

**GNWT Response to:  
MVEIRB IR#1**

**Topic**

Barren-ground Caribou – Assessment Endpoint Clarification

**Comment**

The developer’s conclusions regarding effects of the project on barren ground caribou assumed a scenario where populations meet the assessment endpoint; self-sustaining and ecologically effective populations. However, the developer observed that current populations do not meet the assessment endpoint; populations are not self-sustaining and ecologically effective. The developer states that “due to the current low abundance and harvest restriction on Bathurst Caribou and BNE [Bluenose-East], barren ground caribou are considered unlikely to be self-sustaining and ecologically effective at Base Case” (PR#110 p4-53). The developer also states that “overall, the weight of evidence from the analysis of the primary pathways predicts that incremental and cumulative changes to measurement indicators from the Project and other developments should have no significant adverse effect on self-sustaining and ecologically effective barren-ground caribou populations” (p4-217, PR#110). Based on the above and the information in the Adequacy Statement Response it appears that: at base case barren ground caribou do not meet the assessment endpoint (PR#110 p45) the project will have negative effects on barren ground caribou (PR#110 p56), and the developer concluded that the project will have “no significant adverse effect on self-sustaining and ecologically effective barren-ground caribou populations” (PR#110 p4 217).

**Recommendation**

The Review Board seeks clarification regarding the apparent contradiction (see above) in the developer’s conclusions of effects to barren ground caribou, which are provided on page 4-217 of the Adequacy Statement Response. Can the developer please clarify what the predicted effects of the project, in combination with cumulative effects, would be on caribou populations described in the base case, which are barren ground caribou populations that are not self-sustaining and ecologically effective?

**GNWT Response**

The Bathurst herd has been declining from a high of over 350,000 animals in the mid-1990s. Although it was considered stable at low numbers from 2009-2012 at around 32,000 to 35,000, the photographic survey of the Bathurst calving grounds conducted in June 2015 suggests that the Bathurst herd has further declined to between 16,000 to 22,000 since 2012 (GNWT-ENR 2016a). Similarly, the GNWT-ENR calving ground photo survey results showed that the Bluenose-East herd

declined from more than 100,000 in 2010 to around 38,600 animals in 2014 (GNWT-ENR 2016b). Harvest restrictions have been imposed on both Bathurst and Bluenose-East barren-ground caribou as a result of recent population declines. Barren-ground caribou are considered unlikely to be self-sustaining and ecologically effective at Base Case due to low abundance and ongoing population decline.

Collar locations from the Bathurst caribou herd indicated that the Project is outside of core winter ranges and completely outside of the annual range of the Bluenose-East caribou herd ([PR#110](#), Appendix G). There is low potential for regular interaction between barren-ground caribou and the Project at the population (herd) scale, especially when herd numbers are low (Appendix G). This is supported by the results presented in the Traditional Knowledge Study Report ([PR#28](#)) that indicates barren-ground caribou were harvested in the vicinity of the Project during the mid-1990's when barren-ground caribou herds were more abundant, but also indicate that barren-ground caribou have been absent from the Project area during the recent decline phase for these herds.

Based on this information, no interaction between the Project and barren-ground caribou is predicted during periods of low population abundance. The self-sustaining and ecologically effective status of barren-ground caribou will be determined by factors that affect calving grounds and core ranges, not peripheral habitats. The Project will not contribute to the lack of self-sustaining and ecologically effective barren-ground caribou.

Potential interactions between the Project and barren-ground caribou were identified in the Adequacy Statement Response (e.g., habitat loss, reduced overall carrying capacity of the Regional Study Area, and changes in harvest). However, these interactions are only predicted during periods of higher herd abundance when barren-ground caribou use the RSA (defined for barren-ground caribou as a 35 km buffer around the Project Footprint). If herd size recovers to a size where the RSA is used (e.g., 350,000 animals in the Bathurst herd), barren-ground caribou populations will have regained their self-sustaining and ecologically effective status. Interaction with the Project after recovery would result in small adverse effects on barren-ground caribou, but these effects would be within the adaptability limits of larger herds.

Because barren-ground caribou use of the Project area has tended to be when populations are high and because the potential effects of the Project in the RSA are small, the Project is not predicted to influence the ability of the barren-ground caribou to be self-sustaining and ecologically effective.

**References**

GNWT-ENR (Government of the Northwest Territories-Environment and Natural Resources). 2016a. Overview: Monitoring of Bathurst and Bluenose-east Caribou Herds, October 2014. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NWT.

GNWT-ENR. 2016b. An Estimate of Breeding Females and Analyses of Demographics for the Bluenose-east Herd of Barren-ground Caribou: 2015 Calving Ground Photographic Survey. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NWT.

**GNWT Response to:  
MVEIRB IR#2**

**Topic**

Barren-ground Caribou – Cumulative Effects

**Comment**

The developer used a Regional Study Area of a 35 km buffer around the TASR to assess project and cumulative effects to barren ground caribou (PR#110 p4-5). The developer states that barren ground caribou are a wide ranging species and, that “the RSAs for wildlife VCs [valued components] were identified to capture and assess the significance of incremental and cumulative effects from the Project and other previous, existing and RFDs [reasonably foreseeable developments]” (4-5, PR#110). Further, that “the VC-specific RSA is the scale at which cumulative effects can be appropriately assessed for each VC” (4-5, PR#110).

**Recommendation**

Can the developer clarify if the proposed Regional Study Area is sufficient to identify all other past, present and reasonable foreseeable human activities that could affect the same barren-ground caribou as the project? If not, please conduct a cumulative effects assessment following Appendix H of the Review Board’s Environmental Impact Assessment Guidelines.

**GNWT Response**

The proposed Regional Study Area is sufficient to identify all other past, present and reasonably foreseeable human activities that could interact with the Project to affect barren-ground caribou in the peripheral habitats used by barren-ground caribou when population density is high. Barren-ground caribou are only expected to interact with the Project when population densities are similar to those observed in the mid-1990s. Previous, existing, and reasonably foreseeable developments that may result in loss of self-sustaining and ecologically effective barren-ground caribou populations are those that occur in calving grounds and core ranges, not in peripheral habitats (see response to MVEIRB IR#1).

Section 4.3 on Cumulative Impacts of the Mackenzie Valley Environmental Impact Review Board’s Adequacy Statement ([PR#70](#)) indicated that that the approach of the Project Description Report ([PR#7](#)) to determine previous, existing and reasonably foreseeable developments (RFDs) was satisfactory. The study area for barren-ground caribou in the Adequacy Statement Response ([PR#110](#)) considers the same RFDs identified in the Project Description Report.

**GNWT Response to:  
MVEIRB IR#4**

**Topic**

Moose – Clarification of existing and predicted hunting and harvesting pressures

**Comment**

The developer's description of the base case includes effects from hunting along the existing unmaintained historic access trail. The developer proposes to use this route for the TASR. The developer predicts that the change from the existing trail to an all-season road will have a negligible effect on hunting pressures on moose. The developer states "changes to moose survival and reproduction as a result of improved access is predicted to be negligible given that the TASR ROW follows an existing linear feature that is currently used by hunters to harvest moose and access the WRMA [Wek'èezhìi Resource Management Area] at Base case" (P4-187, PR#110).

**Recommendation**

It is reasonable to assume that an all-season road will allow for faster and easier access and, as a result, that hunting and harvesting pressures on moose may increase. In order to understand the potential change in hunting and harvesting pressures, can the developer please quantify:

1. hunting and harvesting of moose along the existing trail (the base case) from traditional harvesting and non-aboriginal hunters?
2. the predicted change in hunting and harvesting pressures from the all season road?

**GNWT Response**

There are limited baseline data available to quantify harvesting of moose by Aboriginal or non-Aboriginal hunters in the North Slave Region. The Traditional Knowledge Study report ([PR#28](#)) provides a description of the distribution of where moose have been harvested. Description of the existing use of the trail provided in the Project Description Report ([PR#7](#)) indicates that the parts of the existing trail are navigable by truck, most of it by ATV, and on foot during summer months. The entire trail is navigable by snowmobile in winter. The Traditional Knowledge Study Report (PR#28) supports this description. The Project will allow the entire length to be accessible by truck year-round.

Two programs that the GNWT-ENR runs which may provide a rough indication of year to year changes in the resident moose harvest are the annual Resident Hunter Survey and the North Slave Region's moose jaw collection program.

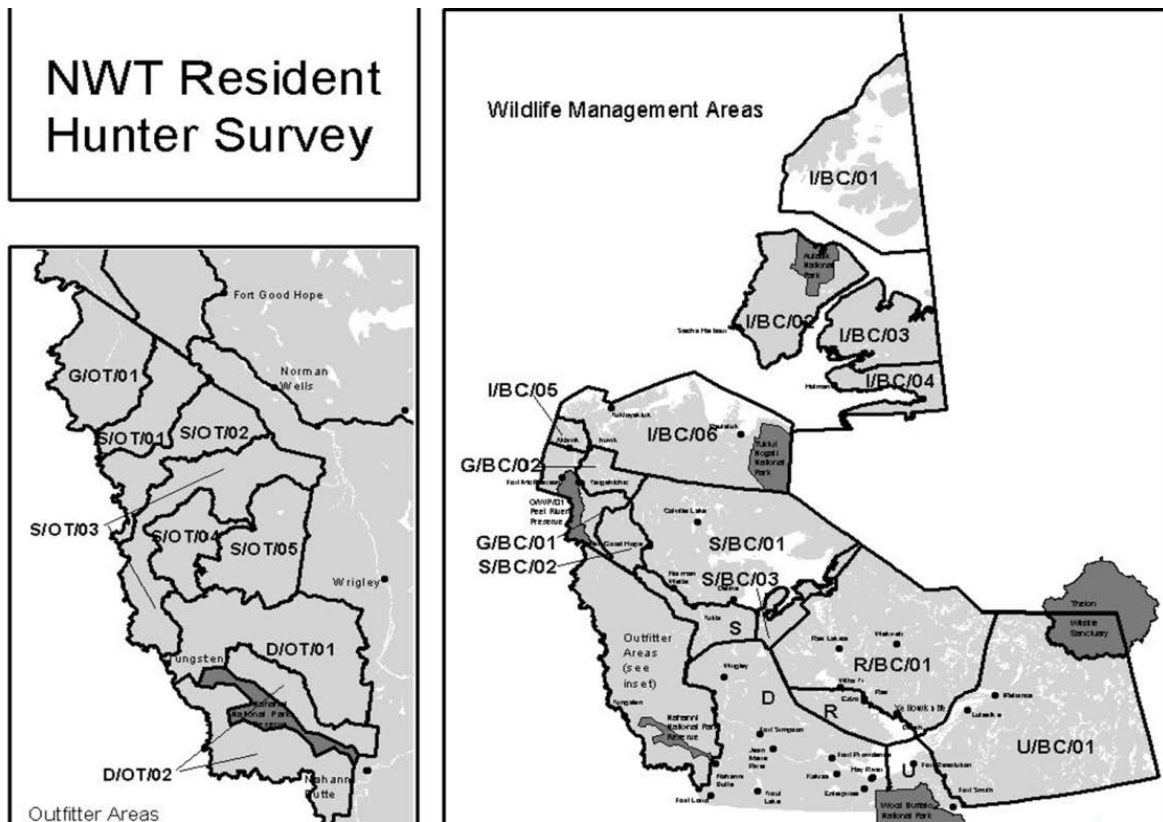
The GNWT has been conducting Resident Hunter Surveys annually since the 1982/83 hunting season, and has maintained roughly the same survey design since the inception of the program. The survey involves mailing three waves of paper questionnaires per year, with reminders sent to hunters who did not respond in previous waves. The most recent comprehensive review of Resident Hunter Survey data was published in 2012, and summarized data from 1997/98 to 2008/2009 (Carriere 2012).

Survey results are typically organized by region for each species, with region representing where a hunter resides or resided at the time of purchasing a hunting licence. Hunters can also provide detailed information on the location of their hunt when responding to the surveys, such as management zone, latitude and longitude, or the name of a landmark. The accuracy of location information provided is highly variable. In recent years, roughly half of resident harvesters that were issued tags responded to the Resident Hunter Surveys. Harvesting rates for a given species and region are estimated by multiplying the total number of kills reported in a survey mail out by the ratio between the number of tags issued for a species and the number of tags held by respondents. Results are reported for three broad regions:

- Inuvik = all communities in the Inuvialuit Settlement Region, the Gwich'in Settlement Area and the Sahtu Settlement Area.
- Fort Smith = all communities in the Dehcho region, South Slave region and the North Slave region, including the Tłıchǫ Lands, except Yellowknife.
- Yellowknife = Yellowknife only.

An estimated average of 90 moose per year were harvested from the Yellowknife region, and 40 from the Fort Smith region between 1998/99 to 2008/09 (Carriere 2012). Extrapolating these estimates to the Tłıchǫ All-season Road (TASR) Regional Study Area is difficult because harvest survey data reporting regions are based on where hunters resided when they obtained their hunting licence, not where they actually harvested a moose, and because the 'Fort Smith' region includes the Dehcho, South Slave and North Slave region (including Tłıchǫ Lands).

To estimate the minimum number of moose harvested by residents within the region surrounding the proposed TASR, Resident Hunter Survey data from 2000-01 to 2015-16 were queried (16 years of data) to determine the number of moose that were reported as harvested within Management Zone R (**Figure 1**). A total of 126 were reported by resident hunters as harvested in Zone R in the last 16 years, representing a minimum average yearly harvest of eight moose.



**Figure 1.** *Wildlife Management Areas used in Resident Hunter Survey questionnaires.*

Of the 126 reported moose harvested within Zone R, there were only three instances where a specific location or landmark was not provided.

To estimate the minimum number of moose harvested by residents along the TASR alignment in the past 16 years, all instances where moose were reported as harvested along the Old Lac La Martre Road (or variants on this name) or near the intersection of the Old Lac La Martre Road with Highway 3 (near Highway 3 km marker 196) were considered. A total of five moose were reported as harvested near the TASR alignment within the last 16 years.

It should be emphasized that the numbers above are underestimates of total resident harvest within Zone R and along the TASR alignment given that generally only half of resident harvesters respond to the annual surveys, and of those that do respond, not all indicate the location of their harvest.

The ENR North Slave Region has also been running a voluntary moose jaw collection program since 2013-2014 whereby harvesters hunting moose in the North Slave Region are provided an incentive of \$50 plus a cap to supply ENR with the lower jaws of harvested moose and general location of harvest on a 10 km by 10 km grid.

Hunter information, specific locations and personal details are kept confidential. The program is run year-long. The objective of the program is to generate the sex and age structure of moose harvested in the North Slave Region, identify general areas of higher harvest pressure and generate an interest in moose management among the public. This program can provide general indicators about patterns of harvest in the North Slave Region. For instance, the age structure of the harvested moose population can provide one broad indicator of the overall sustainability of the harvest. If, over time, there is a change in the age structure of the population (such as a shift to a younger average age of harvested moose) to suggest the harvest is no longer sustainable, increased monitoring and harvest management actions can be considered in areas of concern within the North Slave Region.

ENR is developing a report on the results of the program to date. Location data have not yet been compiled. In 2013-14, the first year of the tooth ageing program, 33 jaws or incisor bars were submitted for aging. Of the 33 moose aged in 2013-14, 16 were males, 15 were females, and two were unknown (kill sites discovered). Awareness of the program increased and more hunters participated the following year. In 2014-15, 57 jaws or incisors bars were submitted, with 8 of them from outside the North Slave Region. Of the 57 moose aged in 2014-15, 39 were males, and 18 were females. Most of the jaw submissions have been by resident hunters but those submitted by Aboriginal hunters have increased slightly. Table 1 summarizes moose jaw submissions from 2013/14 to 2016/17. It should be noted that moose jaw collection for the 2016/17 hunting season is not yet complete.

**Table 1: North Slave Region (NSR) Moose Jaw Submission Program Summary**

	2013/14	2014/15	2015/16	2016/17 (not yet final)
Total jaw submissions	33	59	52	74
Total jaw submission from the NSR	33	53	45	58
from the NSR: males harvested	16	41	33	38
from the NSR: females harvested	15	18	11	20
from the NSR: unknown sex	2		1	
Resident hunters	23	47	26	37
GHL hunters	10	12	19	21

Section 4.4.2.3 of the ASR ([PR#110](#)) predicts that the Project could cause an increase in mortality of moose resulting from increased harvest and vehicle-collisions, but it is not possible to provide a quantitative prediction of that increase. Although there is uncertainty about the magnitude of increased harvest, moose harvest is low under existing conditions and potential increase in harvest along the TASR due to the Project is not predicted to be large enough to adversely affect the ability of moose to be self-sustaining or ecologically effective within the North Slave region given the low predicted traffic volume associated with the Project. The



GNWT will continue to collect moose harvest data on an annual basis, and these data may help to determine whether there is an increase in moose harvest along the TASR relative to baseline levels. The GNWT also recognizes the need for the Wildlife Effects Monitoring Plan (WEMP) to monitor for increased wildlife mortality associated with the likelihood of increased hunting along the TASR. A draft WEMP will be provided to reviewers during this environmental assessment.

### **References**

Carriere, S. 2012. Resident Hunter Surveys 1997-2009 Update and Review. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NWT. Manuscript Report No. 218. 65 pp.

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

**Topic**

Fish Monitoring

**Comment**

In the effects assessment for fish the developer stated that monitoring for project related effects to water quality will occur for two open water seasons (PR#110 p3-64). The developer also states, in regards to mitigation of effects to fish, that “regional cumulative effects monitoring will be considered through the Marian River Watershed Monitoring Program, managed by the Tłıchǫ Government” (PR#110 p3-64). The developer goes on to state that “using monitoring and adaptive management, mitigation may be modified or additional mitigation may be implemented to reduce unexpected impacts to fish and fish habitat” (PR#110 p3-64). It is not clear to the Review Board whether the developer is proposing specific monitoring for fish, including monitoring of new fishing pressure during the proposed two years of monitoring. Further, it is not clear if two years of data is sufficient to detect project related effects to fish. The developer also states that it is “considering” monitoring through the Marian River Watershed Monitoring Program. However, it is not clear if the developer is committing to this monitoring, or whether this monitoring is appropriate to monitor for project related effects to fish.

**Recommendation**

**Part 1**

Can the developer please provide further details on monitoring program(s) for fish and fish habitat including:

1. How it will detect effects to fish and fish populations over the course of the project (construction and operations);
2. The locations of monitoring sites;
3. How long monitoring is proposed for;
4. If monitoring will include fishing pressures at these sites; and
5. How data will inform mitigations.

**Part 2**

The developer states that it is considering the Marian River Watershed Monitoring Program as a way to monitor for project related effects to fish.

1. Can the developer clarify whether it is proposing specific monitoring for the all-season road that will integrate with this program?

2. Does the developer intend to provide specific support to this program for monitoring activities related to the all-season road?
3. If the developer uses this program how will the developer use information from the program to identify project related effects to fish?
4. How will the developer use this information to inform future mitigations?

## **GNWT Response**

### **Part 1**

Monitoring for fish and fish habitat is described in Section 3.6 of the Adequacy Statement Response (ASR, [PR#110](#)).

Environmental monitoring will be conducted at proposed watercourse crossing sites during the period of instream construction (i.e., during installation of culverts and bridges) at each location. The crossing sites include 15 watercourses/drainages, including four crossings of larger, permanent watercourses, the Duport River, an unnamed watercourse at km 45.2 (crossing #9), James River, and La Martre River. Environmental monitoring during instream construction will allow for the Environmental Monitor to confirm that mitigation measures listed in Table 3.2-1 of the ASR for activities related to the Construction of Stream Crossings are implemented to minimize effects to fish and fish habitat, and to provide input into adaptive management as required. Turbidity monitoring will be conducted at watercourses flowing at the time of construction as per the In-Field Water Analysis Plan and according to permit requirements. The Environmental Monitor will provide results of the turbidity monitoring to the GNWT, and construction activities may be adjusted based on the turbidity monitoring results to remain protective of fish and fish habitat.

Post construction monitoring will be conducted at the watercourse crossing sites following construction to provide feedback on the effectiveness of design features and mitigation and to allow for adaptive management as required. Post construction monitoring will be conducted to verify that erosion and sediment control measures have been successful (e.g., bank restoration and revegetation), or if additional measures are required. The integrity of the crossing structures (i.e., culverts and bridges) will be inspected regularly and during periods of high run-off, such as the spring freshet. Any changes to the morphology of the water body channel will be identified and addressed, as needed. At culverts, regular monitoring will be conducted to identify and remove blockages (e.g., ice, woody debris), as needed, that would otherwise lead to scouring and effects to channel morphology and fish habitat, and potentially interfere with fish passage. Post construction monitoring will be conducted in the two open-water seasons following construction. This time period will allow for the understanding as to whether the sediment and erosion control measures have been successful and whether there are any concerns related

to fish movement at fish-bearing watercourses, and allow for the implementation of additional mitigation or adaptive management measures where required.

The GNWT does not plan to conduct any monitoring associated with fisheries harvest in the Project area. The results of the effects analysis for the Tłıchǵ All-season Road (TASR) concluded that the magnitude of effects on fish abundance from harvest pressure was considered to be negligible to low, and likely non-measurable. The watercourses and lakes likely to attract the greatest number of fishers due to the TASR (i.e., Lac La Martre, La Martre River, and Boyer Lake) are large water bodies with abundant valued component populations that can support an increase in fishing pressure. The GNWT will ensure DFO and the Tłıchǵ Government are aware of the changing access and that a review of how fisheries will be managed in the area, including monitoring, may be required. Please see the GNWT's response to [MVEIRB IR#8](#) and [NSMA IR#3](#) for information regarding enforcement of fishing regulations.

## **Part 2**

The Marian Watershed Monitoring Program is a community-based Aquatic Effects Monitoring Program (AEMP) administered by the Tłıchǵ Government. The parameters of the monitoring program are determined, and set by, the Tłıchǵ Government. This is a community-led and community-defined monitoring program that is essential for the Tłıchǵ Government, and Tłıchǵ citizens, to track change and stay informed about what is occurring in the Wek'èezhì area. Furthermore, the current program is designed with specific consideration of the future impacts of the licensed NICO Project and other possible, future developments in the region. Results from the program are currently contributing to the characterization of background conditions and the range of natural variability in water and sediment chemistry in the Marian River watershed (Tłıchǵ Research and Training Institute 2017). While the program is not designed to examine for potential effects of increased access of the TASR on fish populations, future results collected under the program may assist with monitoring cumulative effects of developments, including the TASR, to confirm for communities that the fish are safe to eat and the water is safe to drink, as per objectives of the Tłıchǵ Research and Training Institute (2017). Future monitoring of fish, water, and sediment downstream of the TASR would only be initiated in response to community concerns, and the scope and details of any such monitoring would be updated by the Tłıchǵ Government at that time as needed. However, it is important to note that the mitigation measures listed in the ASR are expected to be effective in minimizing effects to fish and fish habitat, and therefore, additional monitoring is not anticipated for the TASR.

**References**

Tłchq Research and Training Institute. 2017. Monitoring Activities. Website <http://www.research.Tłchq.ca/lands-protection/monitoring-activities> accessed June 2017.