TITLE: Wolf Population Management

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 size increased and exceeded levels that required Federal and State agencies to protect the wolves under endangered species statutes, wildlife managers increasingly found themselves responding to wolf-related conflicts. This change in focus prompted the Department to update the state's wolf management plan. The Department revised the management plan again in 2015.

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 radio collars to determine their survival, cause-specific mortality, movements, and pack and territory size. Over 400 wolves have been captured and radio-collared to provide this important information. We have completed the transition from deploying 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 2018 we were monitoring 32 GPS collared wolves.

In 2018, our research focus has been on continuing our comprehensive analysis of our wolf movement and survival data with Michigan Technological University. In addition to the survival analysis of wolves that we reported on last year, we investigated the form of density dependent habitat selection by wolves. We found that density dependent habitat selection of wolves recovering in the Upper Peninsula was most consistent with the ideal preemptive distribution. In this form of density dependent habitat selection, the first wolves to arrive in a new area select the best habitat. This finding has important implications as it suggests that wolf population density may not indicate the fitness value of their habitat. This finding also suggests that source-sink dynamics are likely to be operating in this population and managers need to consider these dynamics when designing a wolf harvest.

We also continued our assessment of wolf-livestock depredations with State University of New York, College of Environmental Science and Forestry. Our work on wolf-livestock depredation patterns demonstrated nonlinear relationships between cattle density, human density and proportion of agricultural lands with the occurrence of wolf-livestock depredations. Previous studies have always assumed these relationships were linear. The new approach has improved the accuracy of predicting depredations (90%). Identification of high depredation probability areas may allow preemptive deterrence techniques (e.g., lights, fladry, noisemaking devices) to be deployed and focus wolf education efforts. Wolves in the Great Lakes region are currently protected by the Endangered Species Act prohibiting lethal control by state authorities and regulated public harvest. Public harvest of wolves occurred in 2013 in wolf management zones

designed to reduce wolf-related conflicts and improved depredation probability maps may aid in administering future public harvests to reduce conflicts when state controlled wolf management returns.

The information collected from our sample of radio-collared wolves also continues to be critical to our bi-annual wolf abundance surveys. Most importantly, the movement information and identification of pack territories allows us to interpret winter track survey data to estimate wolf abundance. Without a doubt, estimates of wolf abundance are the most important piece of information we collect on this population. In 2018, we estimated a minimum of 662 (± 69) wolves in the Upper Peninsula. We estimated 139 packs with an average pack size of 4.8 animals. The wolf population has remained between 600-700 wolves since 2011.

Partners: Safari Club International-MIC, Michigan Technological University (MTU).

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 when a survey is conducted. The MTU project was completed in 2017 with a total cost of $135,000. The wolf-livestock depredation work is value-added with no direct costs.