ENR Response to WRRB Information Request

Round 3 – Supplemental Information Requests

IR Number: 3.1

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

Based on OLS model runs please provide the probability of different population trajectory outcomes under varied levels of harvest (ranging between 0 and 4% of the current herd size) and herd productivity (based on values measured since 2000).

Response

ENR has contracted a statistician to model likely population trajectories of the Bathurst herd with a range of calf productivities and for harvest ranging from 0 to the estimated 3000-5000 cows and 2000 bulls taken in recent years.

The preliminary results are expressed as probabilities of fast, moderate and slow decline, and slow or moderate increase. A brief report on this work will be provided when it is completed, prior to the WRRB hearing in March.

IR Number: 3.2

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

Given that the relationship between predator and prey may change substantially with prey population size as a result of reduced effectiveness of strategies such as predator swamping, what evidence is there to assume predation rates have remained stable or declined with the decline in caribou population size? Please consider factors such as possible changes in predator functional response.

Response

To the best of ENR's knowledge, the data to address these questions fully do not exist. An intensive (and expensive) study with radio-collared wolves followed regularly to measure kill rates would be required. Some information exists from

Alaska and Yukon on kill rates and wolf numerical and functional responses in forested boreal forests, but these may not apply directly to the situation in the NWT, where wolves rely on barren-ground caribou exclusively.

Based on annual den surveys since 1996, ENR has documented a decline in wolf den occupancy and number of wolves at den, at the south end of the Bathurst herd's summer range. ENR believes that the total number of caribou taken by wolves has also declined proportionately. During the June 2009 Bathurst caribou calving ground photo-survey, approximately 14,000 km of fixed-wing transects were flown and there 4 wolf sightings and 8 bear sightings in total. There have been seven flights to monitor caribou movements this winter in the North Slave and no wolves were seen on four flights. On the other three flights, one, seven and six wolves were seen with caribou. Most flights had at least 4 observers plus a pilot and navigator. These observations also suggest a low wolf population in the range of the Bathurst herd.

IR Number: 3.3

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

The estimate of natural cow mortality (14%) was based on an estimate from the 1980's when the herd was increasing. Please provide rationale for assuming the value of 14% is an appropriate estimate of natural mortality from 2006 to 2009 when the herd was in accelerated decline. How might the uncertainty associated with this assumption affect the certainty in the estimate of cow harvest?

Response

ENR has acknowledged that better information on caribou harvest rates from the Bathurst herd is needed, and some form of mandatory reporting of all harvest is recommended in the joint management proposal submitted to the WRRB.

The reported harvest for resident hunters and the fall bull harvest by outfitters is reliable. Caribou kills reported via check-station and interviews in Tłı̨chǫ communities was 1690 and 2712 for the winters of 2007/2008 and 2008/2009. The majority of this harvest was cows.

In the opinion of the wildlife officers who ran the check-station and who know these communities, these totals are under-estimates of the harvest and the real totals were likely at least double, as detailed in the Bathurst technical report. This doubling would result in an estimated winter harvest of 3380 caribou in 2007/2008 and 5424 caribou in 2008/2009.

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ENR has used values of 3000-5000 cows and 2000 bulls in modeling the Bathurst herd's decline. A back-calculation of likely cow harvest was also made from both the Caribou Calculator and the OLS modeling, and these calculations suggested that a cow harvest of 4000-5000 cows was a reasonable fit if natural mortality for cows was on the order of 14%.

An independent estimate of natural cow mortality and harvest mortality rates would require a large increase in radio-collar numbers on the Bathurst herd. The condition, pregnancy rates, and somewhat increased spring calf:cow ratios (over values in the early 2000's) in 2007, 2008 and 2009 suggest that overall environmental conditions had improved over the early 2000's.

In addition, there is published information on cow survival rates in other barren-ground caribou herds which indicates that cow mortality rates tend to be around 10% in rapidly increasing herds and 15-20% in decreasing herds. An estimate of 14% is within a range that has been found in other herds.

The total estimated mortality for Bathurst cows in 2009 was 32-33%.

IR Number: 3.4

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

Please explain how the effectiveness of the proposed management actions are to be monitored and evaluated? What criteria are to be used in such evaluation and how will management actions be adjusted? For example, will evaluation be based solely on the results of a calving ground survey in 2012? If so, what is the likelihood of detecting a change based on the error associated with such estimates? Are there other means of evaluating success?

Response

ENR uses both population size and trend information to assess the need for and evaluation of management actions. In the joint proposal, the objective of the management actions recommended by ENR is to reverse the decline. The modeling work indicates the key factors to affect recovery are increased cow survival, increased calf survival and decreased harvest levels. ENR suggests these are the key factors to track to assess if management actions are working. ENR recommends keeping management actions in place for three years before undertaking a survey to obtain a new estimate of herd size in 2012. This is based on the results from management actions undertaken for the Bluenose-West and Cape Bathurst herds. Late-winter recruitment surveys will provide an index of calf survival and productivity, and reconnaissance surveys on the calving grounds will provide an index of breeding cow numbers. This information will

provide a measure of population trend prior to the 2012 survey. Any harvest from the Bathurst herd should be reliably documented. This type of information can also be used for population models to estimate likely herd size, as has been done for the Porcupine caribou herd.

ENR is undertaking a statistical evaluation (ability to detect change, power analysis) of preferred intervals for population surveys and other surveys to obtain trend information.

IR Number: 3.5

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

Please provide the statistical rationale (e.g. power analysis) for justifying an increase in number of collars from 20-50 on the Bathurst herd with respect to meeting the objectives of better estimating mortality, herd fidelity and seasonal distribution (or others as you may define). How might sample size and changing age structure affect these estimates? What alternatives are available for meeting these objectives?

Response

The number and type of collars required depends on the purpose of the information being collected. ENR has not, at this time, carried out a power analysis of radio-collar numbers for the Bathurst herd. This evaluation is planned as part of developing the next Caribou Management Strategy. The Alberta Research Council review of GNWT's caribou program recommended a several-fold increase in radio-collar numbers for the Bathurst herd, so that calving ground fidelity, seasonal movements and survival rates could better be monitored.

A contract report from 2008 by J. Rettie evaluated radio-collar numbers for Bluenose caribou post-calving surveys and for detecting changes in survival rates in caribou herds. A sample size of 100 collars or more would be needed to detect small-to-moderate changes in natural cow survival rates. Biologists working with the Porcupine herd maintain approximately 100 collars on that herd, in part to monitor natural cow survival rates.

Determining an adequate radio-collar sample on the Bathurst herd has always been a balance of cost and community concerns with technical needs.

Since 1995, there have been between 8-20 active radio-collar numbers on Bathurst caribou annually. Power analyses of past data will assist in determining what limitations this places on the strength of the inferences drawn from these collar numbers. We do not know of alternatives to radio-collars that can provide the information on caribou movements needed for management. Knowing human harvest levels and calf survival rates, modeling can be used to infer

natural cow mortality rates. Collecting annual condition information annually also provides an indication of whether natural cow mortality may be changing.

IR Number: 3.6

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

Please provide a proposed number of collars to be placed on bulls and the statistical rationale for this number to meeting the objective of better documentation of seasonal distribution (or others as you may define). What alternatives are available for meeting these objectives?

Response

An exact formula of allocation of collars between bulls and cows has not been determined. However, in the Cape Bathurst, Bluenose-West and Bluenose-East herds, where larger numbers of radio-collars are maintained to meet the needs of post-calving photo surveys, collars are allocated roughly in proportion to their representation in the population.

In the case of the Bathurst herd, sex ratios in recent years have been between 31 and 38 bulls:100 cows, so about ¼ of the adult population, and collars could be allocated accordingly if the numbers are increased.

ENR has been criticized for not having collars on Bathurst herd bulls and relying on collared cows to determine which herds (Bathurst, Ahiak, Bluenose East) are being hunted in the fall or winter. However, to date, the majority of the harvest has been cows and the collar data are valid for allocating harvest among herds for cows. There is some limited information on movements of bulls from the Cape Bathurst, Bluenose-West and Bluenose-East herds which indicates they use the same ranges as the cows from those herds. This would suggest there is limited value in putting colars on bulls from the Bathurst herd for the purpose of documenting movements. We do not know of alternatives to radio-collars that can provide the information needed for management.

IR Number: 3.7

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

What monitoring actions do you propose could be done by harvesters and what training opportunities and funds might be available for this purpose?

Response

ENR has proposed, to the Tłı̨chǫ and other communities (Akaitcho) that have hunted the Bathurst herd, hiring a wildlife monitor in each community. Thus far, a few communities have identified individuals interested in these positions. ENR has also assisted some Tłı̨chǫ communities with community caribou hunts outside the Bathurst no-hunting zone, where hunters have collected basic information on health, pregnancy rate and condition of the caribou. Hunters could also report on number of predators observed, annual snow conditions and number of calves seen.

IR Number: 3.8

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

In IR response #2.18 and 2.35 you state that there is no proposed sampling of Bathurst caribou cows for body condition and pregnancy yet in Monitoring Action #2 and 3 health and condition sampling and assessment of pregnancy rates is proposed. Please clarify.

Response

If there is a Total Allowable Harvest (TAH) for the Bathurst herd that includes cows, ENR would propose assessing their condition and pregnancy rates. If the TAH does not include cows, then ENR would not propose to collect condition and pregnancy information by this means.

IR Number: 3.9

Source: Wekeezhii Renewable Resources Board

To: Government of the Northwest Territories

Reference

Request

Please provide spreadsheet files with all available data on demographic parameters for the Bathurst, Ahiak and Bluenose East caribou herds from 1970 onward including means, standard error and sample size for the following: spring and fall calf:cow ratios, sex ratios; mortality; pregnancy rates; spring and fall back fat; spring and fall body mass

Response

ENR receives multiple requests for caribou information in the Wildlife Information Management System (WMIS) system annually and a data release agreement is required which specifies the purpose for which the data will be used and the constraints on the use of the data. ENR is continuing to enter historic data into the WMIS database. The WRRB can submit a data request to Doug Hartt, System Administrator, Wildlife, ENR.

Some of this information was provided in previous responses to Information Requests or is in the draft Technical Report.

February 23, 2010