

Science for Environment Policy

Bear hunting's hidden impacts on cubs is highlighted in new study

Hunting has obvious impacts on wild populations. However, new research concludes that for Scandinavian brown bears (*Ursus arctos*), it also contributes to the killing of cubs by adult males to increase the male's chances of mating with the cubs' mother. The researchers say that this indirect effect of hunting should be considered when developing sustainable hunting quotas and management plans.

Hunting is believed to lead to increases in sexually selected infanticide (SSI) among some species. SSI occurs when mating opportunities are limited and it becomes advantageous for one sex (usually males) to kill the offspring of another individual.

In the case of Scandinavian brown bears, infanticide can benefit adult males because females can mate again shortly after losing their young during the mating season. Hunting may promote SSI in this species because where a resident male is killed, his replacement will probably be unrelated to the cubs in the area.

This study aimed to quantify the impact of hunting and SSI on a Scandinavian brown bear population. The researchers monitored the survival of 180 adult females and their young (a total of 466 cubs) over the period 1990–2011 in a 13 000 km² forested area of south-central Sweden.

They assessed survival rates of these bears in relation to the level of 'hunting pressure' at any one time. Hunting pressure was calculated as the number of bears legally killed divided by the number of bears legally available for hunting and monitored by the researchers. Hunters are allowed to kill any bear except 'family groups', i.e. females and their dependent young.

The researchers noted that there were two distinct periods of hunting pressure during 1990–2011. During 1990–2005, average pressure was low at 0.073. However, it rose to 0.199 during 2006–2011. These two periods provided a useful way to compare the effects of low and high hunting pressure on the bears.

They found that the population growth rate of the bears was positive during the low hunting pressure period: each year the population was estimated to be 1.082 times bigger than the previous year. The growth rate dropped during the high pressure period, to 0.975. This means that the local population would progressively get smaller, by 2.5% every year if hunting pressure stays at this level.

However, this reduction in growth rate cannot be explained by the number of bears directly killed by hunters alone. The researchers also found that 80.9% of cub deaths occur during the mating season. They attribute 'most, if not all' of these deaths to SSI. Without SSI, they expect that nearly all cubs (96.8%) would have survived their first year during 2006–2011, instead of the 53.5% that they actually observed.

The study also noted that fewer cubs were born during the high hunting pressure period, which also contributed to the negative population growth rate. Some mothers may have actively avoided males during mating season in order to protect their young from SSI. This would have possibly reduced the quality of their diet and future opportunities for reproduction.

Without SSI's effects, the population growth rate would have been 1.055. This means that the population would grow even with the direct effects of high hunting pressure.



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