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Subject: Recognition of Southeast Greenland as the 20th polar bear subpopulation

Background:

- Polar bears occur most regularly along the entire coast of eastern Greenland. Bears from East Greenland may also be brought with the pack ice to southwestern Greenland (Born 1995).
- Polar bears in East Greenland (EG) are currently managed as a single subpopulation inhabiting a ca. 3,000 km coastline between 83° and 60°N latitude on East coast and on the Southwest coast between Nunap Isua/Kap Farvel and Paamiut (62° N). This delineation was determined by IUCN PBSG in 1993 and was based on general knowledge about the occurrence and catch of polar bears in East Greenland and Southwest Greenland (see Wiig et al. 1995, page 23).
- Historical polar bear field studies were conducted in parts of East Greenland to determine distribution and habitat use during 1973-1975, 1993 – 1994, 2007 – 2008 and 2011 (Vibe 1976, Born et al. 1997, Wiig et al. 2003, Born et al. 2012, Laidre et al 2015).
- Starting in 2015 and continuing thought 2022, the Greenland Institute of Natural Resources conducted scientific research on the entire coast of EG dedicated to gather hunter's knowledge, mark and track individual polar bears, determine genetic relatedness, assess body condition and health, and assess distribution and habitat use. A main purpose was to determine stock structure and the existence of subpopulations with the boundaries of the East Greenland management unit.
- Findings were recently published by the journal Science in an article entitled *Glacial ice supports a distinct and undocumented polar bear subpopulation persisting in late 21st-century sea-ice conditions* (Laidre et al. 2022).

New scientific findings about Southeast Greenland (SEG):

- Laidre et al. (2022) describe a previously undocumented subpopulation of polar bears living in Southeast Greenland (SEG) between approximately 60-64°N latitude.
- The SEG polar bear subpopulation is the most isolated and genetically distinct in the Arctic. SEG polar bears are different from all other 19 subpopulations, including bears in Northeast Greenland (NEG), north of 64°N latitude.

- SEG polar bears are specially adapted to the physical geography of SEG, occupying the fjords in the area. The length of the SEG sea ice season is too short to support polar bears, so SEG bears use freshwater glacial mélange[1] from the Greenland Ice Sheet as a platform to hunt seals in summer and fall.
- There is conclusive evidence that SEG bears qualify as a new subpopulation of polar bears. The data sources, methods, and sample sizes in Laidre et al. (2022) are more robust than previous evidence used to establish other polar bear subpopulations around the Arctic.
- Although the study was not designed to estimate abundance, data from marked individuals suggest that a few hundred animals currently inhabit Southeast Greenland.
- The current catch of bears in Ittoqqortoormiit and Tasiilaq are from the NEG management unit. Small sample sizes of DNA analyses and tag recovery indicate that most (but not all) polar bears harvested in Southwest Greenland come from the NEG subpopulation, as they pass by the SEG subpopulation on the drifting sea ice.

New Concerns:

- *A small, isolated population with low reproductive potential is vulnerable to natural and human caused perturbations.* The subpopulation has likely been small for several hundred years, and the limited exchange with other subpopulations and low birth rates make SEG polar bears vulnerable. Additional research is needed to estimate the abundance more accurately.
- *The SEG subpopulation is vulnerable to overharvest.* The subsistence harvest for the entire EG region is around 64 bears per year (including bears taken in South-Southwest Greenland, GINR 2022). Although the sustainable harvest from SEG has not been estimated, rough estimates suggest that removal of only 5 adult females from this subpopulation per year would likely result in depletion. More data are needed to produce a robust estimate of abundance, make a scientific harvest assessment, and provide management advice.
- *There is increasing interest in polar bear tourism in SEG.* Tourism, including cruise ship tourism in Greenland was increasing steeply before the Covid-19 pandemic and it is expected to increase again, especially after the construction of new airports (Anon 2021) and there has been interest in non-renewable resource extraction, which may be rekindled in the future. These activities, even in only a few fjords, have the potential for disturbance to the SEG subpopulation. Human activity in the fjords inhabited by SEG polar bears should be monitored and regulated.
- *SEG bears contribute unique genetic diversity that is important to the polar bears species.* Preserving this diversity is valuable to international polar bear conservation and for polar bears to display resilience as a species.
- *SEG bears offer a unique opportunity to understand global persistence of polar bears under climate warming*. SEG bears inhabit a sub-Arctic environment and rely partly on

[1] a mixture of calved icebergs and pieces of freshwater ice that accumulate near glaciers terminating in the sea.

freshwater glacial ice during a short sea ice season of <100 days, a situation similar to what more northern parts of Greenland will experience in the future because of climate warming. Monitoring the SEG subpopulation will allow a better understanding of the challenges other subpopulations of polar bears will face in the near future.

Recommendations for management:

- Southeast Greenland contains a unique and vulnerable group of polar bears that warrant recognition and management as the world's 20th polar bear subpopulation. The current EG polar bear subpopulation should be divided into two subpopulations: Northeast Greenland (NEG) and Southeast Greenland (SEG). Scientific data indicate that the boundary between the NEG and SEG subpopulation occurs at approximately 64°N latitude (Figure 1).
- Additional research is needed to understand the status of the SEG subpopulation and inform management and conservation, including estimation of abundance and identification of sex and age structure.
- Sustainable harvest levels are likely very low for a small subpopulation and the cost of long-term monitoring in SEG is high, therefore we recommend that this subpopulation should not be harvested before quantitative scientific harvest advice has been produced.

Map

A map with new proposed boundaries is attached (Figure 1).

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Background information/ References

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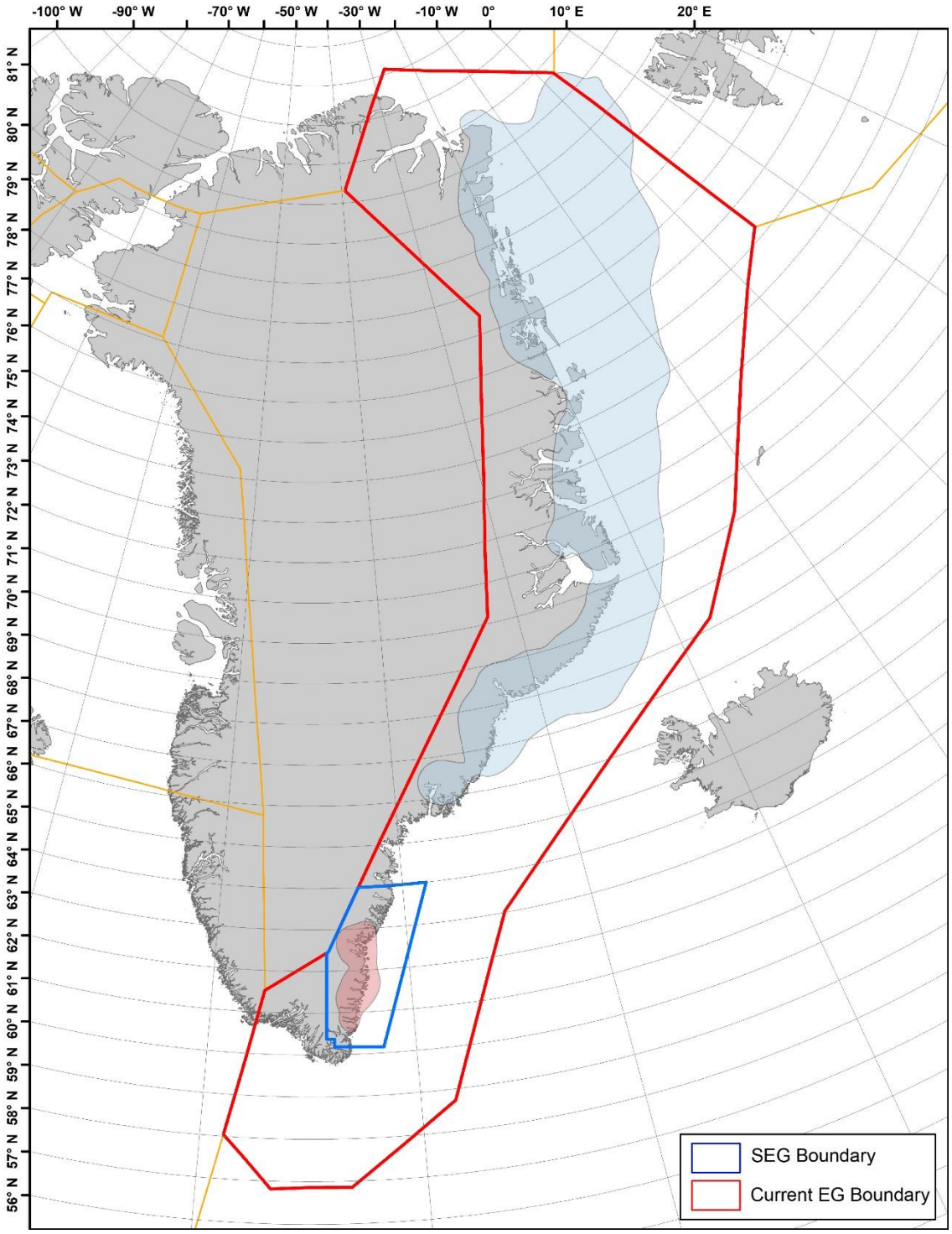

Figure 1. Proposed new boundaries for the East Greenland (EG) and the new Southeast Greenland (SEG) polar bear populations.