Heavily hunted wolves have higher stress and reproductive hormones than wolves with lower hunting pressure

Sidney, BC - New research, published in the scientific journal *Functional Ecology*, suggests that wolves that are heavily hunted experience social and physiological stress. In parts of the world where they remain, wolves have a major influence on ecosystems. Yet wolves are also viewed as competitors with people over shared prey and livestock. Consequently, wolves are often subject to unscientific and unethical management that includes population reductions of up to 50% per year, with occasional reductions up to 90% during intensive lethal control.

The scientists used tiny tufts of hair to measure the hormones cortisol, testosterone, and progesterone in wolves subject to different hunting pressures in Canada. "These hormones are found in minute concentrations in hair," says Dr. Heather Bryan, who conducted the research as part of her PhD research at the University of Calgary and is currently a biologist with the Raincoast Conservation Foundation and Hakai Postdoctoral Scholar at the University of Victoria. "It would be comparable to measuring 10 granules of salt dissolved in 30 Olympic-sized swimming pools. Despite the low concentrations, our measurements on hair revealed that wolves from heavily hunted populations had higher progesterone, testosterone, and cortisol."

"Our finding of elevated progesterone, a hormone produced during pregnancy, likely reflects an unusually higher proportion of breeding females, which might occur if normal pack structure is disrupted by hunting," says Dr. Judit Smits, professor of Veterinary Medicine at the University of Calgary and co-author on the study. "Similarly, heavily hunted wolves had elevated testosterone and cortisol (a stress hormone), which may reflect social instability caused by hunting."

"Although the long-term effects of chronically elevated stress and reproductive hormones are unknown, there are potential implications for wildlife health, welfare, long-term survival, and behaviour," says Dr. Paul Paquet, adjunct professor at the University of Victoria, senior scientist from the Raincoast Conservation Foundation, and co-author. "The effects of stress are often subtle, but the resulting harm can be acute, chronic, and permanent, sometimes spanning generations."

"Wolves have a sophisticated social system that can be disrupted by hunting," says Dr. Marco Musiani, professor at the University of Calgary and co-author. "This can lead to unintended, increased reproductive rates as well as changes in genetic structure. In this study we investigated whether hunting also affects wolf physiology, which has implications for wolf health, welfare, and behaviour."

"These findings emphasize that conservation and management plans should consider not only numeric responses, but also possible social and physiological effects of lethal control programs on wolves and other large carnivores," says Chris Genovali, Executive Director of Raincoast Conservation Foundation.

Citation:
Bryan, H.M., Smits, J.E.G., Koren, L., Paquet, P.C., Wynne-Edwards, K. E., and Musiani, M. 2014. Heavily hunted wolves have higher stress and reproductive hormones than wolves with lower hunting pressure. Functional Ecology.

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Several high-resolution images of wolves, including the ones below, are available with permissions granted and free of charge at https://www.dropbox.com/sh/dqshy3y3rnuwu7h/AAD0cQLLNv08BOqYBzMQmq6na?dl=0


Photo Credit: P. Paquet


Photo Credit: M. Musiani