Lessons from Wyoming Mule Deer Herds on the Effectiveness of Recreational Harvest in Controlling Chronic Wasting Disease

Wynne Moss*, Northern Rocky Mountain Science Center, U.S. Geological Survey, Bozeman, MT
Paul Cross, Northern Rocky Mountain Science Center, U.S. Geological Survey, Bozeman, MT
Samantha E. Allen, Wyoming Game and Fish Department, Laramie
Justin Binfet, Wyoming Game and Fish Department, Laramie
Hank Edwards, Wyoming Game and Fish Department, Laramie
Embere Hall, Wyoming Game and Fish Department, Laramie
Jessica Jennings-Gaines, Wyoming Game and Fish Department, Laramie

*Indicates Presenter

**Indicates Student Presentation

Recreational harvest is a commonly discussed and periodically used strategy for controlling chronic wasting disease (CWD) in cervid populations across the United States and Canada. Evaluating the efficacy of this strategy, however, is not straightforward, due to time lags, feedbacks, and confounding variables. For example, correlations between harvest rates and CWD prevalence may be due to the causal role of hunting on CWD or the reverse (e.g., the impact of CWD on harvest rates or quotas). We analyzed two decades of surveillance data (2000 – 2022) from 10 Wyoming mule deer herds to estimate the effects of harvest on CWD prevalence, using statistical approaches informed by causal inference theory to better control for feedbacks and confounding variables. We found that herds with consistently high harvest pressure across 20 years had significantly lower CWD prevalence. Our models predicted that harvesting 25% of adult males per year across 20 years would result in a prevalence of <10%, whereas if only 15% of males were harvested in each year, prevalence would increase to nearly 30%. Moreover, shifting the relative harvest pressure within a herd over a shorter period (e.g., three years) altered subsequent CWD prevalence, albeit to a smaller degree. Although high harvest is unlikely to completely eradicate CWD, our analysis suggests that maintaining hunting pressure on adult males is an important tactic for slowing CWD epidemics within Western mule deer herds. Our study also provides guidance for future analyses of longitudinal surveillance data, including the importance of demographic data and appropriate time lags.