CHASING PHANTOM RECORDS:
MY QUEST FOR THE GOLDEN REDHORSE
IN THE MISSISSIPPI RIVER HEADWATERS

Konrad Schmidt

Saint Paul, Minnesota

For 10,000 years, St. Anthony Falls (Figure 1) on the Mississippi River at present-day Minneapolis, MN (River Mile [RM] 854), was a barrier to the upstream dispersal of fishes. The delineation of the historical fish fauna is striking with 64 species present above and 123 below the falls (Eddy et al. 1963). However, the falls were replaced with a concrete spillway in 1869, and the upper of two locks was completed in 1963 for commercial navigation. This opened the drainage above the falls to range extensions of many new species. By the early 2000s, eight species were known to have invaded the drainage to the Coon Rapids Dam (CRD) (RM 866) and some further upstream to at least the St. Cloud Dam (SCD) (RM 926) (Hatch et al. 2003).

From a Minnesota perspective, this drainage has been known as the "Upper Mississippi River," which creates confusion with the much more widely accepted meaning of "Upper Mississippi River" referring to the reach above the Ohio River at Cairo, IL. Some (including me) use "Mississippi River Headwaters" to define this reach from St. Anthony Falls (SAF) to the river's source at Lake Itasca (Figure 2). In June and August 2000, I was a Minnesota Department of Natural Resources (MDNR) aquatic biologist assisting the Minnesota Pollution Control Agency (MPCA) with a fish survey at a station on the Sauk River (Stearns County) near Melrose (Figure 2, No. 1).

We electrofished a grand total of 81 redhorse *Moxostoma* spp. comprised of both juveniles and adults. Both times, I identified many Golden Redhorse *M. erythrurum* and Shorthead *M. macrolepidotum*, and one Greater *M. valenciennesi* in the June survey. The survey protocol required taking voucher specimens for independent verification. However, only juveniles were saved, and none of the adults were photographed. When the James Ford Bell Museum of Natural History (JFBM) finished the verifications for the field season, I was shocked to learn that no Golden Redhorse were listed from the Sauk River collections—only Shortheads and the one Greater. I mentioned this to Jay Hatch who is a NANFA member and University of Minnesota professor and studies Minnesota fishes. He sprang the news on me: based on JFBM collections, Golden Redhorse are very widespread in Minnesota but *do not* occur in the Mississippi River Headwaters!

Perplexed with this revelation, I asked the MPCA to query their database for additional records of Golden Redhorse in the drainage. This query showed that in 1999, I had reported one specimen from the Crow Wing River (Cass County) west of Brainerd (Figure 2), and another biologist reported 26 Goldens from the Mississippi River, Sherburne County southeast of Clearwater (Figure 2, No. 2). Again, no extant specimens or photos. I suspected there would be more encountered in future surveys and "issued an edict" to keep adult specimens

Figure 1. Albert Bierstadt's *The Falls of St. Anthony*. The scene depicts the falls before European settlement. However, Bierstadt's painting is from the 1880s and is believed to be based on George Catlin's 1835 sketch of St. Anthony Falls (Thyssen-Bornemisza Museum 2018).
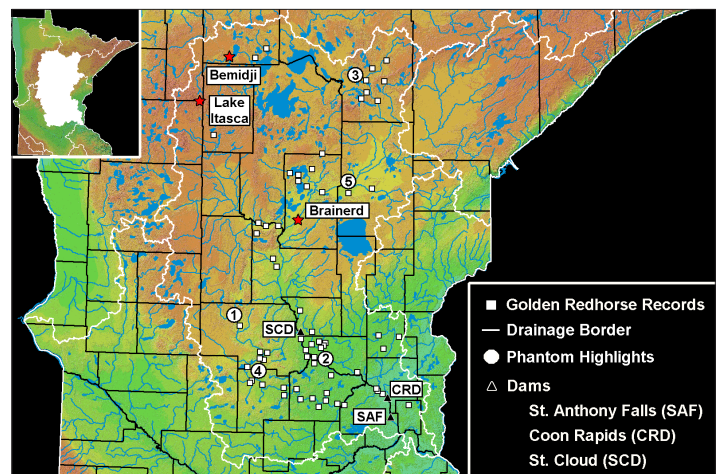

Figure 2. Golden Redhorse phantom records from 1964–2015 in the Mississippi River Headwaters drainage.

Figure 3. Unverifiable 2008 Golden Redhorse from the Sauk River, Stearns County. (MPCA photo)

Figure 4. Greater Redhorse from Prairie Lake, Itasca County.

as vouchers. The species vanished from the Mississippi Headwaters until 2007 when a rash of records appeared in the Crow River system in Meeker and Wright counties (downstream of No. 4). However, I was no longer assisting the MPCA with fish surveys, and my request for specimens had long been forgotten. In 2008, an adult Golden Redhorse was field identified downstream of the 2000 station on the Sauk River (No. 1). This time one photo was taken, but only a ventral shot of the mouth (Figure 3). I knew this was not enough, but sent it on to NANFA members: John Olson, John Lyons, and Bob Hrabik, who are all fish biologists, and have encountered this species countless times. All said there were no definitive characteristics to identify the specimen. Bob H. went the extra yard and forwarded the image to Bob Jenkins (author of *Fishes of Virginia* and god of redhorse identification). Bob J. agreed with rest that the specimen's identity would remain a mystery.

I had no source of funds from MDNR for extensive surveys targeting Golden Redhorse, but NANFA member and colleague Nick Proulx and I did return in 2009 to the 1999 MPCA Mississippi River station with a shocking boat (Figure 2, No. 2). The station was a huge bend in the river named "Big Eddy" and was filled to the brim with very diverse habitats. We were optimistic for success, but after a long and thorough effort all we could report for redhorse were Shortheads and Silvers *M. anisurum*. Foiled once again!

In 2010, I retired from the MDNR and had to give up all my fish survey toys. I still wanted to give the Golden Redhorse quest another effort, but I changed my focus to lakes in the drainage where MDNR Fisheries had reported the species. Prairie Lake, Itasca County (Figure 2, No. 3), near Grand Rapids stood out from the rest with 42 specimens sampled over three surveys from 1990–2012. In 2015, I contacted Chris Kavanaugh, who was also a former MDNR colleague and now the Northeast Region fisheries supervisor in Grand Rapids. After I told him the long fishy story, he was very supportive and extremely helpful loaning me trap nets to survey Prairie Lake. In mid-August 2015, NANFA member Bryan Stefansky and I set four trap nets in Prairie Lake, and we returned the next day hoping to finally strike gold. Again, we found the expected Shortheads and Silvers, but we also found Greaters, which was the first time the species had been reported from Prairie Lake (Figure 4). Howev-

er, not one Golden Redhorse. This new occurrence for Greaters was very puzzling! Could most, if not all, of the Golden phantom records actually be Greater Redhorse? This error should not occur since tailfin color (i.e., red or slate) early in dichotomous keys for redhorse splits them into two groups with Greaters in red and Goldens in slate.

My last two phantom encounters were purely happenstance and were not anywhere near a lake or stream. I used to volunteer a great deal in the JFBM fish collection, sorting and cataloging very old and often brown specimens. One day, I thought I had finally found proof of Goldens in the Mississippi Headwaters drainage in a bucket labeled *Moxostoma erythrurum* from Koronis Lake in Stearns County collected in October 1941 (Figure 2, No. 4). This lake is in the Crow River system where MPCA reported Golden Redhorse at ten stations in 2007. However, my great anticipation evaporated in an instant after a quick look revealed Greater Redhorse. I believed I could finally see a pattern developing here, but it was hard to grasp that Greaters had been confused with Goldens.

The final encounter with a Golden phantom was an angler who caught a redhorse in the Mississippi River near Aitkin (Figure 2, No. 5). MDNR Fisheries biologists tentatively identified it as a Golden Redhorse that, at more than six pounds, would have smashed the current state record. The angler hoped for a little fame setting a new state record, but this fish was a Silver Redhorse and not even close for a state record.

EPILOGUE

I find it extremely curious that Golden Redhorse have never been reported in the 12-mile reach of the Mississippi River between the navigation locks on St. Anthony Falls and the Coon Rapids Dam. For a more than a decade, I conducted full community surveys using multiple sampling gears throughout this entire reach and found no gold. However, in 1986, MDNR Fisheries reported one specimen (not extant) of Golden Redhorse in Pleasant Lake – Ramsey Lake (Figure 2: record under label "CRD"). This is part of a landlocked lake chain used for St. Paul's municipal water supply and receives Mississippi River water within this reach piped-in via an eight-mile aqueduct. I have also surveyed Pleasant Lake and found stream fishes (i.e., Sand Shiner *Notropis stramineus* and Blackside Darter *Percina*

Figure 5. The real McCoy: a classic Golden Redhorse from the Mississippi River many miles downstream of St. Anthony Falls in Winona County, MN.

maculata), which are not indigenous to landlocked lakes. However, once again, no Golden Redhorse.

I remain very confident of my identification in 2000 on the Sauk River. However, it has since been a deep regret I did not take photos or preserve adult specimens. I felt compelled to try one more time, and in October 2020, returned to the same MPCA station. If I did not have the coordinates, I would have been certain I was in the wrong place. Twenty-years before, there was a long series of riffles, runs, and pools with gravel and cobble substrates. All vanished, apparently buried under a deep carpet of sand. In the two-decade interim, many Minnesota streams have been blasted by repeated 100-year-floods and a few have been in the cross-hairs of 500-year floods due to climate change. Not surprising, our efforts that day did not produce any species of redhorse.

Until there is an extant "body of evidence," I cannot accept that Golden Redhorse occur in the Mississippi River Headwaters drainage. I hope this account serves as example for future investigators to keep adult vouchers (Figure 5) and PLEASE assure the specimens are cataloged in a museum collection for ichthyologists to verify!

Literature Cited

Eddy, S., J. B. Moyle, and J. C. Underhill. 1963. The fish fauna of the Mississippi River above St. Anthony Falls as related to the effectiveness of this falls as a migration barrier. Proceedings of the Minnesota Academy of Science 30:111–115.

Hatch, J.T., K.P. Schmidt, D.P. Siems, J.C. Underhill, R.A. Bellig, and R.A. Baker. 2003. A new distributional checklist of Minnesota fishes, with comments on historical occurrence. Journal of the Minnesota Academy of Science 67:1–17.

Thyssen-Bornemisza Museum. https://www.museothyssen.org/en/collection/artists/bierstadt-albert/falls-st-anthony (last visited Nov. 7, 2018).

FishMap.org

FishMap.org is for anglers, aquarium hobbyists, scientific researchers, or anyone else with a passion for fishes who wants to visually explore species' ranges or learn what species are in their local waters. The site is dedicated to spreading knowledge and respect for all fish species.
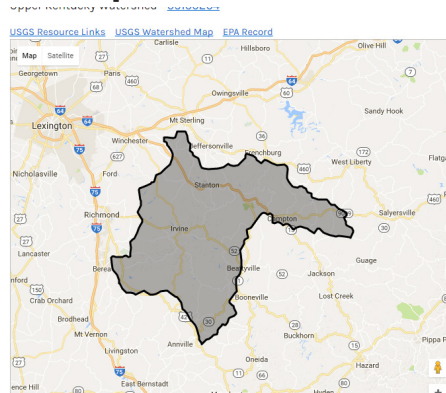
FishMap.org combines numerous data sources to provide a better view and more complete understanding of fish species distribution. It uses data from NatureServe, the National Atlas, the USGS water resources and Nonindigenous Aquatic Species programs, FishNet2, iNaturalist.org, GBIF, and iDigBio.

FishMap.org is sponsored by NANFA. Users can submit their own data to the portal to help map species distribution, so FishMap.org has been working with NANFA members to create an additional database of fish sightings and collections (currently nearly 30,000 records and growing).

Range and Collection Data
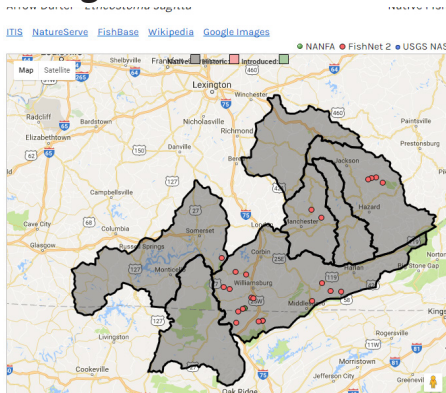
Explore Watersheds

Compare Ranges