

# Department of Natural Resources

## SCI-MIC Supported Research Projects

### 2016 Progress Reports

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#### Wolf Population Management Project

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. Given the intense public debate over wolf hunting, decision-makers will request predictions on the effect of various harvest scenarios on Michigan's wolf population. Biologists can use a population modeling approach to develop these predictions. However, population modeling requires inputs of wolf population vital rates. Important inputs needed include estimates of survival rate, mortality factors, and dispersal dynamics. Biologists commonly estimate these rates and factors by monitoring the fates of radio-collared individuals. In addition, biologists need to understand causes of mortality and dispersal dynamics in order to consider their relative effects and determine which factors management might be able to manipulate to cause desired changes in wolf populations. In cooperation with Michigan Technological University, we have initiated a comprehensive analysis of our wolf movement and survival data to provide the needed information.

In 2016, the focus has been on assessing wolf survival rates from the large dataset ( $n = 365$  individual collared wolves) we have accumulated from 1992-2013. While estimates of survival rates are useful and important for management, understanding the mechanisms that drive wolf survival is critical for decision-making. Preliminary results suggest the annual survival rate of adult wolves is about 0.75 (95% confidence limit =  $\pm 0.10$ ). Mortality risk was greater for males than females. Variables characterizing the landscape wolves occupied (i.e. prey availability, land cover, and topography) had relatively little effect on mortality risk. Density dependence appeared to be the most important factor explaining the temporal variance in survival rates. As wolf numbers increased, survival rates declined. Although density dependent regulation of survival rates can occur from intraspecific aggression (wolves killing other wolves), the data suggest the declines corresponded to an increase in the potential for wolf-human conflicts.

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The information collected from our sample of radio-collared wolves also continues to be critical to our population surveys. Most importantly, the movement information and identification of pack territories allows us to interpret our winter tracks surveys to estimate wolf abundance. Without a doubt, estimates of wolf abundance are the most important piece of information we collect on this population. In 2016, we estimated a minimum population of 618 wolves (95% confidence interval =  $\pm 50$ ;) in the Upper Peninsula. The minimum population has remained over 600 animals since 2011.

We are currently transitioning from deploying VHF collars to GPS collars that transmit data through satellites. The GPS collars will provide more frequent and more accurate locations without the need and expense of aerial relocation flights.

Partners: Safari Club International-MIC, USDA Wildlife Services, Michigan Technological University

Time Line and Budget: This project started in 1999 and will continue for at least five years following Federal delisting, and annual monitoring will likely be needed to support any potential wolf harvest seasons. Thus, we need to maintain a sample of radio-collared wolves. Total project costs are greater than \$800,000.