

## Michigan Department of Natural Resources Research Project Descriptions, 2010

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### **Predator-Prey Project**

The impact of predators on prey populations has been the subject of numerous scientific studies and has been debated at length by the public. There is agreement in the scientific community that the relationship between predators and prey is very complex and broad descriptive statements cannot be made. In some cases predators limit prey populations and in other cases they do not. The relationship between predators and prey is influenced by a host of factors that can vary from place to place and over time. Factors that must be considered include the number of different prey species available, the number of different predators in the system, the relative density of predators and prey in the area, the response of predators and prey to changes in prey numbers, and the effects of weather and disease on predators and prey. Unfortunately, data from areas where predators prey predominately on white-tailed deer are limited.

White-tailed deer are an important species in Michigan providing many values, including ecological, social and economic. Most generally, factors that can limit deer numbers include food supply, winter cover, disease, predation, weather, and hunter harvest. Deer numbers change with changes in these limiting factors. Considerable research has been conducted demonstrating the effects of winter severity on white-tailed deer condition and survival and the importance of food supply and cover, particularly during winter, has been documented. While the role of predation on white-tailed deer survival has received some attention, many questions remain. A better understanding of the possible impact of predators on deer population dynamics requires information on the role of predation on white-tailed deer fawn survival and the extent to which predation is additive or compensatory with other causes of death. The predator-prey system is complex and it will be important to simultaneously address the roles of various limiting factors (e.g., predators, winter weather).

To assess the role of predation on white-tailed deer fawns we are capturing and radio-collaring newborn fawns to estimate their survival and determine the causes of mortality. We are simultaneously assessing the effects of predation and winter severity and indirectly evaluating the influence of habitat conditions on fawn recruitment.

An informative perspective from which to judge the effect of predation on deer population dynamics is to assess the relationship between proportion of deer killed by predators and annual survival rate of deer. If higher levels of predation reduce deer survival then predation is additive to other sources of mortality and might influence deer numbers. In contrast, if deer survival remains constant despite varying levels of predation, then predation simply substitutes for other sources of mortality. To adequately assess this relationship we will need to maintain a sample of at least 300 radio-collared deer for five years. Currently we are on track to meet that goal.

Partners: Safari Club International-MIC, Safari Club International Foundation, Mississippi State University, Michigan Technological University

Time Line and Budget: Major equipment purchases for this project have been made, deer trapping started during the winter of 2009, and predator trapping occurred during May, June and July 2009. We are accumulating an extensive dataset on predation on deer, with an emphasis on fawns and are evaluating impacts of wolves, bear, coyotes, and bobcats. Expendable supplies (e.g., VHS collars, GPS collars, vaginal implant transmitters) are required each year. This project is expected to last approximately ten years. Total project costs could exceed \$3,000,000.

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### **Gray Wolf Population Project**

The gray wolf has returned to its former range in the Upper Peninsula of Michigan (UP). Wolf population growth and range expansion have been monitored since 1989. In winter 2009, we estimated there were at least 575 wolves present in the UP. Wolves have also been documented in the Northern Lower Peninsula as late as July 2009, although no established packs have been located. As the wolf population began to increase, a program of research was developed to aid in monitoring their recovery and management. Over 200 wolves have been captured and radio-collared providing important information on distribution, movements, and pack and territory size. This information is critical to our annual population census. Population estimates are becoming increasingly difficult as the current technique relies on identification of individuals within discrete packs. Important work has been done on evaluating alternative approaches to estimating population size and a new sampling procedure which will save us time and money has been implemented. We have also developed a model of wolf habitat use that predicts the amount and location of suitable habitat.

Despite legal challenges, the US Fish and Wildlife Service continues work toward removing the wolf from the Federal list of threatened and endangered species. We strongly support delisting and this project puts Michigan in an excellent position to defend our science-based management programs in the future.

Partners: Safari Club International-MIC, Michigan Technological University

Time Line and Budget: This project started in 1999 and will continue for at least five years following Federal delisting. Delisting occurred in 2008, yet following legal actions, the wolf was re-listed as endangered by the US Fish and Wildlife Service, so monitoring at high levels continues. Total project costs are greater than \$800,000.

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### **Southern Michigan Black Bear Project:**

Black bears are an important species in Michigan providing many values, including ecological, social and economic. Bear populations are increasing in Michigan and more dispersing bears are entering agricultural regions of southern Michigan, resulting in increased bear-vehicle collisions, and increased conflicts with agriculturalists and the general public. Through surveys, we know that humans in southern Michigan are less tolerant of bears than northern Michigan residents and are more likely to seek action

from the Department when encountering bears. However, seventy-percent of residents in southern Michigan desired at least some level of bears present.

Managing bears involves balancing healthy bear populations that provide both viewing and hunting opportunities for the public against excessive human-bear conflicts. Management of bears in southern Michigan requires information on the ecology and movement patterns of bears outside of the traditional northern range. These factors are likely a function of fragmented agricultural habitats and increased access to human related foods and agricultural crops. Unfortunately there is very little scientific information on bear dispersal, density, and habitat influences in the southern range that the DNR can use to develop a proactive management strategy for bears in southern Michigan.

We propose to outfit 6 bears during each of 2 years (12 bears total) with GPS tracking collars to characterize the movements and habitat use of bears in southern Michigan (generally south of a line from Muskegon to Bay City). We will trap bears in areas of frequent reports of sightings during summer. Yearlings denned with their radio-collared mothers will be outfitted with GPS collars programmed to begin collecting fixes upon emergence in the spring. Collars will be programmed to record regular fixes until denning the following winter. Collars (and stored data) will be recovered from bears once they enter hibernation. In addition to GPS electronics, each collar will carry a conventional VHF beacon to assist in the location of winter den sites and to provide verification that the animal is alive and active between collar attachment and retrieval.

Data collected from GPS collars will provide important information for formulating a management strategy for southern Michigan bears including:

1. Quantifying use of the landscape (home ranges, foraging patterns, dispersal distances) by bears
2. An estimate of the distribution of denning dates
3. An estimate of litter sizes and cub survival
4. Identification of key characteristics of travel corridors used by bears
5. Verification of predictive spatial model(s)
6. An estimation of bear distribution.

Partners: Safari Club International-MIC, University of Wisconsin-Madison

Timeline and Budget: We had anticipated starting this project in early 2009, yet it was delayed due to lack of funding. We are committed to initiating the project in the spring of 2010. It is a multi-state effort in collaboration with Wisconsin, a state that is also experiencing a southward expansion of their bear population. The fiscal year 2010 budget is \$30,000, and the project will continue for approximately five years.

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## **Bear Management Project**

Bear management in Michigan is changing, in part due to the expansion of northern Lower Peninsula populations. In response, the DNR is starting the process of developing a comprehensive Bear Management Plan. That plan will address issues such as population goals, yet will also explore resolution of issues with nuisance bears and orphaned cubs—issues that increase with increasing bear/human contacts.

While the DNR generally does not become involved with nuisance animal issues, sometimes they are unavoidable. One issue repeated in recent years is how to deal with orphaned cubs. While this situation is not common, when it does occur large amounts of staff time are required and management options are limited by involvement of the media and the public. One solution has been to place orphaned cubs in a den with surrogate sows. In order to have a group of sows readily available we have been radio collaring a small number of females every year. An additional issue occurs in the northwest Lower Peninsula where bovine tuberculosis is present. Any problem bears or orphaned bears can only be relocated or placed with surrogate sows in the tuberculosis area (i.e., cannot be taken out of the area).

In order to have surrogate sows available, we will continue to deploy radio collars on winter-denning female black bears in the Northern Lower Peninsula and in the Upper Peninsula. This is achieved by noting where bears are denning and visiting the dens during the winter, or by trapping bears at some point during the year. Additionally, we are in the process of replacing the old style steel culvert bear traps with a new type of trap made from aluminum. This new trap is safer and easier to operate.

Overall, this project has multiple objectives, including evaluating new traps, evaluating nuisance bear procedures, training field biologists in the safe handling of bears, public education, and relocating orphaned cubs with surrogate sows to minimize or eliminate human rehabilitation of bear cubs.

In 2009, we conducted den checks on 10 radio-collared sows (4 UP, 6 NLP). Four UP sows were accompanied by 2 cubs and 4 yearlings. One of the yearlings was an orphaned cub from the previous year. The six NLP sows were accompanied by 12 cubs and 6 yearlings. One orphaned cub was successfully placed with a sow in a den last winter as confirmed by photos provided to us this past September.

Partners: Safari Club International-MIC, DNR Law Enforcement Division

Time Line and Budget: This project started in 2004 and does not have a scheduled end-date. Project costs exceed \$10,000 per year.

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