

Selected Illinois Fishes in Jeopardy: New Records and Status Evaluations

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ABSTRACT

Recent collections (late 1980s, early 1990s) in Illinois waters by resource management and university personnel conducting status surveys of jeopardized fishes, drainage-wide biotic integrity studies, and routine sampling have documented significant new vouchered records for 15 fish species that have been variously placed on lists of rare, threatened, or endangered species. Three species (Sturgeon Chub [*Macrhybopsis gelida*], Blue Sucker [*Cycleptus elongatus*], Greater Redhorse [*Moxostoma valenciennesi*]) are candidates for listing as federally endangered or threatened by the U.S. Fish and Wildlife Service and are restricted to large rivers. Specifically, we document: 1) the threatened Least Brook Lamprey (*Lampetra aepyptera*) in Lusk and Bay creeks; 2) photographic and anecdotal accounts from the 1950s and 1960s of the presumably extirpated Alligator Gar (*Atractosteus spatula*) in the Mississippi River and Horseshoe Lake; 3) the first records in over 30 years of the Alabama Shad (*Alosa alabamae*) from two locations in the Mississippi River; 4) extension of the northern limits of the Blacktail Shiner (*Cyprinella venusta*) in the Clear Creek system upstream to Dutch Creek; 5) the continued occurrence of the endangered Cypress Minnow (*Hybognathus hayi*) in the middle Cache River and below Horseshoe Lake dam; 6) the first record in just over 30 years of the endangered Bigeye Chub (*Hybopsis amblops*) from the Little Vermilion River; 7) the sporadic occurrence of the endangered Sturgeon Chub in the Mississippi River at Grand Tower; 8) numerous records of the endangered Bigeye Shiner (*Notropis boops*) indicating its localized abundance in the Clear Creek system and the Little Vermilion River; 9) the continued occurrence of the River Chub (*Nocomis micropogon*) in the Little Vermilion River, perhaps the only spawning stream known for this fish in Illinois; 10) several records of young-of-the-year Blue Sucker from the mainstem Mississippi and Wabash rivers, the first evidence of spawning in Illinois waters in decades; 11) five new records of the endangered Greater Redhorse from the Fox, Vermilion, and Illinois rivers; 12) the first records of the distributionally restricted Spring Cavefish (*Forbesichthys agassizi*) and threatened Bantam Sunfish (*Lepomis symmetricus*) from the middle Cache River drainage; 13) the sporadic occurrence of the endangered Western Sand Darter (*Ammocrypta clara*) in the Mississippi River; and 14) the first record of the Harlequin Darter (*Etheostoma hystrio*) from the

Wabash River of Illinois in over 90 years. We recommend legal protection for three species (i.e., Alabama Shad, Blue Sucker, and Blacktail Shiner) that presently lack any formal conservation status.

INTRODUCTION

At least 187 fishes have been reported over the past century as native to Illinois waters (Burr 1991), with at least 20% of these having been considered rare, endangered, or threatened (Table 1). Some of these jeopardized species are now considered extirpated, while others disappeared so many years ago that they never made it onto any list of imperiled species. Since the early 1970s, a number of workers have compiled lists or accounts of jeopardized Illinois fishes, including Lopinot and Smith (1973), Smith and Page (1981), Herkert (1992, 1994), and the Illinois Endangered Species Protection Board [IESPB] (1989, 1990, 1994). These reports document that at least 39 native Illinois fishes have for various reasons warranted some form of legal protection. The historical data base on Illinois fishes (Forbes and Richardson 1908, Smith 1979) continues to be enlarged by personnel working for agencies charged with protecting and managing the State's natural resources as well as by university and other personnel interested in rare fishes. As a consequence, new records of rare species accrue annually but seldom are reported in any formal manner. New information on potentially rare or jeopardized fishes assists resource management personnel in making informed decisions regarding protection status and fiscal needs.

Since the most recent reviews (Herkert 1992, 1994) of endangered and threatened fishes have appeared, status surveys of seven potentially jeopardized fishes have been completed (EA Engineering, Science, and Technology 1994, Taylor et al. 1994). In addition, Page et al. (1992) summarized data on aquatic biodiversity for Illinois streams and provided drainage by drainage accounts of rare fishes with the ultimate goal of identifying Illinois' most biologically significant streams.

We report here records for 15 potentially jeopardized Illinois fish species and evaluate their conservation status in light of recent discoveries. Additionally, we confirm the presence in Illinois of several fishes known only to a few specialists and of a few species thought to have been extirpated from the State.

METHODS AND MATERIALS

Records are based on collections made by the authors, the Illinois Department of Natural Resources (IDNR), and collections deposited at the Illinois Natural History Survey (INHS) and Southern Illinois University at Carbondale (SIUC). Collections were made using minnow and bag seines, a boat-mounted electrofishing unit or gill nets. Measurements are in mm standard length (SL) for all species, except *Lampetra aepyptera*, which are in mm total length (TL). Most records reported here are from the late 1980s and early 1990s and are meant to show recent effort in searching for and finding rare Illinois fishes. A number of the new records result from incidental capture during routine surveys of drainages, surveys targeted for particular species, or from general collecting in poorly worked areas. The use of common and scientific names of fishes is somewhat eclectic, but generally follows the recommendations of Robins et al. (1991) or Page and Burr

(1991). Species accounts include catalog number, number of specimens followed by their range in SL or TL (in parentheses), stream or lake name, major drainage (in parentheses), common locality (legal locality in parentheses when available), county, and date of capture. Genera and species are treated alphabetically within the general phylogenetic scheme presented by Robins et al. (1991).

RESULTS

Least Brook Lamprey

Lampetra aepyptera

SIUC 22207 (1, 120 mm), Bay Creek (Ohio R. Dr.), 0.5 mi. W Robbs (T12S, R5E, Sec. 19NW), Pope Co., 4 September 1991; SIUC 22224 (1, 121 mm), Sugar Creek (Saline R. Dr.), at Rt. 166 bridge, 0.5 mi. SE Creal Springs (T10S, R3E, Sec. 25), Williamson Co., 16 September 1993; SIUC 22218 (1, 149), Sugar Creek (Saline R. Dr.), 1.0 mi. SSE Creal Springs (T10S, R3E, Sec. 36SW), Williamson Co., 16 September 1993; SIUC 21234 (1, 127 mm), Big Grande Pierre Creek (Ohio R. Dr.), 0.5 mi. upstream of confluence with Rose Creek (T11S, R7E, Sec. 15S), Pope Co., 11 August 1986; SIUC 22880 (1, 166 mm), Big Creek (Ohio R. Dr.), 3.5 airmi. NNW Elizabethtown at Iron Furnace (T12S, R8E, Sec. 3), Hardin Co., 12 February 1994; SIUC 11907 (1, 136 mm), Lusk Creek (Ohio R. Dr.), at Co. Rd. 5 bridge, 2.8 mi. SE Eddyville (T12S, R6E, Sec. 16SE), Pope Co., 22 March 1985; SIUC 18935 (1, 131.2 mm), same location as SIUC 11907, 26 October 1991.

Remarks: Smith (1979) reported *Lampetra aepyptera* from small streams draining into the Ohio River in southeastern Illinois including Big Creek, Big Grande Pierre Creek, and Sugar Creek. Our records confirm that this species occurs in Big Grande Pierre Creek where it was previously known only from a 26-mm ammocoete (Smith 1979). Also confirmed is the occurrence of this species in Sugar Creek where the previous record was based on a sample taken in the mid-1950s. In addition, the range of this species is now known to include Lusk Creek and Bay Creek, with Lusk Creek records based on pre-spawning males. Smith's (1979:7) suggestion that this species "probably occurs throughout the eastern portion of the Shawnee Hills of southern Illinois" is now substantiated (Fig. 1). As judged from its limited range and few high-quality spawning streams, *L. aepyptera* is considered threatened in Illinois. Information is needed on spawning sites, spawning dates, population size, and threats to continued existence before a more informed status evaluation can be made. The proposed impoundment of Sugar Creek, Williamson County, will almost certainly remove a known population from the species' limited range in Illinois.

Alligator Gar

Atractosteus spatula

SIUC [photograph record] (1, ca. 1,750 mm), Mississippi River (Gulf of Mexico Dr.), in Nine-Mile Shute at Grand Tower, Jackson Co., 1955.

Remarks: As Smith (1979) noted, *Atractosteus spatula* has apparently always been rare in Illinois waters, and the only voucher specimen known from the state is a juvenile collected in 1935 from the Illinois River, locality unknown (INHS 64422). In 1944, 85 *A. spatula* were netted at five stations on the Mississippi River between Grafton and

Cairo (Barnickol and Starrett 1951); 80 of these were captured at Cairo. Additional records of this species are based on literature reports and personal communications judged to be reliable, or of photographs of large adults that are unmistakable as another gar species. The photographic record reported here is of a large adult caught by Mr. C. E. Nickles, formerly of Jonesboro. Roy C. Heidinger, SIUC Fisheries Biologist, caught on hook and line a large adult (>2 m) from the Mississippi River below Windfield Lock & Dam 25 near Batchtown, Calhoun County, in 1963. The huge size of this individual rules out all other gar species known from the Midwest. In 1964, Ora M. Price, then an IDOC Fisheries Biologist, reported a 67 inch (1.7 m) individual captured in a trammel net by a commercial fisherman from Horseshoe Lake, Alexander County (Burr and Heidinger 1994). No post-1970 records of this fish are known from Illinois waters, and these records serve to further document the historical occurrence of this fish in Illinois. *Atractosteus spatula* has declined precipitously in the upper Mississippi basin (Burr and Page 1986) and only occasional waifs from more southerly regions might be expected in Illinois. The species is considered extirpated in Illinois.

Alabama Shad

Alosa alabamae

SIUC 23596 (1, 76.9 mm), Mississippi River (Gulf of Mexico Dr.), just downstream from mouth of Marys River [near Chester] (T7S, R6W, Sec. 33), Randolph Co., 12 November 1994; SIUC 24824 (1, 75.4 mm), Mississippi River (Gulf of Mexico Dr.), at Grand Tower, Devils Backbone Park (T10S, R3W, Sec. 22SW), Jackson Co., 29 September 1995.

Remarks: *Alosa alabamae*, one of the few remaining anadromous species in the Midwest, is one of the most poorly known fishes in Illinois. Smith (1979) reported only a single juvenile (62.2 mm) from the Mississippi River, Monroe County, collected 21 August 1962 (INHS 20096). In the early 1900s, prior to the construction of numerous dams on rivers, this fish spawned near the Keokuk region of the Mississippi River (Coker 1930). Since that time, the only known spawning reaches in the entire upper Mississippi basin are in a few streams in east-central Missouri (Pflieger 1975). Spawning occurs in May and June and young about 100 mm TL (lengths of our specimens are SL) captured in the fall "are presumably making their way back to the sea" (Smith 1979:28). Our specimens, both captured during the fall, are the first records in over 30 years of the Alabama Shad in the Mississippi River and confirm the occasional presence of juveniles presumably en route to the sea. This species has never been placed on Illinois' rare fishes list. It is possible that the species still spawns in Illinois waters. If so, some level of protection should be accorded the species.

Blacktail Shiner

Cyprinella venusta

SIUC 25012 (1, 26.7 mm), Mississippi River at Thebes Access, RM 43.8 (T15S, R3W, Sec. 8SW), Alexander Co., 18 September 1986; SIUC 22639 (1, 53.8 mm), Clear Creek (Mississippi R. Dr.), at mouth (T14S, R3W, Sec. 3SW), Alexander Co., 11 November 1993; SIUC 22378 (4, 41.8 - 48.0 mm), Dutch Creek (Clear Cr. Dr.), near mouth of Caney Fork, 2.75 mi. ENE Ware (T12S, R2W, Sec. 20SE), Union Co., 28 September 1993; SIUC 23054 (1, 37.8 mm), Lake Creek (Cache R. Dr.), at 2nd bridge below Horseshoe Lake spillway (T16S, R2W, Sec. 14), Alexander Co., 25 June 1994; SIUC

21165 (1, 49.5 mm), Lusk Creek (Ohio R. Dr.), 0.8 mi. E of Wattersburg (T13S, R6E, Sec. 16SE), Pope Co., 1986.

Remarks: Taylor et al. (1994) reviewed the historical records and conservation status of *Cyprinella venusta* in Illinois. They pointed out that the narrow Illinois range of this fish, with spawning reaches limited to southwestern Illinois (Clear Creek drainage), low numbers of individuals, and evidence of continued hybridization with the Red Shiner, *C. lutrensis*, has placed the species in a more precarious position than previously known; threatened status was recommended. Our records extend the range of the species in the Clear Creek system to Dutch Creek, perhaps the northernmost extent of this species' range. A post-flood individual is available from Horseshoe Lake, Alexander County. Cook (1994) recently identified specimens (SIUC 22419, 22383, 22282, 22376) as morphological intermediates between *C. venusta* and *C. lutrensis* from throughout the Clear Creek drainage. An additional hybrid involving these two parental species was also identified from Lake Creek, Alexander County, in 1994 (SIUC 23090). We concur that this species should be provided threatened status in Illinois.

Cypress Minnow

Hybognathus hayi

SIUC 21694 (10, 31.3 - 37.0 mm), Horseshoe Lake spillway (Cache R. Dr.), 1.0 mi. E of Miller City (T16S, R2W, Sec. 21NE), Alexander Co., 29 June 1993; SIUC 20187 (1, 67.7 mm), Cypress Creek (Cache R. Dr.), 1.5 mi. W of White Hall (T14S, R1E, Sec. 1SE), Pulaski Co., 9 June 1992.

Remarks: Warren and Burr (1989) reviewed the status of *Hybognathus hayi* in Illinois and recorded its historical occurrence from the Big Muddy River, Clear Creek, Horseshoe Lake, and Cache River drainages. Their status survey revealed that the species was extirpated from the Big Muddy River and Clear Creek drainages. Our records confirm the continued existence of this species in the middle reach of the Cache River (Muir et al. 1995) and the Horseshoe Lake drainage. Specimens from Horseshoe Lake represent young-of-the-year and indicate spawning prior to the flood of 1993. Extensive sampling of the Clear Creek drainage by Cook (1994) and monitoring of the Horseshoe Lake drainage over the past two years has not revealed additional occurrences of the species, nor were any found in a recent survey of the middle Cache River (Cook et al. 1995). The sporadic distribution, general rarity, and extirpation of known historical populations argues for this species' continued status as endangered in Illinois.

Bigeye Chub

Hybopsis amblops

SIUC 20608 (1, 55.5 mm), Little Vermilion River (Wabash R. Dr.), at Peabody Coal property, 3 mi. ESE Georgetown (T17N, R11W, Sec. 2), Vermilion Co., 2 September 1992.

Remarks: Warren and Burr (1988) reviewed the status of *Hybopsis amblops* in Illinois and agreed with Smith (1979) that the species was extirpated from the state, having been last collected in 1961. Their study included searches at 20 sites historically known to harbor the species, including sampling of suitable habitat in the Little Vermilion River. In a recent study by IDOC stream biologists a single adult *H. amblops* was discovered

among several thousand cyprinids collected from the Little Vermilion River representing the first collection of this species from Illinois in over 30 years. Although suitable habitat is present there and in other locations in Vermilion County, the lack of additional specimens despite considerable effort expended to find the species, indicates its extreme rarity. Additional searches are warranted to help locate a viable (i.e., reproducing) population of this state endangered species in Illinois waters.

Sturgeon Chub

Macrhybopsis gelida

SIUC 22921 (3, 26.2 - 28.0 mm), Mississippi River (Gulf of Mexico Dr.), at Grand Tower [aerial pipeline crossing] (T10S, R4W, Sec. 23SE), Jackson Co., 24 February 1994; SIUC 24086 (1, 23.9 mm), Mississippi River (Gulf of Mexico Dr.), at Grand Tower [Devil's Backbone Park] (T10S, R4W, Sec. 23SE), Jackson Co., 1 April 1995.

Remarks: As Smith (1979) noted, *Macrhybopsis gelida* is one of the rarest of Illinois fishes, being restricted to the Mississippi River mainstem below the mouth of the Missouri River. In a one-year study of the composition of Mississippi River shoreline fishes at Grand Tower, Klutho (1983) collected only five individuals of this species in swift water over gravel and sand. Annual sampling of the Mississippi River shoreline for over 10 years by IDOC fisheries biologists has not yielded this species. Our recent records demonstrate the continued occurrence of this species in the Illinois portion of the lower Mississippi River, although it appears to be localized and extremely rare. The recent appearance of this species may be correlated with several years of spring/summer floods, as a closely related species, *Macrhybopsis aestivalis*, spawns during flood events (Bottrell et al. 1964). The decline of this species over much of its range in the Missouri River basin has led to its consideration as a candidate for listing (i.e., a C1 species) as an endangered or threatened species by the U.S. Fish & Wildlife Service (Weldon 1993) and recent addition of the species to the list of endangered Illinois fishes (Table 1).

Bigeye Shiner

Notropis boops

SIUC 20610 (6, 40.0 - 58.7 mm), Little Vermilion River (Wabash R. Dr.), at Peabody Coal property, 3.0 mi. ESE Georgetown (T17N, R11W, Sec. 2), Vermilion Co., 2 September 1992; SIUC 20636 (6, 49.5 - 64.5 mm), Little Vermilion River (Wabash R. Dr.), at Fliermans Nature Preserve (T17N, R11W, Sec. 5), Vermilion Co., 2 September 1992; SIUC 20620 (4, 54.2 - 67.5 mm), Little Vermilion River (Wabash R. Dr.), above Hwy. 150, 1.0 mi. S Georgetown (T17N, R11W, Sec. 6), Vermilion Co., 1 September 1992; SIUC 20721 (6, 44.0 - 64.8 mm), Little Vermilion River (Wabash R. Dr.), above steel bridge, 1.5 mi. N Humrick (T17N, R11W, Sec. 12N), Vermilion Co., 2 September 1992; SIUC 20591 (1, 48.5 mm), Little Vermilion River (Wabash R. Dr.), above Humrick Rd., 0.5 mi. SE Georgetown (T18N, R11W, Sec. 33SW), Vermilion Co., 1 September 1992; SIUC 22256 (5, 41.7 - 61.7 mm), Green Creek (Clear Cr. Dr.), at Hwy. 146 pull-off, 3.5 mi. E of Ware T12S, R2W, Sec. 21SE), Union Co., 1 July 1993; SIUC 22380 (19, 42.7 - 59.6 mm), Dutch Creek (Clear Cr. Dr.), near mouth of Caney Fork, 2.75 mi. ENE of Ware (T12S, R2W, Sec. 20SE), Union Co., 28 September 1993; SIUC 22367 (18, 23.6 - 54.5 mm), Dutch Creek (Clear Cr. Dr.), S of Hwy. 146 bridge, 3.25 mi. E of Ware (T12S, R2W, Sec. 28NW), Union Co., 9 September 1993; SIUC 22359 (2, 55.5 - 62.2 mm), Hutchins Creek (Clear Cr. Dr.), at U. S. Forest Service

property, 2.5 mi. NE (town of) Wolf Lake (T11S, R3W, Sec. 25SW), Union Co., 4 August 1993; SIUC 22384 (1, 43.9 mm), Clear Creek (Mississippi R. Dr.), at U. S. Forest Service access rd., off Co. Rd. 19, 1.75 mi. W of Mountain Glen (T11S, R2W, Sec. 27SW), Union Co., 21 September 1993; SIUC 22423 (9, 36.9 - 53.0 mm), Clear Creek (Mississippi R. Dr.), 2.5 mi. WNW Mountain Glen (T11S, R2W, Sec. 28S), Union Co., 5 October 1993; SIUC 22263 (19, 35.9 - 57.4 mm), Sexton Creek (Clear Cr. Dr.), near ford in creek, 2.5 mi. NE Gale (T14S, R3W, Sec. 25NE), Alexander Co., 23 June 1993; SIUC 22311 (17, 33.4 - 58.7 mm), Miller Creek (Clear Cr. Dr.), at bridge 1 mi. E of Thebes (T15S, R3W, Sec. 9SE), Alexander Co., 23 June 1993; SIUC 22420 (5, 36.3 - 52.4 mm), Seminary Fork (Clear Cr. Dr.), at bridge on Co. Rd. 19, 2.25 mi. NW of Mountain Glen (T11S, R2W, Sec. 21SE), Union Co., 5 October 1993; SIUC 22841 (2, 28.2 - 30.7 mm), Mississippi River (Gulf of Mexico Dr.) at Picayune Chute, 2.75 mi. WNW McClure (T14S, R3W, Sec. 6N), Alexander Co., 25 October 1993.

Remarks: Smith (1979) documented the sporadic distribution and rarity of *Notropis boops* noting that it was probably never abundant in Illinois except in the Vermilion and Little Vermilion River systems. Lack of population knowledge of this species and its presumed extirpation from stream reaches in the Kaskaskia and Little Wabash Rivers led to its upgrading from threatened to endangered between 1990 and 1994 (Table 1). Our recent collections from the Little Vermilion River confirm its historical abundance there. In addition, Cook (1994) found that this species had expanded its range northward in the Clear Creek system of southwestern Illinois where it is now common in streams (e.g., Green, Dutch, and Hutchins creeks) where it had never been previously reported despite intensive sampling over a period of years by several investigators. We also document this species from a side channel (Picayune Chute) of the Mississippi River. Although the status of historically known populations in the Illinois, Kaskaskia, and Little Wabash rivers remains poorly known, the species is thriving in the Little Vermilion River and Clear Creek. *Notropis boops* is sporadic and rare, but much more common than several other endangered species (e.g., *E. histrio*, *H. amblops*, *H. hayi*) discussed here. This species should be considered for downgrading to the threatened category.

River Chub

Nocomis micropogon

SIUC 20609 (1, 130 mm), Little Vermilion River (Wabash R. Dr.), at Peabody Coal property, 3.0 mi. ESE Georgetown (T17N, R11W, Sec. 2), Vermilion Co., 2 September 1992; SIUC 20720 (2, 110 - 111 mm), Little Vermilion River (Wabash R. Dr.), above steel bridge, 1.5 mi. N Humrick (T17N, R11W, Sec. 12N), Vermilion Co., 2 September 1992.

Remarks: Burr et al. (1988) reported the first records of *Nocomis micropogon* from the Little Vermilion River; prior records included only two localities from the mainstem Wabash River in Clark and Lawrence counties (Smith 1979). Our recent records document the continued occurrence of this species in the Little Vermilion River and strongly suggest that this may be the only potential spawning stream known in Illinois. Abundant rocky substrate in the Little Vermilion River provides appropriate nesting habitat for the species. *Nocomis micropogon* was recently added to the Illinois endangered list.

Blue Sucker

Cycleptus elongatus

All vouchered records are Mississippi River, Gulf of Mexico Drainage. SIUC 23892 (1, 21.3 mm), Pool 24, RM 296.1 at Cincinnati Landing (T5S, R7W, Sec. 26SE), Pike Co., 10 June 1993; SIUC 23935 (1, 21.3 mm), Pool 24, RM 280.5 at Delair Access (T7S, R5W, Sec. 20), Pike Co., 10 June 1993; SIUC 23931 (1, 22.4 mm), Pool 24 about 7.5 mi. SW Pleasant Hill [in Pike County], Calhoun Co., 11 June 1993; SIUC 24948 (1, 28.1 mm), RM 244.7, 3 mi. NW Batchtown (T12S, R2W, Sec. 6), Calhoun Co., 10 June 1992; SIUC 25460 (1, 15.7 mm), at Piasa Harbor, RM 209.5, Jersey Co., 17 June 1994; SIUC 23923 (1, 34.0 mm), RM 125.2 at Little Rock Ferry, Randolph Co., 11 June 1993; SIUC 24945 (1, 152 mm), at rock dikes, 4 mi. NW Chester (T7S, R7W, Sec. 15SE), Randolph Co., 29 August 1995; SIUC 24886 (1, 22.4 mm), at Grand Tower aerial pipeline (T10S, R4W, Sec. 23SE), Jackson Co., 16 June 1994; SIUC 23934 (1, 24.4 mm), RM 43.9 at Thebes Public Access (T15S, R3W, Sec. 8SE), Alexander Co., 11 June 1992.

Remarks: According to Smith (1979), *Cycleptus elongatus* had been declining in abundance for many years due in part to dams on navigable rivers, deterioration of water quality, excessive catches of adults in spawning runs, and gradually decreasing depths of river channels from sedimentation. Prior to 1993, the only vouchered young-of-the-year specimen known from Illinois had been collected in 1972 from the Mississippi River, Rock Island Co., RM 506. Seven vouchered collections of young-of-the-year from the Mississippi River in Alexander County (Thebes) north to Pike County (Cincinnati Landing) (Fig. 1) demonstrate recent reproduction, strongly correlated with the 1993 and 1994 floods. Recent (1995) capture of a 152-mm individual demonstrates that some recruitment is occurring in Illinois. The Illinois Department of Natural Resources (IDNR) Streams Database contains a number of records of young-of-the-year/juvenile (sensu Moss et al. 1983) *Cycleptus* from the mainstem Mississippi and Wabash rivers (Fig. 1) between 1972 and 1992 indicating that reproduction has occurred sporadically in these large rivers over the past 20 years. We accept these records as valid even though they are not vouchered. Most records of adults of this species are from the Wabash River, probably not coincidentally the longest free-flowing (i.e., unimpounded) river in the eastern United States. One of us (GLS) collected 16 *C. elongatus* ranging in size from 148 to 675 mm from the Wabash River, Clark County, in 1988 (Fig. 1). Rupprecht and Jahn (1980) reported on the biology of *C. elongatus* in Pool 20 of the Mississippi River. They found adult males in breeding condition in April, but no ripe females. A recent article in *Fisheries* (Anonymous 1993) reported the capture of many young-of-the-year in the upper Mississippi River suggesting that it is a species, along with many others, that reproduces in large numbers in response to a "flood pulse." This species has never been placed on Illinois' rare or endangered fishes lists (Table 1), but is a candidate for listing (i.e., a C2 species) as a federally endangered species by the U.S. Fish & Wildlife Service (Elstad and Werdon 1993). We recommend this species be considered for listing as threatened in Illinois.

Greater Redhorse

Moxostoma valenciennesi

INHS 65239 (1, 382 mm), Illinois River (Mississippi R. Dr.), 3.5 mi. SSW Channahon, Dresden Island Lock and Dam (T34N, R8E, Sec. 25), Grundy Co., 1987-1989;

INHS 30925 (1, 435 mm), Fox River (Illinois R. Dr.), at Mooseheart, just below mouth of Mill Creek, 0.75 mi. upstream Route 56 (T39N, R8E, Sec. 33NE), Kane Co., 26 October 1993; INHS 61192 (1, 292 mm), Fox River (Illinois R. Dr.), at Yorkville, Hwy. 47 crossing (T37N, R7E, Sec. 32NE), Kendall Co., 29 August 1991; INHS 59345 (1, 385 mm), Mud Creek (Vermilion-Illinois R. Dr.), 2.0 mi. NW Cornell (T30N, R4E, Sec. 33SE), Livingston Co., 2 August 1990; SIUC 19736 (2, 306 - 345 mm), Vermilion River (Illinois R. Dr.) at Hummiston Woods, 5.0 mi. NW Pontiac (T29N, R4E, Sec. 36), Livingston Co., 9 July 1991.

Remarks: This species, known historically from one specimen collected in Salt Creek, DuPage County, 1901, was considered extirpated from the State (Smith 1979). Seegert (1986) reported the first modern record of this species, a single adult from the upper Illinois River, Mile 249, taken with electrofishing equipment. Since his report, *Moxostoma valenciennesi* has been captured on five different occasions from five new localities in the Fox, Vermilion, and mainstem Illinois rivers (Fig. 1). All specimens were collected with electrofishing gear, probably the most effective method of sampling for species of *Moxostoma*. Similarly, electrofishing surveys revealed previously unknown populations of *M. valenciennesi* and the River Redhorse, *M. carinatum*, in Ohio streams (Yoder and Beaumier 1986). All vouchered specimens are adults suggesting that either reproduction or recruitment is low in Illinois, or that young are more difficult to collect than adults. Seegert (1991) captured 18 juveniles and adults (ca. 300-550 mm TL) from three of seven locations on the Vermilion River and one of its tributaries (Rooks Creek). Searches for spawning reaches in the Fox, Vermilion, and adjacent rivers are needed. This species is still the rarest of the six species of *Moxostoma* recorded from the state and is considered endangered in Illinois. It is a candidate for listing (i.e., a C2 species) as a federally endangered species by the U.S. Fish & Wildlife Service.

Spring Cavefish

Forbesichthys agassizi

SIUC 24816 (1, 40 mm), Cypress Creek (Cache R. Dr.), 2 mi. N Perks (T13S, R1E, Sec. 35), Pulaski Co., 13 April 1995.

Remarks: Smith (1979) reported this species (as *Chologaster agassizi*) from springs in the Clear Creek drainage and from springs and spring outlets in Hardin and Johnson counties (Big and Bay Creek drainages). Our record is the first from the Cache River drainage and fills a distributional gap between the populations known from southeastern and southwestern Illinois across the Shawnee Hills. Prior to population studies conducted in southern Illinois (Smith and Welch 1978), *Forbesichthys agassizi* was considered endangered (Lopinot and Smith 1973). A clearer understanding of its population size, mostly subterranean existence, and predilection for isolation in caves, springs, spring outlets, and swamp margins resulted in its removal from consideration as endangered or threatened in Illinois. Research presently underway on caves, springs, and groundwater pollution in Illinois waters (e.g., Webb et al. 1993) will allow for a more informed decision regarding future status of and threats to this unusual species.

Bantam Sunfish*Lepomis symmetricus*

SIUC 25847 (1, 27.1 mm), Running Lake Ditch, 0.5 mi. W Ware (T12S, R3W, Sec. 26), Union Co., 30 March 1996; SIUC 22661 (2, 32.1 - 43.0 mm), pool (Clear Cr. Dr.), at culvert on Tamms Rd., 1.5 mi. E McClure (T14S, R3W, Sec. 11NW), Alexander Co., 11 November 1993; SIUC 22678 (4, 28.5 - 55.1 mm), Clear Creek (Mississippi R. Dr.), 2.0 mi. SE Reynoldsville (T13S, R2W, Sec. 30SE), Union Co., 4 September 1993; SIUC 22582 (1, 23.5 mm), Clear Creek (Mississippi R. Dr.), 2.25 mi. ENE of McClure (T14S, R3W, Sec. 1SW), Alexander Co., 23 October 1993; SIUC 22601 (1, 42.5 mm), Clear Creek (Mississippi R. Dr.), 3.25 mi. NE Gale (T14S, R3W, Sec. 22NE), Alexander Co., 11 November 1993; SIUC 22697 (1, 25.5 mm), backwaters (Mississippi R. Dr.), near mouth of Clear Creek (T14S, R3W, Sec. 33), Alexander Co., 11 November 1993; SIUC 24402 (1, 19.9 mm), Lake Creek (Cache R. Dr.) at first bridge below spillway of Horseshoe Lake (T16S, R2W, Sec. 22), Alexander Co., 29 June 1995; SIUC 26054 (3, 49.3 - 52.1 mm), flooded ditches east of picnic area, adjacent Horseshoe Lake spillway (T16S, R2W, Sec. 22), Alexander Co., 15 May 1996; SIUC 24798 (3, 20.8 - 51.5 mm), Buttonland Swamp (Cache R. Dr.), 1.5 mi SE Perks (T14S, R1E, Sec. 13), Pulaski Co., 21 July 1995; SIUC 24809 (4, 27.0 - 49.0 mm), Limekiln Slough (Cache R. Dr.), 4.0 mi. E Ullin (T14S, R1E, Sec. 21), Pulaski Co., 29 July 1995.

Remarks: Smith (1979) considered the range of *Lepomis symmetricus* to be limited in Illinois to the LaRue Pine Hills - Wolf Lake region of Union County. The species reaches its greatest abundance in Illinois in swamps. Burr et al. (1988) provided records that extended the Illinois range of this species south through the Clear Creek drainage to Horseshoe Lake, Alexander County. Records reported here demonstrate a nearly continuous occurrence of *L. symmetricus* in the Clear Creek drainage, including three records from the mainstem. The flood of 1993 presumably contributed to the spread of this species and to its occurrence in atypical mainstem stream habitats (Cook 1994). The surprising recent records are from the Cache River drainage in Buttonland Swamp and Limekiln Slough where previous collections (e.g., Smith 1979, Phillippi et al. 1986, Warren and Burr 1989, Muir et al. 1995) made in suitable habitat failed to produce the species. At least two age classes are represented in the Cache River samples indicating successful reproduction has occurred in the drainage. This species is considered threatened in Illinois.

Western Sand Darter*Ammocrypta clara*

SIUC 22884 (1, 43.5 mm), Mississippi River (Gulf of Mexico Dr.), RM 234 at Martins Landing (T13S, R2W, Sec. 21SE), Calhoun Co., 19 May 1988; SIUC 22808 (1, 32.5 mm), Mississippi River (Gulf of Mexico Dr.), RM 125 at Little Rock Ferry, Randolph Co., 1 September 1989. SIUC 24085 (4, 49.0 - 50.5 mm), Mississippi River (Gulf of Mexico Dr.), RM 223, Pool 26, at Royal Landing (T13S, R1W, Sec. 22NW), Calhoun Co., 4 August 1994; SIUC 24951 (1, 27.7 mm), Mississippi River (Gulf of Mexico Dr.), RM 183.2 at Merchants RR bridge (T3N, R12W, Sec. 26), Madison Co., 16 September 1994.

Remarks: Smith (1979) reported *Ammocrypta clara* from the Mississippi River above the mouth of the Missouri River and from the Kaskaskia and Sugar rivers in inland Illinois. Dimmick (1988) reported the first records in Illinois of this species from the Mis-

Mississippi River below the mouth of the Missouri River. Tucker and Cronin (1996) noted a new locality in the Mississippi River at Hat Island, Calhoun County, with all specimens taken over sand in swift water. Our records document a somewhat more continuous range of this species in the Mississippi River on the Illinois side in Randolph, Madison, and Calhoun counties. Numerous collecting trips to the large sand bar on the Mississippi River at Grand Tower where Dimmick (1988) captured specimens in 1985 and 1987 have not resulted in additional records. A small, highly localized population exists in the Kankakee River. A single juvenile was collected near Custer Park in 1988, a single subadult was collected downstream of Wilmington in 1990, and three adults were collected downstream of Wilmington in 1992 (Seegert 1992). This species is very rare in Illinois and is not easily sampled unless abundant clean sand habitat in swift water is available and fine mesh nets are used. The lack of suitable habitat in the Mississippi River and elsewhere in Illinois is certainly a factor in this species' rarity as well as the degradation of former habitat in the Kaskaskia River. *Ammocrypta clara* is considered endangered in Illinois. Although our few records and those of Tucker and Cronin (1996) document a wider range for this species than formerly known, it warrants endangered status because of largescale habitat loss.

Harlequin Darter

Etheostoma histrio

SIUC 24444 (1, 27.8 mm), Wabash River (Ohio R. Dr.), 1.0 mi. NW of Mount Carmel (T1S, R12W, Sec. 16NE), Wabash Co., 29 July 1995; SIUC 24861 (1, 59 mm), Wabash River (Ohio R. Dr.), at downstream end of Mink Island, 5.0 mi. NE Maunie (T5S, R14W, Sec. 27NW), White Co., 30 October 1995.

Remarks: According to Smith (1979) the only extant population of *Etheostoma histrio* occurred in a 20-mile reach of the Embarras River in Cumberland and Jasper counties, and represents the northernmost known occurrence of the species. Recent records (post-1984) of *E. histrio* from the Embarras River are lacking. There is general concern that the Embarras River population may be at very low population levels or extinct, in part because the dam on the Embarras River below Charleston breached in 1985 releasing an excessive silt load downstream (P. A. Ceas, pers. comm.). Smith (1979) also suggested that an unvouchered record of *Etheostoma zonale* reported from the Wabash River, White County, by Forbes and Richardson (1908) in actuality represented *E. histrio*. Our records are the first known occurrences of *E. histrio* on the Illinois side of the Wabash River in nearly a century, and confirm the existence of this species in Illinois outside of the Embarras River population. One record is very near the presumed Forbes and Richardson locality, and the other is about 60 river miles north of it. Our specimens document that adults and young-of-the-year occupy parts of the lower Wabash River, but may not represent a viable population. The chronology of this species in the lower Wabash River is remarkably similar to that in adjacent Indiana. In Indiana, over 100 years elapsed between the time when Jordan (1890) collected *E. histrio* and when it was next collected in the state by one of us (GLS). We recommend continued endangered status for this species.

DISCUSSION

During the approximately 150 years since Europeans actively colonized Illinois, changes in the fish fauna have been profound. For example, since the late 1970s over 20 nonnative fishes have been reported in Illinois, a number of which are now reproducing in State waters (Burr et al. 1996). Of the 187 native species, a few have expanded their ranges and are now more abundant and more generally distributed than formerly, but many more have been decimated to some degree by the widespread modification of habitats and deterioration of water quality. Prior to the passage of the federal Endangered Species Act in 1973, attempts had been made (e.g., Lopinot and Smith 1973) to list species as rare or endangered on the basis of their natural rarity, restricted distribution, and paucity of habitat as well as on the basis of immediate or potential threats to their existence within Illinois (Smith 1979). After implementation of the act, terminology was revised to include the categories endangered and threatened. Because the Longjaw Cisco, *Coregonus alpenae* (see Table 1), is no longer considered a valid species (Smith and Todd 1984) and was never officially reported from the Illinois waters of Lake Michigan, only one Illinois species (Pallid Sturgeon [*Scaphirhynchus albus*]) qualifies as federally endangered (actively threatened with extinction) throughout all or a significant portion of its range.

The Illinois Endangered Species Act of 1972 (amended in 1977) provides for some protection of rare fishes. Lists and accounts (Lopinot and Smith 1973, Smith and Page 1981, IESPB 1989, 1990, 1994, Herkert 1992, 1994) of rare, endangered, or threatened species have continued to be revised and updated (Table 1); however, potential threats to jeopardized fishes are always present, and the status of each species is constantly subject to change. A change in status can occur quickly, particularly in a peripheral or relict population or when new information on naturally rare species becomes available.

Since 1973, 39 native fishes have been placed on the various lists of rare, threatened, or endangered species for Illinois (Table 1). Some of these (e.g., Alligator Gar, Alabama Shad, Blackfin Cisco [*Coregonus nigripinnis*], Round Whitefish [*Prosopium cylindraceum*], Cypress Minnow, Bigeye Chub, Greater Redhorse) were formerly so poorly known in Illinois that they were presumed extirpated (Smith 1979) or probably so. Records and surveys in the 1980s and 1990s have revealed that the Alabama Shad, Cypress Minnow, Bigeye Chub, and Greater Redhorse are still present in Illinois, although the Alabama Shad and Bigeye Chub are extremely rare and have not been shown to be reproducing in Illinois.

Of the 15 jeopardized species for which additional records are reported here, three (Sturgeon Chub, Blue Sucker, Greater Redhorse) are candidates for listing as federally endangered or threatened by the U.S. Fish and Wildlife Service and are restricted to large rivers. We agree that the Sturgeon Chub and Greater Redhorse warrant state protection as endangered species, and recommend that because of recent evidence of reproduction, the Blue Sucker be considered for state threatened status. One species, Alligator Gar, has not been seen in Illinois since the 1960s, and our photographic record and anecdotal accounts emphasize the rarity and almost certain extirpation from Illinois; except for the vouchered juvenile specimen, there is no evidence that this species ever reproduced in State waters. Seven of the species are state endangered and occupy a variety of stream sizes. One (Bigeye Shiner) is locally abundant in two stream reaches of both southern and central

Illinois, and is demonstrating successful reproduction in a manner that far exceeds the other species placed in the endangered category. Therefore, we recommend the Bigeye Shiner be downgraded to threatened status. The other six species (Cypress Minnow, Bigeye Chub, River Chub, Greater Redhorse, Western Sand Darter, Harlequin Darter) clearly warrant endangered status, some (e.g., Harlequin Darter) being so rare as to have been considered extirpated (Burr 1991) only a few years ago. Two of the species are state threatened, which seems to be the appropriate category, and one additional species, Black-tail Shiner, is recommended for threatened status. One species, Spring Cavefish, with a restricted range, was found for the first time in the middle Cache River drainage, a location between known sites in southwestern and southeastern Illinois. It has not been listed in any jeopardized category since 1973, and perhaps should be considered as sporadic, but locally common in springs and their outflows (Smith and Welch 1978). We note, however, that there is much present concern for water quality in groundwater habitats (Webb et al. 1993) and that localized pollution problems could severely decimate this species. The Alabama Shad, so rare in Illinois that it was presumed extirpated by some researchers, was found at two locations in the Mississippi River. The Alabama Shad presently receives no formal protection in Illinois and should be considered for such in the future.

Recently, Warren and Burr (1994) reviewed the status of imperiled fishes in the United States and noted that imperilment apparently is not confined to particular taxonomic groups, which is an indication of the widespread and pervasive degradation of aquatic habitats that has occurred over the past century. The same pattern appears to hold for Illinois. We reiterate and emphasize the growing call among aquatic resource professionals that Illinois' fishes and the streams they inhabit need: 1) proactive protective efforts in the form of watershed-wide management plans that manage and conserve our finest remaining streams as identified by Page et al. (1992) rather than just individual species; 2) establishment of a statewide network of aquatic preserves; 3) restoration of our degraded hydrologic units; and 4) continued long-term research programs on fish communities aimed at inventories of abundance and distribution, ecosystem recovery, and riparian-riverine interactions (Warren and Burr 1994). Illinois, with its long history of aquatic research, has made great strides in meeting the goals of points 1 and 4, and we urge the need for concern and prompt action in meeting the objectives of points 2 and 3 in the very near future.

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Table 1. History of Rare (R), Endangered (E), Threatened (T), and Extirpated (Ex) fish species in Illinois according to various authorities. Common names follow Page and Burr (1991) and Warren (1992).

	Lopinot & Smith (1973) ¹	Smith & Page (1981)	IESPB (1989)	IESPB (1990)	IESPB (1994)
1. Northern Brook Lamprey	-	-	E	E	E
2. Least Brook Lamprey	-	-	T	T	T
3. Pallid Sturgeon	R	-	-	-	E
4. Lake Sturgeon	R	T	T	T	E
5. Alligator Gar	R	T	T	T	Ex ²
6. Alabama Shad	R	-	-	-	-
7. Longjaw Cisco	-	E	Ex ³	Ex ³	Ex ³
8. Cisco	R	T	T	T	T
9. Lake Whitefish	Ex	T	T	T	-
10. Blackfin Cisco	Ex	-	-	-	-
11. Round Whitefish	Ex	-	-	-	-
12. Cypress Minnow	-	-	E	E	E
13. River Chub	-	-	-	-	E
14. Bigeye Chub	Ex	E	E	E	E
15. Sturgeon Chub	R	-	-	-	E
16. Sicklefin Chub	R	-	-	-	-
17. Pallid Shiner	E	-	E	E	E
18. Pugnose Shiner	R	T	E	E	E
19. Bigeye Shiner	R	-	T	T	E
20. Ironcolor Shiner	-	-	T	T	T
21. Blackchin Shiner	R	-	T	T	T
22. Blacknose Shiner	R	T	T	T	E
23. Bluehead Shiner	-	E	E	E	E
24. Taillight Shiner	-	-	-	-	E
25. Weed Shiner	-	-	E	E	E
26. Longnose Sucker	-	T	T	T	T
27. River Redhorse	R	-	T	T	T
28. Greater Redhorse	-	-	E	E	E
29. Northern Madtom	R	-	E	E	E
30. Spring Cavefish	E	-	-	-	-
31. Banded Killifish	R	-	T	T	T
32. Banded Pygmy Sunfish	R	-	-	-	-
33. Redspotted Sunfish	-	-	T	T	T
34. Bantam Sunfish	E	T	T	T	T
35. Western Sand Darter	R	-	E	E	E
36. Eastern Sand Darter	-	-	E	E	E
37. Bluebreast Darter	E	E	E	E	E
38. Harlequin Darter	R	E	E	E	E
39. Iowa Darter	-	-	T	T	E

¹ The definition of "endangered" as used in Lopinot and Smith (1973) is not equivalent to that used by the U.S. Fish and Wildlife Service

² Presumed extirpated by Illinois Endangered Species Technical Advisory Committee on Fishes and deleted from IESPB listings

³ Presumed extinct throughout range; taxonomic validity in question

Figure 1. Record stations in Illinois (1985-1995) based on vouchered specimens of: *Lampetra aepyptera* (●); post-larval and young-of-the-year *Cycleptus elongatus* (■); and *Moxostoma valenciennesi* (▲). We have included the record from Seegert (1986) for *M. valenciennesi*. Open squares (□) are unvouchered IDNR reports (1972-1992) of young-of-the-year/juvenile *C. elongatus* from the Mississippi and Wabash rivers.

