Spatial Analysis of Chronic Wasting Disease in Northeastern Colorado Deer Populations

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Chronic wasting disease (CWD) is a highly contagious, fatal prion disease found in cervids, which has resulted in their decline; specifically, whitetail deer and mule deer. Data (sex, species, CWD status, and harvest location) were collected during the first and second rifle seasons of 2023 in Colorado for Game Management Units (GMUs) 98, 101, and 102. Data for 2023 was collected by the researcher during Colorado Parks and Wildlife's (CPW) mandatory CWD testing because the researcher had access to CWD status for each harvested deer. It was hypothesized that 1. Male deer would have a higher rate of CWD prevalence than females, 2. Specific geographic areas would yield a higher rate of CWD prevalence, based on soil type and type of vegetation; and 3. CWD prevalence rates would increase from 2019 to 2023. Utilizing a spatial analysis program, each deer's data, including deer-harvested locations, were mapped and analyzed by attributes. Analyses included: hot-spot investigation, soil analysis, overlay of deer information from prior testing years (2019 data provided by CPW), and positive/negative high-density areas. The first hypothesis was accepted as CWD positivity rates were higher for males (36.1%) than females (12.5%). The second hypothesis was not supported as the difference between the positivity rates among the soil types were not significant. The third hypothesis was supported because the prevalence rates in the study area increased from 20.3% in 2019 to 29.9% in 2023. This was found to be significant with a p-value of .007.

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