PLENARY TALK: Population monitoring and management

Hunting and management of chronic wasting disease in cervids in North America and Europe

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Chronic wasting disease (CWD) is a contagious prion disease of cervids, and groups with diseases like bovine spongiform encephalopathy in cattle, scrapie in sheep, and Creutzfeldt–Jakob disease in humans. CWD was first diagnosed in deer in 1967 in Colorado, USA, and has spread to 35 states in USA and 4 provinces of Canada infecting mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and moose (*Alces alces*). The first detected case of CWD in Europe was in 2016 in a wild reindeer (*Rangifer tarandus*) in Norway. With onset of surveillance in Europe, a novel type of sporadic CWD, termed sCWD, was detected in moose and red deer (*Cervus elaphus*), but is not contagious and hence does not require hunting management. Prion diseases are invariably fatal, and there are no vaccines or treatments available. Contagious CWD has a long incubation period, where infected animals shed prions into the environment. Prevalence has reached high levels and led to deer population declines in North America. Hunting or culling is the main way to control CWD. Overall high harvest rate can limit CWD by shortening the infectious period and through other mechanisms.

Here, I review the main hunting strategies as part of CWD management: (i) depopulation, (ii) spatially targeted harvesting (around CWD cases), and (iii) male-biased harvesting. Other strategies have limited efficiency (e.g. targeting clinical suspects) or limited applicability (e.g. capture-test-and-cull), while the effect of density reduction per see remains uncertain. The success of each strategy depends on the species (level of site fidelity), habitat (open, forest), and population demarcation (open, closed). Achieving high harvest rates with recreational hunters only is challenging, and frequently requires the use of marksmen. Hence, success in limiting CWD strongly depends on the level of governmental involvement and public acceptance or resistance. I discuss the dynamic relationship between harvest rate to limit CWD and surveillance, and highlight the importance of pre-emptive culling, i.e., increased harvest before the first detection.