

TITLE: Predator Prey Project

This cooperative study is investigating the role of predators, winter weather, and habitat on deer fawn survival in the Upper Peninsula began in 2009 with a planned completion date of 2021.

You can find progress reports and links to technical publications from this research project on the project's new website:

<https://campfirewildlife.com/projects/predator-prey/>

The project also maintains a Facebook page that is updated with current activities and interesting observations from the field. Follow the link below to keep up with the latest news:

<https://www.facebook.com/campfirewildlife/>

This past year, work included the continued analysis and interpretation of data from the mid-snowfall zone. This work continued our focus on disentangling complex interactions among deer, especially fawns, and predators.

Predation was the dominant source of fawn mortality and accounted for 80% of all deaths. This is largely consistent with studies of white-tailed deer and other ungulate species where predators are present. Although coyote and black bear had lower estimated per-individual kill rates than wolves and bobcats, these species existed at greater densities that resulted in larger population-level contributions to fawn mortality.

Although predation accounted for most fawn mortality in our study system, the presence of 4 predator species did not appear to result in increased white-tailed deer fawn mortality compared to systems with fewer predator species (e.g., 1-3). This finding supports the hypothesis that there may be an upper limit to predation rates on white-tailed deer fawns. In other words, the number of species of fawn predators in a system is likely less important than the fawn kill rates of the predator species present and their respective abundances. Consequently, managers seeking to identify species-specific predator impacts on fawn survival should consider both individual level (per-individual kill rates) and population-level (density of individuals) factors.

We also continued fieldwork in the high-snowfall zone study area. In 2019, we captured and radio-collared 57 adult female and yearling deer and monitored an additional 32 adult female deer captured during 2017 for a total adult female sample of 89 individuals. From 15 September 2018 to 15 September 2019, 18 adult female deer mortalities were attributed to 10 wolf predations, 2 starvations, 1 vehicle collision, 1 legal hunter harvest, 1 unknown predation, and 3 unknown causes.

We also captured and radio-collared 51 neonatal white-tailed deer fawns during May–July 2019. As of 15 September 2019, 5 fawns had slipped their collars or lost radio signal and were censored from the survival sample. Of the remaining 46, 20 were alive (43% survival) as of 15 September. Twenty-six neonatal fawn mortalities observed were attributed to 3 bear predations, 8 coyote predations, 4 wolf predations, 3 unidentified predations, 4 vehicle collisions, 1 weak fawn syndrome mortality, and 3 unknown causes.

We detected pregnancy with ultrasound in 98% of adult ($n = 57$) and 50% of yearling ($n = 12$) female white-tailed deer.

We captured 14 bear, 8 wolves, 1 bobcat, and 1 coyote which were fit with GPS collars. From 15 May to 31 August 2018 we investigated 231 bear, 313 wolf, 15 bobcat, and 100 coyote clusters to search for evidence of kill sites. Evidence of fawn predation was determined at 8 bear, 32 wolf, 4 coyote, and 0 bobcat cluster sites.

During black bear den checks and white-tailed deer trapping we hosted individuals from Michigan Department of Natural Resources (MDNR), Keweenaw Bay Indian Community Natural Resources Department, Michigan State University, Michigan Out-of-Doors, and other interested members of the public.

We also gave presentations at the MDNR District 1 Conservation Officers Meeting and Partners for Watershed Restoration (PWR). We reported select project results at a national conference. We hosted 25 undergraduate students from Purdue University on 31 May for demonstrations of detection dogs, carnivore immobilizations, fawn capture, vegetation surveys, and deer telemetry. We gave presentations to 11 classes at local public schools, reaching 263 students. We hosted 21 educators from the Michigan DNR Academy of Natural Resources-North for demonstrations of detection dogs, carnivore capture, and telemetry.

Partners: Safari Club International-MIC; Safari Club International Foundation; Northwoods Chapter Safari Club International; U.P. Whitetails Association, Inc., Menominee County Chapter; Wildlife Unlimited of Delta County; Ottawa Sportsmen's Club, Ontonagon Valley Sportsmen's Club, Plum Creek Timber Company, and State University of New York College of Environmental Science and Forestry (SUNY ESF).

Timeline and Budget: This project is being conducted in three snowfall zones in the UP with a total duration of approximately twelve years (2009-2021). Total project costs could exceed \$3,000,000. No funds are requested from SCI-MIC for this project in FY2020.
