

02 August 2013

Manasi Audlakiak, Acting Chairperson
Nunavut Wildlife Management Board
Box 1379
Iqaluit, NU X0A 0H0

RE: NWMB Public Hearing for the Foxe Basin Polar Bear

Dear Mr. Audlakiak,

Thank-you for providing the public with an opportunity to provide information and input for the public hearing regarding the level of regional total allowable harvest (TAH) for the Foxe Basin polar bear subpopulation.

I am a Ph.D. candidate, Department of Biological Sciences, University of Alberta and have been researching the movements and sea ice habitat of the Foxe Basin polar bears since 2007. Wildlife harvest management decisions should be considered within the context of a species' habitat requirements, availability and quality. At this time I would like to provide NWMB with information concerning the sea ice habitat of the Foxe Basin subpopulation.

I completed a historical analysis of the trends in polar bear sea ice habitat in Foxe Basin, Hudson Strait and Hudson Bay. Over the 30 year period (1979-2008) available habitat and sea ice season length declined and habitat fragmentation increased in all regions. I have attached a copy of the published paper (Sahanatien and Derocher 2012) for your information and consideration. These changes and trends in sea ice conditions have also been reported by other researchers (for example, Moore 2006; Saucier et al. 2004; Hochheim and Barber 2010; Stirling and Parkinson 2006).

My analysis of the movements of Foxe Basin polar bears, shows that the number of days that female polar bears are on the sea ice differs between regions of the subpopulation (Table 1). The trends observed in habitat availability and fragmentation (Sahanatien and Derocher 2012) may be affecting polar bear access to sea ice, thus limiting overall foraging time in some parts of Foxe Basin. In addition, the satellite collared bears showed strong home range and seasonal site fidelity suggesting that there is limited movement of bears between the regions of the subpopulation. Polar bears may not readily move to new regions with longer ice seasons or better ice conditions, and this could affect body condition, reproductive success and survivorship. As pointed out in Sahanatien and Derocher (2012), the polar bear has potential to exhibit population lag effects. They are slow reproducing, habitat specialists that may not quickly show population level effects of habitat loss or degradation. At this time there is no annual polar bear sea ice habitat monitoring and population monitoring in place to detect if habitat change is influencing Foxe Basin polar bears. But we do know that sea ice habitat loss and changes in sea ice phenology has had impacts on the adjacent western Hudson Bay subpopulation and the

southern Beaufort Sea subpopulation (Rode et al. 2010; Regehr et al. 2007; Regehr et al. 2010).

Table 1. Time spent on the sea ice by GPS satellite collared female polar bears, Foxe Basin (FB), Hudson Strait (HS) and Hudson Bay (HB) (2007-2011).

<i>Region</i>	<i>Mean # Days on Ice</i>	<i>SE</i>	<i>N</i>	<i>Mean Ordinal Date on Ice</i>	<i>SE</i>	<i>N</i>	<i>Mean Ordinal Date off Ice</i>	<i>SE</i>	<i>N</i>
FB	294	6	7	306 (Nov 01)	3	33	238 (Aug 25)	3	8
HS	263	10	6	336 (Dec 01)	6	15	227 (Aug 14)	6	7
HB	238	4	2	313 (Nov 08)	2	16	187 (July 05)	1	2

All values significantly different ($P < 0.05$). Unpublished results, V. Sahanatien

It is my hope that the information I have provided will be useful in NWMB's deliberations on the Foxe Basin TAH. In light of the negative trends in sea ice habitat throughout the Foxe Basin polar bear subpopulation and the potential medium and long term impacts on the population, I would suggest that it is in keeping with conservation precautionary principles that the TAH of 106 polar bears be maintained as recommended by the Nunavut Department of Environment.

Sincerely,



Vicki Sahanatien
Ph.D. Candidate
Department of Biological Sciences
University of Alberta

PO Box 1584
Iqaluit, NU X0A 0H0
Email : vsahanatien@gmail.com

References

- Hochheim KP, Barber DG (2010) Atmospheric forcing of sea ice in Hudson Bay during the fall period, 1980-2005. *J Geophys Res (C Oceans)* 115:C05009.
doi:10.1029/2009JC005334
- Moore GWK (2006) Reduction in seasonal sea ice concentration surrounding southern Baffin Island 1979-2004. *Geophys Res Lett* 33:L20501.
doi:10.1029/2006GL027764

- Regehr EV, Hunter CM, Caswell H, Amstrup SC, Stirling I (2010) Survival and breeding of polar bears in the southern Beaufort Sea in relation to sea ice. *J Anim Ecol* 79:117-127. doi:10.1111/j.1365-2656.2009.01603.x
- Regehr EV, Lunn NJ, Amstrup SC, Stirling I (2007) Effects of earlier sea ice breakup on survival and population size of polar bears in Western Hudson Bay. *J Wildl Manage* 71:2673-2683
- Rode KD, Amstrup SC, Regehr EV (2010) Reduced body size and cub recruitment in polar bears associated with sea ice decline. *Ecol Appl* 20:768-782. doi:10.1890/08-1036.1
- Sahanatien V, Derocher AE (2012) Monitoring sea ice habitat fragmentation for polar bear conservation. *Anim Conserv* 15:397-406. doi:10.1111/j.1469-1795.2012.00529.x
- Saucier FJ, Senneville S, Prinsenberf S, Prinsenberf S, Roy F, Smith G, Gachon P, Caya D, Laprise R (2004) Modelling the sea ice-ocean seasonal cycle in Hudson Bay, Foxe Basin and Hudson Strait, Canada. *Climate Dynamics* 23:303-326
- Stirling I, Derocher AE (2012) Effects of climate warming on polar bears: a review of the evidence. *Global Change Biol.* doi:10.1111/j.1365-2486.2012.02753.x
- Stirling I, Parkinson CL (2006) Possible effects of climate warming on selected populations of polar bears (*Ursus maritimus*) in the Canadian Arctic. *Arctic* 59 (3):261-275