Group size, bioaccumulation, and baiting: quantifying factors affecting disease transmission among deer

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While the pathways for CWD transmission have been well characterized in previous studies, the factors that affect transmission and how those factors may interact are not fully understood. This lack of knowledge leaves a gap in epidemiological models that are used for making effective management decisions to combat CWD. Samantha Courtney, Dr. David Williams, and Dr. Sonja Christensen, Michigan State University and Dr. Dwayne Etter, Michigan Department of Natural Resources, and their team are addressing those questions through a study titled: Group size, bioaccumulation, and baiting: quantifying factors affecting disease transmission among deer.

Funding from the Michigan Department of Natural Resources and Michigan State University Joint Wildlife Disease Initiative of was awarded to this team to identify the direct and indirect factors that affect CWD transmission among deer. This project is funded from 2020-2022 with field work occurring in winter 2021 and 2022.

To better understand the factors affecting CWD transmission, we asked: how do factors such as deer group size and direct contact, bioaccumulation of feces, and deer attractants affect the potential transmissibility of CWD? To answer this question, we sought to address several objectives 1) Quantify group size, composition (age and sex), and physical contact rates among deer; 2) Estimate bioaccumulation of deer feces in congregation areas; and 3) Identify how attractants impact physical contact rates and bioaccumulation of feces.

Our study is being conducted in an agricultural region of southern Michigan. We are observing deer during the post-breeding period (Jan-April), when they tend to congregate into larger groups, potentially increasing the interactions among related and unrelated deer, populations are stable, and deer are most easily observed. We are conducting road-based surveys and direct observations to characterize group size and composition, and selected deer behaviors in areas where deer naturally congregate. We are also using trail cameras to record group composition and behaviors at baited sites and food plots. For this study, we are also exploring the feasibility of using drones to characterize deer grouping behavior in areas that are difficult to view from roads. This design will allow us to compare deer behaviors that potentially increase transmission of CWD among the three potential congregation areas (e.g., natural forage, bait, and food plots). At food plots and bait sites, we will estimate bioaccumulation of deer fecal material because of its potential role in indirect transmission of CWD. Our goal in quantifying these CWD transmissibility factors is to update existing risk models to help inform disease management.