



## SUBMISSION TO THE

## NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

**Information: X**

**Decision:**

**Issue:** 2013-2014 Polar Bear TAH Recommendations for the Foxe Basin (FB) population.

### **Background:**

- The boundaries of the FB subpopulation encompass the northern part of Hudson Bay, the western end of Hudson Strait and Foxe Basin proper (Figure 1). This region is seasonally ice-free, spanning some 1.1 million km<sup>2</sup> across Nunavut and Nunavik in northern Quebec. Seven communities in Nunavut (Cape Dorset, Chesterfield Inlet, Coral Harbour, Hall Beach, Igloolik, Kimmirut, and Repulse Bay) and four communities in Quebec (Akulivik, Ivujivik, Puvirnituaq, and Salluit) lie within the FB bounds.
- A subpopulation estimate of 2,197 ± 260 (S.E.) bears was completed in 1996 from analysis of mark-recapture data collected between 1989 and 1994 (Taylor et al. 2006). In response to the findings of this study which suggested harvest was unsustainable, the permitted harvest from FB underwent a phased reduction (in Nunavut) between 1993 and 1996 to permit slow recovery of the subpopulation. During this period, Total Allowable Harvest went from 137 to 96<sup>1</sup> bears/year. The TAH remained at 96 until 2004<sup>2</sup>.
- Local knowledge suggested the abundance of polar bears in FB had increased since 1996 (McDonald *et al.* 1997; GN community consultations 2004-2009). After community consultations in 2005, resulting in a new Memorandum of Understanding (MOU) for management of FB, the Total Allowable Harvest was increased to a level consistent with a subpopulation size of approximately 2,300 bears (106 bears/year; Table 1).
- Harvesting from FB by residents of Nunavik is unregulated and has averaged approximately 2.5 bears per year over the last 10 years. Note however that the 2005 MOU allocates 7 bears for Quebec for a total potential combined FB harvest of 113 bears.

### **Current Status:**

- In 2009 and 2010, the GN conducted comprehensive aerial surveys of FB (see attached report). The surveys estimated overall abundance at about 2,580 bears, with a 95% confidence interval of 2,093 to 3,180 (CV: 10.7%). Observed litter sizes were comparable to those documented in other subpopulations with robust annual growth rates, suggesting that recruitment is currently indicative of a healthy subpopulation. Anecdotally, polar bears observed during the aerial surveys generally appeared to be in good body condition further supporting the notion that FB is a healthy subpopulation.

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<sup>1</sup> Excludes Nunavik (Quebec) harvest

<sup>2</sup> In some years TAH was less than 96 to compensate for over harvest the year prior, as per the flexible quota system.

- Although the aerial survey provides important insights into the abundance and distribution of bears in FB, unlike mark-recapture surveys 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<sup>3</sup>. However, estimates of abundance from the 1989-1994 (mark-recapture) and 2009-2010 (aerial survey) studies are not statistically different. Although the comparability of these two studies is uncertain due to potential biases in one or both methods, this finding suggests that the current harvest management regimen has allowed FB to remain relatively stable since the early 1990s.
- The Foxe Basin communities have seen an increase in polar bears near communities which has resulted in high levels of defense of life and property kills (DLPK), among them many family groups.
- Additional research is in progress examining the movement patterns, range size and habitat use of FB polar bears. These studies based on satellite tracking of bears in FB and surrounding subpopulations as well as the collection of IQ from local communities will support status assessment and permit the re-evaluation of boundaries for FB.

### **Consultations:**

Meetings with HTO representatives in each of the Nunavut Foxe Basin communities (Igloodik, Hall Beach, Coral Harbour, Chesterfield Inlet, Repulse Bay, and Cape Dorset) with the exception of Kimmirut were conducted between June 25<sup>th</sup> and July 26<sup>th</sup>, 2012. The meeting with the Kimmirut HTO was postponed due to board member availability; however it has been added to the agenda for their next HTO meeting. The purpose of these meetings was to present research findings and to generate discussion on management implications for the subpopulation. (See consultation summary document, attached).

The Nunavik Marine Regional Wildlife Board and the Ministère des Ressources Naturelles et de la Faune Quebec received a copy of the Foxe Basin report and have been asked to provide input or feedback.

### **Recommendations:**

The FB Polar Bear MOU (Section 5.7.1) states that when new research information becomes available the TAH will be adjusted. In the absence of estimates of survival, recruitment and population growth rate, the impact of differing levels of harvest on the FB population is somewhat uncertain at this time. However, given the recent population estimate and the information that was garnered during the research project, the GN Department of Environment is in support of a moderate total increase of the FB harvest from 113 to 123.

**Rationale:** A combined annual removal rate of up to 123 bears can be supported based on the recent aerial survey population estimate of 2,580, and RISKMAN modeling. As there are no current vital rates for the FB population that can be used directly, past Baffin Bay mean survival and recruitment rates were applied for the modeling exercise. Modeling the population over 7 years indicates that at a total removal rate of 130 bears annually the FB subpopulation would likely remain near current levels. However, this modeling approach includes uncertainty with respect to the predicted population size, especially in a changing environment. Recognizing the limitations of the modeling, but also acknowledging traditional local knowledge that indicates that

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<sup>3</sup> Population trend could be established in future by conducting a series of aerial surveys at intervals (e.g. every 5 years).

the population is abundant and appears to be healthy, and noting that the current population estimate is greater than the population target number of 2,300 (as per the MOU), a moderate increase in the total FB removal rate of to up to 123 bears is very unlikely to cause any conservation concern over the short-term (i.e., 5-7 years).

A recommended total FB harvest of 123 bears, which is more conservative than the modeled 130, takes into consideration the 7 bears allotted to Quebec as per the 2005 MOU, potentially leaving Nunavut a TAH of 116 bears [Note that the Quebec communities harvested an average of approximately 2.5 bears per year over a 10-year period].

**Information to consider when evaluating options:**

Unlike physical mark-recapture methods, aerial surveys do not generate estimates of survival and recruitment that are needed in-order to model the impacts of differing levels of harvest. Current harvest levels appear to have allowed the subpopulation to remain relatively stable. Assuming subpopulation growth rate remains unchanged in the future and the management objective is to keep abundance at or near its current level, the slightly increased harvest management regimen carries little risk in terms of over-harvest.

Additional information relevant to harvest management will become available as a result of the recent (2008-2010) research in FB. Amongst other things, the satellite telemetry data collected will be pooled with similar data from surrounding subpopulations to reassess the boundaries of polar bear sub-populations in the Hudson Bay region. This process may result in new TAH recommendations.

Future monitoring of FB should focus on determining the trend in abundance with adjustments in TAH being made accordingly. This monitoring can be achieved by conducting a series of aerial survey counts at regular intervals or by means of a mark-recapture study that generates estimates of survival and recruitment<sup>4</sup>. Monitoring of sea-ice conditions may also inform future harvest management decisions by providing insights into changes in habitat quality resulting from climatic conditions and/or local industrial activity.

**References:**

McDonald, M, L. Arragutainaq and Z. Novalinga (eds.). 1997. Voices from the Bay: Traditional ecological knowledge of Inuit and Cree in the Hudson Bay Bioregion. Canadian Arctic Resources Committee and the Environmental Committee of the Municipality of Sanikiluaq, Ottawa, ON.

Sahanatien, V. and A.E. Derocher (2012). Monitoring sea-ice habitat fragmentation for polar bear conservation. *Animal Conservation*: In press.

Taylor, M., J. Lee, J. Laake and P. McLoughlin. 2006. Estimating population size of polar bears in Foxe Basin using tetracycline biomarkers. Government of Nunavut, Department of Environment, Final Wildlife Report. 13 pp.

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<sup>4</sup> Analyses are currently in progress to determine the appropriate time interval between successive aerial surveys.

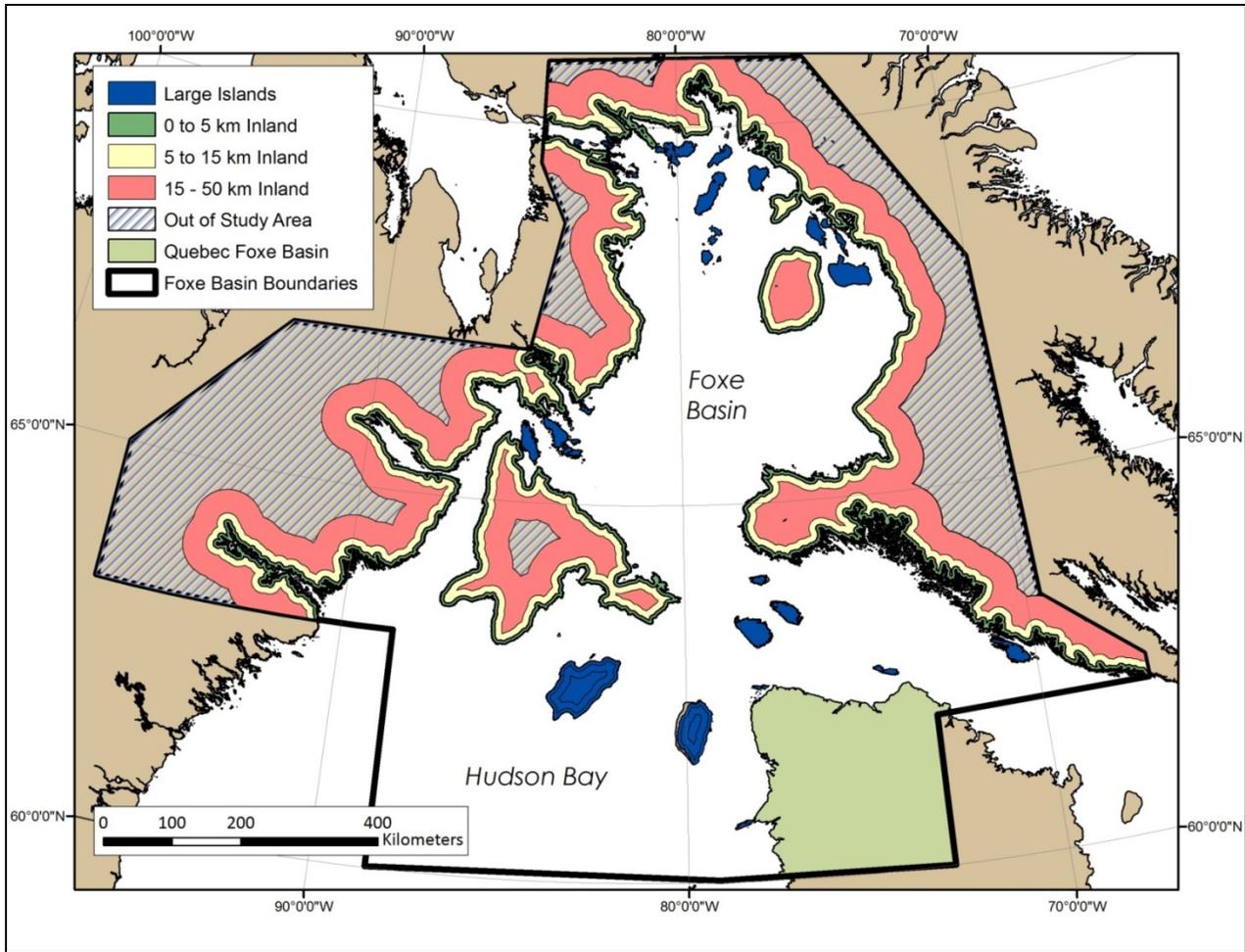


Figure 1. The FB polar bear subpopulation spans more than 1 million km<sup>2</sup> in Nunavut and northern Quebec. Multiple strata were delineated for the FB aerial surveys.

Table 1. Total Allowable Harvest (TAH) base allocations for Nunavut communities hunting in the Foxe Basin polar bear population. (Source: Polar Bear Management Memorandum of Understanding for the Management of the Foxe Basin Polar Bear Population, 2005)

<b>NUNAVUT</b>	<b>TOTAL</b>
Cape Dorset	10
Chesterfield Inlet	8
Coral Harbour	40
Hall Beach	8
Igloolik	10
Kimmirut	10
Repulse Bay	12
Kivalliq Wildlife Board	4
Qikiqtaaluk Wildlife Board	4
<b>Subtotal</b>	<b>106</b>