



## **SUBMISSION TO THE**

## **NUNAVUT WILDLIFE MANAGEMENT BOARD**

**FOR**

### **Information:**

**Decision: X**

**Issue:** 2012-2013 Polar Bear TAH Recommendations for the Western Hudson Bay (WH) sub-population.

### **Background:**

In 2005/2006 new polar bear Memoranda of Understanding (MOUs) came into effect and the Total Allowable Harvest (TAH) for WH 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 Canada 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). 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 these scientific findings, recent observations by local hunters in Nunavut and Inuit traditional ecological knowledge (TEK) suggests that the population may not be declining (Tyrell 2006; NWMB 2007). 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.

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 has been problematic because removals for control actions (defense kills), combined with regular harvest, have exceeded the TAH (8) every year since 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.

### **Current Status:**

Since the 2004 population estimate and subsequent reductions in TAH, new research has been conducted in WH to re-assess the population status to help resolve the disparity between science and Inuit knowledge. A mark-recapture analysis incorporating data collected since 2004 (up to 2011) is underway by Environment Canada (EC). Results from this analysis are expected in June 2012.

Responding to Inuit concerns about the invasiveness and potential biases of the above-noted tagging studies, an aerial survey of the entire summer range of the WH population was conducted by the GN in 2011 (Atkinson and others, 2012). The survey estimated the population size at approximately 1000 bears (95% confidence interval of 715 - 1398). 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.” They also provided evidence that past mark-recapture studies in WH could be biased resulting in underestimation of abundance (and possibly some survival rate estimates). The survey indicated that the mean litter sizes and number of dependent offspring observed during the 2011 survey were less than recent research in other seasonal ice sub-populations, suggesting relatively poor reproductive output.

The aerial survey estimate provides important insights into the distribution and abundance of bears in WH and highlights the need for EC to consider changes to their mark-recapture sampling protocol. It does not provide estimates of survival and recruitment that are needed to determine population growth rate (i.e. trend) and calculate long-term sustainable harvest levels. Population trend could be established in future by conducting a series of aerial surveys at intervals (e.g. every 5 years). Currently there is only a single aerial survey-based estimate. That said, the aerial survey does provide a valid estimate of the number of polar bears in 2011 (which is very likely estimated low [Atkinson et al. 2011]). Overall the population has likely remained stable since 2004, notwithstanding continued harvesting.

### **Consultations:**

Community consultations were held with HTO representatives from Rankin Inlet, Baker Lake, Arviat, Whale Cove and Chesterfield Inlet in March, 2012. 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 Qaujimatugangit 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 has also been 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.

### **Recommendations:**

- 1) DOE recommends an Interim **TAH of up to 24 polar bears for the 2012/2013 harvest season.**

In the absence of current estimates of survival, recruitment and population growth rate, the predicted impact of differing levels of harvesting on the WH population is uncertain at this time. New mark-recapture results will be available from Environment Canada later this year for comparison with the aerial survey and available Inuit Qaujimatugangit . It is recommended that information from each of these sources, together with harvest information from 2012-13, be used to formally re-assess the status of the population and establish a longer-term management plan including levels of TAH and monitoring needs. The GN recognizes that environmental conditions are evolving as compared to previous decades, and that more frequent monitoring of this population will be required in the future for assessment.

This recommendation was derived using the most recent population estimate (of 1000 bears in 2011). Considering the high uncertainty of the status and trend of the population, this TAH was calculated using a mathematical formula (Taylor et al. 1987) that takes into account the current population estimate, and the proportion of females harvested in the previous harvest season (for the 2011/2012 season = 8 females harvested) to obtain a sustainable harvest rate of 30 bears per year<sup>[1]</sup>.

It was assumed that control activities in Manitoba remove 3 bears per year (observed 9-year mean from 2003/2004 – 2011/12 = 3). Therefore, the TAH for 2012/13 would be a maximum of 27. Due to an over-harvest of 3 bears in 2011/12 it is proposed to reduce the maximum TAH recommendation by this amount resulting in 24 for Nunavut. Note that this recommendation is more conservative than the 4.5% harvest limit commonly used in NWT and less than the 3% that has been invoked by NU in other situations.

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.

The above noted recommendation balances the best current available scientific information and Inuit observations while following the precautionary principle to ensure that the harvest does not cause a conservation concern for the population.

## **References:**

Atkinson, S., Stapleton, S., Garshelis, D., and Hedman, D. 2012. Western Hudson Bay Aerial Survey, 2011 Final Report.

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.

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<sup>[1]</sup> This approach has been used to set quotas in the Southern Beaufort and Northern Beaufort populations in the NWT. It is also used as a guide to manage harvest in Southern Hudson Bay.

Nunavut Wildlife Management Board. 2007 West Hudson Bay polar bear population total allowable harvest. Record of Decision. 37pp.

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.

Taylor, M.K., DeMaster, D.P., Bunnell, F.L., and Schweinsburg, R.E. 1987. Modeling the sustainable harvest of polar bears. *J. Wildl. Manage.* 51:811-820.

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.

