2009 Tåîchô Government and Government of Northwest Territories
Joint Proposal on Caribou Management Actions in Wek'èezhìi:
an independent technical review for the
Wek'èezhìi Renewable Resource Board
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Speaking notes for presentation

Slide 2

• The Joint Proposal is a recovery plan which includes Actions 1-5 to increase adult caribou survival by decreasing hunting. Those 5 Actions are the subject of this hearing.
• ENR states that if hunting continued at 2008/09 levels, the herd could be eliminated in 4-5 years which underlines urgency to get recovery actions underway.
• My presentation to review the five proposed actions to restrict hunting is in three parts.
• Firstly, and based on knowledge about declines and recoveries elsewhere, I explain why increasing caribou survival is key to recovery.
• Secondly, I comment on the practicality and risks of the five actions
• And thirdly, I'll offer comments on whether more is needed and what else could be done to ensure recovery of the Bathurst herd.
• For most of the presentation I do not treat the five actions separately as they all contribute to increasing caribou survival.

Slide 3

• Increasing survival is the most direct and fast way to build up caribou numbers = the reasons follow from caribou ecology
• Caribou numbers are the balance between births, deaths and immigration/and emigration
• ENR's analyses show that immigration and emigration between calving grounds are small scale, and there is no net gain or loss.
• However the relationship between herds is a concern for some interveners.
• Two reasons why increasing caribou survival drives recovery are firstly, caribou are like other mammals of similar size such as red deer and big horn sheep in that their abundance is sensitive to the rate that adult females survive.
• So it makes sense to reduce female death rate – it will have the greatest effect. At the same time, males also have to be reduced to maintain a balanced sex ratio.
• Secondly it is practical and possible – we can reduce hunting and or predation.
• Although caribou abundance also depends on pregnancy and calf survival, we can do less about those rates because they are driven by a complex of interacting influences which includes weather : for example, hot dry summers such 2004 increase warble fly harassment and reduce foraging – if the caribou are not fat enough, pregnancy rates are lower.
• Increasing survival is not the only necessary action in caribou recovery which is why the joint proposal refers to other things including protecting calving grounds, education etc which help caribou especially over the longer-term.
• When we look at other caribou herds and their management, we see that increasing caribou survival leads to increases in herd size.

Slide 4

• In Alaska, herds have declined and their recovery followed restricting harvests and in some cases, reducing predation. Harvest restrictions are applied both when herds are declining and sometimes to keep a herd increasing
• For example, the Central Arctic herd is currently increasing: its management is to keep female harvest low and total harvest is <2% herd size.

• Another Alaskan herd, the Fortymile is an example of what it takes for recovery which depended on increasing caribou survival – more details later in presentation.
• In NWT, to halt the recent decline and promote recovery for Cape Bathurst and Bluenose West herds, the co-management boards and GNWT held public hearings before they restricted hunting to increase adult survival.
• In 2006 non-aboriginal and commercial hunting was stopped. Then after 2006 census of herd size, all harvesting halted to increase caribou survival in Cape Bathurst.
• The restricted harvest for the Bluenose West herd was 4% of herd size and hunting of cows would not exceed 20% of the Total Allowable Harvest –
• Both herds similar rate of decline but were very different sizes – when numbers are very low – herd is vulnerable and recovery takes longer.
• So having offered information on why increasing survival helps recovery – which is the proposed five management actions – the second part of my presentation is to consider the practicality and risks of the five actions hunting restrictions for the Bathurst and its neighboring herds.

Slide 5

• I have three comments on what the hunting restrictions for Actions 1-5
• Firstly, the practicality of Actions 4 and 5 is uncertain until details are clarified.
• For example there is confusion between the proposal and responses to information requests about whether it is antlerless or antlered bulls that will be hunted. Either carries the possibility of accidental hunting. If there is limited hunting of antlerless bulls, there is possible accidental kill as in years when cows are in poor condition the %antlerless cows can increase to 3-4%. If it is young antlered bulls, again there is possible accidental kill. In the 2001-06 management plan for the Fortymile caribou herd, concerns were expressed about a bull-only hunting increasing wastage as cows were mistaken for antlered bulls.
• Another point of clarification is that Action 4 states that "No hunting of females is to take place when caribou of different herds are mixed together in the winter time to avoid accidental hunt of Bathurst cows. When this situation occurs, it is recommended that males only be hunted (ENR's position)." But the Joint Proposal offers details such as defining in an operational sense what is meant by 'mixed'.
• Action 5 does not explain the limited number of bulls will be determined , or how mobile zones based on collared caribou will operate especially as only a 'few' bulls will be collared.
• In a sense the lack of specific details is an advantage as it does leave room for a collaborative approach to share and refine those details.

Slide 6

• A second comment on what will the proposed hunting restrictions may mean for the Bathurst is about the proposed timelines to re-consider management actions. Actions 1- 3 will be re-considered in 2012 after a photographic census on the calving ground.
• The 3-year timeline is unrealistic and increases risk for the Bathurst herd.
• It is unrealistic as it is unlikely that recovery will be sufficient to be measurable within the 3 years. The possible change in the number of cows has to be at least 10% to 15% higher or lower than 2009 estimate to be detected (the precision of the mean estimate based on calving ground census 10-15%)
• This is unlikely as stated by ENR in a Responses to Information Request : "Modeling carried out to date suggests that closure of female hunting would most likely result in an estimate of breeding females in 2012 similar to that recorded in 2009. It is unlikely that a statistical comparison of the two estimates would show a significant difference."
• The risk comes from having to wait 3 years (and possibly longer if the census failed) for co-management to credibly distinguish between a continued decline, numerical stability or recovery. That information is essential to decide whether to intensify or relax management actions.
•This is the case for the Porcupine Caribou Management Board where weather has prevented a census and they are relying on computer model projections to integrate rates of calf and adult survival which carries a risk as computer model projections are not exact predictions.
• The risk would be greater for the Bathurst because it's recent (2006-09) rate of decline is high and it is at relatively low numbers.

Slide 7

•A third comment on the actions restricting hunting, is the risks to neighbouring herds
•The Bathurst herd's neighbouring herds - Ahiak and Bluenose East herds are declining and their rates of survival and harvest are unknown.
•The Joint Proposal's Action 4 states a "careful and limited hunting of caribou females may also be considered on those two adjacent herds until a photo census and new population estimates are obtained for those two herds which are scheduled for the

summer of 2010".

•There are no details specifying how the 'limited' hunt will be determined and implemented. Information Response 2.9 from ENR still left open the scale of the limited hunt or how it will affect the hunting levels for the Bluenose East and Ahiak herds. The proposal does not address the risk of hunting from those two declining herds or how this relates to management planning for those herds.

•The proposal also notes that "Consultation . . . to explore avenues to provide financial support to hunters to access new hunting areas". This is vague and fails to address the cumulative risk of moving hunting effort to adjacent herds that are declining.

• The Joint proposal's Action 5 includes a recommendation is to harvest Bluenose East and Ahiak caribou males in the fall using mobile harvesting zones to be determined based on the seasonal distribution of collared caribou. This lacks details about implementation or an assessment of risk for those herds.

•Summarizing then, the effects of the restricted hunting increasing survival is that on one hand, is based on caribou ecology and will be effective. On the other hand the proposal lacks details about how the actions 4 – 5 will be implemented and assessed. Those uncertainties (lack of information) raise the risk for the Bathurst and neighbouring herds.

Slide 8

• I start with asking whether the proposed restrictions are enough for recovery raises the question of what is 'enough' – double the size of the herd in 10 years or what do people want? The proposal states that its goal is " to develop actions that will allow for the *most rapid recovery* of the herd".

• The goal makes sense as the longer the herd stays either declini ng or as low numbers, it is vulnerable.

• It is uncertain, however, the proposed actions restricting will be sufficient for 'rapid recovery for two reasons:

• The uncertainty follows (1) from ENR's lack of information on the accelerated decline and whether it is caused by harvest or harvest and wolf predation (2) changing weather patterns and their effect on pregnancy and calf survival.

Slide 9

• Currently, ENR has explained that for caribou cows of the Bathurst herd, total death rate increased recently since 2006 – currently, the annual death rate is 33% This is based on two lines of evidence
• Firstly, the trend in the number of breeding cows is used by the computer modeling to derive adult survival rates which were estimated as 86% in 1985 to 76% in 2006 and down to 67% in 2009 –
• Secondly, survival of cows based on the satellite collars averaged 82% (ranged between 74 to 88%) for the Bathurst herd 1996-2003 which are within those recorded for declining herds (based on collared cows).
• The question is whether hunting is mostly responsible for the accelerated decline but the information on hunting levels is uncertain.
• The Dogrib Harvest Study (1988-93) for the Bathurst caribou herd estimated mean harvest at 8380 (range: 3318-13107) cows and 7484 (range: 3855-10073) bulls per year compared to 2006-09, a minimum annual estimate based on interviews and check stations is in the likely range of 3000-5000 adult cows/year
•The harvest information is insufficient to understand whether the accelerated decline (2006-09) is a consequence of an increase in hunting and or natural mortality.

Slide 10

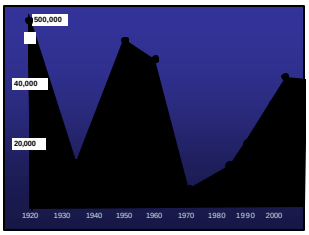
• It is possible, based on experience elsewhere especially from fisheries that hunting can accelerate a decline.
• If the number of caribou taken has not greatly changed during the decline but the reduced size of the herd meant that people were either working harder to take caribou or the winter roads and snowmobiles made it easier to take caribou even as their numbers declined, the hunting has an increasing effect as the herd declines
•This is the basis of ENR's argument that the *effect* of hunting has increased even if the level of hunting has not increased. If this is correct or partially correct, then it also follows that restricting hunting will greatly assist recovery. But there is uncertainty.

Slide 11

• The uncertainty is not knowing the level of natural mortality and in particular whether wolf predation has declined or increased.
• The importance of this is that it relates to the effectiveness of reducing hunting – if

predation is higher than ENR thinks, the increase in survival from restricting hunting may not be as strong as expected.
• Most management agencies face this problem that predation, accidents and disease cause caribou deaths are difficult to monitor.
• Through reports of hunters and samples taken during hunts, no evidence for disease problems except an outbreak of foot rot in summer 2001
• Predation rates are essentially unknown. ENR argues that as 2 of 4 possible indices to wolf abundance (based on wolves and pups at den sites), that wolf numbers and thus wolf predation rates have declined. I do not find this convincing as even if wolves have declined, relative predation rates may not have declined sufficiently.
• Even if wolves had declined from the rough estimate of 1500 wolves in the 1990s, even 200 wolves can annually kill 20x200 = 4000 caribou.
• An unknown is whether declines in neighbouring caribou herds is increasing dispersal of wolves especially for herds overlapping during the winter ranges.
• So given the uncertainty over whether predation is contributing to the accelerated decline, it is worth looking at elsewhere to learn about declines and recoveries. One such example is the Fortymile herd.

Slide 12



• The Fortymile is a medium-sized caribou herd (2009: 46,510 caribou) shared between Alaska and Yukon.
• Recovery based on hunting restrictions is less effective unless predation and weather are taken into account – even a couple of summers and winters with poor weather measurably slowed recovery.
• Recovery was slow: the mid-1970s saw the herd reduced to <10,000 and it did not double in size until late 1980s (despite restricted hunting and wolf control).
• Three consecutive management plans (1996-2012) which annually reviewed harvest is based on trend in herd size.
• The 1995-2000 plan included non-lethal wolf removal for dominant packs - and the harvest was reduced to 150 bulls to increase acceptability.
• In the 2001-2006 Plan, the harvest increased from 150 bulls to 2-3% herd size – target figure of 850 caribou <25% are cows
• The harvest is regulated by season and zone (rather than road corridors which were considered difficult to enforce).
•The Trondek Hwechin have not used their quota in the interests of conservation.
•Looking at declines and recoveries elsewhere may also hold lessons - although fisheries and caribou recovery are two different disciplines, examination of success in fisheries recovery illustrates a couple of points.

Slide 13

• Recovery of fisheries after declining depends on rate of population decline - fisheries that have declined more than 60% over 15 years show little or no recovery as much as 15 years later, even when fishing mortality has been reduced following collapse. With 15 year declines of 70-90%, only about 1/10th of fisheries recovered to 50% of prior abundance.
• This observation from fisheries then raises concerns about the accelerated decline for the Bathurst herd –not to letting declines continue while debating and planning recovery
• Another finding from fisheries is that while reductions in fishi ng are necessary, they are not always sufficient for recovery – recovery can be complicated by ecological changes including environmental trends.

Slide 14

• Reducing death rates are one side of recovery; the other side is birth rates and calf survival – which we cannot directly influence over the short-term. But given the marked changes in weather and vegetation across the caribou ranges, it is prudent to allow for more annual variability in pregnancy rates and calf survival by rebuilding herd quickly and being conservative with other actions such as hunting.
• The need is then for a rapid recovery so as to increase herd size to deal with things such as a poor summer.
• The proposed actions 1-5 cannot be intensified (reducing the bull harvest further is unlikely to change recovery) which also argues for alternative actions.

Slide 15

• So to bring these five threads together – the goal for rapid recovery; accelerated decline and uncertainty as to whether it is caused by harvest or harvest and wolf predation; and the need for rapid recovery to buffer environmental variability brings me to suggest alternative actions such as managing predation.
• The Joint Proposal does not describe alternative or additional actions, even to the extent of arguing why those actions are not being proposed.
• Predator management was listed in the 2004 ENR management plan and 2006 ENR proposal (if wolf predation is a key factor, support for hunters to take more wolves). During the Whati TG caribou workshop, the need to look for solutions to curb wolf numbers was mentioned. A suggestion was made for ENR to issue more tags to outfitters for wolves and bears. Those are some options to explore and to consider the trade-offs – greater certainty for caribou recovery relative to reducing predators – a natural part of the caribou's world.
•Secondly, within the Actions 1-5, the proposal does not offer options. For example, the difference between restricting hunting of cows to zero or, for e xample, 250 is likely undetectable at the scale of resolution of the monitoring. But e ven a low level of hunt (for cows) would address inadvertent wastage. A reduced hunt would be a means to adequately sample pregnancy, health and age structure, and might partially increase support for the actions, the trade-off being a slightly lower rate of recovery.
•Innovative use of seasons, zones and allocation among communities are all options for flexibility and trade-offs which share the responsibility for recovery.
•There is also flexibility to examine trade-offs in the numbers of bulls harvested.
•And during the 3 year timescale of the proposal, enhanced monitoring could be used to assist in determining when to intensify or relax management.

Slide 16

• Although the Joint proposal's second goal is "to identify monitoring of the herd's welfare and the effectiveness of recovery actions", improvements are needed to tie the monitoring more closely to measure the effectiveness of recovery actions. Additionally it is prudent to Intensify monitoring relative to rate of decline – proposed monitoring is the

same that did not detect the accelerated decline.
• Enhancing the proposed monitoring would create a safety net at annual scale.
• The risk of failing to detect changes in herd size is accentuated as the Joint Proposal offers no proposed use of annual monitoring to index changes in herd size as 'an early warning' whether management actions are sufficient or need to be intensified. For example, if calf cow ratios or pregnancy rates are less than some agreed on level, then this can be used to inform decisions about restricting hunting or other actions.
• The proposal lacks objectives with criteria to measure success or failure of the management actions. Unless criteria are established for annual monitoring to index likely direction of change in herd size, timely intervention may be difficult.
• So while restricting hunting will be the essential step toward recovery and a rapid recovery is biologically prudent; Actions 1-5 may not be enough for rapid recovery and to provide a buffer against trends in weather. Enhanced monitoring and alternative actions will be a safety net.
• A rapid recovery may be prudent biologically but people also need to agree with the trade-offs necessary for rapid recovery.

Slide 17

•.Involvement of the fishermen was a key for recovery and this was also the experience with the Fortymile caribou herd – collaboration was essential for recovery.
•The Joint proposal notes the need for a management plan in 3 years – less risky to spend the next 3 years working together collaboratively
•From fisheries there is a strong message that recovery also depends on how societies and governments respond to population collapses. The speed with which managerial action is taken to halt population decline will influence the age structure of the population at the time of collapse, which can significantly influence recovery.
•Recovery is not simple – it involves people as well as caribou. To involve people requires being clear about risk – the risk of inaction and the risk of action - - risk comes from difficulty in deciding whether to intensify or relax management actions, which depends on being able to credibly distinguish between a continued decline, numerical stability or recovery.
•The Actions 1-5 restricting hunting will likely halt the decline and will likely start a slow recover. Given the unpredictability of a changing environment and uncertainty about natural mortality, relying on harvest restrictions alone is risky.