

# PERM Newsletter

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The Partnership for Ecosystem Research and Management (PERM) was established to improve the ability of Michigan State University and DNRE to work with other stakeholders toward identifying significant ecosystem problems and conducting research and outreach toward their solution.

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## Deer Cooperatives in Southern Michigan: A Cooperative Management Effort

**Dr. Dan Kramer**, Assistant Professor in James Madison College and the Department of Fisheries and Wildlife at MSU, and his graduate research assistant, Anna Hamilton, are examining private deer hunting cooperatives (Co-ops) in southern Michigan to see whether these deer Co-ops may hold the key to enhancing deer management in Michigan.

*Deer Cooperative: an association, formal or informal, of deer hunters formed for the benefit of its members.*

Dan's research seeks to understand the role of social capital and social networks in efforts by private deer management cooperatives to manage deer harvest and habitat. Initial evaluations indicate that private deer cooperatives are more effective at habitat management and overall deer harvest than hunters not affiliated with a deer Co-op. This phenomenon may be partly driven by social networks, group dynamics, and social capital generated within the Co-op. Dan will be analyzing these social networks using innovative techniques based on research by Dr. Ken Frank, Professor in Measurement and Quantitative Methods at MSU.

Dan has an exceptional research team associated with this project. Prior to beginning her graduate work, Anna was employed by the DNR Wildlife Division where she worked extensively on deer-related projects. Dan's colleagues from the DNR, Brent Rudolph and Mike Wegan, bring a wealth of deer related knowledge and experience to the project. In addition, the private deer cooperatives are very supportive of the research, and are enthused about collecting and sharing their data. Funding for this research is provided by the Michigan Department of Natural Resources.

Using survey methodologies and face-to-face interactions, Dan's research team will investigate how individual choices, interactions, and relationships among

Co-op members may affect outcomes. More specifically, they will consider whether relationships among Co-op members influence deer hunting behaviors and individual decisions regarding habitat management and harvest. Preliminary data suggests that social network characteristics (e.g., sub-group identification, strength of ties, density of ties) may influence individual Co-op member behavior. The research will target private deer Co-ops within an hour's drive of Lansing.

As a result of this research, the DNR may become able to better manage deer using established private deer cooperatives, and could explore options to expand private deer cooperatives if social networks do indeed positively influence deer management outcomes. In the future, it may be possible to compare the DNR's general hunter satisfaction surveys with the same metrics obtained from questions asked to private deer cooperative members.



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# Spring Bass Fishing: To Fish or Not to Fish?

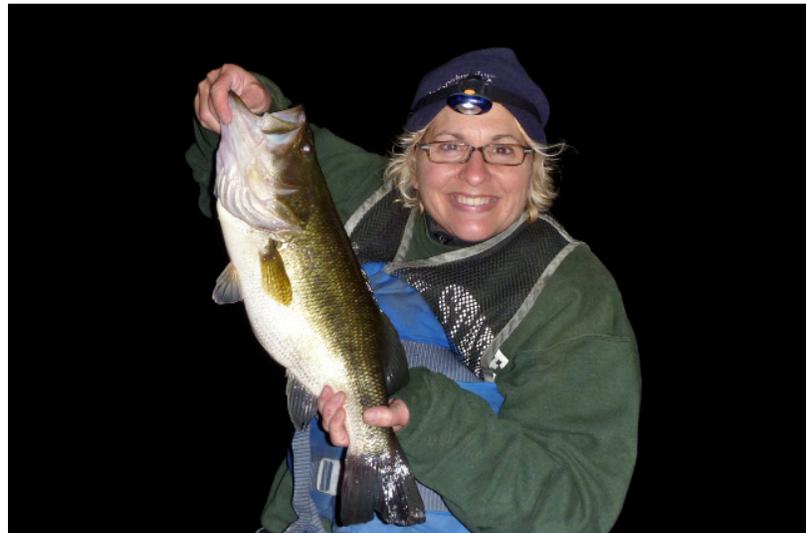
When fisheries management agencies set sportfishing regulations their intent is often two-fold: 1) ensure the long-term sustainability of the fishery, and 2) provide anglers as much access to and enjoyment from the resource as possible. Finding regulations that strike this balance is often challenging because of uncertainty about the extent to which sportfishing affects the population dynamics of the species being managed. This uncertainty is particularly prevalent for the management of largemouth and smallmouth bass in Michigan and throughout their North American range.

**Dr. Mary Tate Bremigan**, Associate Professor in the Department of Fisheries and Wildlife, is conducting research to determine the effects of spring fishing on the reproductive output of bass populations. During spring, male bass build nests in shallow waters where females deposit eggs. Each nesting male bass cares for and aggressively guards the eggs and young offspring in his nest, sometimes for 2-3 weeks. During this time, nesting male bass are quite vulnerable to angling. For some anglers, this is a particularly exciting time to fish for bass. However, removing a bass from his nest, even for short periods of time, can cause failure of that nest (offspring are typically eaten by predators if the guarding male is absent). Managers are left wondering whether sportfishing regulations should allow bass fishing during the nest-guarding season. Most research on this topic has focused on the effects of fishing on individual guarding male bass, but it is uncertain whether bass populations as a whole are affected by spring fishing. Dr. Bremigan is working to reduce that uncertainty.

Dr. Bremigan's team of graduate and undergraduate students and Michigan DNRE Fisheries Division collaborators has been working in four southern Michigan lakes with varying fishing pressure. In spring, they monitor fishing activity, and record the coordinates of bass nests, measure habitat characteristics, guarding male aggression level, and offspring survival for each nest. Dr. Bremigan and graduate student Heidi Ziegenmeyer use these data to determine if successful nests share unique attributes in terms of habitat, guarding male behavior, or amount of fishing pressure. During summer the team collects young-of-year bass to determine reproductive success of each bass population. In the fall they determine the population abundance of bass in each lake.

**Genetic analysis is also being used to reveal secrets of bass population reproductive dynamics and to further determine the effects of fishing on population reproductive output.**

Additionally, Dr. Bremigan is collaborating with Dr. Kim Scribner, also a PERM scientist whose expertise is ecological genetics, and graduate student Jan-Michael Hessenauer to use genetic analysis to compare the reproductive contribution between nests that experience high and low fishing. Findings from this research will be valuable for managers in Michigan and elsewhere as they set scientifically-sound sportfishing regulations that promote natural resource sustainability and public use and enjoyment. Funding for this research is provided by MDNRE Fisheries Division and MSU Center for Water Sciences.



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