

## INFORMATION REQUEST # 50

**Source:**  
MVEIRB

### **Request**

Dezé Energy to provide an analysis of the probability of caribou from the Ahiak and the Beverly Herd encountering the project. How will this change over time considering the historic winter distribution of barren-ground caribou?

### **Response**

This response replaces that provided in the document: Commitments 2009. Commitments Arising From The Mackenzie Valley Environmental Impact Board Technical Sessions Held In Yellowknife On October 1st, 2nd, And 5th And In Lutsel K'e on September 30th, 2009. The original document was submitted to the Review Board by Dézé Energy, and was added to the public registry on 2 November, 2009, in relation to the environmental assessment for the Taltson Hydroelectric Expansion Project (EA0708-007).

#### Transmission line encounter rates by Beverly and Ahiak caribou

The DAR contains a summary of the number of collared caribou that have encountered the proposed Taltson transmission line alignment (Table 9.5.7 in the DAR) based on movements of satellite data collected from 1995 to 2007. The data was sporadic, but indicated that there had been no encounters of the proposed transmission line route by Beverly caribou and some encounters by Ahiak caribou. Collared caribou were assumed to have encountered the proposed transmission line if a tracking location occurred within 5 km of the proposed transmission line.

It has since been brought to our attention that a substantial amount of movement data has been collected for these two herds since October 31, 2007, when data analysis for the DAR was initiated. Thus, Dézé has provided this update to the predictions of encounter rates by these two herds. Table 1 provides updated encounter rates with the proposed transmission line using collar information from 1995 to 2009 for Bathurst, 2006 to 2008 for Beverly and 2001, 2002 and 2007 to 2009 for Ahiak caribou, respectively. Seasonal encounter probabilities were derived using a Bernoulli trial approach (Zar 1999). This approach considers the binomial response (encountered versus did not encounter) of different collared caribou as independent trials. Information from collared individuals in the Beverly herd indicated that caribou encountered the transmission line during winter where as Ahiak caribou encountered the transmission line during autumn, spring and winter (seasons defined in the DAR). Encounter probabilities for both herds were highest during winter but were generally much lower than for Bathurst individuals (Table 1). Encounter rates for the Bathurst herd were much higher than either the Beverly or Ahiak. The post-calving and summer dispersal season had the highest encounter rate, where 77% of the 74 collared caribou have encountered the proposed transmission line.

The original expectation described in the DAR was that the probability of encountering the transmission line would be low for the Beverly caribou and moderate for Ahiak caribou. The results of this re-assessment support these earlier predictions. The effects assessment for barren-

ground caribou presented in the DAR is based on the anticipated encounter rate for the Bathurst herd (see Section 12.5.2.2 of the DAR).

**Table 1 Movements of collared Bathurst, Beverly and Ahiak caribou across the proposed transmission line.**

<b>Herd</b>	<b>Season</b>	<b>Total Number Collared caribou</b>	<b>Total Number Satellite Point Locations</b>	<b>Number of Collared Caribou Crossing</b>	<b>Total Number of Crossings</b>	<b>Crossing Probability* (±1SE)</b>
Bathurst	Autumn	79	1677	41	162	0.52 (0.06)
	Post Calving	74	4729	57	228	0.77 (0.05)
	Spring	76	1800	26	56	0.34 (0.05)
	Winter	85	4371	33	158	0.39 (0.05)
Beverly	Autumn	26	2348	0	0	0.00 (0.00)
	Post Calving	34	2956	0	0	0.00 (0.00)
	Spring	51	2717	0	0	0.00 (0.00)
	Winter	67	8073	7	47	0.10 (0.04)
Ahiak	Autumn	55	5302	3	33	0.05 (0.03)
	Post Calving	64	9974	0	0	0.00 (0.00)
	Spring	66	5467	3	11	0.05 (0.03)
	Winter	62	14167	10	205	0.16 (0.05)

\* Based on a binomial distribution.

#### Long-term changes in Beverly caribou range

Caribou ranges may change over time, which may affect caribou interactions with the Project in the future. Thomas et al. (1995) conducted studies into the effects of forest fires on caribou winter range, from 1982 through 1988. Studies were initiated in part because of concerns raised by hunters from Fort Smith following forest fires northeast of Fort Smith in 1979. Nonacho and Thekulthili Lakes (both in the Taltson River basin) were included in the study area, considered by Thomas et al. (1995) to be in the core of the Beverly herd winter range. Pellet counts indicated regular use of these areas by caribou, and that use correlated with the forest age. Caribou were found to prefer stands aging 151 to 250 years, and little use was made of stands younger than 60 years, although some caribou activity was noted for stands aging 41 to 60 years.

More specific to the Taltson River, Thomas et al. (1998) have reported on winter aerial surveys conducted in this area between 1980 and 1987. A series of maps within this report show the winter distribution of caribou, as observed during aerial surveys. Although collars were not used in the study, large areas were surveyed, including much of the Taltson River basin. Thomas et al. (1998) documented that the extents of caribou distribution along the Taltson River only extended south of Nonacho Lake once between the winters of 1980-81 and 1986-87 (i.e., one winter in six). During the winter of 1985-86, caribou were observed approximately 50 km, or less, of Nonacho Lake, in the area of Taltson Lake. In all years between the winters of 1980-81 to 1986-87, the winter range of Beverly caribou were within the area assessed in the DAR with respect to the Taltson River (Chapter 12, Figure 12.1.1 in the DAR).

Thomas et al. (1998) summarizes Beverly caribou winter ranges from previous authors. According to these earlier studies, the winter range of the Beverly herd regularly extended south and west of the winter range area assessed in the DAR. In particular, extreme ranges from 1935-60 extended as far south and west as the Slave River and Wood Buffalo National Park, encompassing the entire Taltson Watershed (Kelsall 1968 and Banfield 1954, cited in Thomas et al. 1998).

Zalatan et al. (2006) used trampling scars on black spruce roots to create a long-term index of caribou abundance. Four of the study sites (named the Southeast sites) were selected to represent the late summer range of the Beverly herd. These sites were approximately 100 to 150 km west of the eastern arm of Nonacho Lake. The index effectively extended back to approximately 1900. Scar frequency indicated abundance peaks in the Southeast sites in the 1940s, and low abundance in the 1910s and 1990s to 2000.

Extrapolating from these three lines of evidence (i.e., aerial surveys, pellet counts and trampling scars), it can be concluded that the winter range of central Canadian barren-ground caribou was once larger than suggested by the satellite collar data collected from 1996 to 2007. This range contraction in the Taltson River basin is likely a result of extensive forest fires in 1979. Based on the findings of Thomas et al. (1995), caribou may return to these areas in the next 10 to 30 years, although it may not become a preferred area for another 120 years.

## **References**

Thomas, D.C., S.J. Barry and G. Alaie. 1995. Fire-caribou-winter range relationships in northern Canada. *Rangifer* 16 (2) 57–67.

Thomas, D.C., H.P.L. Kiliaan and T.W.P. Trottier. 1998. Fire-caribou relationships: (III) Movement patterns of the Beverly herd in relation to burns and snow. Tech. Rep. Series No. 311. CWS, Edmonton, AB. 176pp.

Zalatan, R., A. Gunn and G.H.R. Henry. 2006. Long-term abundance patterns of barren-ground caribou using trampling scars on roots of *Picea mariana* in the Northwest Territories, Canada. *Arctic, Antarctic and Alpine Research*, 38, 624-630.

Zar, J. H. 1999. Biostatistical analysis. 4<sup>th</sup> Edition, Prentice-Hall, New Jersey.