



Independent Environmental Monitoring Agency

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re: Diamond Mine Wildlife Effects Monitoring Program Review Input

The Agency is submitting the attached comments, suggestions and ideas concerning wildlife effects monitoring for further consideration as we work together in the current comprehensive review of the wildlife monitoring programs for the NWT diamond mines.

As we understand it, there may be upcoming working group meetings to discuss the monitoring of various species. The Agency is prepared to continue participating in such discussions.

Should you have any comments or questions on this submission, I would be pleased to hear from you.

Sincerely,

Kim Poole
Director

cc. Society Members
John McCullum, EMAB
Dave White, SLEMA

Diamond Mine Wildlife Monitoring Program Review

Further Suggestions from the Independent Environmental Monitoring Agency

Here we provide comments on monitoring programs for caribou (behavioural surveys), grizzly bear, wolverine, wolf, and birds. Caribou disturbance was covered in greater detail and in full logical sequence (impact predictions through monitoring objectives and testable hypotheses) in the joint IEMA-EMAB-SLEMA letter of December 2, 2009. We have not provided suggested hypotheses in the comments below.

The following comments could apply to all three NWT diamond mines, but in many cases focus on the Ekati and Diavik mines, in large part because these two mines provided comprehensive summaries on their monitoring programs and due to their close proximity, essentially act as one combined footprint. In particular, we identify the need for BHPB to demonstrate how its ratings of residuals effects¹ will be tested within an updated monitoring program.

Caribou

Behavioural Surveys

Fieldwork to provide more data to determine a behavioural zone of influence (the distance where animal activity is altered, activity being the proportion of time caribou spend feeding, bedded, walking, etc.) should be conducted, to obtain adequate sample sizes and distribution from mine infrastructure. The behavioural zone of influence may be far smaller than the distributional/occupancy zone of influence (the distance where occurrence of animals is altered), and impact predictions and objectives (e.g., whether the dominant behaviour of caribou groups varies with distance from a mine) could be altered to fit. Examples of methodologies to consider include non-intrusive methods such as video surveillance and motion-activated camera.

Grizzly bears

Preamble

During the September WEMP workshop report there was much discussion and some disagreement about what impact questions should be answered. Current impact predictions about “minor physical disturbance and displacement” and “no influence on the presence of grizzly bears in the area” are difficult to test. However, despite grizzly bears having large home ranges that render the current wildlife study areas for both mines (Ekati and Diavik) of

¹ BHPB uses the following ratings for the significance of residual effects for biological components:
Negligible: A specific group of individuals in a localized area affected during a short time period.
Minor: A specific group of individuals affected during less than one generation.
Moderate: Portion of population affected over one or more generations.
Major: Whole stock or population affected over several generations.

insufficient scale, the impact predictions from both mines need to be tested at the appropriate scale, even if these transcend beyond the current wildlife study areas.

Studies on bears, wolverines, and caribou cannot be considered in isolation between Ekati and Diavik mines, since there is no way to separate the overlapping zones of influence generated by these adjacent developments (see Boulanger et al. 2009, submitted). The bear study should commence in 2010, not 2011. There should be plenty of time to plan logistics prior to the June 2010 field season. It should be a collaborative effort among BHPB, Diavik and ENR.

Suggested impact predictions

1. Mine development (of the combined Ekati-Diavik operations or Snap Lake) does not measurably influence the distribution or relative abundance of grizzly bears in the area.

Suggested objectives

1. Determine a zone of influence from the combined Ekati-Diavik mine footprints on grizzly bears.
2. Determine the relative abundance of grizzly bears in the combined Ekati-Diavik mines study area.

Suggested methodology

The pyramid hair-snagging device looks promising as a methodology. However, the methodology should be able to differentiate between the relative distribution of bears and a change in the number of bears moving through and using the study areas (thus requiring DNA identification of individuals). Simply using the pyramid hair snagging devices to more accurately ID bear hair and hence grizzly bear presence, without doing the DNA analysis to provide individual ID information, may not fully address objectives. Without DNA ID, one will still not know whether one is dealing with a single individual on a large walkabout, or eight different bears, thus sacrificing population data that can help address population-level impacts. Hair ID alone should provide a more robust distance from disturbance measure (occupancy from presence/absence), but it will not give estimates of animal abundance or demographic trends (from mark-recapture; as in the proposed wolverine program) that can be linked to long-term changes in bear abundance. Knowing the number of individuals within the study area will help assess cumulative effects. While there may not be a direct linkage between the information provided by DNA identification and the types of mitigation actions a mine uses to minimize mine-related impacts on grizzly bears, knowledge of the number and spatial distribution of individual grizzly bears seems critical to overall assessment of mine impacts on bears (similar to the wolverine).

The temporal study design proposed by Diavik (2 years in a row, then every 2nd year) appears likely to generate robust data, but these questions are better addressed after examining all currently available data, including those generated in Nunavut by Mathieu Dumond. Mathieu has tested grizzly bear hair snagging techniques and study designs south and southeast of Kugluktuk over the past 2-3 years.

Lacking DNA analysis, all hair should be identified by a hair identification expert.

Wolverine

Preamble

There was much discussion on the merits and benefits of different designs of monitoring wolverines at the September workshop. Monitoring can be designed to provide data to identify impacts and trends in impacts to valued ecosystem components (VECs) if there are grounds to believe that impacts do or could occur. These can relate to both spatial (habitat/zone of influence) and population (changes in densities and demographics) impacts. It should be noted that monitoring studies should not just provide information that lead directly to the development of mitigation practises as some predictions and impacts from the mines relate to population-level or regional effects. Therefore, in our opinion it is short-sighted to not address potential population questions simply because of the difficulty of designing mitigative strategies to reduce impacts at the population level.

Suggested impact predictions

1. Mines will not result in a measurable change in the abundance and distribution of wolverines within the regional area.

Suggested objectives

1. Determine whether mining activities influence the distribution and abundance of wolverines within the study area.

Suggested methodology

We understand that both Diavik and Ekati have agreed to recommence DNA inventories on wolverines in spring 2010, with Diavik suggesting the next survey in 2013. However, the original design called for a minimum of 2 years in a row (2005 and 2006), then at 2-year intervals for trend monitoring (Boulanger and Mulders 2008). A single survey in 2010 followed by 2013 may not provide data sufficient to detect changes in population and sex-specific demographic trends, especially given the intervening 4 years since the original “baseline” monitoring. The temporal pattern of DNA surveys should be examined more closely to ensure that objectives can be attained. Similarly, cell size could be reviewed using existing data from a number of sources to examine the trade-offs between cell size, study area size, expected population size, and the robustness of the data. There is not a lot of point in doing this if the data are too weak for meaningful results.

Track counts (assuming a robust study design) and hair snagging/DNA fingerprinting can produce complimentary data that can be used to monitor population status, assess impact predictions, and determine the effects of human development on wolverine population abundance and distribution. If only one methodology is used, DNA fingerprinting may well provide a more robust assessment of the overall health of the wolverine population as related to the mines. DNA studies can provide data appropriate to calculate a zone of influence, while also providing population abundance and trend data.

Raptors

Preamble

Monitoring to date has shown weak trends in distance from mine site affecting raptors. Inter-year variation in nest occupancy and success is high, driven primarily by prey and weather. To fully interpret overall changes in occupancy and productivity, changes in abundance of their main prey (ptarmigan, microtines, passerines) need to be tracked. Ravens, considered a functional raptor because their nest sites are often used by true raptors and they have a common diet, should be monitored along with raptors.

Suggested impact predictions

1. The mine does not measurably change nesting distribution and or reduce productivity of raptors in the study area.

One of the current impact predictions from Diavik (*the mine is not predicted to cause a measurable change in raptor presence in the study area*) is vague and un-quantifiable, since there are no practical means to reliably measure “presence”. Also, we suggest that a lack of documented raptor mortality does not equate to no measurable change in raptor presence.

Suggested objectives

1. Determine whether nest occupancy and productivity varies with distance from mine infrastructure.

Suggested methodology

Helicopter surveys during early nesting for peregrines (late May/early June; occupancy surveys) and the late nestling period (July) are a proven methodology for documenting the presence of nesting raptors in an area. Because of differences in the phenology of the nesting period among species, survey timing should focus on the species of greatest interest, presumably the peregrine falcon. These surveys should be conducted with a qualified/experienced raptor person. “Natural” and man-made (pit wall, mine infrastructure) nest sites should be considered in all analyses of the data, considering whether pit-wall nesting is deterred. Raptor populations are generally limited by prey availability and/or nest site availability, and the pit walls and mine infrastructure do create potential nest sites for the population.

Annual surveys may not be required for longer term monitoring, but linking with the 5-year peregrine surveys will likely provide too few data for meaningful analysis. If surveys are conducted, they must include both occupancy and productivity surveys, and they need to address species separately. Occupancy analyses are compromised if there are no late May/early June data.

Mitigation measures should focus on reducing disturbance early in the nesting period, and reducing the chance of mortality of fledglings. Unless nests on pit walls are going to be actively subject to blasting, they should be left alone. Raptors are more resilient to human disturbance than many give them credit for.

Upland breeding birds, waterfowl, and shorebirds

Preamble

Ekati has committed to a comprehensive analysis of the 13 years of upland breeding bird (UBB) data collection, with a report anticipated in March 2010. In the meantime, we agree that annual UBB surveys should be suspended pending the results of this analysis. Ekati's annual contribution to North American monitoring of UBBs through the North American Breeding Bird Survey is commendable, and the other two mines are encouraged to participate as well. If initiated, future breeding bird surveys should use standardized methodologies coordinated with CWS, to allow better integration into cumulative effects analysis.

Wolves

Preamble

Although the current den surveys conducted by BHPB (in collaboration with ENR) provide interesting trend data on den site occupancy and productivity, they have not been proven to be a robust index to the distribution and success of den sites, and cannot address the current impact predictions on wolves (denning habitat, habituation, mortality). Den site data are not robust enough to assess distance from disturbance and potential effects of the mine on wolves' questions. Mitigation should continue in the form of waste management to reduce the attraction of the mine to wolves, wolverines, and foxes.

Kim Poole

Director, Independent Environmental Monitoring Agency