October 09, 2020

Summary of Science Technical Session related to the 2020 Wolf Joint Management Proposal

October 5, 2020

09:00 a.m. to 5:00 p.m. MDT, Yellowknife, NT.

Participants: Tłı̨chǫ Government; Environment & Natural Resources, Government of the Northwest Territories; North Slave Métis Alliance; Łutsel K'e Dene First Nation; Wek'èezhìı Renewable Resources Board

Estimating wolf numbers, including the ungulate biomass index and its sensitivity to wolf removals and alternate prey. Options for additional methods.

- Estimating wolf numbers is a major key to the overall Wolf Removal Program which hinges on removing 60-80% of the estimated wolves. To do that you need to know how many wolves are associated with the Bathurst and BNE herds. The Pilot Program acknowledged that there was an absence of a robust survey method for wolves. ENR and TG have identified the Ungulate Biomass Index (UBI) as their method to inform management options – how much food out there indicates how many wolves can be supported.
- Are wolves likely to be in equilibrium, particularly because the caribou appear to have continued to decline? The decline measured in 2018 was used to project forward to estimate caribou biomass in 2020 and those caribou estimates were the basis for the 2018 and 2020 wolf estimates.
    - The answer is that there could be a delay in how wolves respond to changes in biomass and wolves could also turn to alternate prey. This is another area of uncertainty in the report.
- Should moose be included as an alternate prey in the UBI and would that increase wolf estimates for the Bathurst and BNE ranges?
    - The role moose play in the UBI and wolf system is another uncertainty. How alternative prey species contribute to wolf density should be considered.
    - Additional information was provided on examining the removed wolves : 58 stomachs from the incentive area, 6 were empty. 51 stomachs had caribou in them, 1 had moose, 1 had garbage.
    - Summary report of stomach content to be proved prior to October 23rd

  - There was an extensive 2016 moose survey done in the north slave. 2864 moose in the area.
  - Anecdotal reports of low wolf numbers seen in the North Slave, from people on the ground and people during surveys for other wildlife by air and the Ungulate Biomass Indicator may over-estimate the number of wolves.

- What are the confidence limits or measure of precision for the wolf estimates?
  - It is possible to calculate confidence intervals as it was done in BC using the Ungulate Biomass Indicator .
  - Precision could be estimated but needs software
- Suggestion to take a caribou centric approach and back calculate from caribou survival to determine how many wolves would have to be removed to achieve an increase in caribou survival.
  - Yes should be done – possibly through more modeling.
- Can the mark recapture survey methods for wolves give us more information about wolf populations? Other survey methods?
  - Caribou tracks on the ground would obliterate any wolf tracks so that makes that sort of survey problematic
  - We use the caribou collars to stratify an area then we fly the area in grid cells and search for wolves
  - Mark recapture work was done in 2012 on wolves in the North Slave. Needed to have 25% of the wolf population marked in order to get clear results. That is substantially more wolves than ENR is able to mark (collar).
  - Very qualified pilots are key to the surveys
- Can you collar enough wolves in a future wolf collaring program to learn more about the wolf populations?
  - Since there will be less wolves now than in 2012, it is reasonable, but it would still require 25% of the population which is a lot of collaring.
  - Very challenging

<u>Herd assignment of wolf removals and herd overlap, including discussion on how to reduce uncertainty and the wolf collaring program</u>

- In figures 32 and 33 of the Technical Report, 9 wolves removed by helicopter are depicted to have been outside of the 95% kernel density estimate utilization

distribution. Why were they attributed to the Bathurst herd? How confident are you that those wolves were Bathurst wolves? Can we link that to the stomach content data?

  - They were assigned based on the herd they were closest to.
  - Greater than 5/10 in confidence they are Bathurst. Difficult to verify.
  - Wolf kill location is only 1 spot they were at, while the kernel density is the average of a month for caribou
  - Removal crew in helicopter does not have the whole month kernel density map when they fly. Only actual locations of caribou.
  - The group of 5 wolves (of 9) were on the flight path the helicopter took on the way to the Bathurst area. They were deemed to be "close enough" to the Bathurst caribou
  - Lack of information on wolf fidelity to herds and movement in/out of core wintering area
  - A question about how robust is the assumption about assigning the wolves to the caribou herds. Attributing wolves to the individual caribou herds is at two scales: the moment of removal and then where the wolves were relative to the individual herds during the previous seasons.
  - No clear indications from current collared wolf movements but some uusual movements

- How far do wolves have to be away from the core area until they are not part of the herd? These rules need to be defined.
  - No answer
- If those nine wolves were harvested on the ground by ground harvesters, would they still be counted as Bathurst caribou?
  - No answer
- Page 13 of the JMP states that "wolf collar locations will be used to locate removal crews in the general vicinity of wolves. Every effort will be made to avoid the removal of collared wolves or its pack mates." How specifically will wolf collars be used in this program?
  - Learning how packs move around the caribou, peripherally, between caribou ranges. This could help removal crews know where to look for uncollared packs.
- If Bathurst and Beverly caribou continue to overlap, or overlap more, how does that change our ability to set targets for wolf removals and meet those targets?

  - Key consideration.
  - Trend analysis for the overlap of the caribou herd over time was not done
  - The more overlap, the less certainty of which herd a wolf belongs to
  - Expected number of wolves with each herd is different. When the Bathurst who are 1/10th the size of the Beverly overlap, there is potentially a comparable overlap in wolves

- Is ENR considering other approaches to herd allocation of wolves? Ways to refine herd allocation or alternate methods to allocate wolves to herds? Did you look at other removal programs?
  - No alternatives are being considered at the moment. There are newer kernel density estimates that could be applied in the future. Potential for different modelling from the collar data but not possible today. They make the data richer but shouldn't' fundamentally change it. There could be analysis on wolf tracking data done.
  - Preliminary work is being done with Caslys looking at multiple grid sizes for analyzing caribou movements. Was meant to be an appendix in the technical report.

<u>The projected effects on caribou, based on PR (Wolf 2020): 019 – Summary Caribou Population Modeling of Varying Levels of Wolf Removal, and scenarios with a higher wolf abundance.</u>

- The model is needed as brings focus to caribou response to wolf removals and the question was to outline the main findings of the model runs
  - The scenarios included current removal; what would happen if there 50% or 75% more wolves than estimated. Even with 80% removal, the outcome is essentially only stabilization of caribou numbers.
- The same survival rates for the Bathurst and Bluenose East derived from the herd size estimates were used in the model. 0.78 were used for 3-8 year-old, and 0.5 for calf survival
- The last two known survival rates by the Board were .87 for 2016 and 2017 for the Bathurst, and it was lower for the bluenose east
- Caribou trends are highly sensitive to adult survival. How much do those older rates affect the projections for the BNE and Bathurst herds?
  - 3-9 year old caribou survival rates are key to the model. Looked at population estimates in 2018 and 2018 and calculated an exponential rate of decline.

  - Evidence of emigration of the Bathurst herd to the Beverly. Did not model emigration in the model. Not enough information
  - Modelled 23-25% decline in the herds per year, which matched the 2015-2018 estimates
  - The Model could instead treat all 3 herds as one meta population to reduce uncertainty.

- How sensitive is the model to calf survival rates that are less than 0.5?
  - More modeling could be done to examine this.
- Concern that the kill rate used in the model was too high (4-77 caribou per wolf per year). Using the average predation rate may be overestimating it. That study took place on the porcupine caribou who were at 178,000 animals, while the Bathurst is at 8,200.
  - The model used the only available predation rate data.
  - More model runs could be done with lower predation rates to see the implications.
- How are Cumulative Effects taken into account in the model?
  - The model assumes 60% of caribou mortality is due to wolves so other effects may be included. That toggle can be moved up or down, and the other mortality factors go up or down. That analysis can be done, but was not for this.
- The model examined if wolf densities were higher (75% or 50% higher than estimated)
  - If there are more wolves out there, mortality stays the same, but each wolf takes less caribou. So each wolf removed is less of a benefit to the caribou
- The applicability of the 60-80% wolf removal is untested for non-territorial wolves
  - How many wolves would have to be removed to get a 10 or 15% increase in adult survival? And run that scenario with different scenarios of calf survival? And different levels of cumulative effects mortalities?
  - Commitment to do this.
- What was not done deliberately in the models was if you want to maintain a wolf population at 80% less than the original numbers, how many do you remove each year? It depends on how fast the wolves can recovered from being removed each year. And how many wolves immigrate from nearby.
- Many uncertainties about the numerical response of wolves including wolves moving in from other herds

  - Radio-collared wolves summered on one herd's range and moved to a neighboring herd early in winter in 2013
  - Additional model runs may help the understanding of the potential effect of management actions and clear up uncertainty

- The newest two years of collar-based survival rates are a little over 90% for Bathurst. For the last two years for the BNE, the collar-based survival is 85% for both years.
  - 90% cow survival is getting to the point where the need for wolf removal can be questioned
  - Additional Model runs should be done with these new survival rates.
- Twin caribou calves being observed recently

<u>The effectiveness of ground harvesting in removing wolves assigned to Bathurst or Bluenose East herds and how to increase effectiveness.</u>

- Effectiveness is defined in the wolf feasibility assessment as the combined likelihood of sighting a wolf, and the likelihood that sighting the wolf will lead to its death or capture. How was effectiveness of the pilot project measured? Was catch-per-unit effort used as an index of effectiveness?
  - CPUE is included in considering effectiveness of the program.
  - Two winters ago, Beverly, Bathurst, and Bluenose East were all quite overlapped on the Tibbitt to Contwoyto Winter road. Wolves were harvested by NWT harvesters simply by putting in miles. Nunavut harvesters travel quite a bit as well, but they also use and monitor bait sites. This past winter the three herds were more segregated and because people were going to the Beverly herd to harvest caribou, fewer wolves associated with the Bathurst herd were harvested. Training programs should continue to have Tłı̨chǫ harvesters use bait, humane traps, and lures as part of their wolf harvesting techniques.
  - GNWT had hoped to provide more robust catch per unit effort data from the ground based harvest, but there weren't as many wolves harvested and people are less likely to stop at the check-stations and complete the surveys if they are not collecting a receipt for their harvest.
  - More time spent on the ground using bait and lures would help ground based harvest. Tłı̨chǫ Government will try to choose a better location for their wolf harvesting camp in their upcoming season that will make travelling easier and provide more access to wolves.
  - Ground and snow conditions are an important factor in wolf harvesting.

- In the North Slave encounter rate for wolves was .2 wolves per 24 hours, in Nunavut 1.88 wolves were seen per 24 hours. There are two ways to making ground-based harvest more effective: (1) point them to the caribou and (2) point them to the right caribou herds. How do we achieve this?
    - Bathurst were not primarily located on the Tibbitt to Contwoyto Winter Road this year, Kugluktuk wolf harvesters had success on the NWT side of Contwoyto Lake. 35 of 37 of the wolves harvested by Kugluktuk harvesters were Beverly wolves. There are just more wolves with the Beverly herd.
    - It is important to share as much information within the wolf management areas with the hunters prior to them going out. The distribution of the herds, and the wolves influence who can harvest them. Should work closely with known hunters to increase their chances of success.
    - Hunters are being pointed to the area with Bathurst wolves using the Mobile Zone, but this could also lead to harvest of caribou within what is supposed to be a conservation zone.
    - Potential to bait where the highest densities of caribou are so there is an expectation of higher wolf densities. Could then fly in harvesters from nearby camps.
    - Number of wolves that visited trail cameras was high and a bait program could be combined with a camera program. Camera results from last year's program are not yet available.
- No mention as to how many packs were seen, the number of wolves in a pack, and whether entire packs were removed or fragmented through removal efforts.
    - Less likely to remove entire packs using ground-based shooters
    - Baiting will increase the effectiveness (number of wolves removed). But pre-baiting along the winter road was determined to be too much of a liability for the GNWT. GNWT can tell people where to go, but the onus will need to be on them to maintain the baiting station.
    - Maybe not best to bait wolves in high density areas as they will be well fed and less likely to interested in the diversionary feeding.
    - It was an oversight that pack sizes were not provided from the aerial removals, however; that question was not included in the ground-based questionnaires. This is something that can be added in the future.
- Has thought been given to improve the number of harvesters completing the questionnaires?

  - Last year a $30 gas card was given to harvesters who completed the survey. But still very few people completed the survey, even after they were called individually. One way to improve this could be to assign one or two individuals to re-contact persistently those who went up the winter road to get information from them.

- Do communities have access to the survey results?
  - Harvesters would have access to any reporting on survey results.
  - Had almost 100% response rates from Kugluktuk harvesters, likely because they work closely with their HTO. It's important that harvesters understand how the information is being used if they are to buy into responding.

<u>Discussion of the program's adaptive management, including the precision and accuracy of candidate indicators and how to identify benchmarks.</u>

- What, specifically will the annual and 5-year reviews of the wolf management program look like?
  - Annual reviews will be much like the science technical session; a collaborative discussion to go through the program from year to year and think through what worked well, what didn't, how can we improve, what we have learned, and any additional model runs.
  - 5-year review will dig in a little bit further to start to assess the effectiveness of the program: are we meeting our goals and objectives? What do adult survival rates look like? Can we correlate those with wolf removal?
  - We collectively need to come up with candidate indicators, and decision thresholds. We are going to get limited data points from the wolf management program and need to be able to use as much as we can.
  - We need to be sure that we are thoughtful in our decisions of indicators to ensure decisions are not made too hastily. We need to be able to commit to an overall management program knowing there will be uncertainties, and risks.
  - We should use modelling to point us to the key indicators, and understand sensitivities of scenarios under different conditions, and as data is collected, we update the information and update our understanding.
  - Need to consider the scales of adaptive management or the wolf removal and then the caribou herd scale.
- What indices will come from the Wolf Collaring project

- Collar information will be useful in determining fidelity of wolves to herds which has implications for the success of wolf removals.

- Are there indicators or data to halt the wolf removal project earlier than expected
    - The parameters do not yet exist that would tell us not to complete the five years of the wolf management program. Modelling different scenarios about recovery will contribute answers. It is likely that the next four years will be needed to determine the cause and effect of wolf management in enough detail to be able to make those decisions on an annual basis. A possibility is that the removals may have to extend beyond 4 years

- Has there been consideration to use criteria for evaluating humanness in the annual reviews that could lead to changes in procedures of the program?
    - There are ways of monitoring animal welfare outcomes of ground shooting and aerial shooting from the Veterinary Report. Thus far methodology has been considered humane.
    - The GNWT intends to implement all the recommendations in the Veterinary report.
    - Data sheet were not included in the Veterinary report. Would be useful to know the pursuit times of each removal and pack sizes.

- Has consideration been given to reducing the wounding rate to improve the humanness of the aerial removals?
    - To-date aerial removals have been mostly humane, but GNWT is open to suggestions on improvements. Training for on the ground harvesters of wolves could incorporate a humaneness factor

<u>Final Questions</u>

- There is a lot of uncertainty in the wolf management program. Is there a point where it will be decided that we do not have enough information to proceed with wolf removals?
    - This program has come out of WRRB recommendations dating back to 2010. GNWT has heard from Tłı̨chǫ communities and others that people are seeing a lot of wolves on the land and they are worried about the impacts of predation on the herds. Harvest has been shut down on the Bathurst herd for a while and there are huge cultural implications to that. Although there is a lot that we do not know, we are trying to build a program where we can learn as we go and address the concerns we are hearing from people. As we progress and share information with our co-management partners, we will learn new ways of better

tackling this problem. But it is fair to say that wolf management will not go on for longer than is needed.

- Considerable effort was put into this program to build on experiences from elsewhere, and the known relationship between wolves and caribou. Although there are a lot of uncertainties there is also probably enough information and experience to justify an adaptive management approach of trying to improve the information as we go.
- The questioner returned to the question about the rationale for moving ahead despite the gaps in information

- Where does wolf management fit in the hierarchy of other recommended actions to support caribou recovery?
    - The Bathurst and Bluenose East herds have declined rapidly. There are many things that affect caribou: weather, bugs, snow conditions, climate change etc. Harvest has been closed in the case of Bathurst and significantly reduced in the case of Bluenose East. The wolf management program is intended to be a short-term measure to help the herds on a road to recovery by increasing adult survival and calf survival. So, although there are many things we should be doing in the long term, but this is a short-term solution.
    - The Tlicho people did not want to be seen as sitting on the side while the herds declined and wanted to be active participants in the management action.
- Was removal from den sites considered as a method for wolf removal?
    - Yes, but it was decided that the GNWT did not know enough about the locations of those den sites to be able to implement that methodology. The collaring program should be able to help with that.

<u>Commitments and Follow Up</u>

- Technical Report, Table 33 – to be updated by October 9, 2020
- Summary of stomach contents of all harvested wolves (both ground and aerial harvest) – to be provided by October 23, 2020
- Additional model runs to be fleshed out with WRRB tech staff using caribou centric model – to be completed by October 23, 2020
- Share summary of the Kelsall wolf poisoning book – to be completed by October 9, 2020

- Share information from aerial removal data forms, specifically information on the number of packs and the number of wolves in those packs – to be provided by October 23, 2020
- Share the adult caribou survival estimates introduced by Jan in writing – to be provided by October 23, 2020
- Identify on which herd's winter range the collared wolves were captured (by individual wolf), and 2) Identify which herd the collared wolves were associated with during calving and post-calving, up to and including September 2020 - to be provided in tabular or text summary by October 23, 2020
- Update precision for the ungulate biomass index estimates found in the technical report (collaboration between John N and Dean) – to be completed by October 23, 2020
- Clarify if the nine (9) wolves attributed to the Bathurst herd were inside or outside of the enhanced incentive area (with a map if possible) – to be provided by October 23, 2020