



Photograph by Klaus Pommerenke

RAINCOAST
CONSERVATION FOUNDATION

Hormone levels in wolf hair reveal the physiological and social stress of being hunted

Science summary for the paper: Bryan, Heather M., Judit E. G. Smits, Lee Koren, Paul C. Paquet, Katherine E. Wynne-Edwards and Marco Musiani. 2014. Heavily hunted wolves have higher stress and reproductive steroids than wolves with lower hunting pressure. *Functional Ecology*. DOI: 10.1111/1365-2435.12354

One sentence overview: This seminal piece, lead by Raincoast's Dr. Heather Bryan, suggests that heavily hunted wolves experience significant social and physiological stress.

Context

Human relationships with wolves date back millennia. Despite their role in maintaining healthy ecosystems, wolves continue to be targets for human-caused mortality through predator control strategies (aerial shooting, poisoning, neck snares), sport hunting, and trapping.

In North America, wolf populations are hunted at rates of 0-50% annually, with increases to 80-90% for short periods as part of intensive control programs.

Yet the effects of human caused mortality go beyond reductions in numbers. Wolves are highly social animals that are particularly susceptible to social disruption caused by high mortality. The loss of family members can disrupt the complex social structures that govern many aspects of wolf populations. Little is known, however, about the physiological and social effects that hunting has on the surviving wolves.



Dr. Heather Bryan



Photograph by Klaus Pommerenke

Research

The study investigated the physiological and social effects of hunting by measuring and comparing stress and reproductive hormones in wolves subject to different hunting pressures. The study was conducted using hair samples from wolves in two regions of Northern Canada.

Stress and reproductive hormones, including cortisol, progesterone, and testosterone are incorporated into growing hair via the blood vessel that feeds the hair follicle, and thus reflect endocrine activity during hair growth.

Measurements of these hormone levels can reveal changes in behaviour, reproductive activity, and social structure in response to population reductions.



Findings

The study found that wolves from a heavily hunted population in the tundra-taiga had higher progesterone compared with lightly hunted wolves in the boreal forest. Elevated progesterone levels suggest increased reproductive effort and social disruption in response to human-caused mortality (poisoning, hunting and trapping).

The tundra-taiga wolves also showed higher testosterone and cortisol levels, which may reflect social instability. Additionally, cortisol was measured in a second group of wolves from the boreal forest in order to control for habitat differences. This group has been heavily hunted through a government culling program and, like the tundra-taiga wolves, showed higher cortisol levels than the lightly hunted group.

Implications

Although the long-term effects of chronically elevated stress and reproductive hormones are unknown, there are potential implications for behaviour, health, and long-term survival. As such, conservation and management strategies should consider not only the number of wolves, but the possible physiological and social effects that hunting causes on the remaining individuals.



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