FINAL

Barren-Ground Caribou
2012/2013 Harvest & Monitoring Summary

HARVEST MONITORING

Since winter 2010, a reduction in hunting of Bathurst caribou in the Northwest Territories (NT) has been an important management action to help the herd recover. The fall 2012 to winter 2013 harvest season was the third season of reduced caribou hunting within barren-ground caribou management zones R/BC/02 and R/BC/03 *(Figure 1).* Environment and Natural Resources (ENR) Officers, Tłı̨chǫ community monitors, and Yellowknives Dene First Nation (YKDFN) wildlife monitors observed the caribou harvest within the North Slave Region during the 2012/2013 fall and winter hunting seasons[i] and the reported harvests are summarized in Tables 1 and 2. For comparison, the reported harvest of caribou during the 2011/2012 harvest season are summarized in Tables 3 and 4.

The annual harvest target for Bathurst caribou in the Northwest Territories is 300 caribou (240 bulls and 60 cows) and is established for management zones R/BC/02 and R/BC/03. In addition to the harvest target of 300 Bathurst caribou in NT, there is an annual allotment of 70 commercial tags from Government of Nunavut to an outfitter within the vicinity of Contwoyto and Pellat Lakes in Nunavut.

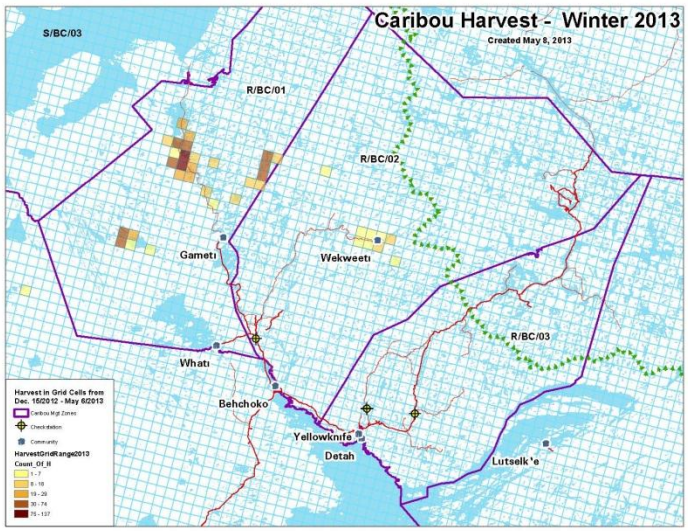

Figure 1: Bluenose-East & Bathurst Caribou Herd Total Reported Harvest – 2012/2013

2012/2013 – Harvest Season

Table 1. Bathurst Caribou Herd: Reported Harvest

Management Area	# Bulls	# Cows	# Calves	# Unknown	Total
R/BC/02 and R/BC/03	79	57	5	25	166
Nunavut *	36	0	0	0	36
TOTAL	**115**	**57**	**5**	**25**	**202**

* There is an annual allotment of 70 commercial tags for Bathurst caribou that are provided to Adventure Northwest from the Government of Nunavut. The actual harvest was reported as 36 in the 2012/2013 harvest season.

Table 2. Bluenose-East Caribou Herd: Reported Harvest

Management Area	# Bulls	# Cows	# Calves	# Unknown	Total
R/BC/01	787	582	0	123	1492
Sahtu Region	173	192	0	0	365
Nunavut	0	0	0	705	705
TOTAL	**960**	**774**	**0**	**828**	**2562**

[i] The 2012/2013 harvest season occurs between August 1, 2012 to July 31, 2013

2011/2012 – Harvest Season

Table 3. Bathurst Caribou Herd: Reported Harvest

Management Area	# Bulls	# Cows	# Calves	# Unknown	Total
R/BC/02 and R/BC/03	110	25	0	0	135
Nunavut *	35	0	0	0	35
TOTAL	**145**	**25**	**0**	**0**	**170**

* There is an annual allotment of 70 commercial tags for Bathurst caribou that are provided to Adventure Northwest from the Government of Nunavut. The actual harvest was reported as 35 in the 2011/2012 harvest season.

Table 4. Bluenose-East Caribou Herd: Reported Harvest

Management Area	# Bulls	# Cows	# Calves	# Unknown	Total
R/BC/01	470	674	0	172	1316
Sahtu Region	9	110	0	181	300
Nunavut	0	0	0	150	150
TOTAL	**479**	**784**	**0**	**503**	**1766**

MONITORING ACTIVITIES

Bathurst Caribou

Fall Composition Survey

- Survey was conducted using a helicopter between October 22 and 23, 2012.
- The preliminary analysis indicates a 56:100 bulls/cow ratio for the Bathurst herd *(Figure 2).*The error bars represent the standard error.
  - The 2011 fall compositions survey indicated a 59:100 bull/cow ratio for the Bathurst herd.

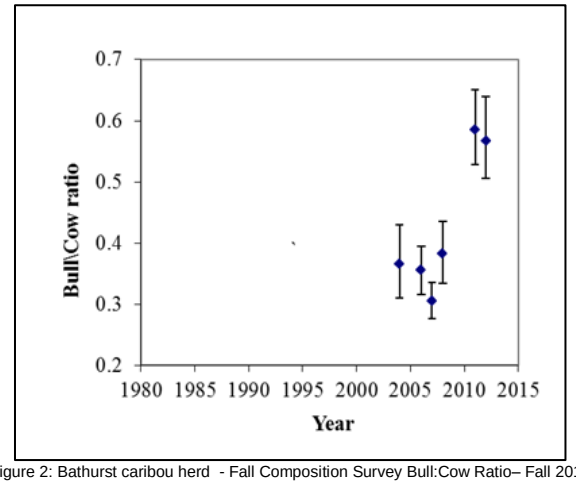

Figure 2: Bathurst caribou herd - Fall Composition Survey Bull:Cow Ratio– Fall 2012

- The analysis of composition data indicates a 24:100 calf/cow ratio for the Bathurst herd *(Figure 3),* which represents the number of calves per 100 cows that were born in the spring of 2012 (calf/cow ratio of 25:100) and had survived to the fall of 2012.
  - The calf:cow ratio for the previous year (Fall 2011) was 33:100 indicting the number of calves recruited in to the herd has decreased. The error bars represent the standard error.

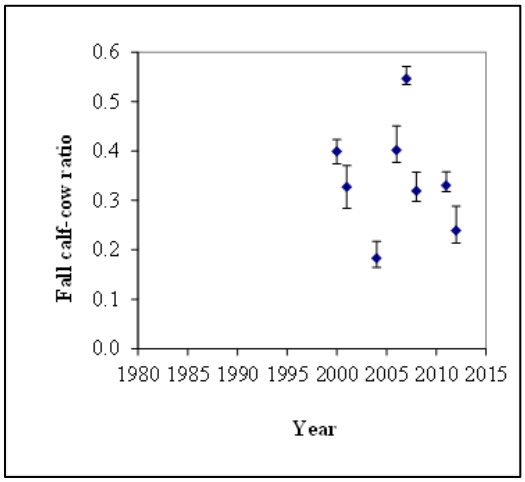

Figure 3: Bathurst caribou herd - Fall Composition Survey calf:cow Ratio – Fall 2012

Satellite Collars

- In March 2013, an additional 13 collars were placed on adult female caribou in the area where Bathurst caribou spent the winter totalling 20 collars.

- Blood samples were taken from the females captured during the collaring activities to determine pregnancy. The results indicate 12 out of the 13 samples (~92%) collected were pregnant. *(Figure 4)*
  - In results in March 2012 indicated The results indicate 13 out of the 14 samples (~93%) collected were pregnant. Note that the previous harvest summary report stated 13 out of 13 (100%) at the time but has been adjusted to correct ratio for this report.
  - Results between 1990 and 2009 were collected by the presence of foetuses from harvested caribou during late winter. Results between 2010 and 2013 are a combined percentage from harvested animals and blood samples taken during collaring activities.

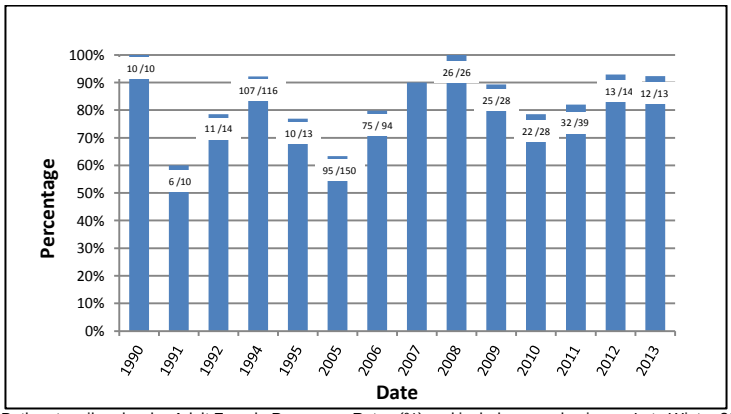

Figure 4 : Bathurst caribou herd - Adult Female Pregnancy Rates (%) and includes sample sizes - Late Winter 2013

Recruitment (spring survival) Survey

- There was no spring 2013 recruitment survey conducted because there was substantial overlap between collared caribou of the Bluenose East and Bathurst herds, which indicated that caribou from the two herds were mixed and it would not have been possible to estimate calf recruitment for a specific herd. *(Figure 5)*. *Note: The yellow dots represent additional collars placed on caribou during late winter*

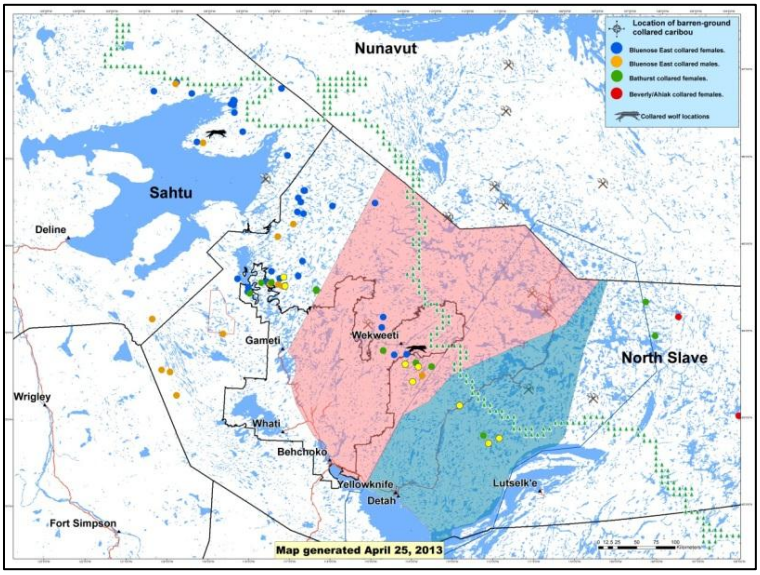

Figure 5 : Bathurst caribou herd collar locations - Spring 2013

- The 2013 spring recruitment results would be expected to be low due to the ratio estimated during the fall 2012 composition survey, which was 24:100.
  - The spring survey results indicated a calf/cow ratio of 25:100 (2012), 50:100 (2011) and 48:100 (2010). Ratios below 30:100, if sustained, suggest a declining trend *(Figure 6).* The error bars represent the standard error.

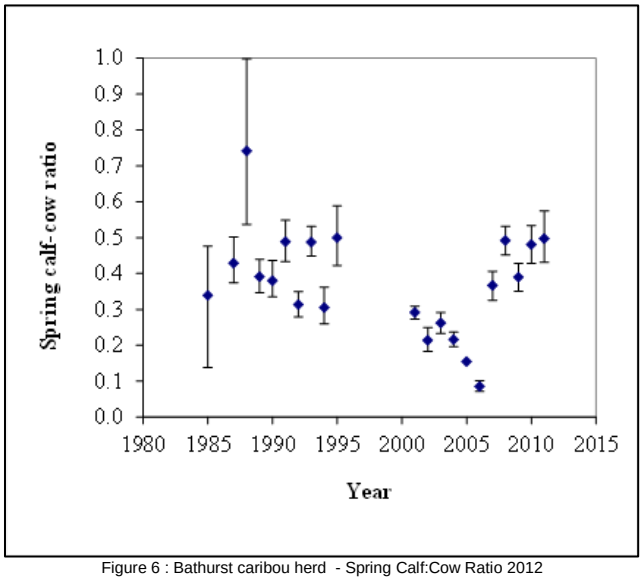

Figure 6 : Bathurst caribou herd - Spring Calf:Cow Ratio 2012

Calving Ground Photographic Surveys

- The results from the *Calving Ground Photographic & Composition Survey* conducted between June 3 to 8, 2012 were released in November 2012, and analysis is reported by Boulanger et al. 2014[ii].
  - The results showed an estimate of 15,935 (SE=1,407, CI=13,009-18,861) breeding females *(Figure 7)* and a total herd size of 34,690 (SE = 4,691, CI=24,934-44,445) *(Figure 8).* The error bars represent the standard error.

[ii] Boulanger, J., B. Croft, and J. Z. Adamczewski. 2014. An estimate of breeding females and analyses of demographics for the Bathurst herd of barren-ground caribou: 2012 calving ground photographic survey. File Report No. 142, Government of the Northwest Territories, Yellowknife, NT.

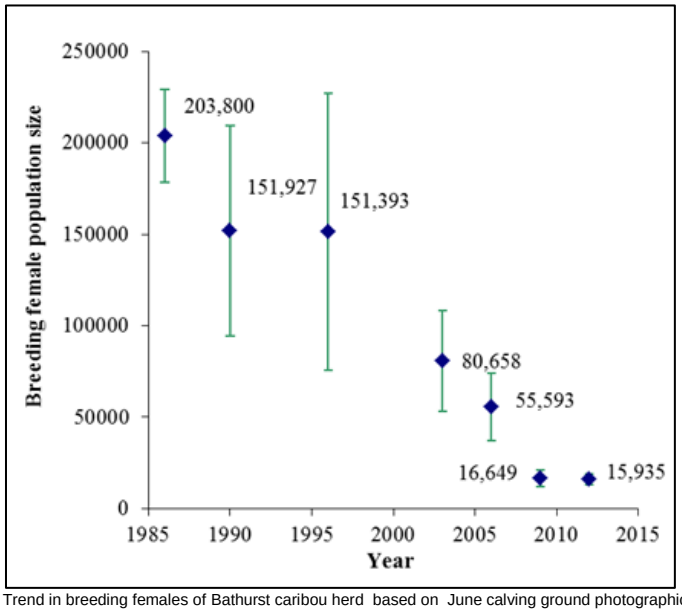

Figure 7: Trend in breeding females of Bathurst caribou herd based on June calving ground photographic surveys

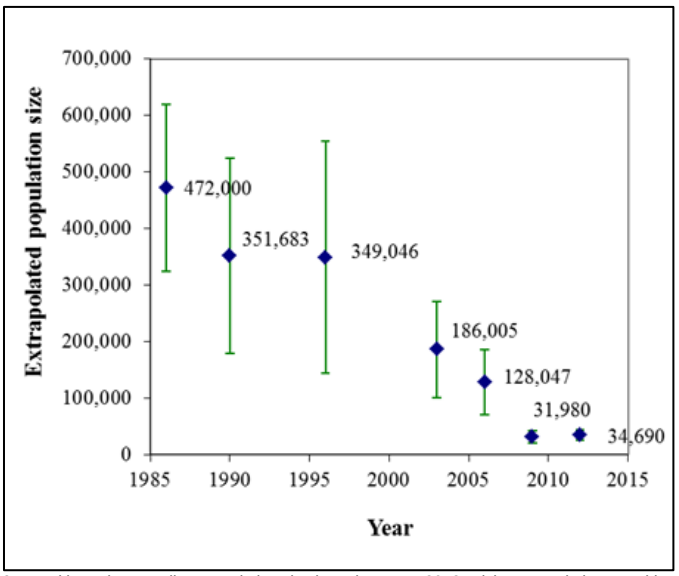

Figure 8: Trend in Bathurst caribou population size based on June 2012 calving ground photographic surveys

- A systematic reconnaissance distribution survey was conducted on June 13, 2013 after a previous attempt on June 9, 2013 was cancelled due to poor weather conditions. However, the June 13th, 2013 survey may have coincided with post-calving aggregation of the herd therefore the results may not be directly comparable to survey results from previous years which is always done around the peak of calving.

Health & Body Condition Sampling

- There was no health & body condition samples submitted for the Bathurst herd in 2013.

Bluenose-East Caribou Herd (BNE)

Satellite Collars

- No additional collars were placed on the BNE herd. A total of 47 remain on the herd (12 males and 35 females).

Recruitment (spring survival) Survey

- There was no survey conducted in spring 2013 due to substantial overlap of collar caribou from the Bluenose East and Bathurst herds during this time (*Figure 5*).
  - The most recent spring survey was conducted in the previous year (2012) with a calf/cow ratio of 25:100 (*Figure 9)* indicating a declining trend.

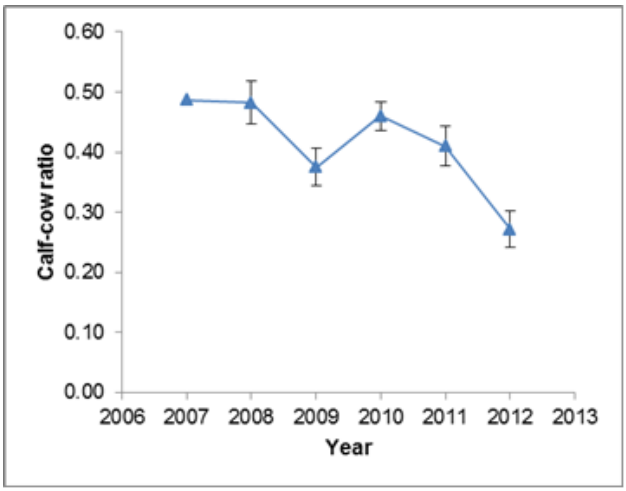

Figure 9: Bluenose East caribou herd cow /calf ratios –based on Recruitment Survey Spring 2012

Calving Ground Photographic Survey

- A calving ground photographic survey was conducted between May 30 to June 10, 2013 in order to estimate abundance of breeding cows for the herd. Results were released in November 2013 and a final report is available[iii].

Health & Body Condition Sampling

- Health & body condition sampling was conducted collaboratively between ENR and Tlicho Government[iv] during the 2013 winter harvest season by hunters and there were 50 samples taken (20 female, 6 males and 24 unidentified). All harvested between on March 22-23, 2013, at Hottah Lake area.
  - Total caribou sample kits submitted in 2012 from hunters: 40
    - 32 harvested between on February 23, 2012, (Grandin River, Grandin Lake)
    - 8 harvested March 4-5, 2012 (Location not specified)
    - Sex composition of harvest: 31 females, 6 males, 3 not identified

- In 2013, the preliminary analysis indicated ~81% pregnancy rate which was based on presence of fetuses in 17 of 21 hunter-killed caribou (*Figure 10).*
  - The preliminary analysis of 37 blood samples from collared female caribou in March 2012 indicated 27/37 (~73%) were pregnant.

[iii] Boulanger, J., B. Croft, and J. Z. Adamczewski. 2014. An estimate of breeding females and analyses of demographics for the Bluenose-East herd of barren-ground caribou: 2013 calving ground photographic survey. File Report No. 143, Environment and Natural Resources, Government of Northwest Territories, Yellowknife.
[iv] Tłı̨chǫ Government. 2014. Tłı̨chǫ Caribou Health and Condition Monitoring Program: Final Report July 2014. Submitted to Cumulative Impact Monitoring Program (CIMP), Aboriginal Affairs and Northern Development Canada, Yellowknife, NT. 34 pp.

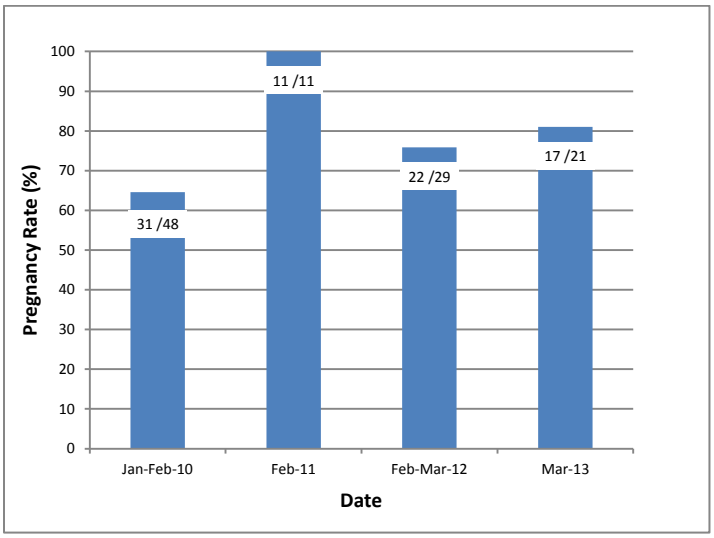

Figure 10: Bluenose East caribou herd- Pregnancy Rates (%)and includes sample sizes – Winter 2013

- The preliminary analysis indicates an average back fat of 4.22 (mm) in adult females (*Figure 11)* and an average of 0.67 (mm) in adult males (*Figure 12*) for the BNE herd in winter 2013. However, sample sizes varied and there was a range in the measurements taken, and results should be interpreted with this in mind. For example, though adult female back fat measurements in 2013 averaged 4.22mm, the range was 0-15mm and the sample size 18. By comparison the male average of 0.67mm was obtained from a sample size of 6, with a range of 0-2mm.

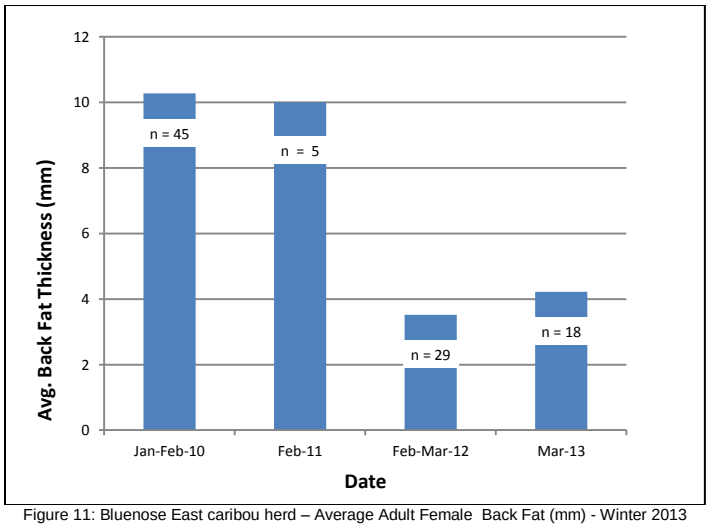

Figure 11: Bluenose East caribou herd – Average Adult Female Back Fat (mm) - Winter 2013

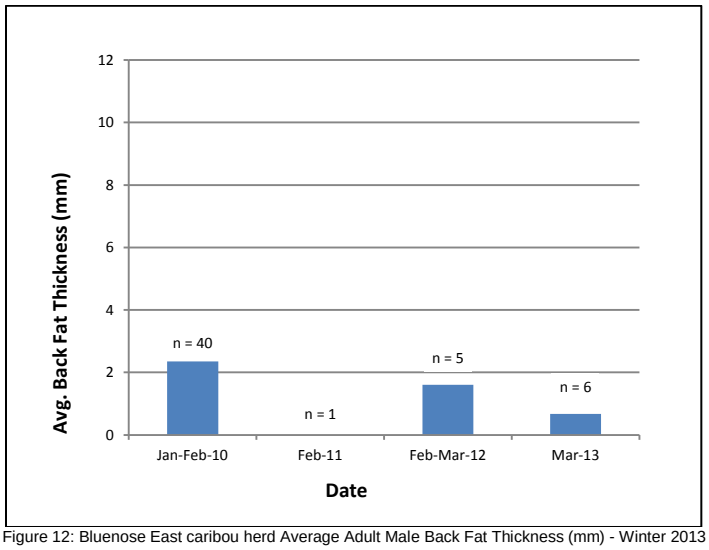

Figure 12: Bluenose East caribou herd Average Adult Male Back Fat Thickness (mm) - Winter 2013

- The preliminary analysis indicates an average kidney fat index of 57.3% in adult females (*Figure 13)* and an average of 33.0% in adult males (*Figure 14*) for the BNE herd in winter 2013. However, sample sizes varied and there was a range in the measurements taken, and results should be interpreted with this in mind. For example, though adult female kidney fat index in 2013 averaged 57.3%, the range was 25 – 105.1% and the sample size 21. By comparison the male index of 33.0% was obtained from a sample size of 6, with a range of 11.5 – 49.3%.

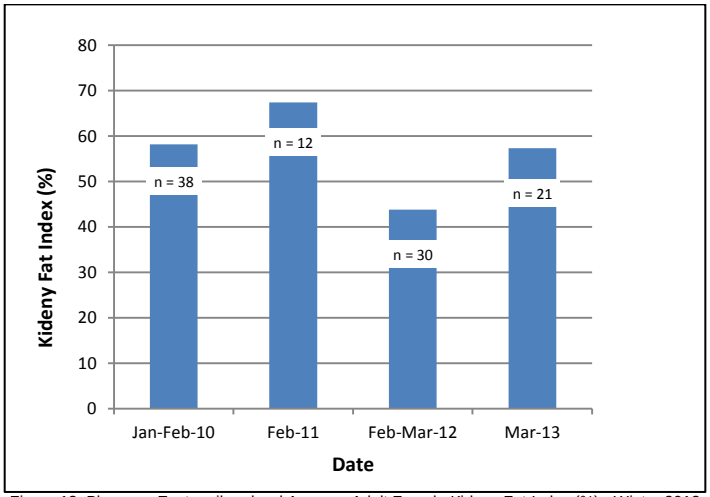

Figure 13: Bluenose East caribou herd Average Adult Female Kidney Fat Index (%) - Winter 2013

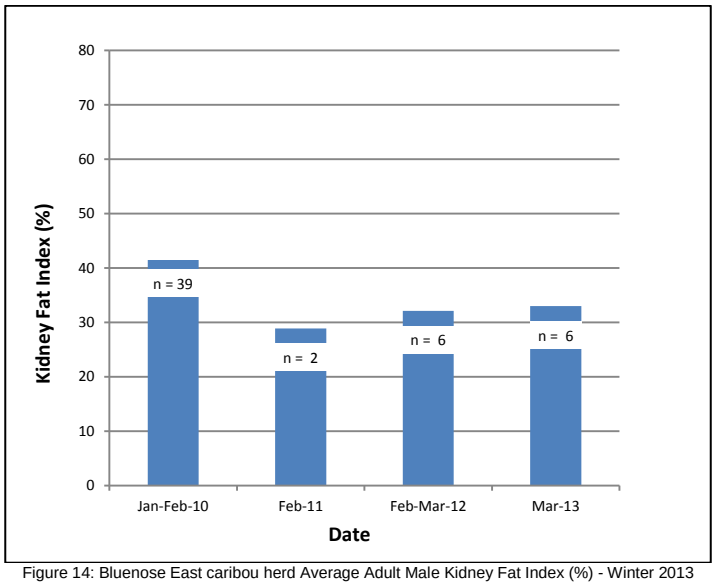

Figure 14: Bluenose East caribou herd Average Adult Male Kidney Fat Index (%) - Winter 2013

Beverly and Ahiak Caribou Herds

Satellite Collars

- There were no new collars were put out on the herd. A total of 20 collars remain on the herd.

Fall Composition Survey

- There was no survey conducted for fall 2012.

2011

- Survey was conducted from October 25 to 29, 2011.
- The preliminary analysis indicates a 69:100 bulls/cow ratio and a 54:100 calf/cow ratio for the Beverly and Ahiak herds.

2009

- Survey was conducted from October 28 to 30, 2009.
- The preliminary analysis indicates a 54:100 bulls/cow ratio and a 46:100 calf/cow ratio for the Beverly and Ahiak herds.

Calving Ground Abundance Survey

- No survey was conducted in 2013.

- Systematic Reconnaissance Survey for the Queen Maud Gulf was conducted in June 2013 by Nunavut. Preliminary results of the survey appear to be similar to 2011. The Government of Nunavut has prepared a report on the 2011 survey results[v].

Health & Body Condition Sampling

- Health & body condition sampling was conducted over the 2013 winter harvest season, including age estimate, field assessment (hunters), and pregnancy rates. A total of 22 samples were collected (6 females, 9 males, and 7 unidentified).
  - Total caribou sample kits submitted in 2012 from hunters: 24
    - All were harvested between January 2 and February 4, 2012 (Artillery Lake)
    - Sex composition of harvest: 17 females, 7 males

[v] http://env.gov.nu.ca/sites/default/files/bev_ek_survey_summary_report_dec_17_2012.pdf

- The pregnancy rate was ~ 83% based on presence of fetuses in 5 of 6 harvested caribou. (*Figure 15)*.
  - The winter 2012 results from harvested caribou, the pregnancy rate is ~62%.
  - The preliminary analysis of 26 blood samples from collared female caribou in March 2012 indicated 16/26 (~62%) were pregnant.

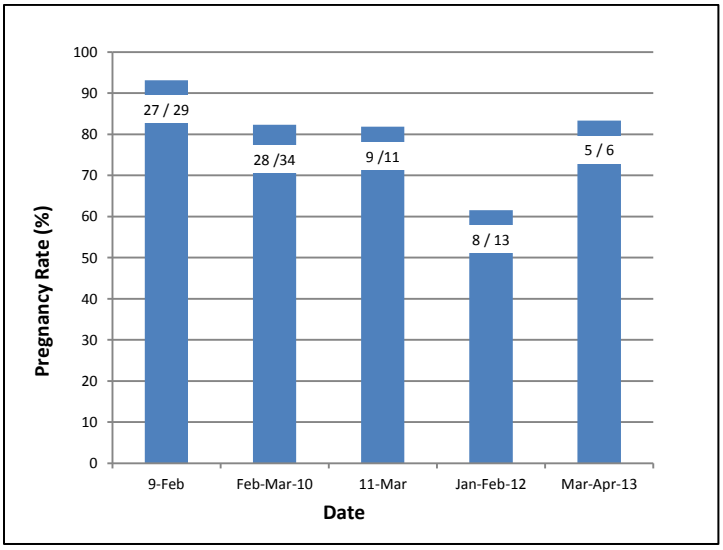

Figure 15: Beverly and Ahiak caribou herd Pregnancy Rate (%) and includes sample sizes - 2013

- Back fat thickness (mm) and kidney fat index (%) results are not available for 2013.

WOLF HARVEST

Wolf Carcass Collection/Necropsy

- The total number of wolf carcasses submitted to ENR in 2012- 2013 was 55 (26 male & 29 female).

Year†	Carcasses	Sample Sizes Male: Female	Sex Ratio Male: Female
1987-88	34	18:16	1.13 : 1
1988-89	55	30:25	1.20 : 1
1989-90*	211	109:102	1.07 : 1
1990-91*	93	45:48	0.94 : 1
1991-92*	150	74:76	0.97 : 1
1992-93*	4	3:1	3.0 : 1
1993-94 to 2002-03	no collections		
2003-04	52	30:22	1.36 : 1
2004-05	17	8:9	0.89 : 1
2005-06	105	55:50	1.10 : 1
2006-07	5	3:2	1.50 : 1
2007-08	40	22:18	1.22 : 1
2008-09	25	10:12	0.8 : 1
2009-10	19	11:8	1.38 : 1
2010-11	41	23:17	1.35 : 1
2011-12	80	45:35	1.29 : 1
2012-13	55	26:29	0.90 : 1

* Does not include wolf carcass collected in the Bathurst Inlet area
† Harvest year is 1 July to 30 June

- Up to and including the 2007-08 hunting season, wolf carcass collections in the North Slave Region were done by a single trapper. A North Slave Region-wide wolf carcass collection was introduced for 2009-09 and 2009-10 harvest years and wolf carcass collections became NWT-wide (all regions) in 2010-11 to 2012-13. During the region-wide collections $100/skinned wolf carcass was offered but was increased to $200/skinned carcass for the NWT-wide collections.

Incentive Payments

Incentive payments of $200/wolf pelt were given during the 2008-09 to 2009-10 harvest seasons. These payments increased to $400/wolf pelt beginning in the 2010-11 harvest season. To qualify, wolf pelts must be prime and properly prepared for the fur market. Incentive prices are guaranteed such that if the pelt sells for less than the incentive price, the GNWT absorbs the difference. If the pelt sells for more than the incentive awarded, the difference is given to the trapper and a $50/pelt is added on as a "prime fur bonus".

WOLF MONITORING ACTIVITIES

Wolf Den Survey

- The annual spring wolf den occupancy survey and follow-up late summer pup count survey was suspended in 2013 pending an ENR review of wolf monitoring methods.
  - Previous year's (2012) survey results 22 active wolf dens were observed in 4,970 km of flying within the study area. That converts to 4.43 active wolf dens/1000 km, an increase from 3.55 dens/1000 km in 2011, the lowest year recorded. There were 4.01 active dens/1000 km flown in 2010. Occupancy rate was estimated at 0.084, up from 0.060 in 2011 and 0.060 in 2010.
  -

- A reconnaissance survey occurred from May 28 to June 02, 2013 to search for candidate sites for collar deployment (*Figure 16*).
  - There were 14 active wolf dens were observed in 5,462 km of flying (34.5 hrs.) over 5½ days within the study area. Additional flying during the collaring effort added two more active wolf dens.
  - A total of 21 wolves were observed at the 14 den sites. Of the 14 active dens, 11 of them had only 1 wolf present. The other 3 dens had 2, 3, and 5 wolves present.

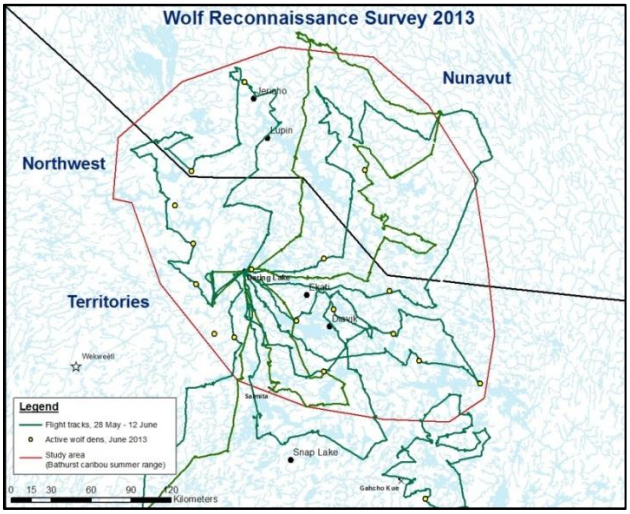

Figure 16: Wolf den reconnaissance survey indicating flight lines and active den locations - Summer 2013

Satellite Collars

- 16 GPS satellite collars were placed on female wolves between June 19- 23, 2013. Since deployment some wolves have died while some collars have failed or prematurely dropped off via a malfunction in their break-away mechanism.

Aerial/ Pup Count

- An aerial survey was conducted using a fixed-wing between August 23 – 25, 2012 to estimate recruitment of tundra wolves (*Figure 17*). Recruitment refers to the average number of pups that survive to late summer/early fall each year.

- Only 1 one den site remained active at the time of the summer and only 1 pup was observed.

- Although pups could have been moved elsewhere, the possibility of whole litter loss is possible, given that few caribou were observed in the study area then.

- Wolf den occupancy increased slightly this year, wolf pup recruitment is likely very low and wolf number are expected to remain low again this year.

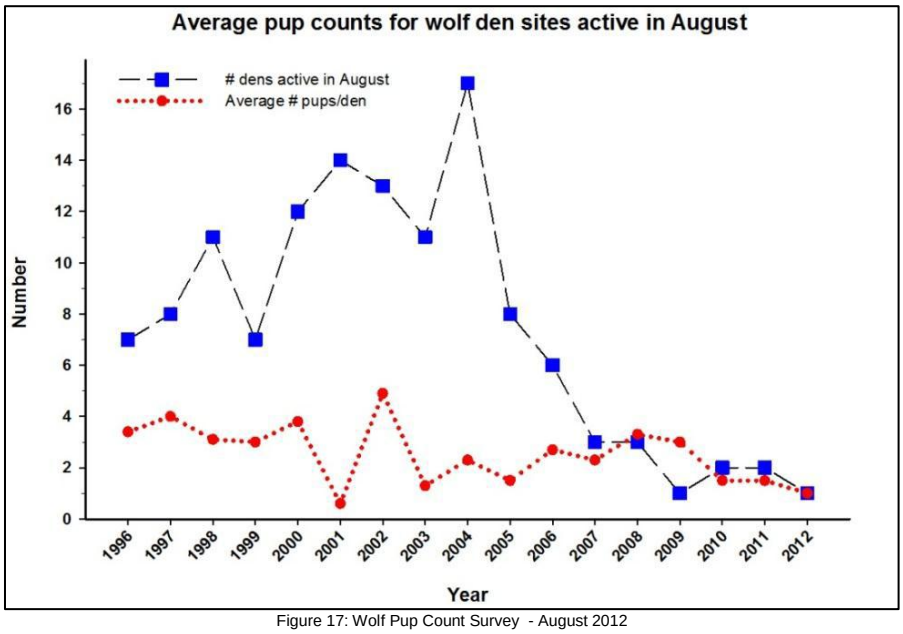

Figure 17: Wolf Pup Count Survey - August 2012