



SUBMISSION TO THE
NUNAVUT WILDLIFE MANAGEMENT BOARD
FOR

Information:

Decision: X

Issue: Polar Bear TAH Recommendations for the Western Hudson Bay (WH) sub-population.

Background:

The WH Polar Bear Memoranda of Understanding (MOU) came into effect in 2005 and increased the TAH from 47 to 56, based on *Inuit Quajimajatuqangit*. The MOU (Section 5.7.1) states that when new research information becomes available the TAH will be corrected as necessary.

New information from Canadian Wildlife Service (CWS), Environment Canada (EC) in February 2005 indicated that the estimated abundance had decreased by approximately 22% from 1200 to 935 bears between 1984 and 2004 (Regehr and others, 2007). In contrast to these scientific findings, observations by local hunters in Nunavut and Inuit traditional ecological knowledge (TEK) suggested that the population was not declining (Tyrell 2006; NWMB 2007).

Following public hearings, the Nunavut TAH for WH was reduced to 38 for 2007-2008, and then set at 8 per year for the 2008-2009, 2009-2010 and 2010-2011 seasons (See Figure 1). Keeping removals from WH to 8 per year was problematic because removals for control actions (defense kills), combined with regular harvest exceeded the TAH (8) every year. In 2011, the TAH was set at 21 bears as an interim measure in anticipation that new research results would be available in 2012.

Responding to Inuit concerns about the invasiveness and potential biases of past tagging studies, an aerial survey of the entire summer range of the WH population was conducted by the GN in 2011 in collaboration with the Government of Manitoba (Stapleton and others 2014). The survey estimated the population size at approximately 1030 bears (95% confidence interval of 754 - 1406). The authors stated that, "The aerial survey-derived estimate is consistent with the 2004 capture-based estimate but inconsistent with projections suggesting continued decreases in abundance."

After public hearings and consultations, the NWMB set the new TAH for WH at 24 polar bears for three years, to be formally reviewed following the 2013-14 harvest season, or at such time as new relevant information (e.g., scientific and/or *Inuit Qaujimatuaqangit*) becomes available (NWMB 2012).

Current Status:

Since the 2011 GN-led aerial survey of the WH subpopulation, new information has become available from the analyses of long-term mark-recapture work (1984 – 2011) conducted by Environment Canada (EC). These mark-recapture results indicate that the 2011 WH population estimate is 806 bears (95% CI = 715-1398), which is roughly consistent with the abundance estimate derived from the aerial survey. The EC study also shows that although a declining trend in population size was detected between 1987 and 2004, the population appears to have remained relatively stable over the past decade. Female growth also appeared to have been stable with a female population growth rate of approximately 2% annually for the period 1991-2011 (Lunn et al 2013). The study also indicated that survival of females of all ages was correlated with sea ice conditions, and was generally lower in years of earlier break-up. However, although the study found long-term (1979-2012) trends in earlier break-up and freeze-up, no such trends were apparent during the last decade (2001-2011; Lunn et al 2013), suggesting there has been a period of relative stability in sea-ice conditions.

Populations models based on the recent mark-recapture analysis can be used to make predictions about the future status of the WH subpopulation. However, the outcome from these models is highly dependent on future sea-ice conditions. This highlights the challenges of setting a sustainable TAH for WH given the uncertainty surrounding future environmental conditions and necessitates a cautious approach to setting a TAH as well as close monitoring of the subpopulation's status in-order to avoid an unintended over harvest.

Consultations:

Community consultations were held with HTO representatives from Rankin Inlet, Baker Lake, Arviat, Whale Cove and Chesterfield Inlet in March, 2012 where results of the GN aerial survey were discussed. Environment Canada presented results of their findings at regional meetings in Rankin Inlet during June 2014. The communities indicated they would like a new (increased) TAH based on concerns for public safety, and the common perception of more bears in the population.

As part of DOE's social science/*Inuit Qaujimatuaqangit* research program, a public opinion poll was conducted in WH communities in March, 2012 (Kotierk, 2012). The most common response when participants were asked for their opinion on current polar bear abundance in the population was that there are, "the most they have seen" in recent

history. When asked about their preference for the number of bears in the population, the majority of people surveyed indicated that they would prefer to have fewer bears.

Acknowledging that the WH population is shared with Manitoba, the Government of Manitoba was provided with the WH aerial survey report, and notified of the Government of Nunavut's TAH recommendation. The report was also provided to the Canadian Wildlife Service of Environment Canada. Government of Manitoba and Environment Canada officials have been encouraged to participate in the NWMB's public hearing process, and to provide any additional information, concerns or recommendations they consider relevant, in the interest of helping the Board make an informed decision.

The reasons for the difference in perspective between Inuit and scientific knowledge has been discussed but not resolved. Climate change may have altered polar bear distribution patterns and behavior giving Inuit hunters the impression that there are more bears because there are more bear-human encounters. However it may also be true that both population numbers and population performance have been underestimated by scientific studies that failed to include the entire summer retreat area used by WH polar bears.

Recommendations:

DOE recommends a) a 3-year **TAH of up to 24 polar bears annually**, and b) that the TAH be reviewed by the NWMB for the 2017/18 harvest season.

This recommendation was derived by taking various sources into consideration, and by carefully evaluating additional relevant data.

1. The 2011 abundance estimates from the GN aerial survey and the EC mark-recapture analysis are both broadly consistent with each other, meaning they do not differ statistically (due to the overlapping confidence intervals). However, in contrast to the mark-recapture study, the aerial survey was conducted across the entire study area and is therefore considered to be more representative of the true population size in WH (Stapleton et al 2014, Lunn et al 2013). . For this reason, the GN uses the aerial survey abundance estimate of 1030 bears as the basis for management planning and monitoring.
2. The EC analysis indicates that the WH subpopulation has remained relatively stable over the past decade, following a period of apparent decline between 1987 and 2004. During this recent decade of stability, the WH population has sustained a combined average Nunavut-Manitoba removal of approximately 32 bears annually (harvest season 2003/2004 – 2012/2013). ¹ In the absence of evidence to indicate a positive or negative change in the capacity of this population to support future harvesting (in the short to medium term), the GN's recommended TAH is

¹ Historically, Manitoba has retained 8 tags for potential defense of life and property kills.

based on the assumption that a similar level of harvesting can be sustained in future.

3. The EC analysis points to a link between sea-ice conditions and the productivity of polar bear populations. In WH, sea-ice freeze-up and break-up patterns over the past decade have not indicated any significant trends; suggesting recent stability in environmental quality for polar bears in this population. However, given the uncertainty in predicting future environmental conditions in WH, GN is advocating an adaptive management approach in WH whereby TAH decisions are made on a short-term basis only and are subject to review in response to results from regularly scheduled aerial surveys (i.e. 4-5 year intervals), the collection of IQ and on-going sea-ice monitoring. Adjustments in the TAH in response to these direct observations (as opposed to reliance on predictions) will ensure that any measurable changes in population size and status and environmental quality are incorporated into the harvest management strategy in a responsive manner. The last aerial survey in WH was conducted in 2011. A second aerial survey is planned for 2016 with results available by 2017. The next scheduled review of the TAH would therefore occur in 2017.
4. The recommendation to adopt an adaptive management approach represents a shift in the GN's strategy for managing polar bears in this population. This takes into account the increasing use of alternative, non-invasive monitoring methods such as aerial survey and genetic tagging that provide less detailed information on population status but are faster and potentially more cost effective than traditional capture-based studies. This shift also considers the uncertainty surrounding environmental conditions and the impact this has on the reliability of predictions about population productivity and the ability to sustain harvest.
5. DOE will continue to work with communities to ensure that public safety is maintained, and bear-human interactions are minimized.
6. DOE recommends that as per Section 5.7.6 of the NLCA, the TAH of 24 should be distributed among the communities that share the WH population as identified by the Regional Wildlife Organization, and that the TAH will be administered according to the existing 2005 MOU.
7. DOE believes the above noted recommendation balances the best current available scientific information and Inuit observations to ensure that the harvest does not cause a conservation concern for the population over the considered time-frame.

References:

Atkinson, S., Stapleton, S., Garshelis, D., and Hedman, D. 2012. Western Hudson Bay Aerial Survey, 2011. Final Report. Government of Nunavut. 56 pp.

- Kotierk, M. 2012. Public and Inuit Interests, Western Hudson Bay Polar Bears and Wildlife Management: Results of a Public Opinion Poll in Western Hudson Bay Communities.
- Lunn, N.J, Regehr, E.V., Servanty, S., Converse, S., Richardson, E., Stirling, I. 2013. Demography and population assessment of polar bears in western Hudson Bay, Canada. Environment Canada Research Report. 50 pp.
- Nunavut Wildlife Management Board. 2007 West Hudson Bay polar bear population total allowable harvest. Record of Decision. 37pp.
- Nunavut Wildlife Management Board. 2012 West Hudson Bay polar bear population total allowable harvest. Record of Decision. 6pp.
- Regehr, E.V., N.J. Lunn, S.C. Amstrup, and I. Stirling. 2007. Effects of earlier sea ice breakup on survival and population size of polar bears in western Hudson Bay. *Journal of Wildlife Management* 71: 2673-2683.
- Stapleton, S., Atkinson, S., Hedman, D., and Garshelis, D. 2014. Revisiting western Hudson Bay: using aerial surveys to update polar bear abundance in a sentinel population. *Biological Conservation* 170: 38-47.
- Tyrrell, M. 2006. More bears, less bears: Inuit and scientific perceptions of polar bear populations on the west coast of Hudson Bay. *Journal of Inuit Studies* 30: 191–208.

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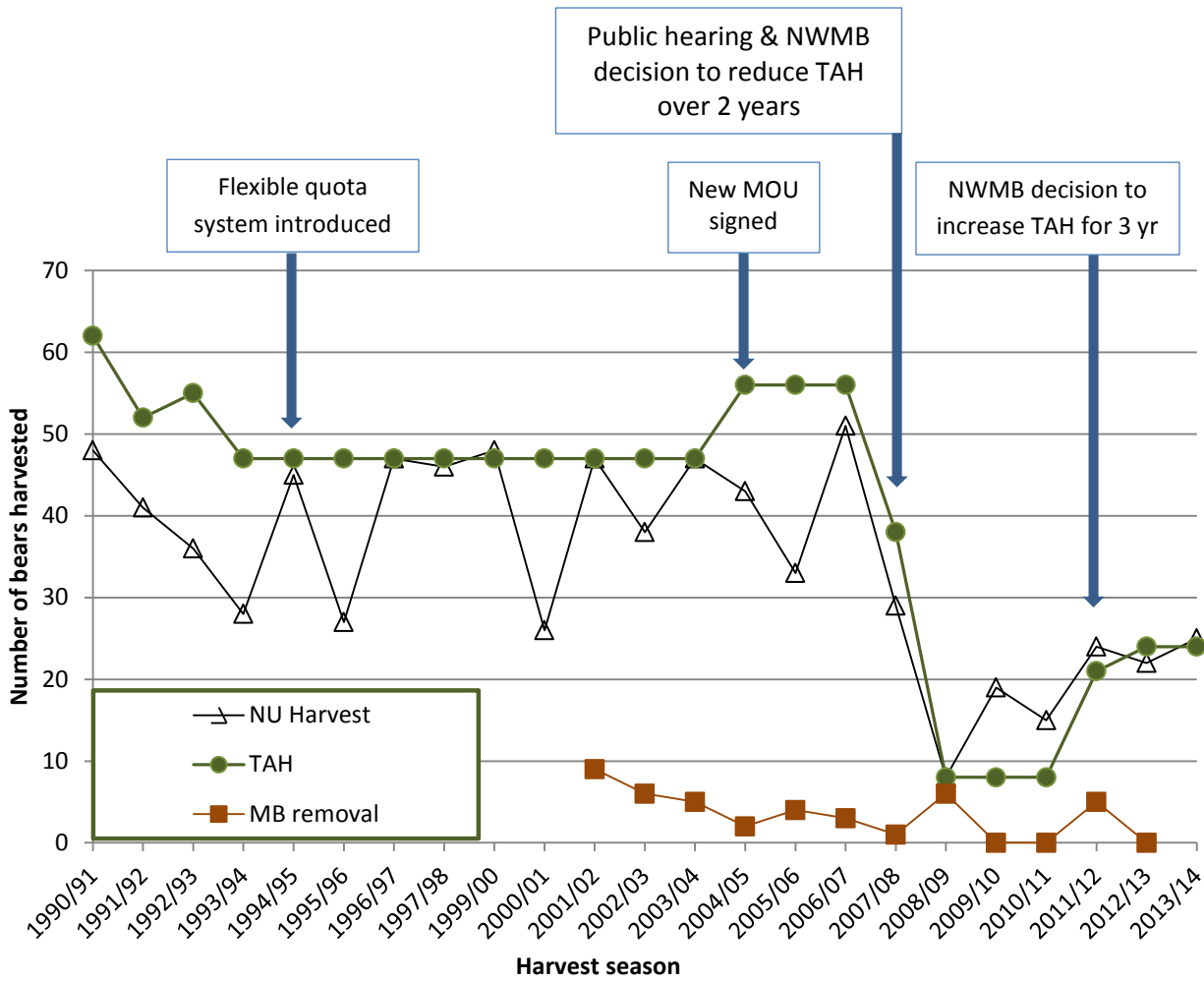


Figure 1. Changes in Total Allowable Harvest (TAH) and actual harvest of polar bears in the Western Hudson Bay.