FORAY INTO THE WILDS OF IOWA FINDS NORTHERN PEARL DACE AND LEAST DARTER BUT NOT NORTHERN SUNFISH

John Olson

Iowa Dept. of Natural Resources, Des Moines, IA

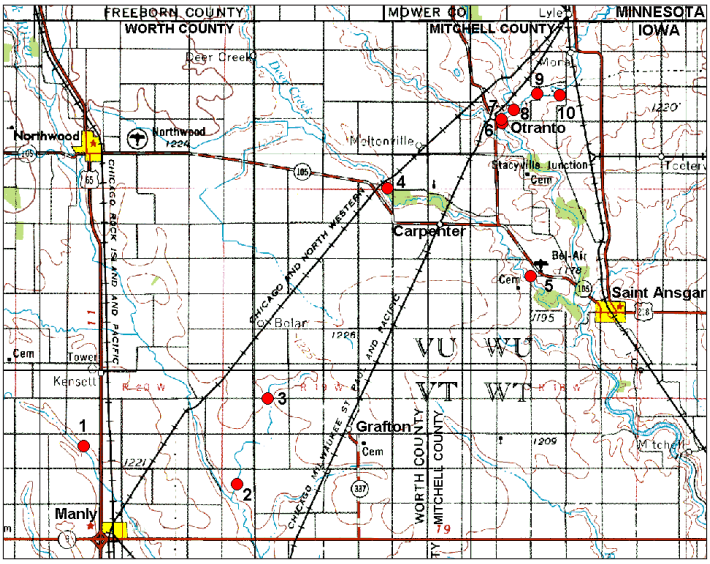
Lacking any formal state agency-level mechanism for tracking the status of rare fishes in Iowa, this responsibility sometimes falls to others with the requisite motivation and expertise. In the past, I have relied on this informal mechanism—in the form of assistance from NANFA stalwarts Konrad Schmidt and Bob Hrabik—to attempt to update the status of rare and "presumed extirpated" fishes in Iowa. For example, in late June 2011, we three met in northwest Iowa to conduct surveys for a species believed to be extirpated from the state since the early 1940s: the Plains Topminnow (*Fundulus sciadicus*) (Hrabik and Schmidt, 2012). It took Konrad and Bob about five minutes at our first site to collect this species which hadn't been reported in the state for 70 years.

The impetus for the current survey was the discovery in July and August 2014 of four *Lepomis* specimens tentatively identified as Longear Sunfish (*L. megalotis*) in flooded hatchery ponds at Iowa DNR's Fairport Fish Hatchery located along the shore of Pool 16 of the upper Mississippi River (UMR) near Muscatine. This was the first Iowa record for a fish in the Longear Sunfish complex in 50 years and only the third record in the last 100 years. If genetic analysis confirms that these four specimens are *L. megalotis* (Longear Sunfish), this would be a new species for Iowa as the form that has been historically documented in Iowa is *L. peltastes*, Northern Sunfish (Figure 1).

Most of the historical records for Longear Sunfish (as *L. peltastes*) in Iowa are from the work of Seth Meek in the late 19th century (Meek, 1892). The only two verified records from the 20th century are from the same location: the Cedar River at the unincorporated village of Otranto in Mitchell County in extreme northern Iowa about three miles from the Iowa/Minnesota state line. One of these records is from a July 1932 survey conducted by J. Clark Salyer, then of the University of Michigan, who along with Carl Hubbs, was contracted by the state of Iowa to conduct a sur-

Photos by the author unless otherwise indicated.

John Olson has worked in the Iowa DNR Water Quality Section since 1985, where his primary responsibility has been complying with reporting requirements of the federal Clean Water Act. He has been involved with stream fish survey work in Iowa since participating in a statewide survey of Iowa fishes from 1981–1984, and has continued to participate in fish surveys in Iowa streams as part of various Iowa DNR water quality projects and as part of special surveys targeted toward state threatened and endangered fish species. John has co-authored papers on invasive fishes in Iowa and on the occurrence of Chestnut Lamprey (*Ichthyomyzon castaneus*) in a southern Iowa river. He has a Bachelor of Science degree in Animal Ecology from Iowa State University, with an emphasis in fisheries biology.



2014 Survey Stations: (1) Beaver Creek. (2 and 3) Shell Rock River tributary. (4 and 5) Deer Creek. (6) Cedar River (above and below dam at Otranto. (8 and 9) Otter Creek. (10) Poor Creek. (Map by Konrad Schmidt)

Figure 1. Left: Longear Sunfish (*Lepomis megalotis*) from Salt Fork Vermilion River, Vermilion County, IL. Right: Northern Sunfish (*Lepomis peltastes*), Hillsdale County, MI. (Photos by Lance Merry)

vey of Iowa fishes as part of natural resource management planning activities (Crane and Olcott, 1933). In his 1932 field notes, Salyer reported "longeared sunfish" (identified at UMMZ as *L. m. peltastes*). A second collection was made in July 1963 by Dr. Karl Eugene Goellner, a biology professor at Coe College in Cedar Rapids from 1949 to 1974 (Meek was also a professor at Coe College from 1887 to 1892). In their respective field notes, both Salyer and Goellner refer to occurrence of springs in the river bed at this location and growths of aquatic vegetation (macrophytes) near the springs. As part of a 1981–84 statewide survey of Iowa fishes conducted by Bruce Menzel at Iowa State University, I had visited and collected fishes at this site on two occasions (1981 and 1982), and made an additional collection in 1986. None of these collections produced Longear (now Northern) Sunfish. In the most recent summary of Iowa fishes (Harlan et al., 1987), this species is considered extirpated from the state.

With the unexpected occurrence of a form of Longear Sunfish in Pool 16 of the UMR near Muscatine, IA, in July 2014, the time seemed right to make yet another attempt to collect the Northern Sunfish from the upper Cedar River. In a late July e-mail, I mentioned to Konrad and Bob that Northern Sunfish had been collected from the upper Cedar River in Iowa in 1932 and 1963, and that this segment of river had at one time been identified in as "the only major vegetated stream relict left in Iowa" (Harlan and Speaker, 1956:136). That was all the push needed to begin the planning for our survey which we set for late August.

We met in northern Iowa on Friday, August 22nd for our three-day collecting trip. We also enlisted the services of regional fish experts George Cunningham from Nebraska and Lance Merry from Illinois. Our survey headquarters was a motel in the town of Northwood in Worth County, IA.

This portion of Iowa—the upper portions of the Cedar River basin, including the Shell Rock River subbasin—supports a relatively high diversity of fishes including the Northern Pearl Dace (*Margariscus nachtriebi*) and Least Darter (*Etheostoma microperca*), both of which are listed as state-endangered species (Figure 2). The upper Shell Rock basin occupies the eastern border of Iowa's portion of the Des Moines Lobe ecoregion (the topographically youngest and most poorly drained land surface in Iowa), and the up-

Figure 2. Top: Northern Pearl Dace from Rose Creek, Mower County, MN. Bottom: Least Darter from Long Lake, Itasca County, MN. (Photos by Konrad Schmidt)

per Cedar River basin occupies the western portion of the Iowan Erosion Surface ecoregion, a gently rolling landscape with shallow soils over limestone bedrock and generally coarse substrates in stream channels (Prior, 1991; Griffith et al., 1994).

The Northern Pearl Dace was first documented in Iowa in 1972 by Menzel and Boyce (1973) from Beaver Creek (aka, Rose Creek), a small tributary of the Shell Rock River near the town of Manly in Worth County (Figure 3). These authors concluded that this population likely represented a glacial relict at the southern extent of its current distribution in North America. This stream has remained Iowa's only known location for Northern Pearl Dace. Although samplings in this stream in 1981 and 1986 had been unsuccessful, this species was again collected from the Beaver Creek system in 1992 by Cunningham. According to the database for the Iowa Natural Areas Inventory (http://www.iowadnr.gov/Environment/ThreatenedEndangered/NaturalAreasInventory.aspx), there had been no subsequent collections of Northern Pearl Dace from this stream since 1992.

About 12 miles east of Northwood is another "only known location" for an Iowa fish species. A small tributary of Otter Creek (locally known as Poor Creek) in the upper Cedar River basin, is the only known Iowa location where the Least Darter still occurs. This species once had a wider distribution in Iowa with verified (museum) records from the late 19th century from the lower Cedar River basin (Cedar County) and from the Maquoketa River basin (Delaware County) in eastern Iowa (Meek, 1892; Burr, 1978). The Least Darter was documented in the Minnesota portion of the Otter Creek drainage in 1962 (Phillips and Underhill, 1967 and by Konrad Schmidt in 1998, 1999, and 2008 personal communication) and in the Iowa portion of the Otter Creek drainage (Poor Creek) by Tom Coon in 1980 (personal communication). An additional collection was made by James Russell in the mid-1970s from the upper portion of the Maquoketa River at Joy Springs County Park in southwestern Clayton County (Roosa, 1977; Menzel, 1981). The last known collection of Least Darter from Poor Creek had been in 1986 by Iowa DNR personnel including the author.

Thus, while we were in the area attempting to document the continued occurrence of the Northern Sunfish in Iowa (a long-shot, to be sure), it seemed like a good idea to check on the status of the Northern Pearl Dace and Least Darter and their very restricted respective distributions in the state.

NORTHERN PEARL DACE

With Konrad and George manning the seine, we were able to collect a number of individuals of Northern Pearl Dace from Beaver Creek, where they had been previously, and

Figure 3. Top: Seining Beaver Creek. Bottom: Northern Pearl Dace collected at site.

exclusively, found (Figure 3). In the hopes of finding other Shell Rock tributaries that held Northern Pearl Dace, we later sampled two locations on an additional tributary, but no Northern Pearl Dace were captured. A thunderstorm on the morning of August 23rd caused the already elevated flows in this tributary to rise further thus potentially reducing our collection efficiency. Regardless, our failure to find Northern Pearl Dace in other nearby tributaries of the Shell Rock River was consistent with findings of Menzel and Boyce (1973).

LEAST DARTER

We also had good success on the tributary (aka, Poor Creek) to Otter Creek where the Least Darter was last collected in 1986. With our chest waders on, the five of us arrived in two vehicles at the farm through which this tributary flows. The family was the same one that had lived there in 1986 when I last visited this site. Further, this family proudly showed us a plaque they had received in 1988 from The Nature Conservancy for their dedication to conservation and preservation of the small stream on their property inhabited by this smallest of darters. In the many years and many hundreds of fish collections made between us in the agricultural Midwest, none of us had encountered a farm family that proudly displayed a plaque for their dedication to protecting habitat for a fish (Figure 4). We seined a number of specimens

Figure 4. (From top) Rustad plaque. Least Darter from Poor Creek. George showing another Rustad generation these tiny fish. (Bottom photo by Lance Merry).

of Least Darter from the tributary along with a number of other fish species including the Ozark Minnow (*Notropis nubilus*), Rainbow Darter (*E. caeruleum*) and Banded Darter (*E. zonale)* (these additional fish species are quite commonly distributed in the upper Cedar River basin).

NORTHERN SUNFISH

Our primary target for this trip, however, was the sunfish formerly known as the Longear Sunfish but now called the Northern Sunfish. Both the 1932 and 1963 collections of this *Lepomis* species from the Cedar River near the village of Otranto mentioned a lowhead dam at this location, and both mentioned springs in the river bed downriver from the dam. Thus, one area of focus was the series of springs in the river about 700 feet downriver from the dam. In his field notes from a warm summer evening in July of 1932, J. Clark Salyer described the Cedar River at Otranto and its springs as follows:

> 6:00 PM. Ia-74; jar. July 14. Air: 95; water: 85.5. Cedar River at Otranto, Mitchell Co., close to Minn. Line here (3 miles to it). River is 125' wide & runs from 1 ft up to ho1e waist deep. . . has nice sand & gravel bottom. Large boulders strewn all over bottom. An abundance of *Potamogeton* in stream here—*P. richardsoni, P. interior* & *pectinatus*. Some *elodea* & coontail. A dam here of concrete & poles—110 ft. long & 6' high. 1/8 mile below dam, 3 large springs in river bed. One forced water up in air above river some 6" or 7". This springs temp at 47 degrees F. This was coldest water or spring we encountered in Iowa. River water in vicinity of spring lowered to 69 degrees F.

Salyer goes on to mention the fishes collected at this location:

> Seined below dam: *S.* [*Noturus*] *gyrinus,* [*Lepomis*] *cyanellus,* rock bass, [*Notropis stramineus*] *deliciosus,* [*Luxilus*] *cornutus*-many, [*Nocomis*] *biguttatus, B.* [*E.*] *nigrum, N.* [*Lythurus*] *umbratilis,* [*Campostoma anomalum*] *pullum, H.* [*Pimephales*] *notatus,* smallmouth, bluegills, long-eared sunfish, fat-head minnows.

Salyer's specimen of "long-eared sunfish" was placed in the collection of the University of Michigan's Museum of Zoology (UMMZ 101383), was 65 mm TL, and was identified as *Lepomis megalotis peltastes*.

To begin our search, we sampled the lower portion of Otter Creek (of Least Darter fame) which enters the Cedar River approximately one-half mile upriver from the lowhead dam at Otranto. Aerial photos showed some promising off-channel habitats along the lower segment of Otter Creek. Prior to the arrival of Bob and Lance, we (Konrad, George, and I) canoed up the Cedar River from the boat access at Otranto Park to the mouth of Otter Creek and seined several of these off-channel areas in our attempt to locate *L. peltastes*. Unfortunately, the reality of the poor quality of these off-channel habitats during late summer of 2014 did not meet the somewhat higher expectations based on the aerial photos: these off-channel areas were typically isolated from the main stream and were generally dominated by filamentous

The survey soldiers of Northern Iowa. Left to Right: John Olson, George Cunningham, Bob Hrabik, Konrad Schmidt, and Lance Merry.

algae. The only *Lepomis* found was, not surprisingly, Green Sunfish (*L. cyanellus*).

On the following day, the full team also sampled the Cedar River both upriver and downriver from the lowhead dam at Otranto. While our efforts with dip nets, seines, and a backpack electrofisher produced a number of species, we did not encounter *L. peltastes*. All agreed that the habitats present did not appear suitable for supporting this species. The area of springs at this location appears to have declined immensely in quality since Salyer's visit in 1932. A very small patch of springs continue to enter the river at this location, but the flows appear greatly reduced, and their impacts on the river's water quality and growth of in-stream aquatic vegetation appear minimal. Similarly, the diversity of aquatic macrophytes described by Salyer appears to have declined significantly with only a few patches of *Potamogeton natans* present upriver from the dam; no aquatic macrophytes were observed downriver. Thus, the statement that the Cedar River at Otranto is "the only major vegetated stream relict left in Iowa" (Harlan and Speaker, 1956) would appear to need revision; this relict has been eliminated. And, along with the aquatic vegetation, our sunfish of interest appears to have been eliminated as well.

CONCLUSIONS

This iteration of Iowa's informal biological survey found the "only known" Iowa populations of Northern Pearl Dace and Least Darter to be secure, at least to the extent that a "one site-only" population can be secure. Based, however, on our searches at its last known Iowa location, the Northern Sunfish appears to have exited the state. Some in the group (Bob), however, continue to feel that this species may still occur in the upper Cedar River, and that finding it may only be a matter of sufficient collection effort.

References:

Burr, B. M. 1978. Systematics of the percid fishes of the subgenus *microperca*, genus *Etheostoma*. Bulletin of the Alabama Museum of Natural History, 4:1–53.

Crane, J. L. and G. W. Olcott. 1933. Report on the Iowa twenty-five year conservation plan. Des Moines, Iowa.

Griffith, G. E., J. M. Omernik, T. F. Wilton, and S. M. Pierson. 1994. Ecoregions and subecoregions of Iowa: a framework for water quality assessment and management. Journal of the Iowa Academy of Science. 10(1):5–13.

Harlan, J. R. and E. B. Speaker. 1956. Iowa Fish and Fishing. Iowa Conservation Commission, Des Moines, Iowa. 365 p.

Harlan, J. R., E. B. Speaker, and J. Mayhew. 1987. Iowa fish and fishing. Iowa Conservation Commission, Des Moines, Iowa. 323p.

Hrabik, R. A. and K. P. Schmidt. 2012. Forays into Iowa yield new records of Plains Topminnow (*Fundulus sciadicus*) and more data on Pugnose Shiner (*Notropis anogenus*). American Currents 37(3): 11–13. North American Native Fishes Association.

Meek, S. E. 1892. Report upon the fishes of Iowa, based upon observations and collections made during 1889, 1890, and 1891. Bull. U.S. Fish Comm. 10(1890):217–248.

Menzel, B. W. 1981. Unpublished interview with James Russell, August 20, 1981, in Auburn, Ia., on fishes of eastern Iowa. 14 pages; handwritten.

Menzel, B. W. and M. S. Boyce. 1973. First record of the pearl dace, *Semotilus margarita* (Cope), from Iowa. Iowa State Journal of Research. 47(4):245–248.

Phillips, G. L. and J. C. Underhill. 1967. Revised distribution records for some Minnesota fishes, with addition of two species to the faunal list. J. Minn. Acad. Sci. 34:177–80.

Prior, J. S. 1991. Landforms of Iowa. University of Iowa Press. 153 p.

Roosa, D. M. 1977. Endangered and threatened fish of Iowa. State Preserves Advisory Board in cooperation with the Fisheries Section, Iowa Conservation Commission. Special Report of the Preserves Board, No. 1. Des Moines, IA. 25 p. + appendix.