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Region 2

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FOX RIVER

Basin Survey Report

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Summary

The Fox River Basin was surveyed in 2002 by the Illinois Department of Natural Resources (IDNR) and the Illinois Environmental Protection Agency (IEPA) as part of a statewide monitoring program to measure the health of Illinois streams. This report summarizes results of the fish surveys including species composition, distribution, and determination of stream quality based on the Index of Biotic Integrity. Results were also compared to the 1996 IDNR/IEPA survey conducted at the same locations. A total of 10,317 fish, representing 63 species were collected in the 2002 survey for all 18 stations combined, including Fox River and tributary locations. Total number of individuals and number of species collected in 2002 were similar to results for 1996. Species composition was also similar in 1996 and 2002 with a few local exceptions. Collection efforts at Fox River mainstem stations yielded a total of 3,331 individuals consisting of 45 native species. Common carp was the only non-native species collected. The State Threatened river redhorse (*Moxostoma carinatum*) was collected at DT-03 and DT-36 indicating that the status of this species appears to be relatively stable, although at low abundance. For all tributary stations, a total of 6984 fish were collected in the 2002 survey, including 51 native species. No State Listed species were found in the tributary collections. Two species of special concern in the Chicago Region were collected in 2002: rainbow darter, and mottled sculpin. Stream quality based on the IBI, was generally higher in the downstream areas of the watershed, both on the mainstem and tributaries. This pattern, present in 1996 and 2002, appears to reflect urbanization and human population levels in the watershed. Another factor, in addition to local water quality and habitat conditions, is fragmentation, or connectivity. A total of 15 dams currently exist on the mainstem of the Fox River, with 11 in Kane County. Most major tributaries also have one or more dams. Although some limited local differences were noted, conditions with the Fox Basin as a whole have not changed significantly between 1996 and 2002. Habitat quality, urban land cover, and degree of connectivity to high quality downstream fish communities continue to be important factors determining stream quality as measured by the IBI.

Introduction

The Fox River Basin was surveyed in 2002 by the Illinois Department of Natural Resources (IDNR) and the Illinois Environmental Protection Agency (IEPA). This effort is part of a statewide monitoring program to measure the health of Illinois streams using data from fish community, macroinvertebrate, habitat, water and sediment sampling. Information from basin surveys is also used in watershed planning and fisheries management applications.

This report summarizes results of the fish surveys including species composition, distribution, and determination of stream quality based on fish community structure. Results from the 2002 survey are also compared to a similar survey conducted in the Fox River River Basin in 1996. Water quality and other results from the 2002 survey can be found in 2002 305b Report (IEPA 2002).

Watershed Description

The Fox River is the third largest tributary to the Illinois River, running from its origin in Waukesha, Wisconsin to the confluence in Ottawa, Illinois. Total watershed area includes approximately 2660 square miles, 1720 of which are in Illinois (IDNR 1998)(Figure 1). Flowing for a total of 115 miles in Illinois, the Fox River winds through the Fox Chain-O-Lakes and then south through a low gradient channel (0.3 ft. /mi. mean slope) to Algonquin. The slope increases downstream of Algonquin, with a mean slope of 2.0 ft./mi. from Algonquin to St. Charles, 4.7 ft./mi. between St. Charles and Yorkville, and 2.7 ft./mi. between Yorkville and Dayton. The Fox River has 15 larger tributaries with watershed areas greater than 15 square miles (Table 1).

The Fox River Watershed includes parts of Lake, McHenry, Cook, Kane, DuPage, Dekalb, Lee, LaSalle, Kendall, Grundy, and Will Counties in Northeastern Illinois (Figure 1). Landuse in the watershed is primarily agricultural (66%) with 18% built-up land (IDNR 1998). About 11% of the State's human population reside in the Fox River region, with several highly urbanized areas, including the Aurora, Illinois' second largest city.

The mainstem of the river has 15 lowhead dams, 11 of which are in the higher gradient area of Kane County (Figure 1). Dams also are found on Nippersink Creek and many of the

smaller creeks in Lake and McHenry Counties, creating recreational impoundments or enhancing water levels in natural glacial lakes. Mill, Waubensee, Blackberry, Big Rock, Somonauk, and Indian Creeks also have one or more dams. Two dams have been removed recently in the Fox Basin, one on Waubensee Creek and one on Brewster Creek. The total number and location of all structures on tributary streams to the Fox River is unknown.

Methods

Fish community samples were taken at a total of 18 locations in 2002 (Table 2, Figure 3). Station locations were the same as the DNR/IEPA stations sampled during the 1996 Fox River Basin Survey with the exception of DT-06, DT-09 and DT-35. Stations DT-06 and DT-09 were moved from the pooled areas behind the Algonquin Dam (DT-06) and South Elgin Dam (DT-09), to the free-flowing areas downstream of the dams. Original station codes were retained since the stations were within one mile of the original locations. Pooled areas behind Fox River Dams typically have degraded water quality and habitat conditions due to the hydraulic modifications (Santucci and Gephard 2003), which may confound, and mask changes in general conditions within the river. Station DT-35 was added in 2002 to include information on the river segment upstream of the Chain-O-Lakes. All tributary stations were sampled at the historic locations, except Boone Creek (DTZT-02) which was moved due to the presence of a beaver dam. DTKA-01 (North Branch of Nippersink Creek) and DTAB-01 (upper Little Indian Creek) were sampled in 1996 but not in 2002.

Fish collection methods for the 2002 survey followed standard IDNR protocols and were the same as methods used in 1996. Selection of gears is dictated by channel width and depth. At wider, non-wadable stations, fish were sampled using a boat equipped with a 3500 watt - 3 phase generator (AC). A supplemental collection was made with a 30-ft., 0.25-in. mesh, minnow seine at all boat sites. Wadable tributary sites were sampled using a 30-ft. electric seine powered by a single-phase, 1600-watt generator (Bayley et al. 1989). At electric seine sites, upstream and downstream limits of each station were blocked by nets to prevent escape and/or entry of fish into the station during sampling. At all stations, larger fish specimens were weighed, measured and returned to the stream. Smaller individuals were preserved and

identified in the laboratory.

Mainstem stations were sampled from 8 July and 19 July, 2002. Most tributary station samples were taken between 7 July and 18 July 2002. Stations on Big Rock and Little Rock Creek were sampled later in August to coincide with IDNR intensive sub-watershed surveys. Discharge levels during the 2002 fish survey (Figure 2) were well below the 1980-2000 average monthly flows at the Algonquin and Dayton gauging stations (USGS).

All boat stations were electrofished for a period of 60 minutes (Table 2), with the exception of DT-09, where low water levels reduced the available sampling area. Catch per unit effort (no. fish/hr.) was adjusted for this location. Electrofishing period at electric seine sites varied (Table 2) based on complexity of the habitat.

The Index of Biotic Integrity (IBI) is a widely used stream quality measurement based on structural and functional components of the fish community such as: species diversity, taxonomic guilds, trophic guilds, reproductive behavior, and tolerance to adverse environmental stressors. IBI scores for each station were calculated using protocols described by Smogor (2002). Fish community attributes were evaluated using 10 different parameters, or metrics, each with a possible score of 0-6 (see Appendix Table A-1, A-2) and a total score ranging from 0-60. Higher scores indicate better stream quality. The IBI is the basis for determining the letter-based Biological Stream Characterization (BSC, Bertrand et al. 1996) which includes the following IBI ranges and descriptors: 51-60 = A (Unique Aquatic Resource); 41-50 = B (Highly Valued Aquatic Resource); 31-40 = C (Moderate Aquatic Resource); 21-30 = D (Limited Aquatic Resource); 0-20 = E (Restricted Aquatic Resource). IBI scores from the 1996 survey were also recalculated at each station using the recently revised Smogor (2002) methodology.

Results and Discussion

Abundance and Distribution. A total of 10,317 fish, representing 63 species were collected in the 2002 survey for all 18 stations combined, including Fox River and tributary locations (Table 3). Total number of individuals and number of species collected in 2002 were similar to results for 1996 (Table 3). Species composition was also similar in 1996 and 2002

with a few limited exceptions. The absence of southern redbelly dace in 2002 was due to the elimination of station DTAB-01 on Indian Creek (Appendix Table A-4), a small headwater tributary sampled in 1996. Other local differences in species distribution and abundance are discussed below. Collections efforts at Fox River mainstem stations yielded a total of 3,331 individuals consisting of 45 native species (Table 4). Common carp was the only non-native species collected. The State Threatened river redhorse (*Moxostoma carinatum*) (IDNR 1999) was collected at DT-03 and DT-36. This species was also captured at DT-03 in 1996 (Appendix Table A-3). The river redhorse has been collected at other Fox River locations in supplemental IDNR collections (FAS 2004) and by Santucci and Gephard (2003), indicating that the status of this species appears to be relatively stable, although at low abundance.

Minnow species (Cyprinidae) and sunfishes (Centrarchidae) were the most numerous family groups, together accounting for 66% of the total abundance at mainstem locations (Table 4). Suckers (Catostomidae) were also prevalent, accounting for 13% of the catch. Nineteen of the 45 species collected on the mainstem were relatively widespread, occurring at 4 or more of the 7 sampling sites. (Table 4). This group included most of the sportfish species, many of the sunfishes, and selected minnow species. A total of 11 species had limited distributions, only occurring at one location (Table 4). The distribution of most suckers species was limited to the lower watershed. This pattern has been noted in previous studies, and may be related to the presence of numerous dams in Kane County, in combination with past and current water quality problems (Santucci and Gephard 2003). In addition, habitat conditions in the upper-most stations (DT-35 and DT-22) in Lake County are very low gradient and not suited to many of the redhorse suckers (*Moxostoma spp.*), which prefer riffle and run habitats. Distribution of the more tolerant suckers, quillback and white sucker, was more widespread. Overall, species composition for the mainstem was similar in 2002 (Table 4) and 1996 (Appendix Table A-3)

For all tributary stations, a total of 6984 fish were collected in the 2002 survey, including 51 native species and common carp (Table 5). No State Listed species were found in the tributary collections. Two species of special concern in the Region were collected in 2002: rainbow darter, and mottled sculpin (Chicago Wilderness 1999). Tyler Creek has the one of

only known populations of rainbow darter found in the Fox Basin, with eighteen individuals collected in 2002 (Table 5); one was collected in Buck Creek. No rainbow darters were collected in 1996 Fox Basin Survey (Appendix Table A-4), although they appeared in Tyler Creek supplemental collections in both 1995 and 1998 (FAS 2004). Mottled sculpin is a cool water species which depends on high ground water input, and therefore may be threatened by the expanding urbanization in the Chicago Area. Sculpins were found in Tyler Creek, as well as Ferson Creek and Little Rock Creek in 2002. In 1996, they were found in Boone Creek (Appendix Table A-4) but were absent in 2002; however, station location was changed in 2002. Also missing from Boone Creek in 2002 was the American Brook Lamprey. The 1996 occurrence of this species in Boone Creek is the only recent record in Northeastern Illinois (FAS 2004). Smith (1979) described their distribution in Illinois as “rare and erratic”. Distributions of most other species were largely unchanged between 1996 and 2000, with a few local exceptions (Table 5, Appendix Table A-4).

Stream Quality. Stream quality based on the IBI, was generally higher in the downstream areas of the watershed, both on the mainstem and tributaries (Table 6, Figure 3). This pattern, present in 1996 and 2002, appears to reflect urbanization and human population levels in the watershed. Higher population densities have been linked to increased impervious ground cover, which is negatively correlated to stream quality in Northeastern Illinois (Dreher 1996) and across the country (Schuler 1995). Another important factor, in addition to local water quality and habitat conditions, is fragmentation. A total of 15 dams currently exist on the mainstem of the Fox River, with 11 in Kane County (Figure 1). These dams have been shown to cause stream degradation, and affect fish species distribution (Santucci and Gebhard 2003). Many tributaries also have structures which limit fish movement, including dams and culverts. Dams can fragment stream segments from downstream, species-rich areas, affecting stream quality ratings, even if local habitat conditions are favorable.

The mainstem location DT-35 in Lake County, was very low gradient, composed almost entirely of silt substrate and limited cover, yielding an IBI score in the “D” range. Located upstream of the Chain-O-Lakes, this segment also lacks connection to downstream riverine fish communities and had the fewest number of species for mainstem stations in 2002. This

location was not sampled in 1996. Sampling locations for Stations DT-06 and DT-09 were changed in 2002, therefore results are not directly comparable to the 1996 survey. Both stations were previously located in the pooled area behind dams which are known to have lower fish species abundance, diversity, and Biotic Integrity scores than free-flowing segments (Santucci and Gebhard 2003). Scores at both DT-06 and DT-09 were higher in 2002, compared to 1996, due to improved habitat in the new free-flowing locations. Stations DT-06, DT-22, DT-09, and DT-69 are all located in the upper, more urbanized areas of the river, where dams impound a large percentage of the river. These stations had IBI scores in the “C” and “D” range. Mainstem stations DT-03 and DT-36, located in the agricultural areas of the river in Kendall and LaSalle Counties, had IBI’s in the “A” range (Table 6). The lower Fox River has longer free-flowing sections with fewer dams (Figure 1) and was found to have high quality fish communities in previous studies (Rung and Pescitelli, unpublished data).

The IBI results for Flint Creek in 2002 were very similar to results for the 1996 survey (Table 6). The fish community in Flint Creek was composed of generalist species with a low number of intolerant species present (Appendix Table A-2). The Flint Creek sampling location contained riffles, and aquatic vegetation, however, pools were mostly shallow. Watershed urbanization, and the presence of in-line reservoir results in a relatively short free-flowing segment, contributing to the low quality rating. Nippersink Creek in McHenry County is a larger stream system (Table 1) with longer free-flowing segments compared to Flint Creek. Stream quality conditions on Nippersink Creek were similar in 1996 and 2002 with both samples ratings in the “B” range (Table 6). The location of the Boone Creek station was moved in 2002 due to the presence of a beaver dam. However, the IBI score for Boone Creek in 2002 was similar to the 1996 results, with both samples scoring in the low “D” range (Table 6) which seems to represent typical condition in this small low gradient stream. Tyler Creek and Ferson Creek station rated in the “B” range in 2002 (Table 6). Both stations are in higher gradient stream segments with gravel/cobble substrate and diverse habitat, including deeper pools and abundant riffles. Ferson Creek showed little change in IBI between 1996 and 2002 (Table 6), however, no darter species were collected in 2002, whereas, 3 were present in 1996. Total abundance was also lower in 2002. IBI and species richness in Tyler Creek were

higher in 2002, compared to results for 1996. Heavy local flooding occurred prior to the 1996 sample, possibly affecting the fish composition. Local flooding may have also affecting 1996 IBI results for Big Rock Creek in Kane County accounting for a lower score of 48, compared to 2002 score of 58 out of possible 60 points (Table 6). An additional 4 stations were sampled on the mainstem of Big Rock Creek in Big Rock Creek during 2002 (Rung and Pescitelli 2003), with all stations scoring in the “A” range due to very good habitat and water quality conditions. Nearby Little Rock Creek also had somewhat higher scores in 2002 (Table 6) with a total of 27 species (Table 5), including many specialist insectivores (Appendix, Table A-2). The Little Rock Station also has very diverse habitat and is in close proximity to the Fox River. The Blackberry Creek station, on the other hand is upstream of a 10-ft. High dam which block fish movement from the Fox River. Species diversity was much lower at DTD-02 on Blackberry Creek, with only 14 species present (Table 5) and IBI’s in the “C” range for 2002 and 1996 (Table 6). Buck Creek and Indian Creek, located in the agricultural area in LaSalle County, both have high quality habitat and diverse fish communities, scoring IBI’s in “A” range, with little change in condition since the 1996.

Although some limited local differences were noted, conditions within the Fox Basin have not changed significantly between 1996 and 2002. Generally, stations in the more urbanized areas of the watershed had lower stream quality, a trend which has been observed in other studies in Northeastern Illinois (Dreher et al. 1999) and throughout the United States (Schuler 1995). Habitat quality and degree of connectivity to high quality downstream fish communities seemed to be important factors determining stream quality as measured by the IBI.

Sportfish. A total of 2134 sportfish were collected at all stations combined in 2002 (Table 7), representing 21% of the total catch . About twice as many sportfish were collected in 2002, compared to results for the 1996 survey (Table 7). Catch rates for bluegill, smallmouth bass, and freshwater drum increased substantially in 2002 compared to the 1996 survey (Table 7). These species have not been stocked in the Fox River, therefore higher abundances in 2002 are due to successful recruitment in recent years. Floods in 1996, and high water conditions in preceding years (USGS) may have reduced sportfish spawning and

recruitment success, resulting in lower catch rates during the 1996 survey.

Bluegill were the most abundant species in 2002, followed by smallmouth bass, freshwater drum, and channel catfish. As expected, sportfish catch rates were generally higher in the Fox River mainstem, compared to the tributary stations (Table 8). Tributary stations typically contained smaller individuals, with the exception of channel catfish. Tributary locations had a larger percentage smallmouth bass young-of-the-year than the mainstem stations (Figure 4), and appear to serve as important spawning and nursery areas. At mainstem locations in 2002, catch rates for quality size (Anderson and Nuemann 1996) individuals were much higher for bluegill, smallmouth bass, and channel catfish than for any of the other species present (Table 8). Total number of walleye collected in the mainstem was much higher in 2002 than observed for 1996 (Table 7). Increased reproductive success in the upper river and supplemental stocking in the lower river (IDNR 2002) appears to have contributed to increased walleye catch rates in 2002. A total of 34 walleye 10 inches or larger were collected ranging in size up to 22 inches.

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Table 1. Larger tributaries to the Fox River with drainage areas (IDNR 1998)

Tributary	Drainage Area (Sq. Mi.)
Nippersink Creek	205
Squaw Creek	46
Boone Creek	23
Flint Creek	37
Tyler Creek	40
Poplar Creek	44
Brewster Creek	15
Ferson Otter Creek	54
Mill Creek	31
Waubonsee Creek	30
Blackberry Creek	73
Big Rock/ Little Rock Creek	194
Somonauk Creek	88
Indian/Little Indian Creek	264
Buck Creek	41

Table 2. Sampling station locations and fish sampling methods information for 2002 Fox River Basin Survey.

IDNR ID NO.	IEPA STATION CODE	SAMPLE DATE	STREAM	STATION LOCATION	COUNTY	SAMPLG METHOD	ELECTRO FISHING MINUTES	SEINE HAULS
11445	DT-35*	08-Jul-02	Fox River	Chain-O-Lakes SP Rt. 173	Lake	Boat EF	60	2
11446	DT-22	11-Jul-02	Fox River	Burton's Bridge Rt. 176	McHenry	Boat EF	60	2
11443	DT-06**	12-Jul-02	Fox River	Algonquin DS Dam	McHenry	Boat EF	60	2
11444	DT-09**	11-Jul-02	Fox River	South Elgin DS Dam	Kane	Boat EF	40	2
11447	DT-69	16-Jul-02	Fox River	Geneva, Fayban Park	Kane	Boat EF	60	2
11442	DT-03	16-Jul-02	Fox River	Oswego Rt. 34	Kendall	Boat EF	60	2
11448	DT-36	19-Jul-02	Fox River	Wedron, Co. Rd. 2153	LaSalle	Boat EF	60	2
11449	DTK-04	09-Jul-02	Nippersink Creek	Spring Grove, Wind Rd	McHenry	Boat EF	62	2
11450	DTZT-02	09-Jul-02	Boone Creek	SW McHenry, Dartmoor Rd.	McHenry	Elec Seine	28	NA
11451	DTZS-01	10-Jul-02	Flint Creek	Lake Barrington, Kelsey Rd.	Lake	Elec Seine	34	NA
11452	DTZP-04	10-Jul-02	Tyler Creek	Elgin, Randall Rd.	Kane	Elec Seine	63	NA
11453	DTF-02	15-Jul-02	Ferson Creek	St. Charles, Leroy Oakes FP	Kane	Elec Seine	37	NA
11454	DTD-02	17-Jul-02	Blackberry Creek	N of Yorkville, 1.0 mi. US Rt. 47	Kendall	Elec Seine	42	NA
11361	DTC-07	22-Aug-02	Big Rock Creek	N of Plano, Big Rock Creek FP	Kane	Elec Seine	48	NA
11366	DTCA-01	22-Aug-02	Little Rock Creek	S of Plano, 0.5 mi. US Milhurst Rd.	Kendall	Elec Seine	38	NA
11455	DTAB-02	17-Jul-02	Little Indian Creek	NW of Sheridan, Co. Rd. 4275	LaSalle	Elec Seine	40	NA
11456	DTA-08	18-Jul-02	Indian Creek	N of Harding Co. Rd. 4150	LaSalle	Elec Seine	43	NA
11457	DTZB-02	18-Jul-02	Buck Creek	W of Wedron, Co Rd. 1900	LaSalle	Elec Seine	41	NA

*Not sampled in 1996

**Station moved from pooled area upstream of dam to free-flowing area downstream of dam

Table 3. Fish species collected during 2002 and 1996 Fox River Basin survey, all station and methods combined.

Common name	Scientific name	Total	
		2002	1996
Unidentified lamprey	Petromyzontidae sp.	0	9
American brook lamprey	Lampetra appendix	0	1
Gizzard shad	Dorosoma cepedianum	4	14
Central mudminnow	Umbra limi	1	10
Carp	Cyprinus carpio	246	201
Carp x Goldfish hybrid	Cyprinus carpio x Carassius auratus	0	1
Golden shiner	Notemigonus crysoleucas	14	8
Southern redbelly dace	Phoxinus erythrogaster	0	504
Creek chub	Semotilus atromaculatus	133	149
Hornyhead chub	Nocomis biguttatus	521	366
Central stoneroller	Campostoma anomalum	907	581
Largescale stoneroller	Campostoma oligolepis	285	187
Suckermouth minnow	Phenacobius mirabilis	24	34
Blacknose dace	Rhinichthys atratulus	3	143
Striped shiner	Luxilus chrysocephalus	7	378
Common shiner	Luxilus cornutus	353	1104
Redfin shiner	Lythrurus umbratilis	8	24
Spotfin shiner	Cyprinella spiloptera	696	457
Pugnose minnow	Opsopoeodus emiliae	3	3
Fathead minnow	Pimephales promelas	2	4
Bluntnose minnow	Pimephales notatus	1720	2359
Bullhead minnow	Pimephales vigilax	23	13
Emerald shiner	Notropis atherinoides	51	33
Rosyface shiner	Notropis rubellus	111	57
Bigmouth shiner	Notropis dorsalis	191	665
Sand shiner	Notropis stramineus	1345	649
Spottail shiner	Notropis hudsonius	154	2
Quillback	Carpiodes cyprinus	160	145
River carpsucker	Carpiodes carpio	8	0
Highfin carpsucker	Carpiodes velifer	5	15
White sucker	Catostomus commersoni	173	249
Northern hog sucker	Hypentelium nigricans	162	170
River redbhorse	Moxostoma carinatum	4	1
Shorthead redbhorse	Moxostoma macrolepidotum	177	127
Black redbhorse	Moxostoma duquesnei	56	169
Golden redbhorse	Moxostoma erythrurum	204	304
Silver redbhorse	Moxostoma anisurum	16	15
Channel catfish	Ictalurus punctatus	202	164
Yellow bullhead	Ameiurus natalis	18	26
Black bullhead	Ameiurus melas	7	0
Flathead catfish	Pylodictis olivaris	9	3
Stonecat	Noturus flavus	11	71
Tadpole madtom	Noturus gyrinus	9	22
Slender madtom	Noturus exilis	34	40
Blackstripe topminnow	Fundulus notatus	8	0
Brook silverside	Labidesthes sicculus	2	530
Mottled sculpin	Cottus bairdi	51	11
White bass	Morone chrysops	16	5
Yellow bass	Morone mississippiensis	27	11
Black crappie	Pomoxis nigromaculatus	23	7
White crappie	Pomoxis annularis	0	4
Rock bass	Ambloplites rupestris	8	32
Largemouth bass	Micropterus salmoides	92	111
Smallmouth bass	Micropterus dolomieu	340	170
Warmouth	Lepomis gulosus	0	1
Green sunfish	Lepomis cyanellus	72	193
Bluegill x Green sunfish hybrid	Lepomis macrochirus x L. cyanellus	5	2
Bluegill	Lepomis macrochirus	997	544
Pumpkinseed	Lepomis gibbosus	3	7
Orangespotted sunfish	Lepomis humilis	19	24
Walleye	Zander vitreum	54	11
Yellow perch	Perca flavescens	4	6
Blackside darter	Percina maculata	0	5
Slenderhead darter	Percina phoxocephala	2	1
Logperch	Percina caprodes	9	21
Johnny darter	Etheostoma nigrum	39	39
Banded darter	Etheostoma zonale	165	143
Rainbow darter	Etheostoma caeruleum	19	0
Orangethroat darter	Etheostoma spectabile	14	45

Fantail darter	Etheostoma flabellare	42	63
Freshwater drum	Aplodinotus grunniens	249	39
Total fish		10317	11502
Total species		63	65

Table 4. Fish community sampling results for IDNR/IEPA 2002 Fox River Basin Survey, mainstem Fox River stations.

Common name	Scientific name	Total	Rt. 173	Burton's Bridge	Algonquin	South* Elgin	Fabyan Park	Oswego	Wedron
			DT-35	DT-22	DT-06	DT-09	DT-69	DT-03	DT-36
Gizzard shad	Dorosoma cepedianum	2	0	0	0	0	0	2	0
Carp	Cyprinus carpio	159	42	34	29	22	14	5	13
Golden shiner	Notemigonus crysoleucas	14	0	1	0	4	1	8	0
Hornyhead chub	Nocomis biguttatus	1	1	0	0	0	0	0	0
Suckermouth minnow	Phenacobius mirabilis	5	4	0	0	0	0	1	0
Spoffin shiner	Cyprinella spiloptera	330	111	81	27	78	6	27	0
Pugnose minnow	Opsopoeodus emiliae	3	0	3	0	0	0	0	0
Bluntnose minnow	Pimephales notatus	161	63	4	0	5	25	36	28
Bullhead minnow	Pimephales vigilax	5	0	0	0	5	0	0	0
Emerald shiner	Notropis atherinoides	41	0	1	7	11	5	2	15
Bigmouth shiner	Notropis dorsalis	144	130	10	0	2	2	0	0
Sand shiner	Notropis ludibundus	308	0	0	13	0	0	273	22
Spottail shiner	Notropis hudsonius	154	0	12	2	3	0	0	137
Quillback	Carpiodes cyprinus	151	5	65	33	1	0	32	15
River carpsucker	Carpiodes carpio	7	0	0	0	0	0	7	0
Highfin carpsucker	Carpiodes velifer	4	2	0	0	0	0	2	0
White sucker	Catostomus commersoni	51	3	34	14	0	0	0	0
Northern hog sucker	Hypentelium nigricans	17	1	0	2	0	0	14	0
River redhorse	Moxostoma carinatum	4	2	0	0	0	0	2	0
Shorthead redhorse	Moxostoma macrolepidotum	147	120	0	0	0	0	27	0
Black redhorse	Moxostoma duquesnei	15	0	0	0	0	0	15	0
Golden redhorse	Moxostoma erythrurum	65	2	0	0	0	0	41	22
Silver redhorse	Moxostoma anisurum	16	0	0	0	0	0	14	2
Channel catfish	Ictalurus punctatus	161	22	30	30	14	2	38	25
Yellow bullhead	Ameiurus natalis	4	1	3	0	0	0	0	0
Black bullhead	Ameiurus melas	2	0	0	0	0	1	0	1
Flathead catfish	Pylodictis olivaris	8	1	0	1	1	0	1	4
Stonecat	Noturus flavus	1	0	0	1	0	0	0	0
Blackstripe topminnow	Fundulus notatus	3	3	0	0	0	0	0	0
Brook silverside	Labidesthes sicculus	2	0	1	0	1	0	0	0
White bass	Morone chrysops	16	0	2	6	5	2	0	1
Yellow bass	Morone mississippiensis	27	0	0	0	2	2	0	23
Black crappie	Pomoxis nigromaculatus	18	3	2	7	5	0	0	1
Rock bass	Ambloplites rupestris	2	0	0	0	0	0	2	0
Largemouth bass	Micropterus salmoides	80	8	5	2	18	16	20	11
Smallmouth bass	Micropterus dolomieu	226	74	39	50	1	4	29	29
Green sunfish	Lepomis cyanellus	49	2	23	8	11	4	0	1
Bluegill x Green sunfish	L. macrochirus x L. cyanellus	1	0	0	0	0	1	0	0
Bluegill	Lepomis macrochirus	612	23	82	63	239	142	3	60
Pumpkinseed	Lepomis gibbosus	3	0	0	0	0	3	0	0
Orangespotted sunfish	Lepomis humilis	19	0	16	2	1	0	0	0
Walleye	Zander vitreum	49	12	2	19	5	1	0	10
Yellow perch	Perca flavescens	4	0	1	0	3	0	0	0
Logperch	Percina caprodes	4	0	1	0	1	0	0	2
Johnny darter	Etheostoma nigrum	5	2	3	0	0	0	0	0
Freshwater drum	Aplodinotus grunniens	231	9	72	16	78	18	2	36
Total fish		3331	646	527	332	516	249	603	458

Total species	45	25	25	20	24	17	24	21
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* Relative abundance, total adjusted for catch per 60 minutes.

Table 5. Fish community sampling results# for IDNR/IEPA 2002 Fox River Basin Survey, tributary stations.

Common name	Scientific name	Total	DTA-08	DTAB-02	DTC-07	DTCA-01	DTD-02	DTF-02	DTK-04	DTZB-02	DTZP-04	DTZS-01	DTZT-02
			Indian Creek	Little Indian Creek	Big Rock Creek	Little Rock Creek	Black-berry Creek	Ferson Creek	Nipper-sink Creek	Buck Creek	Tyler Creek	Flint Creek	Boone Creek
Central mudminnow	Umbra limi	1	0	0	0	0	0	0	0	0	0	1	0
Carp	Cyprinus carpio	87	3	1	2	3	0	26	13	0	16	23	0
Creek chub	Semotilus atromaculatus	133	6	9	5	12	3	10	3	0	85	0	0
Hornyhead chub	Nocomis biguttatus	520	7	12	58	67	0	48	1	285	42	0	0
Central stoneroller	Campostoma anomalum	907	88	142	136	244	0	33	0	245	19	0	0
Largescale stoneroller	Campostoma oligolepis	285	0	0	173	69	0	43	0	0	0	0	0
Suckermouth minnow	Phenacobius mirabilis	19	0	1	1	4	12	0	0	1	0	0	0
Blacknose dace	Rhinichthys atratulus	3	0	0	3	0	0	0	0	0	0	0	0
Striped shiner	Luxilus chrysocephalus	7	0	1	2	3	0	0	0	1	0	0	0
Common shiner	Luxilus cornutus	353	0	21	23	7	1	9	0	256	36	0	0
Redfin shiner	Lythrurus umbratilus	8	0	0	8	0	0	0	0	0	0	0	0
Spotfin shiner	Cyprinella spiloptera	366	9	13	41	48	71	0	66	6	0	112	0
Fathead minnow	Pimephales promelas	2	0	0	0	2	0	0	0	0	0	0	0
Bluntnose minnow	Pimephales notatus	1559	25	45	201	213	101	22	0	368	278	110	196
Bullhead minnow	Pimephales vigilax	18	0	0	0	0	1	0	0	4	5	7	1
Emerald shiner	Notropis atherinoides	10	0	0	0	0	0	0	10	0	0	0	0
Rosyface shiner	Notropis rubellus	111	2	19	21	30	0	0	0	0	32	6	1
Bigmouth shiner	Notropis dorsalis	47	0	0	8	39	0	0	0	0	0	0	0
Sand shiner	Notropis stramineus	1037	22	94	251	340	210	11	9	100	0	0	0
Quillback	Carpiodes cyprinus	9	1	1	0	0	0	0	1	1	0	0	5
River carpsucker	Carpiodes carpio	1	1	0	0	0	0	0	0	0	0	0	0
Highfin carpsucker	Carpiodes velifer	1	1	0	0	0	0	0	0	0	0	0	0
White sucker	Catostomus commersoni	122	0	2	9	12	7	11	13	18	34	1	15
Northern hog sucker	Hypentelium nigricans	145	15	17	52	17	11	4	1	20	7	1	0
Shorthead redhorse	Moxostoma macrolepidotum	30	3	0	4	5	0	0	18	0	0	0	0
Black redhorse	Moxostoma duquesnei	41	23	0	18	0	0	0	0	0	0	0	0
Golden redhorse	Moxostoma erythrurum	139	28	22	57	1	14	0	9	8	0	0	0
Channel catfish	Ictalurus punctatus	41	11	0	0	1	0	7	9	0	0	13	0
Yellow bullhead	Ameiurus natalis	14	4	1	1	1	3	0	0	1	0	3	0
Black bullhead	Ameiurus melas	5	0	0	0	0	0	0	0	2	0	3	0
Flathead catfish	Pylodictis olivaris	1	0	0	0	0	0	0	0	0	0	1	0
Stonecat	Noturus flavus	10	0	1	3	1	0	4	0	1	0	0	0
Tadpole madtom	Noturus gyrinus	9	0	0	0	0	0	0	0	0	0	9	0
Slender madtom	Noturus exilis	34	0	1	0	0	0	0	0	33	0	0	0
Blackstripe topminnow	Fundulus notatus	5	0	0	0	0	5	0	0	0	0	0	0
Mottled sculpin	Cottus bairdi	51	0	0	0	13	0	15	0	0	23	0	0
Black crappie	Pomoxis nigromaculatus	5	0	0	2	0	0	1	0	0	1	1	0
Rock bass	Ambloplites rupestris	6	0	1	1	0	0	0	1	3	0	0	0
Largemouth bass	Micropterus salmoides	12	0	0	2	2	0	0	0	0	1	2	5
Smallmouth bass	Micropterus dolomieu	114	7	5	20	39	0	1	10	23	7	2	0
Green sunfish	Lepomis cyanellus	23	0	0	1	2	0	12	0	0	1	7	0
Bluegill x Green sunfish hybrid	Lepomis macrochirus x L. cyanellus	4	0	0	0	0	0	1	0	0	2	1	0
Bluegill	Lepomis macrochirus	385	2	0	8	2	6	24	19	2	47	232	43
Walleye	Stizostedion vitreum	5	0	0	0	0	0	0	5	0	0	0	0
Slenderhead darter	Percina phoxocephala	2	1	1	0	0	0	0	0	0	0	0	0
Logperch	Percina caprodes	5	0	1	0	0	0	0	3	0	0	1	0
Johnny darter	Etheostoma nigrum	34	0	0	3	8	10	0	0	9	0	0	4
Banded darter	Etheostoma zonale	165	2	45	28	26	0	0	4	29	30	0	1
Rainbow darter	Etheostoma caeruleum	19	0	0	0	0	0	0	0	1	18	0	0
Orangethroat darter	Etheostoma spectabile	14	0	6	0	0	0	0	0	0	8	0	0
Fantail darter	Etheostoma flabellare	42	0	9	0	0	0	0	0	25	8	0	0
Freshwater drum	Aplodinotus grunniens	18	0	0	0	0	0	0	18	0	0	0	0
Total fish		6984	261	471	1142	1211	455	282	213	1442	700	536	271

Total species	51	21	25	30	28	14	17	19	24	20	19	9
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Table 6. Comparison of stream ratings for 1996 and 2002 Fox River Basin Survey; IBI = Index of Biotic Integrity (Smogor 2000), BSC = Biological Stream Characterization (Bertrand et al 1996).

STREAM	COUNTY	EPA CODE	1996		2002	
			IBI	BSC	IBI	BSC
Fox River	Lake	DT-35	NA-		24	D
Flint Creek	Lake	DTZS-02	27	D	27	D
Fox River	McHenry	DT-22	24	D	33	C
Fox River	McHenry	DT-06	25	D	36	C
Nippersink Creek	McHenry	DTK-04	50	B	43	B
Boone Creek	McHenry	DTZT-02	30	D	21	D
Fox River	Kane	DT-09	31	C	38	C
Fox River	Kane	DT-69	44	B	38	C
Tyler Creek	Kane	DTZP-04	39	C	46	B
Ferson Creek	Kane	DTF-02	48	B	44	B
Big Rock Creek	Kane	DTC-07	48	B	58	A
Fox River	Kendall	DT-03	45	B	52	A
Blackberry Creek	Kendall	DTD-02	37	C	31	C
Little Rock Creek	Kendall	DTCA-01	44	B	51	A
Fox River	LaSalle	DT-36	49	B	52	A
Indian Creek	LaSalle	DTA-08	55	A	51	A
Little Indian Creek	LaSalle	DTAB-02	44	B	52	A
Buck Creek	LaSalle	DTZB-02	46	B	51	A

Table 7 Total number of sport species and number collected per hour of electrofishing for 2002 Fox River Basin Survey.

SPECIES	1996		2002	
	BASIN TOTAL	NO./ HOUR	BASIN TOTAL	NO. / HOUR
Bluegill	544	35.7	1020	67.0
Smallmouth bass	170	11.2	414	27.2
Channel catfish	164	10.8	224	14.7
Largemouth bass	111	7.3	100	6.6
Freshwater drum	39	2.6	258	16.9
Walleye	11	0.7	66	4.3
Black crappie	7	0.5	26	1.7
White bass	5	0.3	16	1.1
Flathead catfish	3	0.2	10	0.7
Total	1054		2134	

Table 8. Sportfish catch rates (no./hour) for all sampling location, tributary stations, and mainstem stations, and for stock size and quality size (Anderson and Gutrueter 1983) individual for the 2002 Fox River Basin Survey.

SPECIES	2002 BASIN TOTAL (NO./ HR.)			2002 FOX RIVER MAINSTEM			
	ALL STATIONS	TRIBU-TARIES	FOX RIVER	STOCK SIZE (IN.)	NO./HR. STOCK SIZE	QUALITY SIZE (IN.)	NO./HR. QUALITY SIZE
Bluegill	69.0	48.7	85.4	3	54.1	6	11.3
Freshwater drum	17.2	2.3	33.0	8	20.3	16	0.7
Smallmouth bass	23.5	14.4	32.3	7	17.1	11	8.3
Channel catfish	14.0	5.2	23.0	11	20.3	16	7.4
Largemouth bass	6.4	1.5	11.4	8	3.3	12	2.0
Walleye	3.7	0.6	7.0	10	4.9	15	1.0
Black crappie	1.6	0.6	2.6	5	2.0	8	0.4
White bass	0.8	0.0	2.3	6	2.3	9	0.1
Flathead catfish	0.6	0.1	1.1	11	0.7	16	0.3

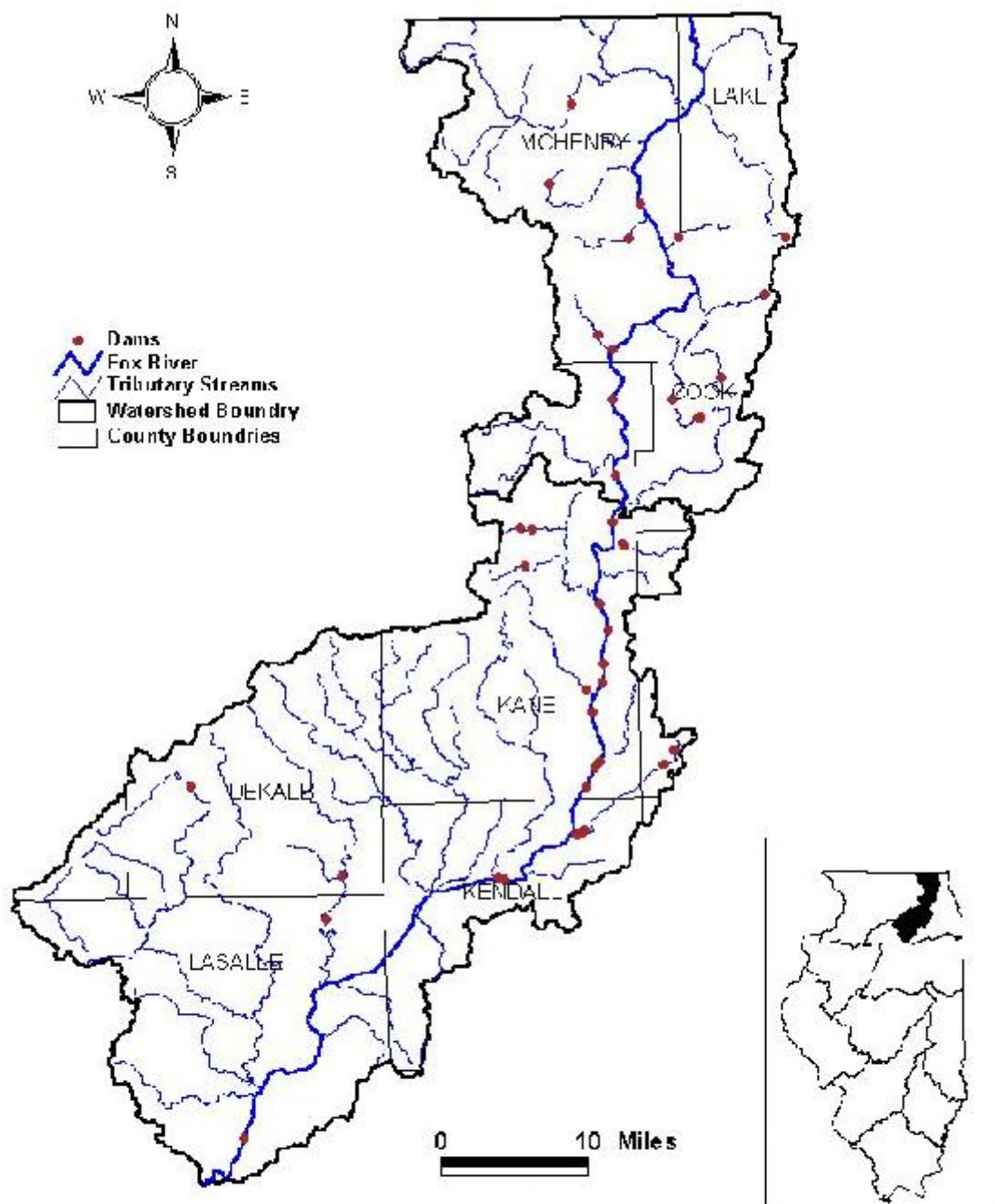
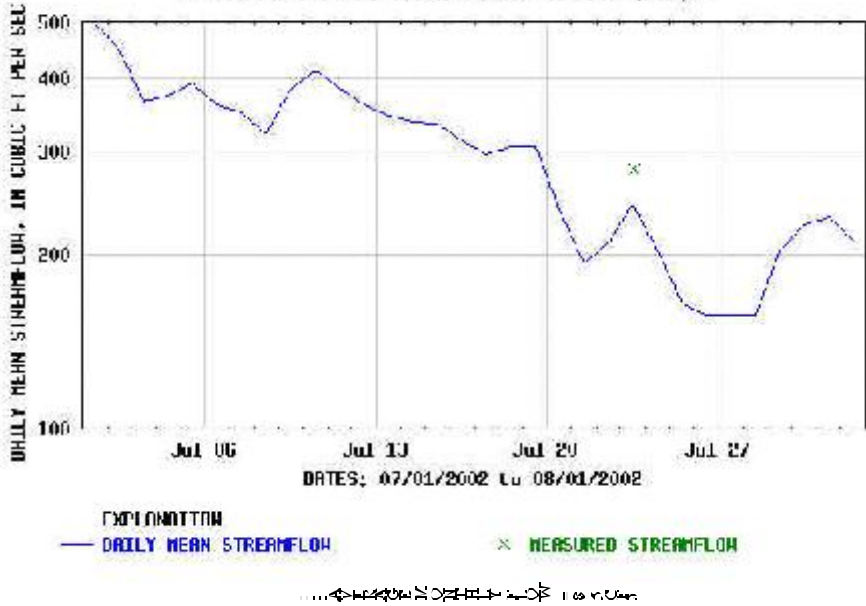


Figure 1. Map showing the Fox River Watershed, and location of 27 dams.



USGS 05550000 FOX RIVER AT ALGONQUIN, IL



USGS 05552500 FOX RIVER AT DAYTON, IL

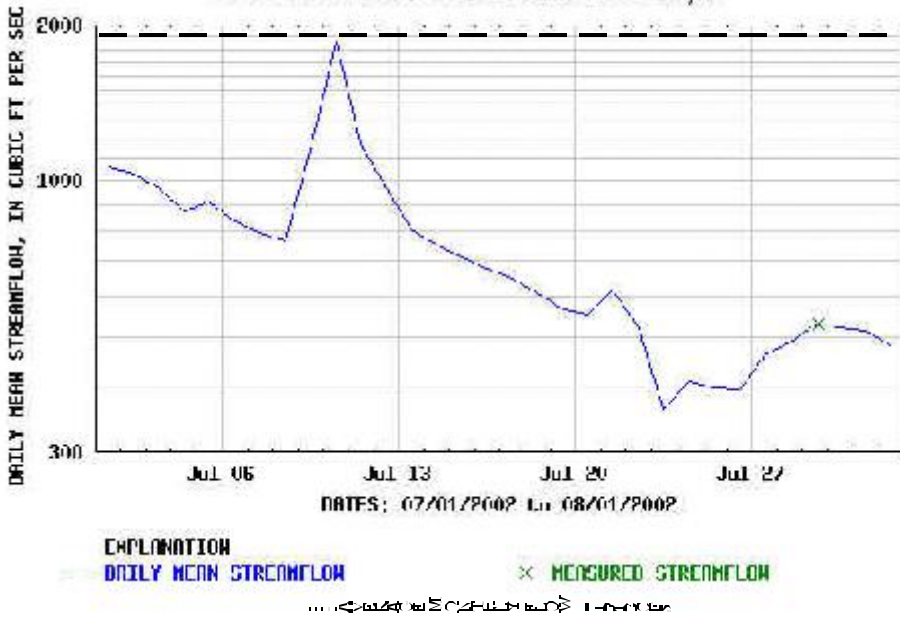


Figure 2. Discharge levels at United States Geological Survey (USGS) Gauging Station on the Fox River at Algonquin (River mile 82.5) and Dayton (River mile 5.7) during the Fox River Basin Fish Survey. Average monthly flows are for the period from 1980 to 2000.

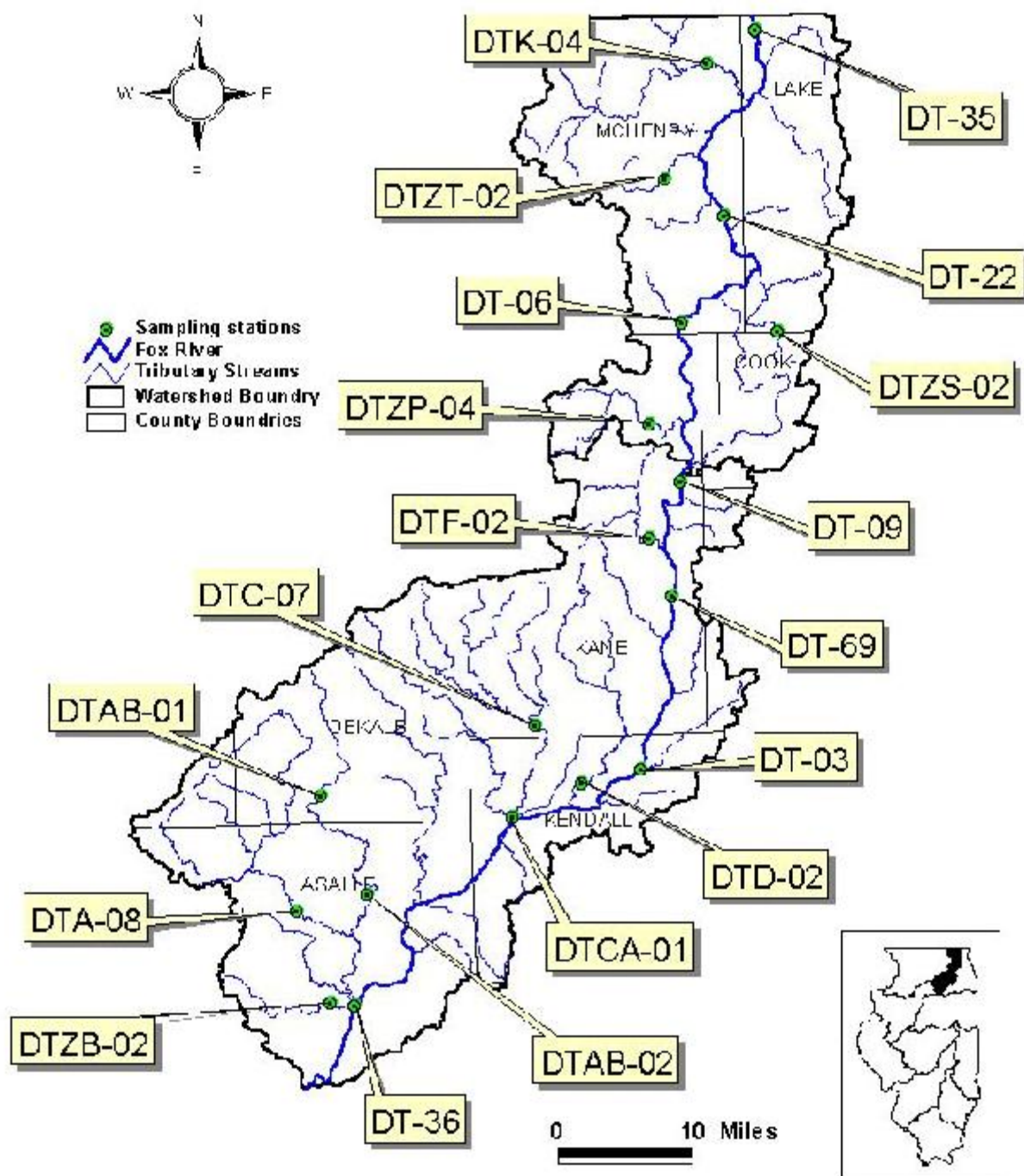


Figure 3. Map showing locations of sampling stations for the 2002 the Fox River Basin Survey

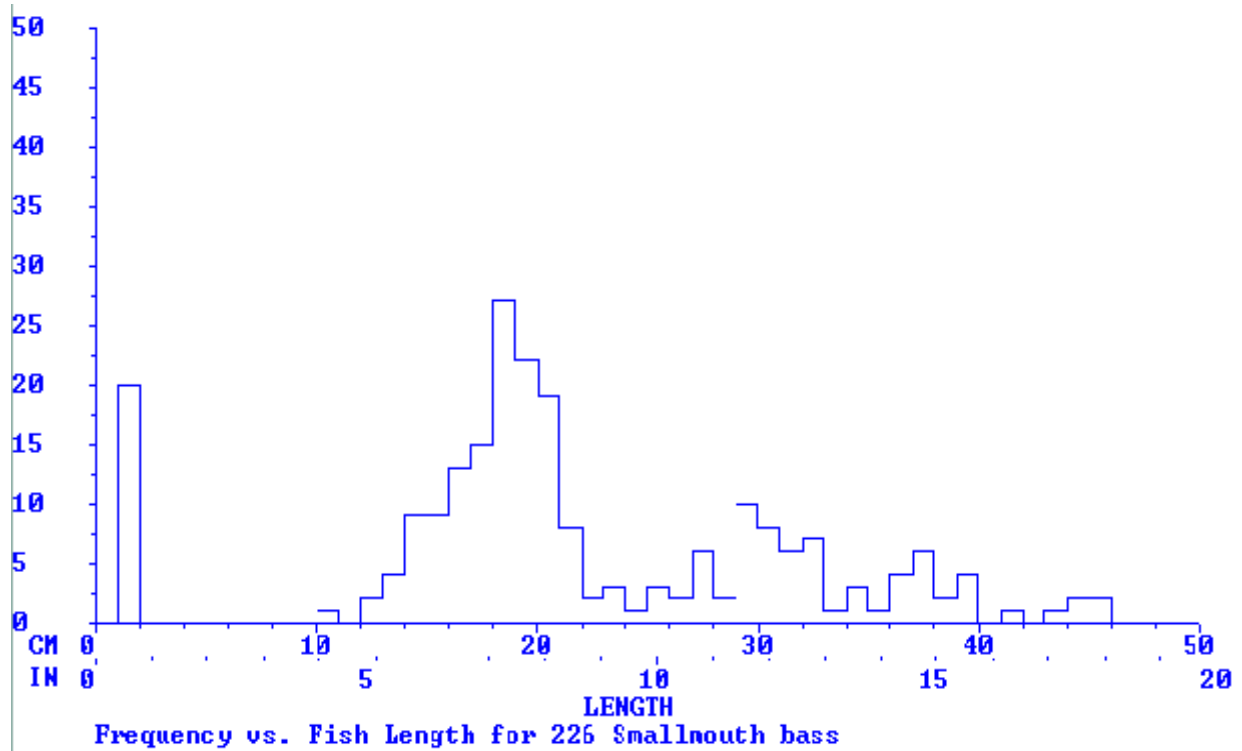
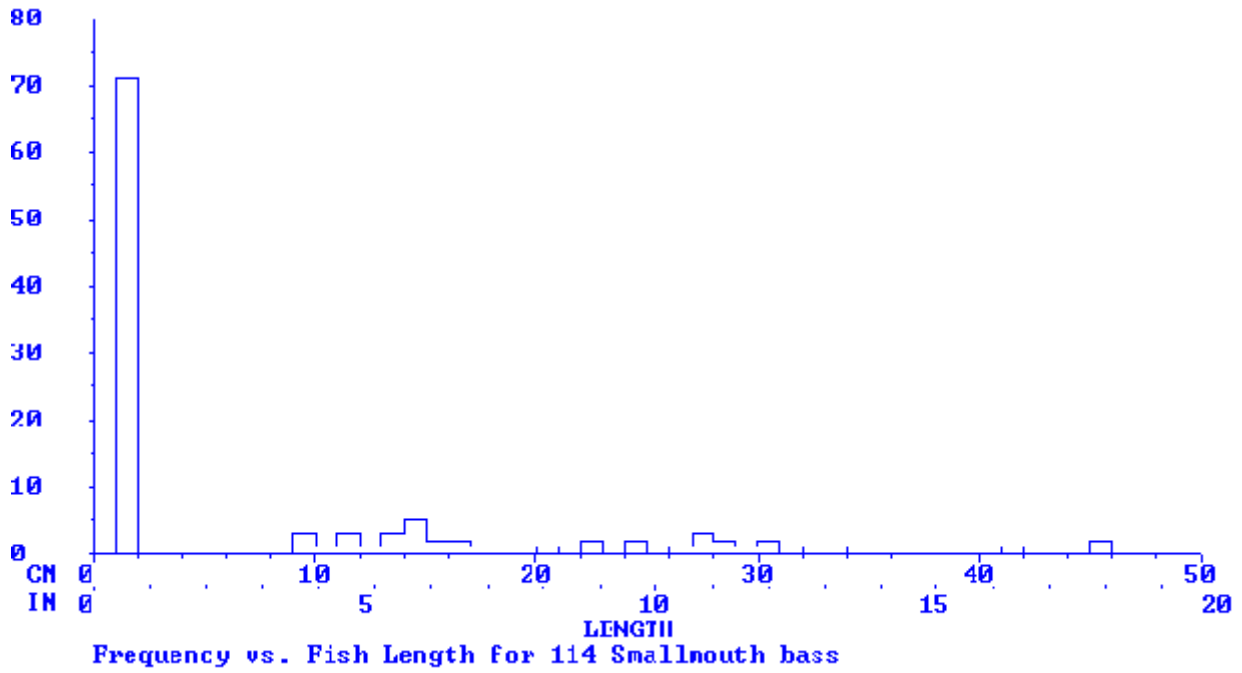


Figure 4. Length frequency distributions for smallmouth bass from tributary stations (top) and mainstem Fox River station (bottom) for the 2002 Fox River Basin Survey.

Appendix

Table A-1. Index of Biotic Integrity (Smogo 2002) with individuals metric values and scores (in paren) for IDNR/IEPA 2002 Fox Basin Survey, mainstem Fox River Stations.

METRIC	Rt. 173	Burton's Bridge	Algon- quin	South Elgin	Fabyan Park	Oswego	Wedron
	DT-35	DT-22	DT-06	DT-09	DT-69	DT-03	DT-36
Native fish species	14 (3)	23 (5)	24 (5)	19 (4)	20 (4)	24 (5)	23 (5)
Native minnow species	4 (3)	7 (4)	7 (4)	4 (3)	4 (3)	5 (3)	6 (4)
Native sucker species	0 (0)	1 (1)	2 (2)	3 (3)	3 (3)	7 (6)	9 (6)
Native sunfish species	5 (5)	6 (6)	6 (6)	6 (6)	5 (5)	5 (5)	4 (4)
Benthic invertivore species	0 (0)	2 (2)	3 (3)	2 (2)	3 (3)	7 (5)	7 (5)
Intolerant species	1 (1)	1 (1)	2 (2)	2 (2)	1 (1)	4 (4)	4 (4)
Prop. specialist benthic invertivores	0.00 (0)	0.00 (1)	0.01 (1)	0.01 (1)	0.06 (3)	0.20 (6)	0.19 (6)
Prop. generalist feeders	0.76 (6)	0.74 (6)	0.72 (6)	0.66 (6)	0.66 (6)	0.63 (6)	0.72 (6)
Prop. mineral-substrate spawners	0.03 (1)	0.01 (1)	0.08 (2)	0.21 (5)	0.14 (4)	0.33 (6)	0.24 (6)
Prop. tolerant species	0.29 (5)	0.17 (6)	0.25 (5)	0.16 (6)	0.15 (6)	0.21 (6)	0.13 (6)
Extrapolated IBI	24	33	36	38	38	52	52

Table A-2. Index of Biotic Integrity (Smogo 2002) with individuals metric values and scores (in paren) for IDNR/IEPA 2002 Fox Basin Survey, tributary stations.

METRIC	DTA-08	DTAB-02	DTC-07	DTCA-01	DTD-02	DTF-02	DTK-04	DTZB-02	DTZP-04	DTZS-01	DTZT-02
	Indian Creek	Little Indian Creek	Big Rock Creek	Little Rock Creek	Black- berry Creek	Ferson Creek	Nipper- sink Creek	Buck Creek	Tyler Creek	Flint Creek	Boone Creek
Native fish species	20 (4)	24 (5)	29 (6)	27 (6)	14 (3)	16 (4)	18 (4)	24 (5)	19 (5)	18 (4)	9 (2)
Native minnow species	7 (4)	10 (6)	14 (6)	13 (6)	7 (5)	7 (5)	5 (3)	9 (5)	7 (5)	4 (3)	3 (2)
Native sucker species	7 (6)	4 (4)	5 (5)	4 (5)	3 (4)	2 (3)	5 (5)	4 (4)	2 (3)	2 (2)	2 (3)
Native sunfish species	2 (2)	2 (2)	6 (6)	4 (5)	1 (2)	4 (5)	3 (3)	3 (3)	5 (6)	5 (5)	2 (3)
Benthic invertivore species	6 (5)	10 (6)	9 (6)	9 (6)	4 (4)	3 (3)	5 (4)	9 (6)	6 (6)	3 (3)	2 (2)
Intolerant species	8 (6)	7 (6)	6 (6)	6 (6)	1 (2)	4 (5)	4 (4)	6 (6)	7 (6)	3 (3)	2 (3)
Prop. specialist benthic invertivores	0.28 (6)	0.22 (6)	0.14 (6)	0.06 (3)	0.08 (3)	0.07 (3)	0.16 (6)	0.09 (4)	0.13 (5)	0.02 (1)	0.02 (1)
Prop. generalist feeders	0.33 (6)	0.40 (6)	0.49 (6)	0.57 (5)	0.89 (2)	0.47 (6)	0.62 (5)	0.53 (6)	0.72 (3)	0.95 (1)	0.96 (1)
Prop. mineral-substrate spawners	0.67 (6)	0.53 (6)	0.51 (5)	0.40 (4)	0.08 (1)	0.49 (5)	0.23 (3)	0.58 (6)	0.24 (3)	0.02 (1)	0.00 (1)
Prop. tolerant species	0.20 (6)	0.21 (6)	0.21 (6)	0.26 (5)	0.29 (5)	0.31 (5)	0.17 (6)	0.12 (6)	0.26 (5)	0.28 (5)	0.22 (5)
IBI	51	53	58	51	31	44	43	51	47	28	23

Table A-3. Fish community sampling results for IDNR/IEPA 1996 Fox River Basin Survey, mainstem Fox River stations.

Common name	Scientific name	Total	Burton's Bridge	Algon quin	South Elgin	Fabyan Park	Oswego	Wedron
			DT-22	DT-06	DT-09	DT-69	DT-03	DT-36
Gizzard shad	Dorosoma cepedianum	7	0	0	0	0	0	7
Carp	Cyprinus carpio	150	44	33	19	11	34	9
Golden shiner	Notemigonus crysoleucas	7	0	0	1	6	0	0
Spotfin shiner	Cyprinella spiloptera	72	10	3	38	4	13	4
Pugnose minnow	Opsopoeodus emiliae	3	0	0	3	0	0	0
Bluntnose minnow	Pimephales notatus	11	0	0	6	3	2	0
Bullhead minnow	Pimephales vigilax	12	5	3	3	1	0	0
Emerald shiner	Notropis atherinoides	11	3	2	4	2	0	0
Rosyface shiner	Notropis rubellus	1	0	0	0	0	0	1
Sand shiner	Notropis ludibundus	7	2	0	0	0	2	3
Spottail shiner	Notropis hudsonius	2	1	0	0	1	0	0
Quillback	Carpiodes cyprinus	110	0	2	0	12	13	83
Highfin carpsucker	Carpiodes velifer	10	0	0	0	0	1	9
White sucker	Catostomus commersoni	6	0	0	2	0	4	0
River redborse	Moxostoma carinatum	1	0	0	0	0	1	0
Shorthead redborse	Moxostoma macrolepidotum	86	0	0	0	0	55	31
Black redborse	Moxostoma duquesnei	1	0	0	0	0	0	1
Golden redborse	Moxostoma erythrurum	75	0	0	11	17	4	43
Silver redborse	Moxostoma anisurum	15	0	0	0	11	2	2
Channel catfish	Ictalurus punctatus	154	33	64	16	31	6	4
Yellow bullhead	Ameiurus natalis	4	2	1	0	1	0	0
Flathead catfish	Pylodictis olivaris	3	1	0	1	1	0	0
Tadpole madtom	Noturus gyrinus	1	0	0	0	1	0	0
Brook silverside	Labidesthes sicculus	527	515	12	0	0	0	0
White bass	Morone chrysops	5	2	1	1	0	1	0
Yellow bass	Morone mississippiensis	10	0	8	1	1	0	0
Black crappie	Pomoxis nigromaculatus	4	2	0	0	0	0	2
White crappie	Pomoxis annularis	4	2	2	0	0	0	0
Rock bass	Ambloplites rupestris	1	0	0	0	0	0	1
Largemouth bass	Micropterus salmoides	58	4	10	33	7	3	1
Smallmouth bass	Micropterus dolomieu	115	0	3	20	27	40	25
Warmouth	Lepomis gulosus	1	1	0	0	0	0	0
Green sunfish	Lepomis cyanellus	55	1	13	20	3	16	2
Bluegill x Green sunfish hybrid	Lepomis macrochirus x L. cyanellus	2	0	0	0	2	0	0
Bluegill	Lepomis macrochirus	401	105	95	127	22	43	9
Pumpkinseed	Lepomis gibbosus	5	0	2	0	2	1	0
Orangespotted sunfish	Lepomis humilis	21	4	4	2	11	0	0
Walleye	Stizostedion vitreum	9	1	0	0	6	2	0
Yellow perch	Perca flavescens	4	4	0	0	0	0	0
Johnny darter	Etheostoma nigrum	1	0	1	0	0	0	0
Freshwater drum	Aplodinotus grunniens	39	10	28	0	1	0	0
Total fish		2011	752	287	308	184	243	237
Total species		40	21	19	18	23	19	18

Table A-4. Fish community sampling results for IDNR/IEPA 1996 Fox River Basin Survey, tributary stations.

Common name	Scientific name	DTA-08DTAB-01 DTAB-02 DTC-07 DTCA-01 DTD-02 DTF-02 DTK-04 DTKA-04 DTZB-02 DTZP-04 DTZS-02 DTZT-02													
		Total Indian Creek	Little Indian Creek	Little Indian Creek	Big Rock Creek	Little Rock Creek	Black-berryFerson Creek	Nippersink Creek	N. Br. Nippersink Creek	Buck Creek	Tyler Creek	Flint Creek	Boone Creek	Boone Creek	
Unidentified lamprey	Petromyzontidae sp.	9	0	0	0	0	0	0	0	0	0	0	0	9	
American brook lamprey	Lampetra appendix	1	0	0	0	0	0	0	0	0	0	0	0	1	
Gizzard shad	Dorosoma cepedianum	7	0	0	0	0	7	0	0	0	0	0	0	0	
Central mudminnow	Umbra limi	10	0	0	0	0	0	0	0	0	6	3	1	0	
Carp	Cyprinus carpio	51	4	0	8	0	5	5	4	3	0	15	7	0	
Carp x Goldfish hybrid	Cyprinus carpio x Carassius auratus	1	0	0	0	0	1	0	0	0	0	0	0	0	
Golden shiner	Notemigonus crysoleucas	1	0	0	0	0	1	0	0	0	0	0	0	0	
Southern redbelly dace	Phoxinus erythrogaster	504	0	504	0	0	0	0	0	0	0	0	0	0	
Creek chub	Semotilus atromaculatus	149	0	77	7	1	1	14	1	0	6	5	1	36	
Hornyhead chub	Nocomis biguttatus	366	12	63	20	8	21	1	48	10	35	135	0	13	
Central stoneroller	Campostoma anomalum	581	23	113	75	7	42	0	204	0	0	95	22	0	
Largescale stoneroller	Campostoma oligolepis	187	48	0	105	5	25	0	0	0	4	0	0	0	
Suckermouth minnow	Phenacobius mirabilis	34	0	5	17	0	5	0	0	0	7	0	0	0	
Blacknose dace	Rhinichthys atratulus	143	0	142	0	0	0	1	0	0	0	0	0	0	
Striped shiner	Luxilus chrysocephalus	378	16	0	98	0	0	0	1	0	262	1	0	0	
Common shiner	Luxilus cornutus	1104	19	315	67	8	5	1	11	0	101	131	9	436	
Redfin shiner	Lythrurus umbratilis	24	0	0	2	0	2	0	0	0	18	0	0	0	
Spotfin shiner	Cyprinella spiloptera	385	38	0	84	40	64	30	0	39	59	6	0	25	
Fathead minnow	Pimephales promelas	4	0	0	0	0	0	0	0	0	0	2	0	2	
Bluntnose minnow	Pimephales notatus	2348	8	951	411	0	132	49	14	1	4	733	12	19	
Bullhead minnow	Pimephales vigilax	1	0	0	0	0	0	0	0	0	0	0	0	0	
Emerald shiner	Notropis atherinoides	22	0	0	0	0	0	0	22	0	0	0	0	0	
Rosyface shiner	Notropis rubellus	56	9	0	37	0	10	0	0	0	0	0	0	0	
Bigmouth shiner	Notropis dorsalis	665	0	432	2	0	6	0	0	0	28	41	0	156	
Sand shiner	Notropis ludibundus	642	22	85	278	0	101	2	28	4	21	101	0	0	
Quillback	Carpiodes cyprinus	35	20	0	0	15	0	0	0	0	0	0	0	0	
Highfin carpsucker	Carpiodes velifer	5	3	0	2	0	0	0	0	0	0	0	0	0	
White sucker	Catostomus commersoni	243	0	0	17	1	15	92	33	13	3	19	12	38	
Northern hog sucker	Hypentelium nigricans	170	23	0	17	12	17	1	53	7	27	9	4	0	
Shorthead redhorse	Moxostoma macrolepidotum	41	21	0	0	3	0	0	17	0	0	0	0	0	
Black redhorse	Moxostoma duquesnei	168	138	0	8	22	0	0	0	0	0	0	0	0	
Golden redhorse	Moxostoma erythrurum	229	66	0	14	28	0	55	5	1	55	0	0	0	
Channel catfish	Ictalurus punctatus	10	1	0	0	2	0	0	5	0	0	1	1	0	
Yellow bullhead	Ameiurus natalis	22	5	0	0	0	1	0	2	0	3	0	11	0	
Stonecat	Noturus flavus	71	7	0	4	0	0	12	5	4	39	0	0	0	
Tadpole madtom	Noturus gyrinus	21	0	0	0	0	0	0	0	0	0	0	21	0	
Freckled madtom	Noturus nocturnus	1	0	0	0	0	1	0	0	0	0	0	0	0	
Slender madtom	Noturus exilis	40	0	0	0	0	0	0	0	0	40	0	0	0	
Brook silverside	Labidesthes sicculus	3	0	0	0	0	0	0	3	0	0	0	0	0	
Mottled sculpin	Cottus bairdi	11	0	0	0	0	3	0	0	0	0	2	0	6	
Yellow bass	Morone mississippiensis	1	0	0	0	0	0	0	1	0	0	0	0	0	
Black crappie	Pomoxis nigromaculatus	3	0	0	0	0	0	1	0	2	0	0	0	0	
Rock bass	Ambloplites rupestris	31	11	0	7	0	0	0	0	5	8	0	0	0	
Largemouth bass	Micropterus salmoides	53	0	0	0	0	5	2	4	8	0	6	27	1	
Smallmouth bass	Micropterus dolomieu	55	9	0	6	5	0	4	4	3	20	0	0	0	
Green sunfish	Lepomis cyanellus	138	11	0	3	6	21	18	10	2	0	30	37	0	
Bluegill	Lepomis macrochirus	143	2	0	0	7	16	4	42	14	0	9	33	16	
Pumpkinseed	Lepomis gibbosus	2	0	0	0	0	0	0	2	0	0	0	0	0	
Orangespotted sunfish	Lepomis humilis	3	0	0	0	0	0	0	0	0	0	0	3	0	
Walleye	Stizostedion vitreum	2	0	0	0	0	0	0	2	0	0	0	0	0	
Yellow perch	Perca flavescens	2	0	0	0	0	0	0	2	0	0	0	0	0	
Blackside darter	Percina maculata	5	0	0	0	0	0	3	0	1	0	0	0	1	
Slenderhead darter	Percina phoxocephala	1	0	0	1	0	0	0	0	0	0	0	0	0	
Logperch	Percina caprodes	21	0	0	0	0	0	0	8	10	0	0	3	0	
Johnny darter	Etheostoma nigrum	38	0	12	6	0	10	0	2	0	3	1	0	4	
Banded darter	Etheostoma zonale	143	44	0	49	0	11	0	18	7	6	8	0	0	
Orangethroat darter	Etheostoma spectabile	45	0	18	1	0	1	0	0	0	6	11	0	8	
Fantail darter	Etheostoma flabellare	63	2	2	0	0	0	0	0	0	51	8	0	0	
Total fish		9492	562	2719	1307	194	477	213	541	240	320	1769	203	205	742
Total species		56	25	13	22	18	23	16	21	25	19	24	18	16	15

