Bluenose - East and Bathurst Caribou photographic surveys: June 2015

Cambridge Bay January 14, 2015

Northwest Territories Environment and Natural Resources

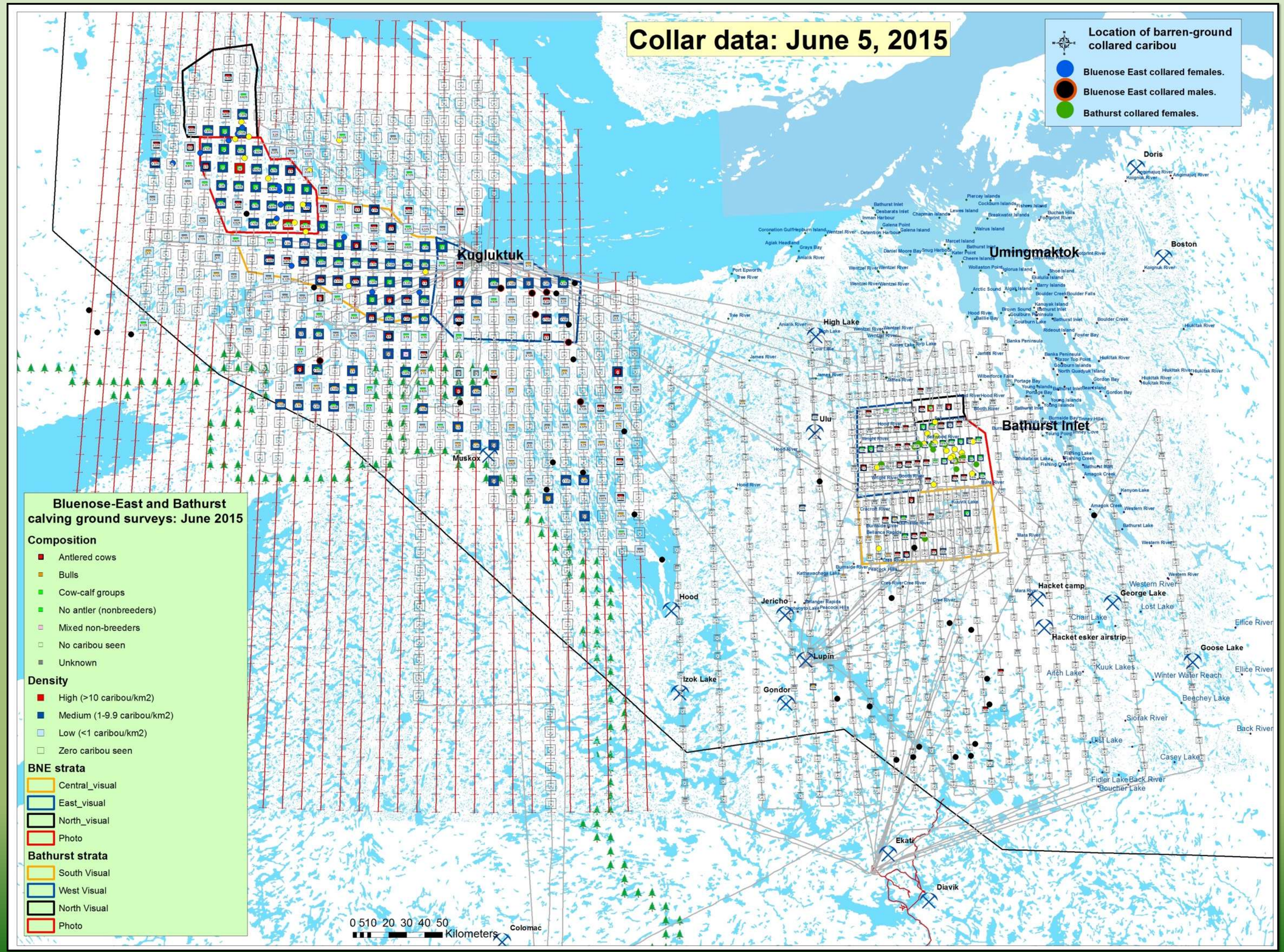
Logistics

- 2 Cessna caravans, 1 Pilatus Porter and 1 helicopter based out of Kugluktuk.

- 1 Cessna caravan and 1 helicopter based out of Ekati. 2 photo planes based out of Kugluktuk (Piper Malibu and Cessna 206)

- **June 2: Both calving ground recons started and status of calving assessed.**
- **June 3 - 7: Systematic reconnaissance survey for both calving grounds.**
- **June 5: BNE photographic survey completed.**
- **June 6: Bathurst photographic completed.**
- **June 5 and 6: BNE composition survey on all strata.**
- **June 6: Bathurst composition survey commenced in photo strata.**
- **June 7: Bathurst composition survey interrupted due to weather**
- **June 8: Bathurst composition survey completed in the Photo, West and South Strata.**
- **June 9: Bathurst composition survey completed on the North strata.**

Bluenose-East and Bathurst Systematic Reconnaissance Coverage June 2 – 9, 2015



Bluenose-East photo strata June 2015

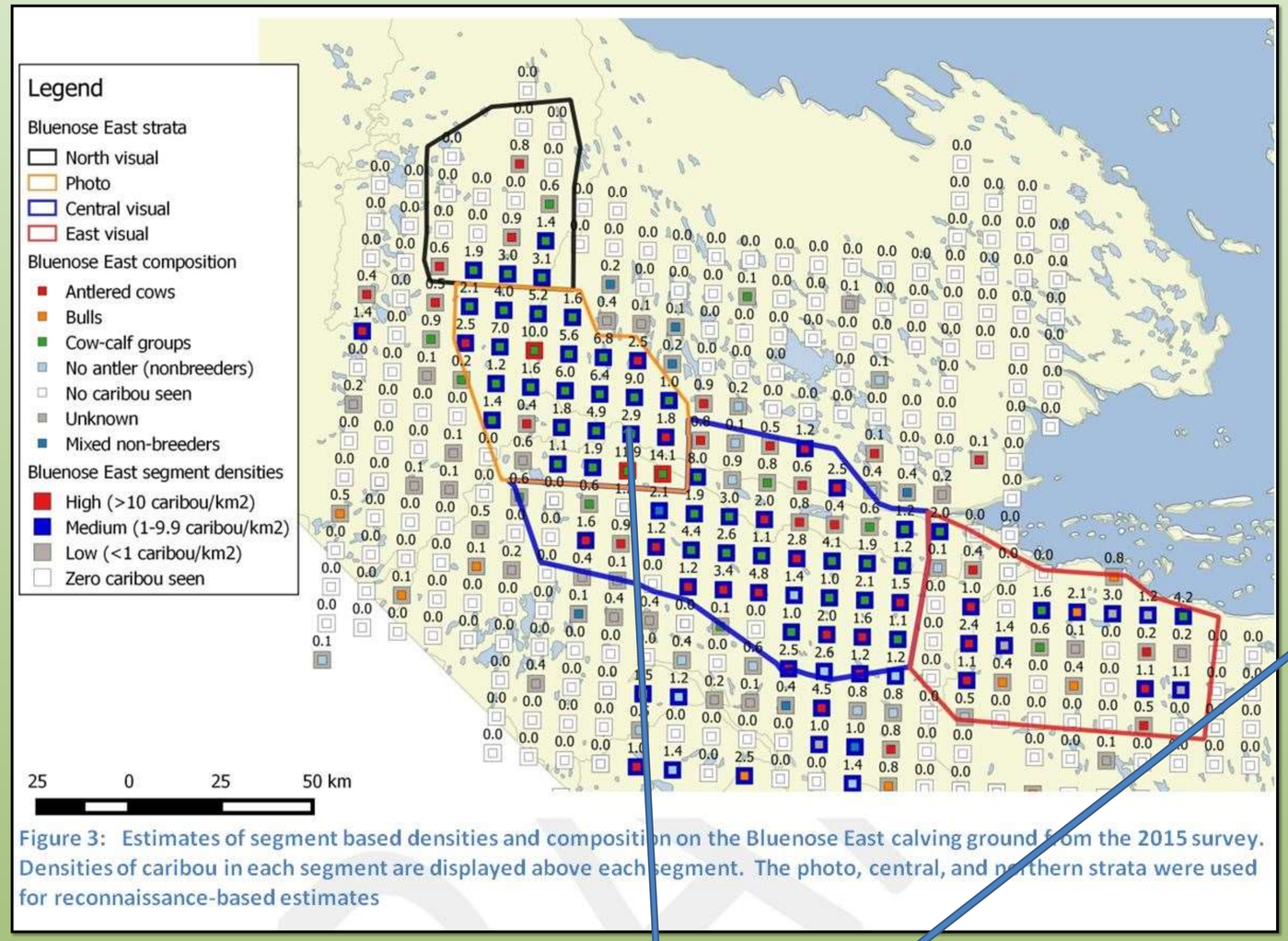
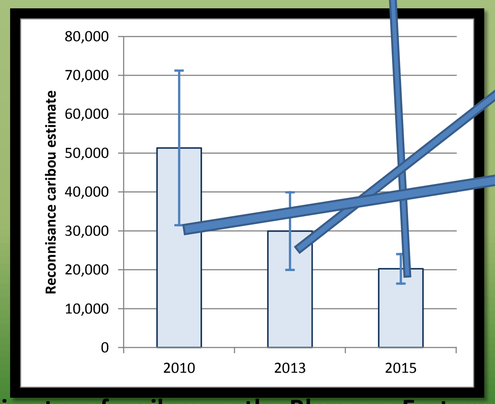
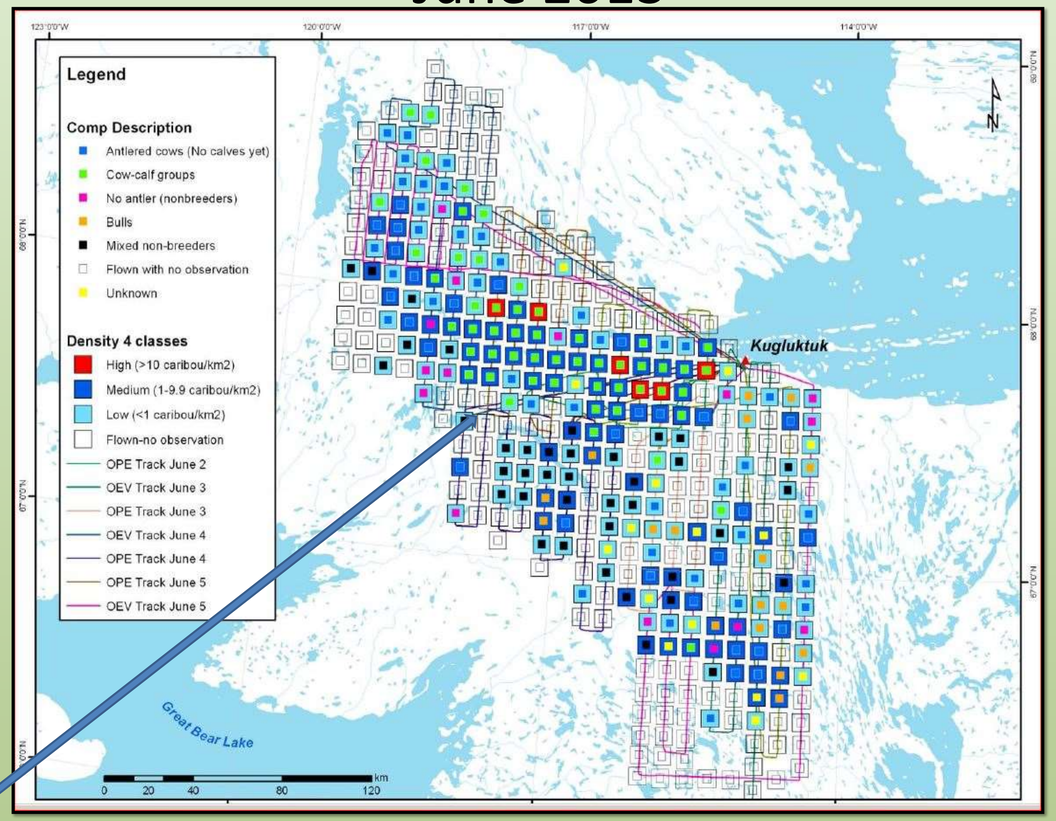


Figure 3: Estimates of segment based densities and composition on the Bluenose East calving ground from the 2015 survey. Densities of caribou in each segment are displayed above each segment. The photo, central, and northern strata were used for reconnaissance-based estimates

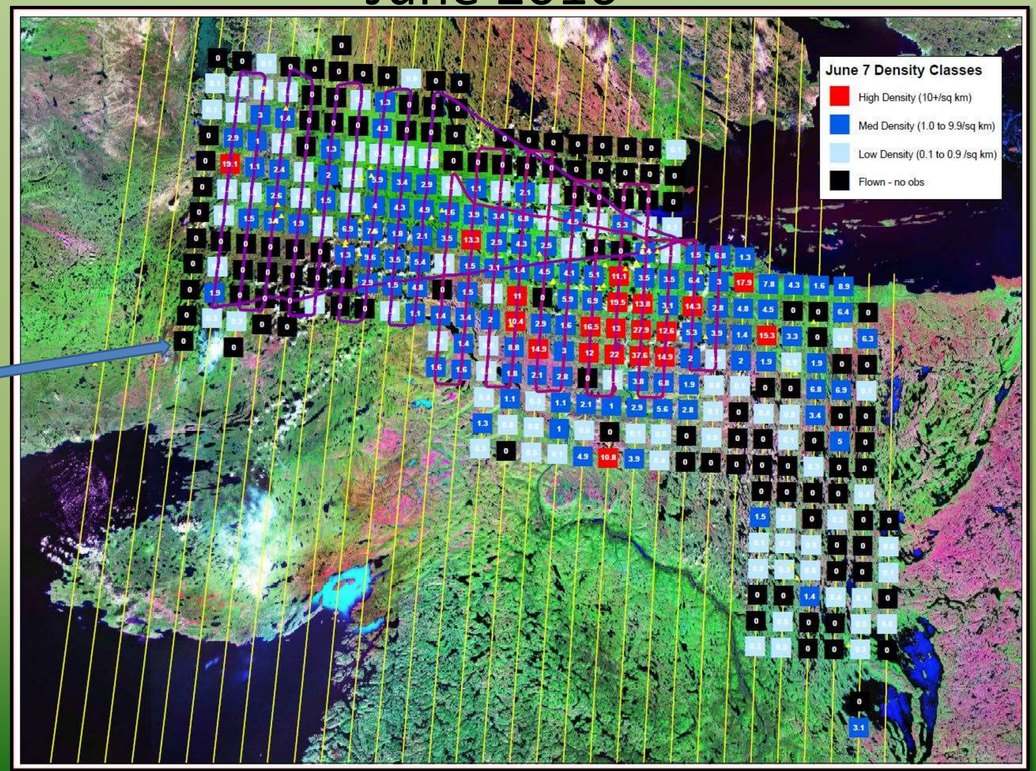


Reconnaissance-based estimates of caribou on the Bluenose East core calving ground as defined by the 2015 survey and previous calving ground surveys

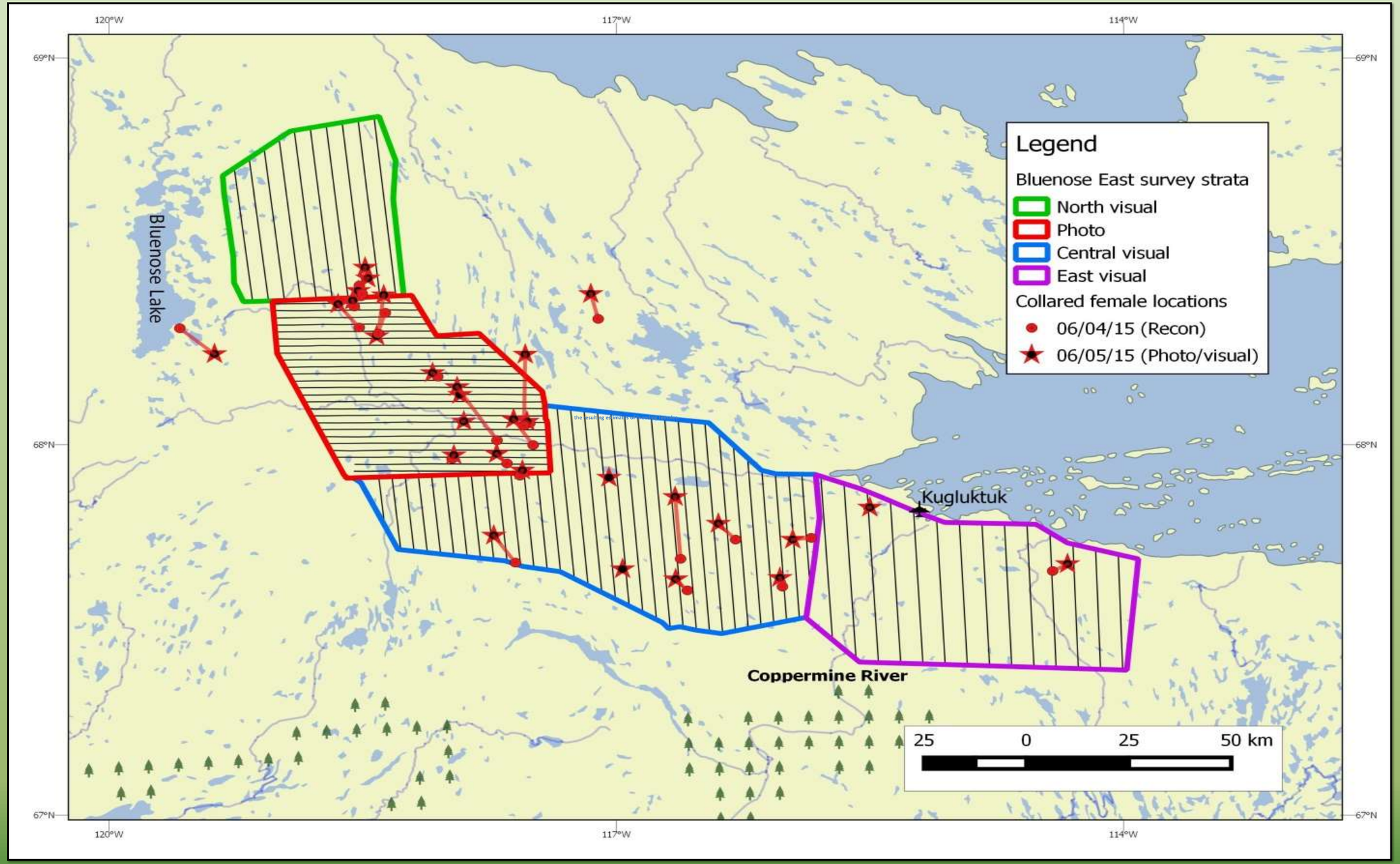
June 2013



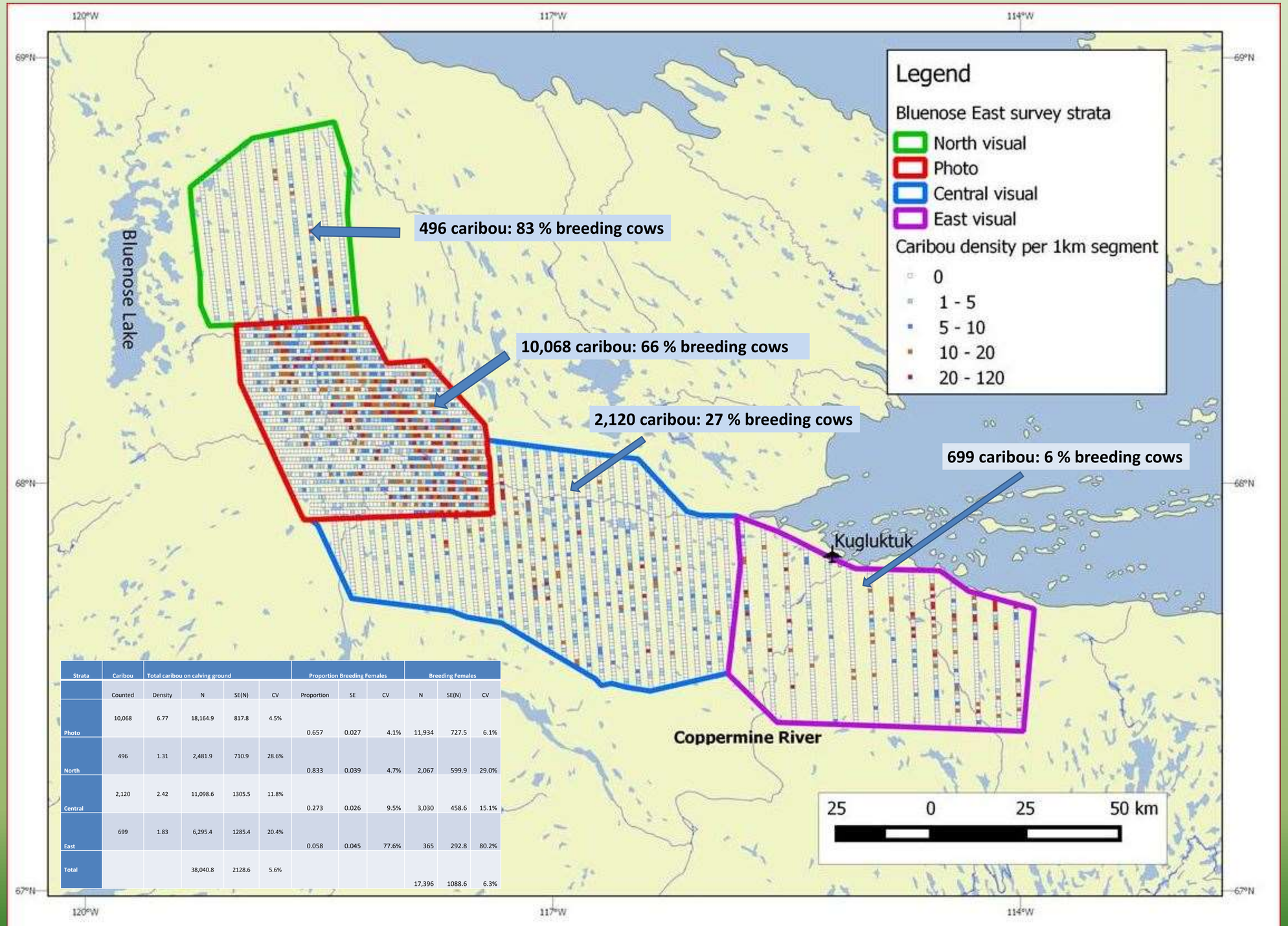
June 2010



Transect layout of the photo and visual strata. Also shown are the locations of collared females during the primary reconnaissance survey (June 4th) and photo/visual survey (June 5th). Red lines connect the locations for June 4th and 5th for individual caribou.

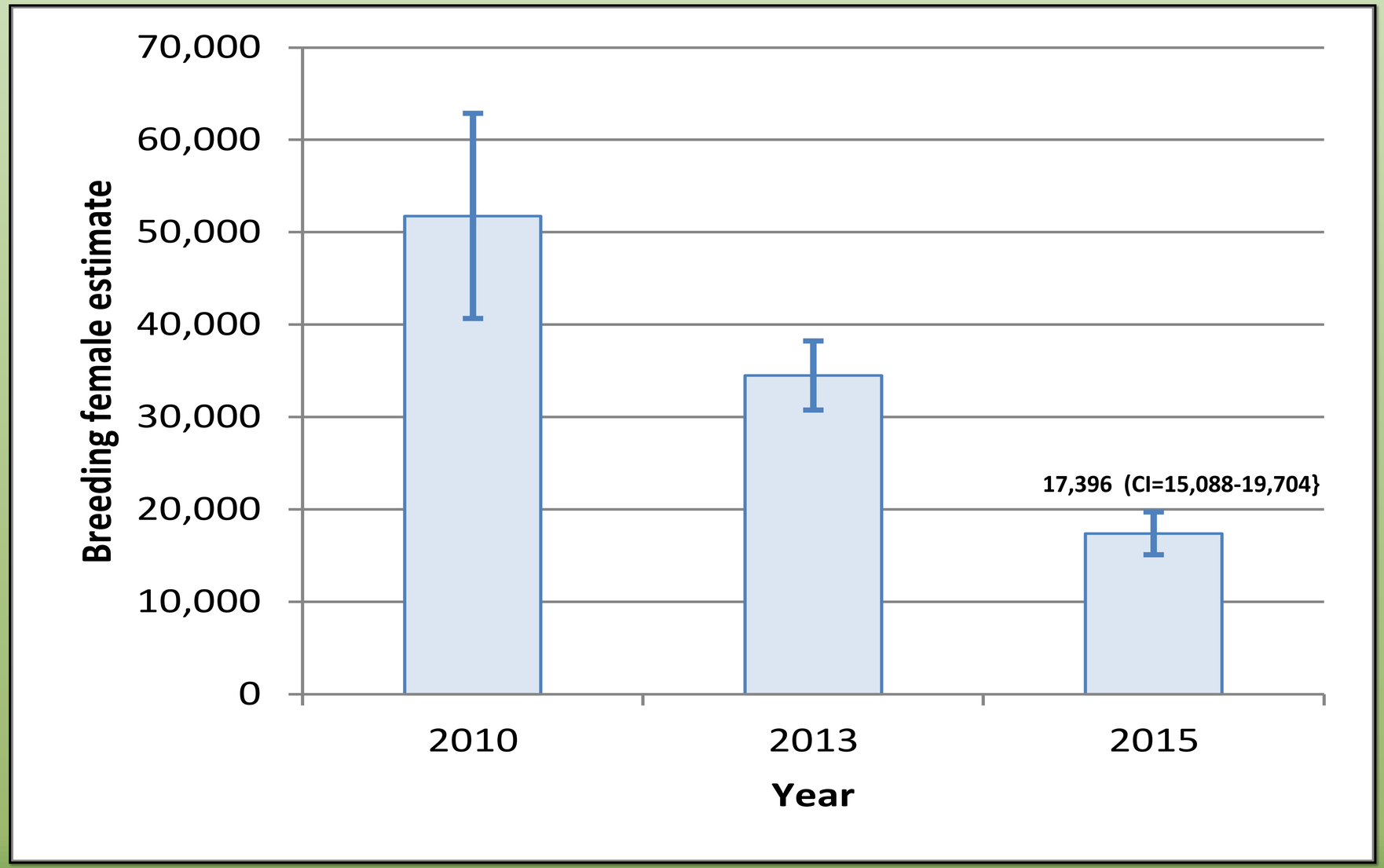


Distribution and density of caribou counted on the photo and visual survey lines June 4th.



Strata	Caribou	Total caribou on calving ground				Proportion Breeding Females			Breeding Females		
	Counted	Density	N	SE(N)	CV	Proportion	SE	CV	N	SE(N)	CV
Photo	10,068	6.77	18,164.9	817.8	4.5%	0.657	0.027	4.1%	11,934	727.5	6.1%
North	496	1.31	2,481.9	710.9	28.6%	0.833	0.039	4.7%	2,067	599.9	29.0%
Central	2,120	2.42	11,098.6	1305.5	11.8%	0.273	0.026	9.5%	3,030	458.6	15.1%
East	699	1.83	6,295.4	1285.4	20.4%	0.058	0.045	77.6%	365	292.8	80.2%
Total			38,040.8	2128.6	5.6%				17,396	1088.6	6.3%

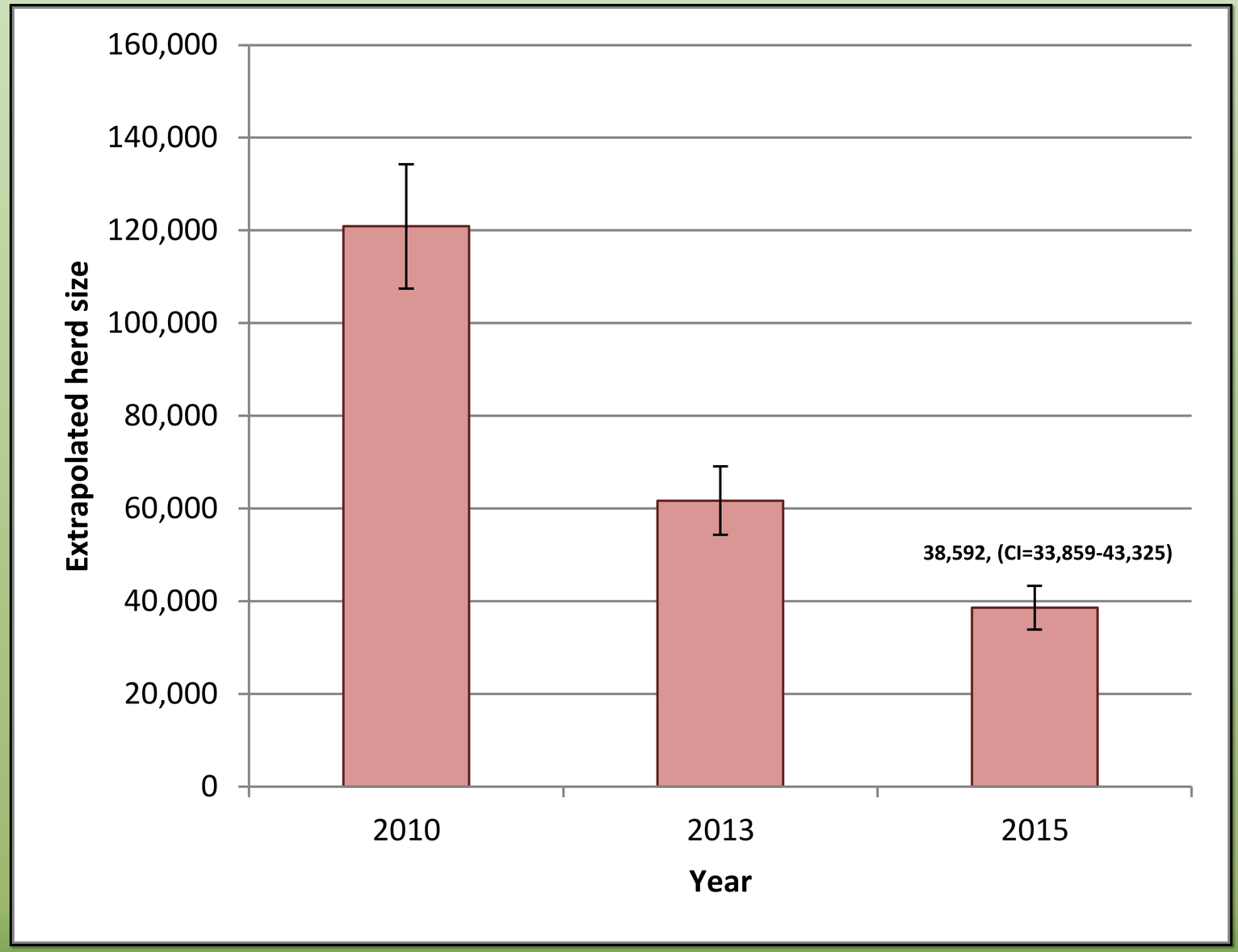
Comparison of 2015 breeding female estimate with estimates from the 2013 and 2010 calving ground surveys for the Bluenose-East herd.



Bluenose-East extrapolated Herd Size

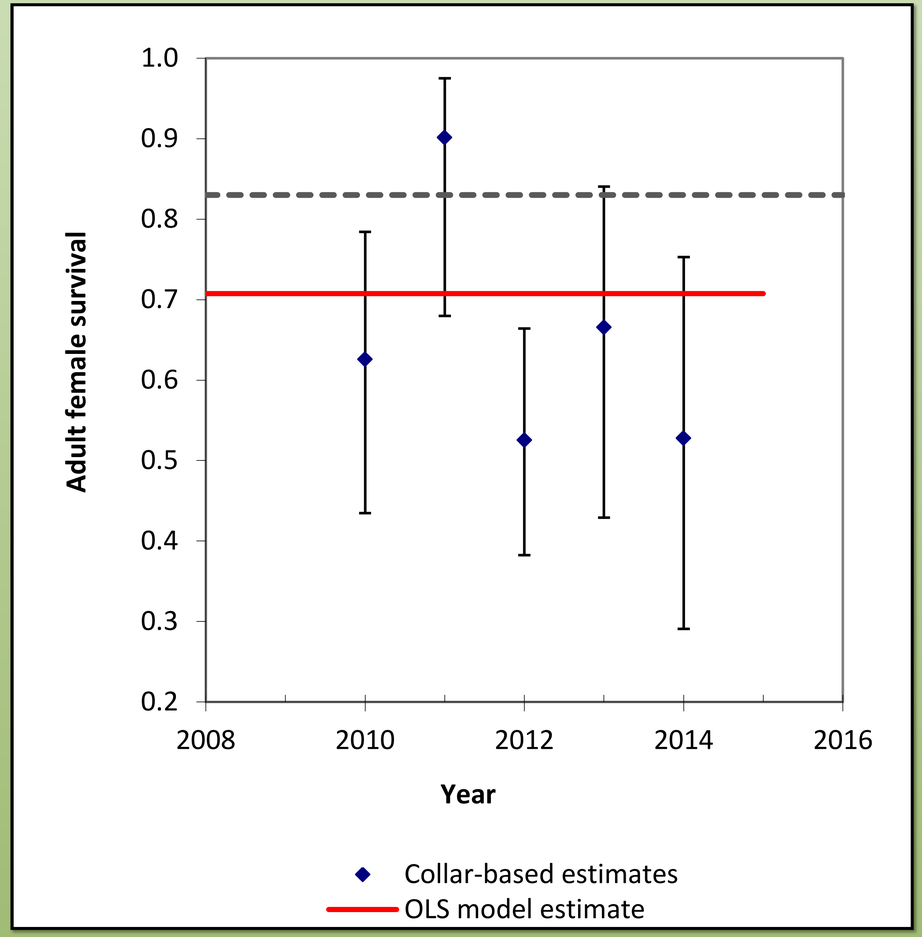
- **Adult female based extrapolated estimate**

- **<u>21% annual decline rate</u>**



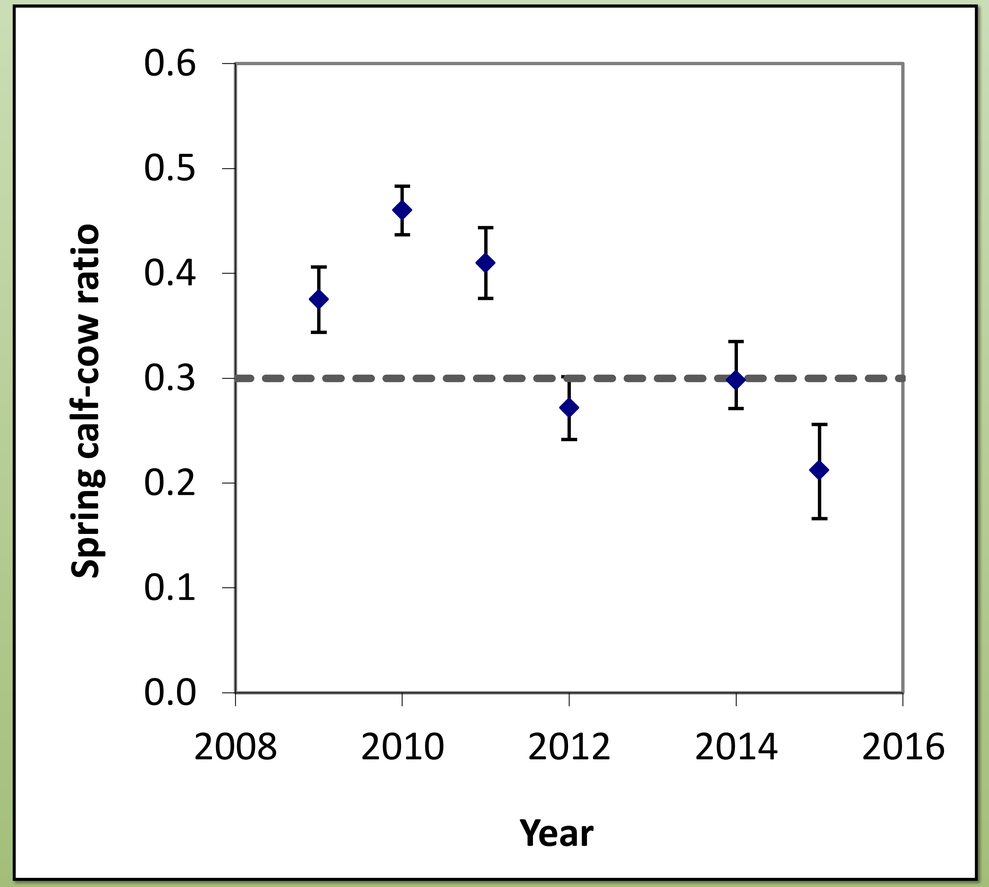
Thresholds defined: Why are we so concerned about the Bluenose-East Herd?

- **OLS modeling estimated adult female survival is 0.71**
- **Caribou herds need survival rates of at least 0.8 to 0.85 to maintain stability**



Thresholds defined: Why are we so concerned about the Bluenose-East Herd?

- **Calf cow ratios estimate productivity (are caribou replacing themselves)?**
- **Rule of thumb: Should be >0.3 for herd stability**



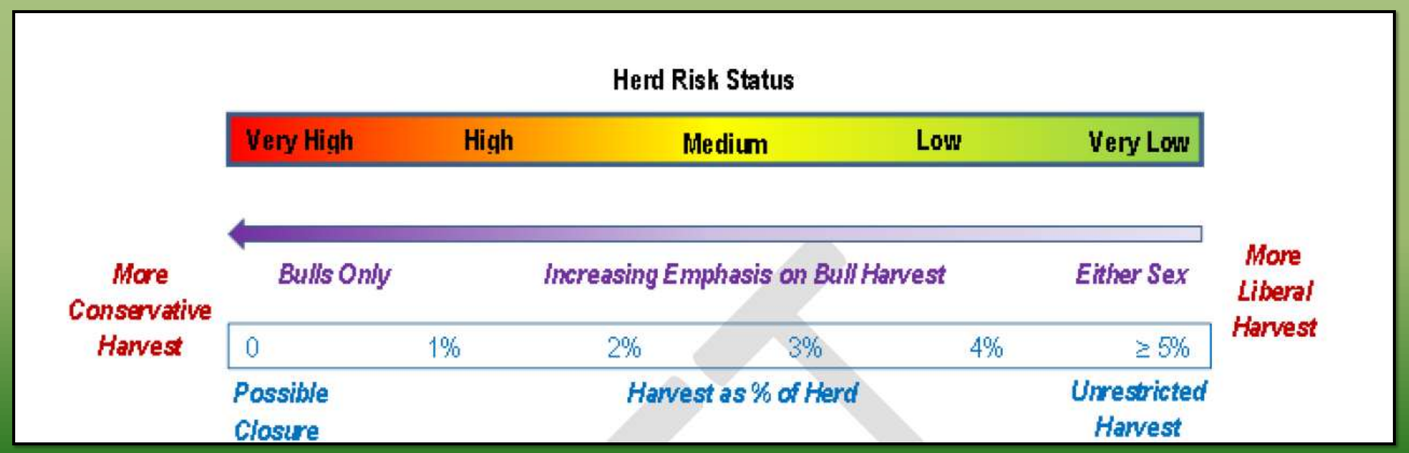
Thresholds defined: Why are we so concerned about the Bluenose-East Herd?

Table 1: Thresholds of risk as a function of trend and population size

		Population Size (thousands)				
Lambda	**% change**	**<30**	**30-60**	**60-90**	**90-120**	**>120**
>1.1	>10%	5	4	3	2	1
1.02-1.09	2-9%	10	8	6	4	2
0.98-1.02	-2 to +2%	15	12	9	6	3
0.9-0.98	-10 to -2	20	16	12	8	4
<0.9	<-10%	25	20	15	10	5

Bluenose East herd

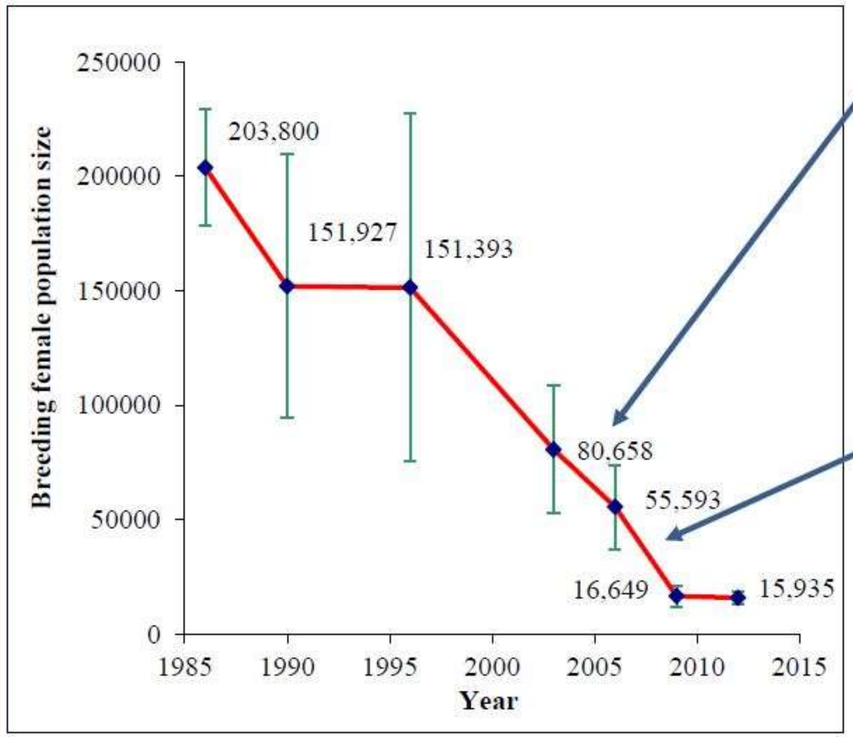
Minimizing harvest risk



Is a high (20-30%) annual rate of decline reasonable?

The Bathurst herd

Trends in Bathurst herd breeding female estimates



11.7% annual rate of decline from 2003-6

33.1% annual rate of decline from 2006-9

Bathurst 2006-9

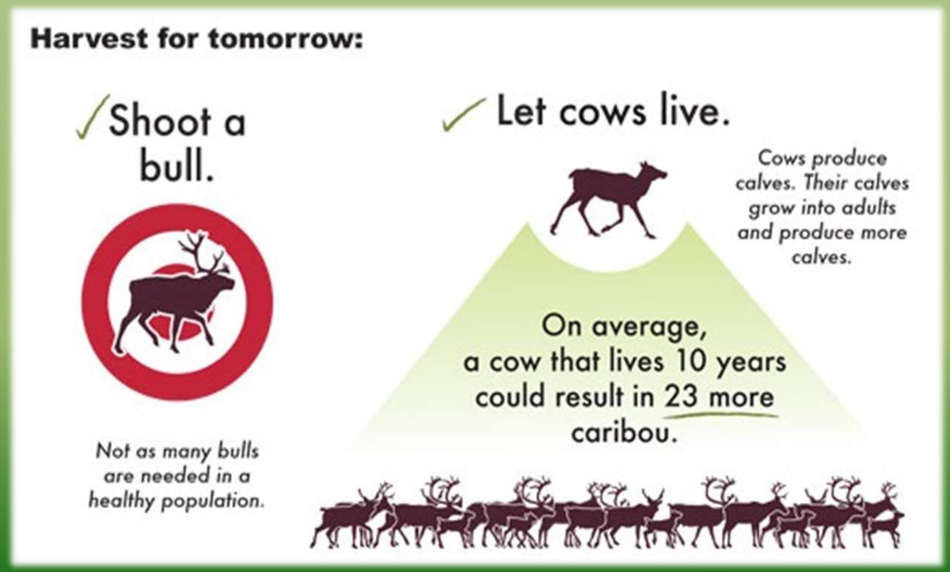
Low survival and constant harvest on a declining population steepened the rate of decline

Conclusions for Bluenose-East Herd

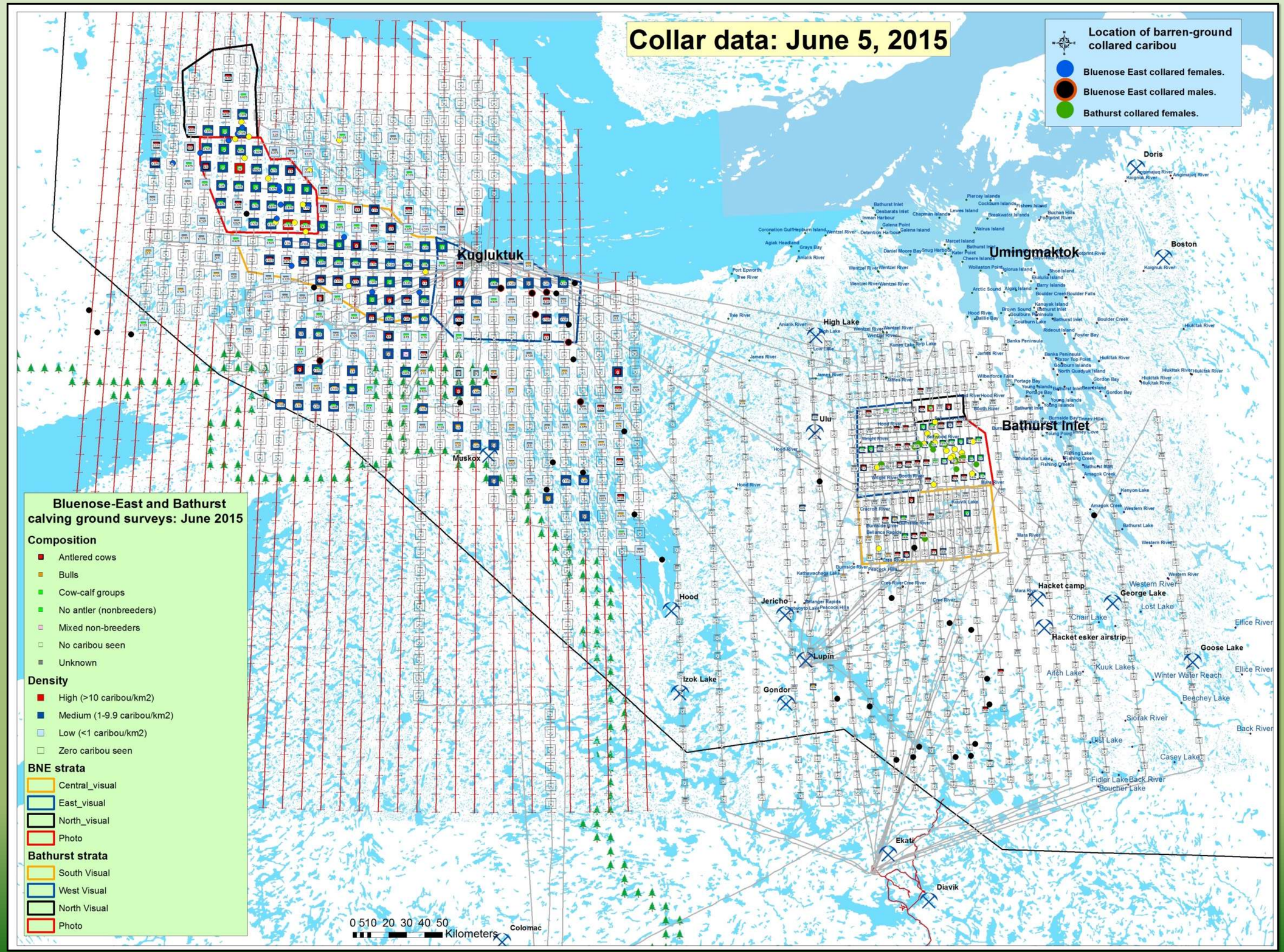
- **Bluenose-East is probably somewhere near the bottom of the orange zone due to its rapid (21%) rate of decline.**

- **Demographic indicators suggest low adult female survival, low pregnancy rate and low productivity.**

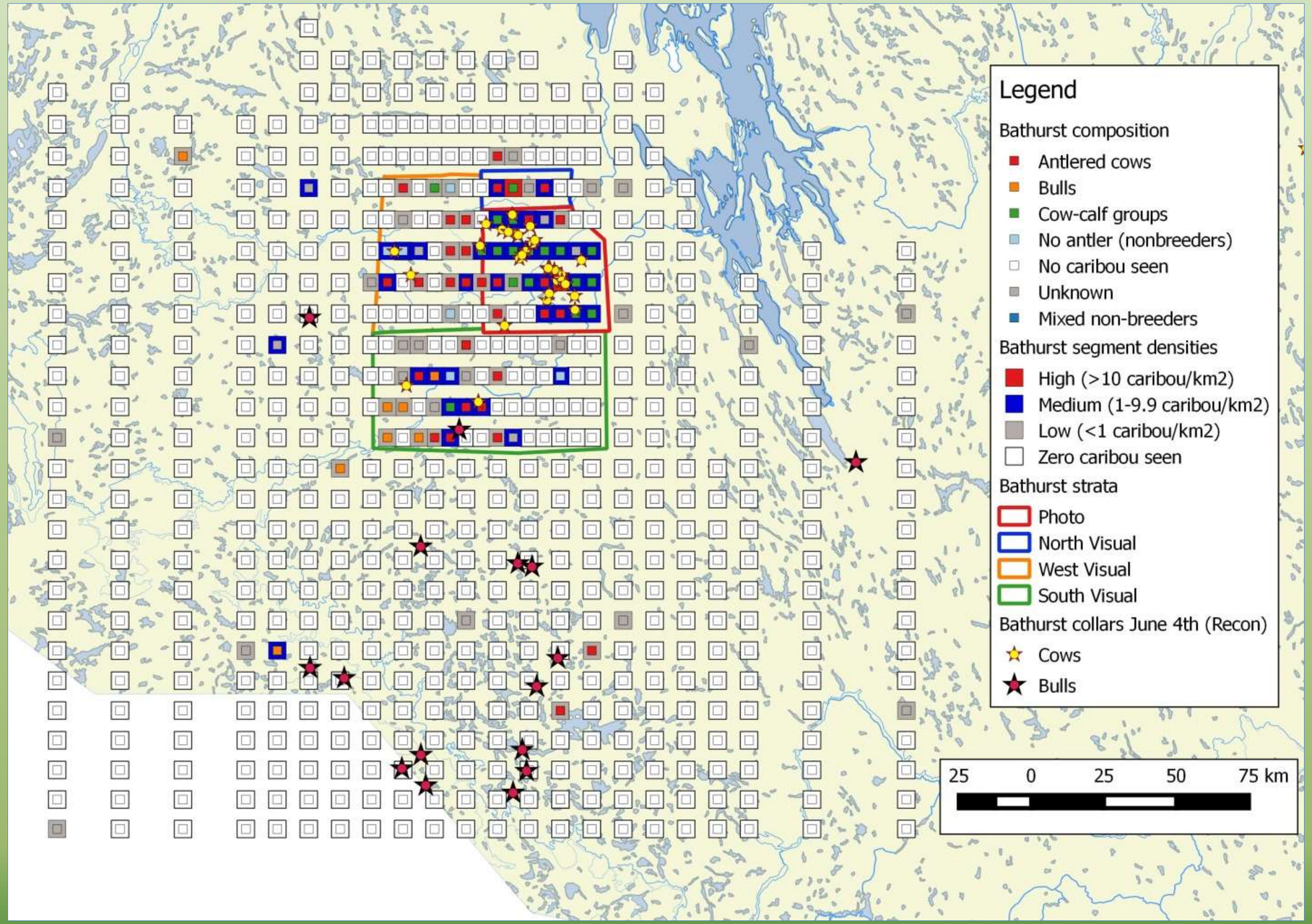
- **Therefore, the resilience of the herd to harvest pressure is low.**



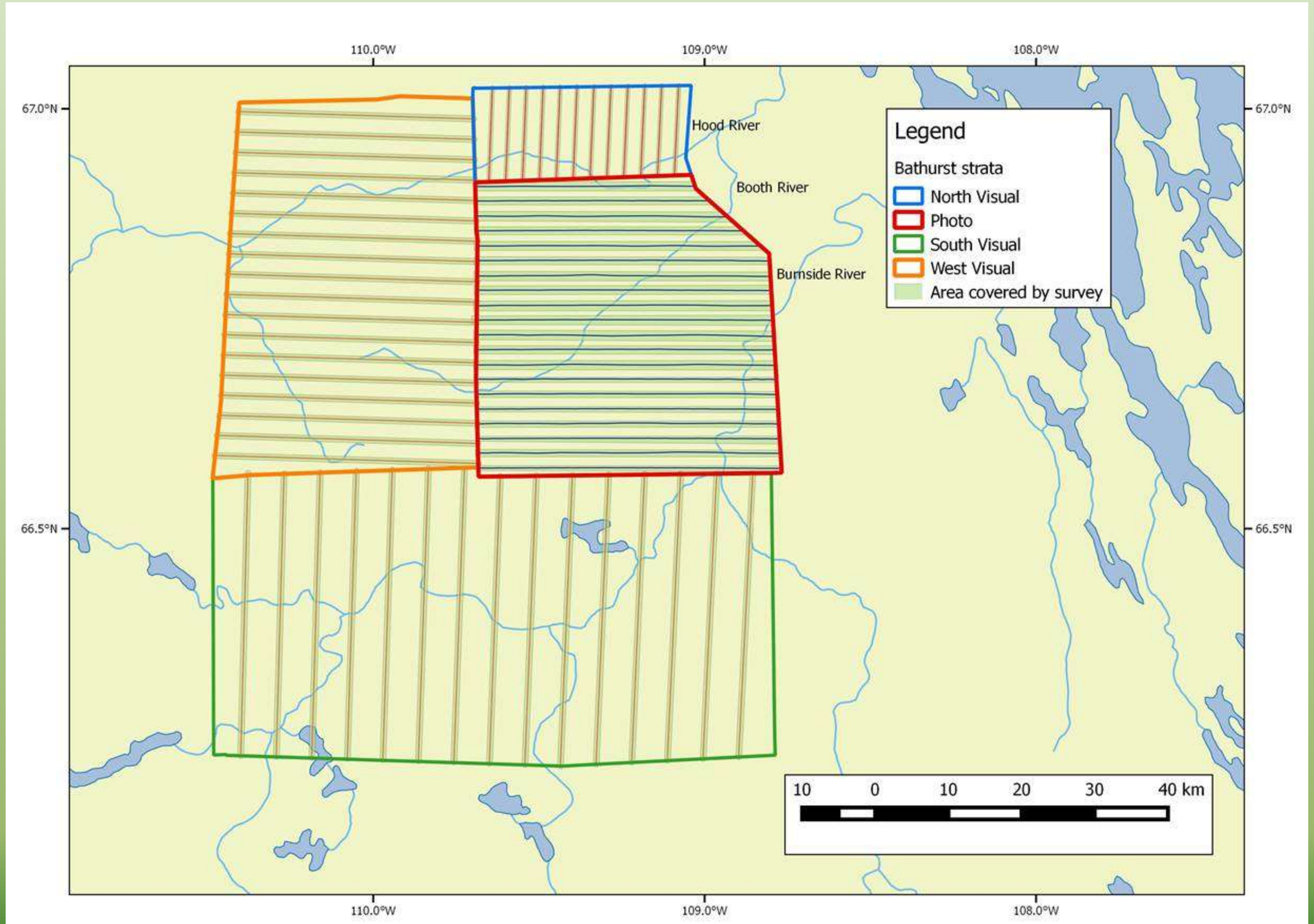
Bluenose-East and Bathurst Systematic Reconnaissance Coverage June 2 – 9, 2015



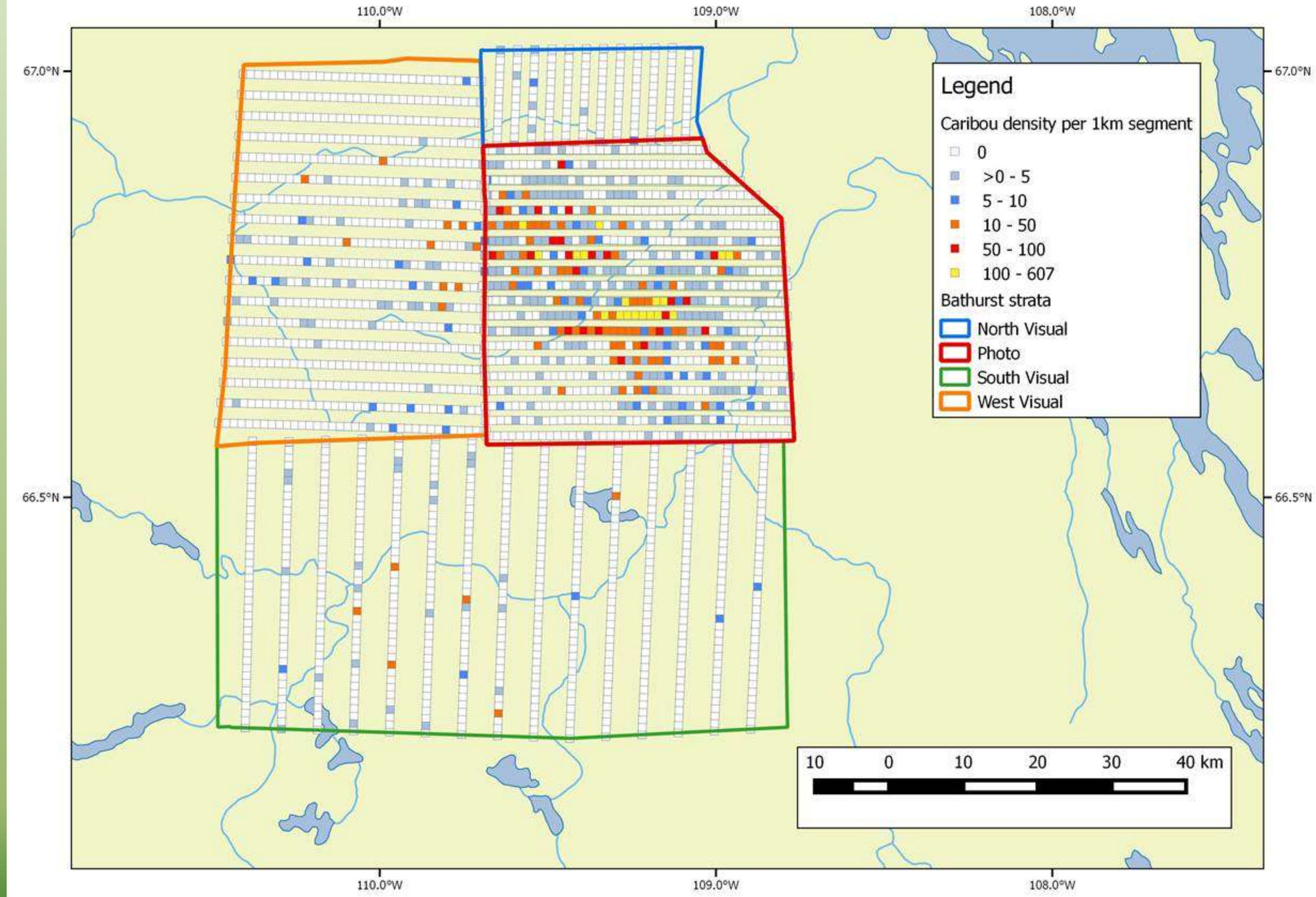
Bathurst caribou herd core calving area: June 2015



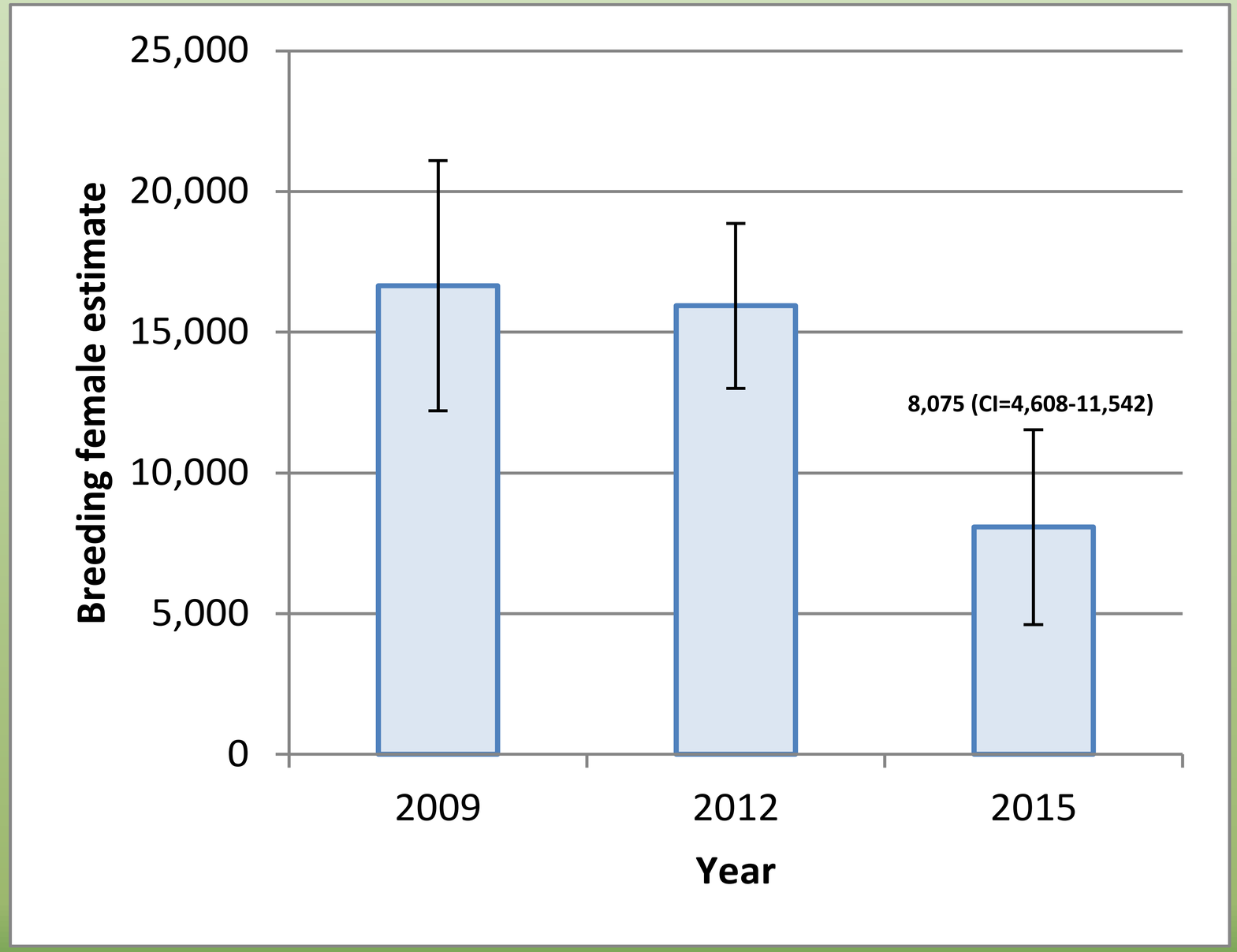
Transect layout of the photo and visual strata for the Bathurst herd June 5-6, 2015.



Distribution and density of caribou counted on the photo and visual survey lines June 6th.

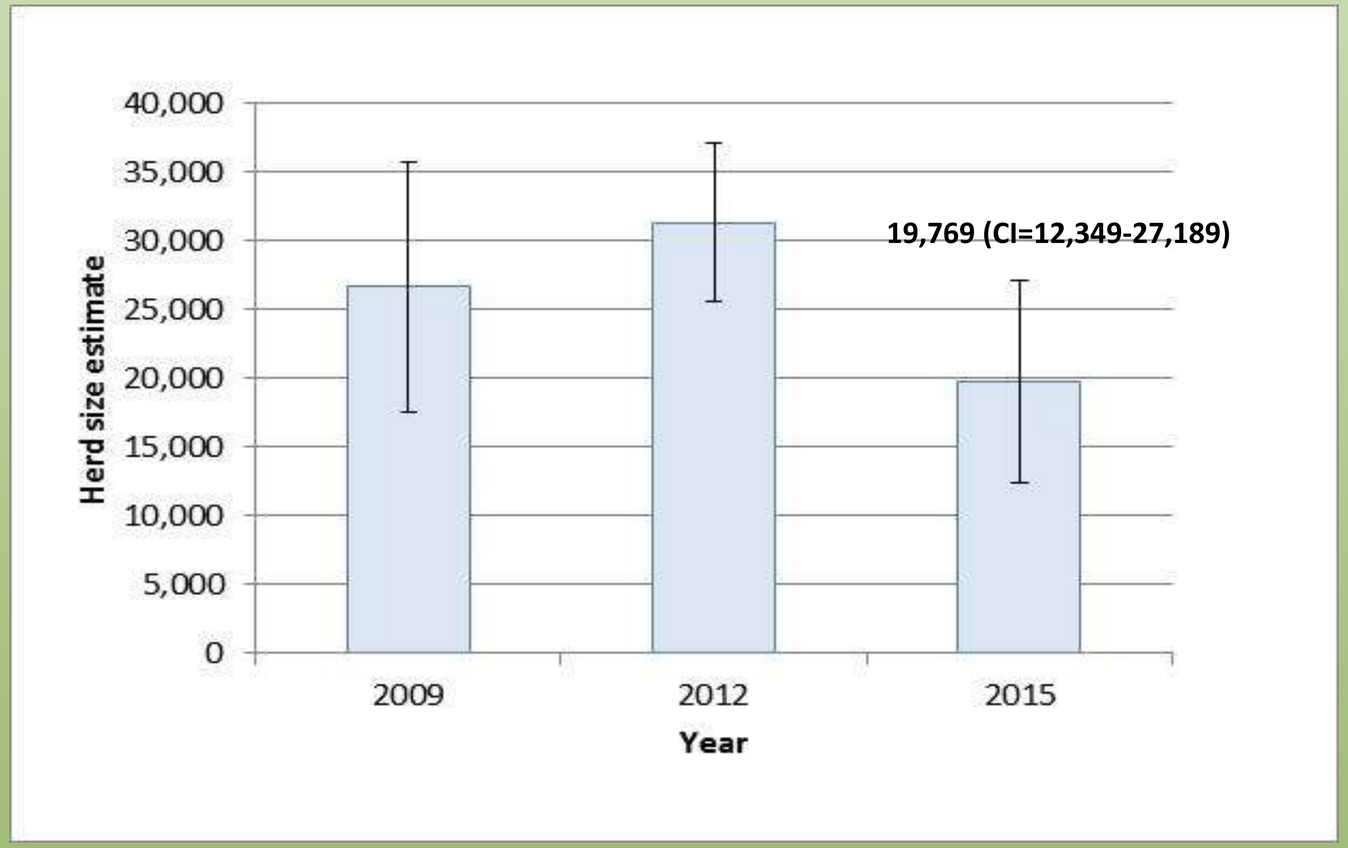


Comparison of 2015 breeding female estimate with estimates from the 2009 and 2012 calving ground photo surveys for the Bathurst herd.



Trends in herd size

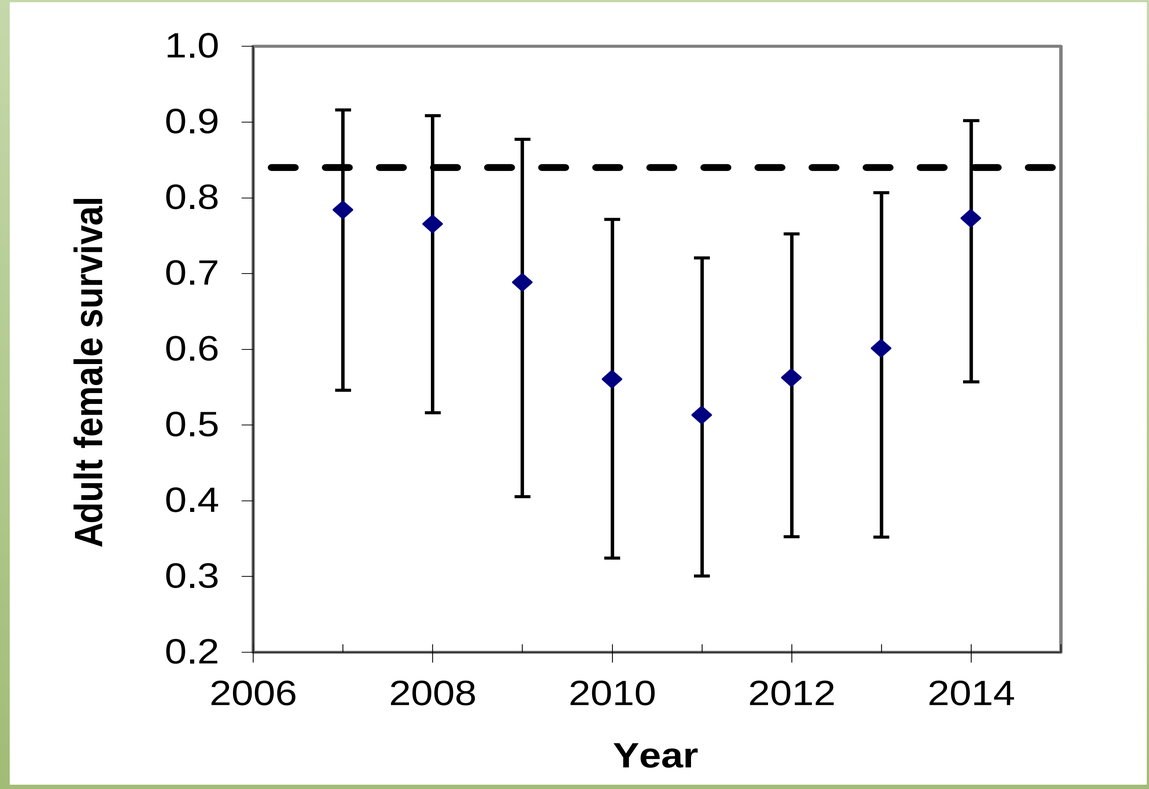
Adult female-based herd estimates



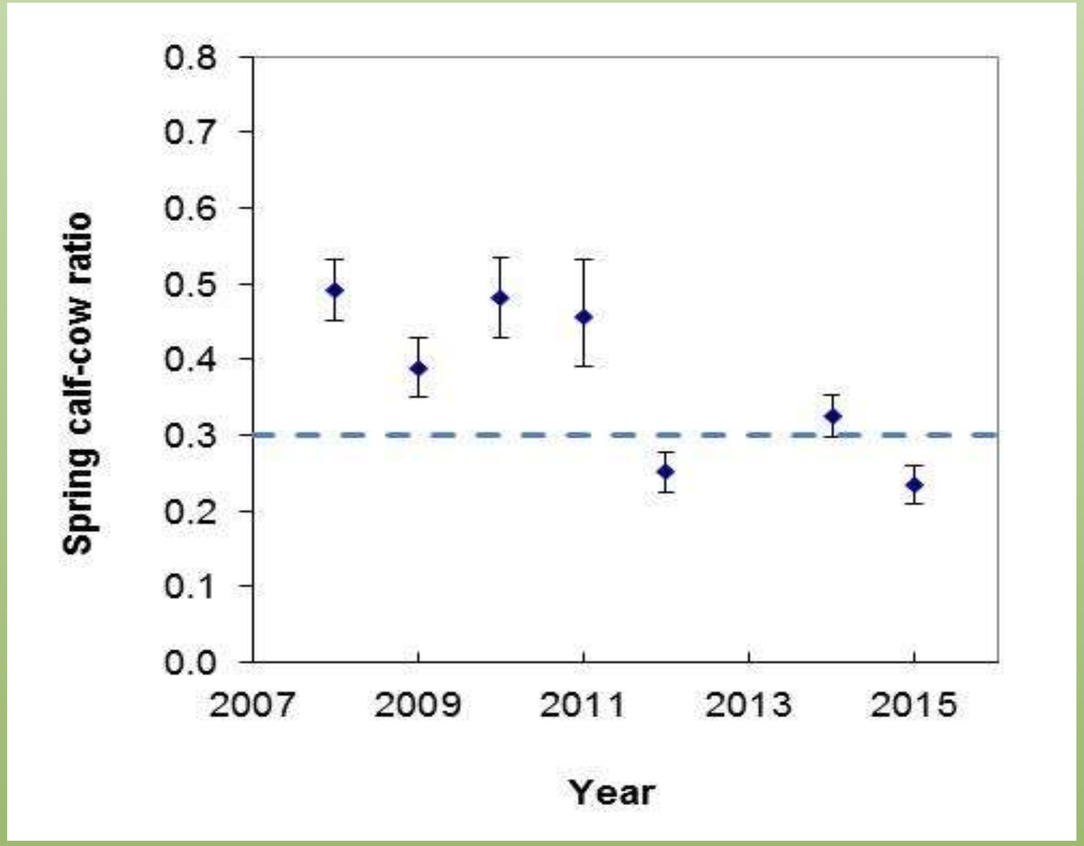
- Using adult female based herd estimates
  - 2015 estimate is 37% lower than 2012 estimate
- Annual rate of decline of 14%

Demography
Adult female survival

- Based on “caribou year”
  - June (calving) start of each year
- Caribou herds need survival rates of at least 0.8 to 0.85 to maintain stability
- Low sample sizes of collared caribou with large confidence intervals on estimates



Productivity
Spring calf cow ratios



- Productivity has declined since spring of 2011

Conclusions for Bathurst Herd

- **The Bathurst is in the highest risk category given the high rate of decline (approx 14%) and low herd size (approx 20K).**

- **Basically the demographic analysis suggests that the only way the Bathurst could be stable is if productivity was high…**

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Bathurst herd

Koana!