Invasive Crayfish Collaborative
Great Lakes

Invasive Crayfish Collaborative Hybrid Meeting – Summary Notes

June 25, 2024
9:00am – 11:00am ET
Invasive Species Centre, Sault Ste. Marie, Ontario

Facilitated by Natalia Szklaruk, Katie O'Reilly and Greg Hitzroth, Illinois-Indiana Sea Grant

9:00-9:15, Welcome and Introduction

Szklaruk welcomed all members, introduced herself and asked other facilitators and ICC members (in-person and online) to introduce themselves to meeting attendees. Szklaruk then introduced Don Eaton of the Minnesota Department of Natural Resources, the first speaker to present an update.

Member Updates

The purpose of the meeting is to give ICC members the opportunity to reconnect and update each other on their crayfish work after almost five years since the last meeting. Seven presenters were determined prior to the meeting: Don Eaton, Colin Lake, Brook Schryer, Kathleen Quebedeaux, Chris Pennuto, Will Budnick, and Brandon Fehrenbacher. Summaries of their presentations are as follows:

9:15-9:35, Don Eaton, Minnesota Department of Natural Resources

Don Eaton provided an update on Signal crayfish (*Pacifastacus laniusculus*) in Minnesota. He gave a summary of their native and non-native ranges, as well as their new discovery in Lake Winona, MN. 10 large signal crayfish were captured by a commercial harvester in October of 2023 (9 males and 1 female) with baited fyke nets. The female caught showed no signs of recent copulation of oviposition. The record was verified by experts and made public by MN DNR.

Follow-up trapping was conducted between April 23 and May 19, 2024. Baited funnel traps, refuge traps, and eDNA were used. Virile crayfish (*Faxonius virilis*) were found in 78 of the traps. Calico crayfish (*Faxonius immunis*) were found in 2 traps. No signal crayfish were found.

Current efforts include follow-up trapping and netting that targets all life stages and both sexes. This includes using baited funnel traps, refuge traps, bundle and lead-pack traps, as well as baited fyke nets. MN DNR will also be assessing the potential to enhance crayfish predation by analyzing population age-size structure as well as conducting gut analyses of yellow perch *Perca flavescens* and *Lepomis macrochirus*.

Don ended his presentation with novel research conducted by Eric Larson and Caitlin Bloomer that conducted COI mtDNA sequencing to identify the potential source populations of Winona's signal crayfish. The sequencing identified a common, invasive lineage known from other non-native populations in Europe and Lake Tahoe in CA or NV. The signal crayfish were likely sourced from the coastal Pacific Northwest.

9:35-9:50, Colin Lake, Ontario Ministry of Natural Resources and Forestry; **Brook Schryer of** Ontario Federation of Anglers and Hunters

Colin Lake gave a presentation on marbled crayfish, their regulations in Ontario, observations, management efforts, and current activities and priorities. Marbled crayfish were listed as a prohibited species under Ontario's Invasive Species Act in 2022. They are illegal to import, possess, deposit, release, transport, breed/grow, buy, sell, lease or trade. The entire genus *Procambarus* was prohibited in January 2024.

Marbled crayfish were found in Burlington (City View Park) in autumn 2021 within a small network of stormwater control ponds. These ponds are not connected to any tributaries or Lake Ontario. The observation was initially incorrectly identified in iNaturalist; however, Dr. Přemek Hamr was able to correctly identify it after outreach was made to academia in 2022.

In spring 2022, efforts were made to collect more specimens, but none were found. In August of 2022, eDNA sampling found weak detections and no individuals were captured. In the winter of 2022, the water was drained from these ponds to induce less mobility in crayfish. In October of 2023, marbled crayfish were captured and included juveniles (n=25), using e-fishing, eDNA, and passive/active netting. Sampling was conducted at nearby locations but none were captured. In December of 2023, water was drained again and 54 were collected.

Current activities include regular trapping, collaborating with academia, investigating potential use of chemical control, and eDNA surveys.

Brook Schryer presented on their efforts at the Ontario Federation of Anglers and Hunters and their priorities. The priorities include monitoring and reporting, providing the public with outlets to track and report crayfish observations (i.e., EDD MapS and iNaturalist), and conducting outreach to the public. Schryer introduced the new Guide to Ontario's Crayfishes. This source includes an introduction to crayfishes of Ontario and Canada, native and invasive crayfish profiles, how to sample, and a taxonomic key.

9:50-10:05, Kathleen Quebedeaux, Michigan Department of Natural Resources

Kathleen Quebedeaux provided an update on red swamp crayfish management in Michigan. Red Swamp were prohibited in 2015 and then found across the state in 40 waterbodies (retention ponds, gold courses, small man-made ponds, backyard ponds). The majority of the waterbodies are near known complexes. The response effort included setting baited traps and pesticide treatments. Pesticide treatments were used with an irrigation line that ran in the waterbody. Challenges using irrigation lines to disperse pesticide treatment arose- muskrats chewed on the lines, cold temperatures froze and broke lines. Due to these challenges, a new application method is being tested that includes a long wand application.

Quebedeaux and her team are also collaborating with USGS to test the efficacy of light traps. Preliminarly data from Missouri trials showed traps with lights and dog food outperformed others. Quebedeaux will be replicating trials in four Michigan ponds with red swamp crayfish.

Along with trapping, Quebedeaux presented a brief update on a Structured Decision Making (SDM) approach for making informed decisions. The SDM model will be informing their five-year plan to guide statewide efforts from 2025-2030. The process includes multiple steps that involve workshops, meetings, and expert feedback. A workshop was held in March with partners to begin the process.

10:05-10:20, Chris Pennuto, Buffalo State University

Chris Pennuto presented a potential research project exploring the use of the winner-loser effect to influence interspecific interactions during a crayfish invasion. The research idea relates to a crayfish invasion that occurred in 2020 when the first detection of red swamp crayfish was made by Park School students in the school's pond. Western New York's Partnership for Regional Invasive Species Management (WNY PRISM) was then contacted to verify and assist in red swamp management.

In summer 2021, WN PRISM installed a silt fence around the entire pond after the school refused to drain it or treat it with pesticides. Intensive trapping efforts followed in 2022. In summer 2023, native crayfish species were collected, including the white river crayfish (*Procambarus acutus)* and calico crayfish (*Faxonius immunis*). Trapping continues, and alternative methods are being explored to manage the red swamp crayfish population without pesticides, biocontrol, or draining the pond.

The focus of the presentation then shifted to exploring dominance hierarchies and the winner-loser effect. The winner-loser effect suggests that the winner of a competition is more likely to win future competitions, whereas the loser has a higher probability of losing future competitions. Previous studies have shown that males winning interactions have higher mating probabilities, and those that lost spent more times in shelters.

The objective of the project is to determine if intraspecific winner-loser effects influence interspecific dominance hierarchies. Pennuto is interested in understanding whether white river crayfish can be trained to dominate in competitive interactions with other crayfish species. Methods include training larger native crayfish to feel more dominant by allowing them to win multiple intraspecific competitions with smaller crayfish. Once these crayfish have won several intraspecific interactions, they will then compete with other species, such as the red swamp crayfish. Separate trails with food as a competing resource will be conducted as well.

10:20-10:25, Will Budnick, Michigan State University

Will Budnick spoke about a new crayfish outreach product that was created by Michigan State University in collaboration with multiple Great Lakes partners. The product is a pamphlet-poster (pamphlet that opens up into a large poster) and is packed with facts about crayfish, practical tips for inspecting and reporting suspected invasive crayfish, and detailed illustrations of key anatomical features for a few invasive crayfish species (red swamp, rusty, marbled, and two Australian *Cherax* species). It was written for a general audience and is most applicable to those in the aquarium trade. Printer-friendly versions are also available in three languages: Spanish, Hmong, and Mandarin. Budnick promoted the product and emphasized that they are completely free to order and can be shipped directly to anyone at no cost. Links to the PDF and the order form were shared with the chat and with the in-person attendees.

10:25-10:45, Brandon Fehrenbacher, Illinois Department of Natural Resources

Brandon Fehrenbacher gave the group an update on conservation policing and invasive crayfish regulations in Illinois. The IL Conservation Police Invasive Species Unit was established in 2012 and specializes in regulating water-related industries that are likely to cause future introductions of invasive species. Areas where they have detected invasive crayfish include: bait trade, food trade, pond stocking industries, and pet trade. Fehrenbacher then gave a few examples of how invasive crayfish are being utilized, sold, and spread within the bait trade and food market. Fehrenbacher then emphasized that there is an enormous amount of commerce involving involving invasive crayfish species in trade. Despite being notified of regulations, many wholesalers still sell invasive crayfish. There have also been occurrences of red swamp crayfish being purchased and *intentionally* released for cultural reasons.

Fehrenbacher then introduced the Conservation Police Officer trainings that were conducted over the past two years in IL. These trainings included giving an overview of the damage caused by invasive crayfish, invasive crayfish distributions, future invaders, and native vs. invasive crayfish identification. Identification guides and translation cards were shared among CPOs. A live demonstration lab was held afterwards to help CPOs see examples of wild invasive crayfish species. The CPO trainings were given positive feedback and have increased detection of anglers and businesses possessing invasive crayfish.

10:45-10:55, Open discussion

Previous questions that were not answered were then asked and discussed together as a group.

11:00, Adjourn

Invasive Crayfish Collaborative
Great Lakes

In-person Attendees

Natalia Szklaruk szklaruk@illinois.edu
Katie O'Reilly keo@illinois.edu
Greg Hitzroth hitzroth@illinois.edu
Brook Schryer brook_schryer@ofah.org
Colin Lake colin.lake@ontario.ca
Doug Jensen doug.jensen@state.mn.us
Justin Bopp nathanl@michigan.gov
Kathleen Quebedeaux quebedeauxk@michigan.gov
Kelly Pennington kelly.pennington@state.mn.us
Lindsay Chadderton lchadderton@tnc.org
Lucas Nathan nathanl@michigan.gov

Virtual Attendees

Rochelle Sturtevant sturtev1@msu.edu
Don Eaton Don.Eaton@state.mn.us
Christopher Pennuto PENNUTCM@buffalostate.edu
William R Budnick wbudnick@usgs.gov
Maude Tremblay Maude.Tremblay@dfo-mpo.gc.ca
Ann L Allert aallert@usgs.gov
Sydney Currier scurrier@invasivespeciescentre.ca
Elizabeth E Tanner Elizabeth.Tanner@wisconsin.gov
Amy L Kretlow Amy.Kretlow@wisconsin.gov
Lindsey Reisinger lreisinger1@ufl.edu
Kate Wyman-Grothem katherine_wyman-grothem@fws.gov
Jofina Victor Jofina.Victor@dfo-mpo.gc.ca
Dusty Swedberg swedberg@illinois.edu
John Navarro john.navarro@dnr.ohio.gov
Sara Thomas ThomasS35@michigan.gov
Brandon Fehrenbacher Brandon.Fehrenbacher@Illinois.gov