



ILLINOIS NATURAL
HISTORY SURVEY

T E C H N I C A L R E P O R T

**THE LONG-TERM ILLINOIS RIVER FISH
POPULATION MONITORING PROGRAM**

Project F-101-R-20

Annual Report to the Illinois Department of Natural Resources

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The Long-Term Illinois River Fish Population Monitoring Program

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DISCLAIMER

The findings, conclusions, and views expressed herein are those of the researchers and should not be considered as the official position of the United States Fish and Wildlife Service or the Illinois Department of Natural Resources.

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EXECUTIVE SUMMARY

Between 21 August and 20 October 2008, 25 sites on the Illinois River waterway and one site in Reach 26 of the Mississippi River were electrofished to monitor fish communities. A total of 8,171 fishes representing 62 species (plus one hybrid) from 15 families were collected during 24.68 hours of sampling. Collections made in 2008 indicated continued high catches of gizzard shad, emerald shiner, and bluegill throughout most of the Illinois River waterway. Two new fish species were collected for the first time during project F-101-R. Blackside darter and longnose dace were each collected in the upper river. Single specimens of blackside darter were collected from Bull's Island Bend (RM 241.5) in Starved Rock Reach and Waupecan Island (RM 260.6) in Marseilles Reach. Two specimens of blackside darter were collected from Treat's Island (RM 279.8) in Dresden Reach. Two specimens of longnose dace were also collected at Waupecan Island. Several fish species were collected for the first time within a given river reach in 2008. A single specimen of bighead carp was collected for the first time at Brickhouse Slough on the Mississippi River. A single specimen of redear sunfish was collected at Crater-Willow Islands (RM30.0) in Alton Reach. Two new species were collected in La Grange Reach; a single pumpkinseed was collected at Pekin (RM 155.1) and two specimens of bowfin were collected at Lower Bath Chute (RM 107.1). Two specimens of blackstripe topminnow were collected for the first time in Peoria Reach at Hennepin Island (RM 207.6). Along with blackside darter and longnose dace, two additional fish species were collected in Marseilles Reach. A single specimen of mud darter and two specimens of brook silverside were also collected at Waupecan Island. A single logperch was collected for the first time in Dresden Reach at the Mouth of the DuPage River (RM 277.4). Gizzard shad were the most abundant species collected throughout the waterway in 2008 with 1,802 fish collected comprising 22.1% of the total catch. The sample from Lambie's Boat Harbor (RM 170.3, Peoria Reach) yielded the highest collection of total fish (1,375, 16.8% of the total collection), while the sample from Turkey Island (RM 148.0) produced the lowest total fish (58, 0.07% of the total collection). Fish species richness at sites ranged from 27 at Clark Island (RM 215.3, Peoria Reach) to 12 species at Moore's Towhead (RM 75.3, Alton Reach) and Turkey Island. Fish species richness of the lower, middle, and upper waterway was 24, 49, and 42, respectively. Cyprinid catches continued to remain relatively high in the upper waterway, with bluntnose minnow being the most abundant (429 total fish), making up 17.9% of the total upper waterway catch. Bluntnose minnow, emerald shiner and spotfin shiner together totaled 1,223 fish comprising 51.1% of the upper waterway catch. Important sport fish species such as bluegill, largemouth bass, and channel catfish were collected in all six waterway reaches in 2008. Bluegill catch per unit effort in number of fish collected per hour ($CPUE_N$) ranged from 169.50 in Dresden Reach to 12.76 in Alton Reach. Largemouth bass $CPUE_N$ ranged from 25.50 in Dresden Reach to 4.50 in Starved Rock Reach. Channel catfish $CPUE_N$ ranged from 20.78 in La Grange Reach to 2.07 in Marseilles Reach. In terms of pounds of fish collected per hour ($CPUE_W$), the collection from Peoria Reach yielded the highest biomass at 140.4 pounds per hour while the collection from Marseilles Reach yielded the lowest biomass at 38.3 pounds per hour. Common carp biomass ranked first over all reaches at 27.1 pounds per hour, comprising 28.6% of the total biomass. Common carp also ranked first in $CPUE_W$ for Alton, La Grange, Peoria, Starved Rock, and Marseilles reaches and second in $CPUE_W$ in Dresden Reach. Silver carp were only collected in three reaches of the waterway yet catch in weight for silver carp ranked second over all reaches with a $CPUE_W$ of 16.19. Catch in weight for two sport fish species, channel catfish and bluegill, were the highest ever observed in a given reach. A high $CPUE_W$ of 23.48 was observed for channel catfish in Alton Reach and a high $CPUE_W$ of 8.31 was observed for bluegill in Dresden Reach.

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^aJob numbers and titles refer to the F-101-R-20 annual work plan dated January 2008

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INTRODUCTION

This report presents a summary of data collected in 2008 during segment 20 of federal aid project F-101-R, The Long-term Illinois River Fish Population Monitoring Program. Previous summaries of the long-term data set, begun in 1957, were given by Sparks and Starrett (1975), Sparks (1977), Sparks and Lerczak (1993), Lerczak and Sparks (1994), Lerczak et al. (1994), Koel and Sparks (1999), and McClelland and Pegg (2004). The annual reports for project F-101-R will continue to build upon previously collected data with major analyses of the long-term data set scheduled at five-year intervals. The next summary is due at the end of segment 20. The format used in this report is patterned after previous annual reports of this project (Lerczak et al. 1993, 1994, 1995, and 1996; Koel et al. 1997 and 1998; Koel and Sparks 1999; Arnold et al. 2000; McClelland and Pegg 2001, 2002, 2003, 2004, 2005; McClelland and Cook 2006; McClelland and Sass 2007; McClelland and Sass 2008) to allow for easy comparisons of data among years.

STUDY AREA AND METHODS

Twenty-seven sites have been sampled annually for fish at fixed locations along the Illinois Waterway. Twenty-six of the site locations were defined by Sparks and Starrett (1975) and Lerczak et al. (1994). In 1999, a twenty-seventh site was added at Moore's Towhead in Alton Reach, Illinois River mile 75.3, to more closely monitor fish communities near The Nature Conservancy's (TNC) floodplain restoration project (Spunky Bottoms Merwin Preserve). Twenty-five of the sites were located on the Illinois River, with two additional sites on the lower Des Plaines River. The Des Plaines River,

along with the Illinois River forms part of the Illinois Waterway. One additional site was located on the Mississippi River (Figure 1). Seventeen of the sites were in side channels; the remaining sites were in other habitats, including the main channel border, or in a combination of habitat types (see Lerczak et al., 1994). In 2008, a total of 25 sites were sampled.

Following water quality measurements (e.g., dissolved oxygen) at each site, fish populations were sampled by electrofishing from a 16-ft (5-m) aluminum boat using a 3000-watt, three-phase AC generator. Sampling at each site typically lasted one hour. Stunned fish were gathered with a dip net (1/4-in [0.64-cm] mesh) and stored in an oxygenated livewell until sampling was completed. Fish were then identified to species, measured (total length and weight), inspected for externally visible abnormalities, and returned to the water. Additional details on the electrofishing method and equipment were given by Lerczak et al. (1994).

DATA ANALYSIS (Job 4)

For each site, the number of individual fish and total weight (pounds) were tallied for each species. Fish catch rates were quantified as the number of individuals collected per hour of electrofishing ($CPUE_N$) and as weight in pounds collected per hour of electrofishing ($CPUE_W$). Catch data, both the number of individuals and pounds collected per sample and hour, were summarized and reported by collection site. Data from sites was also grouped into reaches defined by navigation dams (Figure 1) as follows: Alton Reach, river mile (RM) 0-80; La Grange Reach, RM 80-158; Peoria Reach, RM 158-231; Starved Rock Reach, RM 231-247; Marseilles Reach, RM 247-271.5; and Dresden Reach, RM 271.5-286 on the Des Plaines River. Data from

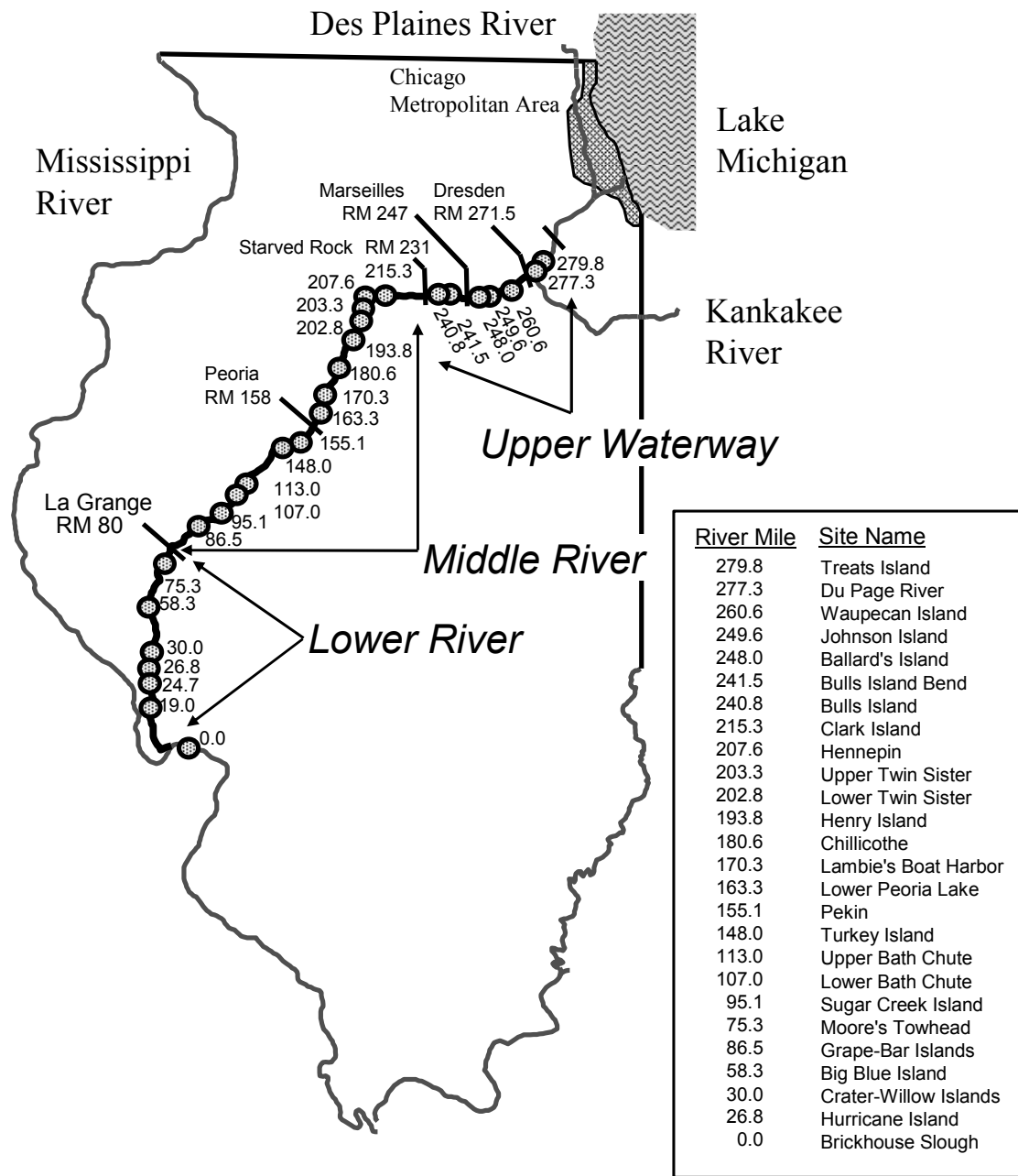


Figure 1. Map of the Illinois River waterway illustrating the three segments of the Illinois River Waterway with sites sampled by electrofishing to monitor fish communities in 2008.

reaches was also combined into three groups; lower (Alton Reach), middle (La Grange and Peoria reaches), and upper (Starved Rock, Marseilles, and Dresden reaches) Illinois Waterway segments defined by their location along the river (waterway) and by the amount of off-channel habitat accessible to fish per unit length of river (Figure 1; Lerczak et al. 1994). Lerczak et al. (1994, 1995, and 1996) found that river fish communities of the three segments differed substantially enough to give segment designations biological meaning.

RESULTS AND DISCUSSION (Job 5)

All equipment was tested and repaired as necessary before the fish sampling season began and staff were given a review in safety procedures and electrofishing methods (**Job 1**).

A total of 26 sites were sampled between 21 August and 20 October 2008 (**Job 2**); two sites were unable to be sampled due to high water conditions. River levels exceeded water level criteria at Dark Chute (RM 24.7) and Mortland Island (RM 19.0) in Alton Reach during the sampling period. Total electrofishing time for sites sampled was 24.68 h (Table 1). Collected data were entered into Microsoft ACCESS 2000 and verified against original field data sheets until no errors were detected (**Job 3**). The original data sheets from 2008 sampling and all of the other original data sheets of this project (1957-2008) are stored in flame-resistant cabinets at the Illinois River Biological Station at 704 N. Schrader Avenue, Havana (**Job 3**).

Table 1. Station information and characteristics during sampling in 2008. All stations, except where noted, are on the Illinois River and are listed in downstream-to-upstream order. Site miles are the average river mile and refer to Figure 1.

Order Sampling	Date	Site		End time (CST)	Duration (h)	Temp (°F)		DO (% Sat.)	Secchi (cm)	Cond. (umhos)	Volts		Depth ^b (ft)		
		Mile ^a	Name			air	water				(ft/s)	Vel.	min	max	
Reach 26, Mississippi River															
22	8-Oct	0.0	Brickhouse Slough ^d	11:05	1.00	61.9	66.2	8.50	92.30%	21.0	353	225	0.01	0.5	5.5
Alton Reach															
10	3-Sep	26.8	Hurricane Island	9:55	0.93	68.9	79.2	3.60	42.08%	22.0	485	220	0.06	1.0	7.0
8	28-Aug	30.0	Crater-Willow Island	9:30	1.00	79.0	80.4	5.20	67.02%	27.0	648	220	0.13	0.5	7.0
7	27-Aug	58.3	Big Blue Island	11:30	1.00	78.6	80.1	6.70	86.04%	19.0	655	220	0.15	0.5	6.0
6	27-Aug	75.3	Moore's Towhead	8:45	0.75	68.9	78.6	6.40	74.82%	26.0	652	220	0.19	0.5	6.0
La Grange Reach															
11	8-Sep	86.5	Grape-Bar Islands	12:50	1.00	61.9	70.7	5.50	59.73%	16.0	648	220	0.56	1.0	7.0
9	2-Sep	95.1	Sugar Creek Island	11:23	1.00	87.1	82.4	5.00	69.25%	18.0	676	220	0.20	0.5	5.5
4	25-Aug	107.1	Lower Bath Chute	9:30	1.00	68.9	79.9	4.50	52.61%	17.0	655	220	0.20	0.5	7.0
3	22-Aug	113.0	Upper Bath Chute	9:06	1.00	77.0	80.6	5.00	63.26%	24.0	654	220	0.13	1.0	7.0
2	21-Aug	148.0	Turkey Island	12:30	0.58	70.3	81.7	5.90	69.95%	23.0	663	220	0.23	0.5	7.5
1	21-Aug	155.1	Pekin	10:20	1.00	68.0	80.2	7.20	83.40%	22.0	640	220	0.23	0.5	7.0
Peoria Reach															
12	9-Sep	163.4	Lower Peoria Lake	9:15	1.00	59.3	64.9	7.20	75.97%	16.0	680	225	0.06	0.5	3.5
13	9-Sep	170.3	Lambie's Boat Harbor	12:50	1.00	70.8	68.2	9.30	110.82%	18.0	679	220	0.06	0.5	2.5
18	12-Sep	180.6	Chillicothe	10:15	1.00	70.3	71.1	6.80	80.62%	19.0	607	220	0.23	0.5	7.0
26	20-Oct	193.8	Henry Island	10:15	1.00	56.9	59.0	9.30	95.47%	42.0	660	220	0.41	0.5	7.0
25	17-Oct	202.8	Lower Twin Sister	13:40	1.00	55.2	63.0	8.40	84.54%	60.0	681	220	0.32	0.5	7.0
24	17-Oct	203.3	Upper Twin Sister	11:35	1.00	52.6	62.8	8.80	85.85%	54.0	683	220	0.29	0.5	7.0
23	17-Oct	207.7	Hennepin	9:50	1.00	49.2	62.6	8.60	80.43%	52.0	681	220	0.24	0.5	8.0
5	26-Aug	215.3	Clark Island	10:24	1.00	69.2	77.7	8.50	99.67%	33.0	708	220	0.14	0.5	6.5
Starved Rock Reach															
15	10-Sep	240.8	Bulls Island	11:25	1.00	77.7	74.1	8.00	101.88%	52.0	621	220	0.29	0.5	7.5
14	10-Sep	241.5	Bulls Island Bend	9:30	1.00	61.1	72.7	8.00	86.12%	50.0	617	225	0.46	0.5	7.0
Marseilles Reach															
16	11-Sep	248.0	Ballards Island	10:08	1.00	70.2	73.2	7.60	90.02%	85.0	677	220	0.23	0.5	4.0
17	11-Sep	249.7	Johnson Island	11:35	0.42	74.3	73.8	7.60	93.72%	70.0	626	220	0.12	0.5	3.5
21	2-Oct	260.6	Waupecan Island	9:40	1.00	54.2	64.0	8.90	88.51%	78.0	594	225	0.46	1.0	6.0
Dresden Reach															
19	24-Sep	277.4	Du Page River ^e	11:15	1.00	74.2	75.9	7.00	86.24%	67.0	854	215	0.05		504.50
20	24-Sep	279.9	Treats Island ^e	13:00	1.00	79.0	76.3	7.40	95.38%	60.0	852	215	0.17		504.50
Minimum															
Maximum															
Mean															
Total time electrofished															
24.68															

^aRefers to approximate average river mile electrofished at each site, 1957-2008.

^bEstimated during sampling.

^cFeet above sea level or river stage (ft) at the U.S. Army Corps of Engineers river gage nearest to the sampling site.

^dMississippi River.

^eDes Plaines River.

A. CONDITIONS DURING ELECTROFISHING RUNS

Sampling was conducted in full daylight between 8:45 AM and 1:40 PM central standard time (Table 1). The ranges for physical measurements collected during the 2008 sampling season were as follows: air temperature, 49.2-87.1° F; water temperature, 59.0-82.4° F; dissolved oxygen concentration, 3.6-9.3 ppm; secchi disk transparency, 16.0-85.0 cm; conductivity, 353-854 µhos/cm; surface velocity, 0.01-0.56 ft/s; water depth, 0.5-8.0 ft. All physical values were within the ranges expected based upon previous sampling (Lerczak et al. 1994; Koel and Sparks 1999). The 26 sites sampled were within established water temperature and river level criteria (Table 1; Lerczak et al. 1994).

B. ELECTROFISHING RESULTS

The following data summaries proceed through several levels of detail. First, data on the number of individual fish (by species) collected at each of the 26 sites are presented. Second, catch rates of the number of individuals collected per hour of electrofishing are calculated for each of the seven navigation reaches. Similar summaries are presented for fish weights. Fish common names used throughout this report follow Robins et al. (1991). Fish common and scientific names are listed in APPENDIX A.

Numbers of Fish Collected

We collected a total of 8,171 fishes representing 62 species (plus one hybrid) from 15 families during 24.68h of electrofishing at 25 sites on the Illinois River waterway and a single site on the Mississippi River in 2008. Gizzard shad were the most

abundant species collected (1,802 total fish), representing 22.0% of the total catch. Gizzard shad were followed by bluegill (1,141, 14.0% of total), freshwater drum (732, 9.0% of total), emerald shiner (730, 8.9% of total), silver carp (478, 5.9% of total), bluntnose minnow (429, 4.1% of total), spotfin shiner (377, 4.6% of total), and largemouth bass (307, 3.8% of total). Bluegill were collected at all 26 sites sampled; common carp were collected at 25 sites; gizzard shad and largemouth bass were collected at 24 sites; channel catfish and freshwater drum were collected at 22 sites; smallmouth buffalo were collected at 21 sites. The collection from Lambie's Boat Harbor (RM 170.3, Peoria Reach) yielded the most fish (1,375, 16.8% of the total collected from 26 sites sampled), while the collection from Turkey Island (RM 148.0, La Grange Reach) yielded the least fish (58, 0.07% of the total collected from 26 sites sampled). The most fish species collected at one site was 27 obtained at Clark Island (RM 215.3) in Peoria Reach. The fewest species collected at a single site was 12 from Moore's Towhead (RM 75.3, Alton Reach) and Turkey Island.

Of the 62 fish species and one hybrid cross, 16 species (bighead carp, brook silverside, brown bullhead, golden shiner, grass pickerel, highfin carpsucker, logperch, longnose dace, mooneye, mud darter, river carpsucker, rock bass, silverband shiner, slenderhead darter, tadpole madtom, and western mosquitofish) were collected at only one site. Six fish species (black buffalo, black bullhead, bowfin, longear sunfish, redear sunfish, and round goby) were collected at only two sites. Ten fish species (bighead carp, golden shiner, grass pickerel, longnose gar, mooneye, mud darter, silverband shiner, slenderhead darter, tadpole madtom, and western mosquitofish) were represented by single individuals at sites. A maximum of two individuals were collected

at sites for each of six fish species (black buffalo, brook silverside, brown bullhead, highfin carpsucker, longnose dace, and redear sunfish).

On the 25 Illinois River waterway sites sampled, we collected 8,052 fishes representing 62 species (plus one hybrid) from 15 families during 23.68 h of sampling. At Brickhouse Slough on the Mississippi River (RM 204.9), we collected 119 fishes representing 19 species from nine families (Table 2). The total number of fish species collected from Brickhouse Slough in 2008 was the third highest collection ever recorded in F-101-R sampling at this site. The highest fish species collection occurred in 2005 when 20 fish species were collected (McClelland and Cook 2006). A single bighead carp was collected at Brickhouse Slough in 2008 marking the first collection for this species at this site in F-101-R sampling.

On the lower Illinois River waterway, we collected 611 fishes representing 24 species from nine families (Table 2). In 2008, fish species richness ranged from 12 at Moore's Towhead (RM 75.3) to 19 at Big Blue Island (RM 58.3). Hurricane Island (RM 26.8) exhibited the highest total catch in the lower waterway with 178 total fishes.

We collected 5,048 fishes representing 49 species and one hybrid on the middle Illinois River waterway (Tables 3 and 4). The total catch for the middle river in 2008 was the second highest recorded for this region in F-101-R sampling. The six sites on La Grange Reach (RM 80-158) produced 1,603 fishes representing 37 species and one hybrid. Total fish species collections for La Grange Reach are the highest ever recorded for this reach in F-101-R sampling, while total fish numbers were the third highest ever recorded. The eight sites on Peoria Reach (RM 158-231) produced 3,445 fishes representing 42 species and one hybrid. The total fish numbers and total fish

Table 2. Number of individuals of each fish species collected on the Mississippi River (Brickhouse Slough) and the lower Illinois Waterway (Alton Reach, RM 0-80) in 2008.

Species	Mile Effort	River Mile and Hours Fished					Total
		Miss. River	Lower Illinois River				
		0.0 1.00	26.8 1.00	30.0 1.00	58.3 0.93	75.3 0.75	
Amiidae							
bowfin				2			2
Catostomidae							
bigmouth buffalo		2		1			1
river carpsucker			1		1		2
shorthead redhorse			1	1	3		5
smallmouth buffalo		8		3	8	3	14
Centrarchidae							
black crappie		1		2	1		3
bluegill		12	11	18	17	1	47
green sunfish		10					
largemouth bass		4	3	8	7	4	22
orange spotted sunfish		4			1		1
redeer sunfish				1			1
smallmouth bass		1					
warmouth					1		1
Clupeidae							
gizzard shad		55	5	23	29	99	156
skipjack herring			1			1	2
threadfin shad		1	4	2	3		9
Cyprinidae							
bighead carp		1					
bullhead minnow		1	4		2		6
common carp		2	11	11	6	10	38
emerald shiner			3	5	1		9
silver carp		4	12	4	18	2	36
Ictaluridae							
channel catfish		6	32	17	8	12	69
flathead catfish		2	5	5	4	4	18
Lepisosteidae							
spotted gar		1	1				1
Moronidae							
white bass		1	13	6	4	6	29
Percidae							
sauger					1	5	6
Sciaenidae							
freshwater drum		3	71	18	28	16	133
Total individuals		119	178	127	143	163	611
Total species/hybrids		19/0	16/0	17/0	19/0	12/0	24/0

Table 3. Number of individuals of each fish species collected on La Grange Reach (RM 80-158) of the middle Illinois Waterway (RM 80-231) in 2008.

Species	Mile Effort	River Mile and Hours Fished						La Grange	Middle
		86.5 1.00	95.1 1.00	107.1 1.00	113.0 1.00	148.0 0.58	155.1 1.00	Reach Total 5.58	River Total 13.58
Amiidae									
bowfin				2				2	2
Catostomidae									
bigmouth buffalo			1		1		1	3	67
black buffalo	1							1	2
river carpsucker	4	3	1				1	9	22
shorthead redhorse	7	3	4	2	1		1	18	22
smallmouth buffalo	2	11	21	1	6			41	108
Centrarchidae									
black crappie	3	5	26	8				42	79
bluegill	20	21	35	45	12		11	144	647
bluegill x green sunfish			1					1	11
green sunfish	2	5	25	3			1	36	164
largemouth bass	7	7	80	29	3		8	134	195
orange spotted sunfish	30	35	14	8			2	89	237
pumpkinseed							1	1	2
warmouth			2	1				3	4
white crappie		2	2	8				12	14
Clupeidae									
gizzard shad	33	34	20	6			8	101	1376
skipjack herring	3		2					5	7
threadfin shad	29	6	17	24				76	85
Cyprinidae									
bullhead minnow	4							4	22
common carp		21	11	8	5		9	54	151
emerald shiner	13	4	3	1				21	292
goldfish			12					12	20
grass carp		1	1		1		2	5	18
red shiner	1							1	9
silver carp	4	8	10	13	1		11	47	438
silver chub	5	2						7	7
silverband shiner		1						1	1
Hiodontidae									
mooneye		1						1	1
Ictaluridae									
black bullhead			14					14	21
channel catfish	58	5	12	18	10		13	116	136
flathead catfish	5	5	7	3	1			21	27
tadpole madtom	1							1	1
Lepisosteidae									
longnose gar	1							1	1
spotted gar							1	1	1
Moronidae									
white bass	8	5	17	13	10		42	95	134
yellow bass	7	2	2					11	12
Percidae									
sauger	6	1	1		3			11	21
Sciaenidae									
freshwater drum		284	16	42	33	5	81	461	591
Total Individuals		538	205	384	225	58	193	1603	5048
Total species/hybrids		25/0	25/0	26/1	19/0	12/0	16/0	37/1	49/1

Table 4. Number of individuals of each fish species collected on Peoria Reach (RM 158-231) of the middle Illinois Waterway (RM 80-231) in 2008.

Species	River Mile and Hours Fished									Peoria Reach Total	Middle River Total
	Mile Effort	163.3 1.00	170.3 1.00	180.6 1.00	193.8 1.00	202.8 1.00	203.3 1.00	207.6 1.00	215.3 1.00		
Catostomidae											
bigmouth buffalo		3	4		6	6	34	5	6	64	67
black buffalo									1	1	2
golden redhorse		1	1	1	3					6	6
highfin carpsucker									2	2	2
river carpsucker		10							3	13	22
shorthead redhorse					1			1	2	4	22
smallmouth buffalo		9	4	7	4	15	19		9	67	108
Centrarchidae											
black crappie				2		1	23		11	37	79
bluegill		230	87	85	2	2	38	10	49	503	647
bluegill x green sunfish		4	5						1	10	11
green sunfish		69	36	6	1		3	7	6	128	164
largemouth bass		18	16	20			1	1	5	61	195
orange spotted sunfish		21	26	13	9	2	9	63	5	148	237
pumpkinseed							1			1	2
smallmouth bass			1	2		1			3	7	7
warmouth							1			1	4
white crappie		1					1			2	14
Clupeidae											
gizzard shad		55	554	10	8	7	2	105	534	1275	1376
skipjack herring			1					1		2	7
threadfin shad					4	1	1	1	2	9	85
Cyprinidae											
bullhead minnow		3	3	1					11	18	22
central stoneroller								1		1	1
common carp		19	8	13	21	17	4	3	12	97	151
emerald shiner		2	201	11		10	1	31	15	271	292
golden shiner							1			1	1
goldfish			4			1	1	2		8	20
grass carp		3	4	3	1		1		1	13	18
red shiner		2		5					1	8	9
silver carp		7	342	18	2	1	13	5	3	391	438
spotfin shiner				1				4	7	12	12
spottail shiner		10	40					2	5	57	57
Fundulidae											
blackstripe topminnow								2		2	2
Ictaluridae											
black bullhead			7							7	21
brown bullhead			2							2	2
channel catfish		5		8	4			1	2	20	136
flathead catfish							1		5	6	27
yellow bullhead		1	4							5	5
Moronidae											
white bass		2		11	4	7	2	5	8	39	134
yellow bass			1							1	12
Percidae											
logperch								4		4	4
sauger				1			3	2	4	10	21
Poeciliidae											
western mosquitofish								1		1	1
Sciaenidae											
freshwater drum		19	24	21	7	19	9	9	22	130	591
Total individuals		494	1375	239	77	90	169	266	735	3445	5048
Total species/hybrids		21/1	22/1	20/0	15/0	14/0	22/0	23/0	27/1	42/1	49/1

species collections for Peoria Reach represent the second highest recorded for this reach in F-101-R sampling. Fish species richness in the middle river ranged from 12 species collected at Turkey Island (RM 148.0, La Grange Reach) to 27 species and one hybrid collected at Clark Island (RM 215.3, Peoria Reach) in 2008. Our 2008 collections represent the highest fish species richness observation ever recorded in the middle river with 36 fish species (plus one hybrid) collected in La Grange Reach. Numerous sites in the middle river also recorded highest fish species collections. Observations at Bar-Grape Islands (25; RM 86.5), Sugar Creek Island (25; RM 95.1), and Lower Bath Chute (26; RM 107.1) in La Grange Reach were all the highest ever recorded in F-101-R sampling at these sites. In Peoria Reach high fish species collections were recorded at Lower Peoria Lake (21; RM 163.3), Lambie's Boat Harbor (22; RM 170.3), Upper Twin Sisters Island (22; RM 203.3), and Clark Island (27). Lambie's Boat Harbor was the site of the highest total catch on the middle Illinois River waterway with 1,375 fishes. Our 2008 collection at Lambie's Boat Harbor represents the second highest number of fishes ever collected in F-101-R sampling for a single collection site throughout the river. The highest total catch at any given site was 2,293 fishes recorded at Lambie's Boat Harbor in 2007 (McClelland and Sass 2008). In addition to the high numbers observed at Lambie's Boat Harbor, the collections at Bar-Grape Islands (538 fishes) and Clark Island (735 fishes) each recorded their highest total catches in F-101-R sampling.

We collected 2,393 fishes representing 42 species and one hybrid (Table 5) on the upper Illinois River waterway in 2008. In addition, fish species collections were the highest ever recorded for Marseilles and Dresden reaches. A total of 36 fish species in

Table 5. Number of individuals of each fish species collected on Starved Rock, Marseilles, and Dresden Reaches of the upper Illinois Waterway (RM 231-280) in 2008.

Species	River Mile and Hours Fished								
	Mile Effort	Starved Rock		Marseilles			Dresden		Upper Waterway Total
		240.8 1.00	241.5 1.00	248 1.00	249.6 0.42	260.6 1.00	277.4 1.00	279.8 1.00	6.42
Atherinidae									
brook silverside					2				2
Catostomidae									
golden redbhorse		1			2				3
river carsucker				1	2				3
shorthead redbhorse		3			1				4
smallmouth buffalo	6		1	1	4		1		13
Centrarchidae									
black crappie	2	1	1	2			1		7
bluegill	16	23	30	10	17	209	130		435
bluegill x green sunfish						5	9		14
green sunfish	6	3	2	2	3	20	33		69
largemouth bass	3	6	21	4	1	39	12		86
longear sunfish			3				1		4
orange spotted sunfish			2	1	3	4	11		21
pumpkinseed		4	3	1	8	1			17
redeer			1						1
rock bass						16			16
smallmouth bass	2	3	1		2	12			20
Clupeidae									
gizzard shad	35	78	43	23		32	4		215
skipjack herring		1		1					2
threadfin shad		2				1			3
Cyprinidae									
bluntnose minnow	41	81	56	32	68	78	73		429
bullhead minnow	21	40	20	5	6		7		99
central stoneroller	3	7	3						13
common carp	3	4	5	2	5	4	7		30
emerald shiner	198	172	20	11	18	10			429
goldfish					1	5	1		7
grasscarp		1							1
longnose dace					2				2
river shiner		8							8
silver chub			1						1
spotfin shiner	60	99	36	47	102	12	9		365
spottail shiner		12	3		1	1			17
Esocidae									
grass pickerel			1						1
Fundulidae									
blackstripe topminnow			3				3		6
Gobiidae									
round goby		2			3				5
Ictaluridae									
channel catfish	5	4	3		2	7	3		24
flathead catfish	1								1
yellow bullhead							6		6
Moronidae									
white bass					1				1
Percidae									
blackside darter		1			1		2		4
logperch			1			1			2
mud darter					1				1
slenderhead darter					1				1
Sciaenidae									
freshwater drum		1		2			2		5
Total individuals		402	557	260	145	257	457	315	2393
Total species/hybrids		15/0	24/0	23/0	16/0	25/0	17/1	18/1	42/1

Marseilles Reach and 25 fish species (plus one hybrid) in Dresden Reach were collected. Fish species richness at a single site ranged from 15 at Bull's Island (RM 249.6, Marseilles Reach) to 25 at Waupecan Island (RM 260.6, Marseilles Reach). Fish species collections in 2008 at Ballard's Island (23 fish species; RM 248.0, Marseilles Reach), Johnson Island (16 fish species; RM 249.6, Marseilles Reach), and Waupecan Island (25 fish species) were the highest fish species catches observed for these sites in F-101-R sampling.

Catch Rates in Numbers of Individuals Collected per Hour by Reach.

In the following data summary, most of the discussion was restricted either to species that each separately accounted for over 10% of the total catch or to species that were of special significance. A 95% list was created for fish species ranks by reach. Fish species were added to the list until 95% of the total catch in number was obtained.

Alton (lower waterway, Illinois River). Twelve fish species accounted for 94.8% of the total catch in Alton Reach (Tables 6 and 7) and overall CPUE_N was 166.03 in 2008. The highest CPUE_N for an individual fish species was 42.35 for gizzard shad. Gizzard shad comprised 25.5% of the total fish collected in this reach. Freshwater drum ranked second with a CPUE_N of 36.11 (21.8% of the total). The catch rate observed for freshwater drum is the highest recorded for this species in Alton Reach in F-101-R sampling. The previous high catch rate for freshwater drum in

Table 6. Number of individuals of each fish species collected per hour of electrofishing (CPUE_N) on Reach 26 of the Mississippi River (Brickhouse Slough) and on six reaches of the Illinois Waterway in 2008.

Species	Reach and Hours Fished							Overall CPUE _N
	Reach 26	Alton	La Grange	Peoria	Starved Rock	Marseilles	Dresden	
	1.00	4.68	5.58	8.00	2.00	2.42	2.00	24.68
Amiidae								
bowfin		0.54	0.36					0.16
Atherinidae								
brook silverside						0.83		0.08
Catastomidae								
bigmouth buffalo	2.00	0.27	0.54	8.00				2.84
black buffalo			0.18	0.13				0.08
golden redhorse				0.75	0.50	0.83		0.36
highfin carpsucker				0.25				0.08
river carpsucker		0.54	1.61	1.63		1.24		1.09
shorthead redhorse		1.36	3.22	0.50	1.50	0.41		1.26
smallmouth buffalo	8.00	3.80	7.34	8.38	3.00	2.48	0.50	5.79
Centrarchidae								
black crappie	1.00	0.81	7.52	4.63	1.50	1.24	0.50	3.65
bluegill	12.00	12.76	25.79	62.88	19.50	23.59	169.50	46.23
bluegill x green sunfish			0.18	1.25			7.00	1.01
green sunfish	10.00		6.45	16.00	4.50	2.90	26.50	9.85
largemouth bass	4.00	5.97	24.00	7.63	4.50	10.76	25.50	12.44
longear sunfish						1.24	0.50	0.16
orange spotted sunfish	4.00	0.27	15.94	18.50		2.48	7.50	10.66
pumpkinseed			0.18	0.13	2.00	4.97	0.50	0.77
redeer sunfish		0.27				0.41		0.08
rock bass							8.00	0.65
smallmouth bass	1.00			0.88	2.50	1.24	6.00	1.13
warmouth		0.27	0.54	0.13				0.20
white crappie			2.15	0.25				0.57
Clupeidae								
gizzard shad	55.00	42.35	18.09	159.38	56.50	27.31	18.00	73.01
skipjack herring		0.54	0.90	0.25	0.50	0.41		0.45
threadfin shad	1.00	2.44	13.61	1.13	1.00		0.50	3.97
Cyprinidae								
bighead carp	1.00				1.00			0.04
bluntnose minnow					61.00	64.55	75.50	17.38
bullhead minnow	1.00	1.63	0.72	2.25	30.50	12.83	3.50	5.19
central stoneroller				0.13	5.00	1.24		0.57
common carp	2.00	10.32	9.67	12.13	3.50	4.97	5.50	8.95
emerald shiner		2.44	3.76	33.88	185.00	20.28	5.00	29.58
golden shiner				0.13				0.04
goldfish			2.15	1.00		0.41	3.00	1.09
grass carp			0.90	1.63	0.50			0.77
longnose dace						0.83		0.08
red shiner			0.18	1.00				0.36
river shiner					4.00			0.32
silver carp	4.00	9.77	8.42	48.88				19.37
silver chub			1.25					0.32
silverband shiner			0.18					0.04
spotfin shiner				1.50	79.50	76.55	10.50	15.28
spottail shiner				7.13	6.00	1.66	0.50	3.00
Esocidae								
grass pickerel						0.41		0.04

Table 6. (continued)

Number of individuals of each fish species collected per hour of electrofishing (CPUE_N) on Reach 26 of the Mississippi River (Brickhouse Slough) and on six reaches of the Illinois Waterway in 2008.

Species	Reach and Hours Fished							Overall CPUE _N
	Reach 26	Alton	La Grange	Peoria	Starved Rock	Marseilles	Dresden	
Fundulidae								
blackstripe topminnow				0.25		1.24	1.50	0.32
Gobiidae								
round goby					1.00	1.24		0.20
Hiodontidae								
mooneye			0.18					0.04
Ictaluridae								
black bullhead			2.51	0.88				0.85
brown bullhead				0.25				0.08
channel catfish	6.00	18.73	20.78	2.50	4.50	2.07	5.00	9.52
flathead catfish	2.00	4.89	3.76	0.75	0.50			1.94
tadpole madtom			0.18					0.04
yellow bullhead				0.63			3.00	0.45
Lepisosteidae								
longnose gar			0.18					0.04
spotted gar	1.00	0.27	0.18					0.04
Moronidae								
white bass	1.00	7.87	17.01	4.88		0.41		6.69
yellow bass			1.97	0.13				0.49
Percidae								
blackside darter					0.50	0.41	1.00	0.16
logperch				0.50		0.41	0.50	0.24
mud darter						0.41		0.04
sauger		1.63	1.97	1.25				1.09
slenderhead darter						0.41		0.04
Poeciliidae								
western mosquitofish				0.13				0.04
Sciaenidae								
freshwater drum	3.00	36.11	82.57	16.25	0.50	0.83	1.00	29.66
Total Number per hour	119.00	166.03	287.28	430.63	479.50	273.55	386.00	330.92
Number of species/hybrids	19/0	24/0	37/1	42/1	26/0	36/0	25/1	62/1

Table 7. Fish species ranks by relative abundance (number of fish collected per hour) for 2008 on the 6 reaches of the Illinois Waterway. Species were added to the list in descending order of abundance until 95% of the total catch for that reach was obtained. Percentages are in parentheses.

Species	Rankings by Reach					
	Alton	La Grange	Peoria	Starved Rock	Marseilles	Dresden
Catostomidae						
bigmouth buffalo			10 (1.9)			
shorthead redhorse		16 (1.1)				
smallmouth buffalo	10 (2.3)	12 (2.6)	9 (1.9)		11 (0.9)	
Centrarchidae						
black crappie		11 (2.6)	14 (1.1)			
bluegill	4 (7.7)	2 (9.0)	2 (14.6)	6 (4.1)	4 (8.6)	1 (43.9)
bluegill x green sunfish						9 (1.8)
green sunfish		13 (2.2)	7 (3.7)	9 (0.9)	10 (1.1)	3 (6.9)
largemouth bass	8 (3.6)	3 (8.4)	11 (1.8)	9 (0.9)	7 (3.9)	4 (6.6)
orange spotted sunfish		7 (5.5)	5 (4.3)		11 (0.9)	8 (1.9)
pumpkinseed					8 (1.8)	
rock bass						7 (2.1)
smallmouth bass						10 (1.6)
white crappie		18 (0.7)				
Clupeidae						
gizzard shad	1 (25.5)	5 (6.3)	1 (37.0)	4 (11.8)	3 (10.0)	5 (4.7)
threadfin shad	11 (1.5)	8 (4.7)				
Cyprinidae						
bluntnose minnow				3 (12.7)	2 (23.6)	2 (19.6)
bullhead minnow				5 (6.4)	6 (4.7)	
central stoneroller				8 (1.0)		
common carp	5 (6.2)	9 (3.4)	8 (2.8)		8 (1.8)	11 (1.4)
emerald shiner	11 (1.5)	14 (1.3)	4 (7.9)	1 (38.6)	5 (7.4)	12 (1.3)
goldfish		18 (0.7)				
silver carp	6 (5.9)	10 (2.9)	3 (11.3)			
spotfin shiner				2 (16.6)	1 (27.9)	6 (2.7)
spottail shiner			12 (1.7)	7 (1.3)	14 (0.6)	
Ictaluridae						
black bullhead		17 (0.9)				
channel catfish	3 (11.3)	4 (7.2)		9 (0.9)	13 (0.8)	12 (1.3)
flathead catfish	9 (2.9)	14 (1.3)				
Moronidae						
white bass	7 (4.7)	6 (5.9)	13 (1.1)			
Sciaenidae						
freshwater drum	2 (21.8)	1 (28.8)	6 (3.8)			
Number of species accounting for 95 % of total catch						
	12	19	14	11	14	13

Alton Reach was 34.97 recorded in 2005 (McClelland and Cook 2006). Channel catfish ranked third with a CPUE_N of 18.73 (11.3% of the total) representing the second highest CPUE_N in Alton Reach for this species. Redear sunfish were collected for the first time in Alton Reach in 2008. A single specimen was collected at Crater-Willow Islands (RM 30.0).

La Grange (middle waterway, Illinois River). Nineteen fish species accounted for 95.6% of the total catch in La Grange Reach (Tables 6 and 7). Overall, CPUE_N was 287.10. In 2008, the highest catch rate for any fish species was 82.57 for freshwater drum which comprised 28.8% of the total fish collected in this reach. This is the highest catch rate ever observed for freshwater drum over all reaches in F-101-R sampling. The previous high catch for freshwater drum was 46.06 recorded in Peoria Reach in 2005 (McClelland and Cook 2006). Bluegill ranked second with a CPUE_N of 25.79 (9.0% of the total). Largemouth bass ranked third with a CPUE_N of 24.00 and accounted for 8.4% of the total. The largemouth bass catch observed represents the highest ever recorded for this species in La Grange Reach in F-101-R sampling. A previous high catch rate of 9.19 was recorded in 1991 (Lerczak et al. 1992). Channel catfish also recorded a high catch rate in La Grange reach in 2008. Channel catfish ranked fourth with a CPUE_N of 20.78 (7.2% of the total). This catch rate is the highest ever recorded for channel catfish over all reaches in F-101-R sampling. The previous high catch rate was 19.40 observed in Peoria Reach in 1996 (Koel et al. 1997). Two fish species were collected in La Grange Reach for the first time in 2008. A single pumpkinseed was collected at Pekin (RM 155.1) and two bowfin were collected at Lower Bath Chute (RM 107.1).

Peoria (middle waterway, Illinois River). Fourteen fish species accounted for 94.9% of the total catch in Peoria Reach (Tables 6 and 7). Overall, CPUE_N was 430.62 representing the second highest catch rate recorded for Peoria Reach in F-101-R sampling. The highest CPUE_N for any fish species was 159.38 for gizzard shad comprising 37.0% of the total fishes collected in this reach. Bluegill ranked second in Peoria Reach with a CPUE_N of 62.88 (14.6% of the total). Bluegill have ranked among the top two species since 1990 in the Peoria Reach (Lerczak et al. 1993, 1994, 1995, 1996; Koel et al. 1997, 1998, Koel and Sparks 1999; Arnold et al. 2000; McClelland and Pegg 2001, 2002, 2003, 2004, 2005; McClelland and Cook 2006; McClelland and Sass 2007, McClelland and Sass 2008). Silver carp ranked third with a CPUE_N of 48.88 (11.3% of the total). The catch rate observed for silver carp represents the second highest CPUE_N recorded for this species in F-101-R sampling since they were first collected in this reach in 2004 (McClelland and Pegg 2005). One fish species was collected in for the first time in F-101-R sampling for Peoria Reach in 2008; two specimens of blackstripe topminnow were collected at Hennepin Island (RM 207.6)

Starved Rock (upper waterway, Illinois River). Eleven fish species accounted for 95.2% of the total catch in Starved Rock Reach (Tables 6 and 7). Overall, CPUE_N was 479.50 in 2008. The highest CPUE_N for any species was 185.00 recorded for emerald shiner, which comprised 38.6% of the total catch. Spottfin shiner ranked second with a catch rate of 79.50 comprising 16.6% of the total catch representing the highest CPUE_N for this species over all reaches in F-101-R sampling. Bluntnose minnow ranked third with a catch rate of 61.00 (12.7% of the total) and gizzard shad

ranked fourth with a catch rate of 56.50 (11.8% of the total). One fish species was collected for the first time in F-101-R sampling in Starved Rock Reach. A single blackside darter was collected at Bull's Island Bend (RM 241.5) representing the first record of this species at any site for F-101-R sampling.

Marseilles (upper waterway, Illinois River). Fourteen fish species accounted for 94.1% of the total catch in Marseilles Reach (Tables 6 and 7) and overall CPUE_N was 273.55 in 2008. The highest CPUE_N for any species was 76.55 for spotfin shiner comprising 27.9% of the total fishes collected in this reach. The CPUE_N observed for spotfin shiner represents the second highest catch rate recorded for this species over all reaches in F-101-R sampling and tops the previous high catch rate of 71.00 recorded in 2007 (McClelland and Sass 2008). The catch rates recorded for spotfin shiner for both Starved Rock Reach and Marseilles Reach in 2008 were each higher than our 2007 observation. Bluntnose minnow ranked second with a CPUE_N of 64.55 (23.6% of total), representing the highest catch rate in Marseilles Reach for bluntnose minnow in F-101-R sampling. Gizzard shad ranked third with a CPUE_N of 27.31 (10.0% of total). Largemouth bass again ranked in the top 95% CPUE_N in Marseilles Reach; a catch rate of 10.76 (7th ranked, 3.9% of the total) was recorded for this species in 2008 representing the second highest CPUE_N for this species in Marseilles Reach. Pumpkinseed were collected for the second straight year in Marseilles Reach in 2008, the CPUE_N of 4.97 observed for this species represented the highest catch rate ever recorded in F-101-R throughout the entire Illinois River waterway for this species. Four fish species were collected in Marseilles Reach for the first time in F-101-R sampling in 2008. In addition to the first collection of blackside darter in Starved Rock Reach, a

single specimen of this species was also collected at Waupecan Island (RM 260.6). Two specimens of longnose dace were also collected for the first time in F-101-R sampling at Waupecan Island. Two specimens each of brook silverside and a single mud darter were also collected at Waupecan Island, marking the first collection of these two fish species in Marseilles Reach.

Dresden (upper waterway, Des Plaines River). Thirteen fish species accounted for 95.7% of the total catch in Dresden Reach (Tables 6 and 7). Overall, CPUE_N was 386.00 in 2008. The highest CPUE_N in Dresden Reach for any species was 169.50 for bluegill, which made up 43.9% of the fishes collected. The catch rate observed for bluegill represents the highest CPUE_N ever recorded for this species over all reaches in F-101-R sampling. The previous high catch rate of 164.00 was also recorded in Dresden Reach in 2005 (McClelland and Cook 2006). Bluntnose minnow ranked second with a CPUE_N of 75.50 (19.6% of total). The catch rate for largemouth bass in 2008 was the second highest ever observed for this species in Dresden Reach with a CPUE_N of 25.50 (4th ranked, 6.6% of the total catch). This is the third highest catch rate recorded for largemouth bass throughout the entire Illinois River waterway in F-101-R sampling. The highest CPUE_N of 41.00 was recorded in 2005 in Starved Rock Reach (McClelland and Cook 2006). The catch rate for rock bass in 2008 tied the current highest CPUE_N recorded for this species throughout the entire Illinois River waterway with a CPUE_N of 8.00 (7th ranked, 2.1% of the total catch). The previous high CPUE_N of 6.50 was recorded in Dresden Reach in 1995 (Lerczak et. al 1996). Two fish species were collected for the first time in Dresden Reach in 2008. As in the case of Starved Rock and Marseilles reaches, two specimens of blackside darter were collected

for the first time at Treat's Island (RM 279.9). A single logperch was also collected at the Mouth of the Du Page River site (RM 277.4).

Catch Rates in Weights (pounds) Collected per Hour by Reach.

The following data summary and discussion was restricted to fish species that individually accounted for over 10% of the total catch and to species that were of special interest. A 95% list was produced for each reach, in which species were ranked by relative biomass (pounds per hour) and added to the list until 95% of the total catch rate in weight for that reach was obtained. Overall, these data indicated that, in terms of biomass, the fish communities of the Illinois River waterway were dominated by common carp, silver carp, and channel catfish.

Alton (lower waterway, Illinois River). Eight fish species accounted for 95.5% of the total catch by weight in pounds per hour ($CPUE_W$) in Alton Reach (Tables 8 and 9) in 2008. Overall $CPUE_W$ was 94.98. Common carp $CPUE_W$ ranked highest at 28.76 (30.3% of total). Silver carp ranked second with a $CPUE_W$ of 24.65 (26.0% of total). Channel catfish ranked third with a $CPUE_W$ of 23.48 (24.7% of total). The $CPUE_W$ observed for channel catfish represents the highest catch by weight for this species over all reaches for F-101-R sampling. A previous high $CPUE_W$ of 19.07 was recorded for channel catfish in Alton Reach in 1996 (Koel et al. 1997). The catch by weight observed for freshwater drum was the highest recorded for this species in Alton Reach in F-101-R sampling with a $CPUE_W$ of 4.34 (4th ranked, 4.6% of the total).

Table 8. Pounds of each fish species collected per hour of electrofishing (CPUE_W) on Reach 26 of the Mississippi River (Brickhouse Slough) and on six reaches of the Illinois Waterway in 2008. Pounds per hour less than 0.01, but greater than zero, are indicated by 0.00.

Species	Reach and Hours Fished							Overall CPUE
	Reach 26	Alton	La Grange	Peoria	Starved Rock	Marseilles	Dresden	
	1.00	3.68	5.58	8.00	2.00	2.42	2.00	24.68
Amiidae								
bowfin		3.32	0.11					0.52
Atherinidae								
brook silverside						0.00		0.00
Catastomidae								
bigmouth buffalo	0.17	1.18	1.82	19.58				6.94
black buffalo			0.25	0.31				0.16
golden redhorse				0.26	0.16	0.19		0.12
highfin carpsucker				0.05				0.02
river carpsucker		0.69	2.06	2.16		0.99		1.37
shorthead redhorse		0.49	0.76	0.36	0.02	0.01		0.36
smallmouth buffalo	1.94	0.18	4.04	15.12	3.87	4.32	0.28	6.68
Centrarchidae								
black crappie	0.02	0.31	0.92	1.76	1.07	0.52	0.22	0.98
bluegill	1.15	0.85	2.10	6.31	0.53	1.18	8.31	3.53
bluegill x green sunfish			0.01	0.17	0.04			0.15
green sunfish	0.15		0.37	1.13	0.14	0.06	1.24	0.57
largemouth bass	0.69	1.53	5.66	6.17	1.83	6.64	22.44	6.15
longear sunfish						0.03	0.02	0.00
orange spotted sunfish	0.05	0.00	0.23	0.18		0.04	0.03	0.12
pumpkinseed			0.02	0.00	0.04	0.16	0.03	0.03
redeer sunfish		0.01				0.05		0.01
rock bass							1.20	0.10
smallmouth bass	1.01			0.62	0.98	0.08	2.21	0.51
warmouth		0.02	0.09	0.00				0.02
white crappie			0.53	0.10				0.15
Clupeidae								
gizzard shad	1.18	0.36	0.36	1.82	1.57	1.61	1.24	1.16
skipjack herring		0.01	0.01	0.02	0.03	0.05		0.02
threadfin shad	0.01	0.01	0.06	0.01	0.01		0.00	0.02
Cyprinidae								
bighead carp	2.04							0.08
bluntnose minnow					0.17	0.20	0.20	0.05
bullhead minnow	0.00	0.01	0.00	0.01	0.09	0.04	0.01	0.02
central stoneroller				0.00	0.03	0.01		0.00
common carp	1.15	28.76	23.02	40.90	12.73	16.60	20.24	27.10
emerald shiner		0.00	0.01	0.08	0.71	0.06	0.03	0.09
golden shiner				0.00				0.00
goldfish			0.08	0.05		0.03	1.02	0.12
grass carp			2.38	3.56	7.59			2.31
longnose dace						0.01		0.00
red shiner			0.00	0.01				0.00
river shiner					0.01			0.00
silver carp	4.11	24.65	15.27	27.43				16.19
silver chub			0.00					0.00
silverband shiner			0.00					0.00
spotfin shiner				0.01	0.17	0.20	0.03	0.04
spottail shiner				0.04	0.03	0.01	0.01	0.02
Esocidae								
grass pickerel						0.05		0.00

Table 8. (continued)

Pounds of each fish species collected per hour of electrofishing (CPUEw) on Reach 26 of the Mississippi River (Brickhouse Slough) and on six reaches of the Illinois Waterway in 2008. Pounds per hour less than 0.01, but greater than zero, are indicated by 0.00.

Species	Reach and Hours Fished							Overall CPUE
	Reach 26	Alton	La Grange	Peoria	Starved Rock	Marseilles	Dresden	
	1.00	3.68	5.58	8.00	2.00	2.42	2.00	24.68
Fundulidae								
blackstripe topminnow				0.00		0.00	0.00	0.00
Gobiidae								
round goby					0.01	0.01		0.00
Hiodontidae								
mooneye			0.01					0.00
Ictaluridae								
black bullhead			0.01	0.16				0.05
brown bullhead				0.06				0.02
channel catfish	3.82	23.48	16.56	4.66	5.09	4.13	17.49	11.15
flathead catfish	0.83	2.97	3.41	0.26	1.20			1.43
tadpole madtom			0.00					0.00
yellow bullhead				0.23				0.21
Lepisosteidae								
longnose gar			0.01					0.00
spotted gar	0.12	0.04	0.02					0.01
Moronidae								
white bass	0.05	1.59	3.35	2.01		0.03		1.65
yellow bass			0.25	0.00				0.06
Percidae								
blackside darter					0.00	0.00	0.00	0.00
logperch				0.01		0.00	0.00	0.00
mud darter						0.00		0.00
sauger		0.10	0.19	0.09				0.09
slenderhead darter						0.00		0.00
Poeciliidae								
western mosquitofish				0.00				0.00
Sciaenidae								
freshwater drum	2.42	4.34	7.75	4.68	0.55	1.02	1.61	4.29
Total pounds per hour	20.91	94.98	91.76	140.37	38.63	38.30	80.70	94.68

Table 9. Fish species ranked by relative biomass in pounds of fish collected per hour for 2008. Species were added to the list in descending order of abundance until 95% of the total catch for that reach was obtained. Percentages are in parentheses.

Species	Rankings by Reach					
	Alton	La Grange	Peoria	Starved Rock	Marseilles	Dresden
Amiidae						
bowfin	5 (3.5)					
Catostomidae						
bigmouth buffalo		12 (2.0)	3 (13.9)			
river carpsucker		11 (2.2)	10 (1.5)		8 (2.6)	
smallmouth buffalo		6 (4.4)	4 (10.8)	4 (10.0)	3 (11.3)	
Centrarchidae						
black crappie				8 (2.8)		
bluegill		10 (2.3)	5 (4.5)		6 (3.1)	4 (10.3)
green sunfish						8 (1.5)
largemouth bass	8 (1.6)	5 (6.2)	6 (4.4)	5 (4.7)	2 (17.3)	1 (27.8)
smallmouth bass				9 (2.5)		5 (2.7)
Clupeidae						
gizzard shad			12 (1.3)	6 (4.1)	5 (4.2)	8 (1.5)
Cyprinidae						
common carp	1 (30.3)	1 (25.1)	1 (29.1)	1 (33.0)	1 (43.3)	2 (25.1)
emerald shiner				10 (1.8)		
grass carp		9 (2.6)	9 (2.5)	2 (19.6)		
silver carp	2 (26.0)	3 (16.6)	2 (19.5)			
Ictaluridae						
channel catfish	3 (24.7)	2 (18.0)	8 (3.3)	3 (13.2)	4 (10.8)	3 (21.7)
flathead catfish	6 (3.1)	7 (3.7)		7 (3.1)		
yellow bullhead						6 (2.1)
Moronidae						
white bass	7 (1.7)	8 (3.6)	11 (1.4)			
Sciaenidae						
freshwater drum	4 (4.6)	4 (8.4)	7 (3.3)		7 (2.7)	7 (2.0)
Number of species accounting for 95% of total catch	8	12	12	10	8	9

La Grange (middle waterway, Illinois River). Twelve fish species accounted for 95.3% of the total catch by weight in La Grange Reach (Tables 8 and 9) in 2008. Overall, CPUE_W was 91.76 in La Grange Reach in 2008. Common carp ranked first in La Grange Reach catch by weight with a CPUE_W of 23.02 (25.1% of the total). Channel catfish ranked second in total catch by weight in La Grange Reach with a CPUE_W of 16.56 (18.0% of total). The catch by weight observed for channel catfish was again the highest recorded for La Grange Reach in F-101-R sampling following a previous high CPUE_W of 14.84 recorded in 2007 (McClelland and Sass 2008). Silver carp ranked third in catch by weight with a CPUE_W of 15.27 (16.6% of the total). The catch by weight for freshwater drum was 7.75 (4th ranked, 8.4% of the total) representing the highest CPUE_W ever recorded for this species over all reaches in F-101-R sampling. A previous high catch by weight of 5.60 was recorded in 2005 (McClelland and Cook 2006). The catch by weight for largemouth bass on the La Grange Reach prior to 1996 varied, but was typically above two pounds per hour (Lerczak et al. 1993, 1994, 1995, 1996). CPUE_W for largemouth bass was previously below two pounds per hour for the last 11 of 12 years (1996, 1997, 1998, 1999, 2001, 2002, 2003, 2004, 2005, 2006, and 2007) and had been below one pound per hour since 2001 (Koel et al. 1997, 1998; Koel and Sparks, 1999; Arnold et al. 2000; McClelland and Pegg 2002, 2003, 2004, 2005; McClelland and Cook 2006; McClelland and Sass 2007 and 2008). The catch by weight for largemouth bass in 2008 increased considerably (5.66; 5th ranked) and was the second highest CPUE_W ever recorded in La Grange Reach in F-101-R sampling.

Peoria (middle waterway, Illinois River). Twelve fish species accounted for 95.7% of the total catch by weight in Peoria Reach (Tables 8 and 9). Overall, CPUE_W was 140.37. The Peoria Reach collection was the highest catch by weight recorded for all reaches of the Illinois River waterway in 2008. The highest species-specific CPUE_W was 40.90 for common carp, which made up 29.1% of the total catch by weight for this reach in 2008. Silver carp ranked second with a CPUE_W of 27.43 (19.5% of total). Bigmouth buffalo ranked third with a CPUE_W of 19.58 (13.9% of total) and smallmouth buffalo ranked fourth with a CPUE_W of 15.12 (10.8% of the total). The catch by weight observed for bluegill was 6.31 and represents the highest CPUE_W recorded in Peoria Reach and the second highest over all reaches (behind the catch by weight observed in Dresden Reach in 2008) in F-101-R sampling. The previous high CPUE_W observed for this species in Peoria Reach was 4.33 recorded in 2005 (McClelland and Cook 2006).

Starved Rock (upper waterway, Illinois River). Ten fish species accounted for 94.8% of the total catch by weight in Starved Rock Reach (Tables 8 and 9). Overall, CPUE_W was 38.63. The highest CPUE_W for any species was 12.73 for common carp, which made up 33.0% of the total catch by weight. Grass carp ranked second with a CPUE_W of 7.59 (19.3% of total) representing the second highest catch by weight in Starved Rock Reach and over all reaches for this species in F-101-R sampling. Channel catfish ranked third with a CPUE_W of 5.09 (13.2% of total). Smallmouth buffalo catch by weight ranked fourth with a CPUE_W of 3.87 (10.0% of the total).

Marseilles (upper waterway, Illinois River). Eight fish species accounted for 95.3% of the total catch by weight in Marseilles Reach (Tables 8 and 9). Overall, CPUE_W was 38.30 in 2008. Common carp CPUE_W ranked highest at 16.60 (43.3% of total). Largemouth bass ranked second with a CPUE_W of 6.64 (17.3% of total). The catch by weight observed for largemouth bass represents the highest CPUE_W recorded for this species in Marseilles Reach in F-101-R sampling. Smallmouth buffalo ranked third with a CPUE_W of 4.32 (11.3% of total) and channel catfish ranked fourth with a CPUE_W of 4.13 (10.8% of total).

Dresden (upper waterway, Des Plaines River). Nine fish species accounted for 94.7% of the total catch by weight in Dresden Reach (Tables 8 and 9). Overall, CPUE_W was 80.70 in 2008 representing the second highest catch by weight observed for Dresden Reach in F-101-R sampling. The highest CPUE_W for any species in Dresden Reach was 22.44 for largemouth bass, which made up 27.8% of the total. The catch by weight for largemouth bass was the second highest ever observed over all reaches and in Dresden Reach for this species in F-101-R sampling. The highest catch by weight for largemouth bass was 22.57 recorded in Dresden Reach in 2007 (McClelland and Sass 2008). Common carp ranked second with a CPUE_W of 20.24 (25.1% of total). Channel catfish ranked third with a CPUE_W of 17.49 (21.7% of total). The catch by weight observed in Dresden Reach for bluegill was 8.31 (4th ranked, 10.3% of the total) representing the highest catch by weight ever recorded for bluegill throughout the Illinois River waterway. Smallmouth bass catch by weight in Dresden Reach was also the highest ever recorded throughout the Illinois River waterway with a

CPUE_w of 2.21 (5th ranked, 2.7% of the total). The previous high catch by weight observed for smallmouth bass was 1.64 recorded in 1995 in Dresden Reach (Koel et al. 1996).

CONCLUSIONS

Samples collected by electrofishing on the Illinois Waterway during August through October 2008 provided evidence of continued increases in fish species richness and catch rates. A total of 102 fish species and seven hybrids have been collected since William Starrett began this survey in 1957. Eighty-five fish species and six hybrids have been documented by project F-101-R sampling (1989-present); 62 species and one hybrid from 15 families were collected during 24.68 h of sampling in 2008. Blackside darter and longnose dace were collected for the first time in 2008 along the waterway. A single specimen of blackside darter was collected at two sites; Bull's Island Bend in Starved Rock Reach (upper waterway) and Waupecan Island in Marseilles Reach (upper waterway). Two specimens of blackside darter were collected at Treat's Island in Dresden Reach (upper waterway). Two specimens of longnose dace were collected at Waupecan Island. Redear sunfish was collected for the first time in Alton Reach; one specimen was collected at Crater-Willow Islands. Two fish species were collected for the first time in La Grange Reach (middle waterway) in 2008. Two specimens of bowfin were collected at Lower Bath Chute and one specimen of pumpkinseed was collected at Pekin. Blackstripe topminnow was collected for the first time in Peoria Reach (middle waterway) in 2008. Two specimens were collected at Hennepin Island. Two additional new fish species were collected in Marseilles Reach

for the first time in conjunction with blackside darter. Two specimens of brook silverside and a single specimen of mud darter were also collected at Waupecan Island. A single specimen of logperch was collected in Dresden Reach (upper river) for the first time at the Mouth of the Du Page River.

Peoria Reach continued to produce the highest number of fish species (42 plus one hybrid) along the Illinois River waterway and the highest total catch (3,445). This was likely due, in part, to a greater number of sites in this reach, varied site types (backwater and side channel), and its position along the waterway, which included the Great Bend (above Hennepin) of the Illinois River. Peoria Reach represents a transition from a river which is constricted, has few contiguous backwaters, and is high in gradient (upper river) to a large river floodplain system with low gradient (lower river) (Sparks 1977).

Catch rates in terms of number of fish collected per hour and total catch numbers along the Illinois Waterway were again among the highest ever recorded for La Grange and Peoria reaches. Catches of several sportfish species in multiple reaches were at their highest in 2008. Channel catfish and largemouth bass exhibited high catch rates for La Grange Reach. The catch rates for pumpkinseed in Marseilles Reach and bluegill in Dresden Reach were the highest ever recorded for these species throughout the entire river in F-101-R sampling. Continued increase in catches of individual sportfish species may be a result of numerous factors, many of which may be difficult to identify, but may be indicative of improved water quality conditions, coherent timing of hydrological events (flooding), and habitat improvements.

The catch in weight of fishes collected in 2008 was dominated by common carp,

silver carp, and channel catfish. These three fish species combined for a total weight of 1343.65 pounds, comprising 57.5% of the total biomass observed. Catch in weight for a single reach was again highest in Peoria Reach in 2008. Fish species accounting for this high catch in weight were common carp, silver carp, bigmouth buffalo, and smallmouth buffalo. Several sportfish species catches in terms of relative biomass were at their highest in 2008. Channel catfish catch in weight was the highest ever observed for La Grange Reach and the catch in weight recorded for Alton Reach was the highest ever observed for this species in a single reach. Largemouth bass catch in weight was the second highest ever observed for La Grange and Dresden reaches and the highest catch in weight for this species in Marseilles Reach. Bluegill catch in weight was the highest recorded for Peoria Reach and the catch in weight in Dresden Reach was the highest ever observed throughout the Illinois River waterway in a single reach. Non-native fish species continued to have a major role in relative biomass catches in the Illinois River waterway. Common carp, silver carp, bighead carp, and grass carp combined to produce 1,127.5 pounds of the 2,336.5 total pounds collected comprising 48.2% of the total biomass. Common carp relative biomass collections ranked first in Alton, La Grange, Peoria, Starved Rock, and Marseilles reaches and second in Dresden Reach in 2008. The total catch in weight across all reaches for common carp was the highest recorded for this species in F-101-R sampling. Silver carp continued to rank among the top three species of the lower and middle river in terms of relative biomass, while the total relative biomass collection across all reaches for grass carp was the highest recorded for this species in F-101-R sampling.

The middle river comprised 1,634.8 (70.6%) of the 2,315.6 total pounds of fish

collected on the Illinois River waterway during our 2008 survey. The lower waterway produced 349.4 pounds (15.1%) while the upper waterway produced 331.4 pounds (14.3%). Although these catches may be reflective of higher productivity of the middle Illinois Waterway floodplain ecosystem, a greater number of collections in this section may continue to play a role.

Sport fishes were collected throughout the waterway in 2008, although catch rate in number and weight varied among reaches. For channel catfish, we usually collected more individuals per hour in Alton Reach (lower waterway) than in the middle or upper waterway reaches. However, La Grange Reach produced the greatest catch of channel catfish in number over all reaches at 20.78 fish per hour. In terms of catch in weight for channel catfish, the lower and middle waterway reaches usually produced the highest pounds per hour and in 2008, Alton Reach exhibited the highest $CPUE_W$ of channel catfish at 23.48 pounds per hour. As in previous years, white bass were most abundant and provided the highest $CPUE_W$ in the middle waterway. Black crappie was most abundant and provided the highest catches by weight in the middle waterway. Bluegill $CPUE_N$ and $CPUE_W$ was greatest in Dresden Reach and the upper waterway as a whole, but total catch numbers were greatest in the middle river. Largemouth bass $CPUE_N$ and $CPUE_W$ was also highest in Dresden Reach in 2008, but catch rates by river segment were highest in the middle river. As in previous years of project F-101-R sampling, we collected low numbers of sauger (27 total fish collected). Smallmouth bass, which were usually found in low numbers, were again collected in every reach of the upper waterway and in the Peoria Reach of the middle waterway (27 total fish collected).

APPENDIX A. Fish species collected during Long-term Monitoring of the Illinois Waterway, 1957-2008. Common names marked by an asterisk indicate species that were collected from 1989 through 2008 during federal aid project F-101-R. Common and scientific names are from Robins et al. (1991) and Cross et al. (1995). Habitat associations are based on behavioral descriptions from Pflieger (1975), Cross et al. (1995) and communications with INHS fisheries biologists.

Family Name	Common Name	Scientific Name	Habitat Association (B=benthic)
Lepisosteidae	longnose gar*	<i>Lepisosteus osseus</i>	
	shortnose gar*	<i>Lepisosteus platostomus</i>	
	spotted gar*	<i>Lepisosteus oculatus</i>	
Amiidae	bowfin*	<i>Amia calva</i>	
Hiodontidae	goldeye*	<i>Hiodon alosoides</i>	
	mooneye*	<i>Hiodon tergisus</i>	
Anguillidae	American eel	<i>Anguilla rostrata</i>	
Clupeidae	gizzard shad*	<i>Dorosoma cepedianum</i>	
	skipjack herring*	<i>Alosa chrysochloris</i>	
	threadfin shad*	<i>Dorosoma petenense</i>	
Cyprinidae	bighead carp*	<i>Hypophthalmichthys nobilis</i>	
	bigmouth shiner*	<i>Notropis dorsalis</i>	B
	blacknose dace*	<i>Rhinichthys atratulus</i>	B
	bluntnose minnow*	<i>Pimephales notatus</i>	
	bullhead minnow*	<i>Pimephales vigilax</i>	
	central stoneroller*	<i>Campostoma anomalum</i>	B
	common carp*	<i>Cyprinus carpio</i>	B
	common carp x goldfish*	<i>Cyprinus carpio x Carassius auratus</i>	B
	common shiner*	<i>Luxilus cornutus</i>	
	creek chub*	<i>Semotilus atromaculatus</i>	
	emerald shiner*	<i>Notropis atherinoides</i>	
	fathead minnow*	<i>Pimephales promelas</i>	
	ghost shiner	<i>Notropis buechanani</i>	
	golden shiner*	<i>Notemigonus crysolucas</i>	
	goldfish*	<i>Carassius auratus</i>	B
	grass carp*	<i>Ctenopharyngodon idella</i>	
	hornyhead chub	<i>Nocomis biguttatus</i>	
	longnose dace*	<i>Rhinichthys cataractae</i>	B
	Mississippi silvery minnow	<i>Hybognathus nuchalis</i>	B
	pugnose minnow	<i>Opsopoeodus emiliae</i>	
	redfin shiner	<i>Lythrurus umbratilis</i>	
	red shiner*	<i>Cyprinella lutrensis</i>	
	ribbon shiner*	<i>Lythrurus fumeus</i>	
	river shiner*	<i>Notropis blennioides</i>	
	sand shiner*	<i>Notropis stramineus</i>	
	silverband shiner*	<i>Notropis shumardi</i>	
	silver carp*	<i>Hypophthalmichthys molitrix</i>	
	silver chub*	<i>Hybopsis storeriana</i>	B
	silverjaw minnow	<i>Notropis buccatus</i>	B
	southern redbelly dace*	<i>Phoxinus erythrogaster</i>	
spotfin shiner*	<i>Cyprinella spiloptera</i>		
spottail shiner*	<i>Notropis hudsonius</i>		
steelcolor shiner	<i>Cyprinella whipplei</i>		
striped shiner*	<i>Luxilus chrysocephalus</i>		
suckermouth minnow*	<i>Phenacobius mirabilis</i>	B	
Catostomidae	bigmouth buffalo*	<i>Ictiobus cyprinellus</i>	B
	black buffalo*	<i>Ictiobus niger</i>	B
	black redbhorse	<i>Moxostoma duzuesnei</i>	B
	golden redbhorse*	<i>Moxostoma erythrurum</i>	B
	highfin carpsucker*	<i>Carpoides velifer</i>	B
	northern hogsucker*	<i>Hypentelium nigricans</i>	B
	quillback*	<i>Carpoides cyprinus</i>	B
	river carpsucker*	<i>Carpoides carpio</i>	B
	river redbhorse	<i>Moxostoma carinatum</i>	B
	shorthead redbhorse*	<i>Moxostoma macrolepidotum</i>	B
	silver redbhorse*	<i>Moxostoma anisurum</i>	B
	smallmouth buffalo*	<i>Ictiobus bubalus</i>	B
	white sucker*	<i>Catostomus commersoni</i>	B

Appendix A Continued.

Family Name	Common Name	Scientific Name	Habitat Association (B=benthic)
Ictaluridae	black bullhead*	<i>Ameiurus melas</i>	B
	blue catfish	<i>Ictalurus furcatus</i>	B
	brown bullhead*	<i>Ameiurus nebulosus</i>	B
	channel catfish*	<i>Ictalurus punctatus</i>	B
	flathead catfish*	<i>Pylodictis olivaris</i>	B
	freckled madtom*	<i>Noturus nocturnus</i>	B
	tadpole madtom*	<i>Noturus gyrinus</i>	B
	white catfish	<i>Ameiurus catus</i>	B
yellow bullhead*	<i>Ameiurus natalis</i>	B	
Esocidae	grass pickerel*	<i>Esox americanus vermiculatus</i>	
	nothern pike	<i>Esox lucius</i>	
Salmonidae	rainbow trout	<i>Oncorhynchus mykiss</i>	
Percopsidae	trout-perch	<i>Percopsis omiscomaycus</i>	B
Fundulidae	banded killifish*	<i>Fundulus diaphanus</i>	
	blackstripe topminnow*	<i>Fundulus notatus</i>	
Poeciliidae	western mosquitofish*	<i>Gambusia affinis</i>	
Atherinidae	brook silverside*	<i>Labidesthes sicculus</i>	
Moronidae	striped bass	<i>Morone saxatilis</i>	
	striped bass x white bass*	<i>Morone saxatilis x M. chrysops</i>	
	white bass*	<i>Morone chrysops</i>	
	white perch*	<i>Morone americana</i>	
	yellow bass*	<i>Morone mississippiensis</i>	
	yellow bass x white perch*	<i>Morone mississippiensis x M. americana</i>	
Centrarchidae	black crappie*	<i>Pomoxis nigromaculatus</i>	
	bluegill*	<i>Lepomis macrochirus</i>	
	bluegill x green sunfish*	<i>Lepomis macrochirus x L. cyanellus</i>	
	green sunfish*	<i>Lepomis cyanellus</i>	
	largemouth bass*	<i>Micropterus salmoides</i>	
	longear sunfish*	<i>Lepomis megalotis</i>	
	orangespotted sunfish*	<i>Lepomis humilis</i>	
	orangespotted sunfish x bluegill*	<i>Lepomis humilis x L. macrochirus</i>	
	orangespotted sunfish x green sunfish*	<i>Lepomis humilis x L. cyanellus</i>	
	pumpkinseed*	<i>Lepomis gibbosus</i>	
	pumpkinseed x green sunfish*	<i>Lepomis gibbosus x L. cyanellus</i>	
	redeer sunfish*	<i>Lepomis microlophus</i>	
	rock bass*	<i>Ambloplites rupestris</i>	
	smallmouth bass*	<i>Micropterus dolomieu</i>	
	spotted sunfish*	<i>Lepomis punctatus</i>	
	warmouth*	<i>Lepomis gulosus</i>	
white crappie*	<i>Pomoxis annularis</i>		
Percidae	blackside darter*	<i>Percina maculata</i>	B
	bluntnose darter	<i>Etheostoma chlorosomum</i>	B
	johnny darter*	<i>Etheostoma nigrum</i>	B
	logperch*	<i>Percina caprodes</i>	B
	mud darter*	<i>Etheostoma asprigene</i>	B
	sauger*	<i>Stizostedion canadense</i>	
	slenderhead darter*	<i>Percina phoxocephala</i>	B
	walleye*	<i>Stizostedion vitreum</i>	
yellow perch*	<i>Perca flavescens</i>		
Sciaenidae	freshwater drum*	<i>Aplodinotus grunniens</i>	B
Gobiidae	round goby*	<i>Neogobius melanostomus</i>	B

APPENDIX B. Species richness (S) at Long-term Illinois River Fish Population Monitoring (F-101-R) sites.

Description	Site #	Reach	Low S (year)	High S (year)
Treats Island	279.8	3	10 (2003)	20 (2007)
Du Page River	277.4	3	11 (1999, 2000)	20 (2006)
Waupecan Island	260.6	4	11 (1996)	25 (2008)
Johnson Island	249.6	4	6 (1993)	16 (1995, 2008)
Ballards Island	248.0	4	10 (1991)	23 (2007, 2008)
Bulls Island Bend	241.5	5	8 (1990)	25 (2007)
Bulls Island	240.8	5	8 (1990, 96, 99)	21 (2007)
Clark Island	215.3	6	11 (1990)	27 (2007, 2008)
Hennepin	207.6	6	2 (1990)	27 (2007)
Upper Twin Sister	203.3	6	8 (1990)	22 (2001, 2008)
Lower Twin Sister	202.8	6	7 (1992)	22 (2007)
Henry Island	193.8	6	12 (1991)	24 (2005)
Chillicothe	180.6	6	14 (1989,91,92,96)	26 (2006)
Lambie's Boat Harbor	170.3	6	9 (1989)	22 (2006, 2008)
Lower Peoria Lake	163.3	6	10 (1989)	21 (2008)
Pekin	155.1	7	6 (1992)	19 (2005)
Turkey Island	148.0	7	8 (2004)	18 (2007)
Upper Bath Chute	113.0	7	12 (1994)	22 (2001, 2007)
Lower Bath Chute	107.1	7	9 (1992)	26 (2008)
Sugar Creek Island	95.1	7	10 (1989, 1999, 2003)	25 (2008)
Grape-Bar Islands	86.5	7	7 (1989)	25 (2008)
Moore's Towhead	75.3	8	6 (2002)	17 (2004, 2005)
Big Blue Island	58.3	8	9 (1990)	20 (2005, 2006)
Crater-Willow Islands	30.0	8	11 (2003)	19 (2007)
Hurricane Island	26.8	8	11 (1990, 1999, 2004)	20 (1997)
Dark Chute	24.7	8	11 (1994, 2004)	18 (2006)
Mortland Island	19.0	8	10 (2003)	19 (2006)
Brickhouse Slough	0.0	26	10 (1990)	20 (2005)

¹Sites 0.0,26.8-215.3 were not sampled during 1993 (n=19 years) (sites 240.8-279.8 n=20 years).

²Sites 19.0, 24.7 were not sampled during 1993, 2008 (n=18 years)

APPENDIX C. Total catch (C) at Long-term Illinois River Fish Population Monitoring (F-101-R) sites.

Description	Site #	Reach	Low C (year)	High C (year)
Treats Island	279.8	3	55 (1996)	586 (1995)
Du Page River	277.4	3	88 (1991)	614 (1995)
Waupecan Island	260.6	4	35 (1996)	266 (2006)
Johnson Island	249.6	4	15 (2003)	224 (2007)
Ballards Island	248.0	4	34 (1991)	492 (2005)
Bulls Island Bend	241.5	5	36 (1990)	897 (1995)
Bulls Island	240.8	5	32 (1990)	919 (2006)
Clark Island	215.3	6	45 (1991)	735 (2008)
Hennepin	207.6	6	2 (1990)	523 (2005)
Upper Twin Sister	203.3	6	33 (1990)	222 (2007)
Lower Twin Sister	202.8	6	33 (1990)	218 (2001)
Henry Island	193.8	6	54 (1990)	474 (1996)
Chillicothe	180.6	6	80 (1992)	331 (2007)
Lambie's Boat Harbor	170.3	6	47 (2003)	2293 (2007)
Lower Peoria Lake	163.3	6	83 (1991)	507 (2005)
Pekin	155.1	7	22 (1992)	524 (1996)
Turkey Island	148.0	7	30 (1992)	165 (1995)
Upper Bath Chute	113.0	7	80 (2002, '03)	581 (2007)
Lower Bath Chute	107.1	7	57 (1992)	701 (2007)
Sugar Creek Island	95.1	7	37 (2003)	238 (1996)
Grape-Bar Islands	86.5	7	42 (1990)	538 (2008)
Moore's Towhead	75.3	8	31 (2003)	263 (2005)
Big Blue Island	58.3	8	25 (1990)	240 (2005)
Crater-Willow Islands	30.0	8	57 (2003)	207 (1994)
Hurricane Island	26.8	8	50 (1999)	304 (2005)
Dark Chute	24.7	8	47 (2004)	237 (1991)
Mortland Island	19.0	8	28 (2004)	195 (1991)
Brickhouse Slough	0.0	26	53 (1996)	267 (2006)

¹Sites 0.0,26.8-215.3 were not sampled during 1993 (n=19 years) (sites 240.8-279.8 n=20 years).

²Sites 19.0, 24.7 were not sampled during 1993, 2008 (n=18 years)

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Appendix D (Job 5). Publications, reports, and presentations that resulted from research conducted during segments 6-15 of project F-101-R, the Long-term Illinois River Fish Population Monitoring Program (funded under Federal Aid in Sportfish Restoration Act, P.L. 81-681, Dingell-Johnson, Wallup-Breaux).

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Koel, T.M. and R.E. Sparks. Interannual variation in catches of young-of-year fish correlated with hydrology of the Upper Mississippi River System. 47th Annual Meeting of the North American Benthological Society, Duluth, Minnesota, May 23-24, 1999.

Koel, T.M. Changes in fish community structure: effects of hydrological variability in the Upper Mississippi River System. Presented to the Illinois Natural History Survey, Center for Aquatic Ecology, Havana Field Station Director Search Committee and Senior Staff, March 24, 1999.

Koel, T.M. Spatial and temporal variability of channel catfish populations in the Upper Mississippi River System. Illinois Department of Natural Resources LTRMP field station biannual retreat, Dickson Mounds, Illinois, December 15, 1998.

Koel, T.M. Long Term Resource Monitoring Program Showcase: analysis of catfish catch. Environmental Management Program Coordinating Committee, Fall Quarterly Meeting, Rock Island, Illinois, November 19-20, 1998.

Koel, T.M. and K.D. Blodgett. Fish-environment associations: effects of inter-annual hydrological variability on fish populations of the Illinois River waterway, 1957-1997. Upper Mississippi River Conservation Committee, Fish Technical Section Annual Fall Meeting, Dubuque, Iowa, September 15-17, 1998.

Koel, T.M., K.S. Irons, T.M. O'Hara, K.D. Blodgett, and R.E. Sparks. Changes in fish community structure: effects of hydrological variability in the Upper Mississippi River System. 128th Annual Meeting of the American Fisheries Society, Hartford, Connecticut, August 23-27, 1998.

Koel, T.M., T.M. Mihuc, R.E. Sparks, and K.D. Blodgett. Upper Mississippi River System status and trends report. Fish species-environment relationships: LTRMP data analysis and preliminary results. 54th Annual Meeting of the Upper Mississippi River Conservation Committee, Moline, Illinois, 17-19 March 1998.

Blodgett, K.D. and T.M. Mihuc. Decision support using Long Term Resource Monitoring Program component data and supplementary data on the Illinois River. 54th Annual Meeting of the Upper Mississippi River Conservation Committee, Moline, Illinois, 17-19 March 1998.

Koel, T.M. and T.M. Mihuc. Fish abundance in the La Grange Reach of the Illinois River correlated with environmental factors: problems of cross-component analysis. Presented at the Long Term Resource Monitoring Program Annual Winter Meeting, Davenport, Iowa, 13 January 1998.

Lerczak, T.V., R.E. Sparks, and K.D. Blodgett. Some upstream-to-downstream differences in Illinois River fish communities. Contributed paper presented at the Illinois State Academy of Science Annual Meeting, Galesburg, Illinois, 7 October 1994.

Sparks, R.E. Large river-floodplain ecosystems of the Midwest: status, trends, and management needs. Presented at the U.S. Environmental Protection Agency's "Ecological Seminar Series" held in Chicago, Illinois, 14 March.

IV. Poster Presentations (presenter in bold)

Koel, T.M. and R.E. Sparks. The Long-term Illinois River Fish Population Monitoring Program. National Meeting of the Ecological Society of America, Spokane, Washington, August 10-14, 1998.

Lerczak, T.V., R.E. Sparks, and K.D. Blodgett. Long-term trends (1959-1994) in fish populations of the Illinois River. Poster presented at the 56th Midwest Fish and Wildlife Conference, Indianapolis, Indiana, 4-7 December 1994.

Lerczak, T.V., R.E. Sparks, and K.D. Blodgett. Long-term trends (1959-1994) in fish populations of the Illinois River. Poster presented at the Illinois State Academy of Science Annual Meeting, Charleston, Illinois, 6 October 1995.

Lerczak, T.V., R.E. Sparks, and K.D. Blodgett. Long-term trends (1959-1994) in fish populations of the Illinois River with emphasis on upstream-to-downstream differences. Poster presented at the annual meeting of the Mississippi River Research Consortium, La Crosse, Wisconsin, 26-28 April 1995.

Michael A. McClelland, Greg G. Sass, Thad R. Cook, Kevin S. Irons, T. Matt O'Hara, Camilla S. Smith, Nerissa N. Michaels, and Mathew R. Stroub. Fifty Years of the Long-Term Illinois River Fish Population Monitoring Program, 1957-2007. Presented at the 46th Annual Meeting of the Illinois Chapter of the American Fisheries Society, Rockford, IL, February 26-28, 2008.

Pegg, M.A. and M.A. McClelland. Long-term fish population trends along the Illinois River. Poster presented at the 63rd Midwest Fish and Wildlife Conference, Des Moines, Iowa, December, 2001.

Pegg, M.A. and M.A. McClelland. Long-term fish population trends along the Illinois River. Poster presented at the 131st Annual Meeting of the American Fisheries Society, Phoenix, Arizona, August, 2001.

V. Popular Presentations

Lerczak, T.V. Wintering bald eagles along the Illinois River and factors affecting their environment. Invited presentation to the Peoria Audubon Society, Peoria, Illinois, 8 March 1995.

Lerczak, T.V. Seminar on Illinois River environmental issues. Conducted for Biology 140 (Human Ecology) at Spoon River College, 27 June 1994.

Lerczak, T.V. A photo trip up the Illinois River. After dinner talk presented to Havana Rotary Club, Havana, Illinois, 17 April 1995.

Blodgett, K.D. Ecosystem management for the Illinois River: can biological integrity be restored? Invited lecture for Earth Day celebration at Spoon River College, Canton, Illinois, 19 April 1995.

McClelland, M.A. The Long Term Illinois River Fish Population Monitoring Program. After dinner talk presented to Central Christian Men's 10th Annual Fish Fry, August 2003.

VI. Data Requests

1. Sam Cull, City of Peru, Electrical Department, Peru, Illinois
2. Stanley and Associates, Muscatine, Iowa
3. U.S. Army Corps of Engineers, Rock Island, Illinois
4. Shelly Miller, Aquatic Ecologist, The Nature Conservancy, Peoria, Illinois
5. K. Douglas Blodgett, Project Manager, The Nature Conservancy, Havana, Illinois
6. Kevin Irons, Fishery Biologist, LTRMP, Havana, Illinois
7. Matt O'Hara, Fishery Biologist, LTRMP, Havana, Illinois
8. Scott Langloss, Writer for Adventure Sports Outdoors
9. Richard Sparks, Director of Research National Great Rivers Research & Education Center
10. Jim Mick, Illinois Department of Natural Resources
11. James B. McLaren, ASA Analysis & Communication, Inc.
12. Ximing Cai, University of Illinois
13. Rob Maher, Illinois Department of Natural Resources
14. Karen Haggerty, U.S. Army Corps of Engineers
15. Mike Kacinski, EA Engineering
16. Sam McCord, EA Engineering
17. Kelly Baewaldt, U.S. Army Corps of Engineers
18. Dave Thomas, Former Chief of Illinois Natural History Survey