



SUBMISSION TO THE

NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

Information:

Decision: X

Issue: Polar Bear Total Allowable Harvest Recommendations for the Western Hudson Bay Sub-population

Background:

- The Western Hudson Bay (WH) polar bear subpopulation is shared with Manitoba (Figure 1).
- In 2005/2006, polar bear Memoranda of Understanding (MOUs) came into effect and the Total Allowable Harvest (TAH) for WH polar bears was increased from 47 per year to 56 per year. The WH 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 and Climate Change Canada (ECCC) in February 2005 indicated that the estimated abundance had decreased by approximately 22% from 1200 to 935 bears between 1984 and 2004. The researchers attributed this decline in population size to the combined effects of progressive sea-ice decline causing reductions to survival and recruitment rates, and subsequent unsustainable control and harvest removals.
- In contrast to the scientific findings, the observations by local hunters in Nunavut and Inuit traditional ecological knowledge (TEK) suggested that the population may not be declining.
- Climate change may have altered polar bear distribution patterns and behaviour, 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 previous scientific studies which failed to include the entire summer retreat area used by WH polar bears.
- The Nunavut TAH for WH was reduced to 38 bears for 2007-2008, and then set at 8 bears per year for the 2008-2009, 2009-2010 and 2010-2011 seasons. Removals for control actions (defense kills), combined with regular harvest, exceeded the TAH (8) every year following the reduction.

- In 2011, the TAH was set at 21 bears as an interim measure in anticipation that new research results would be available in 2012.
- An aerial survey of the entire summer range of the WH population was conducted by the Government of Nunavut (GN) in 2011 in collaboration with the Government of Manitoba. The survey estimated the population size at approximately 1030 bears (754 – 1406, 95% CI). The report stated that, “the aerial survey-derived estimate is consistent with the 2004 capture-based estimate but inconsistent with projections suggesting continued decreases in abundance”.
- The Nunavut Wildlife Management Board (NWMB) set a new TAH for WH at 24 polar bears for three years, to be formally reviewed following the 2014-15 harvest season, or at such time as new relevant information becomes available.
- The NWMB made an initial decision on 31 March 2015 to increase the TAH for WH by 14 to a total of 38 bears, which the Minister disallowed in his initial reply. The NWMB’s final decision was made on 7 October 2015 which remained at 38 bears. The Minister varied the NWMB decision on 23 October 2015 to an increase of 4 bears to a total regional TAH of 28 bears for the 2015/2016 harvest season (Figure 2).
- Since the 2011 aerial survey of the WH subpopulation, new information became available from the analyses of long-term mark-recapture work (1984 – 2011) conducted by ECCC. Their results indicated that the 2011 WH polar bear estimate was 806 bears (715-1398, 95% CI), which was roughly consistent with the abundance estimate derived from the aerial survey.
- A declining trend in population size was detected between 1987 and 2004, but the population appears to have remained relatively stable over the past decade. Female growth (the proportion of females in the population) also appeared to have been stable with a female population growth rate of 2% annually for the period 1991-2011($\lambda = 1.02$ (0.98-1.06, 95% CI)).
- 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), suggesting there has been a period of relative stability in sea-ice conditions.

Current Status:

- A new collaborative aerial survey study was conducted between 12 – 22 August, 2016 to re-assess the abundance of the WH polar bear subpopulation (Figure 3).
- The new sub-population estimate was assessed at 842 bears (562-1121, 95% CI; 16.9% Coefficient of Variation) during August of 2016.
- During the time of the survey, very few bears (~5.3%) were sighted in Nunavut, with the vast majority summering in Manitoba.

- As with the last survey, indicators of reproductive performance were poorer in WH polar bears during 2016 when compared to any other subpopulation in the Hudson Bay complex (e.g. polar bear cubs-of-the-year and yearlings presented a small proportion of the total observations).
- The new population estimate is lower than that of the previous (2011) aerial survey, but not significantly since confidence intervals overlap. The current estimate is not significantly different from the 2011 aerial survey estimate of 949 bears (618–1280, 95% CI) based upon similar transect sampling methods and analysis of covariates ($t=0.48$, $df=452$, $p=0.63$).

Consultations:

- Community consultations were held with HTO representatives from Rankin Inlet, Arviat, Whale Cove and Chesterfield Inlet between 4 and 7 July 2017, also including participants from Nunavut Tunngavik Inc. (NTI) and the Kivalliq Wildlife Board (KWB).
- During those meetings, results of the 2016 GN-led aerial survey were discussed, in addition to the GN recommendation of no change to the current TAH of 28 bears, given the results of the study.
- Several communities indicated their support for fall coastal surveys to assess bear distribution that could assist in preventing problem bear occurrences, as well as support for a more detailed traditional knowledge study.
- The Arviat HTO requested that polar bear tag credits be zeroed so that full allocation of tags becomes available for the polar bear harvest but also for potential problem bears.
- The Government of Manitoba was provided with the 2016 WH aerial survey report, and notified of the Government of Nunavut's TAH recommendation of no change to the current TAH of 28 bears, with a recommendation to the NWMB to re-set credits and TAH.
- The Report has also been provided to ECCC and Parks Canada Agency. Government of Manitoba and ECCC officials have been encouraged to participate in the NWMB's decision-making process, and to provide any additional information, concerns or recommendations they consider relevant, in the interest of helping the Board make an informed decision.

Recommendations:

1. DOE recommends **no change** to the current WH TAH of 28 bears.
2. DOE recommends a **re-set to the TAH** by zeroing-out existing polar bear tag credits so that all communities harvesting from WH will be in a position to have

their full allocation available to cover any harvested bears and problem bears if necessary.

This recommendation was derived by taking various sources into consideration, and by carefully evaluating additional important relevant data, as follows:

- The GN aerial survey results of 2011 and 2016 are both very similar in that they are not statistically significantly different. That means that although a decline of approximately 18% in the population was observed, results and comparisons of both studies indicate that the WH polar bear population has remained relatively stable.
- The ECCC analysis indicated that the WH subpopulation has remained relatively stable over the past decade, whereas a declining trend was apparent between 1987 and 2004.
- Sea-ice freeze-up and break-up patterns over the past decade have not indicated any significant trends; however, when a larger time-frame (1979-2012) is considered, break-up and freeze-up of sea-ice has been occurring three weeks earlier and three weeks later on average, respectively.
- Average body condition (body mass) of solitary adult female polar bears has been declining since 1980. As body condition declined over this period so did recruitment rates (or litter production). Similar observations were made during both aerial surveys, where both cubs-of-the-year and yearling observations were lower as compared to any other seasonal ice-free polar bear population with available data.
- The mean combined annual Nunavut-Manitoba removal for the WH subpopulation was approximately 32 bears (harvest season 2003/2004 – 2015/2016). Manitoba in the past has retained 8 tags for potential defense of life and property kills (their removal for the same time period was 2.8 bears/year).
- DOE will continue to work with communities to ensure that public safety is maintained, and bear-human interactions are minimized through a strong emphasis on polar bear deterrent efforts.
- DOE recommends that as per section 5.7.6 of the Nunavut Land Claims Agreement, the TAH should be distributed among the communities that share the WH polar bear sub-population as identified by the Regional Wildlife Organization, and that consideration should also be given to communities that endure a higher level of polar bears that become a risk to public safety and property.
- DOE believes the recommendation to maintain the current TAH of 28 bears balances the best current available scientific information and Inuit observations to ensure that the harvest does not cause a conservation concern for the WH polar bear sub-population over the short and long-term.

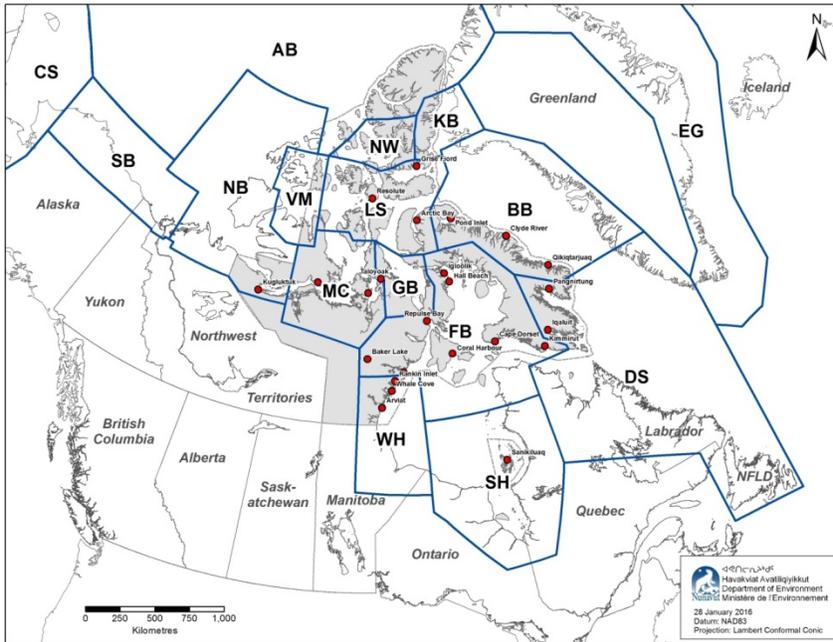


Figure 1. Overview of Nunavut polar bear subpopulations (WH = western Hudson Bay; SH = southern Hudson Bay, FB = Foxe Basin).

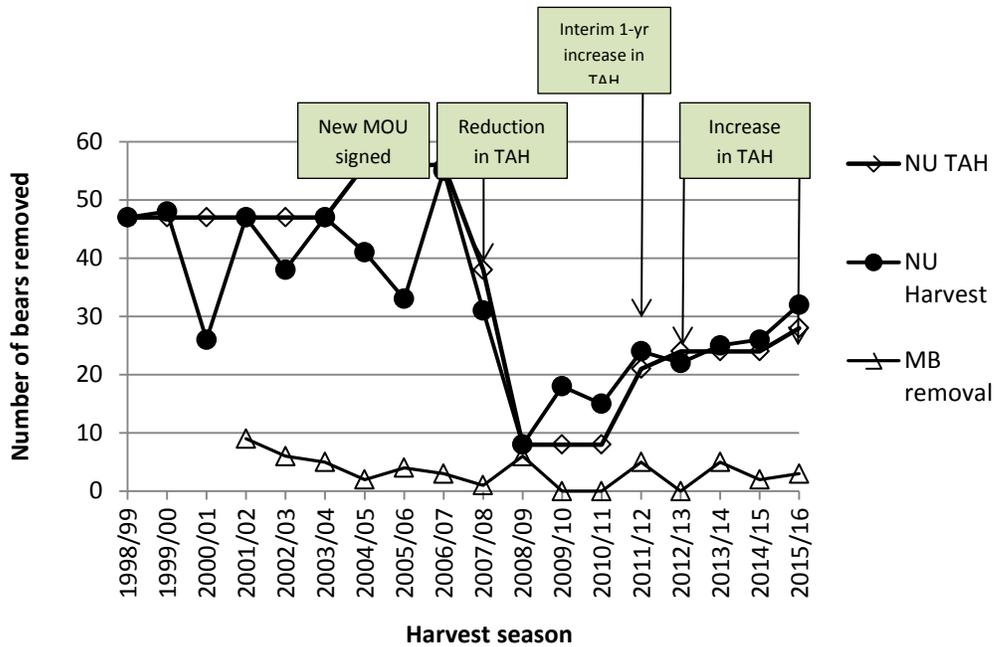


Figure 2. Overview of the removals from the western Hudson Bay polar bear population and management actions between 1998/99 and 2015/16

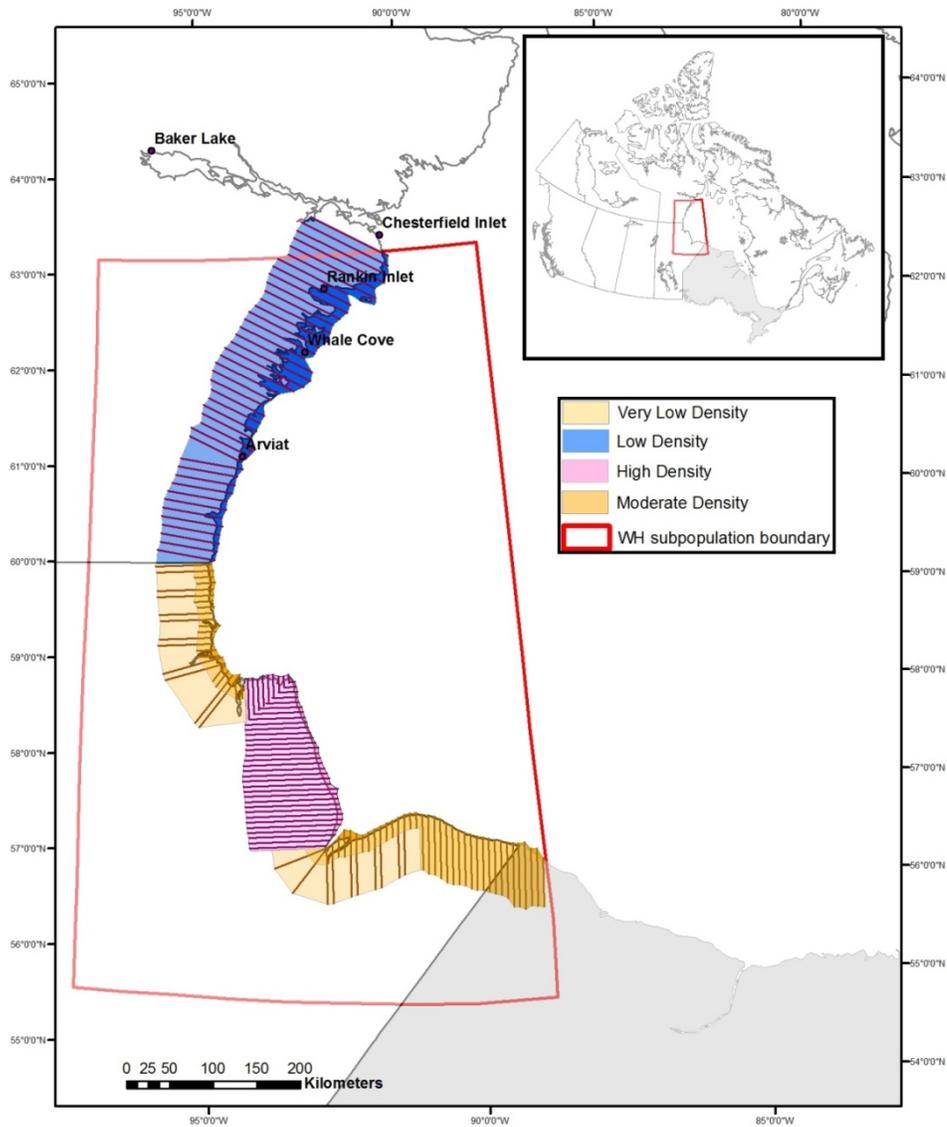


Figure 3. An overview of the various strata that were employed during the August 2016 aerial survey in western Hudson Bay.