

# Hunting and Mountain Sheep: Do Current Harvest Practices Affect Horn Growth?

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Brief by Rhiannon Jakopak and Tayler LaSharr



## Why the study was needed

The horns and antlers of big game species signal strength to rivals and potential mates, as well as allure hunters seeking to hang the most impressive animals on their living room walls. But could the removal of these animals through hunting reduce the size of horns and antlers over time?

Bighorn sheep have been at the center of a controversy over the potential negative effects of selectively hunting large males, in large part because scientists observed declines in horn size due to intense hunting pressure on one population in Canada. This controversy and the question of whether certain hunting practices can negatively affect horn growth warranted further evaluation in other populations of bighorn sheep.

## How it was done

The factors that determine horn size are age, genetics, and nutrition. All else being equal, older sheep have bigger horns than younger sheep because horns grow throughout life. Although age is the primary factor, genetics also can influence size and shape of horns. Finally, sheep with access to good forage can grow bigger horns than sheep with limited resources.

Hunting can change horn size in two ways. First, hunting can change the age structure of a herd by removing older animals, which also tend to be the largest; under heavy harvest, the average horn size can decline over time simply because the animals remaining in the herd are younger. Second, harvesting animals with large, fast-growing horns more frequently than those with small, slow-growing horns could negatively affect the genetic material for large horns in the herd.

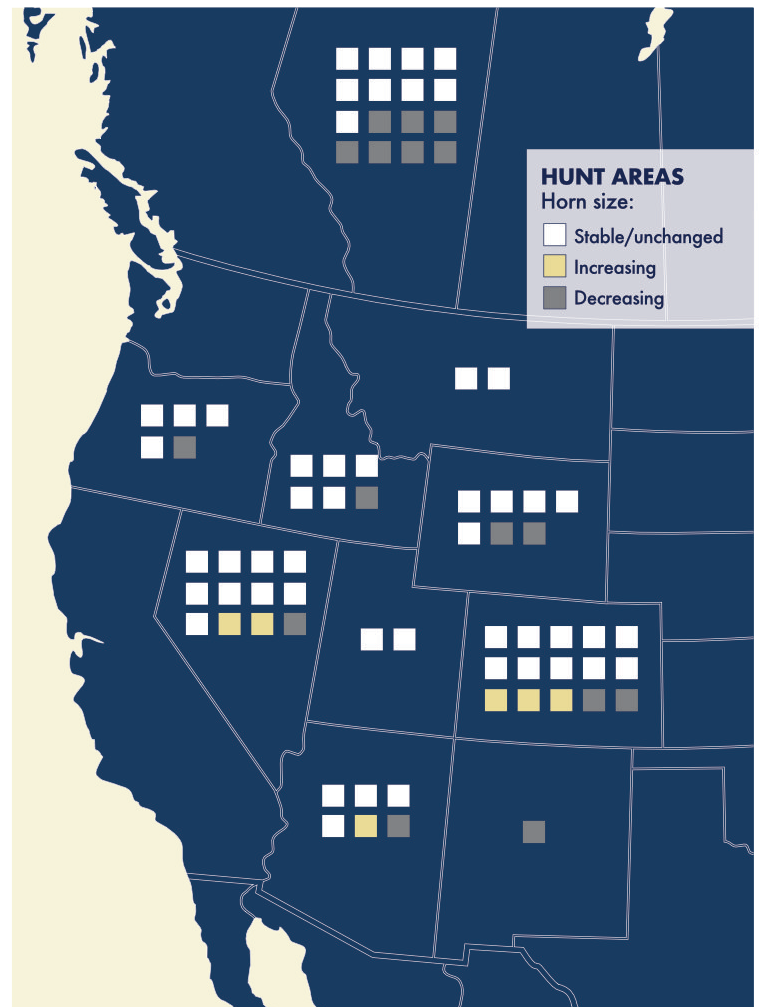
The researchers evaluated nearly 25,000 harvest records of male bighorn sheep recorded by state and provincial wildlife management agencies. Records spanned 72 hunt areas throughout nine US states and one Canadian province over 35 years from 1981 to 2016. Researchers first assessed whether horn size was changing through time in each hunt area. Where changes did occur, they determined whether age or nutrition was responsible for that change. The primary metric used to evaluate if hunting could cause genetic change was to identify where declines in horn size couldn't be explained by age or environmental factors.

# What the researchers discovered

The researchers found evidence that all three mechanisms affected horn size, depending on the hunt area in question. After addressing the influence of age and the environment, horn size remained unchanged in 50 hunt areas, decreased in 16, and increased in 6. In hunt areas where horn size declined, only 7—fewer than half—had hunting regulations consistent with the potential to cause evolutionary changes in horn size. In all, current harvest regimes in most hunt areas do not appear to be reducing horn size in bighorn sheep.

## Why it's important

Throughout North America, having big game with large horns and antlers is important both to the animals themselves and to those who enjoy watching or hunting them. Hunting is a critical part of our wildlife heritage and the cornerstone of conservation and management in North America; yet, the potential consequences of harvesting large males has been a point of controversy. This research demonstrates that the way most state and provincial agencies manage bighorn sheep hunting, even when hunters target animals with large horns, doesn't cause an evolutionary change in horn size. Although scientists, managers, and the public should continue to consider the effects of hunting on wildlife populations, current practices in most hunt areas do not appear to negatively affect horn growth in bighorn sheep.



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## Read the paper

T. N. LaSharr, R. A. Long, J. R. Heffelfinger, V. C. Bleich, P. R. Krausman, R. T. Bowyer, J. M. Shannon, R. W. Klaver, C. E. Brewer, M. Cox, A. A. Holland, A. Hubbs, C. P. Lehman, J. D. Muir, B. Sterling, and K. L. Monteith. 2019. "Hunting and mountain sheep: do current harvest practices affect horn growth?" *Evolutionary Applications* 12:1823 – 1836.

## About the authors

This research was a collaborative effort among scientists, managers, and researchers across North America, led by Tayler LaSharr and Kevin Monteith of the Monteith Shop at the University of Wyoming. LaSharr is a graduate student and Monteith is an associate professor, both in the Haub School of Environment and Natural Resources and the Wyoming Cooperative Fish and Wildlife Research Unit.