

## **M.L. 2013 Project Abstract**

For the Period Ending September 30, 2017

**PROJECT TITLE:** Aquatic Invasive Species Research Center Sub-Project 6: Determining Heterosporosis Threats to Inform Prevention, Management, and Control

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

**APPROPRIATION AMOUNT:** \$111,889

**AMOUNT SPENT:** \$111,889

**AMOUNT REMAINING:** \$0

### **Overall Project Outcomes and Results**

Heterosporosis is an emerging disease of concern in Minnesota that is caused by the parasite *Heterosporis sutherlandae*. It damages fish muscle and renders them inedible. Heterosporosis was discovered in Leech Lake in 1990 and has since been detected in ~30 waterbodies and in over a dozen species. Heterosporosis was identified as a high research priority by the 2014 MAISRC Research Needs Assessment because it can infect up to 40% of fish and we knew little about the disease or its population-level effects. Our objectives were to collect data to better understand this disease, and to estimate the threat that heterosporosis poses to perch harvest in a typical Minnesota lake.

We collected perch and other fishes from Leech Lake seasonally from fall 2015 to winter 2017, and from Cass and Winnibigoshish lakes in fall 2015 and 2016. Heterosporosis was rare among all species, seasons, and lakes. We detected the disease in only 9% of perch, and 20-30% of these fish had visible muscle damage. Heterosporosis did vary seasonally, and infected perch were not more susceptible to angling. In the lab, we found a 32-34% infection rate when fish were fed infected tissue and a 2-17% infection rate with passive transmission from cohabitating healthy and infected fish. We found no evidence of a relationship between growth or survival and infection.

We used this and other information to develop a population model that suggested that heterosporosis can have short-term impacts on yellow perch harvest (e.g., in a naïve population or after a bad year), but that long-term impacts are unlikely. Sensitivity analysis indicated that disease associated parameters had little effect on overall harvest. Based on the results of this project, we do not consider heterosporosis to be a significant threat to Minnesota fish, but recommend further research to improve the model, because threats to aquaculture or laboratory fish may be higher.

### **Project Results Use and Dissemination**

We generated a heterosporosis fact sheet that is available on the MAISRC website (<http://www.maisrc.umn.edu/fishdisease/>) and was distributed to participating resorts and an interested fishing guide. We have maintained contact with two resorts (one on Leech Lake and one on Cass Lake), both of which contributed angler log book data that we used to estimate heterosporosis prevalence. We also had many positive conversations with individuals who approached us during field work. We have given numerous presentations of this work to a combined audience of over 300 researchers, managers, policymakers, and stakeholders. These include three presentations at MAISRC Showcase events, a presentation at the MN DNR's summer 2017 Fisheries Research Meeting, presentations at four academic conferences, and internally at the University of Minnesota. Our research has been highlighted in local and national media outlets, and our first paper is currently in review with

the *Journal of Aquatic Animal Health*. Masters student Megan Tomamichel was recently awarded a competitive, \$2,500 Judd Fellowship through the University of Minnesota to travel to Chile and adapt her model to sea lice infestations in salmon farms.