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Recent Observations of the Distribution and Status of Bluntnose Darters and Crystal Darters in Iowa

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The distribution and status of Iowa's fishes were last extensively described in *Iowa Fish and Fishing* (Harlan et al. 1987). Since then, numerous fish collections have been made in Iowa's interior and bordering rivers and streams. Excluding non-native species, there have been three documented accounts of new fish species distributional records in Iowa since 1987. In this paper, I describe new collections of crystal darter *(Crystallaria asprella)* and bluntnose darter *(Etheostoma chlorosomum)* from the Mississippi River. The first documented specimen of *C. asprella* in Iowa was collected in Pool 11 of the Upper Mississippi River (UMR) in 1995. One specimen of *E. chlorosomum* was collected in Pool 13 of the UMR in 1998, and another was collected in 1999. The bluntnose darter had not been collected since 1975 and was generally thought to be extirpated in Iowa.

INDEX DESCRIPTORS: bluntnose darter, crystal darter, *Crystallaria asprella,* endangered species, *Etheostoma chlorosomum,* fish distribution, Long Term Resource Monitoring Program, Upper Mississippi River.

This paper describes the distribution and status of two extremely rare percids in Iowa: the crystal darter (*Crystallaria asprella,* Jordan) and the bluntnose darter (*Etheostoma chlorosomum,* Hay). Previously, the crystal darter was not known from the historical records in *Iowa Fish and Fishing* (Harlan et al. 1987) or from the Iowa Natural Areas Inventory database (Iowa Department of Natural Resources unpublished data 1999). However, if the crystal darter occurs in Iowa, it is probably limited to the Mississippi River drainage basin, which would be similar to its Wisconsin distribution (Becker 1983).

Harlan et al. (1987) described the bluntnose darter as extremely rare and eluded they may not exist at all in Iowa. Historical records from the Iowa Natural Areas Inventory database show the bluntnose darter had been collected only 11 times in Iowa. All collections occurred prior to 1976 in the Mississippi River drainage basin.

The Upper Mississippi River (UMR) borders Iowa from New Albin to Keokuk (Fig. 1). The UMR is a complex of impounded pools consisting of backwater lakes, braided side channels, main channel borders, impounded areas, and tailwater zones below dams. The fish communities within these aquatic habitats are rich. Of the 148 fish species described by Harlan et al. (1987), 90 (61%) can be found in the UMR bordering Iowa (Pitlo et al. 1995). Since 1989, fisheries biologists from the Long Term Resource Monitoring Program (LTRMP) have documented 79 species from Pool 13 alone. Currently, 18 species (Table 1) have special status listings in Iowa (Iowa Administrative Code 1994). Ten of these species have been documented in the UMR in Iowa (Pitlo et al. 1995, Bowler et al. 1998).

Pool 11 of the UMR is approximately 51 kilometers long extending between Lock and Dam 10 at Guttenberg, Iowa and Lock and Dam 11 at Dubuque, Iowa. Pool 13 of the UMR is approximately 51 kilometers long extending between Lock and Dam 12 at Bellevue, Iowa and Lock and Dam 13 at Clinton, Iowa. Pools 11 and 13 contain nearly 21,000 and 28,000 acres of aquatic area, respectively. Both pools are a mosaic of aquatic habitats that include the main channel, channel border areas, side channels, backwater lakes, sloughs, the impounded areas above the Locks and Dams and the tailwater zones just below the Locks and Dams.

METHODS

Crystal Darter

Since 1984, young-of-the-year (YOY) channel catfish (*Ictalurus punctatus*) have been annually collected from Pools 9, 11, 16 and 18 in the UMR by trawling during July, August and September, by the Iowa Department of Natural Resource's (IDNR) fisheries research personnel in Bellevue, Iowa. Methods taken from Pitlo (1997) are as follows: Trawl samples were collected with a 4.8 m (16 ft) semi-balloon otter trawl; the bag of the trawl is made with 18 mm (.75 in) bar mesh and has a 3 mm (.125 in) cod end liner; trawl hauls were three minutes in duration (approximately 380 m) taken in a downstream direction and consisted of a minimum of 44 and a maximum of 74 hauls per pool; habitats sampled were main channel border and major side channels; all species other channel catfish were recorded and enumerated.

Bluntnose Darter

LTRMP fish samples were collected during 1989–1992 using standardized gear at fixed sites in all habitat types (strata). All gears were used at each sampling site and the field season was split into two time periods. Fish samples collected during 1993–1999 utilized the same standardized gears, but site selections were made using a stratified random sampling regime—stratified by habitat into three time periods. The time periods were June 15 to July 31, August 1 to September 15 and September 16 to October 31. Sampling was conducted in eight strata in Pool 13. Strata included: contiguous backwater offshore, contiguous backwater shoreline, impounded offshore, impounded shoreline, main channel border unstructured, main channel border wing dam, side channel border and tailwater zone. Fish were collected using ten different standardized gears described

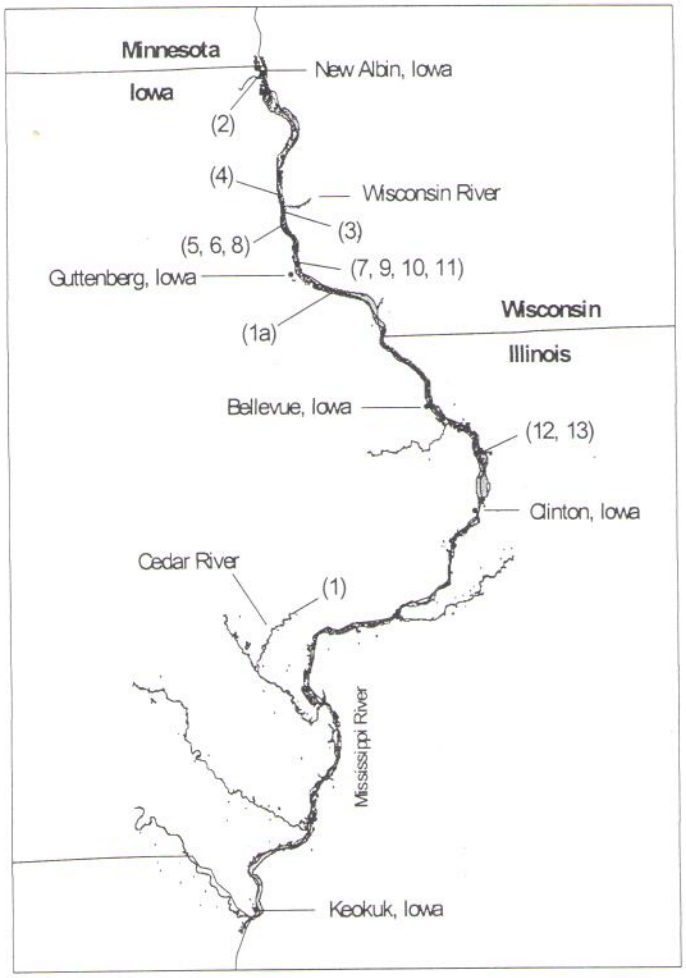

Fig 1. Mississippi River and major tributaries in Iowa, with locations of bluntnose darters (1–13) and crystal darter (1a) in parentheses. Locations and site descriptions can be cross-referenced in Table 2.

Table 1. Iowa listing of fish species considered endangered, threatened or special concern (Iowa Administrative Code 1994).

Scientific name	Common name	Iowa Listing
Acipenser fulvescens	Lake sturgeon	Endangered**
Scaphirhynchus albus	Pallid sturgeon	Endangered*
Notropis anogenus	Pugnose shiner	Endangered
Notropis texanus	Weed shiner	Endangered**
Semotilus margarita	Pearl dace	Endangered
Noturus nocturnus	Freckled madtom	Endangered
Etheostoma chlorosomum	Bluntnose darter	Endangered**
Etheostoma microperca	Least darter	Endangered
Ichthyomyzon castaneus	Chestnut lamprey	Threatened**
Lamptera appendix	American brook lamprey	Threatened
Esox americanus vermiculatus	Grass pickerel	Threatened**
Notropis heterolepis	Blacknose shiner	Threatened
Moxostoma duquesnei	Black redhorse	Threatened**
Lota lota	Burbot	Threatened**
Ammocrypta clara	Western sand darter	Threatened**
Etheostoma spectabile	Orangethroat darter	Threatened
Opsopoeodus emiliae	Pugnose minnow	Special Concern**
Aphredoderus sayanus	Pirate perch	Special Concern**

*Federally endangered
**Documented in the Mississippi River between New Albin, Ia. and Keokuk, Ia.

in Gutreuter et al. (1995). Gear types included: day electrofishing, night electrofishing, fyke netting, tandem fyke netting, mini-fyke netting, tandem mini-fyke netting, seining, hoop netting—small, hoop netting—large and trawling. A target of 486 samples (162 per period) is allocated for each year. Of these, 438 are stratified random samples and 48 are fixed site samples confined to the TWZ stratum. LTRMP fisheries component procedures can be found in Gutreuter et al. (1995).

RESULTS AND DISCUSSION

Crystal Darter

A single specimen of crystal darter was collected on 26 July 1995 in Pool 11 of the UMR by Maury Anderson, IDNR (Fig. 1). This specimen was captured in 2–3 meters of water by trawl in a main channel border habitat while assessing young-of-the-year channel catfish populations using the methods of Pitlo (1997), over sand substrate (M. Anderson, personal communication). This was the first documented collection of the crystal darter from Iowa waters, although it has been collected in the UMR in nearby southwestern Wisconsin (Becker 1983, Burkhardt et al. 2000).

Current status of the crystal darter in Iowa is undetermined (Harlan et al. 1987; Iowa Administrative Code 1994). Minnesota lists it as a species of special concern, and Wisconsin, endangered (U.S. Army Corps of Engineers 1997). In Illinois, the crystal darter has been presumed extirpated since 1901 (James Herkert, Illinois Endangered Species Protection Board, personal communication). The U.S. Fish and Wildlife Service lists the crystal darter as a species of concern for Region 3, which includes Illinois, Indiana, Iowa, Michigan, Missouri, Ohio and Wisconsin (Ron Refsnider, U.S. Fish and Wildlife Service, Endangered Species Listing Coordinator for Region 3, personal communication).

The crystal darter is found in medium to large, clear rivers and streams with expanses of silt-free sand and gravel substrates (Bruner 1980, Harlan et al. 1987). It is often found buried in sand where water velocities are strong and depths are one meter and greater (Becker 1983, Pflieger 1997). The cryptic nature of this species and its burying habit suggests crystal darters are not easily sampled with conventional methods, such as electrofishing or seining. These factors, in addition to the possible lack and/or reduction of suitable habitat for crystal darters, may explain its scarcity and undetermined status in Iowa.

Loss of aquatic habitat due to sedimentation is widely considered the most serious environmental problem in the UMR (Bhowmik and Adams 1989, U.S. Fish and Wildlife Service 1992, Gaugush and Wilcox 1994). It is conceivable this silt intolerant species will lose critical habitat as silt continues to enter the Mississippi River, especially from Illinois and Iowa tributaries. Consideration of the crystal darter for endangered status in Iowa is warranted and the species' federal status (at least in Region 3) should be re-evaluated. Focused attempts to document this species in the UMR may require utilizing non-traditional sampling gears and methods in the habitats crystal darters would likely be found, e.g. pulling seines by boat to allow deeper and swifter habitats to be sampled and using electrified seines or modified trawls.

Table 2. Locations of bluntnose darter (1–13) and crystal darter (1a) in Iowa.

Year	County	Figure 1 location () and Site Description
1943	Muscatine	(1) Overflow pool of Cedar River, five miles south of Atalissa, Ia.
1944	Allamakee	(2) UMR* Pool 9, between New Albin, Ia. and Minnesota Slough
1957	Clayton	(3) UMR Pool 10, below mouth of Wisconsin River
1961	Clayton	(4) UMR Pool 10, island region between Marquette, Ia./Prairie Du Chien, Wi.
1962	Clayton	(5) UMR Pool 10, at Clayton, Ia.
1963	Clayton	(6) UMR Pool 10, at Clayton, Ia.
1963	Clayton	(7) UMR Pool 10, two miles north of Guttenberg, Ia.
1964	Clayton	(8) UMR Pool 10, at Clayton, Ia.
1966	Clayton	(9) UMR Pool 10, Frenchtown access–two miles north of Guttenberg, Ia.
1968	Clayton	(10) UMR Pool 10, Frenchtown access–two miles north of Guttenberg, Ia.
1975	Clayton	(11) UMR Pool 10, Frenchtown Lake
1998	Jackson	(12) UMR Pool 13, UTM** coordinates 4660535 N, 735375 E
1999	Jackson	(13) UMR Pool 13, Edick Lake–UTM coordinates 4660685 N, 734925 E
1995	Clayton	(1a) UMR Pool 11, UTM coordinates 4726590 N, 672176 E

*UMR–Upper Mississippi River
**UTM–Universal Transverse Mercator

Bluntnose Darter

A single specimen of bluntnose darter (*Etheostoma chlorosomum*) was collected in Pool 13 of the UMR on 7 October 1998 by Iowa LTRMP staff. This specimen was captured by day electrofishing in a backwater lake during standard LTRMP fisheries monitoring (Gutreuter et al. 1995). Another single specimen of bluntnose darter was collected in Pool 13 on 11 October 1999 by Iowa LTRMP staff using a mini-fyke net in a backwater lake also during LTRMP fisheries monitoring. Both locations had similar habitat conditions; water velocities were less than 0.2 m/s over detritus laden, silty substrates with many woody snags and water depths were 0.5 and 0.6 m and secchi disk transparencies were 34 and 39 cm, respectively for the 1998 and 1999 collections. These were the first two documented collections of bluntnose darter in Iowa in more than 20 years. Only eleven other collections of bluntnose darter have been documented in Iowa since it was first sampled by R. M. Bailey and E. B. Speaker in 1943 (Iowa's Natural Areas Inventory Database 1999). Historic bluntnose darter collections are given in Figure 1 and Table 2.

The bluntnose darter is currently listed as endangered in Iowa. Harlan et al. (1987) reported the bluntnose darter to be extremely rare in Iowa, with possible remnant populations in the Mississippi River. The 1998 and 1999 backwater collection sites were less than 0.5 km apart and the two backwater complexes were linked via a small side channel. A viable population of bluntnose darters may inhabit these backwater complexes.

Bluntnose darters may not be as rare as collection records indicate. They superficially resemble johnny darters (*Etheostoma nigrum)* and the two species may easily be confused. Beginning in 1999, I carefully examined all johnny darters captured during LTRMP fisheries monitoring in Pool 13 to ensure proper identification. Only one bluntnose darter was found of 56 johnny darters examined. Because the johnny darter is common in Iowa, and these two Etheostomids appear so similar, status of the bluntnose darter probably should be "undetermined" until more is known about its distribution.

The importance of recording the distributions of Iowa's rare and endangered fishes has been well documented (Menzel 1981, Paragamian 1990, Howell and Leoschke 1992). Changes in fish fauna reflect changes in the quality of aquatic habitats, and thus documentation of these changes is vital to understanding the general health of the aquatic environment. To understand these trends, we must have an accurate record of species distributions and abundances, especially for poorly studied, non-game fish communities.

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