Department of Natural Resources
2023 SCI-MIC Project Requests

Project Title **- Deer Behavior and CWD**

Project Background - Effective CWD management strategies depend on understanding how disease spreads and grows on a landscape. While DNR and its partners have developed advanced models to estimate the spread and growth of CWD in Michigan, there is a critical need to inform the fundamental processes that lead to disease transmission among deer. Transmission pathways for CWD are through direct (deer to deer) and indirect (environment to deer) contacts. Recent studies of CWD transmission pathways in deer have focused on common patterns of interactions of radio-collared deer. These studies imply direct contacts by assuming that animals in close-proximity in time and space have an opportunity to directly contact each other; however, direct contact is not observed and likely varies from predictions. In theory, this information is useful, but practical use is limited because direct interactions among a few individuals may fail to represent potential interactions among all deer in a population. A better understanding of how deer ecology and social interactions facilitate direct contacts among deer is critical for understanding CWD transmission within populations.

Existing estimates of indirect contacts among deer are based on overlapping space-use by collared deer and do not account for important processes such as the differential shedding of infectious agents. Infectious CWD prions from cervids are shed in feces and remain infectious for up to 7 freeze-thaw cycles. Quantifying the accumulation and persistence of feces in different habitats would be informative for understanding the potential for disease transmission through indirect contact, particularly in the Midwest where deer frequently congregate in agricultural areas in late winter and early spring. Seasonal congregation of deer influences localized deer density and may lead to increased bioaccumulation of feces and potential for increased fecal prion seeding. Thus, we want to know if there are predictable factors influencing deer congregations, social behavior, and associations in agricultural regions of Michigan.

Direct and indirect contact behavior among deer may be facilitated or disrupted by the presence of food attractants, which has been shown to alter the movement behavior of deer. In the presence of bait, deer significantly shift space use, potentially increasing opportunities for direct and indirect contact. While changes in deer movement patterns have been documented, little is known about how direct contact behaviors, or the shedding of infectious agents differ in the presence of bait and at wildlife food plots. This research is designed to quantify how the landscape, deer density, and artificial attractants, such as bait and food plots, influence where and to what extent deer congregate. This research will also provide estimates of direct contact rates among individual deer, and the accumulation and persistence of deer feces; factors input into existing disease models.

Partners - Safari Club International-Michigan Involvement Committee; DNR; MSU Applied Forest and Wildlife Ecology Lab.

Timeframe and budget - This project was initiated in winter 2021 and is now extended through 2024. Total cost of this project exceeds $400,000 plus in-kind services from MSU and DNR.

2023 SCI-MIC funding request – Targeted funding request from SCI-MIC for 2022 is $3,000.

Project Title - Wolf Population Management

Project Background - The gray wolf has returned to its former range in the Upper Peninsula of Michigan (UP). Since 1989, the Department has monitored wolf population growth and range expansion. As Michigan's wolf population increased, protections under Federal and State laws for wolves changed necessitating action in wildlife managers response to wolf-related conflicts. This prompted the Department to update the state's wolf management plan. The Department revised the management plan in 2015 and again in 2022. As part of the 2022 wolf management plan revision, the Division surveyed the public to assess their attitudes and beliefs regarding wolves and various management options. The social science data collected as a part of this study provided critical input to the plan's revision.

As the wolf population increased, the Department developed a program of research to aid in monitoring their recovery and management. An important component of this work has been the capture and tagging of wolves with telemetry collars to determine their survival, cause-specific mortality, movements, pack and territory size, and abundance. To date, over 700 wolves have been captured and radio-collared to provide this important information. We completed the transition in 2016 from deploying outdated VHF collars to GPS collars that transmit data through satellites. The GPS collars provide more frequent and more accurate locations without the need and expense of aerial relocation flights. At the end of 2022 we were monitoring 29 GPS collared wolves.

The Division is currently evaluating a new approach as an alternative wolf abundance estimation technique, and this will be evaluated against the existing abundance estimator. Any new abundance technique will still rely heavily on having collared wolves on the landscape.

Partners - Safari Club International-Michigan Involvement Committee and MDNR.

Timeframe and budget - Wolf population monitoring began in 1989 and work continues annually. Total annual costs in years without a survey are approximately $60,000 and annual costs increase to over $100,00 in years when a survey is conducted.

2023 SCI-MIC funding request – Targeted funding request from SCI-MIC for 2023 is $3,000.

Project Title – Developing a Cost-Effective Technique to Estimate Wolf Abundance

Project Background - The Michigan Department of Natural Resources (MDNR) has a public trust responsibility for the management of wolves in the state. Though the legal status of wolves at the Federal and State level has changed multiple times over the past several decades, wolf numbers in Michigan have exceeded State and Federal population recovery goals for 20 years. The primary technique for estimating wolf distribution and abundance in Michigan is winter track count surveys, typically during January–March. Simplistically, this approach involves agency biologists searching areas of known or suspected wolf activity for tracks and other evidence of wolves, estimating the minimum number of wolves in each pack from sets of tracks observed, and summing these values to obtain a minimum count of wolves.

Minimum counts can provide a useful index of abundance, however, for species of low abundance and of high public profile, more rigorous counts are often desired. Recent efforts in several western states (e.g., Idaho, Montana) have attempted to address the shortcomings of minimum counts through occupancy-based winter track surveys. A similar survey approach is being used in Wisconsin that includes GPS-collared wolves and demonstrates promise as a long-term and efficacious approach to estimate wolf abundance. In addition to occupancy-based track surveys, use of remote cameras has gained considerable attention for estimating distribution and abundance of wildlife during the last 15 years. Coupled with statistical advances to estimate wildlife abundance, particularly using unmarked animals, remote cameras now provide a field tool capable of facilitating long-term monitoring of wildlife.

This research includes use of >1,300 remote trail cameras and an occupancy-based winter track count to develop an approach for monitoring long-term trends in wolf abundance and distribution. Augmented by continued long-term monitoring of GPS-collared wolves, this approach will be compared against the existing estimator for efficacy in terms of accuracy, precision, and cost (economic and personnel). Funds to replace and supplement ongoing GPS collaring efforts and remote camera work will be important to the success of this peninsula-wide monitoring effort.

Partners - Michigan State University and MDNR.

Timeframe and budget – Work for this project began in 2022 and will continue through 2027. Total project costs exceed $1.2 million.

2023 SCI-MIC funding request – Targeted funding request from SCI-MIC for 2023 is $3,000.