

Rediscovery of the Freckled Madtom *Noturus nocturnus* Jordan & Gilbert in the Des Plaines River, Illinois

Philip W. Willink¹, Francis M. Veraldi², and James B. Ladonski¹

¹The Field Museum, 1400 S. Lake Shore Dr, Chicago, IL 60605-2496

²U.S. Army Corps of Engineers, 111 N. Canal Street, Suite 600, Chicago, IL 60606-7206

ABSTRACT

An interesting catfish, the freckled madtom (*Noturus nocturnus*), was collected in the Des Plaines River just above its confluence with the Chicago Sanitary and Ship Canal on 16 May 2005. Measuring 86.3 mm in standard length and weighing 14.6 grams, this is the first time a freckled madtom has been collected at a close proximity to Chicago in 100 years. It is possible that the freckled madtom was present all along, but was overlooked due to its difficulty to collect, naturally sporadic occurrence (Pflieger 1975, Mettee et al. 1996), and misidentification. It is the hope that this can be interpreted as an improvement in water quality, and if so, other native fishes may possibly regain their former ranges closer to Chicago in the future.

Key Words: freckled madtom, *Noturus nocturnus*, Des Plaines River, identification, recolonization, water quality

INTRODUCTION

Madtoms are a subgroup of the North American bullhead catfish family Ictaluridae. These small catfishes, usually less than a few inches long, comprise the genus *Noturus*. There are currently 28 named species of madtoms throughout eastern North America (Burr et al., 2005), seven of which are known from Illinois and four from the Chicago Region (which can roughly be defined as a 100-mile radius around the city). They live along the bottom, usually hiding among rocks, logs, vegetation and detritus. Madtoms are most active at night when they feed on aquatic insect larvae and other small organisms. Because of their small size and reclusive nature, anglers and wildlife observers rarely see madtoms. They are also commonly confused with bullheads and other juvenile catfishes.

Freckled madtoms are found in medium-sized creeks to large rivers. The preferred habitats are riffles and nearby pools with slow to swift current, with substrates of boulder, cobble, gravel, sand, silt, woody debris and detritus (Pflieger, 1975; Smith, 1979; Burr and Mayden, 1982; Etnier and Starnes, 1993; Mettee et al., 1996; F.M. Veraldi, pers. observ.). The freckled madtom may also be found among root masses and undercut banks, as well as discarded bottles, cans, and other foreign debris (Burr and Mayden, 1982). It is found in clear to moderately turbid waters (Smith, 1979; Burr and Mayden,

1982; Page and Burr, 1991; Etnier and Starnes, 1993). The majority of the freckled madtom's diet is composed of aquatic insect larvae, but it will consume other invertebrates, such as crustaceans (Burr and Mayden, 1982; Cross and Collins, 1995).

RECENT COLLECTIONS

The known range of the freckled madtom extends from eastern Texas to western Alabama and from central Indiana to southeastern Iowa (Pflieger, 1975; Etnier and Starnes, 1993; Mettee et al., 1996). The northernmost range of this species reaches northeastern Illinois (Page and Burr, 1991) within the Illinois River system and most recently the Des Plaines River.

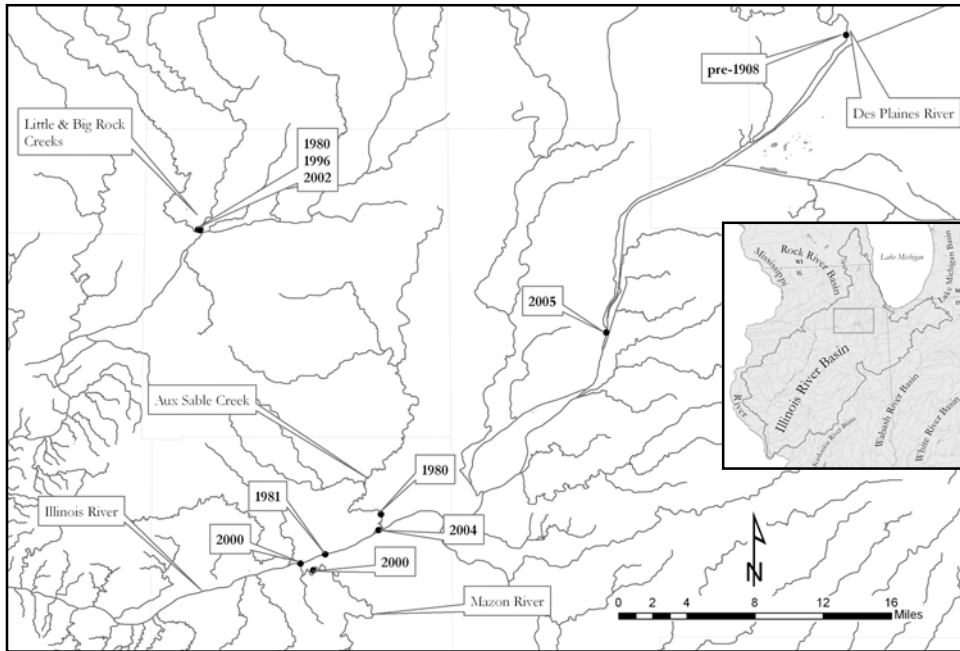


Figure 1. Distribution map of the freckled madtom *Noturus nocturnus* near Chicago, IL

Within Illinois, the freckled madtom is occasionally found in the central and southern portions of the state (INHS 2006). This species has been collected within the Chicago Region (Figure 1) in Aux Sable Creek (1980, 2004), Mazon River (2000), Illinois River near Morris (1981, 2000), and Little Rock Creek near Plano (1980, 1996, 2002). Aux Sable Creek, Mazon River, and Little Rock Creek are some of the highest rated streams in regards to quality in northeastern Illinois, whereas the Des Plaines River is one of the lowest rated rivers (S. Pescitelli, IDNR, pers. comm., 2005). The recent Des Plaines River sample is approximately 22 river miles upstream from the nearest collection, which is fragmented by two lock and dam structures.

According to Smith (1979), there is a record from the Des Plaines River near Brookfield, Illinois (pre-1908). Unfortunately, we have been unable to verify this record via specimen confirmation. The record is attributed to Stephen A. Forbes and Robert E. Richardson,

both of the Illinois Natural History Survey, who conducted most of their survey work between 1880 and 1905. Their *The Fishes of Illinois* (1920) states that the freckled madtom is rare in Illinois and was only found in the central portion of the state with the northernmost locality near Havana. They do not mention the Brookfield locality. Until other information on this old Des Plaines River record becomes available, we will assume it is valid in light of the collections made since the 1980s.

RESULTS AND DISCUSSION

A freckled madtom (*Noturus nocturnus*) was collected on 16 May 2005 during monthly monitoring for silver (*Hypophthalmichthys molitrix*) and bighead carp (*Hypophthalmichthys nobilis*) in the lower Des Plaines River. The exact locality was a deep, swift riffle in the Des Plaines River just above its confluence with the Chicago Sanitary and Ship Canal at the town of Joliet in Will County, IL. The specimen was collected through boat electro-fishing and then photographed and deposited in the Field Museum of Natural History's research collections (FMNH Accession number Z-19815). No other specimens were found despite additional surveys in the area throughout the rest of 2005.

The recently collected freckled madtom (Figure 2) measures 86.25 mm in standard length and 105.89 mm (4.17 inches) in total length. It weighs 14.60 grams (0.52 ounces). This is a larger than average-sized adult for this species, although some individuals can reach 150 mm (6 inches) in length (Smith, 1979; Burr and Mayden, 1982; Page and Burr, 1991; Cross and Collins, 1995). Madtoms are most easily distinguished from other catfishes by the shape of their adipose fin, which is long, low, and connected to their tail. The freckled madtom may be confused with three other sympatric madtom species within the Chicago Region: the stonecat (*Noturus flavus*), slender madtom (*Noturus exilis*), and tadpole madtom (*Noturus gyrinus*). The following key may be used to help correctly identify collections of these species:

- 1a. Upper and lower jaw even..... 2
- 1b. Upper jaw longer and protrudes over lower jaw..... 3
- 2a. Body elongate; dorsal, anal and caudal fins with black margins; side of body lacking vein-like lines*Noturus exilis*
- 2b. Body stout and robust; dorsal, anal and caudal fin without black margins; body with vein-like lines *Noturus gyrinus*
- 3a. Lower lip and chin without freckled pigment; tooth patch located on upper jaw with backward extensions*Noturus flavus*
- 3b. Lower lip and chin with freckled pigment; tooth patch located on upper jaw lacking backward extensions*Noturus nocturnus*



Figure 2. Freckled madtom *Noturus nocturnus* 105.89 mmTL, Des Plaines River, Will County, IL 16 May 2005 (FMNH Accession number Z-19815).

DISCUSSION

The Des Plaines River is routinely sampled by a variety of agencies. It is possible that the freckled madtom was present all along, but was overlooked for the past 100 years due to its difficulty to collect, a naturally sporadic occurrence (Pflieger, 1975; Mettee et al., 1996), and possible misidentification. Since the freckled madtom appears to be sensitive to water quality conditions, it is also possible that recent improvements to water quality have lead to local recolonization. The recolonization hypothesis requires the freckled madtom to move upstream through the Dresden Lock and Dam complex (21.7 feet high) and Brandon Lock and Dam complex (34 feet high). A dam would be an almost impossible barrier for a small catfish to pass, but locks that frequently fill and empty with water would not prevent the spread of small fishes. For example, the threadfin shad *Dorosoma petenense* is a species from Central America, Mexico, and the southern United States. It has been gradually been expanding its range northward and can now be found in the Des Plaines and Kankakee rivers (Laird and Page, 1996; INHS, 2006). A more extreme example is the american eel *Anguilla rostrata* that is born in the Sargasso Sea, Atlantic Ocean then occasionally swims all the way up the Mississippi and Illinois rivers into the Kankakee River (P.W. Willink, pers. observ.). These examples indicate that fishes can move upstream through multiple lock and dam complexes. The spread of the round goby *Neogobius melanostomus* from Lake Michigan to the Illinois River indicates that fishes can also move downstream through the same lock and dam complexes (USGS, 2006). There is no data on the seasonal movement patterns of the freckled madtom. Other madtom species tend to be largely sedentary (Burr and Stoeckel, 1999). Additional studies are needed to investigate the movement patterns and specific environmental preferences and sensitivities of the freckled madtom within the Chicago Region.

Although the occurrence of the freckled madtom in the Des Plaines River may be a sign of improved water quality, this does not imply that the Des Plaines River is pristine or has returned to its natural condition. There is still much work to be done in terms of

restoring habitat, connectivity and water quality. However, recent collections of the freckled madtom, an Iowa darter (*Etheostoma exile*) in Salt Creek (Gutmann, 2005), and a freshwater sponge (possibly *Spongilla aspinosa*) in the Chicago River (Murphy, 2005) are encouraging news for the region. The reappearance of the freckled madtom also demonstrates the importance of routine ichthyological sampling, particularly of the often-overlooked non-game fishes, as a way to monitor the status of our lakes and rivers. Additional knowledge and public awareness of our regional biodiversity will improve our ability to make decisions that impact our environment and way of life.

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