Northwest Territories Environment and Natural Resources

May 11, 2012 VIA EMAIL

Eli Nasogaluak
Environmental Impact Review Coordinator
Environmental Impact Review Board
PO Box 2120 Inuvik, NWT, Canada X0E 0T0
eirb@jointsec.nt.ca

Dear Mr. Nasogaluak,

Re: GNWT Round 2 IR Responses, File Number 02/10-05, Inuvik to Tuktoyaktuk Highway Construction Project

Please find attached the Government of the Northwest Territories responses to Information Requests 75 and 76.

Please contact me at gavin_more@gov.nt.ca or 867-873-7107 if you have any questions regarding the attached submission.

Sincerely

Gavin More

Gavin More
Manager
Environmental Assessment and Monitoring
Environment and Natural Resources

IR Number: 75

Source: MSES

To: Government of the Northwest Territories (ENR)

Subject: Grizzly bear habitat loss (EIS Sections 4.2.7.3 p.529, IR Responses Round 1 IR 35)

Preamble

When asked to provide and justify estimates of habitat loss in the LSA for grizzly bear and incorporate an appropriate ZOI into the coarse calculations of habitat loss, the Developer, in part, stated:

Based on these [North American] studies, a zone of influence (ZOI) of 500 m or 1 km on either side of the 137 km ITH road could be suggested, which would amount to 13,700 ha or 27,400 km^2 [the unit should be ha in the original] this is 100% or 200% of the LSA. A behavioural response at 1.5 km (3 km corridor), would increase the potential ZOI to 41,100 hectares. Although this is likely a ZOI within which grizzly bear behaviour might be affected, the expectation is grizzly bears would learn to cross the road and would likely do so regularly, except if road traffic was very heavy (IR #35 Response, p.9).

Regarding monitoring, the Developer states the following:

ENR is collaborating with the Developer to develop a Wildlife Effects Monitoring Plan that will include a project to try to use the baseline collected by Edwards (2009) and the deployment of additional collars in the right-of-way prior to construction to look at avoidance of the area during the construction and operation phases of the Highway (IR Responses, #35.1, p.10).

Given the supposed need of the Developer to begin project construction as soon as possible, the status of this project, and its underlying goals and objectives based on testable questions, should be provided to the Board.

Request:

75.1 Please explain and provide a scientifically defensible rationale in support of the Developer's expectation that grizzly bear will not be affected in their regional movements except if road traffic is heavy.

75.2 Please present a management plan that would alleviate impacts from heavy traffic on grizzly bear movements.

75.3 Please provide a status update of the above mentioned grizzly bear project. Please explain when and how the results of the above grizzly bear project will be made available for the EIRB to consider as part of this review.

Request/Response:

75.1 Please explain and provide a scientifically defensible rationale in support of the Developer's expectation that grizzly bear will not be affected in their regional movements except if road traffic is heavy.

ENR believes the expectation is that movement would be affected in the zone of influence (avoidance behaviour) but due to low site fidelity and low bear densities the overall impact will be miminzed for the reasons decribed below. The monitoring program outlined in the WEMP is expected to help determine if this prediction is correct for future projects in the NWT.

Individual home ranges of the barren-ground grizzly bear in this region are large[1,2]. Females with cubs have the smallest home ranges and adult males have the largest. Densities of grizzly bears are also thought to be low (4 bears per 1000 km^2 in the late 1970s) . Studies in the region confirm that little site fidelity exists including denning areas[2]. As a result, the small number of grizzly bears potentially affected are spread across a large landscape[3] and the number of encounters with the highway during the summer months will be low or nonexistent for most individual bears in the Inuvialuit Settlement Area. Individual bears may be affected by local avoidance of the road but movement patterns suggest that they will just move to other areas as site fidelity is not strong. The prediction is there will not be significant effectsto movements unless the road traffic is heavy and bears stop crossing the highway altogether. This level of traffic is not expected.

Regarding Zone of Influence for barren-ground grizzly bears, studies in the 1970s during oil and gas exploration activities on Richards Island generally indicate an avoidance of human activities(Harding and Nagy 1978)[4].The development activitiesin this study included"*3 base camps, drilling rigs (each with associated camp and airstrip), a communication tower with generating plant, gravel (borrow) pits, and a network of winter roads. These facilities and associated aircraft flight corridors are distributed over approximately half the study area and are concentrated in the southwest portion of the island.*"

The observations of 'avoidance' by moving grizzly bears were summarized as "*Of 17 instances where bear movements were followed in detail within 7.2 km of camps, 16 of the bear groups did not venture closer than 1.0 km to the camps. Tracks measured during the summer of 1973 indicated that on at least 8 occasions, bears foraged or traveled within 2.6-7.4 km of industry camps without being seen and without entering the camps. A good*

[1]Nagy et al 1983. A study of grizzly bears on the barren grounds of Tuktoyaktuk Peninsula and Richards Island, Northwest Territories. 1974 to 1978.Can. Wildl.Serv. Rep. 136 pp.

[2]Edwards, M.A., J.A. Nagy and A.E. Derocher.2009. Low site fidelity and home range drift in a wide-ranging, large Arctic omnivore. *Animal Behaviour*77: 23-28.

[3]Edwards, M.A., A.E. Derocher, K. A. Hobson, M. Branigan and J.A. Nagy. 2010.Fast carnivores and slow herbivores: differential foraging strategies among grizzly bears in the Canadian Arctic. Oecologia.DOI 10.1007/s00442-010-1869-9

[4]Harding, L. and J. Nagy. 1978. Responses of grizzly bears to hydrocarbon exploration on Richards Island, Northwest Territories, Canada. Journal of Zoology

example occurred in July 1973 when tracks of a large single bear were located and followed along a beach towards a drilling rig. The tracks indicated that as the bear came in sight of a drilling rig 1.4 km away, it turned and then bypassed the rig, keeping approximately the same distance from it. On a ninth occasion, tracks of 1 bear were found adjacent to an active gravel pit, although the bear had not been noticed by shift workers."

The authors also observed *"In April 1974, 3 bear dens were located within 4.8 km south of a borrow pit and the associated camp. Upon abandoning their dens, 2 single bears and a sow-cub group traveled generally northward toward the camp, bypassing it by 1.2, 1.0, and 2.0 km, respectively. An adult male spent several days foraging 3.0 km from a drilling rig that was audible to the investigator at that distance but was not visible because of a low, intervening hill. Similarly, another adult male foraged for several days approximately 7.2 km from a staging camp. The camp was visible to the investigator at that distance. Tracks indicated that these male bears finally left the vicinity of the camps without venturing closer.In 1975, a single bear vacated a den 1.6 km from a gravel excavation camp and bypassed the camp by approximately 1.0 km. Similarly, a single adult and a sow-cub group, which denned 3.2 and 6.4 km, respectively, from a staging camp, did not approach the camp.*"

The connectivity of the individuals across their home ranges affected by the highway during operations is the question posed in this request. It is clear from the variety of studies that grizzly bears are sensitive to human development including roads. However, grizzly bears elsewhere in Alberta and British Columbia cross a variety of levels of roads including major highways. Grizzly bears prefer to cross roads during times of low traffic (<10 vehicles per hour)[5] . This low volume of traffic is similar to overall traffic volumes for the Highway (150-200 vehicles per day, EIS pg 474). It is predicted grizzly bears will continue to cross the highway but may show more avoidance when there is more traffic on the Inuvik to Tuktoyaktuk Highway. It is also expected that grizzly bears will select den sites away from the highway based on their sensitivity to human activities.

The more significant change that could occur is a shift in hunting patterns from the current distribution to bears with ranges close to the right-of-way. While this is not expected to increase the overall harvest of bears as these areas are under quota that includes all human caused mortality, it could change the distribution of hunting pressure by the highway. Nagy et al. (1983[6]) identified the period of den emergence (i.e. mid April to late May) as the time when grizzly bears would be most vulnerable.

[5] Waller, J.S. and C. Servheen. 2005. Effects of transportation infrastructure on grizzly bears in Northwestern Montana. J. Wildl. Man. 69(3):985-1000.

[6]Nagy, J.A., R.H. Russell, A.M. Pearson, M.C.S. Kingsley and C.B. Larsen. 1983. A study of grizzly bears on the barren-grounds of Tuktoyaktuk Peninsula and Richards Island, Northwest Territories, 1974- 1978. Can. Wildl. Serv. Edmonton. 136 pp.

75.2 Please present a management plan that would alleviate impacts from heavy traffic on grizzly bear movements.

This request pre-supposes the traffic levels on the Inuvik to Tuktoyaktuk road will increase to "heavy traffic" which is not predicted in the EIS. It is expected the Department of Transportation will monitor traffic volumes. A management plan, if needed, for grizzly bears and human activities will be developed in collaboration with the parties responsible for management of this species in the Inuvialuit Settlement Region.

75.3 Please provide a status update of the above mentioned grizzly bear project. Please explain when and how the results of the above grizzly bear project will be made available for the EIRB to consider as part of this review.

Further clarification on "existing baseline" and updated discussion on the proposed Wildlife Effects Monitoring Plan is contained in the GNWT ENR response to IR Response 76.1.

GNWT ENR is discussing the application of the new information databases prepared for the 1 km alignment and borrow sites to data collected by ENR to identify high potential denning areas (using DEM models as discussed in the Developer's statements in IR Response 35.3) and using this model to supplement the fall denning surveys. The Developer would have to provide additional information as to when this work will be complete but indicate it is anticipated prior to the design phase of the Project (IR 35.3).

IR Number: 76

Source: MSES

To: Government of the Northwest Territories (ENR)

Subject: Grizzly bear habitat fragmentation (EIS Sections 3.1.9.12, p.259, IR Responses Round 1 IR #37)

Preamble

As briefly discussed by the Developer, habitat fragmentaton may or may not be an issue for wildlife species (such as Grizzly bear). The Developer states "*Historic human-caused disturbances to vegetation in the Regional Study Area were limited to small sites or resulted in minimal impacts. The level of fragmentation and connectivity are considered to be insignificant*" (EIS Section 3.1.9.12, p. 259). No scientifically-defensible rationale has been provided to support this claim and it does not appear that any type of habitat fragmentation analysis was completed as part of the assessment of impacts to grizzly bear. As a result, the Developer's residual effects assessment for grizzly bear and grizzly bear habitat in the RSA may be underestimating (qualitatively) the potential Development impacts to grizzly bear.

In response, the Developer states:

Grizzly bear habitat could be considered to be fragmented if bears were to avoid crossing the proposed Highway. The Developer predicts that the proposed Highway will not block grizzly bear movement. As there are no other studies of the effect of habitat fragmentation on grizzly bears in Arctic environments; ENR is collaborating with the Developer to develop a Wildlife Effects Monitoring Program that will outline a program to monitor grizzly bear movements and habitat use relative to the Highway during the pre-construction, construction and operation phases that will provide additional data on potential behavioural changes in grizzly bears (IR Responses #37.1, p. 15).

Given that there appears to be no baseline data surrounding grizzly bear movements through the project LSA (none was presented in the EIS) it is not clear how any such program, as outlined above, could evaluate the potential impacts to grizzly bear movements and habitat fragmentation.

Request/Response:

76.1 Please provide a status update of the above mentioned grizzly bear project. Please explain when and how the results of the above grizzly bear project will be made available for the EIRB to consider as part of this Review.

The GNWT ENR is extending the "reponse to this request" to include information on grizzly bear baseline since this is highlighted in the Preamble. This baseline is also key to understanding the basis for Wildlife Effects Monitoring Program referred to by the Developer in IR Response 35.2 and 35.3.

The GNWT has the following baseline information based on radio collaring in its Wildlife Management Information System (WMIS):

Tuk Peninsula and Richards Island 1974-78. Seventy-one (71) different bears were collared on Richards Island and the Tuktoyaktuk Peninsula as part of a major ecological study conducted by the Canadian Wildlife Service. The Study Area encompassed the entire Inuvik to Tuktoyaktuk Highway project area [see Figure 1. Nagy et al. 1983[7]]. Bears were captured after emergence in the spring and VHF telemetry transmitter collars were deployed. Flights were conducted weekly until denning. The most intensive work was done in 1974 to 1975. Nagy et al., in addition to other work on Richards Island[8], provided substantial details on dens, home ranges and foraging information. Nagy contrasted this research on a hunted population to similar studies in Yukon on an unhunted population.

Western NWT Biophysical Study 2001-09. Telemetry locations have been obtained from 2001 until 2009. The data sets include den and emergence data from 2001 to 2006 and capture locations from 2001 – 2005. Forty-one (41) grizzly bears were captured in May 2003–2006, shortly after they emerged from overwinter dens. Sampling was biased toward females to minimize interference with hunting of males by nearby communities. Bears were fitted with global positioning system (GPS) telemetry collars and deployed GPS radio collars to track movements and behaviour. Collars were programmed to acquire a location once every 4 hours from 1 April to 30 November during the non-denning season and then shut off to prolong battery life. Edwards also used data points from the 1970s work[6] in his analysis. The main publications from this to date are Edwards 2009[9], Edwards et al. 2005[10], Edwards 2006[11], Edwards et al. 2008[12], Edwards et al. 2009[13], and Edwards et al. 2010[14].

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[7] Nagy, J.A., R.H. Russell, A.M. Pearson, M.C.S Kingsley and C.B. Larsen. 1983. A study of grizzly bears on the barren-grounds of Tuktoyaktuk Peninsula and Richards Island, Northwest Territories, 1974 – 1978. Edmonton, AB. Canadian Wildlife Service.

[8] Harding, L.E. 1976. Den-site characteristics of arctic coastal grizzly bears (Ursusarctus L.) on Richards Island, Northwest Territories, Canada. Can. J. Zool. 54: 1357 – 1363.

[9] Edwards, M. A. 2009. Spatial ecology of grizzly bears (Ursusarctos) in the Mackenzie Delta, Northwest Territories, Canada.PhD Thesis University of Alberta.

[10] Edwards, M. A., A. E. Derocher and J. A. Nagy. 2005. Barren-ground grizzly bears of the Western Arctic: potential influence of oil and gas development and climate change. In: *New Northern Lights, Graduate Research by Circumpolar Students from the University of Alberta* (Ed. By Castleton, H., Danby, R., Giles, A., and Pinard, J.-P.), pp. 66–87. Edmonton, Alberta, Canada: Canadian Circumpolar Institute, University of Alberta Press.

[11] Edwards, M.A. 2006. Habitat and movement ecology of grizzly bears in the Mackenzie Delta, NWT. Arctic 50: 453-456.

A related study by a second University of Alberta student has also been published (Barker and Derocher2010[15],Barker 2011[16]); extending the efforts to determine food habits, movement patterns, denning and reproductive ecology of grizzly bears in the Mackenzie Delta. This study used GPS data from eight (8) grizzly bears still functioning in August 2007. Field observations were conducted in September and October 2007.

ENR staff conducted spring productivity surveys during this study period and fall denning surveys in years when winter oil and gas exploration was proposed using radio collared bears.

Aerial Surveys and Ground Observations - WHMIS also contains den survey data submitted by IOL to the GNWT ENR. This included aerial survey and ground observations for all of the MGP project components in the Inuvialuit Settlement Region.

WHMIS also has grizzly bear sightings obtained during caribou surveys, surveys by Inuvik staff for Source 177 and the Project alignment and some borrow sites. Additional casual observation data collected by DOT contractors will be incorporated.

The Wildlife Effects Monitoring Program is still under development and a draft outline will be provided to the EIRB soon. Part of the program is the proposal to reinstate the grizzly bear project with a focus on the RSA and LSA of this project, rather than the MGP as originally designed. The study proposed to date includes collaring grizzly bears in the area and monitoring movements during the construction and post construction phases of the project. The results from this project would not be available to the ERIB as part of the review. The intention of the project is to monitor movements of bears in the RSA and LSA in an attempt to determine if the predictions made in the EIS are correct. The working hypothesis is that bears would initially avoid the road, but still cross the road thereby not creating a permanent barrier and not causing fragmentation of the habitat.

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[12]Edwards, M.A., J.A. Nagy and A.E. Derocher.2008. Using subpopulation structure for barren-ground grizzly bear management. *Ursus*19: 91-104.

[13]Edwards, M.A., J.A. Nagy and A.E. Derocher.2009. Low site fidelity and home range drift in a wide-ranging, large Arctic omnivore. *Animal Behaviour* 77: 23-28.

[14]Edwards, M.A., A.E. Derocher, K. A. Hobson, M. Branigan and J.A. Nagy. 2010.Fast carnivores and slow herbivores: differential foraging strategies among grizzly bears in the Canadian Arctic. Oecologia.DOI 10.1007/s00442-010-1869-9

[15]Barker, O. and A.E Derocher. 2010. Brown bear (*Urusarctos*) predation of broad whitefish (*Coregonusnasus*) in the Mackenzie Delta region. Arctic 62:312 – 316.

[16] Barker, O. E. 2011. Foraging ecology of brown bears in the Mackenzie Delta region, NWT. M.Sc. Thesis. University of Alberta.