

## **Ramifications of the Hunt: Horn Growth, Selection, and Evolution of Bighorn Sheep in British Columbia**

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**Abstract:** Natural and artificial selection may work in opposing directions on horn size in wild sheep. The horns of bighorn sheep (*Ovis canadensis*) rams are both a heritable, fitness-related trait and a trait selected by trophy hunters. Population management regimes for sheep trophy hunting in British Columbia are based primarily on sex and horn-curl criteria. The potential selective, evolutionary effect of these management strategies has only recently attracted attention. If trophy hunting is an artificial selection pressure expressed by the removal of the largest or fastest-growing males from the population, the fitness of large-horned rams should decrease, and small-horned rams may be favoured. Compulsory inspection data for hunter-harvested bighorn sheep rams have been recorded in British Columbia since 1975. Analysis of total horn length and growth annuli measures provides an excellent opportunity to assess temporal trends in ram horn size, and explore relationships among horn growth and harvest management strategies. Preliminary analyses show a strong correlation between early horn growth and harvest age: rams with fast-growing horns are shot at a younger age than rams with slow-growing horns. This result has implications for individual reproductive success because rams with large horns may have a shorter life expectancy. Measuring a phenotypic response to artificial selection on a heritable trait is of evolutionary and conservation interest. Our findings suggest that trophy sheep management based on minimum horn-curl criteria and unlimited-entry hunts may over time favour rams with slow-growing horns.

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