

Mummichogs Establish Beachhead in Michigan

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Source: U. S. Geological Survey Nonindigenous Aquatic Species webpage: <http://nas2.er.usgs.gov/viewer/omap.aspx?SpeciesID=688>

In May of 2012, we began surveying Upper and Middle Rouge River fish communities looking for Redside Dace *Clinostomus elongatus*, a Michigan-endangered species. At the second site on the first day in Minnow Pond Creek we sampled a stretch east of Farmington Road that had a narrow riparian zone and, although channelized years ago, it had cool water with waist deep pools separated by shallow riffles. On the west side of Farmington Road, the creek had a straight uniform depth and foot-high banks, with lawns of homes coming down to its edge. The riparian zone was a few feet wide at best, not mowed, with an occasional tree or shrub. We had already collected so many fishes that I was involved in identifying, measuring, and counting the catch. Philip Kukulski remained in

the creek, directing the sampling. Because it would be a change of habitat, Philip made the call to do a few feet west of Farmington Road to see what species might be there. There was a concrete pipe coming out of a backyard with a muck-filled channel seeping down into the creek. Philip, always attuned to checking every possible change in habitat, scooped some of the muck up and found a fish. Looking at the mud-covered thumb-sized fish with a round tail, he announced it was a mudminnow. When I got the fish I realized it was a killifish, and as only Blackstripe Topminnow *Fundulus notatus* and Western Banded Killifish *F. diaphanous menona* occur in southeast Michigan, I made the call of a male Western Banded Killifish. It was the most colorful male I had ever seen, as it had bright yel-

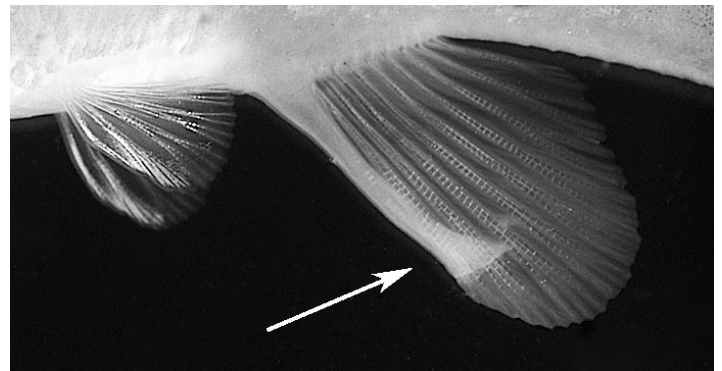
low pelvic and anal fins which, breeding Banded Killifish get. We found this rather exciting as this fish had never been sampled in the Rouge River before. Not bad for a first day of the survey.



Mummichog locality: Minnow Pond Creek (Oakland County, MI)

Part of the survey protocol was to take high-quality photos of the fishes for Friends of the Rouge's use. The male was photographed, and since Western Banded Killifish had never been sampled in the Rouge, I sent the photo to Dr. Gerald Smith at the University of Michigan and was congratulated on the new record. In June, we returned to the sites to take temperature readings and I did a quick dip net search wanting females to also photograph; two were caught. When photographing fish, the attention is on getting a good photo; I did notice that the anal fin seemed to be damaged and was annoyed, as you want perfect fins in the photos. When Dr. Smith looked at the photo he emailed me asking if the fish had an ovipositor. A quick look at the photo and yes, the suspected damage was some type of structure. A copy of the photo was also sent to Jim Langhammer, a former curator of Detroit's Belle Island Aquarium. Jim sent the photo to several people asking if they were familiar with ovipositors on Banded Killifish and also did some searching in literature. Nowhere was data on this structure found. Philip sent a copy of the photo to the North American Native Fishes (NANFA) online forum and several people said they thought we had a Mummichog *F. heteroclitus*, an east coast brackish-water killifish. Our comment back was, did you notice where we live, as this seemed very unlikely. The University of Michigan fish collection was being moved to another building so looking at reference material was impossible at that time. Returning again to take temperature data,

two more females were sampled and fry were seen. Killifish have the ability to bend their body into an extreme "S" shape, making identification of fry very easy. Keeping fishes in aquariums was what got me into studying native fishes almost fifty years ago. For this reason, the fish I collect are kept alive. All of the killifish we collected were alive in my aquariums, and when they died I did not preserve them which proved to be a big mistake. In the fall after our study was completed I wrote an article for *American Currents* on the survey. The editors, Fritz Rohde (a biologist with the National Marine Fisheries Service) and Konrad Schmidt (retired non-game fish biologist for the Minnesota DNR) both responded, suggesting the possibility we had a Mummichog. This made us stop and think a little, but we still felt a native verses a salt-marsh fish was a better call for Michigan. Fritz sent the photo to a number of fellow ichthyologists and a Mummichog was the major opinion. The scales were beginning to tilt in the Mummichog's direction. Having no specimen, we needed more fish. I tried to sample in December but there was hardly enough water to wet a dip net; we planned to return in the spring.



Mummichog ovipositor (Photos by Bob Muller)

During the winter, Jim Langhammer informed me that he had found a detailed reference to ovipositors on Mummichogs in *Freshwater Fishes of Canada* by Scott and Crossman. The scale was tilting even further onto the Mummichog's side. Then in early May, Dr. Smith sent me an email: "Just looked at our collection, we are in trouble, get more fish." Philip and I went back to the site and in the same mucky side channel he netted three fish. I caught two more in the main stream channel within one hundred feet of Philip. A pair of large robust fish and a male and two females of fish about three quarters their length were collected. Best guess is two adults from last summer; we had a breeding colony. Dr. Smith was out of town, and not being familiar with proper preserving methods, I kept the fish alive. During this time they spawned, resulting in seven eggs. When he returned several weeks later, the fish were taken to Ann Arbor. In viewing both Mummichogs and locally-collected Western Banded Killifish from their fish collection, there was no doubt we had Mummichogs (see page 14).

Jeff Braunscheidel, the Senior Fisheries Biologist handling the Rouge River, was notified and the wheels began to turn. All of the Mummichogs we sampled came out of the mucky side channel or within one hundred feet of it. We had gone upstream several hundred yards in the fall and found no Mummichogs. We had been researching maps of Minnow Pond Creek and seven ponds were within a couple miles upstream and one downstream. We felt this

could be good habitat for the Mummichogs and sent detailed information on where we had sampled them and what we felt should be left to Jeff. Within a couple weeks we received an email from Liz Hay-Chmielewski, the Fisheries Supervisor of the Lake Erie Unit of the DNR, informing us that they had been out and collected some Mummichogs. They sampled extensively up and downstream and only found them in the same area we had. They were returning every two weeks and saw the number they sampled going down (6, 4, 2 & 0). By mid-August, no fish had been caught in three more trips. Liz was interested in the fish I had spawned and where they were. I explained that no fish from my fish room are ever placed back into nature, whether natives or tropicals, and that this was a NANFA rule.

The 2013 sampling on another branch of the Rouge River was gathering data on another Great Lakes invasive, the Round Goby *Neogobius melanostomus*. By the time it was noticed, it had a foothold and is now found throughout the Great Lakes and beyond. It is now impossible to remove them from North America. Hopefully, we found the Mummichogs at a point where their population had not spread past their introduction point. How they got here

can only be speculation, but one comment from the East Coast was ballast water, a continuing problem here. This can't apply to the Mummichog case as no freighters have ever been in Minnow Pond Creek, and several dams are between the Mummichog site and the shipping channels. I guess if an invasive species is found early enough, electro-shocking can be an effective way to eliminate them. The DNR does plan on returning in the spring to check again. It was a rather negative feeling to discover what shouldn't be here, but I guess Philip wanting to sample a poor stretch of the creek may have paid off for our Michigan native fishes.

After submitting this article we unfortunately found another invasive in the main Rouge River from a five-mile stretch between the Ford Rouge Plant and Henry Ford's old power dam on the University of Michigan Dearborn Campus. In September we collected three female mosquitofish (*Gambusia* spp.) and more in late October. The fish in the latter collection were near death possibly from water temperatures in the 50s F, which may be too cool for this southern species. I suspect they were purchased out of state with the sales pitch that never dies: mosquito control. 🐟

Michigan Mummichogs - Bob Muller
Minnow Pond Creek (Oakland County, MI)



Males

Females