

Spatially Targeted Surveillance for Deer Hair Loss Syndrome in Columbian black-tailed deer (*Odocoileus hemionus columbianus*) in the Pacific Northwest

Ryan S. Miller¹, Jack A. Mortenson²

¹ Animal Plant Health Inspection Service, Centers for Epidemiology and Animal Health

² Animal Plant Health Inspection Service, Veterinary Services

Hair-loss syndrome (HLS) has affected Columbian black-tailed deer (*Odocoileus hemionus columbianus*) in the western Oregon and Washington since 1996. The presence of exotic lice *Damalinia (Cervicola)* has been implicated as contributing factor. The degree to which HLS causes mortality has been debated, however it is reported to affect population densities. The potential impact on deer populations presents the need for detection if present in a population. However, surveying black-tailed deer is inherently difficult due to dense costal forests. The goals of this analysis were two fold, first using ectoparasite collections identify environmental and ecological variables that might be associated with the presence of lice; second, use these variables to identify areas where surveillance for the lice should be focused.

The geographic location of ectoparasite collections from deer (N = 199) were merged with environmental and climatic data to look for associations between the presence of the lice and HLS sightings. These data were then used as spatial constraints to identify areas important for risk-based targeted surveillance of HLS and the lice. The area resulting from application of the spatial constraints was compared with reported sightings of HLS by biologists (N = 1,973).

The presence of lice increased significantly in areas with an average minimum temperature above 5.0 C (odds ratio=2.5; P <0.000). Elevations below 300 meters were also significantly associated with presence of the lice (odds ratio=2.7; <0.000). When reports of HLS sightings were compared with the spatially constrained areas 64% of the locations fell within the constrained area.

This spatial analysis indicates that a correlation may exist between the presence of lice, elevation, and temperature. Elevation and temperature demonstrated strong gradients which are likely related to other processes that were not explored in this analysis. However, these analyses serve as a foundation for identifying areas important for targeted surveillance.

Citation: Ryan S. Miller and Jack A. Mortensen. Spatially Targeted Surveillance for Deer Hair Loss Syndrome in Columbian black-tailed deer (*Odocoileus hemionus columbianus*) in the Pacific Northwest. The Wildlife Society 17th Annual Conference. Snowbird, Utah, October 2-6, 2010.

Contact: Ryan.Miller@rsmiller.net