

Hunting male polar bears risks population collapse

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Catherine Brahic

The Canadian policy of "harvesting" mainly male polar bears could bring about the collapse of entire populations of the already vulnerable bears, warn researchers.

Péter Molnár of the University of Alberta in Canada and colleagues say that precisely when such a collapse may occur will depend on the density of each population. Their findings are the result of a modelling study designed to predict how successfully polar bears are mating.

In Canada, government hunting quotas encourage killing male polar bears over female ones. The theory is that, because females rear the bear cubs, losing one female polar bear will have a more serious impact on the population's ability to sustain its number.

As a result, at least two thirds of polar bears killed in Canada each year are male, according to a separate study that will appear in a forthcoming issue of the journal *Wildlife Biology* (lead author: Mitchell K. Taylor, government of Nunavut, Canada).

Research has shown that the policy has significantly reduced the ratio of males to females in polar bear populations across the Canadian Arctic.

Declining numbers

A population that is not hunted would normally have two or three males for each female not taking care of a cub. But research carried out in the late 1990s showed that Canadian bear populations had at best even numbers of males and females, while some had more females than males.

Molnár and his colleagues have been studying the effects of Canada's male-specific hunting policy on the long-term sustainability of polar bear populations.

They built a computer model to describe how male polar bears seek out females after collecting data from polar bears numbers and distribution around Lancaster Sound in the Canadian Arctic, between 1993 and 1997. The model predicts the way males locate females, mate with them, and then separate in order find other females.

The idea was to build a model that could predict how many pairs could be formed with a given population density and distribution.

The Lancaster Sound population has roughly as many males as it has females. Despite this depleted ratio, their model predicts that 99% of available females will be fertilised. However, they warn that once the population drops below about three females for every male, it may collapse.

Moreover, the model shows that the point at which a population of polar bears collapses depends on the density of the bears. In a less dense population, females need more males in order to reproduce successfully. In this case, the collapse of a bear population can begin when there are fewer than one male for every two females.

'Unlikely situation'

John Harwood of the University of St. Andrews in the UK believes such a dramatic situation "seems extremely unlikely under the current management regime in Lancaster Sound". But both Harwood and Steve Buckland, also at St. Andrews, point out that any drop in the proportion of females that are fertilised is likely to be made worse by other problems affecting polar bear populations.

Scientists have previously suggested that polar bear populations may dwindle as ice cover melts in the Arctic, making it more difficult for them to find food.

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Earlier in 2007, research from the US Geological Survey showed the melting ice is also forcing female polar bears to change their breeding habits.

"Our results indicate that not isolated populations but low density populations would be the most endangered, as in low-density populations it takes males and females longer to find each other during the mating season," explains Molnár.

Other animal populations have been known to collapse as a result of misguided sex-specific hunting quota. Most famously, the saiga antelope of the steppes of Russia and Kazakhstan collapsed in the late 1990s. The population, once numbering over one million, dropped to fewer than 30,000 in just 10 years as a result of a male-targeted hunting.

Embarrassingly, the quotas had been encouraged by conservationists who promoted the antelope's horn as an alternative to the endangered rhino horn.

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