

### ***Commitment 3 – Caribou distribution data***

**Parties:** WRRB and GNWT

**Reference:** Meeting note from August 23, 2017

GNWT commits to describe the likelihood of caribou distribution relative to the RSA by specifically including all available data on the distribution of barren-ground caribou on the western winter ranges including locations of harvesting and locations of caribou recorded during winter aerial surveys since 1996.

#### **Response:**

Maps described or referenced below are provided in the attached maps package.

The Regional Study Area (RSA) for assessing impacts to barren-ground caribou from the TASR project was based on a 35 km buffer around the Project footprint (ASR page 4-5; Figure 4.1-2), representing an area of over 1 million hectares (Table 4.1-2).

The Adequacy Statement Response (page 4-27), and response to WRRB IR#3 acknowledged that although the project likely occurs outside of the core seasonal range boundaries based on locations obtained from collared caribou cows (Nagy et al. 2005; Anderson and Johnson 2014; Golder 2016; Appendix G), TK indicated that barren-ground caribou have occurred in areas near the north end of the Project during winter ([PR#28](#)), likely during periods of high abundance.

Annual ranges of collared caribou from 1996 to 2015 and 2005 to 2015 from the Bathurst and Bluenose-East caribou herds, respectively, are presented in Appendix G of the Adequacy Statement Response (Page 638-640, [PR#110](#)). The Tłıchq All-Season Road Project (TASR) RSA overlaps with the western boundary of the annual Bathurst caribou range delineated by Nagy et al. (2011) based on collar data from 1996-2009, but is completely outside 100% Utilization Distribution mapped by Caslys Consulting Inc. based on collar data spanning a more recent time period from 2002-2015. The TASR RSA is completely outside the annual range of the Bluenose-East caribou herd based on the 100% Utilization Distribution of collar data from 2005-2015.

In response to WRRB IR#6 ([PR#134](#)), GNWT confirmed that there were no collar locations from collared cows collected from 1996 to 2016 that were within the 35 km buffer around the TASR footprint. Furthermore, even when a large buffer of 50 km is applied to the Project footprint, only twenty three locations from the Bathurst

herd were within this 50 km buffer during 1996 to 2017. All of the Bathurst caribou locations within the 50 km buffer occurred north of the RSA and indicate no interaction with Project. No locations from the BNE herd occur within 50 km of the Project footprint.

Despite the information provided by the GNWT for the TASR EA to date, GNWT acknowledges that barren-ground caribou could interact with the TASR in the future if the population of Bluenose East and Bathurst caribou herds increase to former levels, and that collared caribou only capture a small portion of the movement and distribution of these herds at times year when they are more dispersed. The GNWT's technical submission for the NICO Project EA0809-004 (GNWT 2012<sup>1</sup>) emphasized the importance of recognizing the "long term" range used by barren-ground caribou herds, and provided maps that included locations of barren-ground caribou observed during spring surveys from 2008 to 2012, in addition to collar data. Figure 4 in the NICO technical submission illustrated that animals may be more widespread than the satellite data alone suggest, and illustrated use of the larger winter range. Furthermore GNWT pointed out that only a fraction of 1% of the herd is radio-collared, thus some ranges used by one or more herds may not include collared caribou in the area. Figure 4 from the GNWT's NICO Project technical submission indicates that there was one sighting of barren-ground caribou inside the TASR RSA from a spring survey (Dec-March) conducted in 2012.

#### Overlap with the TASR RSA based on GNWT aerial survey data:

GNWT reviewed the following information sources to further assess whether the distribution of barren-ground caribou (Bathurst and Bluenose East herds) on their winter ranges overlapped with the RSA for the Tłı̨ch̨o All-Season Road based on aerial survey data from 1985-2016:

- 1) Williams, T.M. and Fournier, B. 1996. Summary of spring classification surveys of the Bathurst caribou herd from 1985-1995. Manuscript Report No. 92. Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories, Yellowknife, NT.  
<http://www.enr.gov.nt.ca/sites/enr/files/92.pdf>
- 2) Gunn, A.G., J. Boulanger, and J. Williams. 2005. Calf survival and adult sex ratio in the Bathurst herd of barren-ground caribou 2001-2004. Manuscript

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<sup>1</sup> GNWT. 2012. Government of the Northwest Territories Technical Report, June 19, 2012. Fortune Minerals Ltd. – NICO Project – EA0809-004 [2009].  
[http://www.reviewboard.ca/upload/project\\_document/EA0809-004\\_GNWT\\_Technical\\_Report.PDF](http://www.reviewboard.ca/upload/project_document/EA0809-004_GNWT_Technical_Report.PDF)

Report 163, Department of Environment and Natural Resources,  
 Government of the Northwest Territories, Yellowknife, NT.  
[http://www.enr.gov.nt.ca/sites/enr/files/calf\\_survival.pdf](http://www.enr.gov.nt.ca/sites/enr/files/calf_survival.pdf)

- 3) Cluff, H.D., Croft, B., and Boulanger, J. 2017. Calf Production and Adult Sex Ratio in the Bathurst and Bluenose East Herds of Barren-Ground Caribou 2006-2016. Unpublished draft Manuscript Report. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT.
- 4) J. Adamczewski, J. Boulanger, B. Croft, D. Cluff, B. Elkin, J. Nishi, A. Kelly, A. D'Hont, and C. Nicolson. 2009. Decline in the Bathurst Caribou Herd 2006-2009: A technical Evaluation of Field Data and Modeling. Draft Technical Report. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT.  
[http://wrrb.ca/sites/default/files/Adamczewski\\_2009.pdf](http://wrrb.ca/sites/default/files/Adamczewski_2009.pdf)
- 5) Spatial data available in GNWT ENR's Wildlife Information Management System database consisted of the following projects that provided information on distribution of Bathurst and Bluenose East barren-ground caribou from aerial spring composition surveys:

<b>Project #</b>	<b>Project Name</b>	<b>SURVEY DATA TYPE</b>
69	Sahtu - Bluenose East Caribou Spring Survey 2005	Aerial surveys
87	North Slave - Bathurst Caribou Spring Composition Survey 2006	Aerial surveys
89	North Slave - Bathurst Caribou Spring Composition Survey 2007	Aerial surveys
91	North Slave - Bathurst Caribou Spring Composition Survey 2008	Aerial surveys
95	North Slave - Bathurst Caribou Spring Composition Survey 2001	Aerial surveys
96	North Slave - Bathurst Caribou Spring Composition Survey 2002	Aerial surveys
97	North Slave - Bathurst Caribou Spring Composition Survey 2003	Aerial surveys
98	North Slave - Bathurst Caribou Spring Composition Survey 2004	Aerial surveys
126	Sahtu - Bluenose East Caribou Spring Survey 2009	Aerial surveys
131	North Slave - Bathurst Caribou Spring Composition Survey 2009	Aerial surveys
132	Sahtu/NWT - Barren-ground Caribou Late Winter Surveys 2004	Aerial surveys
166	North Slave - Barren-ground Caribou	Aerial surveys

	Reconnaissance Survey March 16-19, 2010	
167	North Slave - Barren-ground Caribou Reconnaissance Survey March 3-4, 2010	Aerial surveys
170	North Slave - Bathurst Caribou Spring Composition Survey 2010	Aerial surveys
172	North Slave - Barren-ground Caribou Reconnaissance Surveys 2010	Aerial surveys
268	North Slave - Barren-ground Caribou sightings Nov 2004	Aerial surveys
269	North Slave - Bathurst Caribou Spring Composition Survey 2011	Aerial surveys
270	Sahtu - Bluenose East Caribou Spring Composition Survey 2011	Aerial surveys
282	North Slave - Bathurst Caribou Reconnaissance Survey January 2012	Aerial surveys
297	Sahtu - Bluenose East Caribou Spring Composition Survey 2012	Aerial surveys
298	North Slave - Bathurst Caribou Spring Composition Survey 2012	Aerial surveys
346	North Slave - Bathurst Caribou Spring Composition Surveys 2014 to present	Aerial surveys
347	Sahtu - Bluenose East Caribou Spring Composition Surveys 2014 to present	Aerial surveys
351	Bathurst Caribou spring composition survey, 2016	Aerial surveys
352	Bluenose East Caribou spring composition survey, 2016	Aerial surveys

The following information is taken from Cluff et al. (2017 unpublished draft):

Composition surveys to estimate over-winter calf production were conducted by the Wildlife Division at ENR Headquarters from 1979 to 1995, paused for five years, then resumed in 2001 (Williams & Fournier 1996, Gunn et al. 2005a). Beginning in March 2006, the North Slave regional office assumed responsibility for conducting these surveys for the Bathurst caribou herd. Prior to spring 2009, the Sahtu regional office conducted composition surveys for the Bluenose East herd. However, for the spring 2009 survey, the North Slave Region (NSR) assisted with the reconnaissance component. Beginning with the Fall 2009 survey, the NSR assumed responsibility for conducting Bluenose East composition surveys for all subsequent years.

The Bluenose East herd often winters in the northeastern portion of the NSR, which can sometimes lead to significant range overlap with the adjacent Bathurst caribou

herd. While it became logistically practical to conduct the composition surveys from the NSR, increased residency time of the Bluenose East herd in this region also led to more interest in the herd by North Slave communities.

Reconnaissance flights are “semi-systematic” and cover the area with collared caribou, the known distribution of barren-ground caribou derived from any previous aerial surveys or monitoring programs done earlier that winter, and include recent reports of caribou sightings from communities and aircraft pilots. Often a reconnaissance survey in spring is flown as transects. In these cases, a more complete determination of caribou abundance and distribution is needed to inform planning for new deployment of radio-collars. Typically, the reconnaissance team is composed of one observer/navigator in the front (co-pilot seat), and four observers in the back seats. The number of caribou, incidental sightings, and fresh tracks are recorded, plus a GPS track obtained of the flight path. Maps showing this information are created for use during the classification part of the survey.

For the composition/classification survey, a helicopter (Bell 206B, 206L or A-Star) was used to search for caribou groups in the vicinity of satellite collared caribou cows and where caribou were observed during the reconnaissance flight(s). Depending on the interval between reconnaissance and composition surveys, some shift in location is expected, as caribou move about the landscape, especially during fall. Flight paths are dispersed across the known barren-ground caribou distribution of interest where possible. In years where overlap in the winter range of adjacent herds (Bluenose East and Ahiak/Beverly herds) was substantial, we focused on areas where only the target herd was found.

Fall classification surveys are typically completed in October, and spring classification typically takes place in late March/early April. No spring surveys were conducted in 2013, and no fall surveys were conducted in 2009, 2010, and 2013 for Bathurst caribou. No spring survey was conducted in 2013, and no fall surveys conducted in 2010, 2011, 2012, and 2014 for the Bluenose East herd.

Based on the maps of fall and spring surveys provided in Cluff et al. (2017), there were 10 spring surveys that had flightlines overlapping the TASR RSA, and only one caribou sighting in 2012 within the TASR RSA from a Bluenose East spring composition survey (Table 1). **Based on this information, barren-ground caribou were sighted within the TASR RSA in 1 year out of the 9 (11%) years during which either fall or spring surveys were conducted between 2006 and 2016.**

Table 1. Summary of maps provided in Cluff et al. (2017) of spring and fall aerial composition surveys conducted between 2006-2016 maps that had flightlines

overlapping the TASR RSA. Any sightings of barren-caribou within the TASR RSA are noted.

<b>Figure #</b>	<b>Herd</b>	<b>Year</b>	<b>Survey Timing</b>	<b>Caribou observations in TASR RSA?</b>	<b>Comment</b>
A3	Bathurst	2007	Spring	No	
A11	Bluenose East	2010	Spring	No	
A12	Bathurst	2011	Spring	No	
A13	Bluenose East	2011	Spring	No	
A16	Bluenose East	2012	Spring	Yes	One sighting north of Whatì on eastern shore of Lac la Martre
A20	Bluenose East	2014	Spring	No	
A22	Bathurst	2015	Spring	No	
A23	Bluenose East	2015	Spring	No	Two caribou sightings on west side of Lac La Martre outside TASR RSA
A25	Bathurst	2016	Spring	No	
A26	Bluenose East	2016	Spring	No	

Fall and spring aerial composition surveys conducted for the Bathurst herd between 2001-2004 are summarized in Gunn et al. (2005). Based on an examination of the maps provided in this report, none of the flight lines for spring and fall composition surveys during this study period overlapped with the TASR RSA, and no surveys were conducted around Lac La Martre. Therefore, no data on barren-ground caribou within or near the TASR RSA is available for this period from aerial surveys. It is important to note that no spring classification surveys took place between 1995-2000.

Williams and Fournier (1996) summarizes spring classification surveys conducted from 1985-1995 for the Bathurst caribou herd. Classification surveys were conducted in 1985, 1987-1989, and 1991-1995, for a total of ten surveys. There was only 3 out of 9 years where survey flights overlapped with the TASR RSA, 1989 (Figure 6), 1994 (Figure 11) and 1995 (Figure 12); however, 1995 was the only year where a group of Bathurst caribou was sighted that overlapped with the TASR RSA (Figure 22) in the area southwest of Lac La Martre. Based on this information, **there was 1 year out of 9 (11%) where Bathurst caribou distribution overlapped with the TASR RSA based on aerial surveys conducted between 1985-1995.**

A query of the available aerial survey data in ENR's Wildlife Management Information System from 2001-2016 indicated that there were 3 barren-ground caribou observations within the TASR RSA (Figure A). All three observations were made on a survey conducted in November 2004, and group observed were 1, 4 and 200 individuals. The observation made south of Whatì consisted of a group of 4 individuals. Based on this information, **there was 1 year out of 15 (7%) where Bathurst caribou distribution overlapped with the TASR RSA based on aerial surveys conducted between 2001-2016.**

#### Harvest Data:

GNWT evaluated spatial harvest data on barren-ground caribou available in existing reports to determine overlap of harvest locations with the TASR RSA. Legat et al. (2015)<sup>2</sup> provides a series of maps in Appendix I of that report displaying annual barren-ground caribou distribution based on Tłıchǫ harvesting patterns in winter and spring from 1925 to 1998. The maps are based on interviews with 28 elders and harvesters to document their oral histories associated with harvesting caribou.

The following table summarizes the number of annual caribou distribution polygons from 1925 to 1998 that overlap with the TASR RSA, based on a visual assess of the maps in Appendix I of Legat et al. (2015):

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<sup>2</sup> Legat, A., Chocolate, G., Gon, B., Zoe, S.A., and Chocolate, M. 2014. Caribou Migration and the State of their Habitat: Tłıchǫ Knowledge and Perspectives on zekwǭ (Barrenland Caribou). [Tłıchǫ Traditional Knowledge Reports: Series 2](#). Tłıchǫ Research and Training Institute.

<b>Year Range</b>	<b>Number of polygons overlapping with TASR RSA</b>
1941-1946	1
1947-1952	2
1965-1970	4
1971-1977 (no data in 1972)	1
1986-1991	1
<b>Total</b>	<b>9</b>

No data was available for 1972, and 1981/1982, so between 1925 and 1998 there were 70 years with caribou distribution based on harvesting patterns. There were 9 years that had polygons overlapping the TASR RSA. **If the same patterns of barren-ground caribou distribution reoccurred over the next 70 years, there would be a 13% likelihood (9 out of 70 years) that barren-ground caribou distribution would overlap with the TASR RSA.** This information supports the assumption made in the ASR that barren-ground caribou distribution could overlap with the TASR RSA if populations increase again in the future.

Adamczewski et al. (2009) also provides two maps of spatial data on aboriginal harvest of barren-ground caribou in the NWT. The North Slave ENR regional office in collaboration with the Tli Cho Land Protection Department operated a check-station on the winter road to Gamètì and Wekweètì during winters 2007/2008 and 2008/2009. In addition, hunters from Whatì, Gamètì and Wekweètì were interviewed to determine numbers of caribou harvested during the two years of the project from hunters of those three communities (Figure 5.21a and 5.21b). The total reported harvest for those winters were 1690 and 2712 caribou respectively, with more than half being cows (B. Croft and T. J. Rabesca, ENR, unpublished data). Figure 5.21a in this report indicates that some barren-ground caribou winter harvest took place in 2007/2008 within 10x10 km grid cells that overlapped the TASR RSA along the south and southwest shores of Lac La Martre. Figure 5.21b suggests that there was no harvest within the TASR RSA in 2008/2009, although harvest of 18 caribou was arbitrarily assigned to the check station near Whatì because no location data was provided for those harvested caribou. This information suggests that there may have been barren-ground caribou in the TASR RSA in winter 2007/2008 that weren't captured by the aerial surveys conducted that year, although this may be due to these being Bluenose East caribou whereas aerial surveys in that year were focussed on Bathurst caribou.

## **Summary**

The available maps and spatial data from aerial surveys and harvest information for Bathurst and Bluenose-East barren-ground caribou both indicate that there has



been some overlap of individuals from these herds with the TASR RSA between 1925 and 2016. Most of the overlapping barren-ground caribou sightings from aerial surveys occurred north of the TASR road alignment within the 35 km buffer used to define the RSA. Information from both these sources suggests that there would be a 7-13% potential likelihood of future overlap of these barren-ground caribou herds within the 35 km buffer around the TASR that defines the RSA. It should be noted that there is a high degree of uncertainty surrounding this estimate, as future distribution of the Bathurst and Bluenose East barren-ground caribou herds during winter will depend on a number of factors such as population size, climatic conditions (snow and ice conditions), and the state of winter habitat which may be influenced by forest fires, development and rates of habitat recovery.

As GNWT-ENR's barren-ground caribou monitoring programs are expected to continue well into the future, GNWT will use caribou collar locations, as well information from aerial surveys and reports of caribou sightings from communities and aircraft pilots to monitor whether or not barren-ground caribou move within the vicinity of the TASR. As outlined in the draft WMMP, if barren-caribou locations are noted within 10 km of the TASR alignment, GNWT will follow up with ground-based or aerial surveys to determine the number of individuals that might be in the area.