

Hunting males could harm polar bear populations

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New research by the University of Alberta in Edmonton suggests that current wildlife management practices in Canada could make it harder for polar bears to find mates.

Harvesting regulations vary around the world, notes biological sciences PhD student Péter Molnár, lead author of the study published in the *Proceedings of the Royal Society*.

For example, Canada uses a quota system, permitting some hunting to a predetermined limit, while Norway bans any hunting of polar bears.

Current Canadian management polices encourage hunters to go after male bears in order to conserve females, while maximizing the number of bears that may be harvested. But harvesting based on sex selection has reduced the number of males compared to females in polar bear populations across the Canadian Arctic, Molnár says.

The U of A team warns that under certain conditions, this practice of sex-selective harvesting could lead to trouble when it comes to polar bears finding a mate - based on a biological mathematical model they developed, and data from the polar bear population at Lancaster Sound off Cornwallis Island, northwest of Baffin Island, in the High Arctic.

The mathematical model allows researchers to predict how many male bears are needed in an area, compared to the number of female bears available, to maintain successful mating.

They determined that there is a critical threshold in the male-to-female ratio. If the sex ratio drops below this threshold, the model predicts a sudden and rapid collapse in fertilization rates. This threshold depends on whether the area has a high-density or low-density bear population.

Each bear population must be evaluated separately, because results will be different depending on the population characteristics of the area. But the U of A scientists can say that in regions with fewer bears travelling in a larger area, there actually needs to be more males than breeding females to maintain high fertilization rates.

Given this important population threshold, the study concludes that polar bear populations should be closely monitored and carefully harvested, as severe negative effects could arise either from overharvesting male bears or from population decline.

Molnár's work was supervised by professor Andrew Derocher, a noted polar bear expert, and professor Mark Lewis, who holds the Canada Research Chair in Mathematical Biology. The study was conducted in collaboration with the Government of Nunavut.

Source: University of Alberta

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