Office of Resources Conservation
Division of Fisheries
Region II Streams Program
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# *Summary of Fish Sampling for the Lower Fox River Land Conservation Planning Project*

The Fox River is an important larger river habitat which offers a diverse assemblage of fish species, as well as sport fishing opportunities on a public waterway. The Division of Fisheries maintains a comprehensive monitoring program which includes sampling of fish communities on the rivers and streams throughout the state, including the Lower Fox River. One of the primary uses of the information from these surveys is to measure the overall health of the river for use in water quality reporting, watershed management, permit review, and project evaluation, as well as outreach and education. Targeted sportfish surveys are also used to develop population management activities and to provide information to local anglers.

Due to the importance of the Lower Fox River as a recreational and scenic resource, and the presence of unique flora and fauna, it has been designated by the Illinois DNR as a Conservation Opportunity Area (COA, Figure 1). In this report we summarize results of fish sampling activities in order to provide background information for conservation activities of the Lower Fox River Land Conservation Planning Project.

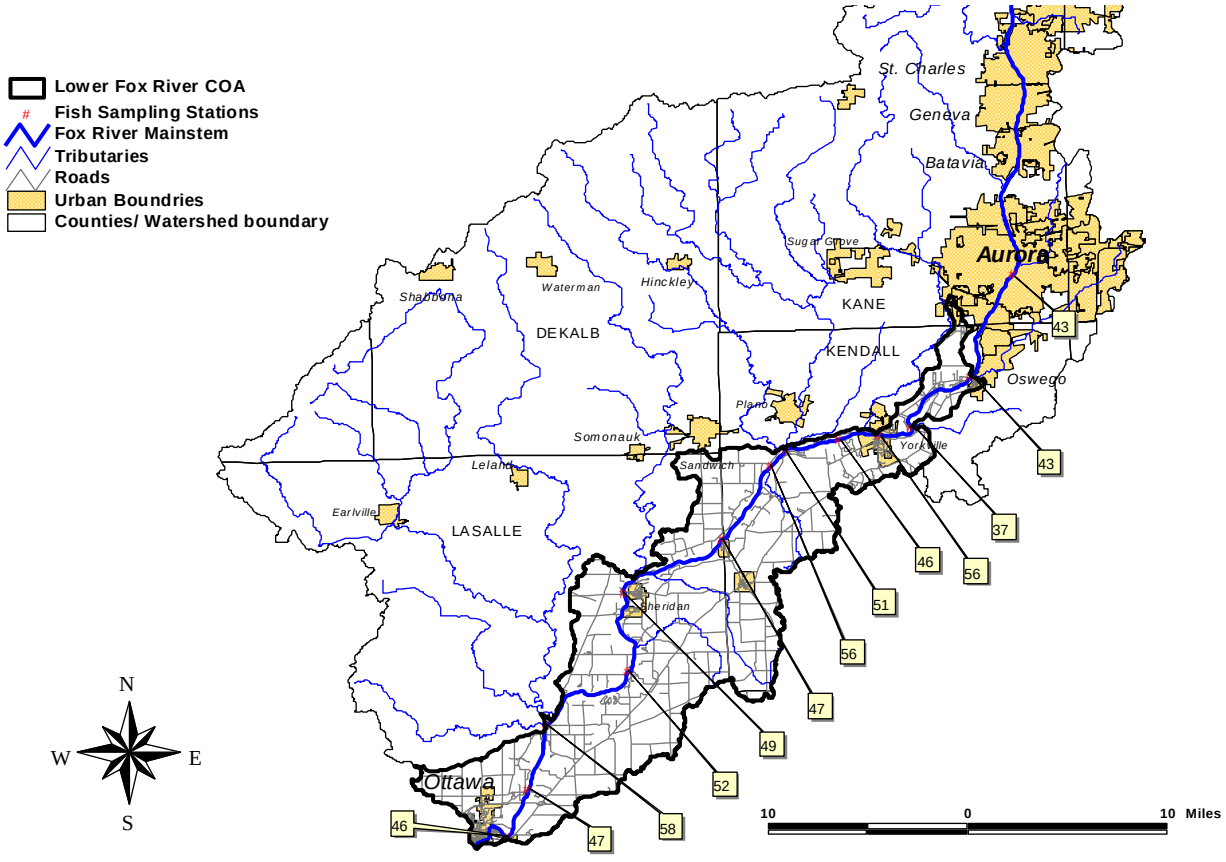


Figure 1. Lower Fox River Conservation Opportunity Area with Illinois DNR sampling station locations and Index of Biotic Integrity scores for each location.

### *Fish Community Samples*

The Lower Fox River COA river segment stretches from Oswego to the confluence with the Illinois River at Ottawa. Since 1978, a total of 31 fish community samples have been performed at 12 locations (Figure 1) on the Lower Fox River within the Conservation Opportunity Area (COA). For all stations combined we collected 31,200 individual fish, representing 67 species from 13 families (Table 1). Fish were collected by boat electrofishing and seining.

The State-threatened river redhorse, a member of the sucker family, has been found throughout much of the Lower Fox River, although in low abundance. The relatively high gradient of the river with many rocky riffles favors sucker species, which are very abundant. Contrary to public opinion, suckers are generally a sensitive, desirable group. Native minnows typically dominate the collections numerically. Their diversity and abundance is another good indicator, along with the diversity of another sensitive group, the darters, belonging to the perch family.


River redhorse

The presence of these indicator species, along with other characteristics of the fish community are used to measure the health of the river with a widely used technique known as the Index of Biotic Integrity (IBI). The IBI is composed of 10 individual metrics which rate several ecological attributes including: species diversity, habitat preference, food habits, and spawning characteristics, as well as tolerance to environmental degradation. Each metric receives a score from 0-10 based on comparison to least impacted reference streams of similar size and geographic region. The total IBI score is the sum of the 10 metric scores, and ranges from 0 to 60, with higher scores representing higher quality.

Using the most recent collections, IBI scores in the Lower Fox River ranged from 37 to 58 (Figure 1). Stream quality was generally lower in the area upstream of the Yorkville Dam where scores ranged from 37 to 43. This section of the river has more urbanized land cover and receives more significant waste water inputs. The dams at Yorkville and Montgomery also have an impact on habitat, water quality, and fish migration (fish passage was installed at the Yorkville Dam in 2010). The areas downstream of the Yorkville Dam had higher scores ranging from 47 to 58, with 5 of 10 stations scoring over 50 points. This river segment from Yorkville to Dayton is the longest free-flowing section on the entire river, which together with less urbanized land cover and diverse habitat, contributes to higher IBI scores. Conditions have been relatively stable since 1996. Prior to 1996 fish data is very limited for the lower Fox River.

Stream quality ratings based on fish community data indicate that the Lower Fox River is currently in good condition, in terms of water quality and habitat. However, incorporating a broader measure of stream quality, which includes aquatic organisms other than fish, the Lower Fox River receives a somewhat lower rating. Like many other river systems, freshwater mussels have been especially affected by past and current water quality and habitat degradation. In the Lower Fox River, mussel populations are below expected levels resulting in lower overall rating compared to less impacted areas of the State. Results of these multi-organism ratings can be found at http://www.dnr.state.il.us/orc/biostrmratings/ .

### *Sport Fishery Investigations*

Routine electrofishing collections specifically targeted for game species have been conducted at six locations and included 28 total collections. Smallmouth bass are one of the most the most abundant and popular sport species in the Lower Fox River. Average catch rate for this species is in the range of 60 individuals per hour of electrofishing; equivalent to or exceeding most other northern Illinois streams. Channel catfish are also very abundant throughout the river. Flathead catfish, walleye, and muskie are also present, and are targeted by many anglers. In addition to routine monitoring, other sport fish management currently underway in the Lower Fox River include: 1). Special investigation on flathead catfish populations which includes sampling and tagging operations to determine population abundance and size structure and 2). Walleye stocking program to supplement natural reproduction.

***Fox River Tributary Streams***

Although many of the Lower Fox River tributaries are not technically included in the COA, these streams are very important to the river ecosystem. They provide essential spawning and nursery areas for many of the river species, especially suckers and smallmouth bass. We have conducted extensive sampling on many of the watersheds in order to characterize stream quality and species distribution. Streams of notable quality include, Big Rock Creek, Rob Roy Creek, Indian Creek, Little Indian Creek, Buck Creek, and Mission Creek. These systems contain many segments with IBI's exceeding 50 points, especially in the lower, unchannelized segments. They also contain some interesting and unique species such as the State-endangered greater redhorse, mottled sculpin, rainbow darter, and largescale stoneroller. Recent DNR management activities on tributary streams include installation of fish passage for two dams on Big Rock Creek and removal of several dams on Waubonsee Creek. Removal of the dam on Blackberry Creek is planned for the near future.

**Rainbow darter (photo by Dan Kirk)**

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Table 1. Species collected in the Lower Fox River Conservation Opportunity Area.

| Family | Common name | Scientific name | Family | Common name | Scientific name |
|---|---|---|---|---|---|
| Lepisosteidae | Shortnose gar | Lepisosteus platostomus | Esocidae | Northern pike | Esox lucius |
| | Longnose gar | Lepisosteus osseus | | Muskellunge | Esox masquinongy |
| Clupidae | Skipjack herring | Alosa chrysochloris | Catostomidae | Smallmouth buffalo | Ictiobus bubalus |
| | Gizzard shad | Dorosoma cepedianum | | Quillback | Carpiodes cyprinus |
| Hiodontidae | Mooneye | Hiodon tergisus | | River carpsucker | Carpiodes carpio |
| Cyprinidae | Grass carp | Ctenopharyngodon idella | | Highfin carpsucker | Carpiodes velifer |
| | Goldfish | Carassius auratus | | White sucker | Catostomus commersoni |
| | Carp | Cyprinus carpio | | Northern hog sucker | Hypentelium nigricans |
| | Golden shiner | Notemigonus crysoleucas | | River redhorse | Moxostoma carinatum |
| | Creek chub | Semotilus atromaculatus | | Shorthead redhorse | Moxostoma macrolepidotum |
| | Hornyhead chub | Nocomis biguttatus | | Black redhorse | Moxostoma duquesnei |
| | Unidentified Stoneroller | Campostoma sp. | | Golden redhorse | Moxostoma erythrurum |
| | Central stoneroller | Campostoma anomalum | | Silver redhorse | Moxostoma anisurum |
| | Largescale stoneroller | Campostoma oligolepis | Cyprinodontidae | Blackstripe topminnow | Fundulus notatus |
| | Suckermouth minnow | Phenacobius mirabilis | Atherinidae | Brook silverside | Labidesthes sicculus |
| | Blacknose dace | Rhinichthys atratulus | Moronidae | White bass | Morone chrysops |
| | Speckled chub | Extrarius aestivalis | | Yellow bass | Morone mississippiensis |
| | Striped shiner | Luxilus chrysocephalus | Centrarchidae | Black crappie | Pomoxis nigromaculatus |
| | Common shiner | Luxilius cornutus | | Rock bass | Ambloplites rupestris |
| | Redfin shiner | Lythrurus umbratilus | | Largemouth bass | Micropterus salmoides |
| | Spotfin shiner | Cyprinella spiloptera | | Smallmouth bass | Micropterus dolomieu |
| | Red shiner | Cyprinella lutrensis | | Green sunfish | Lepomis cyanellus |
| | Fathead minnow | Pimephales promelas | | Bluegill | Lepomis macrochirus |
| | Bluntnose minnow | Pimephales notatus | | Pumpkinseed | Lepomis gibbosus |
| | Bullhead minnow | Pimephales vigilax | | Orangespotted sunfish | Lepomis humilis |
| | Emerald shiner | Notropis atherinoides | Percidae | Walleye | Stizostedion vitreum |
| | Rosyface shiner | Notropis rubellus | | Sauger | Stizostedion canadense |
| | Bigmouth shiner | Notropis dorsalis | | Blackside darter | Percina maculata |
| | Sand shiner | Notropis ludibundus | | Slenderhead darter | Percina phoxocephala |
| | Spottail shiner | Notropis hudsonius | | Logperch | Percina caprodes |
| Ictaluridae | Channel catfish | Ictalurus punctatus | | Johnny darter | Etheostoma nigrum |
| | Yellow bullhead | Ameiurus natalis | | Banded darter | Etheostoma zonale |
| | Black bullhead | Ameiurus melas | | Orangethroat darter | Etheostoma spectabile |
| | Flathead catfish | Pylodictis olivaris | | Fantail darter | Etheostoma flabellare |
| | Stonecat | Noturus flavus | Scianidae | Freshwater drum | Aplodinotus grunniens |