

Department of Natural Resources SCI-MIC Supported Research Projects 2014 Progress Reports

Snowshoe Hare Distribution and Abundance Project

In 2014 we completed all phases of the snowshoe hare research project. The objectives of this project were to: 1) Spatially and temporally (at least 15 years) quantify trends in snowshoe hare occupancy as related to forest management history, mesocarnivore abundance (where data were available), historical land use, and climate patterns, and 2) Quantify the relationship between current stand-level snowshoe hare occupancy and abundance and measures of vegetation structure, composition, and surrounding land use. During the project we added a third objective to verify the use of snow track

surveys to accurately quantify site occupancy. The goal of identifying the climatic and vegetation factors that influence snowshoe hare occupancy in Michigan was fulfilled. Key findings from the project included: 1) snow track surveys, if correctly configured, can accurately estimate site-level hare occupancy, 2) of the climate variables we analyzed, maximum temperature from May 15 – January 19 and the number of days with snow on the ground explained the most variation in site-level extinction probability for hares, 3) given the forest dominated landscapes that we worked in, historical land use was not an important factor in determining snowshoe hare site occupancy, 4) current land use (i.e., the ratio between forest and open edges) and visual obstruction at 2-3m above the ground were important factors influencing site-level occupancy, and 5) when climate, land use, and vegetation structure variables were combined, the top-ranking model included both climate and vegetation variables suggesting that vegetation management may help mitigate negative climate impacts to snowshoe hares. MDNR-Wildlife Division is working to incorporate findings from this research into forest management recommendations.

The student, David Burt, completed his thesis and achieved a Master of Science Degree from MSU. The researchers have submitted a manuscript on climate effects on snowshoe hare occupancy to the journal *Animal Ecology*. Another manuscript on using snow track surveys for estimating occupancy probability will be submitted to the *Wildlife Society Bulletin* and a third manuscript on the effects of historical and current land use and vegetation conditions on snowshoe hare occupancy will be submitted to the *Journal of Wildlife Management*. Researchers presented results at three professional society meetings, at four meetings with MDNR – Wildlife Division stakeholder groups, and at the Wildlife Division annual meeting. The research results were also disseminated to the sportsperson community in Michigan through an article in the *Michigan Outdoor News* (~80,000 subscribers).