

Barren-Ground Caribou 2016/2017 Harvest Monitoring Summary

CARIBOU HARVEST

Bathurst caribou

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. In January 2015, a mobile management zone was formally implemented for Bathurst caribou to assist in the herd's recovery. The fall 2016 to winter 2017 harvest season saw the continued use of the Mobile Core Bathurst Caribou Management Zone to enforce the zero allowable harvest of the Bathurst herd.

There has been an annual allotment of 70 tags from Government of Nunavut to the Kitikmeot Regional Wildlife Board which in turn distributes to Hunters and Trappers Organizations. The 70 tags have been used for subsistence and outfitted hunts in the vicinity of Contwoyto Lake (Kqk'èeti) and Pellat Lake in Nunavut. Estimated harvest is summarized in Table 1.

Bluenose East caribou

Wildlife Management Boards in NWT and Nunavut held public hearings and made recommendations for reduced harvest of Bluenose-East caribou as a result of reduced population estimates. In June 2016, a Total Allowable Harvest (TAH) of 750 bulls was established in Wek'èezhìi for Bluenose East caribou. A TAH for Bluenose East caribou in the Sahtú was set at 150 in the fall of 2016. And a Nunavut Wildlife Management Board public hearing resulted in the establishment of a TAH in the fall of 2016 of 340 caribou for the Bluenose East herd in Nunavut. Estimated harvest is summarized in Table 2.

2016-17 – Harvest Season

Table 1: Bathurst Caribou Herd: Reported Harvest

Management Area	# Bulls	# Cows	# Calves	# Unknown	Total
NWT					0
Nunavut					~70
TOTAL					~70

Table 2: Bluenose-East Caribou Herd: Reported Harvest

Management Area	# Bulls	# Cows	# Calves	# Unknown	Total
North Slave Region*	15				15
Sahtu (Deline)	~93	~32			~125
Deh Cho Region					0
Nunavut				~165	~165
TOTAL					~305

*Hunters focused on accessing the Beverly caribou that were along the Tibbitt to Contwoyto winter road.

MONITORING ACTIVITIES

Bathurst Caribou

Fall Composition Survey

- A fall composition survey was not done for the Bathurst herd in 2016 (nor was it undertaken in 2015).
- The calf:cow ratio represents the number of calves per 100 cows that were born in June and survived to the fall of the same year. Calf:cow ratios below 30:100, if sustained, suggest a declining natural trend.
- Previous results for bull:cow ratio and calf:cow ratios are shown in Figure 1 and Figure 2 below.

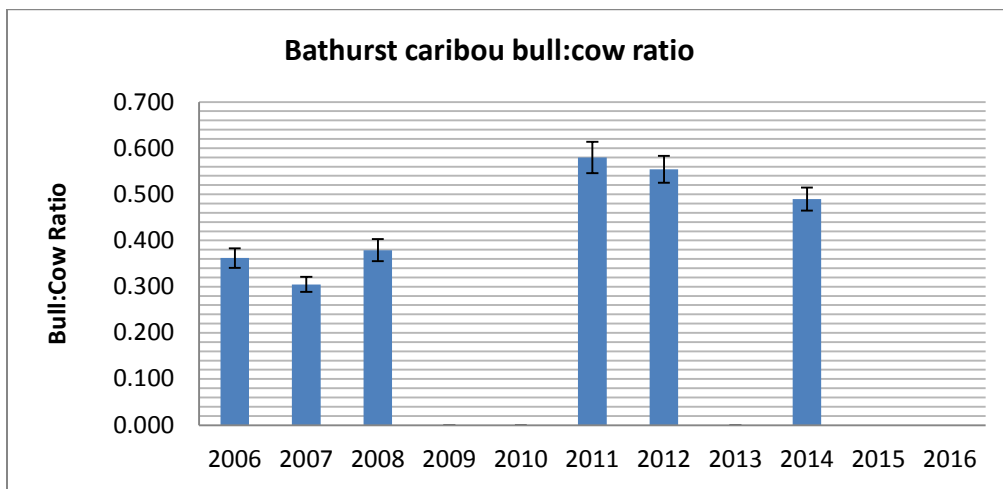


Figure 1: Bathurst caribou herd fall composition survey - bull:cow ratio. Error bars are standard error.

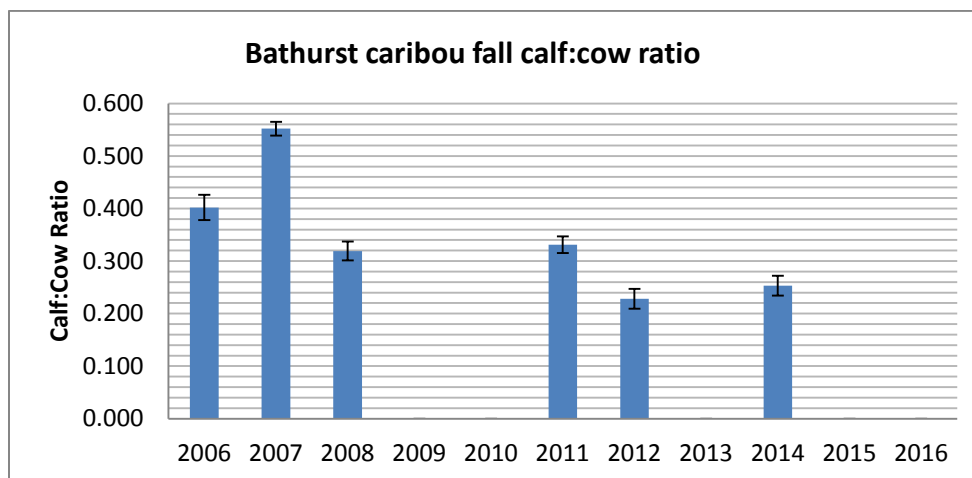


Figure 2: Bathurst caribou herd fall composition survey - calf:cow ratio. Error bars are standard error.

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Satellite Collars

- Target numbers of collars for the Bathurst herd in 2016/17 were 50 collars (30 cows and 20 bulls).
- A reconnaissance survey occurred from February 27 to March 5, 2017 to search for candidate sites for collar deployment.
- Between March 12 to 17, 2017, 5 cow collars and 4 bull collars were placed on adult caribou where Bathurst caribou spent the winter to retain target collar numbers for the herd.
- Blood samples were taken from the female caribou captured during collaring activities to determine pregnancy (Table 3). Note these pregnancy rates are for the sampled caribou which may or may not belong to the Bathurst herd. Herd assignment is made after an animal migrates to a calving ground in June.

Table 3: Bathurst Caribou Herd - Pregnancy Rates from Targeted Collared Caribou 2012 – 2017.*

Year	Number of Cows Tested*	Number of Cows Pregnant	Percent Pregnant (%)
2012	12	12	100
2013	2	2	100
2014	13	9	69
2015	16	12	75
2016	5	5	100
2017	7	7	100

* Blood not always collected for all cows captures. All samples taken were tested for pregnancy

Spring Recruitment Survey

- There was no spring 2017 recruitment survey conducted because there was substantial overlap between collared caribou of the Bathurst and Bluenose-East 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.
- Previous years spring survey results are shown in Figure 3.

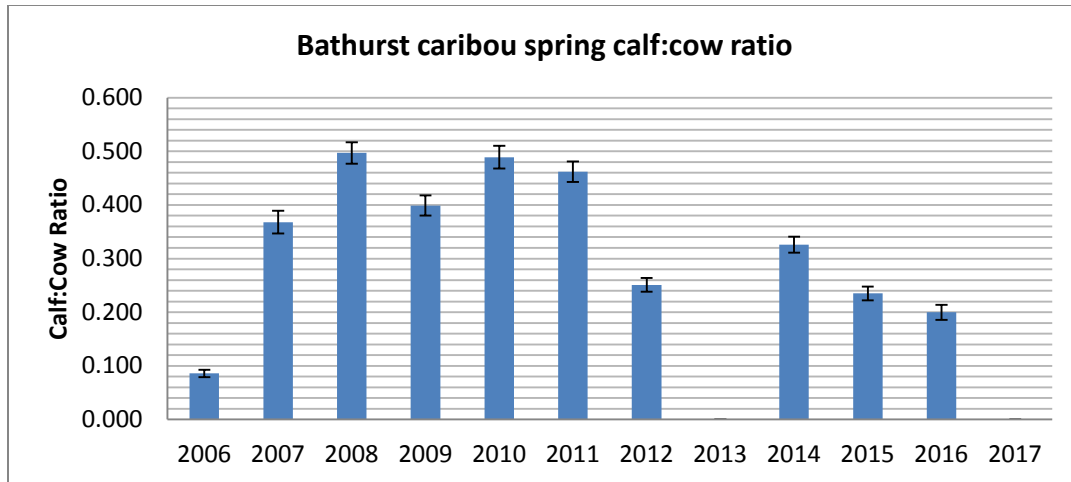


Figure 3: Bathurst caribou herd spring recruitment survey – calf:cow ratio. Error bars are standard error.

Calving Ground Reconnaissance Surveys

- There was no calving ground reconnaissance survey in 2017.
- In 2016, a calving ground reconnaissance survey gave an estimate of 10,576 +/- 1969.6 animals at least one year old in the core calving area.

Body Condition

- Body condition is evaluated by handlers during caribou collaring programs undertaken annually in March. The ranking system spans from 1 – 4 (skinny, not bad, fat, very fat).
- Average body condition for Bathurst caribou is shown in Figure 4.

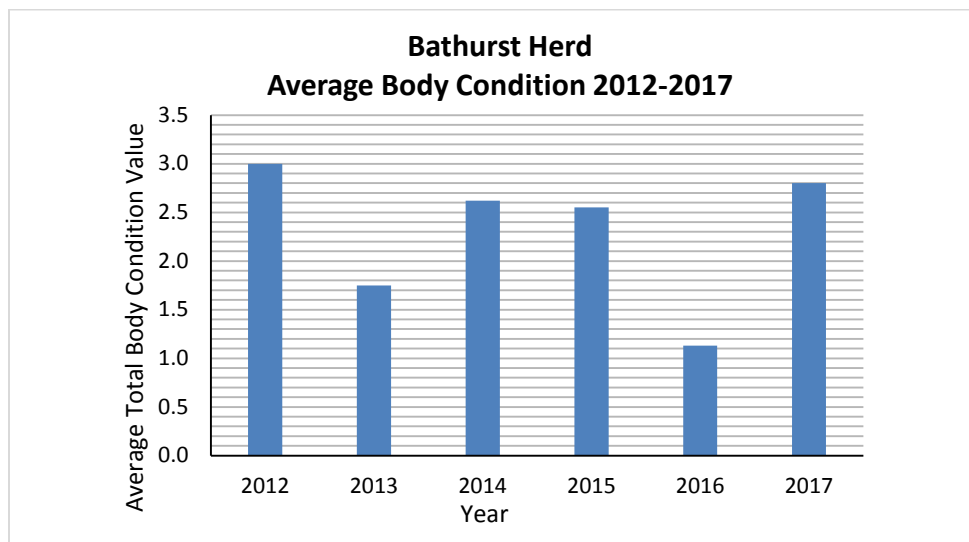


Figure 4: Bathurst caribou herd – Average body condition

- Besnoitia is a cyst-forming usually non-fatal disease that can cause sickness and infertility.

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- The presence of *Besnoitia* in caribou is assessed by handlers during caribou collaring by examining the eyes. *Besnoitia* cysts look like grains of salt on the whites of the eyes.
- Table 4 shows presence of *Besnoitia* in sampled Bathurst caribou.

Table 4: Bathurst caribou - Presence of *Besnoitia* in caribou samples during annual collaring programs in March.

Year	Total Tested	Total with <i>Besnoitia</i> (R)	Total with <i>Besnoitia</i> (L)	Percent with <i>Besnoitia</i> R (%)	Percent with <i>Besnoitia</i> L (%)
2012	0				
2013	0				
2014	13	3	3	23	23
2015	52	11	10	21	19
2016	12	3	1	25	8
2017	21	5	5	24	24

Bluenose-East Caribou Herd (BNE)

Fall Composition Survey

- A fall composition survey for the Bluenose East caribou herd was conducted by helicopter on 24-25 October 2016.
- 4019 caribou from 193 groups were classified with a mean group size 10.
- The analysis indicates a 37.2:100 bulls:cow ratio (Figure 5) and a calf:cow ratio of 43.4:100 (Figure 6) for the Bluenose-East herd.
- The calf:cow ratio represents the number of calves per 100 cows that were born in June and survived to the fall of the same year. Calf:cow ratios below 30:100, if sustained, suggest a declining natural trend.

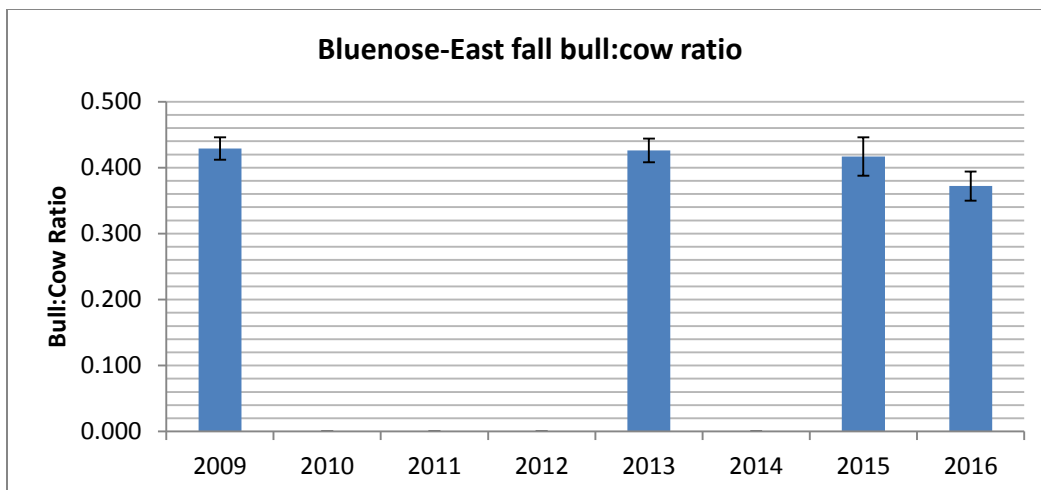


Figure 5: Bluenose-East caribou herd fall composition survey - bull:cow ratio. Error bars are standard error.

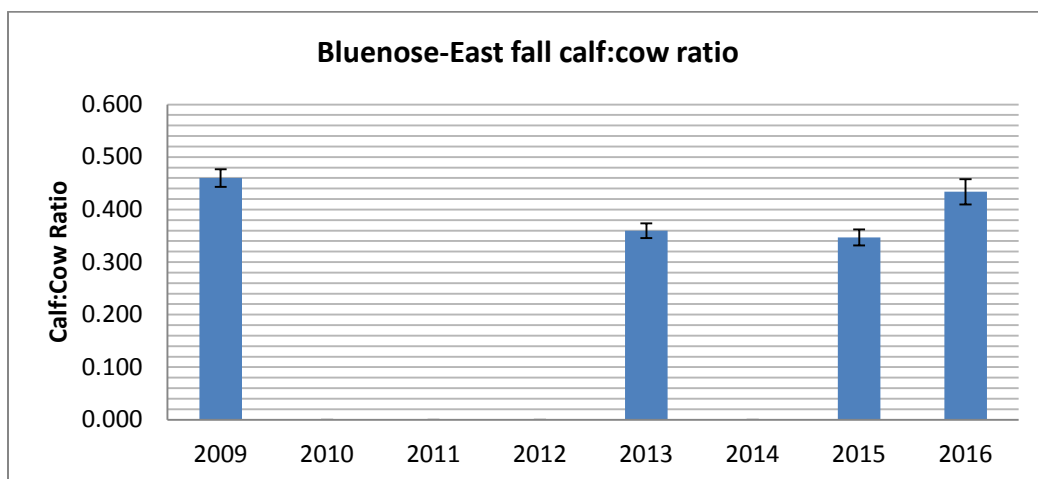


Figure 6: Bluenose-East caribou herd fall composition survey - calf:cow ratio. Error bars are standard error.

Satellite Collars

- A reconnaissance survey occurred from February 27 to March 5, 2017 to search for candidate sites for collar deployment.
- Our targets for 2016/17 were 50 collars (30 cows and 20 bulls) and between March 10 to 17, 2017, an additional 8 GPS collars were placed on cows and 14 were placed on bulls in the area where BNE caribou spent the winter.
- Blood samples were taken from the female caribou captured during collaring activities to determine pregnancy. The results indicate 5 out of the 5 caribou sampled (~100%) were pregnant (Table 5). Note these pregnancy rates are for the sampled caribou which may or may not belong to the Bluenose-East caribou herd. Herd assignment is made after an animal migrates to a calving ground in June.

Table 5: Bluenose-East caribou herd - Pregnancy Rates of Targeted Collared Caribou 2012 – 2017*

Year	Number of Cows Tested*	Number of Cows Pregnant	Percent Pregnant (%)
2012	35	27	77
2013	3	2	67
2014	8	7	88
2015	14	13	93
2016	13	11	85
2017	5	5	100

* Blood not always collected for all cows captures. All samples taken were tested for pregnancy

Spring Recruitment Survey

- No spring recruitment survey was conducted in 2017.
- Previous years' results are shown in Figure 7.

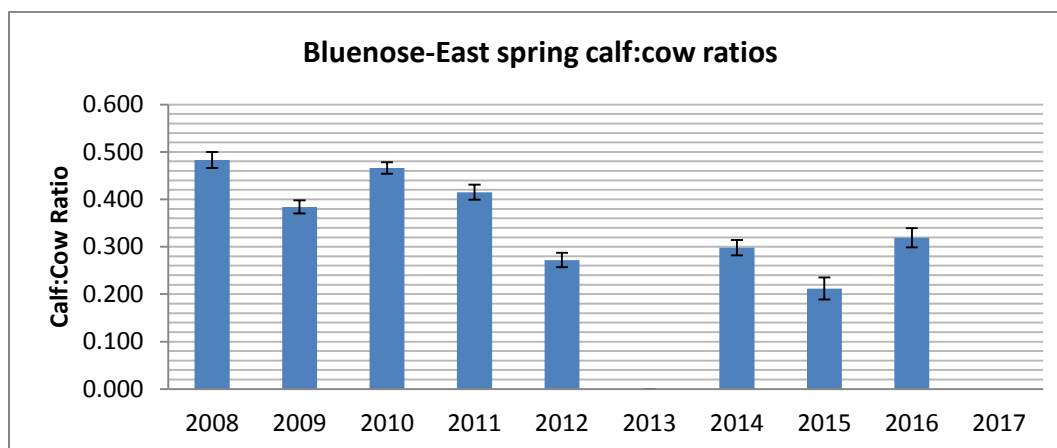


Figure 7: Bluenose East caribou herd spring recruitment survey – calf:cow ratio. Error bars are standard error.

Calving Ground Reconnaissance Surveys

- A visual calving ground reconnaissance survey was conducted by fixed-wing aircraft June 6-8, 2017.
- The results from the visual estimates of adult caribou in the core calving area were 33,782 ± 5189 caribou at least 1 year-old.

Calving Ground Photographic Survey

No calving ground photo survey to estimate population size of Bluenose-East caribou herd was conducted in 2017.

Body Condition

- Body condition is evaluated by handlers during caribou collaring programs. The ranking system

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spans from 1 – 4 (skinny, not bad, fat, very fat).

- Average body condition for Bluenose-East caribou is shown in Figure 8

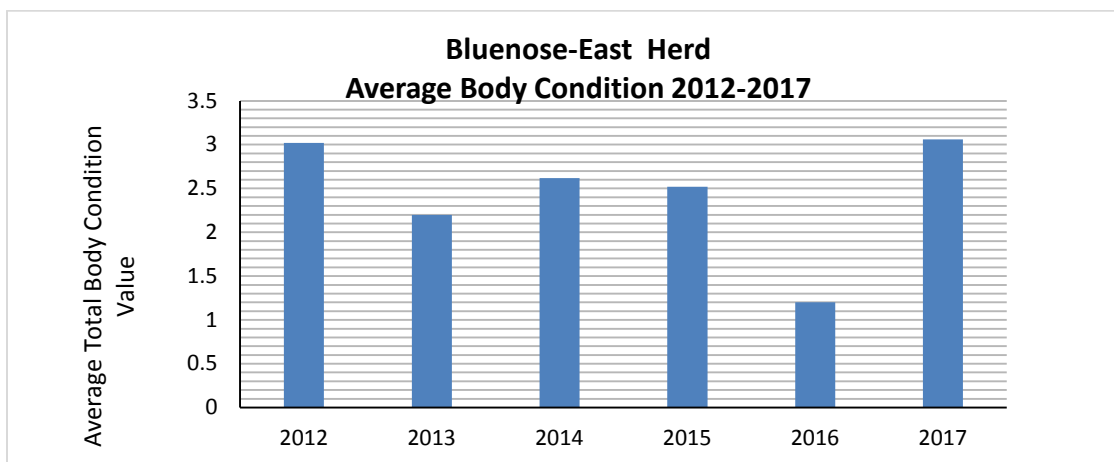


Figure 8: Bluenose-East caribou herd – Average body condition

- Besnoitia is a cyst-forming, usually non-fatal disease that can cause sickness and infertility.
- The presence of Besnoitia in caribou is assessed by handlers during caribou collaring by examining the eyes. Besnoitia cysts look like grains of salt on the whites of the eyes.
- Table 6 shows presence of Besnoitia in sampled Bluenose-East caribou.

Table 6: Bluenose-East caribou - Presence of Besnoitia in caribou samples during annual collaring programs in March.

Year	Total Tested	Total with Besnoitia (R)	Total with Besnoitia (L)	Percent with Besnoitia R (%)	Percent with Besnoitia L (%)
2012	0				
2013	0				
2014	13	1	1	8	8
2015	31	9	9	29	29
2016	19	0	1	0	5
2017	15	4	4	27	27

Beverly Caribou Herd

Fall Composition Survey

- No survey was conducted in 2016.
- Previous years fall composition survey results indicated a bull:cow ratio of 69:100 (2011) and 54:100 (2009) (Figure 9), and a calf:cow ratio of 54:100 (2011) and 46:100 (2009) (Figure 10).

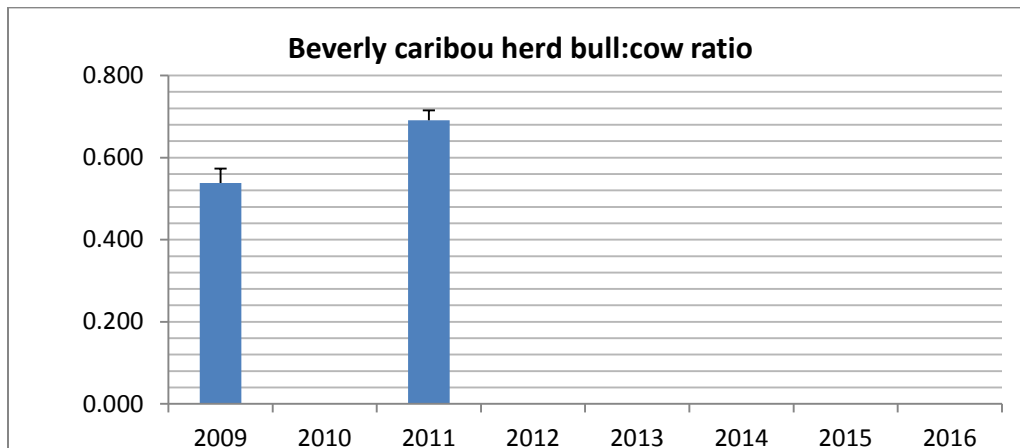


Figure 9: Beverly caribou herd fall composition survey - bull:cow ratio. Error bars are standard error.

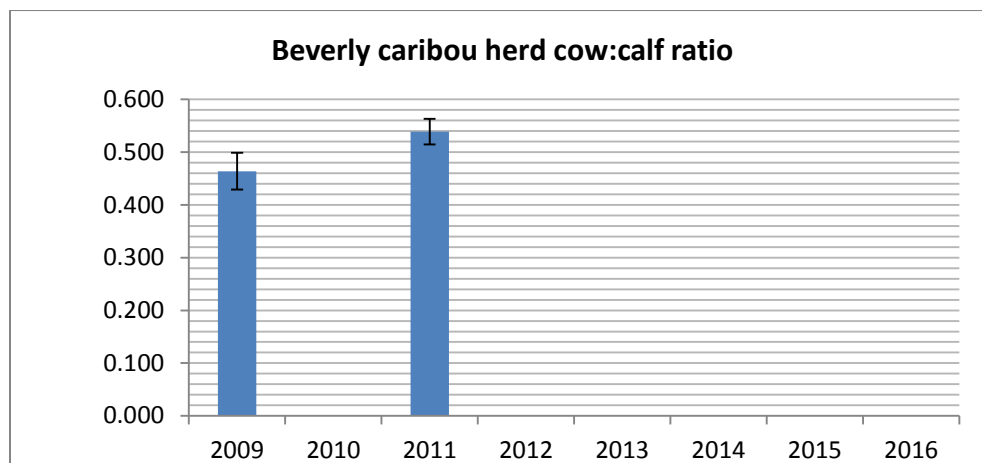


Figure 10: Beverly caribou herd fall composition survey -calf:cow ratio. Error bars are standard error.

Satellite Collars

- A reconnaissance survey occurred from February 27-March 5, 2017 to search for candidate sites for collar deployment.
- Target numbers for 2016/17 were 50 collars (30 cows and 20 bulls) and between March 18-22, 2017, a 15 GPS collars were placed on adult female caribou and 15 were placed on adult male caribou in the area where Beverly caribou spent the winter.
- Blood samples were taken from the female caribou captured during collaring activities to determine pregnancy. The results indicate 11 out of the 11 caribou sampled (~100%) were pregnant (Table 7). Note these pregnancy rates are for the sampled caribou which may or may not belong to the Beverly caribou herd. Herd assignment is made after an animal migrates to a calving ground in June.

Barren-ground Caribou Technical Working Group

Table 7: Beverly caribou herd - Pregnancy Rates of Targeted Collared Caribou 2012 – 2017.*

Year	Number of Cows Tested*	Number of Cows Pregnant	Percent Pregnant (%)
2012	18	10	56
2013	1	1	100
2014	23	20	87
2015	8	3	38
2016	0	0	-
2017	11	11	100

* Blood not always collected for all cows captures. All samples taken were tested for pregnancy

Spring Recruitment Survey

- The spring recruitment survey was conducted by helicopter on March 18, 20, and 21, 2017.
- 4282 caribou from 220 groups were classified with a mean group size of 13.
- The results of the spring recruitment survey indicated a calf:cow ratio of 41.9:100 (Figure 11). Ratios below 30:100, if sustained, suggest a declining natural trend.

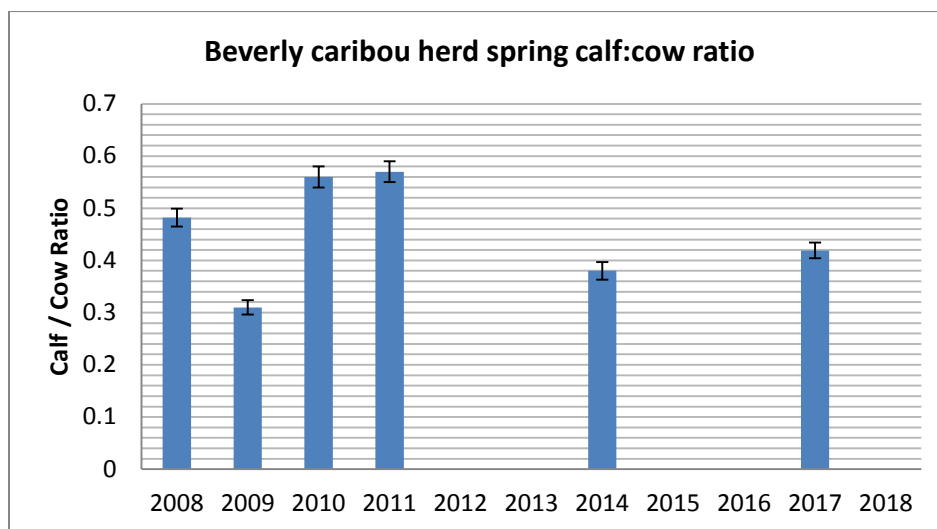


Figure 11: Beverly caribou herd spring recruitment survey – calf:cow ratio. Error bars are standard error.

Calving Ground Reconnaissance Surveys

- The calving ground reconnaissance survey was flown in June 2016. The estimated number of adult caribou on the calving ground was 48,086 (SE 5803, CI 36,382-59,790).

Calving Ground Survey

- There has been no calving ground photo survey conducted since 2011.¹ At that time the herd was estimated at 124,189 with a standard error of 13,996. Since 2011 the survey results have

¹Campbell et al. "Calving ground Abundance Estimates of the Beverly and Ahlak Subpopulations of Barren-ground Caribou (*Rangifer tarandus groenlandicus*) – June 2011" Government of Nunavut, Department of Environment, Technical Report Series – No:01-2013. April 23, 2014.

Barren-ground Caribou Technical Working Group

been reworked taking into account caribou on the Adelaide Peninsula.² The revised estimate for this herd in 2011 is 136,608 with a standard error of 6,603.

Body Condition

- Body condition is evaluated by handlers during caribou collaring programs. The ranking system spans from 1 – 4 (skinny, not bad, fat, very fat).
- Average body condition for Beverly caribou from 2012 to 2017 is shown in Figure 12.

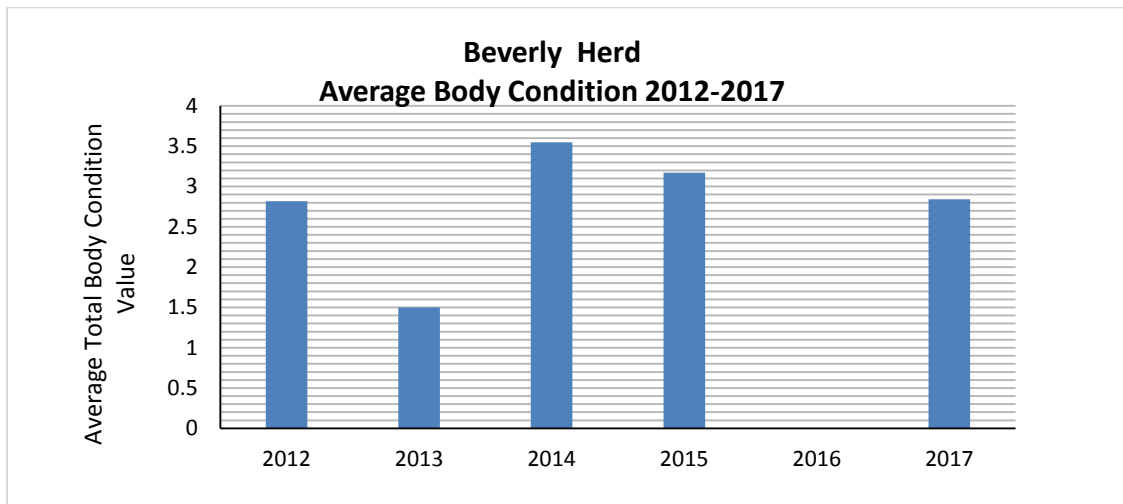


Figure 12: Beverly caribou herd – Average body condition

- Besnoitia is a cyst-forming, usually non-fatal disease that can cause sickness and infertility.
- The presence of Besnoitia in caribou is assessed by handlers during caribou collaring by examining the eyes. Besnoitia cysts look like grains of salt on the whites of the eyes.
- Table 8 shows presence of Besnoitia in sampled Beverly caribou from 2014 to 2017.

² Campbell, M. D. Lee and J. Boulanger. 2019. Abundance Trends of the Beverly Mainland Migratory Subpopulation of Barren-Ground Caribou (*Rangifer tarandus groenlandicus*) June 2011 – June 2018. Government of Nunavut, Department of Environment Technical Report Series – No: 01-2018. May 30, 2019.

Table 8: Beverly caribou - Presence of Besnoitia in caribou samples during annual collaring programs in March.

Year	Total Tested	Total with Besnoitia (R)	Total with Besnoitia (L)	Percent with Besnoitia R (%)	Percent with Besnoitia L (%)
2012	0				
2013	0				
2014	23	0	4	0	17
2015	24	4	3	17	13
2016	0				
2017	27	1	1	4	4

WOLF HARVEST

Wolf Carcass Collection/Necropsy

- The wolf carcass collection program in the North Slave Region was intended to monitor the nutritional and reproductive condition of wolves. Incentives were introduced in 2010 to encourage an increase in wolf harvest to help the recovery of caribou.
- While an increase in wolf harvest occurred during the incentive program, many wolves (e.g., >25%) were killed near communities and dumps and did not target areas where barren-ground caribou recovery was desired.
- A wolf skull collection program replaced the carcass collection program, at \$50/skull, in the 2013/14 season. Collecting the skull from wolf hunters still allowed for collecting tissue samples for genetic and stable isotope analysis, skull morphology measurements, and a method of recording the wolf harvest both numerically and spatially.
- The total number of wolf skulls submitted to in 2016-17 was 74 (35 male, 28 female and 11 unknown) . Table 9 shows the number of carcasses and/or skulls and the sex breakdown over time.

Table 9. Wolf Carcass/Skulls Collection

Year[†]	Carcasses/Skulls	Male:Female
1987-88	34	18:16
1988-89	55	30:25
1989-90*	211	109:102
1990-91*	93	45:48
1991-92*	150	74:76
1992-93*	4	3:1
1993-94 to 2002-03	no collections	
2003-04	52	30:22
2004-05	17	8:9
2005-06	105	55:50
2006-07	5	3:2
2007-08	40	22:18
2008-09	25	10:12
2009-10	19	11:8
2010-11	41	23:17
2011-12	80	45:35
2012-13	55	26:29
2013-14**	24	16:8
2014-15	21	11:9
2015-16	56	16:12
2016-17	74	35:28

* Does not include wolf carcass collected in the Bathurst Inlet area

** Skull collection

† Harvest year is 01 July to 30 June

WOLF MONITORING ACTIVITIES

Wolf Den Survey

- Wolf den surveys were terminated after 2012.
- In 2012, survey results were 4.43 dens/1000km (2012), 3.55 dens/1000km (2011, which was the lowest year recorded) and 4.01 active dens/1000km (2010).
- No further wolf monitoring activities have been initiated since 2014.