

M.L. 2013, Chp. 52, Sec. 2, Subd. 06a **Project Abstract**
For the Period Ending July 31, 2017

PROJECT TITLE: Common carp management using biocontrol and toxins

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LEGAL CITATION: M.L. 2013, Chp. 52, Sec. 2, Subd. 06a

APPROPRIATION AMOUNT: \$ 384,231

Overall Project Outcome and Results

We tested two new methods to control common carp, which are invasive fish that degrade lakes of south-central Minnesota. First, we tested biocontrol, which is the ability of bluegill sunfish (native fish) to control carp reproduction by consuming their eggs and larvae. This was tested in 6 small lakes. All lakes were stocked with adult carp and every other lake was stocked with bluegills. Carp offspring survival was assessed through electrofishing and mark-recapture. At the end of the season, lakes with bluegills had 11 times fewer carp offspring than those without bluegills. This shows that biocontrol by bluegill is an important element of common carp management strategies. Bluegill populations can be strengthened in many shallow lakes by winter aeration to prevent winter fish kills.

Second, we tested if toxic bait could be developed to target carp without impacting native fish. This is important in lakes where biocontrol is unlikely. We incorporated an EPA-approved toxin antimycin-A (ANT-A) into corn pellets, which the carp consume with high specificity and performed 4 experiments: 1) using gavage trials we showed that the bait was toxic at 8 mg/kg; 2) using leaching trials we showed that <1% of ANT-A leached out of the bait and did not cause mortality among native fish; 3) using lab tanks where carp were stocked with three native fish we showed that 46% of carp and 76% of fathead minnows perished after one application of pellets, but perch and bluegill were not impacted; 4) using ponds with carp, bluegills and perch we showed that 37% adult carp perished after 6 days of pellet application, while no perch and bluegill did. Our results suggest that corn-based toxic pellets could be developed to selectively target carp but more work is needed to minimize impacts on native minnows. This is being addressed by ongoing work.

Project Results Use and Dissemination

Information collected in these experiments were disseminated and will continue to be disseminated in a variety of ways. Presentations were given at MAISRC showcases, the Minnesota and National American Fisheries Society meetings, and will be given at the International Conference for Invasive Species. We anticipate publishing 3 papers, one of which is in revisions, another written, and one to be completed. We have also shared this work with colleagues, watershed association, and MAISRC extension.