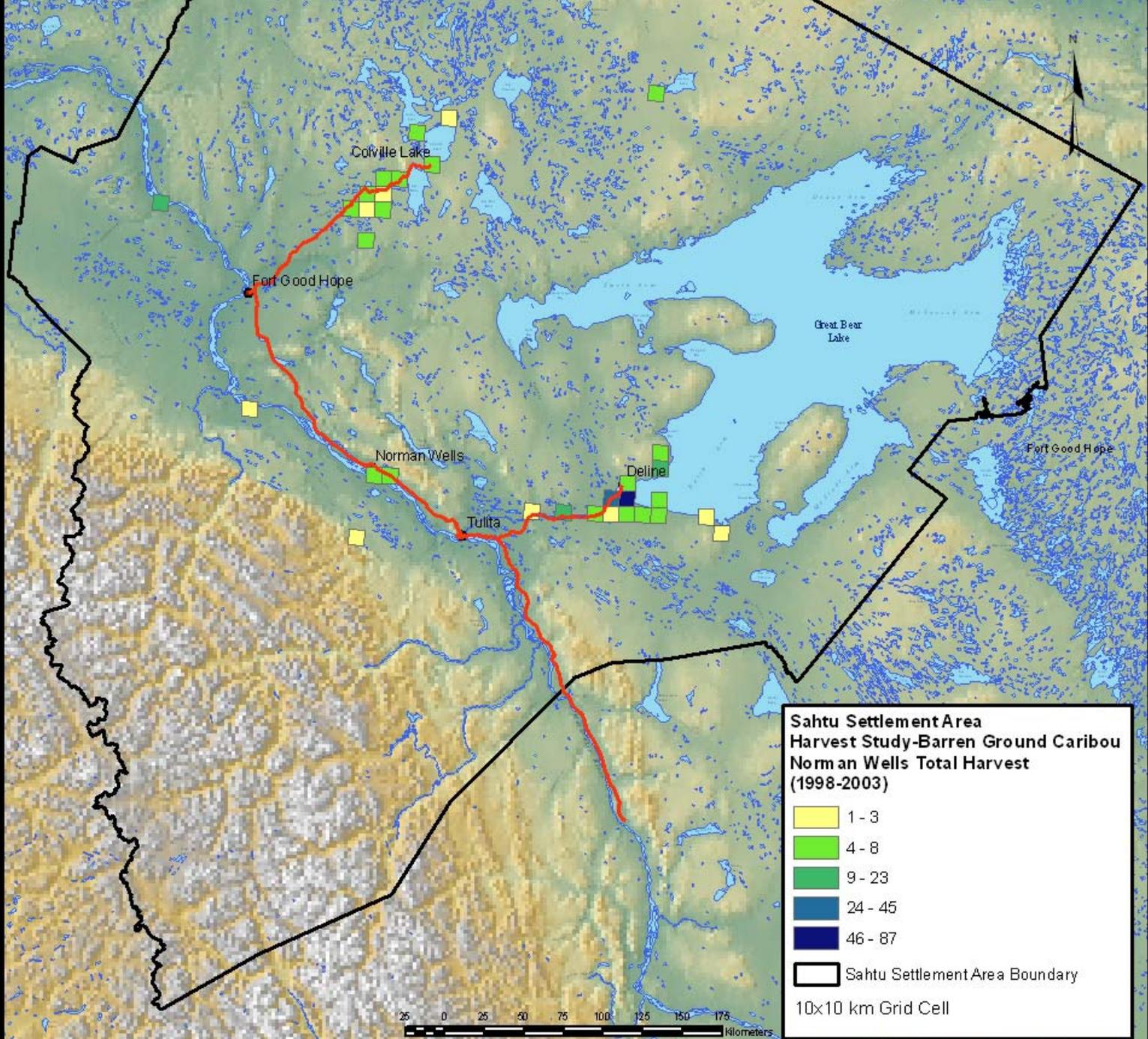
Data compiled by the Sahtu Renewable Resources Board, Harvest Study Program.



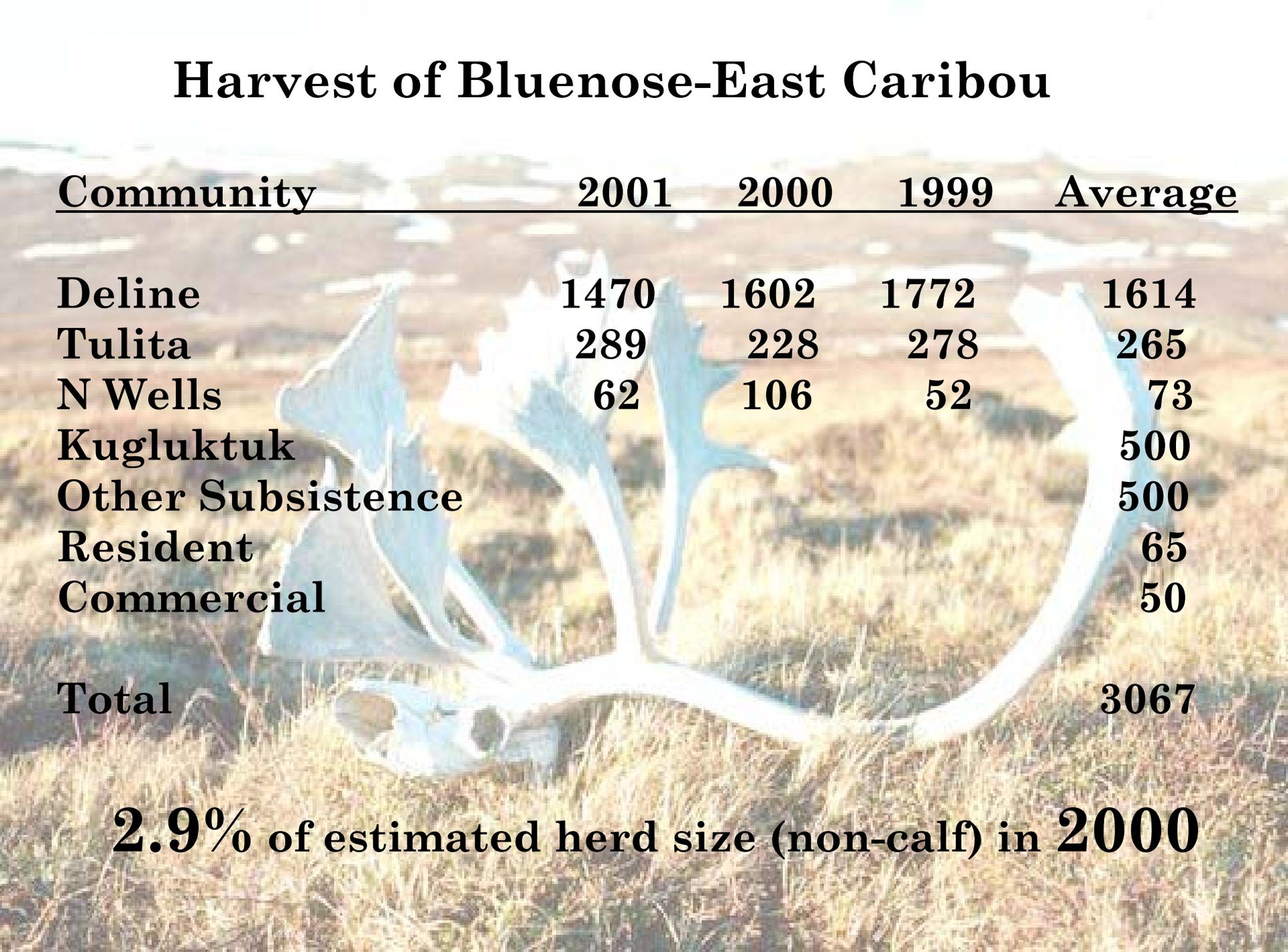








Harvest of Bluenose-East Caribou



<u>Community</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>	<u>Average</u>
Deline	1470	1602	1772	1614
Tulita	289	228	278	265
N Wells	62	106	52	73
Kugluktuk				500
Other Subsistence				500
Resident				65
Commercial				50
Total				3067

2.9% of estimated herd size (non-calf) in **2000**



Harvest of Bluenose-West Caribou (includes Paulatuk, Inuvik, and Tuktoyaktuk)

1998/99 to 2001/02

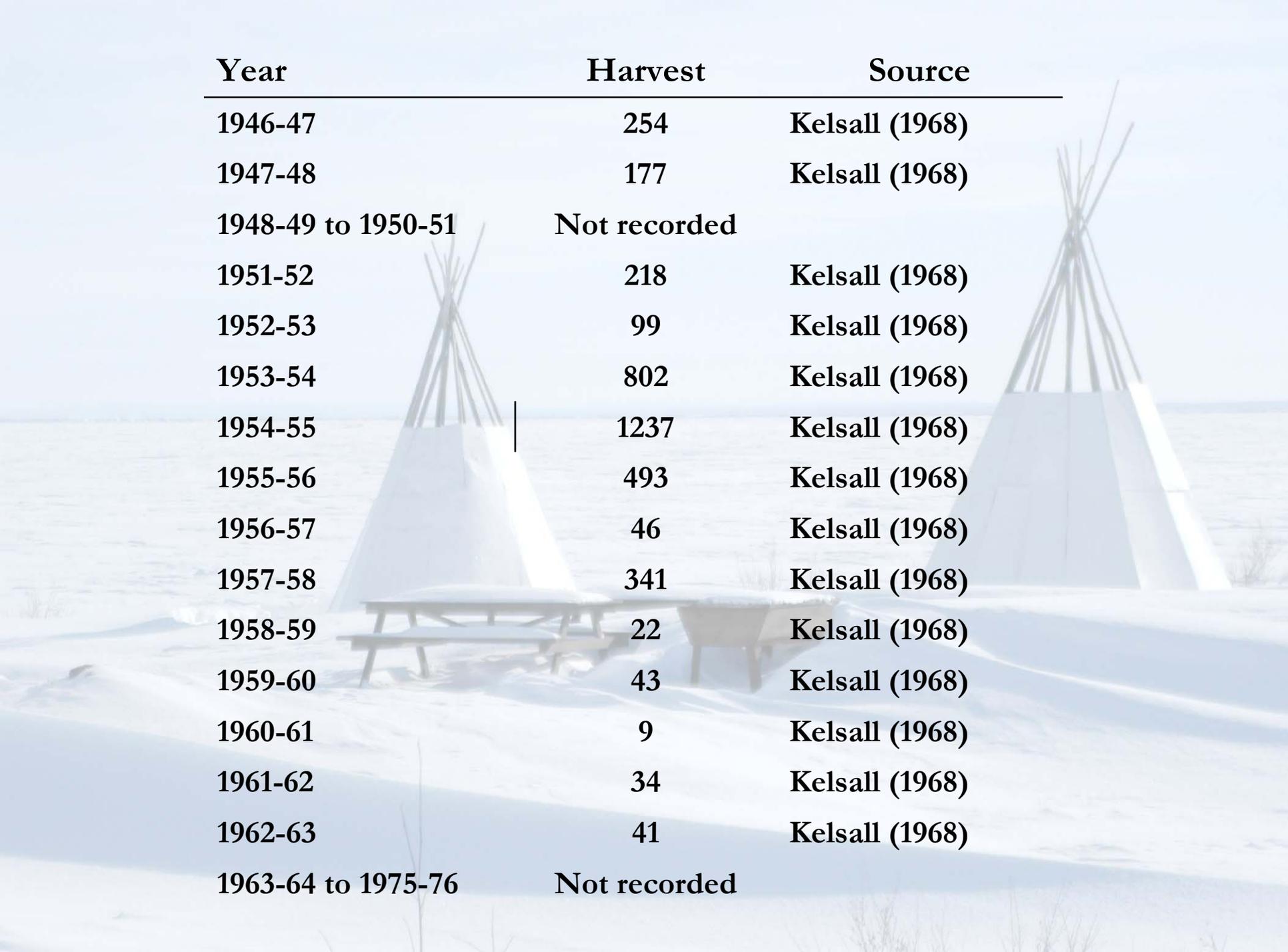
<u>Type</u>	<u>Harvest</u>	<u>% of Total</u>
Subsistence	1735	90.7
Resident	58	3.0
Commercial	52	2.7
Non-resident	69	3.6
Total	1914	

2.6% of estimated herd size (non-calf) in **2000**

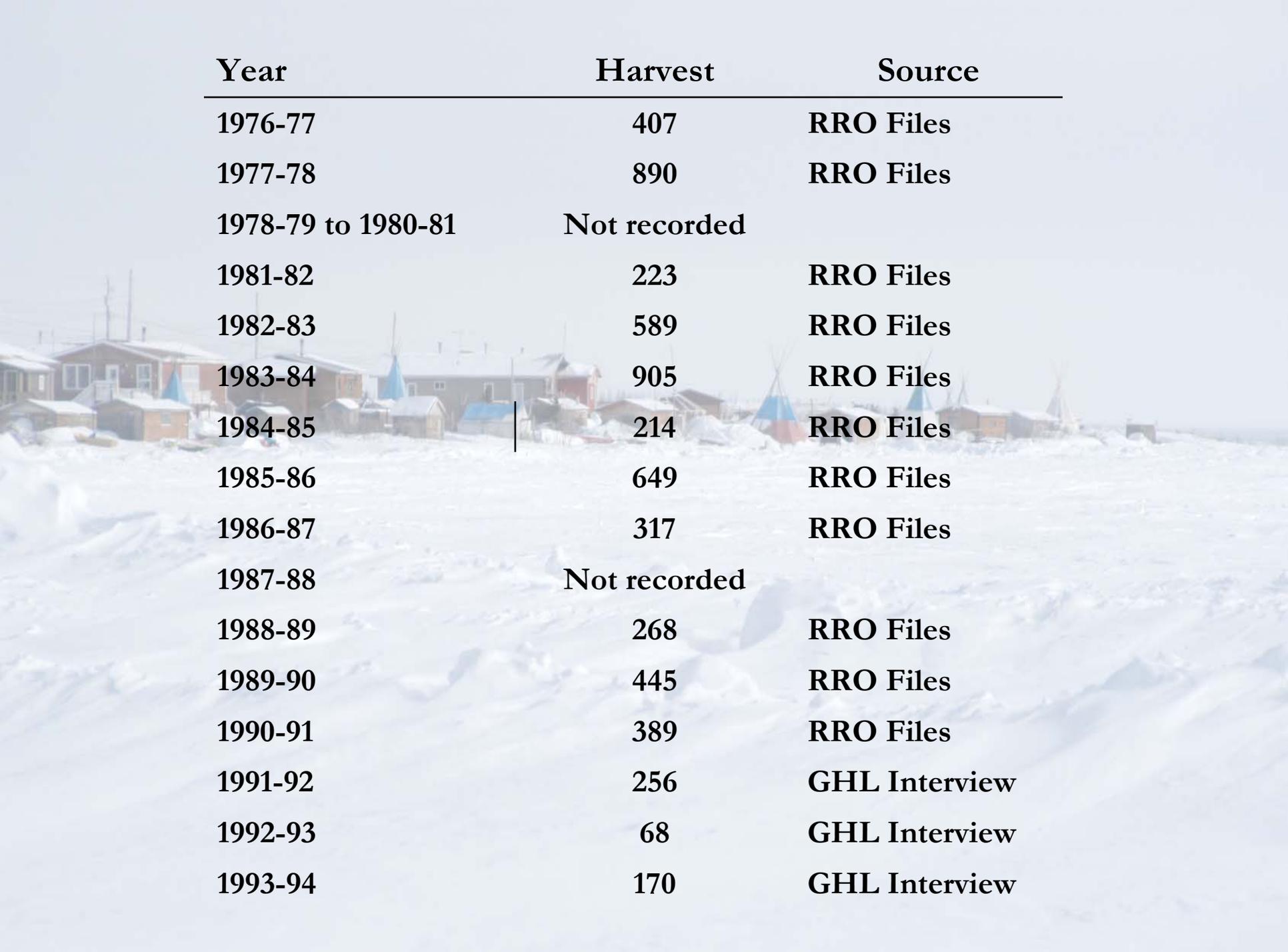
Commercial Tags – “Bluenose Caribou”

<u>Community</u>	<u>Number</u>
Kugluktuk	50
Tuktoyaktuk	175
Paulatuk	175
Inuvik - Inuvialuit	87.5
Inuvik – Gwich’in	87.5
Aklavik – Inuvialuit	87.5
Aklavik – Gwich’in	87.5
Sahtu & Tsiighetchic	200
Total	950

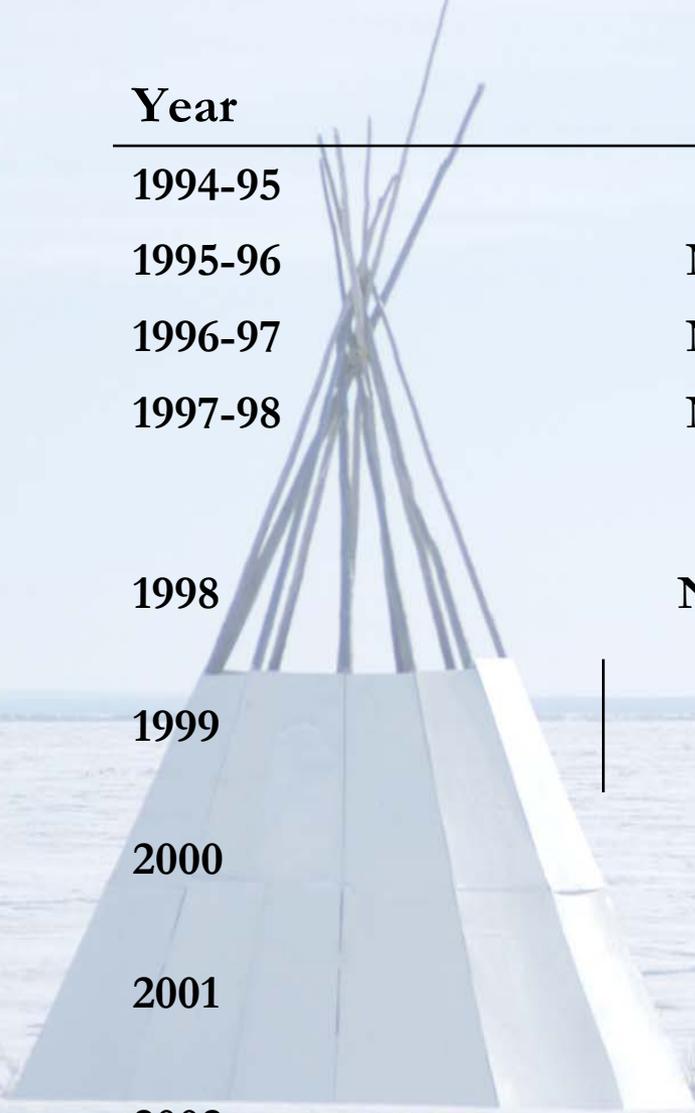




Year	Harvest	Source
1946-47	254	Kelsall (1968)
1947-48	177	Kelsall (1968)
1948-49 to 1950-51	Not recorded	
1951-52	218	Kelsall (1968)
1952-53	99	Kelsall (1968)
1953-54	802	Kelsall (1968)
1954-55	1237	Kelsall (1968)
1955-56	493	Kelsall (1968)
1956-57	46	Kelsall (1968)
1957-58	341	Kelsall (1968)
1958-59	22	Kelsall (1968)
1959-60	43	Kelsall (1968)
1960-61	9	Kelsall (1968)
1961-62	34	Kelsall (1968)
1962-63	41	Kelsall (1968)
1963-64 to 1975-76	Not recorded	



Year	Harvest	Source
1976-77	407	RRO Files
1977-78	890	RRO Files
1978-79 to 1980-81	Not recorded	
1981-82	223	RRO Files
1982-83	589	RRO Files
1983-84	905	RRO Files
1984-85	214	RRO Files
1985-86	649	RRO Files
1986-87	317	RRO Files
1987-88	Not recorded	
1988-89	268	RRO Files
1989-90	445	RRO Files
1990-91	389	RRO Files
1991-92	256	GHL Interview
1992-93	68	GHL Interview
1993-94	170	GHL Interview



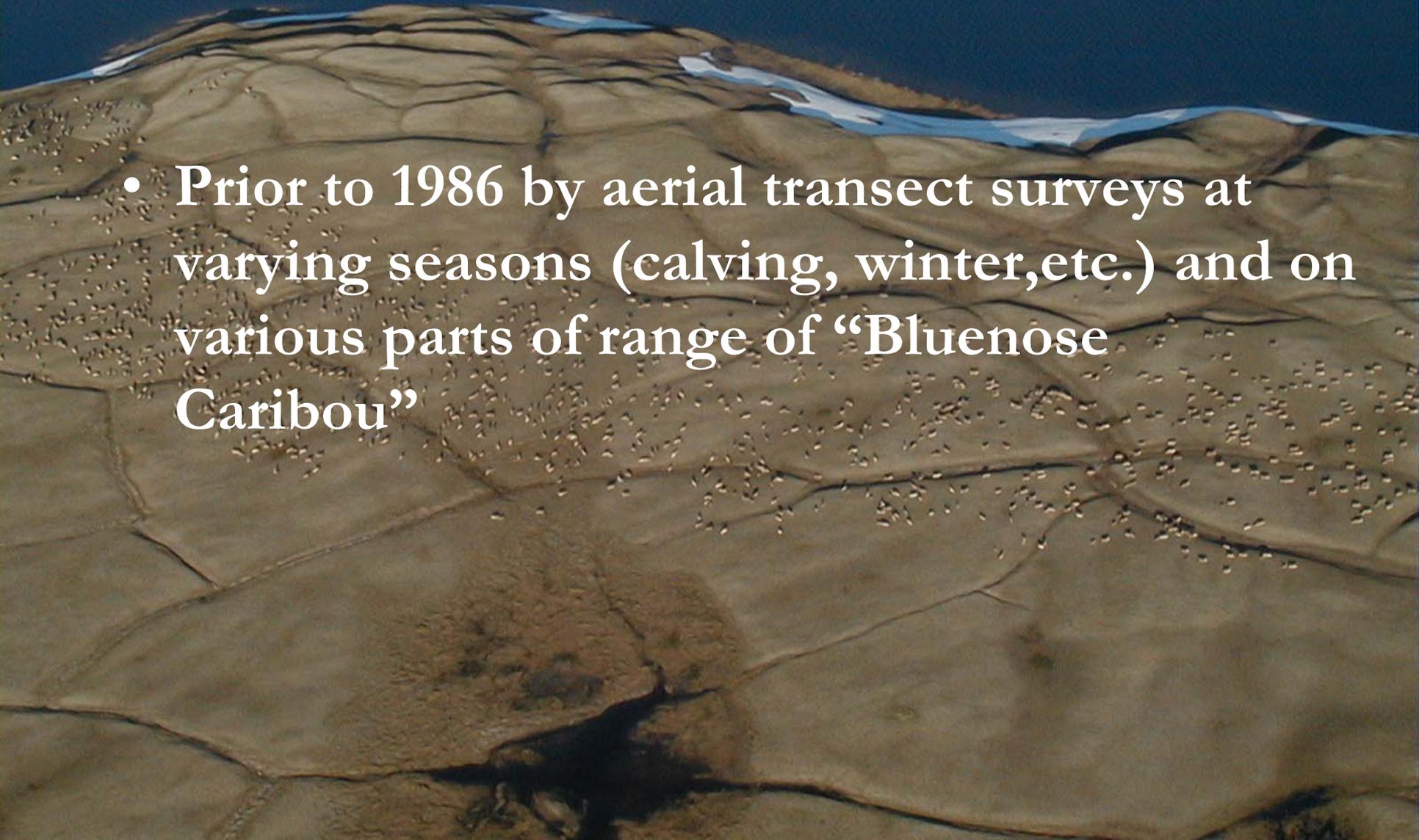
Year	Harvest	Source
1994-95	253	RRO Files
1995-96	Not recorded	
1996-97	Not recorded	
1997-98	Not recorded	
1998	Not Recorded	Sahtu Harvest Study
1999	1772	Sahtu Harvest Study
2000	1470	Sahtu Harvest Study
2001	1602	Sahtu Harvest Study
2002	1377	Sahtu Harvest Study
2003	947	Sahtu Harvest Study

Herd Size



How have estimates of herd size been obtained?

- Prior to 1986 by aerial transect surveys at varying seasons (calving, winter, etc.) and on various parts of range of “Bluenose Caribou”



How have estimates of herd size been obtained?

- First photo-census in 1987; again in 1992 and 2000



How have estimates of herd size been obtained?

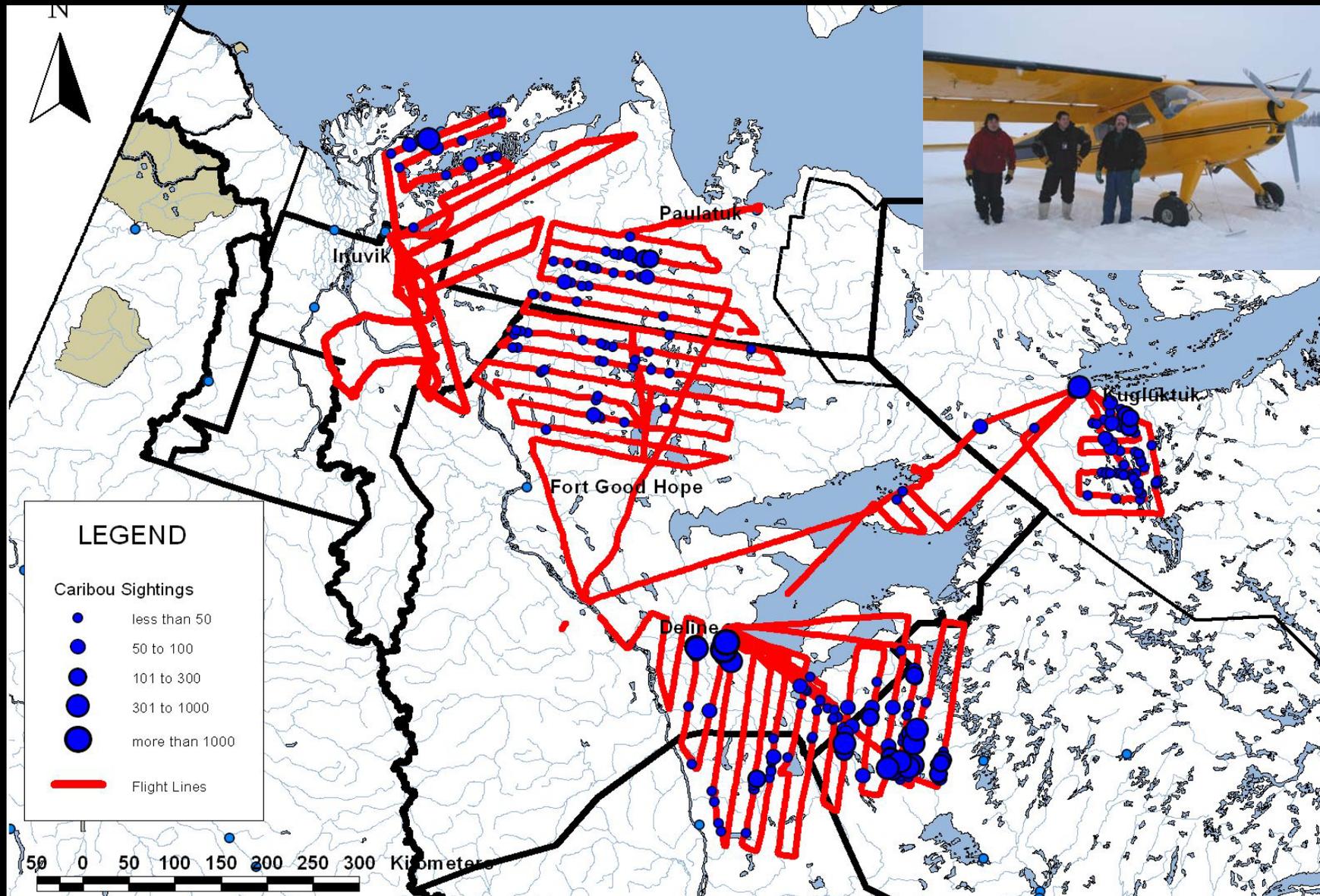
- Cape Bathurst, Bluenose-West, and Bluenose-East herds first surveyed as separate herds in 2000.



July 2005 Aerial Photocensus



Early/mid March 2005: survey to locate caribou on winter ranges



March 2005 - Captures

**70 Bluenose-West
caribou (52 cows; 18 bulls)**



March 2005 - Captures

**50 Bluenose-East
caribou (37 cows; 13 bulls)**



March 2005 - Captures

**10 satellite-tracked
collars per herd**



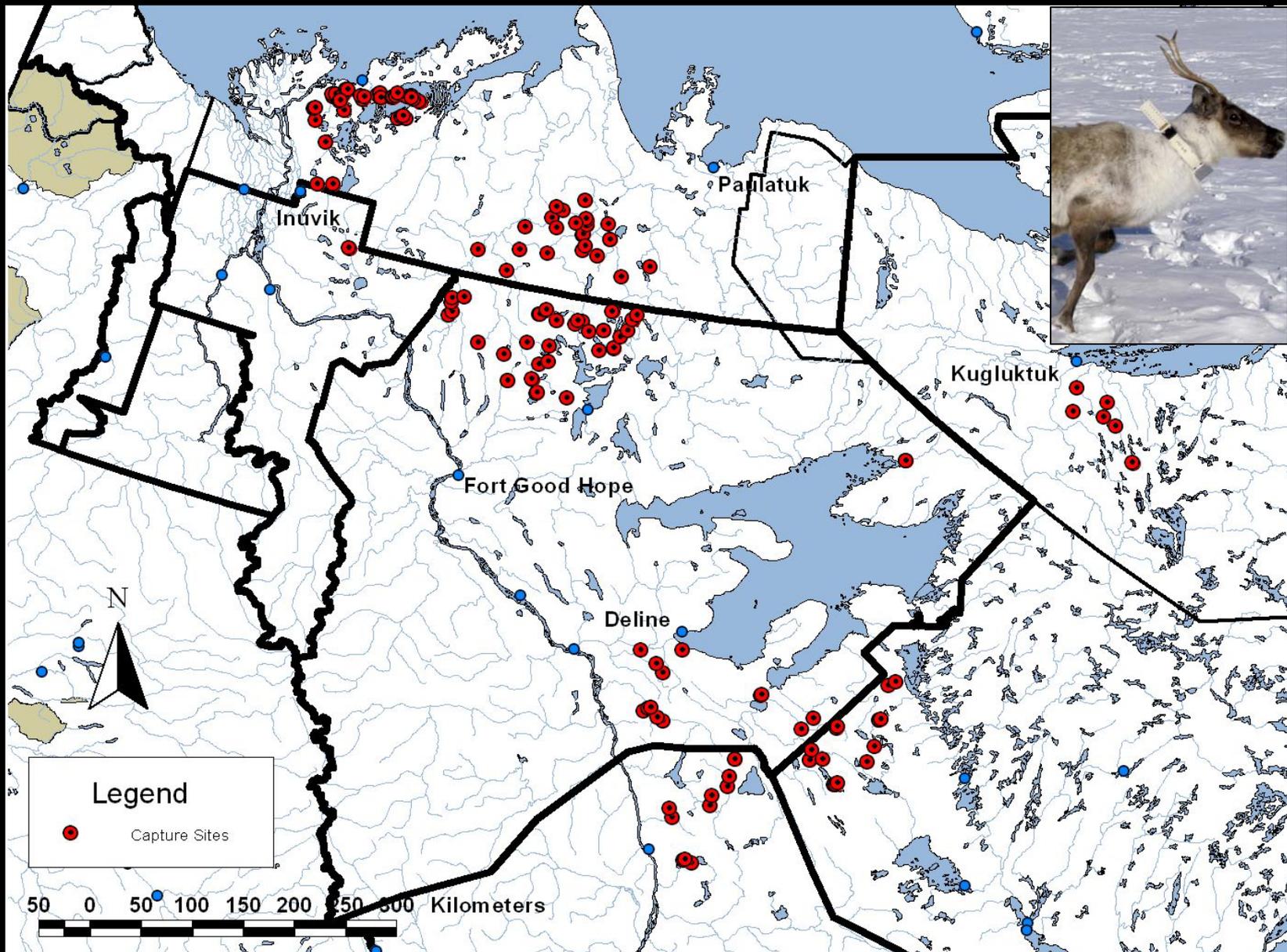
**Blood sample – DNA, pregnancy status, parasites,
exposure to disease**

**Body condition
assessment**

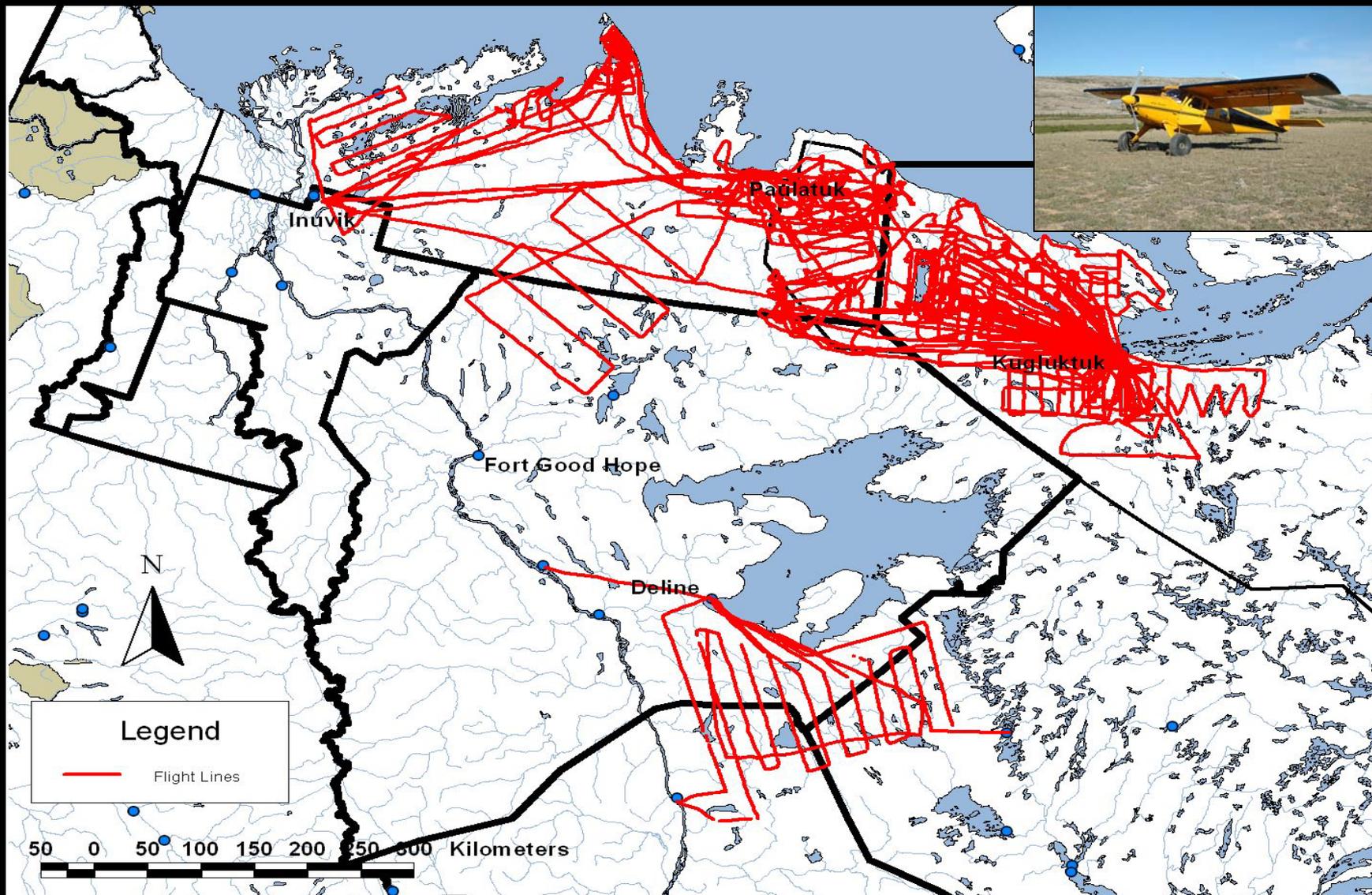
**Radiocollar with
pre-programmed
drop-off mechanism**



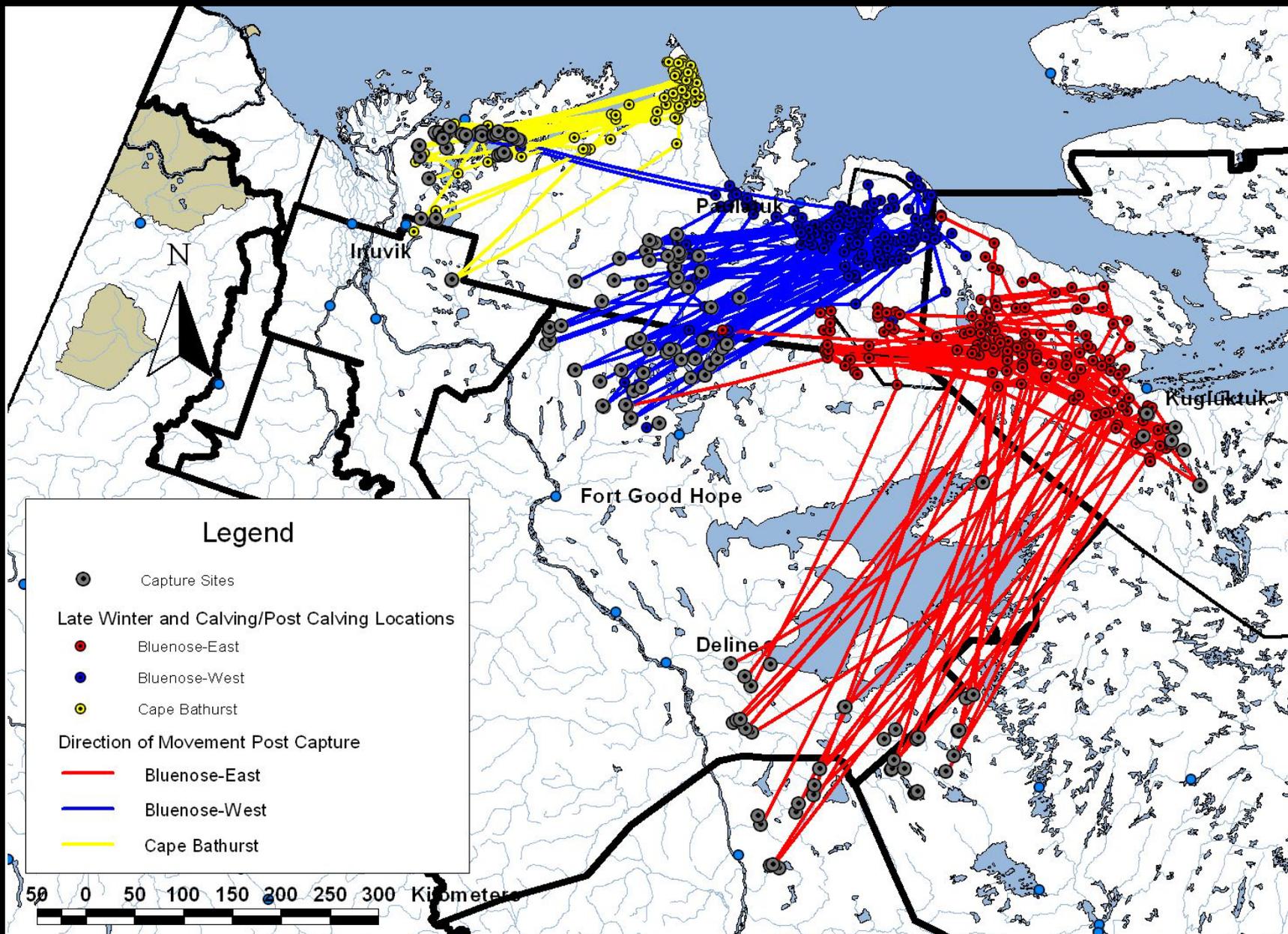
Caribou were radio-collared throughout the winter ranges of all 3 herds – good distribution



Survey radio-collared caribou on post-calving & early summer ranges (Jun-Jul)



Where we found caribou collared in March 2005



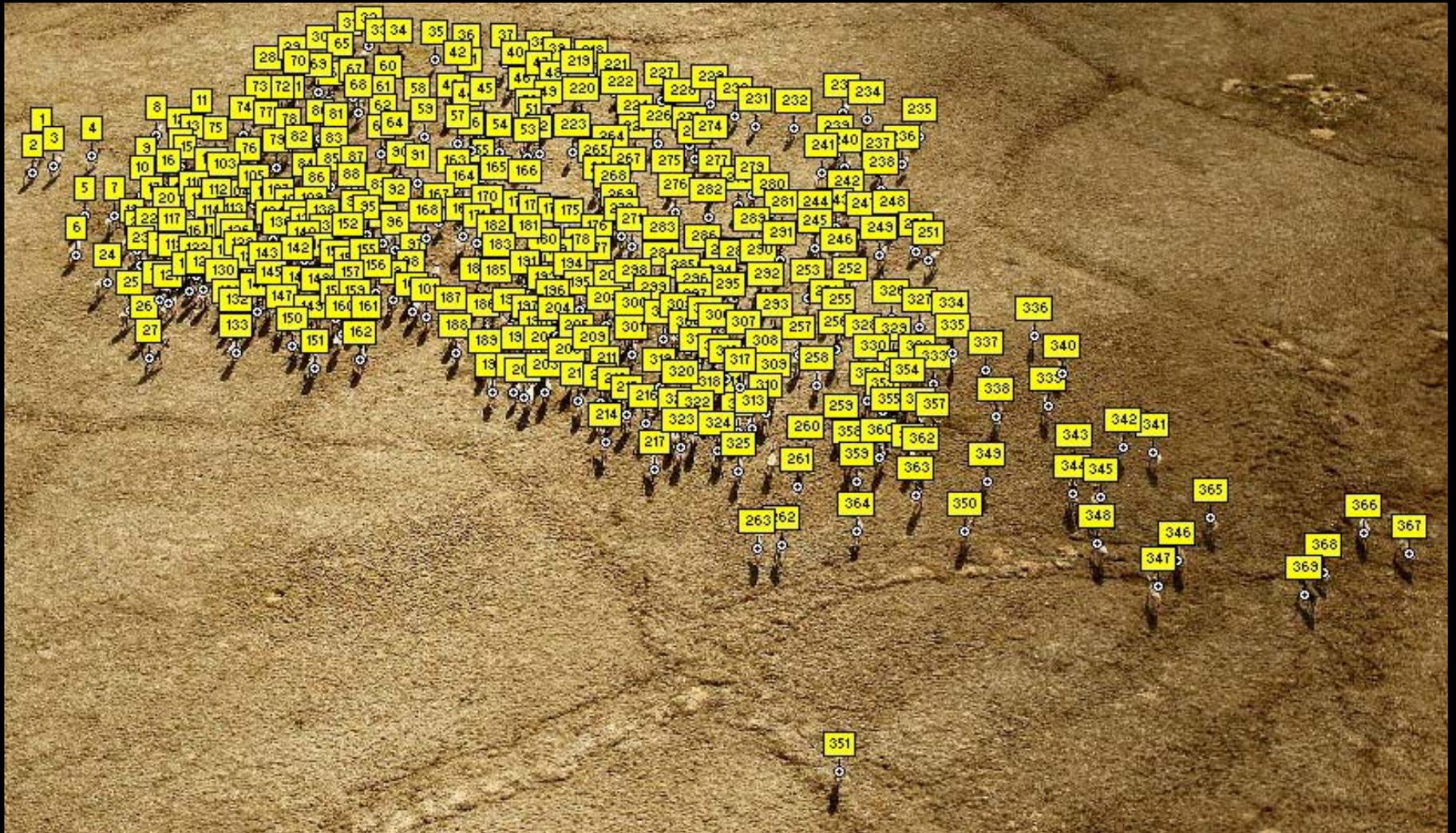
Groups of caribou were photographed



A computer was used to count caribou on photos



Until all the caribou were counted



**How many non-calf caribou (over 1-yr-old)
were in the herds in early July 2005?**

Cape Bathurst:

2,400 (range 2,179 to 2,692)

95% confidence interval

**How many non-calf caribou (over 1-yr-old)
were in the herds in early July 2005?**

Bluenose-West:

20,800 (range 18,761 to 22,841)

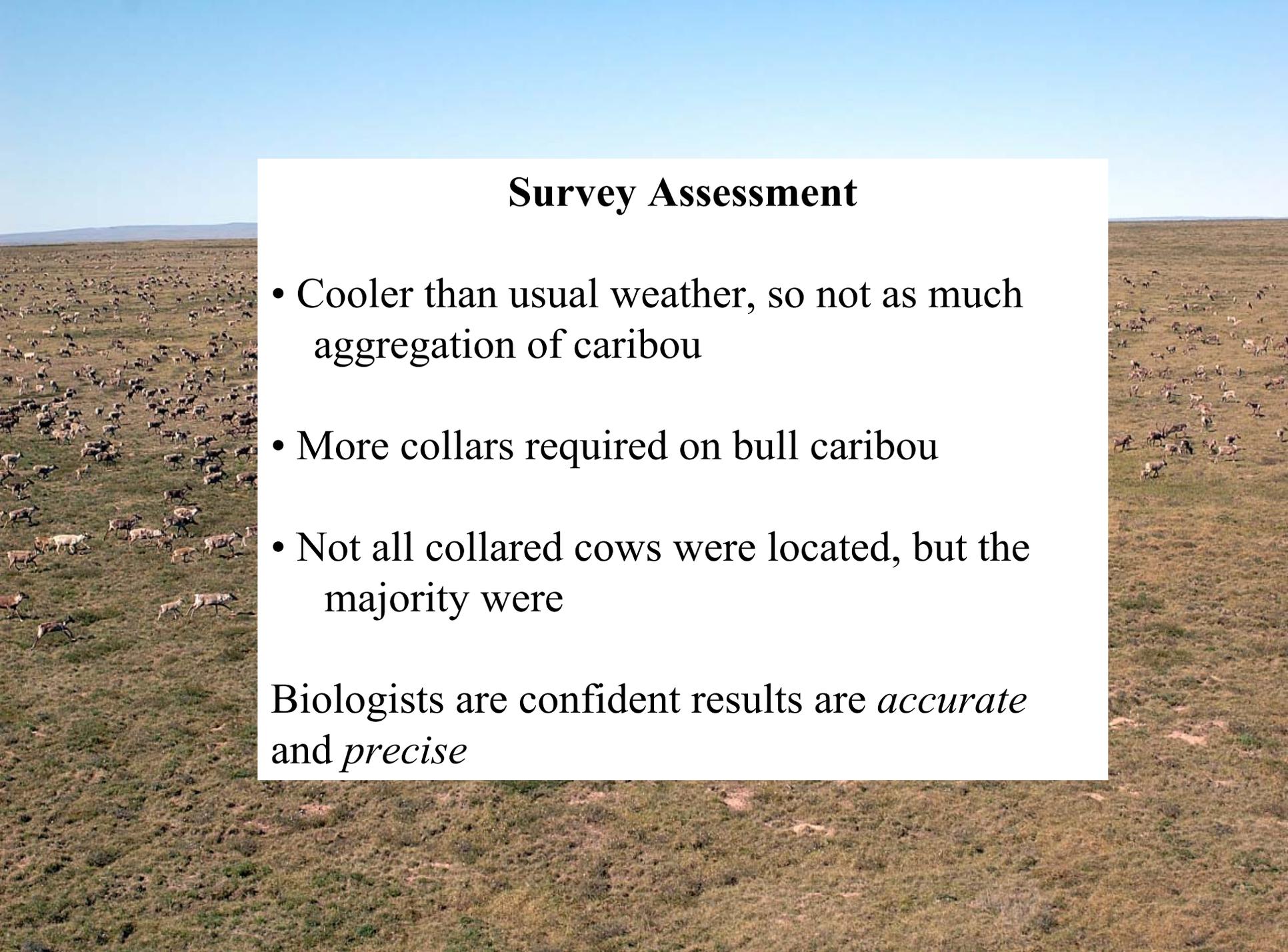


**How many non-calf caribou (over 1-yr-old)
were in the herds in early July 2005?**

Bluenose-East:

66,600 (range 62,196 to 70,972)



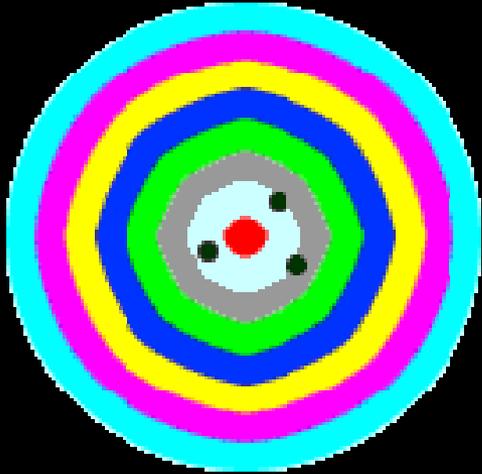


Survey Assessment

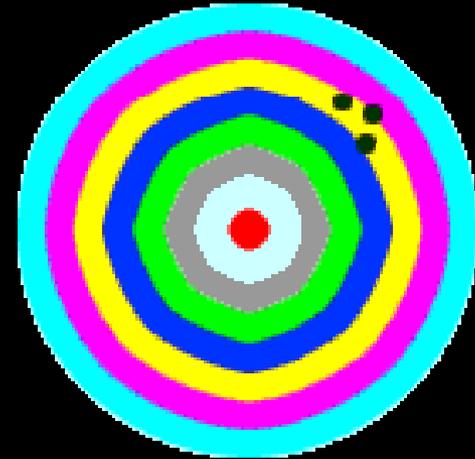
- Cooler than usual weather, so not as much aggregation of caribou
- More collars required on bull caribou
- Not all collared cows were located, but the majority were

Biologists are confident results are *accurate* and *precise*

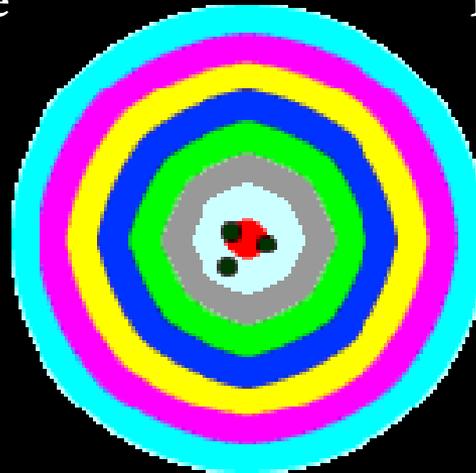
Accuracy and Precision



Accurate but not Precise

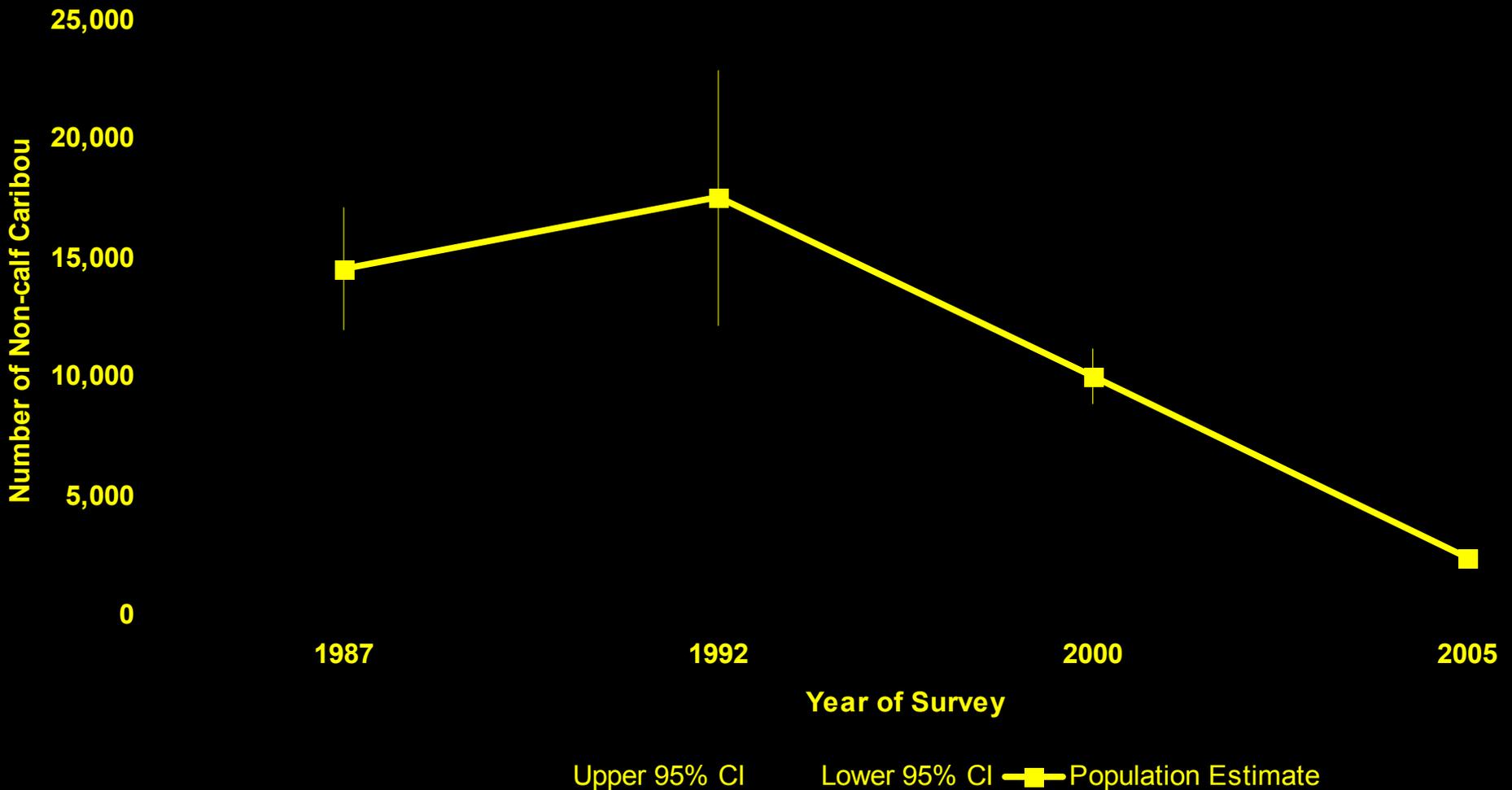


Precise but not Accurate

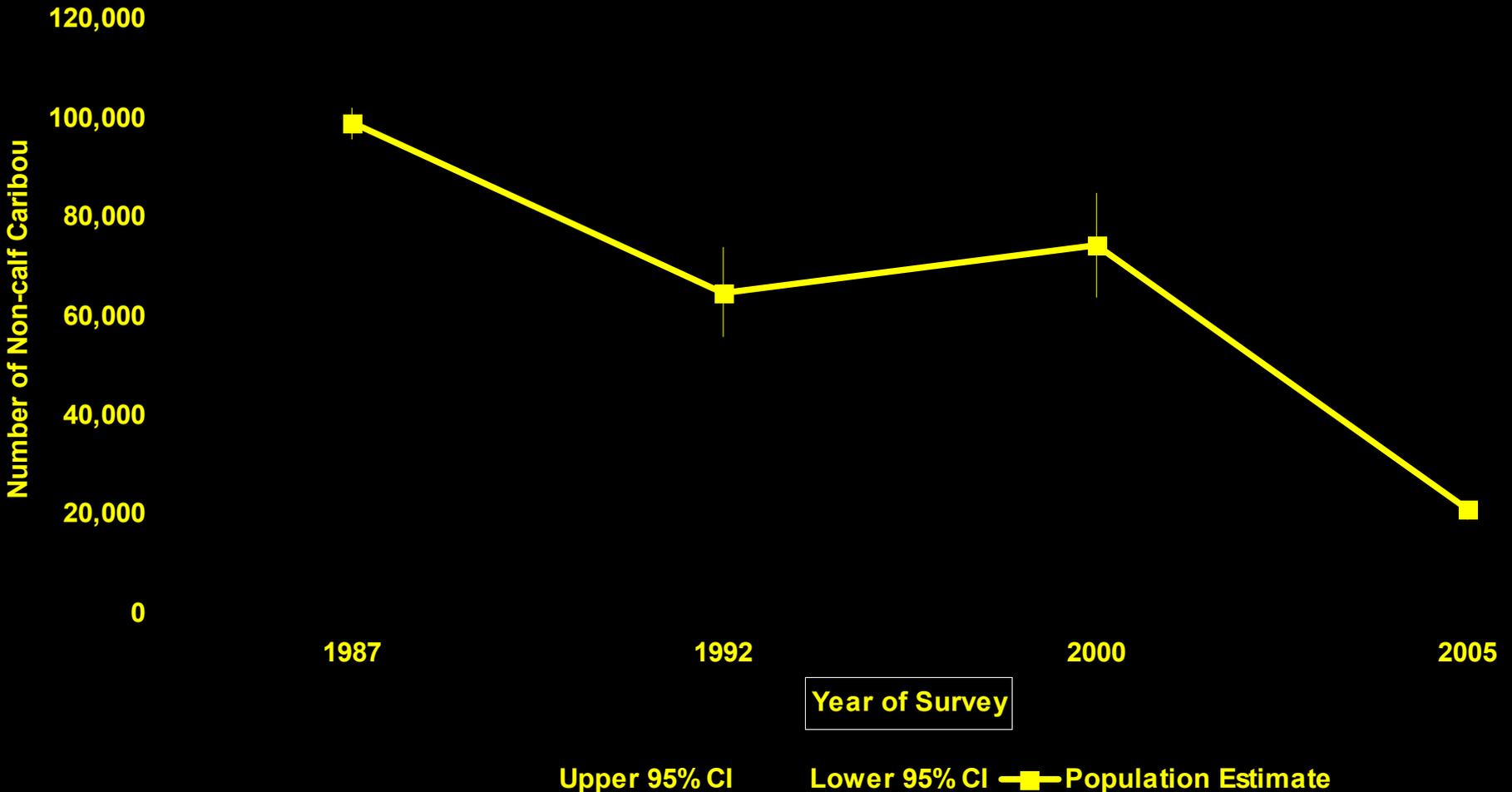


Accurate and Precise

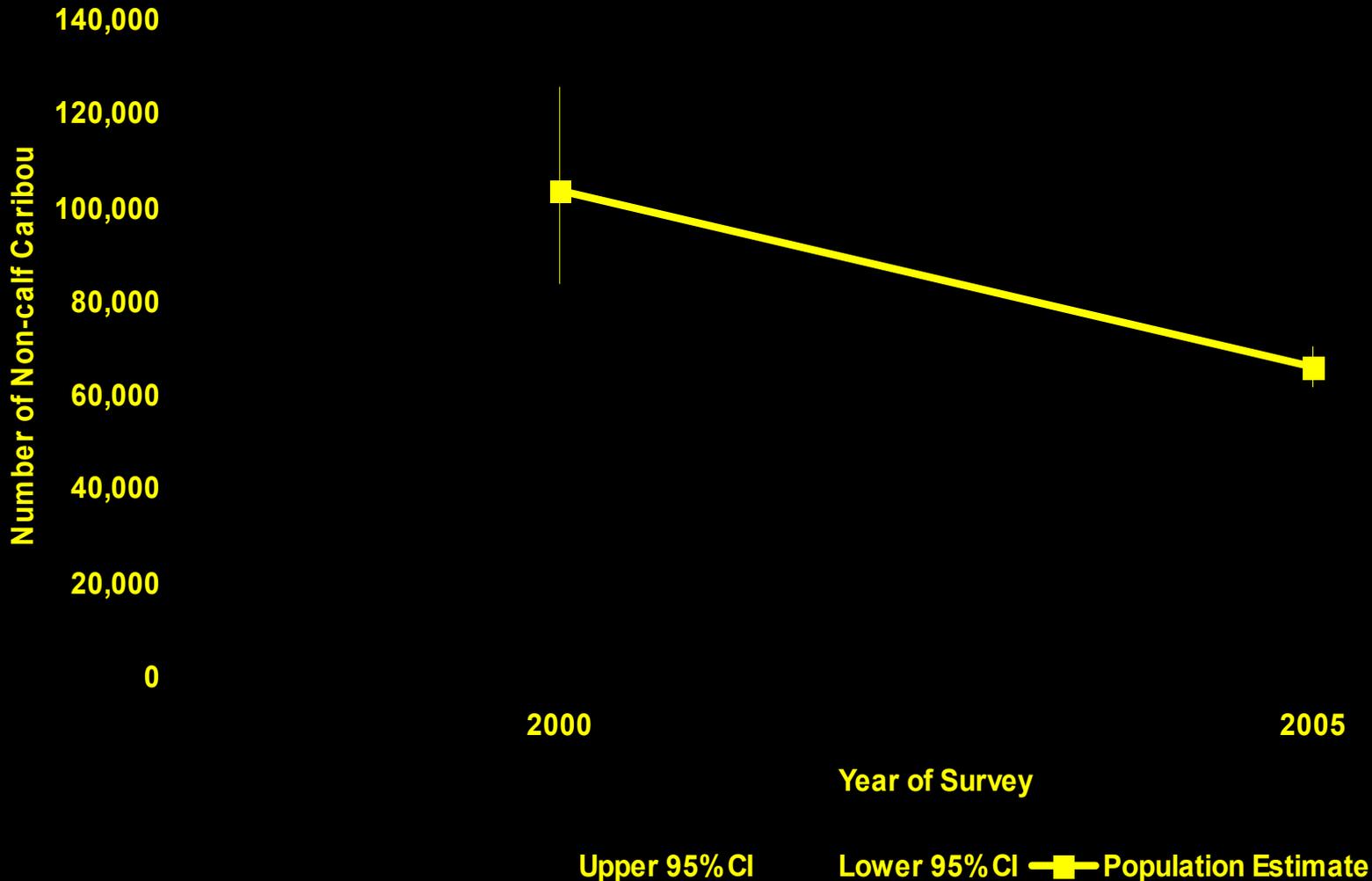
Population trend for the Cape Bathurst barren-ground caribou herd: 1987-2005



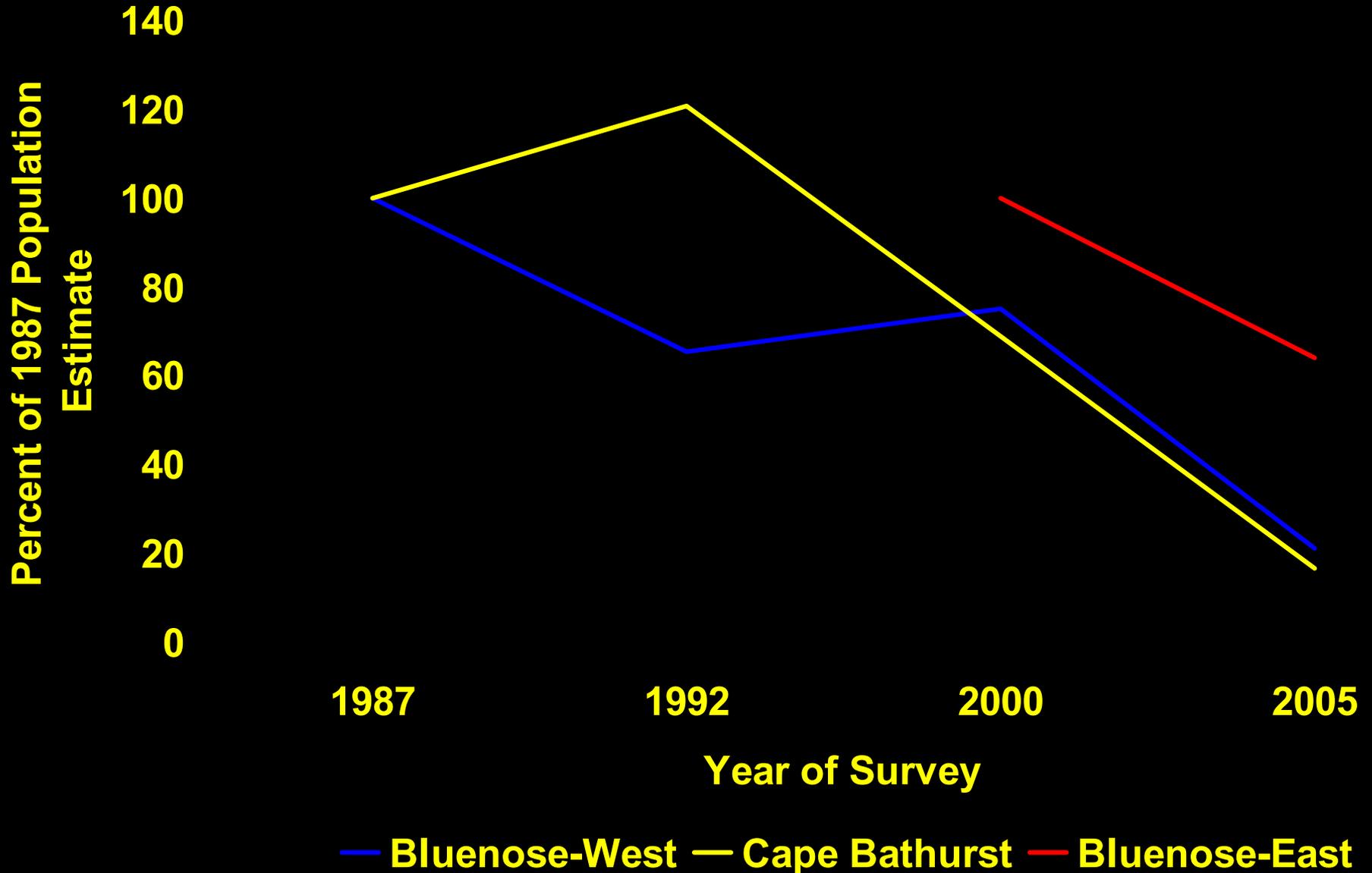
Population trend for the Bluenose-West barren-ground caribou herd: 1987-2005



Population trend for the Bluenose-East barren-ground caribou herd: 2000-2005

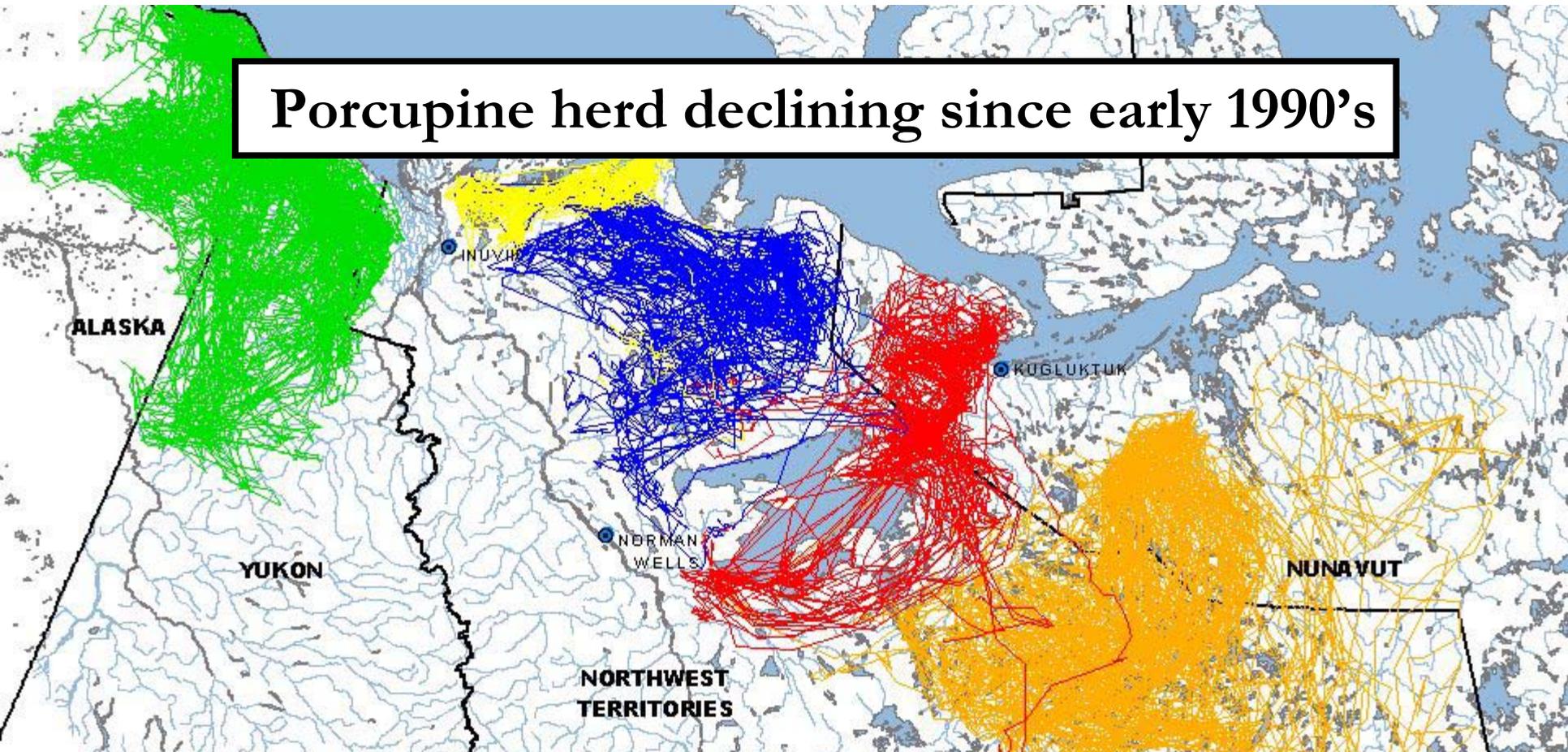


Population Trends: 1987-2005



What is happening with neighbouring herds?

Porcupine herd declining since early 1990's

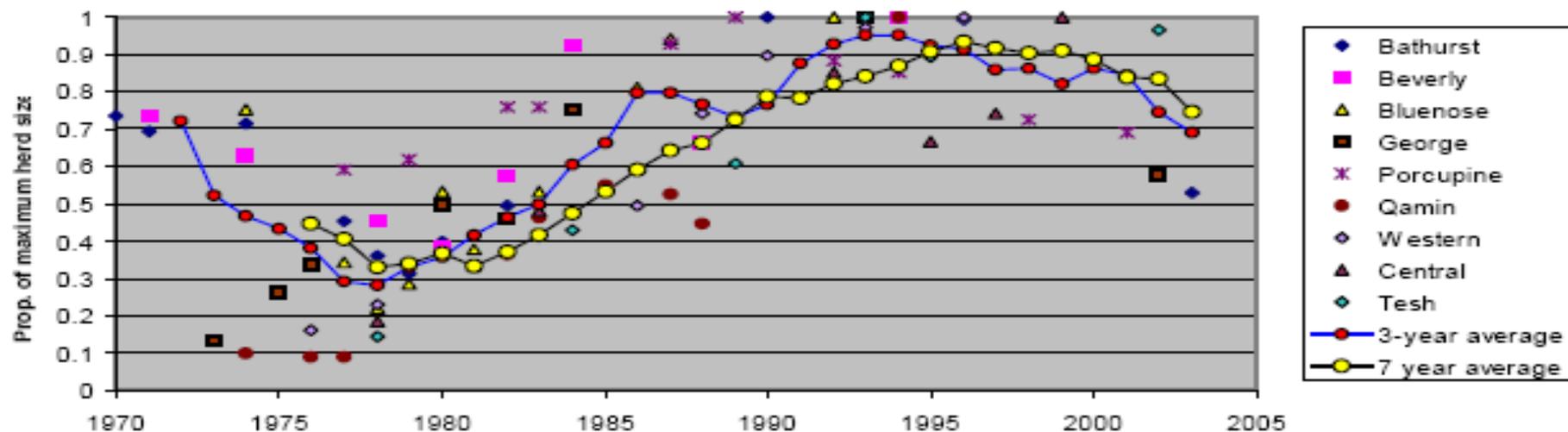


Bathurst herd - 472,000 (1986) to 186,000 (2003)

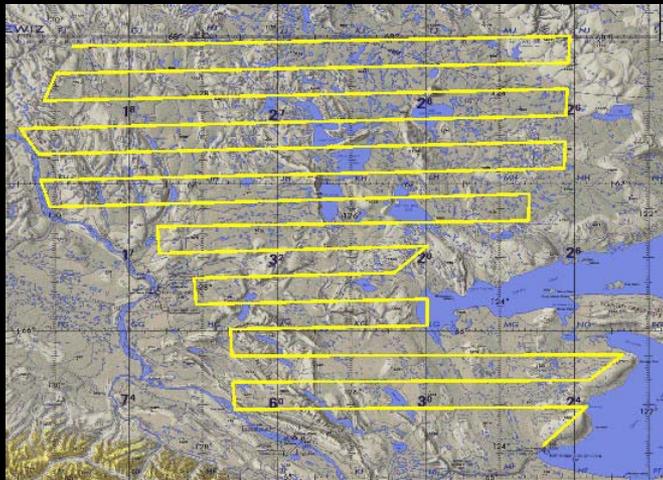
- Porcupine
- Bluenose-East
- Bluenose-West
- Cape Bathurst
- Bathurst

200 0 200
Kilometers

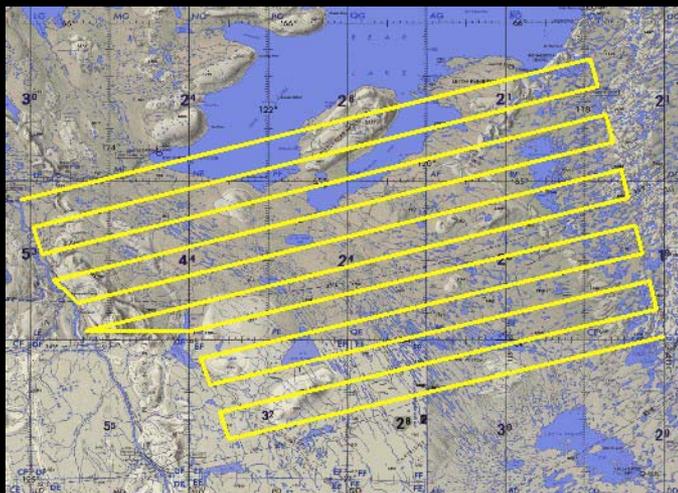
Figure 2.1. Relative sizes of North American migratory caribou, 1970 – 2003.



Caribou Winter Distribution Surveys – 2004 & 2005



2004



Both herds surveyed – transects at
20 km intervals

Other NWT herds surveyed at
same time

24-29 Feb 2004

Fort Good Hope

Colville Lake

Norman Wells

Deline

 Flight Path

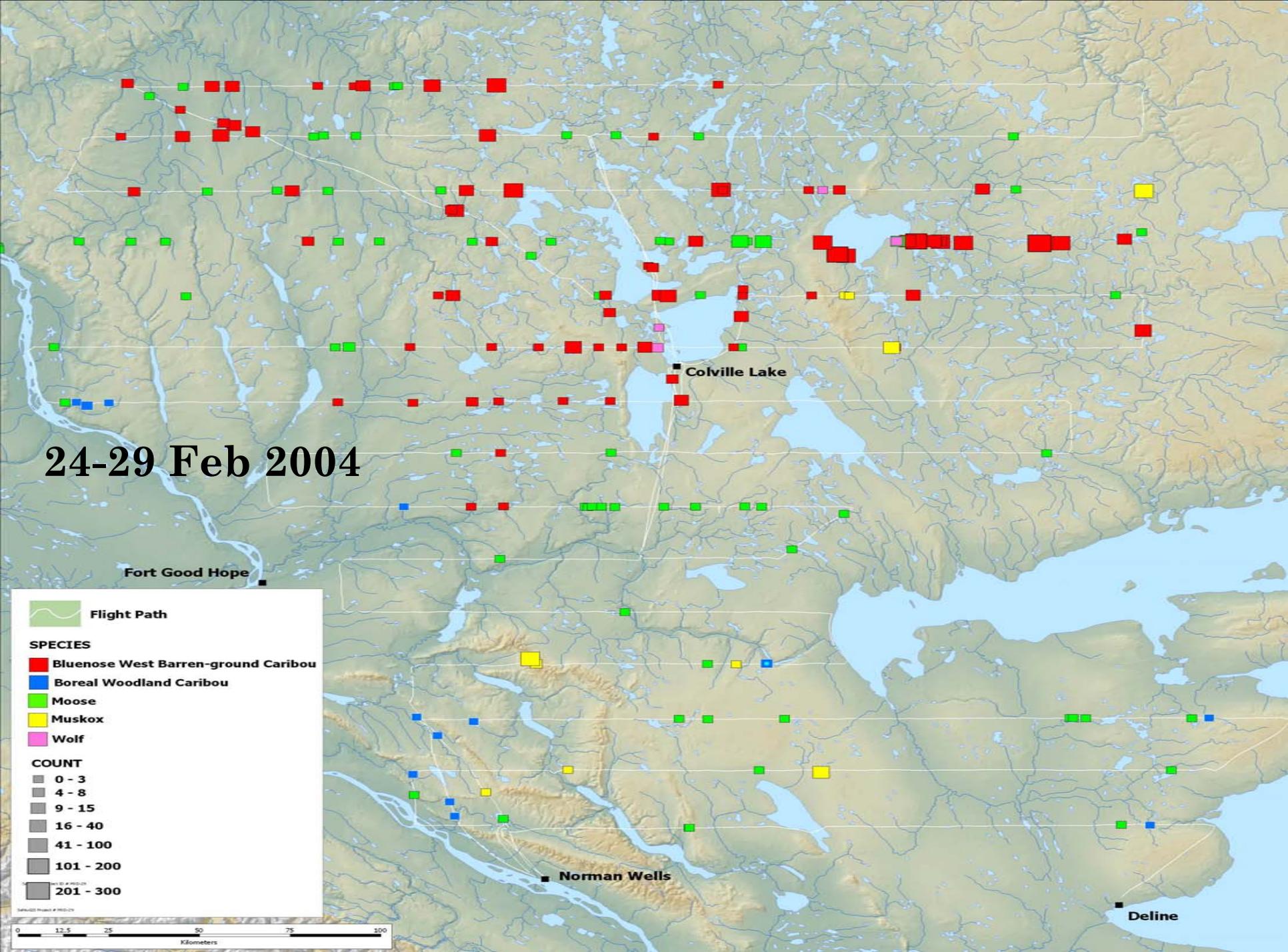
SPECIES

-  Bluenose West Barren-ground Caribou
-  Boreal Woodland Caribou
-  Moose
-  Muskox
-  Wolf

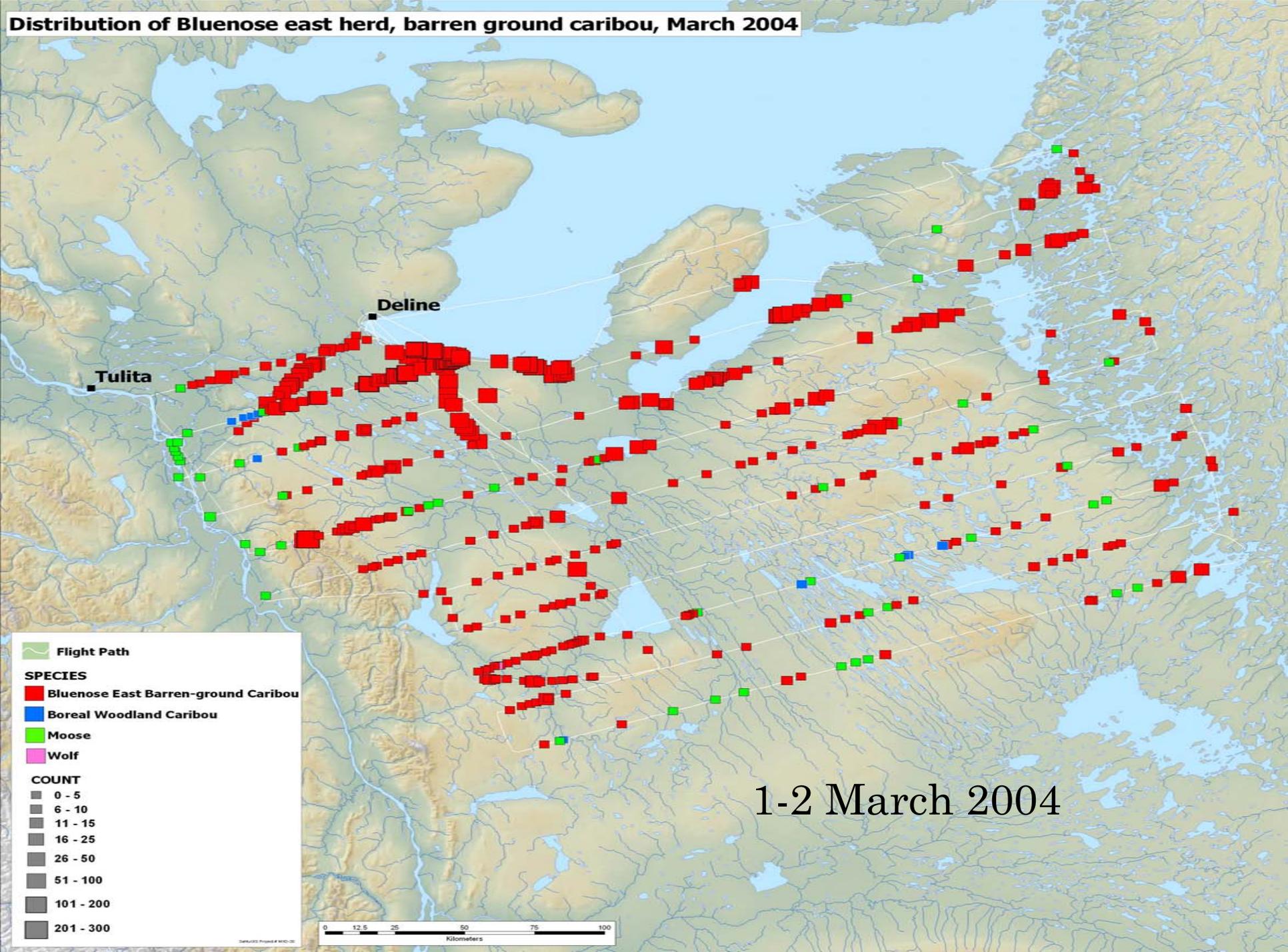
COUNT

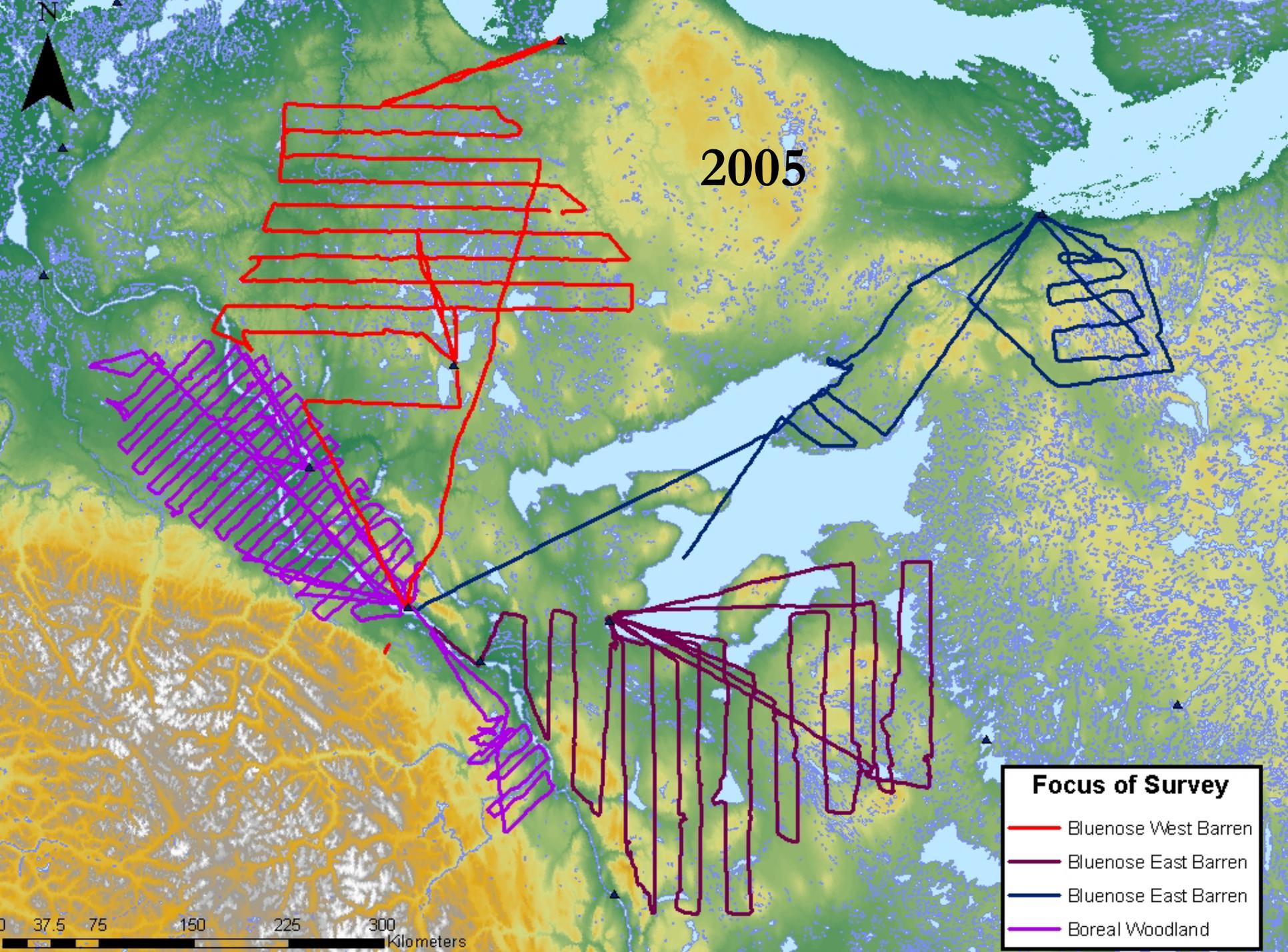
-  0 - 3
-  4 - 8
-  9 - 15
-  16 - 40
-  41 - 100
-  101 - 200
-  201 - 300

SOURCE: PROUD & POLYAK

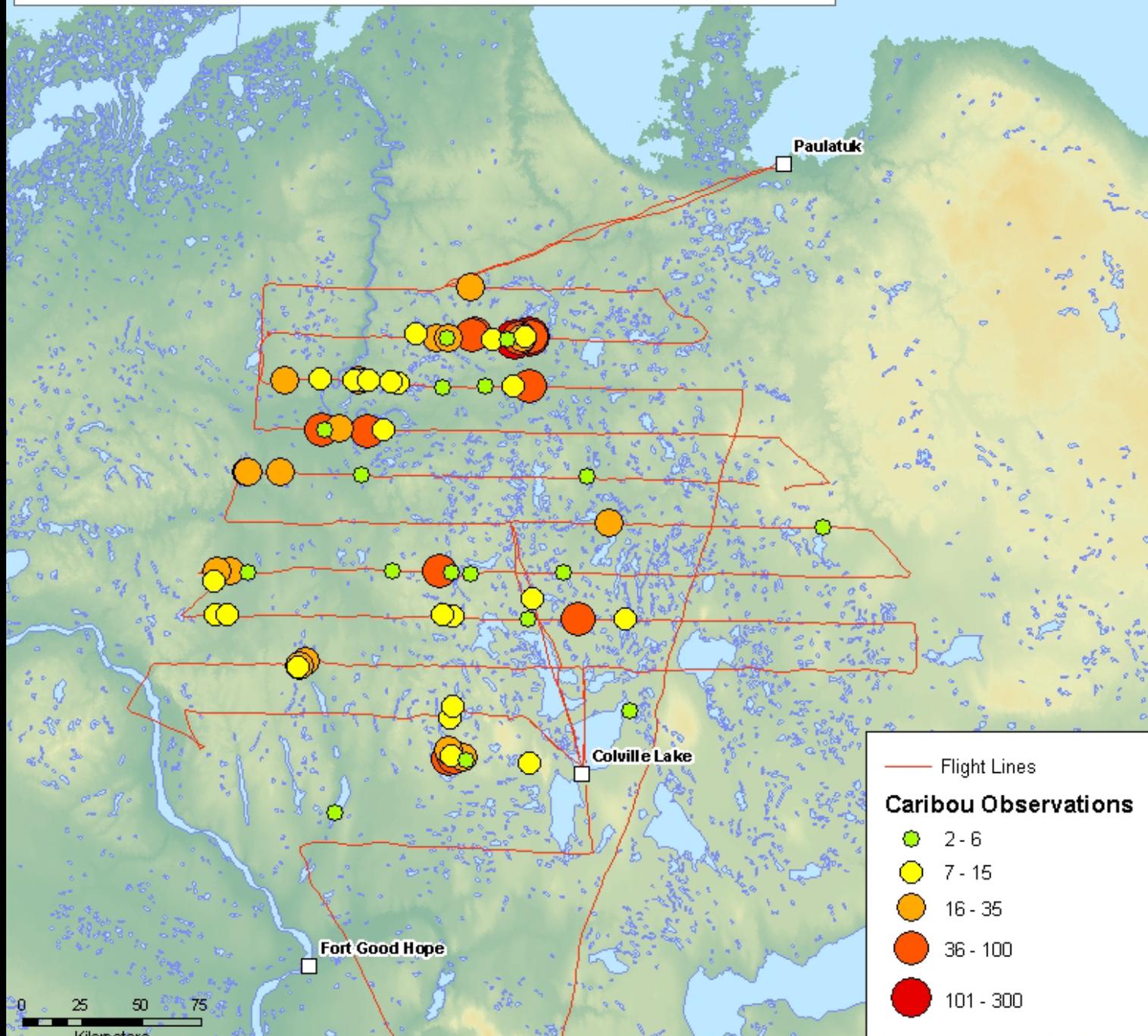


Distribution of Bluenose east herd, barren ground caribou, March 2004

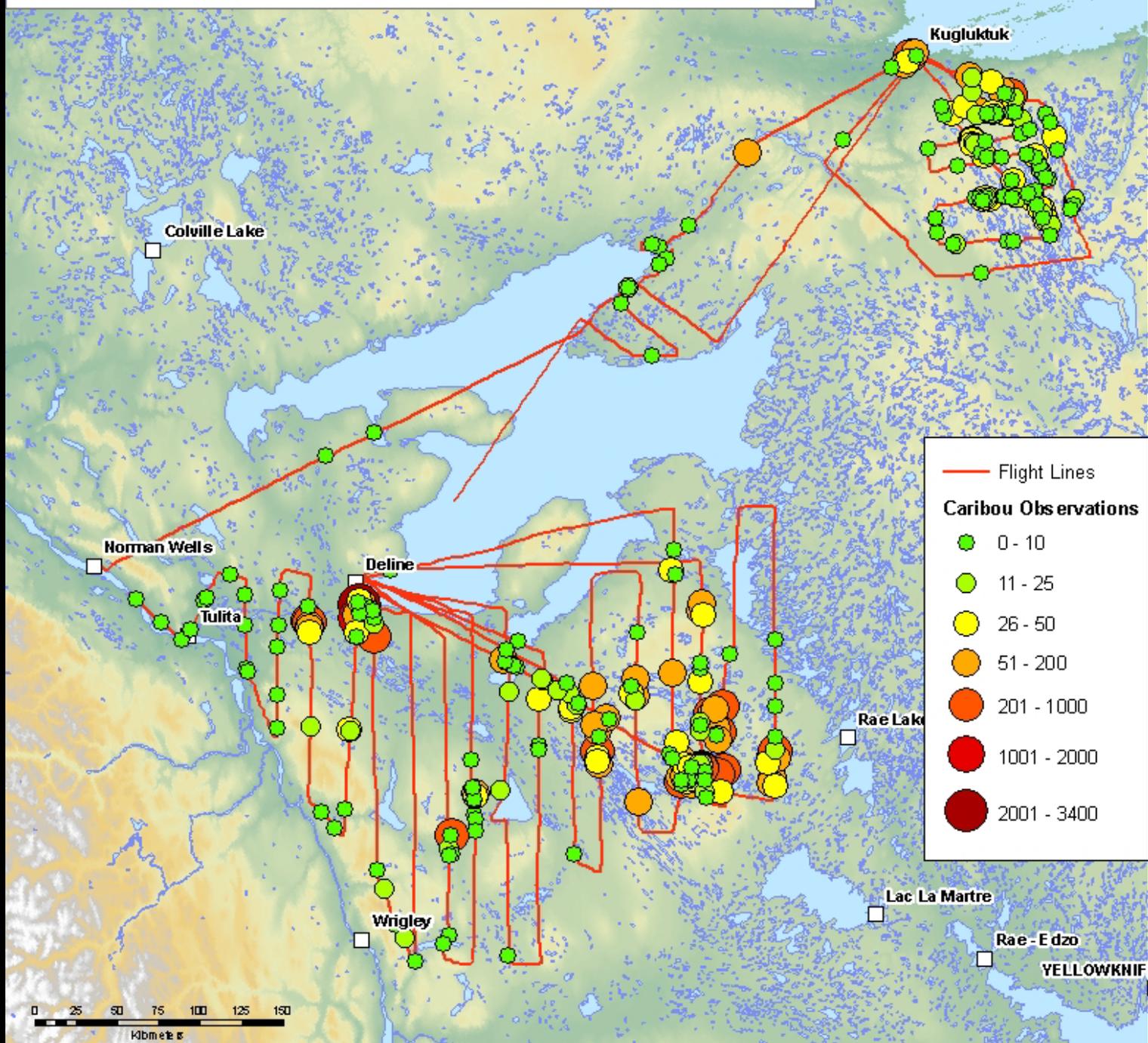




Bluenose-west Caribou Survey Observations, March 2005



Bluenose-east Caribou Survey Observations, March 2005

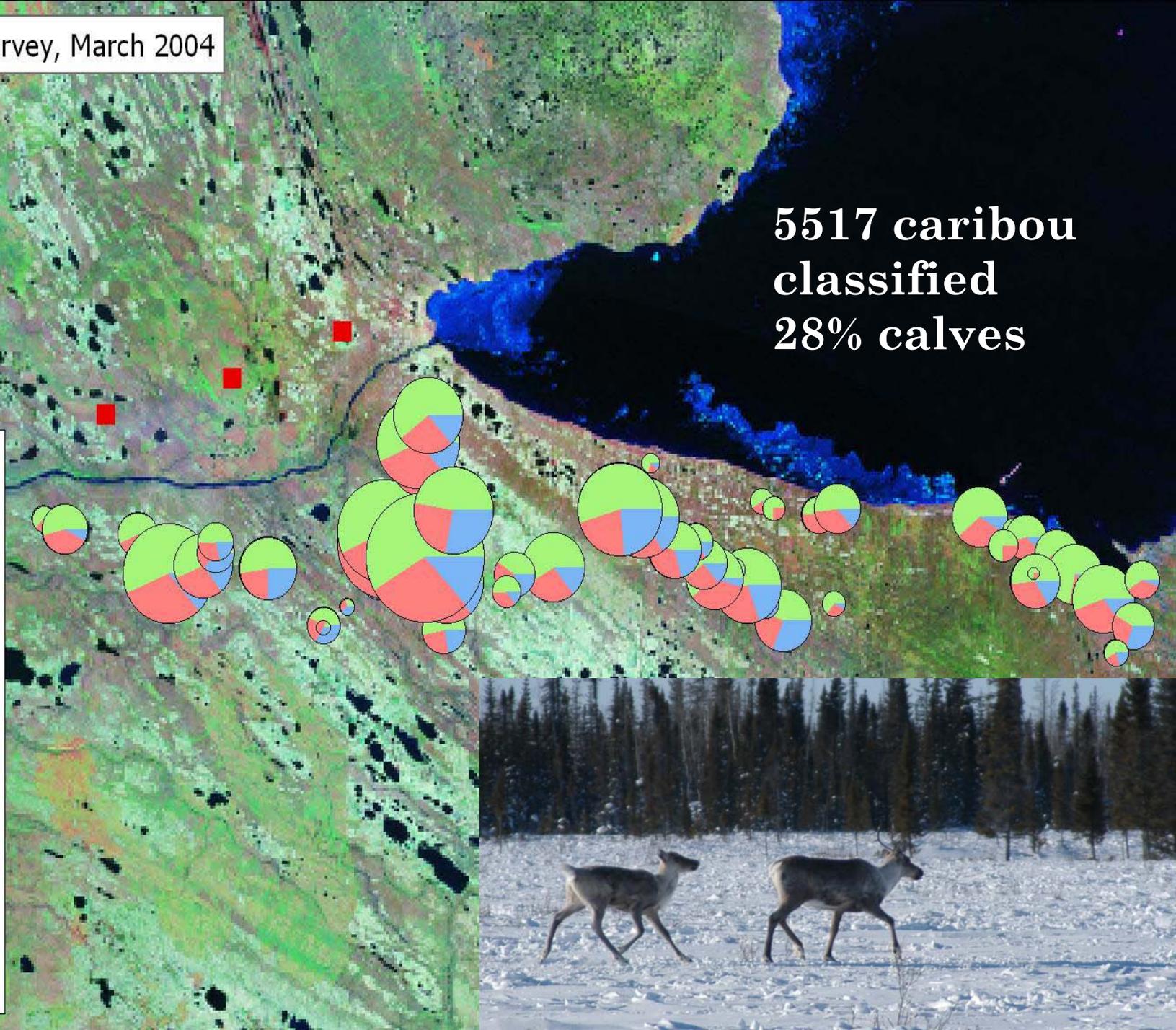
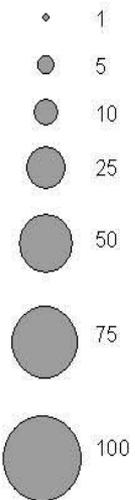


Recruitment Survey, March 2004

5517 caribou
classified
28% calves

 Cow
 Calf
 Bull
 Observation Only

TOTAL



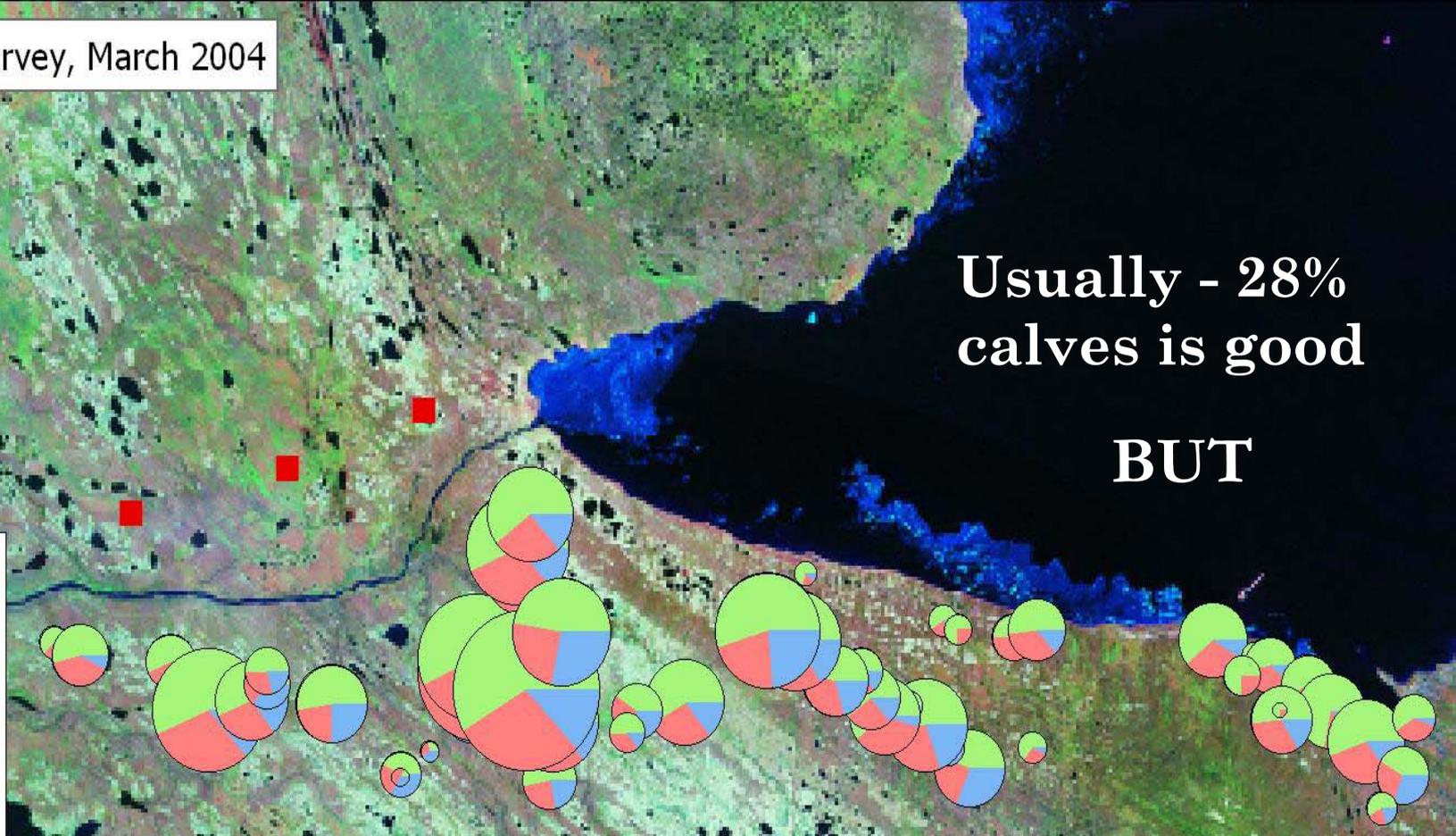
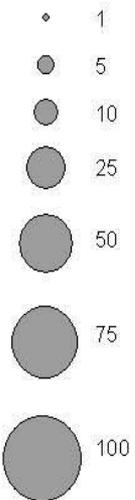
Recruitment Survey, March 2004

Usually - 28% calves is good

BUT

 Cow
 Calf
 Bull
 Observation Only

TOTAL

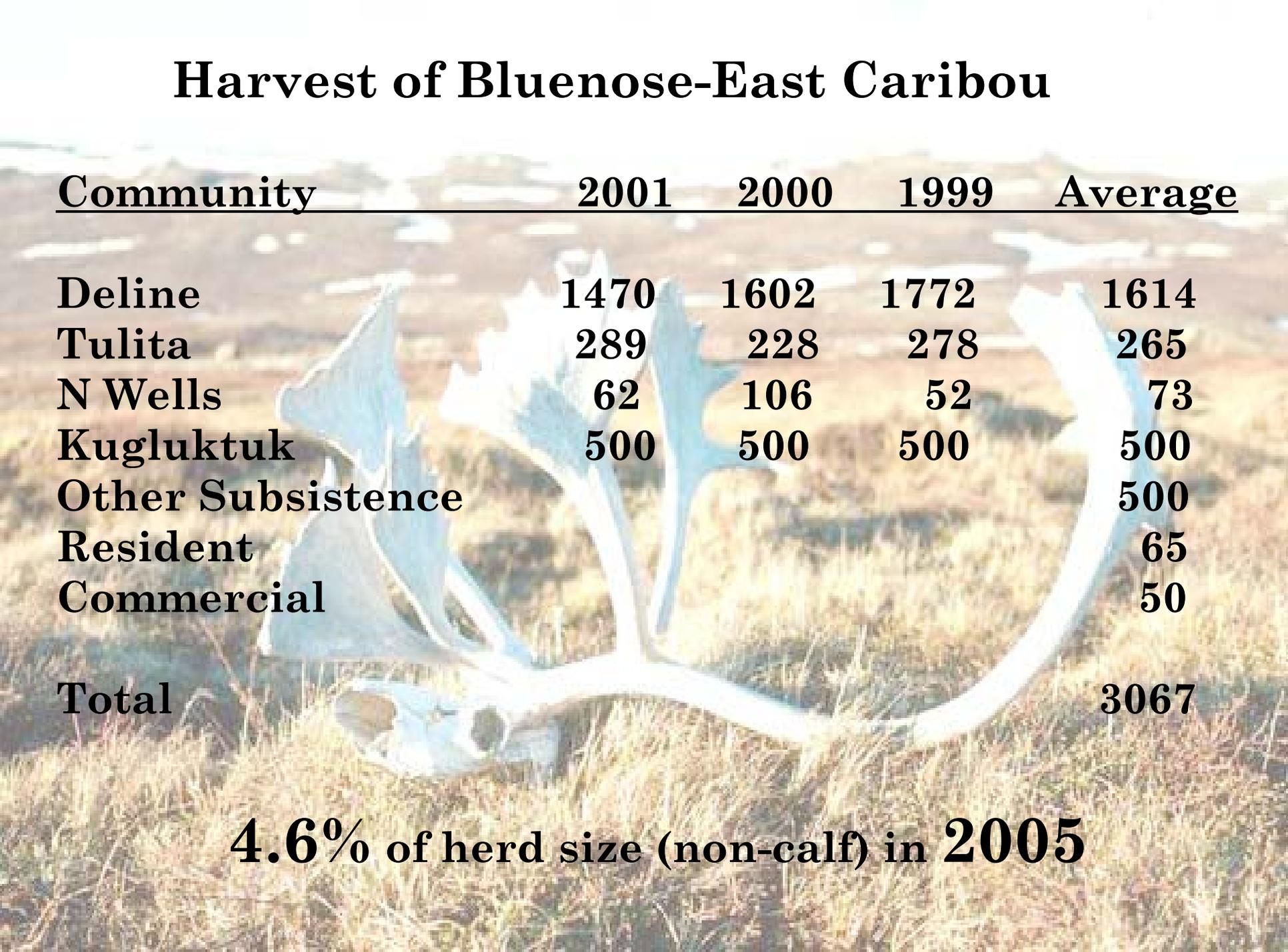


Sex Ratio of Barren-ground Caribou Harvest as Reported in Sahtu Harvest Study 1998-2003

<u>Year</u>	<u>% Female</u>
-------------	-----------------

1998	42.3
1999	47.2
2000	54.0
2001	64.8
2002	67.9
2003	71.4

Harvest of Bluenose-East Caribou



<u>Community</u>	<u>2001</u>	<u>2000</u>	<u>1999</u>	<u>Average</u>
Deline	1470	1602	1772	1614
Tulita	289	228	278	265
N Wells	62	106	52	73
Kugluktuk	500	500	500	500
Other Subsistence				500
Resident				65
Commercial				50
Total				3067

4.6% of herd size (non-calf) in **2005**

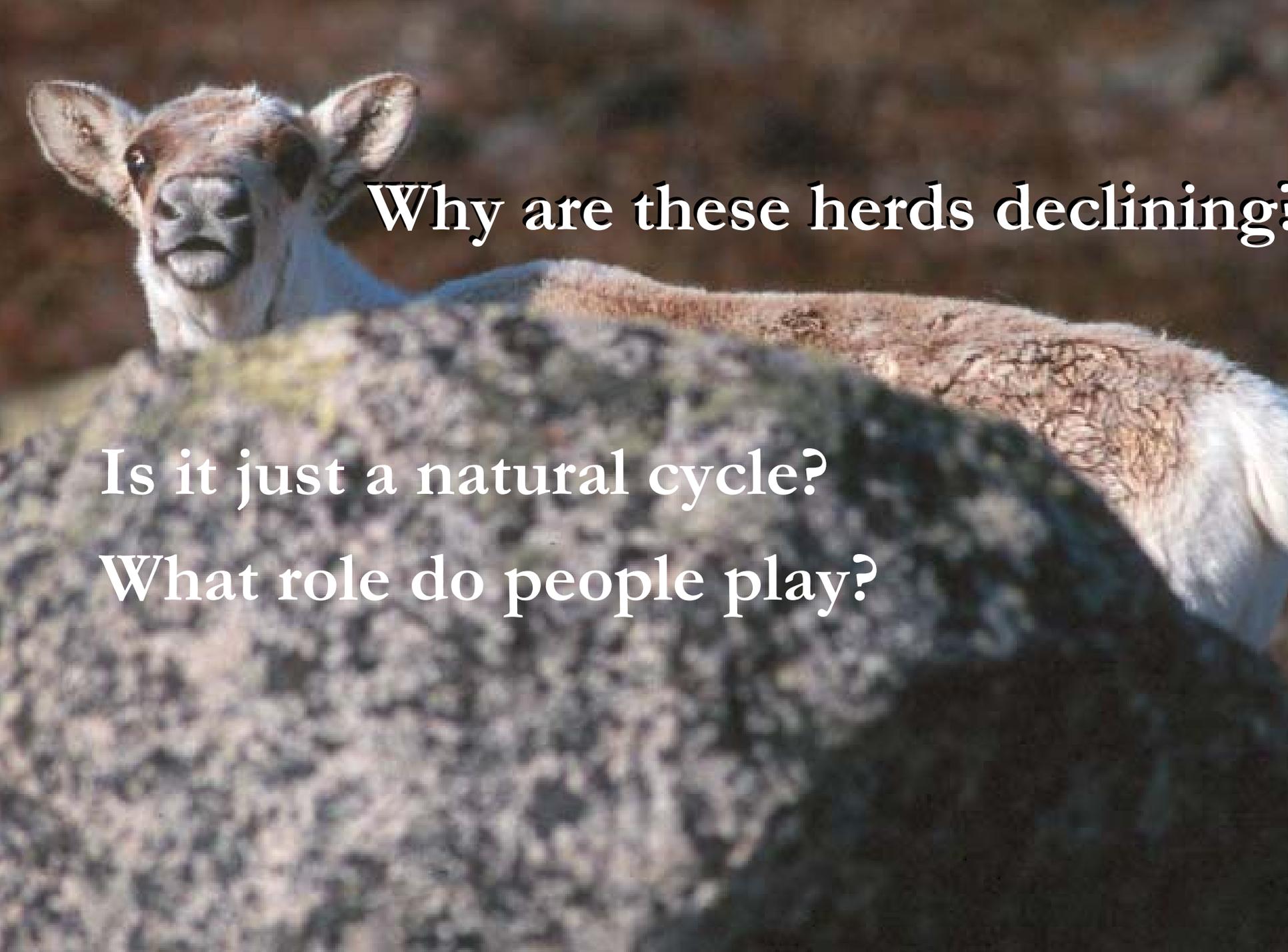


Harvest of Bluenose-West Caribou (includes Paulatuk, Inuvik, and Tuktoyaktuk)

1998/99 to 2001/02

<u>Type</u>	<u>Harvest</u>	<u>% of Total</u>
Subsistence	1735	90.7
Resident	58	3.0
Commercial	52	2.7
Non-resident	69	3.6
Total	1914	

9.2% of estimated herd size (non-calf) in **2005**



Why are these herds declining?

Is it just a natural cycle?

What role do people play?

Factors that can affect population growth in caribou herds

- calving rates, calf survival, & recruitment
- body condition (incl. parasites & diseases)
- predation
- habitat quality/loss
- harvest
- disturbance
- climate & climate change

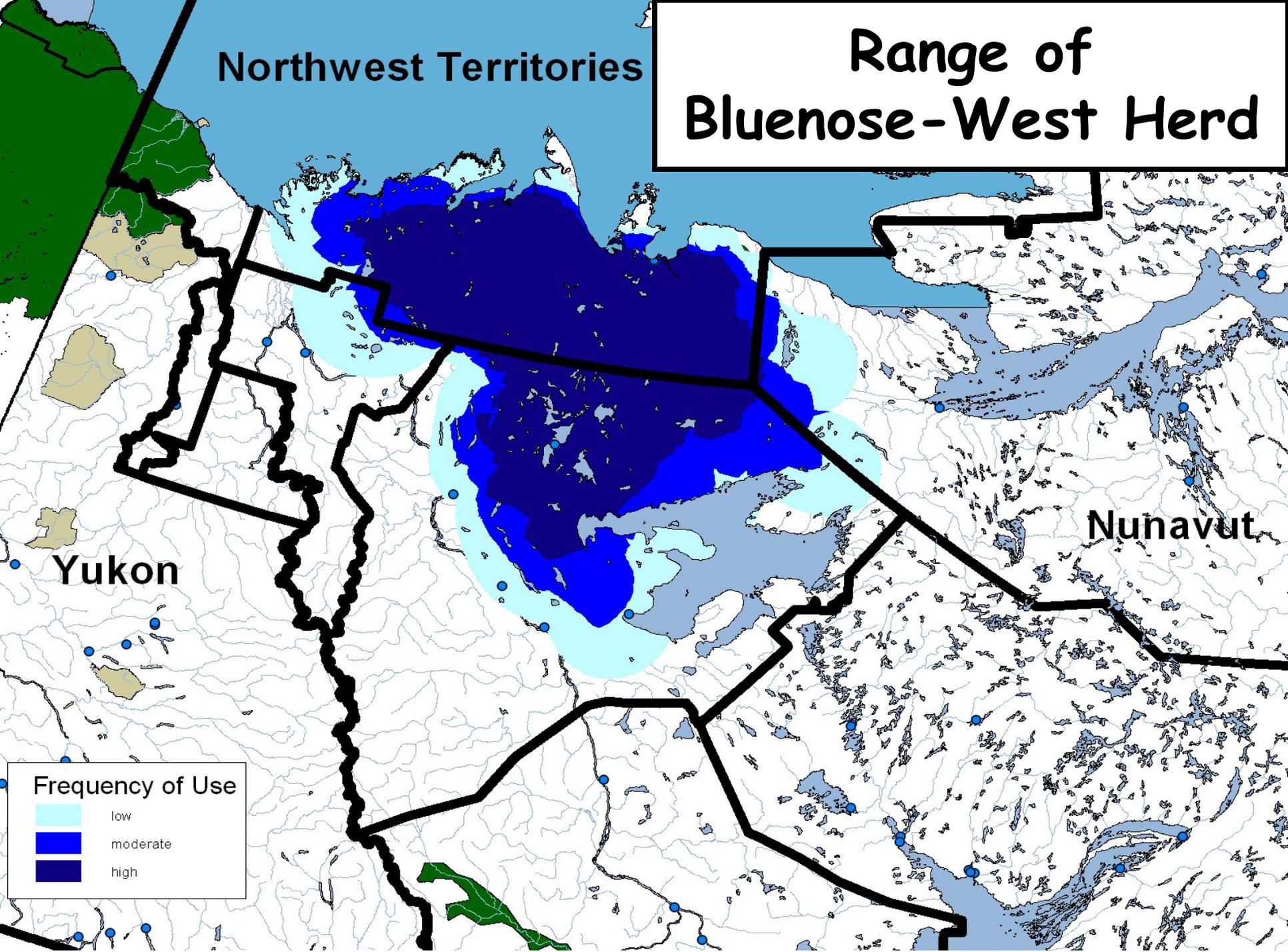
Range of Bluenose-West Herd

Northwest Territories

Nunavut

Yukon

Frequency of Use

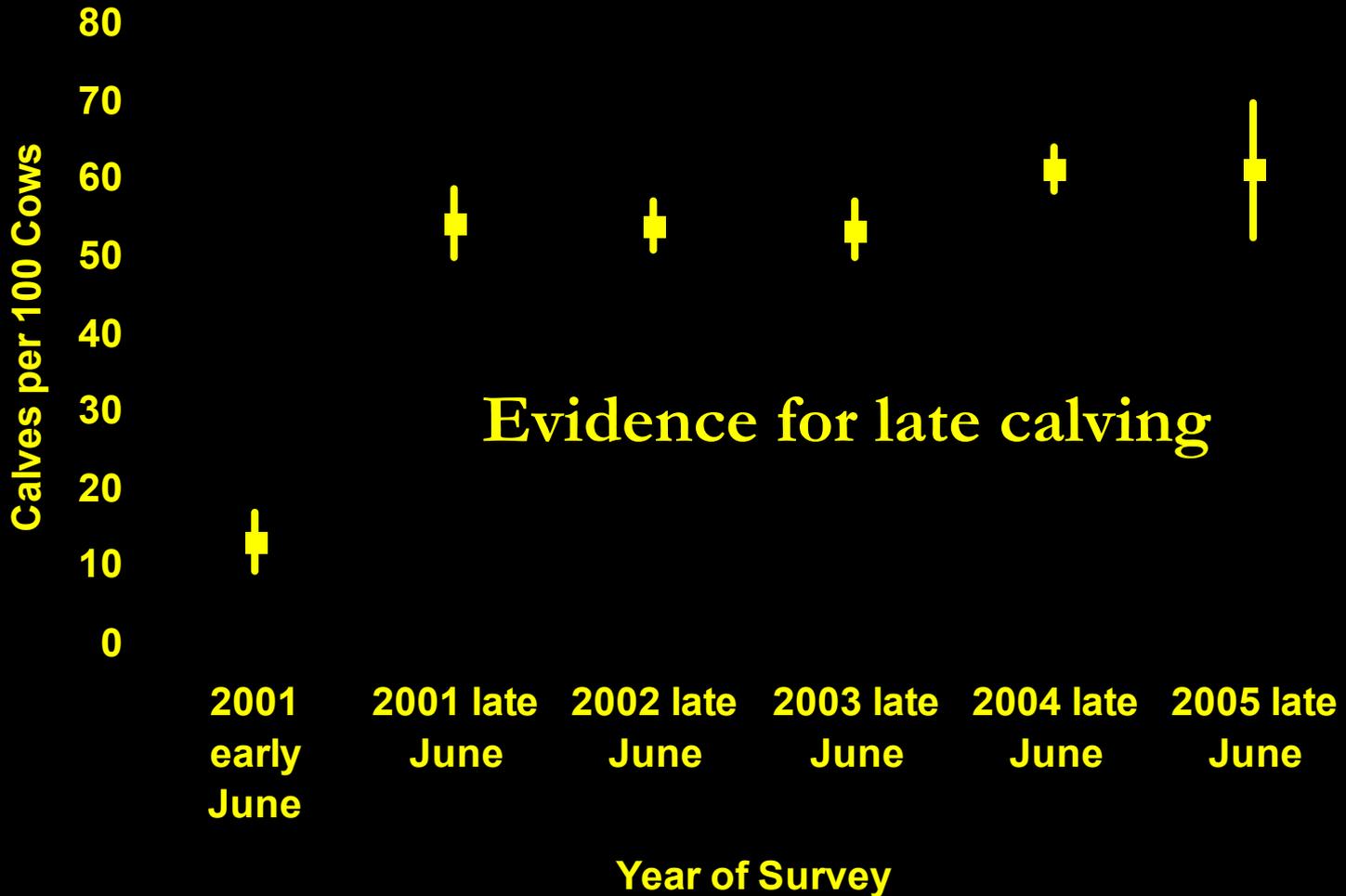




Calving Rates, Calf Survival, Recruitment

- surveys to estimate post-calving calf:cow ratios since 2001
- calf: cow ratios relatively low 2001 to 2003, but increased in 2004 and 2005
- proportion of calves born late June increased 2002-2004; in 2004 most born late June
- estimated recruitment rate 25 calves per 100 cows in late April 2005 suggests declining population

Bluenose-West Herd: Calf:Cow Ratios



Upper 95% CI Lower 95% CI ■ Mean Estimate

Evidence of late calving

(photo taken 17 July 05 Bluenose-East herd)





Predation

- predators include wolves, grizzly bears, wolverines, and eagles



- level and impact of predation are unknown



Habitat Quality/ Loss

- no information to suggest that range conditions or habitat loss is currently a problem



Harvest



- need accurate and current information on total numbers and sex ratio of harvest, particularly outside Sahtu

- need estimate of wounding/crippling loss to add to harvest estimates

-5 of 70 caribou (7%) collared March 2005 died of natural causes on winter range or during spring migration

-only 1 collared caribou (1%) was harvested

Disturbance



- the Bluenose-West herd winters from north of Inuvik to FGH-Colville Lake areas in Sahtu

- disturbance on winter range by snowmobiles, aircraft, and vehicles

Disturbance

- increased oil and gas exploration activity on the winter range near Colville Lake
- impact of these activities on caribou is unknown

Climate Change

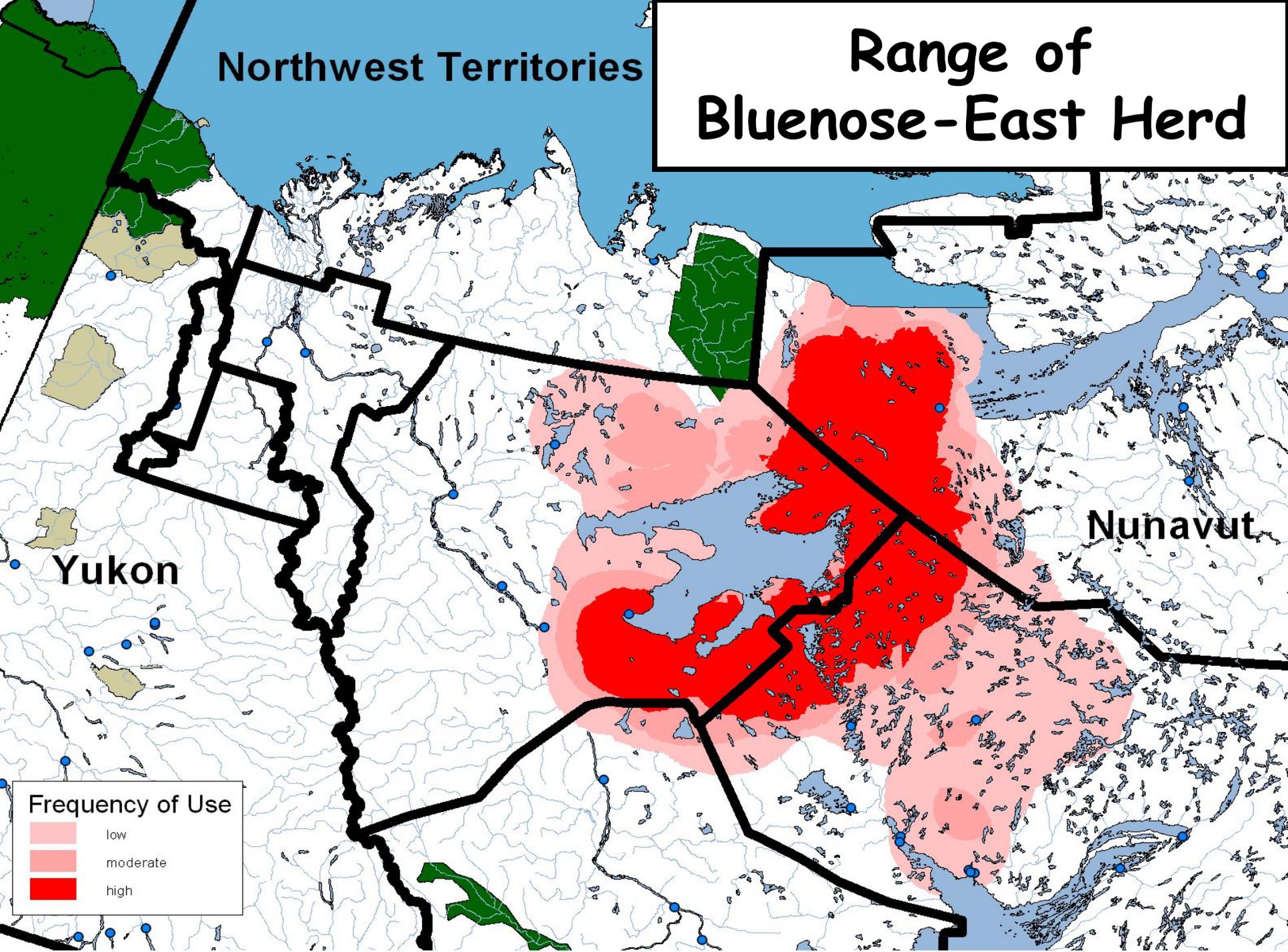
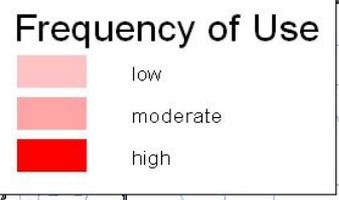
- increasingly variable weather conditions during winter
- Over last 5 years summers were cooler, wetter, and more overcast days:
 - less insect harassment
 - poorer food quality?

Range of Bluenose-East Herd

Northwest Territories

Nunavut

Yukon





Calving Rates, Calf Survival, Recruitment

- lacking surveys to estimate post-calving calf:cow ratios
- evidence of late calving in 2005, with some calves not born until July
- estimated recruitment rate from March 2004 (28%) suggested *increasing* population, but high mortality of adult females could be reason



- level and impact of predation
are unknown



- no information to suggest that
range condition or habitat loss
are currently a problem

Harvest



-need accurate and current information on total numbers and sex ratio of harvest, particularly from outside Sahtu



-need estimate of wounding/crippling loss to add to harvest estimates

-1 of 50 caribou (2%) collared March 2005 died of natural causes on winter range or during spring migration

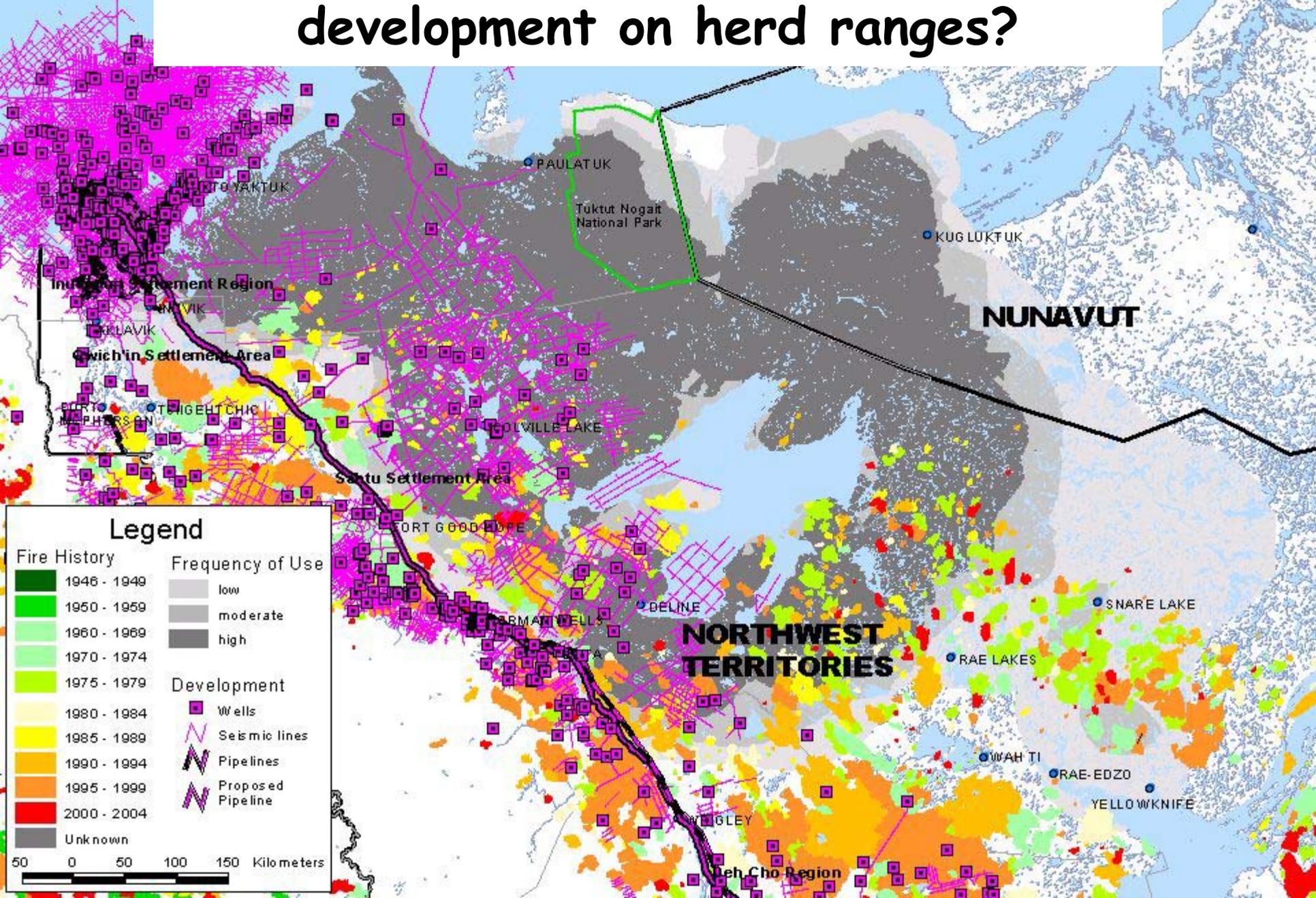


-only 1 collared caribou (2%) was harvested

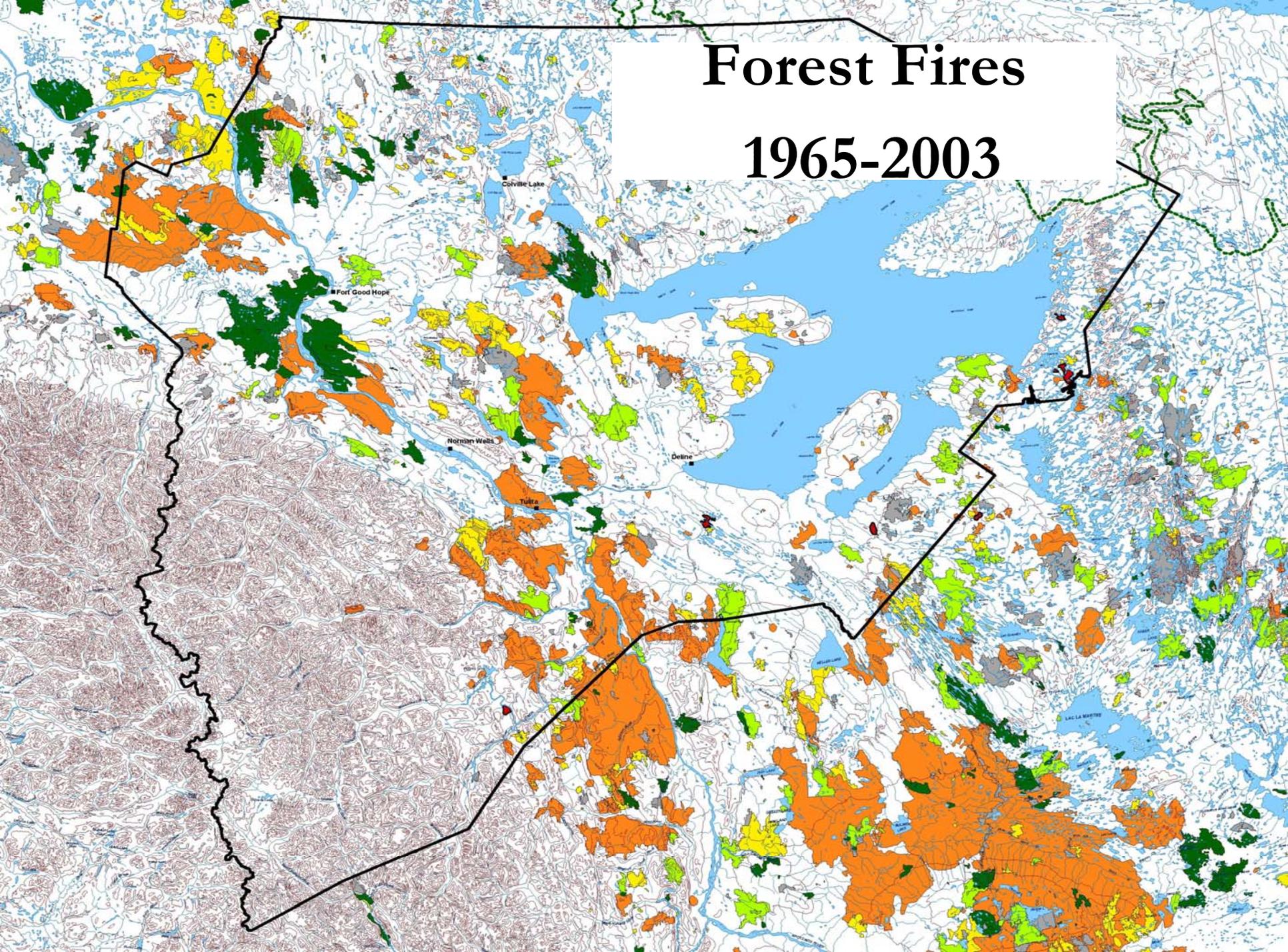
Disturbance

- So far, not as much as for Bluenose-West, but is also an issue
- PetroCan permit in winter range
- Mineral staking – Caribou Point and other areas
- **NO** protection of calving grounds – Tuklut Nogait National Park only protects Bluenose-West caribou herd

Future impact of forest fire and development on herd ranges?



Forest Fires 1965-2003



Forest Fire History – Sahtu Settlement Area

Annual Mean Area Burned (ha)

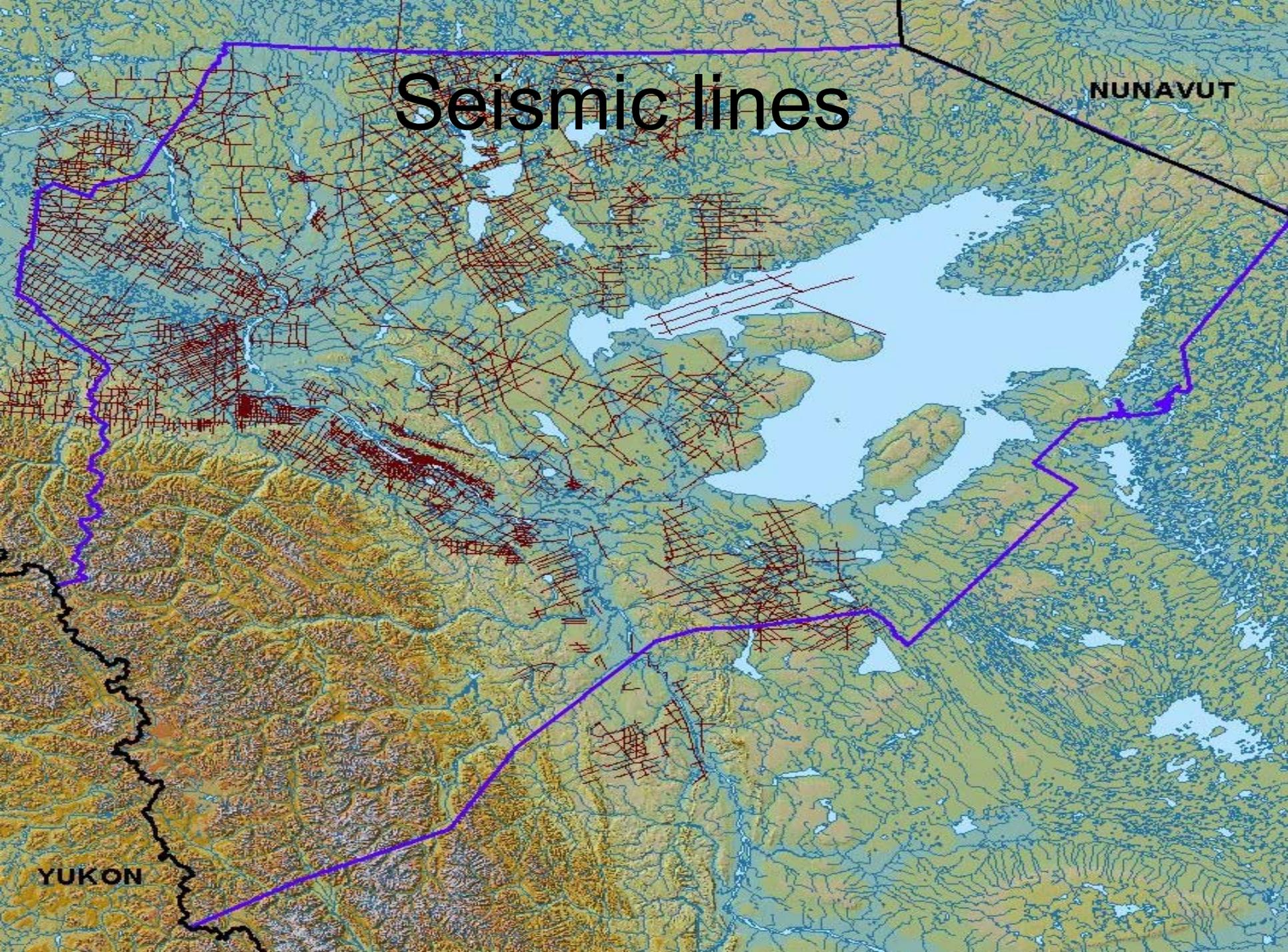
1980-84	29,900
1985-89	97,820
1990-94	152,420
1995-99	209,170
2000-05	24,120



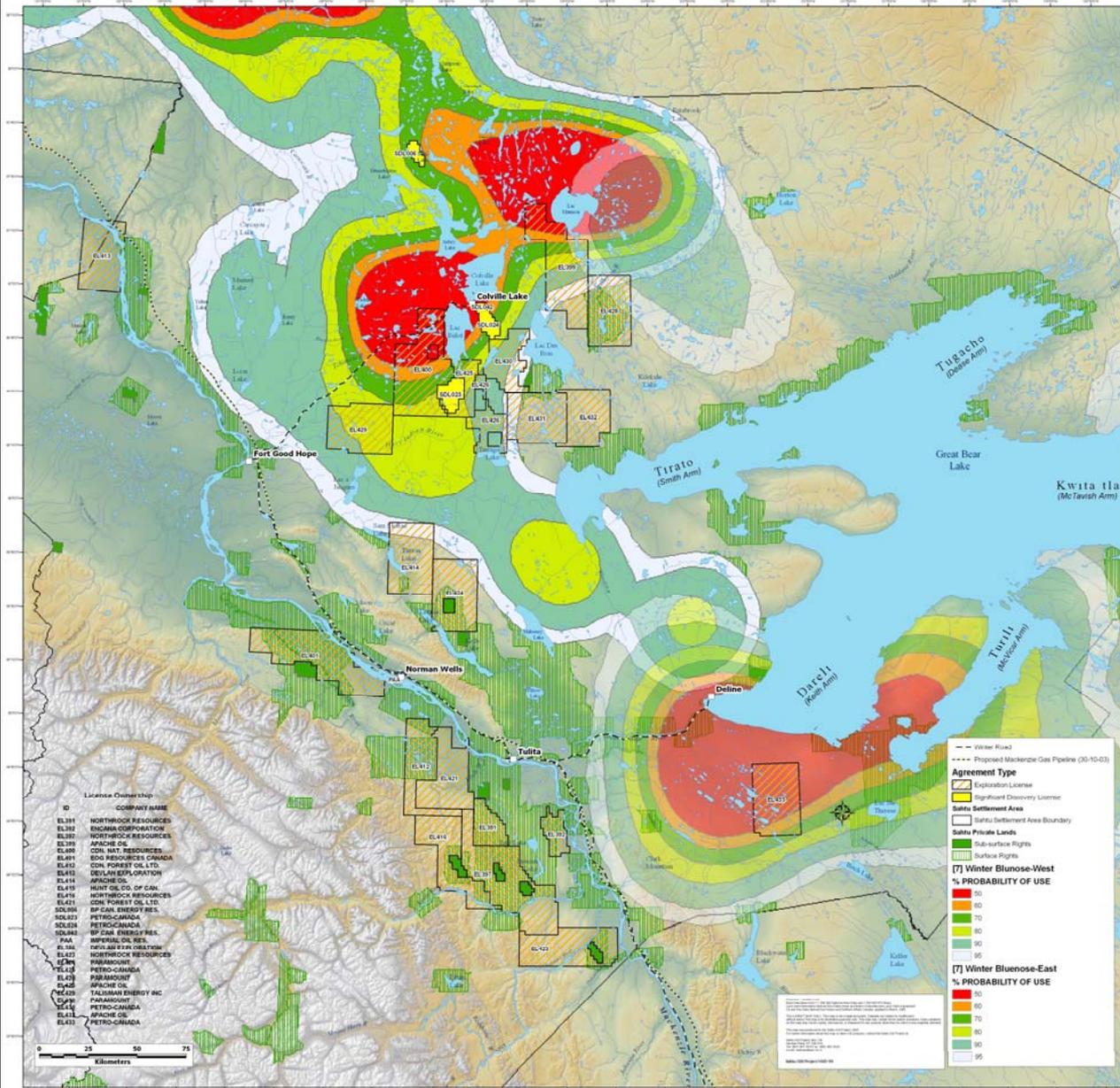
Seismic lines

NUNAVUT

YUKON



Seasonal Range Use Estimates for the Bluenose East and Bluenose West Caribou Herds Winter (1 Dec-31 March) and Sahtu Oil & Gas Licenses 2005



Map #2

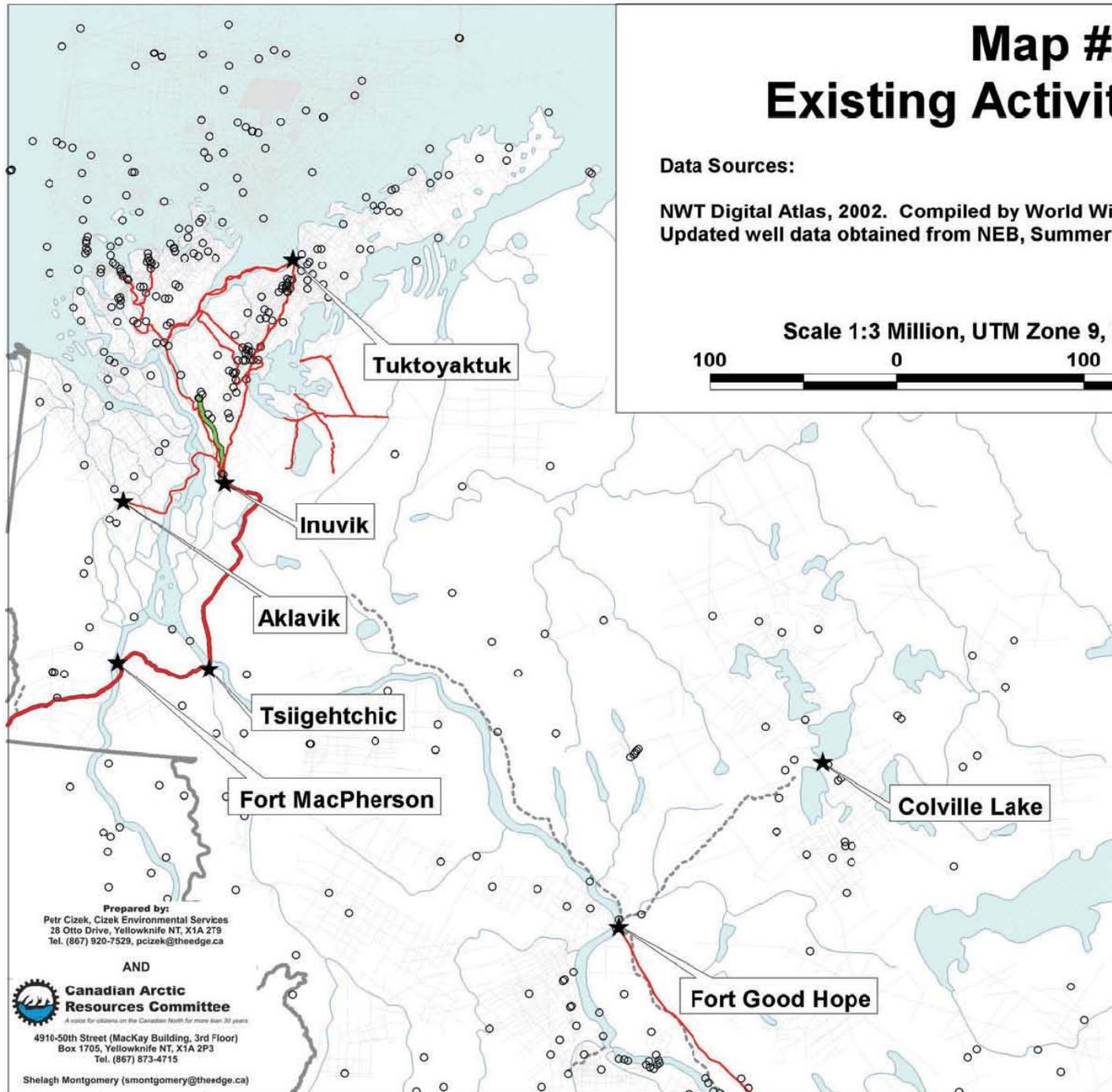
Existing Activities - 2004

Data Sources:

NWT Digital Atlas, 2002. Compiled by World Wildlife Fund. 3 CD-ROMs
 Updated well data obtained from NEB, Summer 2004



Scale 1:3 Million, UTM Zone 9, NAD 83



Legend

- ★ Communities
- Wells summer 2004
- Unpaved Surface
- Winter Access Only
- Trail
- Ikhil pipeline
- Historical seismic
- Political borders

Prepared by:

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AND



Canadian Arctic Resources Committee

A voice for citizens on the Canadian North for more than 30 years

4910-50th Street (MacKay Building, 3rd Floor)
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 Tel. (867) 973-4715

Shelagh Montgomery (smontgomery@theedge.ca)

Map # 8

Terminal Development - 2027

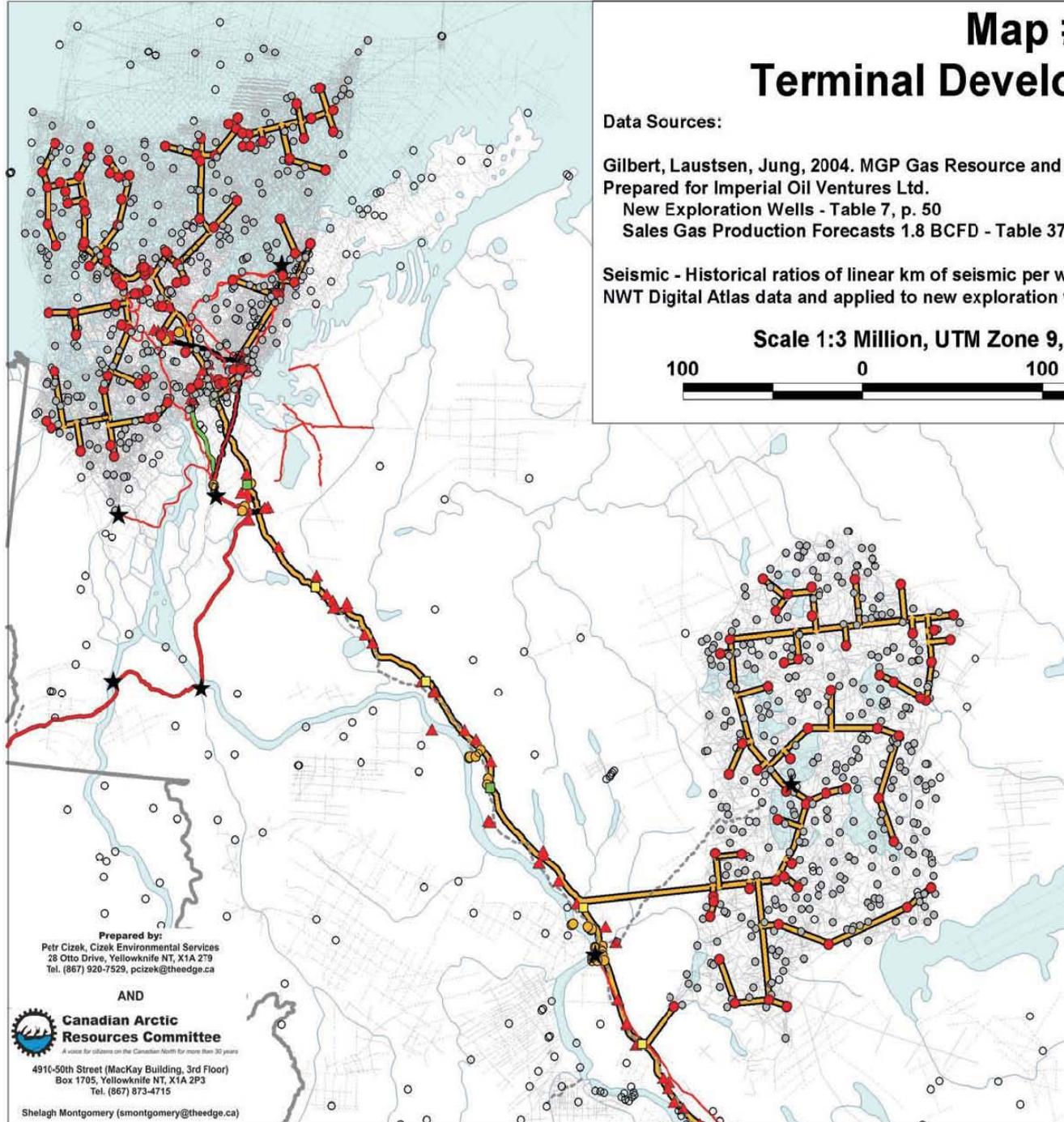
Data Sources:

Gilbert, Laustsen, Jung, 2004. MGP Gas Resource and Supply Study - a Study Prepared for Imperial Oil Ventures Ltd.
 New Exploration Wells - Table 7, p. 50
 Sales Gas Production Forecasts 1.8 BCFD - Table 37, p. 83

Seismic - Historical ratios of linear km of seismic per well computed from NWT Digital Atlas data and applied to new exploration wells

Scale 1:3 Million, UTM Zone 9, NAD 83

100 0 100 200 Kilometers



Legend

- ★ Communities
- Compressor stations
 - Initial
 - Future
- Camps, stockpile, staging
- ▲ Borrow sites
- Wells summer 2004
- Producing wells
- Exploration wells
- Existing roads
 - Unpaved Surface
 - - Winter Access Only
 - - Trail
- Proposed all weather road
- Proposed winter road
- Ikhil pipeline
- Extended pipeline 2027
- Historical seismic
- New seismic
- Political borders

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Evidence of late calving

(photo taken 17 July 05 Bluenose-East herd)



**Weather
&
Insects**



**Food
Intake**



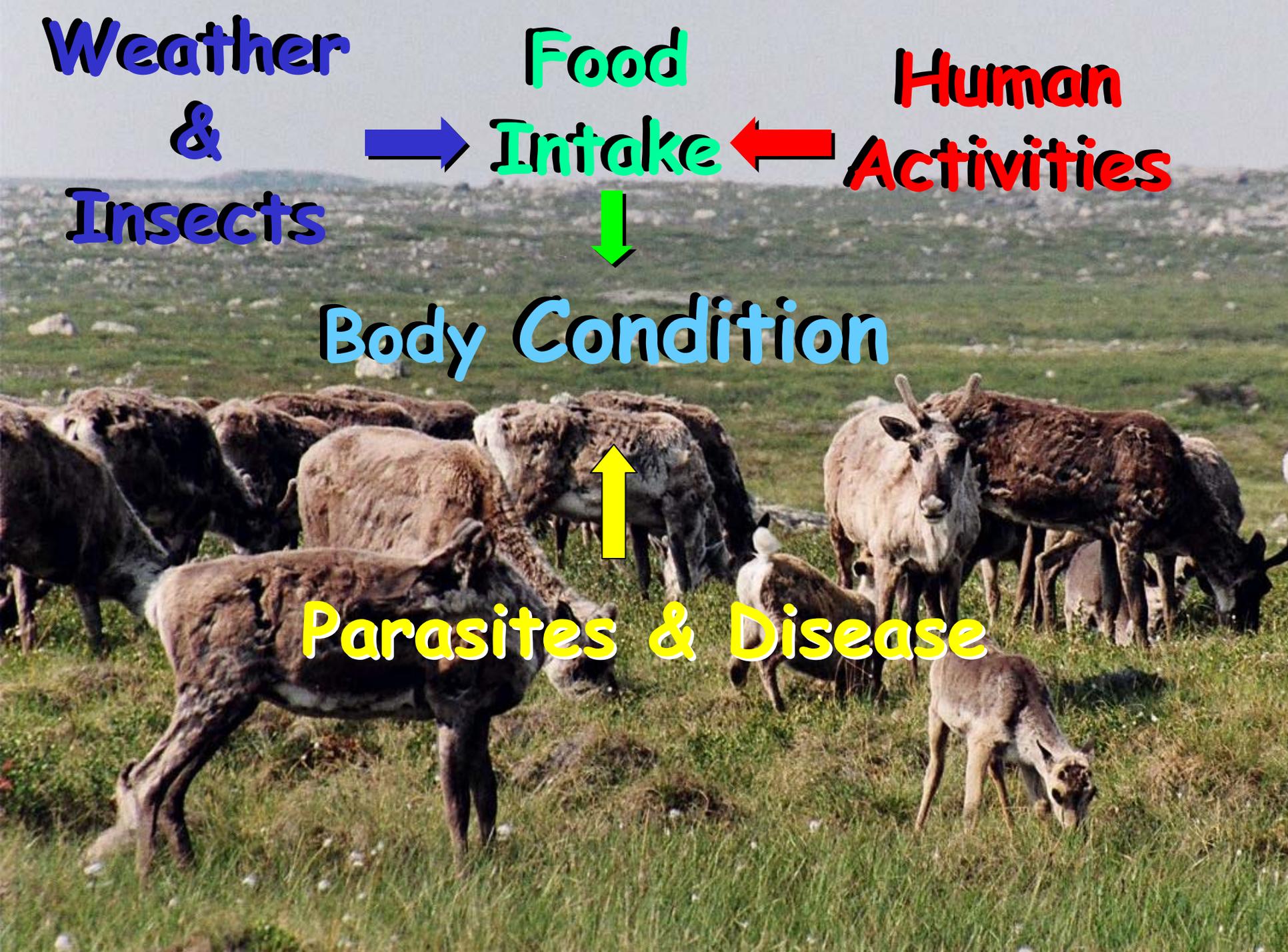
**Human
Activities**



Body Condition



Parasites & Disease





Body Condition:

- Bluenose-West cows collared in March 2005 were in the best condition of the 3 herds
- most of the collared cows had low to moderate fat cover

Body Condition:

- 92% of collared
Bluenose-West cows were
pregnant in March 2005
- calf survival is positively correlated with body
condition of cows



Body Condition:



- Bluenose-East cows collared in March 2005 were in better condition than Cape Bathurst but poorer than Bluenose-West
- many of the collared cows had relatively low fat cover

Body Condition:

- only 64% of collared
Bluenose-East cows
were pregnant in March 2005



Body Condition:



- lacking long-term data
- established a project in 2004 to address this –
the *Wildlife Health Monitor* project

Wildlife Health Monitors:
Eyes on the Land in the Sahtu



Déline 2004

- Pilot project
- Two WHMs trained: Chris Yukon and Bruce Kenny
- Collected samples and data from Bluenose-East caribou



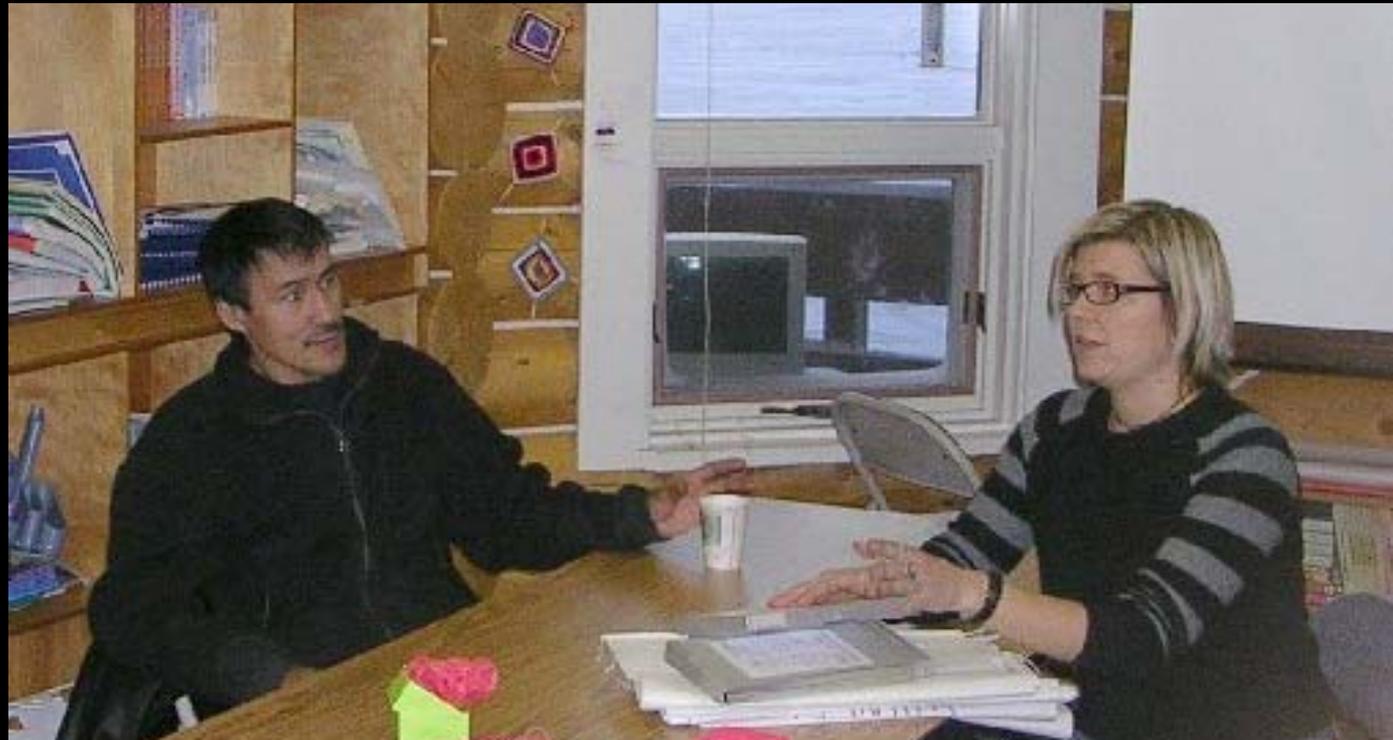
Sahtu 2005

- Continue Déline WHMs (Chris Yukon and Bruce Kenny) -Bluenose-East caribou



Sahtu 2005

- Two WHMs in Colville Lake (Joseph and Richard Kochon) - Bluenose-West caribou

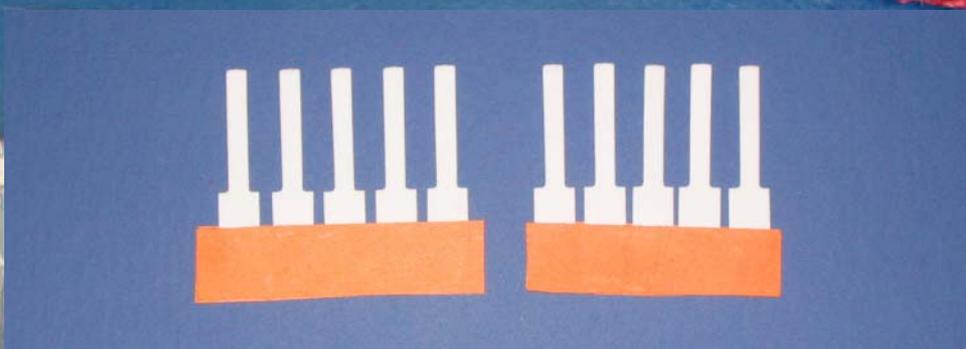


Sahtu 2005

- Two WHMs in Fort Good Hope (Wilfred and Michael Jackson) - moose



WHM completed sample set - 2005



Caribou Health Monitoring 2005

ANIMAL ID: _____

Hunter Name: _____ Date of Kill: _____

Location: Name _____

Latitude _____ Longitude _____

Sex: (✓) Cow Bull

1. Was cow producing milk? (✓) Yes No Unknown

2. Was cow with a calf? (✓) Yes No Unknown

3. Was cow pregnant? Yes No

Sex of fetus: Female Male Unknown

4. Amount of back fat: _____mm (millimetres)

Remember to turn in: (✓)

Lower jaw

Leg bone

Left kidney

Liver

Fecal sample

Blood (on paper strips)

Any abnormalities

Hunter's overall assessment of animal's condition

For this time of the year, is the condition of the animal: (✓)

Poor

Fair

Good

Very Good



Wildlife Health Monitor Summary – 2004 & 2005

	<u>BNE 2004</u>	<u>BNE 2005</u>	<u>BNW 2005</u>
Total Harvested	20 F	20 F	26 F & 4 M
Pregnant	16/20 (80%)	18/20 (90%)	12/12 (100%)
M Calf	4	5	4
F Calf	3	8	8
With Calf?	4/13 (30.8%)	2/14 (14.3%)	1/11 (9.1%)



Wildlife Health Monitor Summary – 2004 & 2005

	<u>BNE 2004</u>	<u>BNE 2005</u>	<u>BNW 2005</u>
Total Harvested	20 F	20 F	26 F & 4 M
Poor Condition	0	0	0
Fair Condition	2 (11%)	5 (25%)	7 (47%)
Good Condition	13 (72%)	9 (45%)	8 (53%)
VG Condition	3 (17%)	6 (30%)	0



Wildlife Health Monitor Summary – 2004 & 2005

	<u>BNE 2004</u>	<u>BNE 2005</u>	<u>BNW 2005</u>
Total Harvested	20 F	20 F	26 F & 4 M
Backfat (mm)	7.3 (N=20)	3.5 (N=20)	3.8 (N=12)
Kidney Fat Index	89.1 (N=15)	81.1 (N=19)	73.6 (N=26)
Bone Marrow Fat	NR	91.9 (N=17)	91.0 (N=20)



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Parasites



- In 2004 generally had few parasites
- Waiting for 2005 results



Parasites



- Trypanosomes in blood are common
- We don't know their effect on caribou



Parasites



- **Stomach worms have been shown to cause reduction in pregnancy in reindeer**
- **All our barren-ground caribou have stomach worms**



Parasites



- Found a worm similar to lungworm of sheep and muskox in Bluenose-East caribou
- We don't know what it is (new genus?) or its effect

Summary

- **Bluenose-West herd size from 74,300 in 2000 to 20,800 in 2005 (72% drop)**
- **Bluenose-East herd size from 104,000 in 2000 to 66,600 in 2005 (36% decrease)**
- **Biologists are confident in census results**

Summary

- late calving (especially 2001 & 2002) with relatively high post-calving mortality and likely low recruitment
- no information to suggest range condition or habitat loss is currently a problem
- level and role of predation are unknown
- need current, accurate harvest data

Summary

- role of parasites and diseases needs further study
- gas exploration and development activities in some areas of the winter range
- unknown whether the declines are part of a natural cycle

Summary

- current harvest levels, particularly of adult females, are not sustainable.



What do YOU think?





Thank You