

**GNWT Response to:
WRRB IR#3**

Topic

Barren-ground Caribou – Spatial Boundaries

Comment

The ASR (sec 4.1.3.1) describes the spatial boundaries for the wildlife assessment, which for barren-ground caribou are a 35km buffer for the TASR. However, in previous environmental assessments (e.g. Fortune NICO, EA0809-004 [2009]), the cumulative winter range or the cumulative annual range have been the spatial scope for barren-ground caribou herds.

Recommendation

1. Please summarize in tabular form the precedents set in previous environmental assessments (e.g. MVEIRB and NIRB) for spatial boundaries of barren-ground caribou herds used for assessment of incremental and cumulative impacts
2. Re-examine and justify the spatial boundaries for TASR relative to the precedents established for previous environmental assessments.

GNWT Response

Seasonal ranges of barren-ground caribou herds have been used to assess incremental and cumulative effects of proposed developments when

1. a proposed development is located within a valued component's defined range; and,
2. a proposed development interacts with other developments to generate cumulative effects within the same defined range.

Recent examples in the Northwest Territories where this has occurred include the Jay project (Dominion Diamond 2014), Gahcho Kué project (De Beers 2011) and NICO project (Fortune 2010).

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 ([PR#110](#)). The Tłıchǫ All-Season Road Project is completely outside the annual range of the Bluenose-East caribou herd and outside the 99% utilization distribution of the Bathurst caribou herd based on collar data. This indicates that barren-ground caribou herds are unlikely to interact with the Project across a range of abundances. See response to WRRB IR#6.

Based on the approach used in recent environmental assessments, barren-ground caribou could have been omitted from the assessment because the Project does not interact with the defined ranges for barren-ground caribou. However, following a precautionary approach, barren-ground caribou were included in the assessment. A primary reason for inclusion was that the Traditional Knowledge Study report ([PR#28](#)) indicated that barren-ground caribou were harvested in the area surrounding the Project in the mid-1990s, when barren-ground caribou in the Bathurst and Bluenose-East herds were much more abundant than today. This suggests that some individuals within barren-ground caribou populations have the potential to interact with the Project intermittently when the herds are at high abundance. The study area used in the assessment was precautionary, appropriate for understanding potential effects of the Project to barren-ground caribou when population densities are high, and meets the Terms of Reference ([PR#69](#)).

References

De Beers (De Beers Canada Inc.). 2010. Gahcho Kué Project Environmental Impact Statement. Submitted to the Mackenzie Valley Review Board. Yellowknife, NWT.

Dominion Diamond (Dominion Diamond Ekati Corporation). 2014. Developer's Assessment Report for the Jay Project. Submitted to the Mackenzie Valley Review Board. Yellowknife, NWT.

Fortune (Fortune Minerals Limited). 2011. NICO Cobalt-Gold-Bismuth-Copper Project. Developer's Assessment Report. Submitted to the Mackenzie Valley Review Board. Yellowknife, NWT.

**GNWT Response to:
WRRB IR#6**

Topic

Barren-ground Caribou – Potential encounter rates with TASR

Comment

The ASR concludes that regular interaction of barren-ground caribou with the proposed TASR is not expected, primarily based on changes in placement of herd seasonal ranges due to declines in populations. The ASR discusses the declines in the Bathurst and Bluenose-East herds and where herds were harvested historically (using both science and TK-based information sources), though data analyses describing the changes in population size and distribution relative to the TASR are not included. However, data are available to quantify the extent of the overlap barren-ground caribou may have with the TASR, incorporating the level of abundance when either herd wintered in the vicinity of the TASR corridor, and the number of years.

Recommendation

1. Provide an analysis, including a tabular summary, of Bathurst and Bluenose-East herds overlap with the TASR corridor by year and by sample attributes relative to estimated trends in herd size;
2. Please identify and comment on limitations (e.g. number of collars, cows only vs. cows and bulls)

GNWT Response

The number of collared caribou locations from the Bathurst and Bluenose-East (BNE) caribou herds occurring within the 35 km Regional Study Area (RSA) considered in the assessment are presented in Tables 1 and 2. Both herds have declined since collaring programs began so year serves as an inverse index of trend in herd size.

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Table 1: Annual collared caribou summary of Bathurst herd and interaction with the Project Regional Study Area (RSA)

Year	Number of locations within RSA	Number of Females with Collars	Number of Collar Locations	Number of Males with Collars	Number of Collar Locations	Total Collars	Total Locations
1996	0	10	577	0	0	10	577
1997	0	8	541	0	0	8	541
1998	0	27	516	0	0	27	516
1999	0	18	947	0	0	18	947
2000	0	15	850	0	0	15	850
2001	0	15	753	0	0	15	753
2002	0	15	843	0	0	15	843
2003	0	15	1004	0	0	15	1004
2004	0	17	649	0	0	17	649
2005	0	23	1810	0	0	23	1810
2006	0	17	1536	0	0	17	1536
2007	0	21	2180	0	0	21	2180
2008	0	32	4829	0	0	32	4829
2009	0	26	10209	0	0	26	10209
2010	0	24	12487	0	0	24	12487
2011	0	20	8286	0	0	20	8286
2012	0	24	11700	1	516	25	12216
2013	0	18	7739	0	0	18	7739
2014	0	20	9481	0	0	20	9481
2015	0	32	16396	17	6616	49	23012
2016	0	31	24733	16	13121	47	37854
2017	0	22	2991	11	1840	33	4831

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Table 2: Annual collared caribou summary of Bluenose-East herd and interaction with the Project Regional Study Area (RSA)

Year	Number of locations within RSA	Number of Females with Collars	Number of Collar Locations	Number of Males with Collars	Number of Collar Locations	Total Collars	Total Locations
1996	0	5	844	0	0	5	844
1997	0	6	994	0	0	6	994
1998	0	5	924	0	0	5	924
1999	0	4	828	0	0	4	828
2000	0	4	626	0	0	4	626
2003	0	3	285	0	0	3	285
2004	0	5	300	0	0	5	300
2005	0	10	738	0	0	10	738
2006	0	19	2431	0	0	19	2431
2007	0	14	1786	0	0	14	1786
2008	0	33	5968	0	0	33	5968
2009	0	55	16521	10	5450	65	21971
2010	0	46	21672	10	5928	56	27600
2011	0	29	11877	5	3568	34	15445
2012	0	47	22108	19	2763	66	24871
2013	0	44	18998	12	1339	56	20337
2014	0	27	16358	12	3824	39	20182
2015	0	39	18829	29	11746	68	30575
2016	0	35	20676	24	11628	59	32304
2017	0	31	9892	12	3673	43	13565

The results indicate that no collar locations have occurred within the RSA across a range of abundances in either herd. These results are consistent with the herd distribution maps in Appendix G of the Adequacy Statement Response ([PR#110](#)), which delineate annual ranges through time from 1996 to 2015 for Bathurst and 2005 to 2015 for BNE.

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.

The presence of barren-ground caribou in the RSA described here and in Appendix G are based on the best available data, which are limited to cows only for most years. Overall changes in ungulate population sizes are generally accepted to depend upon combinations of adult female survival rates and calf recruitment rates (Gaillard et al. 1998). Both of these rates can be robustly assessed with female animals alone. While the number of collars in service in most years may be considered low, particularly in the Bathurst herd, their distribution generally corresponds well with the herd distribution from other data sources (Golder 2011; Gunn et al. 2013).

References

- Gaillard JM, Festa-Bianchet M, Yoccoz N. 1998 Population dynamics of large herbivores: variable recruitment with constant adult survival. *Trends Ecol Evol* 13:58-63.
- Golder (Golder Associates Ltd.). 2011. Analysis of Environmental Effects of the Diavik Diamond Mine in the Lac de Gras Region. Prepared for Diavik Diamond Mines (2012) Inc. by Golder Associates Ltd., Yellowknife, NWT.
- Gunn A, D'Hondt A, Williams J, Boulanger J. 2013. Satellite Collaring in the Bathurst Herd of Barren-ground Caribou, 1996 – 2005. Manuscript Report 225. The Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NWT.

**GNWT Response to:
WRRB IR#8**

Topic

Boreal Caribou – Habitat Availability (thresholds at NT1 and Wek'èezhì scale)

Comment

The ASR states that: “...66.8% of the NT1 range is undisturbed boreal caribou habitat, which exceeds the 65% minimum threshold for undisturbed habitat predicted necessary to support a self-sustaining boreal caribou population (Environment Canada 2012). At Base Case, boreal caribou are predicted to be self-sustaining and ecologically effective with a low risk, but are near their resilience limits” (Section 4.2.3). The ASR goes on to state that habitat selection by boreal caribou is typically driven by an avoidance of deciduous and early succession forest stands that support high densities of moose and deer neither of which occur in the Wek'èezhì portion of NT1 range, but are present and inherent in the results of southern jurisdictions reflected in the 65% threshold. As a result, it is suggested that boreal caribou in the Wek'èezhì area may not require as much undisturbed habitat in order to meet their life history requirements and avoid predation. The NWT Recovery Strategy states “...there must be strong evidence, validated by Environment Canada, from population data collected over an extended period of time to support the management decision to establish a lower range-specific threshold. In the absence of strong evidence to support lowering the undisturbed habitat threshold below 65%, the amount of critical habitat for all ranges is at least 65% undisturbed habitat (Environment Canada 2012). The NWT does not currently have strong evidence to support changing the threshold, and the minimum threshold of 65% disturbance applies to the NWT range.” The Recovery Strategy also recognizes that habitat disturbance and fragmentation vary among administrative regions in NWT, and that regions have their own management agencies and land use plans, requiring development of region-specific range plans and an overall NWT-Yukon range plan for habitat management (i.e. see Approach 1.1). Although the NWT Recovery Strategy focuses on the NWT boreal caribou population (NT1), it feeds into a national process and aims to be complementary to the national recovery strategy.

Recommendation

1. Please describe how the percentage of critical habitat in Wek'èezhì (see also IR#1) changes the level of uncertainty about whether boreal caribou in Wek'èezhì can be considered to be self-sustaining;
2. Please comment on the need to modify the threshold of undisturbed habitat (65%) according to the accuracy of the habitat mapping (see also IR#7).

GNWT Response

Following guidance from Environment and Climate Change Canada (ECCC), the Adequacy Statement Response (ASR, [PR#110](#)) evaluated self-sustaining status of caribou at the NT1 range. The threshold of undisturbed critical habitat for the NT1 range was determined by ECCC (EC 2012) using cross-Provincial and -Territorial boreal caribou data. The application of this threshold in the Adequacy Statement Response (ASR) is consistent with the Federal and Territorial recovery strategies.

Boreal caribou present in the Wek'èezhì portion of the NT1 range have the ability to use undisturbed critical habitat outside of the Wek'èezhì portion of the NT1 range to meet survival and reproductive requirements and interact at a population level with other caribou in the NT1 range. The relationship between undisturbed critical habitat in the Wek'èezhì portion of the NT1 range and the dynamics of the boreal caribou occupying the Wek'èezhì portion of the NT1 range is unknown, and uncertainty about whether this may represent a source or sink within the broader NT1 range is high.

There is no need to modify the threshold based on map accuracy. Results generated in the Project Description Report ([PR#7](#)), during preliminary screening and the ASR, which consider reasonably foreseeable developments (RFDs), all indicate that that amount of undisturbed critical habitat is above the 65% threshold so conclusions about boreal caribou status remain the same. Any difference due to different land cover data or projection is systematic (i.e., it affects disturbed and undisturbed habitat the same way) so does not influence relative changes between the Base, Application and RFD cases. In other words, the percent of undisturbed critical habitat is calculated the same way. The disturbance data used in habitat mapping included disturbances through 2016 and was more representative of existing conditions. No adjustment to the ECCC (EC 2012) threshold is proposed nor is necessary for the purpose of the assessment.

References

Environment Canada. 2012. Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. xi + 138 pp.