**Sex-based Differences in Disease Transmission May Affect Management Efficacy of Chronic Wasting Disease

Will Rogers*, Montana State University. Bozeman
Paul Cross, United States Geological Survey
Ellen Brandelll, University of Wisconsin-Madison

*Indicates Presenter

**Indicates Student Presentation

Chronic wasting disease (CWD), a pathogenic prion affecting Cervidae, has repeatedly been observed at higher prevalence among males than female deer. This sex bias is potentially due to differences in susceptibility or transmission, but the underlying mechanism may not be discernable from prevalence data alone. We used an age- and sex-structured simulation model to explore harvest-based management of CWD under three different transmission scenarios that all generated higher male prevalence: (1) increased male susceptibility, (2) high male-to-male transmission, or (3) high female-to-male transmission. Heavily male-biased harvests were typically able to control CWD epidemics and maintain host population sizes under high male-to-male transmission and high male susceptibility scenarios. However, male-biased harvests were ineffective under high female-to-male transmission and female-biased harvests were required to limit disease transmission but resulted in low population sizes. Higher disease prevalence in a sex or age group may be due to higher exposure or susceptibility but does not necessarily indicate if that group also is responsible for more disease transmission. We showed that multiple processes can result in the pattern of higher male prevalence, but that population-level management interventions need to focus on those groups responsible for disease transmission not just those that are most exposed. Disclaimer: This will be presentation from a draft manuscript. Its content is deliberative and predecisional, so it must not be disclosed or released by reviewers. Because the manuscript has not yet been approved for publication by the U.S. Geological Survey (USGS), it does not represent any official USGS finding or policy.