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## Sex threat to polar bears

By Roger Highfield, Science Editor

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Concerns have been raised that female polar bears are running out of eligible males because of the way the creatures are being hunted, which could trigger the sudden collapse of endangered populations.

Even though the bear is deemed vulnerable by conservationists, management policies in Canada - where 60 per cent of the world's population live - encourage hunters to select for males in order to conserve females while maximising the number of bears that may be harvested for the fur trade, recreational hunting and Inuit communities, where bear hunts are a tradition.



Female polar bear with her cub: The study raises the possibility of female polar bears not being able to find a mate

"However, prolonged sex-selective harvest has reduced the numbers of adult males in all Canadian polar bear populations, leading to female-biased sex-ratios," said Péter Molnár of the University of Alberta, Edmonton, one of a team that reports on the lack of male bears today in the journal Proceedings of the Royal Society Biological Sciences.

This raises the concern that males could become depleted to the point where females cannot find mates. Using data on around 500 bears - about one fifth of the total population in Lancaster Sound, Canada - the team shows that the current numbers of males remain high enough to fertilise all females.

Molnár says that, given the trends, the findings are "a cause for concern," though he stressed

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the team only looked at conditions that would cut mating success, rather than the overall impact on population growth.

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However, his team warns that "a sudden and rapid reproductive collapse could occur if the sex ratio drops below a critical threshold. This threshold depends on local bear densities, and must therefore be evaluated separately for each population."

As a result, they believe that the current harvesting methods should err on the safe side. "Currently observed high litter production rates despite reduced male numbers should not be taken as evidence that populations are secure."

Prof Stephen Buckland of the University of St Andrews comments that this work does raise questions about the wisdom of the harvesting strategy in Canada.

He notes that the work "also has implications for polar bear populations threatened by climate change, where the combination of habitat loss and any significant harvest, however structured, may lead to rapid reductions in population sizes."

The polar bear is a vulnerable species at high risk of extinction, not least because predicted decreases in the polar sea ice due to global warming. Local long-term studies show that seven out of 19 subpopulations are declining or already severely reduced..

The new study focuses on a phenomenon called the Allee effect, in which individuals of many plant and animal species suffer reduced fitness at low population densities, which increases their extinction risk.

This has been seen at work in saiga antelopes, African wild dogs, African elephants and moose and is thought to have helped drive the passenger pigeon to extinction.

The team fears that the bear may see the same collapse as has been well documented with the saiga antelope: "Despite heavy sex-selective poaching and a continuing depletion of adult males, female fertilisation rates remained unaffected for a long time..but eventually collapsed in a sudden and nonlinear fashion when males were depleted below a critical threshold."

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