Long Term Resource Monitoring Program

Program Report
98-P008

1997 Annual Status Report

A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

June 1998

The Environmental Management Technical Center issues LTRMP Program Reports to provide Long Term Resource Monitoring Program partners with programmatic documentation, procedures manuals, and annual status reports.

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A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

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June 1998

Suggested citation:

Burkhardt, R. W., M. Stopyro, E. Kramer, A. Bartels, M. C. Bowler, F. A. Cronin, D. W. Soergel, M. D. Petersen, D. P. Herzog, T. M. O'Hara, and K. S. Irons. 1998. 1997 Annual Status Report: A summary of fish data in six reaches of the Upper Mississippi River System. U.S. Geological Survey, Environmental Management Technical Center, Onalaska, Wisconsin, June 1998. LTRMP 98-P008. 15 pp. + Chapters 1–6

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Preface

This report is a product of the Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System. The LTRMP was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Environmental Management Technical Center, a U.S. Geological Survey science center, in cooperation with the five Upper Mississippi River System (UMRS) States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The U.S. Army Corps of Engineers provides guidance and has overall Program responsibility. The mode of operation and respective roles of the agencies are outlined in a 1988 Memorandum of Agreement.

The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers. Congress has declared the UMRS to be both a nationally significant ecosystem and a nationally significant commercial navigation system. The mission of the LTRMP is to provide decision makers with information for maintaining the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and effects, develop management alternatives, manage information, and develop useful products.

Data (factual record) and information (usable interpretation of data) are the primary products of the LTRMP. Data on water quality, vegetation, aquatic macroinvertebrates, and fish are collected using a network of six field stations on the Upper Mississippi and Illinois Rivers. Analysis, interpretation, and the reporting of information are conducted at the six field stations and at the Environmental Management Technical Center, the operational center of the LTRMP. Informational products of the LTRMP include professional presentations, reports, and publications in the open and peer-reviewed scientific literature.

This document is an annual status report for 1997, containing a synthesis of data from fish populations and communities in the Upper Mississippi River System. This report satisfies, for 1997, Task 2.2.8.4, *Evaluate and Summarize Annual Results* under Goal 2, *Monitor Resource Change* as specified in the Operating Plan for the Long Term Resource Monitoring Program (U.S. Fish and Wildlife Service 1993). This report was developed with funding provided by the Long Term Resource Monitoring Program. The purposes of this annual synthesis report are to provide (1) a systemwide summary of data in standardized tables and figures and (2) initial identification and interpretation of observed spatial and temporal patterns. The primary data summarized in this report are available from the Environmental Management Technical Center.

1997 Annual Status Report

A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

by

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Abstract

The Long Term Resource Monitoring Program (LTRMP) completed 2,797 collections of fishes from stratified random and permanently fixed sampling locations in six study reaches of the Upper Mississippi River System during 1997. Collection methods included day and night electrofishing, hoop netting, fyke netting (two net sizes), gill netting, seining, and trawling in select aquatic area classes. The six LTRMP study reaches are Pools 4 (excluding Lake Pepin), 8, 13, and 26 of the Upper Mississippi River, an unimpounded reach of the Mississippi River near Cape Girardeau, Missouri, and the La Grange Pool of the Illinois River. A total of 66–76 fish species were detected in each study reach. For each of the six LTRMP study reaches, this report contains summaries of: (1) sampling efforts for each combination of gear type and aquatic area class, (2) total catches of each species from each gear type, (3) mean catch-per-unit of effort statistics and standard errors for common species from each combination of aquatic area class and selected gear type, and (4) length distributions of common species from selected gear types.

Introduction

The objective of this report is to summarize key features of fish populations and communities from samples collected by field stations of the Long Term Resource Monitoring Program (LTRMP) from the Upper Mississippi River System (UMRS). The fisheries component of the LTRMP is charged, in part, with monitoring and reporting trends in the status of selected fish populations and fish communities of the UMRS (U.S. Fish and Wildlife Service 1993). Intended as a data summary, this report contains only minimal descriptive syntheses. The LTRMP is required to produce trend reports at 5-year intervals that contain quantitative analyses and systemic syntheses of temporal changes. Further, the LTRMP uses these monitoring data in analyses to address specific issues of concern to LTRMP partners; these analyses are reported in special reports and in the open scientific literature.

Fish are the primary biotic object of recreational and commercial use on the UMRS. During 1982, UMRS fisheries provided more than 8.5 million activity days of sportfishing that generated more than $150 million in direct expenditures (Fremling et al. 1989). Commercial fisheries of the UMRS were valued at more than $2.4 million in 1987 (Upper Mississippi River Conservation Committee 1989). Adverse trends in fisheries of the UMRS would have detrimental effects on recreation and the regional economy. Therefore, it is important to detect any adverse trends as they occur so that remedial actions can be considered.

Monitoring of and research on fish are also important because fish often affect other ecosystem elements. Although documentation of the effects of fish on other biota is derived primarily from lakes and reservoirs (Northcote 1988), and traditional thought maintains that the dynamics of river biota are influenced primarily by abiotic factors, recent evidence shows that the dynamics of fish assemblages in temperate rivers are regulated in part by biotic factors (Welcomme et al. 1989). Fish may exert influences on other biota in riverine ecosystems and may, therefore, be of broad ecological importance. For example, evidence shows that common carp (*Cyprinus carpio*), an abundant species in the UMRS, may depress or even eliminate macrophytes either

through uprooting or disturbance of substrate (Cahn 1929; Macrae 1979). Effects of fish on benthic macroinvertebrates are well known (Northcote 1988). Therefore, trends in abundance of fish may be crucial in explaining trends in abundance of other riverine biota.

Resource monitoring is an important component of long-term ecological research on processes governing large-scale ecosystems. It is nearly impossible to perform experimental manipulations of the UMRS on large spatial scales and to incorporate replication. Long-term data from standardized sampling programs that span natural or anthropogenic disturbances are the only means for gaining an understanding of large-scale processes governing large river systems (Sparks et al. 1990). Further, the LTRMP fisheries component will provide support for the formulation and investigation of research hypotheses concerning smaller scales using focused experimentation. Therefore, the combination of routine monitoring coupled with more intensive investigation of consequences of disturbances and experimentation at reduced spatial and temporal scales is the only available means for better understanding the UMRS and for identifying viable management alternatives.

Study Areas

The LTRMP study areas include six river reaches within the Upper Mississippi River System, five on the Mississippi River and one on the Illinois River (Figure). Study areas are referred to herein by the navigation pool designations according to the U.S. Army Corps of Engineers lock and dam system. Mississippi River navigation pools studied are Pool 4 (river mile 752 to 797), Pool 8 (679 to 703), Pool 13 (523 to 557), Pool 26 (202 to 242), and an unimpounded, open river reach (29 to 80). The remaining study area is the La Grange Pool of the Illinois River (80 to 158).

The LTRMP study areas were chosen, in part, to reflect important differences in geomorphology, floodplain land-use practices, and navigation management strategies that exist within the UMRS (Table 1). Pools 4, 8, and 13 are located in an upper impounded reach characterized by high percentages of open water and aquatic vegetation and low agricultural use (Figure). Relatively high percentages of the total aquatic area in these study reaches are composed of contiguous (to the main channel) backwaters, and relatively low percentages are composed of main channel. Qualitatively, Pools 4, 8, and 13 are geomorphically complex and richly braided by side channels and backwaters. Pool 26, in a lower impounded reach, is characterized by relatively low percentages of open water and aquatic vegetation and a high percentage of agriculture in the floodplain. A low percentage of the total aquatic area is composed of contiguous backwaters, and commensurately, a high percentage is composed of the main channel. The Open River study reach is characterized by low percentages of open water and aquatic vegetation and 71.5% agriculture in the floodplain. Of the total aquatic area in the Open River study reach, only 1.8% is contiguous backwater and 79% is main channel (Table 1). The La Grange Pool is similar to Pool 26 in floodplain composition, but is similar to Pools 8 and 13 in composition of the aquatic area (Table 1). In fact, the La Grange Pool has the greatest percentage (52.2%) of contiguous backwaters among the six LTRMP study areas.

Sampling sites are randomly selected within nine strata for each study area: backwater contiguous shoreline (BWCS), backwater contiguous offshore (BWCO), impounded shoreline (IMPS), impounded offshore (IMPO), main channel border unstructured (MCBU), main channel border wing dam (MCBW), side channel border (SCB), tributary mouth (TRI), and tailwater (TWZ). The definitions of sampling strata are based on geomorphic regions that have been mapped and entered into a Geographic Information System.

Figure. Long Term Resource Monitoring Program study reaches.

Table 1. Key features of the floodplain and aquatic area compositions of the Long Term Resource Monitoring Program's five Mississippi and Illinois River study reaches. Aquatic area is that portion of the floodplain that is inundated at normal water elevations. Main channel includes area in the navigation channel and main channel border areas. Data on floodplain composition are from Laustrup and Lowenberg (1994). Data on the composition of aquatic areas are from the Long Term Resource Monitoring Program aquatic areas spatial database.

		Floodplain composition (%)			Aquatic area composition (%)	
Study reach	Floodplain area (ha)	Open water	Aquatic vegetation	Agriculture	Contiguous backwater	Main channel
Pool 4	28,358	50.5	10.0	12.1	21.3	10.5
Pool 8	19,068	40.1	14.4	0.9	30.6	14.2
Pool 13	34,528	29.7	8.6	27.9	28.5	24.7
Pool 26	51,688	13.4	1.4	65.4	17.3	54.4
Open River	105,244	9.9	0.6	71.5	1.8	79.0
La Grange Pool, Illinois River	89,554	15.7	2.2	59.6	52.2	21.3

Methods

Sampling Methods

The LTRMP fish monitoring design and sampling protocols, including historical changes, are given in Gutreuter et al. (1995). Readers requiring detailed descriptions should refer to that report. An abbreviated description of the LTRMP design and protocols follows; a list of common and scientific names of fish used in this report is found in Table 2.

In this report, we summarize the annual increment of fish data obtained by the LTRMP from stratified random and fixed-site sampling during 1997. The LTRMP converted to a stratified, random fish sampling design in 1993, augmented with limited sampling at a few permanently fixed sites. Selected aquatic areas, chosen for their enduring geomorphic features (Wilcox 1993), were used as sampling strata. These aquatic areas were largely compatible with the habitat classes used in 1990–92, with the exception of the 1990–92 classifications, which were based on the presence of aquatic vegetation; those fixed sites were reclassified into strata according to aquatic areas. Each aquatic area is artificially partitioned into 50-m^2 sampling grids beginning with a random origin for each LTRMP study reach (Gutreuter et al. 1995) using the ARC Geographic Information System. Beginning in 1993, sampling sites were randomly chosen from this lattice of square grids. Whenever it is discovered that a randomly selected site cannot be sampled because of environmental constraints (e.g., limited physical access or high flow), the nearest accessible site from a list of randomly selected alternate sites is sampled within the same aquatic area class.

Table 2. Long Term Resource Monitoring Program list of fishes, arranged phylogenetically by family, then alphabetically by genus and species. Hybrids are listed after respective genera. Nomenclature follows Robins et al. (1991).

Common name	Family name	Scientific name
	Petromyzontidae	
Chestnut lamprey		*Ichthyomyzon castaneus*
Northern brook lamprey		*I. fossor*
Silver lamprey		*I. unicuspis*
Least brook lamprey		*Lampetra aepyptera*
American brook lamprey		*L. appendix*
Sea lamprey		*Petromyzon marinus*
	Carcharhinidae	
Bull shark		*Carcharhinus leucas*
	Acipenseridae	
Lake sturgeon		*Acipenser fulvescens*
Pallid sturgeon		*Scaphirhynchus albus*
Shovelnose sturgeon		*S. platorynchus*
	Polyodontidae	
Paddlefish		*Polyodon spathula*
	Lepisosteidae	
Spotted gar		*Lepisosteus oculatus*
Longnose gar		*L. osseus*
Shortnose gar		*L. platostomus*
Alligator gar		*L. spatula*
	Amiidae	
Bowfin		*Amia calva*
	Hiodontidae	
Goldeye		*Hiodon alosoides*
Mooneye		*H. tergisus*
	Anguillidae	
American eel		*Anguilla rostrata*
	Clupeidae	
Alabama shad		*Alosa alabamae*
Skipjack herring		*A. chrysochloris*
Alewife		*A. pseudoharengus*
Gizzard shad		*Dorosoma cepedianum*
Threadfin shad		*D. petenense*

Table 2. Continued.

Common name	Family name	Scientific name
	Cyprinidae	
Central stoneroller		*Campostoma anomalum*
Largescale stoneroller		*C. oligolepis*
Goldfish		*Carassius auratus*
Lake chub		*Couesius plumbeus*
Grass carp		*Ctenopharyngodon idella*
Red shiner		*Cyprinella lutrensis*
Spotfin shiner		*C. spiloptera*
Blacktail shiner		*C. venusta*
Steelcolor shiner		*C. whipplei*
Common carp		*Cyprinus carpio*
Goldfish × common carp		*Carassius auratus* × *C. carpio*
Gravel chub		*Erimystax x-punctatus*
Western silvery minnow		*Hybognathus argyritis*
Brassy minnow		*H. hankinsoni*
Mississippi silvery minnow		*H. nuchalis*
Plains minnow		*H. placitus*
Silver carp		*Hypopthalmichthys molitrix*
Bighead carp		*H. nobilis*
Striped shiner		*Luxilus chrysocephalus*
Common shiner		*L. cornutus*
Rosefin shiner		*Lythrurus ardens*
Ribbon shiner		*L. fumeus*
Redfin shiner		*L. umbratilis*
Speckled chub		*Macrhybopsis aestivalis*
Sturgeon chub		*M. gelida*
Sicklefin chub		*M. meeki*
Silver chub		*M. storeriana*
Pearl dace		*Margariscus margarita*
Hornyhead chub		*Nocomis biguttatus*
River chub		*N. micropogon*
Golden shiner		*Notemigonus crysoleucas*
Bigeye chub		*Notropis amblops*
Pallid shiner		*N. amnis*
Pugnose shiner		*N. anogenus*
Emerald shiner		*N. atherinoides*
River shiner		*N. blennius*
Bigeye shiner		*N. boops*
Silverjaw minnow		*N. buccatus*
Ghost shiner		*N. buchanani*
Ironcolor shiner		*N. chalybaeus*
Bigmouth shiner		*N. dorsalis*
Blackchin shiner		*N. heterodon*
Blacknose shiner		*N. heterolepis*
Bluehead shiner		*N. hubbsi*
Spottail shiner		*N. hudsonius*
Ozark minnow		*N. nubilus*
Rosyface shiner		*N. rubellus*
Silverband shiner		*N. shumardi*
Sand shiner		*N. stramineus*
Weed shiner		*N. texanus*
Mimic shiner		*N. volucellus*

Table 2. Continued.

Common name	Family name	Scientific name
Channel shiner		*N. wickliffi*
Pugnose minnow		*Opsopoeodus emiliae*
Suckermouth minnow		*Phenacobius mirabilis*
Northern redbelly dace		*Phoxinus eos*
Southern redbelly dace		*P. erythrogaster*
Bluntnose minnow		*Pimephales notatus*
Fathead minnow		*P. promelas*
Bullhead minnow		*P. vigilax*
Flathead chub		*Platygobio gracilis*
Blacknose dace		*Rhinichthys atratulus*
Longnose dace		*R. cataractae*
Creek chub		*Semotilus atromaculatus*
	Catostomidae	
River carpsucker		*Carpiodes carpio*
Quillback		*C. cyprinus*
Highfin carpsucker		*C. velifer*
Longnose sucker		*Catostomus catostomus*
White sucker		*C. commersoni*
Blue sucker		*Cycleptus elongatus*
Creek chubsucker		*Erimyzon oblongus*
Lake chubsucker		*E. sucetta*
Northern hog sucker		*Hypentelium nigricans*
Smallmouth buffalo		*Ictiobus bubalus*
Bigmouth buffalo		*I. cyprinellus*
Black buffalo		*I. niger*
Spotted sucker		*Minytrema melanops*
Silver redhorse		*Moxostoma anisurum*
River redhorse		*M. carinatum*
Black redhorse		*M. duquesnei*
Golden redhorse		*M. erythrurum*
Shorthead redhorse		*M. macrolepidotum*
Greater redhorse		*M. valenciennesi*
	Ictaluridae	
White catfish		*Ameiurus catus*
Black bullhead		*A. melas*
Yellow bullhead		*A. natalis*
Brown bullhead		*A. nebulosus*
Blue catfish		*Ictalurus furcatus*
Channel catfish		*I. punctatus*
Mountain madtom		*Noturus eleutherus*
Slender madtom		*N. exilis*
Stonecat		*N. flavus*
Tadpole madtom		*N. gyrinus*
Brindled madtom		*N. miurus*
Freckled madtom		*N. nocturnus*
Northern madtom		*N. stigmosus*
Flathead catfish		*Pylodictis olivaris*

Table 2. Continued.

Common name	Family name	Scientific name
	Esocidae	
Grass pickerel		*Esox americanus vermiculatus*
Northern pike		*E. lucius*
Muskellunge		*E. masquinongy*
Tiger muskellunge		*E. masquinongy* × *E. lucius*
Chain pickerel		*E. niger*
	Umbridae	
Central mudminnow		*Umbra limi*
	Osmeridae	
Rainbow smelt		*Osmerus mordax*
	Salmonidae	
Cisco		*Coregonus artedi*
Bloater		*C. hoyi*
Coho salmon		*Oncorhynchus kisutch*
Rainbow trout		*O. mykiss*
Brown trout		*Salmo trutta*
Brook trout		*Salvelinus fontinalis*
	Percopsidae	
Trout-perch		*Percopsis omiscomaycus*
	Aphredoderidae	
Pirate perch		*Aphredoderus sayanus*
	Amblyopsidae	
Spring cavefish		*Chologaster agassizi*
	Gadidae	
Burbot		*Lota lota*
	Cyprinodontidae	
Northern studfish		*Fundulus catenatus*
Banded killifish		*F. diaphanus*
Starhead topminnow		*F. dispar*
Blackstripe topminnow		*F. notatus*
Blackspotted topminnow		*F. olivaceus*
	Poeciliidae	
Western mosquitofish		*Gambusia affinis*

Table 2. Continued.

Common name	Family name	Scientific name
	Atherinidae	
Brook silverside		*Labidesthes sicculus*
Mississippi silverside		*Menidia audens*
Inland silverside		*M. beryllina*
	Gasterosteidae	
Brook stickleback		*Culaea inconstans*
Ninespine stickleback		*Pungitius pungitius*
	Cottidae	
Mottled sculpin		*Cottus bairdi*
Banded sculpin		*C. carolinae*
Slimy sculpin		*C. cognatus*
Deepwater sculpin		*Myoxocephalus thompsoni*
	Percichthyidae	
White perch		*Morone americana*
White bass		*M. chrysops*
Yellow bass		*M. mississippiensis*
Striped bass		*M. saxatilis*
White bass × striped bass		*M. chrysops* × *M. saxatilis*
	Centrarchidae	
Shadow bass		*Ambloplites ariommus*
Rock bass		*A. rupestris*
Flier		*Centrarchus macropterus*
Banded pygmy sunfish		*Elassoma zonatum*
Green sunfish		*Lepomis cyanellus*
Pumpkinseed		*L. gibbosus*
Warmouth		*L. gulosus*
Orangespotted sunfish		*L. humilis*
Bluegill		*L. macrochirus*
Longear sunfish		*L. megalotis*
Redear sunfish		*L. microlophus*
Spotted sunfish		*L. punctatus*
Bantam sunfish		*L. symmetricus*
Green sunfish × pumpkinseed		*L. cyanellus* × *L. gibbosus*
Green sunfish × warmouth		*L. cyanellus* × *L. gulosus*
Green sunfish × orangespotted sunfish		*L. cyanellus* × *L. humilis*
Green sunfish × bluegill		*L. cyanellus* × *L. macrochirus*
Green sunfish × redear sunfish		*L. cyanellus* × *L. microlophus*
Green sunfish × unknown		*L. cyanellus* × sp.
Pumpkinseed × warmouth		*L. gibbosus* × *L. gulosus*
Pumpkinseed × orangespotted sunfish		*L. gibbosus* × *L. humilis*
Pumpkinseed × bluegill		*L. gibbosus* × *L. macrochirus*
Orangespotted sunfish × longear sunfish		*L. humilis* × *L. megalotis*
Bluegill × warmouth		*L. macrochirus* × *L. gulosus*
Bluegill × orangespotted sunfish		*L. macrochirus* × *L. humilis*

Table 2. Continued.

Common name	Family name	Scientific name
Bluegill × longear sunfish		*L. macrochirus* × *L. megalotis*
Bluegill × redear sunfish		*L. macrochirus* × *L. microlophus*
Redear sunfish × warmouth		*L. microlophus* × *L. gulosus*
Smallmouth bass		*Micropterus dolomieu*
Spotted bass		*M. punctulatus*
Largemouth bass		*M. salmoides*
White crappie		*Pomoxis annularis*
Black crappie		*P. nigromaculatus*
White crappie × black crappie		*P. annularis* × *P. nigromaculatus*
	Percidae	
Crystal darter		*Ammocrypta asprella*
Western sand darter		*A. clara*
Eastern sand darter		*A. pellucida*
Mud darter		*Etheostoma asprigene*
Greenside darter		*E. blennioides*
Rainbow darter		*E. caeruleum*
Bluebreast darter		*E. camurum*
Bluntnose darter		*E. chlorosomum*
Iowa darter		*E. exile*
Fantail darter		*E. flabellare*
Slough darter		*E. gracile*
Harlequin darter		*E. histrio*
Stripetail darter		*E. kennicotti*
Least darter		*E. microperca*
Johnny darter		*E. nigrum*
Cypress darter		*E. proelaire*
Orangethroat darter		*E. spectabile*
Spottail darter		*E. squamiceps*
Banded darter		*E. zonale*
Yellow perch		*Perca flavescens*
Logperch		*Percina caprodes*
Blackside darter		*P. maculata*
Slenderhead darter		*P. phoxocephala*
Dusky darter		*P. sciera*
River darter		*P. shumardi*
Sauger		*Stizostedion canadense*
Walleye		*S. vitreum*
Sauger × walleye		*S. canadense* × *S. vitreum*
	Sciaenidae	
Freshwater drum		*Aplodinotus grunniens*
	Mugilidae	
Striped mullet		*Mugil cephalus*

Since 1990, the LTRMP uses day and night electrofishing, fyke nets, seines, small mini fyke nets, hoop nets, and small trawls to sample fish in various strata. The following is a summary of sampling gears according to Gutreuter et al. (1995):

Electrofishing

Electrofishing is conducted with pulsed direct current; boat configuration and power output are standardized (Burkhardt and Gutreuter 1995; Gutreuter et al. 1995). Electrofishing effort is of 15-min duration and is paced so that the boat covers a rectangle of about 200 × 30 m. Day and night electrofishing data from these two methods were combined for length–frequency analysis. The unit of effort is a 15-min run.

Hoop Netting

The LTRMP uses two sizes of hoop nets. The large nets are composed of seven fiberglass hoops with diameters of 1.1 to 1.2 m. These nets are 4.8 m long, contain two finger-style throats, and are constructed of 3.7-cm (bar measure) nylon mesh. The small nets are composed of seven fiberglass hoops with diameters of 0.5 to 0.6 m. The small nets are 3 m long, contain two finger-style throats, and are constructed of 1.8-cm (bar measure) nylon mesh. Hoop nets are deployed separately but in pairs within sampling sites. Both nets are baited with 3 kg of soybean cake. Because of gear inefficiency, hoop net sets in BWCO areas were optional during 1997. For this report, the estimates from pairs of nets are pooled and therefore treated as a single gear for consistency with the 1990–92 data. The unit of effort is a net-day, which is 24 h of effort by a pair of nets.

Seining

The LTRMP uses 10.7-m-long seines constructed of 3-mm Ace-type nylon mesh. These seines are 1.8 m high and have a 0.9-m^2 bag in the centers. Seines are extended perpendicularly to shorelines and then swept in a 90° arc downstream to the shoreline. The unit of effort is a haul.

Fyke Netting

The LTRMP uses Wisconsin-type fyke nets (trap nets) that contain three sections: the lead, frame, and cab. All netting is 1.8-cm (bar measure) mesh. Leads are 15 m long and 1.3 m high. The spring steel frames are 0.9 m high and 1.8 m wide with two internal wing throats. The cabs are constructed of six steel hoops (0.9 m in diameter) containing two throats. These nets are fished singly from shoreline or from beds of dense vegetation or in tandem (with leads connected) offshore. The unit of effort is a net-day, where each frame is one net. Fyke net and tandem fyke net data were combined for length–frequency distribution analysis.

Mini Fyke Netting

Mini fyke nets are small, Wisconsin-type fyke nets. Mesh size is 3-mm Ace-type nylon. The leads are 4.5 m long and 0.6 m high. The spring steel frames are 0.6 m high and 1.2 m wide with two internal wing throats. The cabs are constructed of two steel hoops (0.6 m in diameter) with one throat. These nets are fished singly from shoreline or from beds of dense vegetation or in tandem (with leads connected) offshore. The unit of effort is a net-day, where each frame is one net.

Trawling

Trawling is conducted only at permanently fixed sampling sites in tailwater zones and unstructured channel borders. The LTRMP trawls collect mainly small, bottom-dwelling fish. The trawls are two-seam, 4.8-m slingshot balloon trawls (TRL16BC, Memphis Net and Twine Co., Inc., or the equivalent). The body of the trawl is made of No. 9 nylon with stretch mesh 18 mm in diameter. The cod end is made of No. 18 nylon with stretch mesh 18 mm in diameter. The cod end contains a 1.8-m liner consisting of 3-mm Ace-type nylon mesh. Floats are spaced every 0.91 m along the headrope, and a 4.8-mm steel chain is tied to the footrope. The trawl is equipped with 37-cm-high by 75-cm-long iron "V" doors (otter boards). These trawls are dragged downriver by small, flat-bottomed boats. Trawl speed is barely faster than ambient current speed. The standard unit of trawl effort is a haul. A minimum of six hauls is collected in main or side channel sites and four hauls at tailwater sites.

Gill Netting

In 1993, gill nets became an optional experimental sampling gear. This option was included to improve monitoring capabilities for some large riverine species. Gill nets are 91.44 m long and consist of four, 22.86-m panels of monofilament mesh. The panels are 2.44 m deep. Each panel consists of different mesh of 10.2-, 20.3-, and 25.4-cm stretch measure. The 10.2- and 15.2-cm mesh are woven from No. 8 (9.07-kg [20-pound] test) transparent nylon monofilament. The 25.4-cm mesh is woven from No. 12 (13.61-kg [30-pound] test) transparent nylon monofilament. The top line is floating foam-core rope and the bottom line is 29.50-kg lead-core rope. Gill nets are set either perpendicularly (preferred) or parallel (in high-flow conditions) to the shoreline. The standard unit of gill netting effort is the net-day, where a day is 24 h.

Trammel Netting

In 1994, trammel nets became an optional experimental sampling gear. This option was included to improve monitoring capabilities for some large riverine species. Trammel nets may be anchored or drifted with the current.

Trammel nets are 91.44 × 2.44 m, inside netting is 10.16-cm bar of No. 8 monofilament hung about 85 m per 30.48 m of finished net, wall size is 35.56-cm bar of No. 9 multifilament twine hung 61 m per 30.48 yards of finished net, float line is 1.27 cm foam-core (two strands on the floating nets, one strand on the bottom set nets), and lead line is lead-core (No. 20 on the floating net, No. 65 on the sinking net).

Statistical Methods

The LTRMP uses mean catch-per-unit-effort *C/f* as an index of abundance, as is conventional practice (Ricker 1975). The units of effort are specific to particular gears. For electrofishing and seining, effort is a constant, but for other gears it is somewhat variable. For example, although the effort goal for fyke nets is 1 day (Gutreuter et al. 1995), actual effort may vary between 20 and 30 h. Catch and effort are recorded for each species from individual samples (deployments of particular gears at unique combinations of time and place. Whenever a species is not caught in a sample, the catch for that species in that sample is zero. Although these zero catches are not recorded, they are reconstructed for analyses.

The estimates of pooled reachwide mean *C/f* were obtained from the conventional design-based estimator for stratified random samples (Cochran 1977). For an arbitrary random variable denoted y (for this report y represents *C/f*), the pooled mean, denoted $\bar{y}_{st}$ (*st* represents stratified) is given by

$$\bar{y}_{st} = \frac{1}{N}\sum_{h=1}^{L} N_h \bar{y}_h \qquad (1)$$

where N_h is the number of sampling units within stratum h, $N = \Sigma_{h=1}^{L} N_h$, and $\bar{y}_h$ denotes the estimator of the simple mean of y for stratum h. The estimator of the variance of $\bar{y}_{st}$ is

$$s^2(\bar{y}_{st}) = \frac{1}{N^2}\sum_{h=1}^{L} N_h(N_h - n_h)\left(\frac{s_h^2}{n_h}\right) \qquad (2)$$

where

$$s_h^2 = \frac{\sum_{i=1}^{n_h} (y_{hi} - \bar{y}_h)^2}{n_h - 1}$$

is the usual estimator of the variance of y_h and n_h is the number of samples taken in stratum h (Cochran 1977). The standard error of $\bar{y}_{st}$ is therefore $s(\bar{y}_{st})$. For LTRMP fish monitoring, the sampling units are 50-m^2 sampling grids.

In this report, *C/f* statistics are reported separately for the limited, fixed-site sampling and the primary stratified random sampling. Equation (1) is used to estimate means of data obtained from fixed-site sampling to maintain computational consistency. The pooled means from fixed-site sampling are not guaranteed unbiased because there is no assurance that the fixed sites were unbiased within the stratum. Equation (1) is also used to obtain estimates of overall mean catch-per-unit-effort from stratified random sampling. In random samples, equation (1) yields unbiased estimates of the pooled means regardless of the probability distribution of y (Cochran 1977).

Length distribution analysis was performed for 13 selected fish species (gear used): gizzard shad (electrofishing), common carp (electrofishing), smallmouth buffalo (electrofishing; large and small hoop netting), channel catfish (electrofishing; large and small hoop netting), northern pike (electrofishing; fyke and tandem fyke netting), white bass (electrofishing), bluegill (electrofishing; fyke and tandem fyke netting), largemouth bass (electrofishing), white crappie (electrofishing; fyke and tandem fyke netting), black crappie (electrofishing; fyke and tandem fyke netting), sauger (electrofishing), walleye (electrofishing), and freshwater drum (electrofishing; fyke and tandem fyke netting). The data are illustrated in the form of histograms within the following chapters. In some instances, meaningful biological interpretation of these distributions may be limited by small sample size or size selectivity of the gear (Anderson and Neumann 1996). Some fish histograms with small sample sizes (<100) are included in this report because of local interest, while others were omitted (reach dependent).

Acknowledgments

This report is a result of the efforts of the staff and partners of the Long Term Resource Monitoring Program (LTRMP) of the Upper Mississippi River. The LTRMP is a cooperative effort by the U.S. Geological Service—Biological Resources Division, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Illinois Department of Natural Resources, the Iowa Department of Natural Resources, the Minnesota Department of Natural Resources, the Missouri Department of Conservation, and the Wisconsin Department of Natural Resources. Monitoring is conducted by six field stations operated by the participating state resource management and research agencies. We especially thank the staff at the LTRMP field stations for their sampling assistance and Steve Gutreuter for his efforts in writing most of the statistical analysis program used in this manuscript.

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Chapter 1. Pool 4, Upper Mississippi River

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Hydrograph

At the beginning of the first sampling period, water levels were below normal, then rose abruptly midway through the first period and remained above normal throughout the second period (Figure 1.1). The river was at approximately normal levels during the third period. The high water during the first and second periods negatively affected sampling efforts in the MCBW and TWZ. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

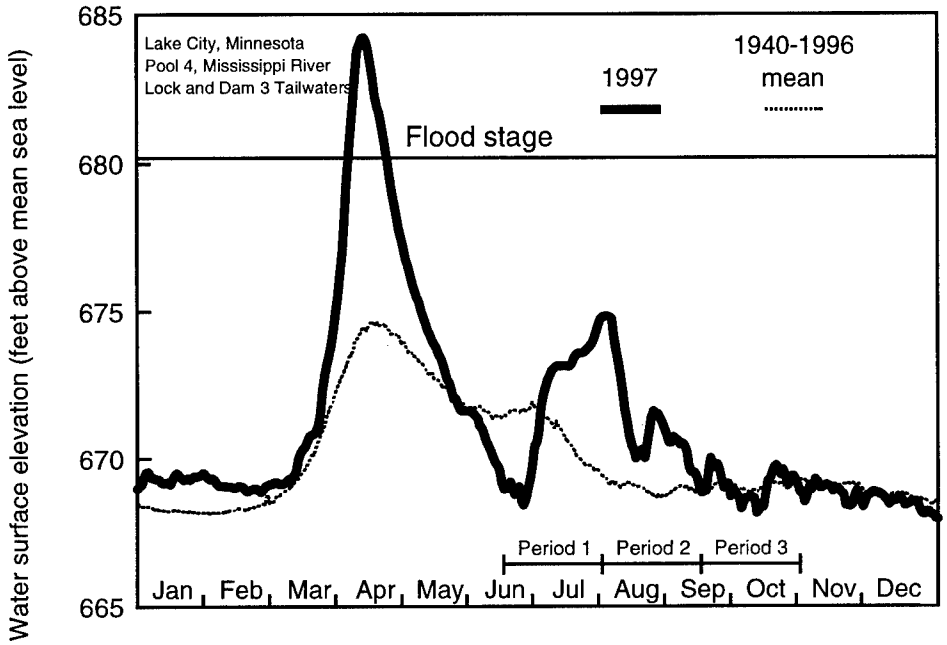

Figure 1.1. Daily water surface elevation from Lock and Dam 3 for Pool 4, Upper Mississippi River, during 1997 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

Summary of Sampling Effort

In 1997, we completed 376 collections at randomly selected sites and 73 collections at fixed sites (Table 1.1). Fixed-site sampling consisted of 43 collections in the TWZ and 30 collections in the MCBW.

Total Catch by Gear

We collected 37,289 fish comprising 71 species and 4 hybrids in 1997 (Table 1.2). Historically, about 99 species have been documented in Pool 4 (Pitlo et al. 1995). In 1997, the most numerically abundant species (and total catches) were the emerald shiner (18,549), mimic shiner (1,719), spotfin shiner (1,983), gizzard shad

(1,500), and common carp (1,363). Total catches by gear were day electrofishing, 10,509; night electrofishing, 4,818; fyke net, 807; tandem fyke net, 1,148; mini fyke, 3,377; tandem mini fyke, 566; seine, 14,849; small hoop net, 307; large hoop net, 463; gill net, 306; trammel net, 57; and trawl, 82.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

We collected 58 species using day electrofishing (Table 1.3.1). Species with the highest poolwide mean catch-per-unit-effort (*C/f*s) in day electrofishing collections were the emerald shiner (245/h = 4 × 61.3 per 15-min run) , gizzard shad (52/h), and bluegill (34/h). The emerald shiner was the most commonly collected species by electrofishing in the MCBU (568/h) and SCB (273/h). The gizzard shad predominated in the BWCS (101/h); in the MCBW, the highest *C/f* was for the shorthead redhorse (59/h). Eight species taken by electrofishing were not collected by any other gear. These were the chestnut lamprey, hornyhead chub, northern hog sucker, river redhorse, burbot, orangespotted sunfish, crystal darter, and blackside darter.

Fyke Net

Twenty-five species were collected from two strata in fyke nets (Table 1.3.2). Poolwide mean *C/f*s in fyke nets were highest for the bluegill (7/net-day), black crappie (6/net-day), and gizzard shad (3/net-day). The bluegill had the highest stratumwide *C/f* in the BWCS (7/net-day), and the rock bass had the highest catch rate in the MCBW (2/net-day).

Tandem Fyke Net

Tandem fyke nets were used solely in the BWCO and 27 species were collected (Table 1.3.3). The most commonly caught species in tandem fyke nets were the black crappie (5/net-day), bluegill (3/net-day), and common carp (3/net-day). The yellow bullhead was collected exclusively in this gear type during 1997.

Mini Fyke Net

We collected 37 species in mini fyke nets (Table 1.3.4). Poolwide *C/f*s were highest for the white bass (7/net-day), river darter (5/net-day), and emerald shiner (5/net-day). The river darter was the most abundant species in mini fyke net collections from the MCBU (20/net-day). The white bass was the most common species in collections from the BWCS (11/net-day) and SCB (7/net-day). In the MCBW, catches were low (<0.4/net-day) for all species in mini fyke nets. Catches in the MCBW were low, and catch rates were not reported.

Tandem Mini Fyke Net

We collected 32 species in tandem mini fyke nets in the BWCO (Table 1.3.5). The most commonly collected species were the emerald shiner (2/net-day), pugnose minnow (1/net-day), and freshwater drum (1/net-day).

Small Hoop Net

In small hoop nets, 11 species were collected (Table 1.3.6). The channel catfish was the most frequently caught species in the MCBU (3/net-day), MCBW (0.3/net-day), and SCB (3/net-day).

Large Hoop Net

We collected 14 species in large hoop nets (Table 1.3.7). Poolwide, the most commonly caught species were the common carp and channel catfish (1 each/net-day). The common carp was the most frequently collected species in the MCBU (1/net-day) and SCB (1/net-day). The channel catfish had the highest *C/f* in the MCBW (1/net-day).

Seine

We collected 39 species in the seine (Table 1.3.8) during 1997. Poolwide *C/f*s in the seine were highest for the emerald shiner (146/haul), spotfin shiner (26/haul), and mimic shiner (16/haul). The emerald shiner was the most frequently collected species in the MCBU (76/haul) and SCB (202/haul). Three species were collected exclusively in the seine. These were the bigmouth shiner, blacknose dace, and western sand darter.

Gill Net

Gill nets were set solely in the BWCO and collected 26 species (Table 1.3.9). The highest *C/f*s were for the common carp (8/net-day), white bass (5/net-day), and freshwater drum (4/net-day). The goldeye and highfin carpsucker were collected exclusively in gill nets during 1997.

Trammel Net

Trammel nets were set solely in the BWCO and collected 8 species (Table 1.3.10). The most frequently caught species were the common carp (3/net-day) and bigmouth buffalo (0.2/net-day).

Fixed Sampling, Mean *C/F* by Gear and Stratum

Day Electrofishing

The *C/f*s for 26 species collected by day electrofishing at fixed sites in the MCBW are reported in Table 1.4.1. The highest *C/f*s were for the emerald shiner (203/h), shorthead redhorse (66/h), and gizzard shad (56/h).

Night Electrofishing

We collected 31 species by night electrofishing at fixed sites in the TWZ (Table 1.2). The most frequently caught species (Table 1.4.2) were the emerald shiner (1,093/h), gizzard shad (183/h), and sauger (152/h).

Fyke Net

Fyke nets were set at fixed sites in the TWZ and MCBW and 16 species were collected. In the MCBW, the highest *C/f*s in fyke nets (Table 1.4.3) were for the freshwater drum (13/net-day), black crappie (3/net-day), and bluegill (1/net-day). Catches in fyke nets in the TWZ were low, and catch rates are not reported.

Mini Fyke Net

Mini fyke net at fixed sites in the MCBW collected 22 species and *C/f*s (Table 1.4.4) were highest for the mimic shiner (27/net-day), spotfin shiner (11/net-day), and emerald shiner (9/net-day). The most frequently collected species in mini fyke nets in the TWZ stratum were the mimic shiner (81/net-day), emerald shiner (75/net-day), and spotfin shiner (12/net-day).

Small and Large Hoop Nets

The channel catfish was the most frequently collected species in small hoop nets at fixed sites (Table 1.4.5) in the MCBW (0.7/net-day), and the common carp had the highest *C/f* in the TWZ (3/net-day). In large hoop nets (Table 1.4.6), the common carp had the highest *C/f*s in the MCBW (3/net-day) and the TWZ (7/net-day).

Trawl

Eleven species were collected in the trawl in the TWZ. The channel catfish (4/haul), sauger (2/haul), and freshwater drum (1/haul) were the most frequently caught species in the trawl (Table 1.4.7). A paddlefish collected in the trawl was the first specimen of this species collected by the LTRMP in Pool 4 since monitoring began in 1990.

Length Distributions of Selected Species

Gizzard Shad

The modal length of 1,195 gizzard shad collected by electrofishing was 10 cm, and the maximum length was 20 cm (Figure 1.2). An additional 175 unmeasured gizzard shad from subsampled collections are not included in this length distribution.

Common Carp

The modal length of 622 common carp collected by electrofishing was 48 cm (Figure 1.3).

Smallmouth Buffalo

The length distribution of 33 smallmouth buffalo collected by electrofishing shows a bimodal grouping, with peaks at 38 and 50 cm (Figure 1.4). The 93 smallmouth buffalo collected in hoop nets ranged in length from 32 to 66 cm, and the modal length was 48 cm (Figure 1.5).

Channel Catfish

The modal length of 29 channel catfish collected by electrofishing was 50 cm (Figure 1.6). The 254 channel catfish collected in hoop nets ranged in length from 2 to 74 cm, and the modal length was 40 cm (Figure 1.7).

Northern Pike

The lengths of 38 northern pike collected by electrofishing ranged from 12 to 98 cm (Figure 1.8). Lengths of 17 northern pike caught in fyke nets ranged from 20 to 90 cm total length (Figure 1.9).

White Bass

The length distribution of 392 white bass collected by electrofishing is presented in Figure 1.10. Lengths ranged from 2 to 40 cm, and the modal length was 10 cm.

Bluegill

The modal length of 684 bluegills collected by electrofishing was 4 cm, and the maximum length was 20 cm (Figure 1.11). The 309 bluegills collected in fyke nets ranged in length from 4 to 22 cm, and the modal length was 18 cm (Figure 1.12).

Largemouth Bass

The length distribution of 236 largemouth bass collected by electrofishing is presented in Figure 1.13. Lengths ranged from 2 to 46 cm. The modal length was 8 cm.

Black Crappie

The lengths of 470 black crappies collected in fyke nets ranged from 6 to 32 cm (Figure 1.14). The modal length was 24 cm.

Sauger

The length distribution of 540 saugers collected by electrofishing is presented in Figure 1.15. Lengths of saugers ranged from 4 to 48 cm, and the modal length was 14 cm.

Walleye

The length distribution of 274 walleyes collected by electrofishing is presented in Figure 1.16. Individuals ranged from 4 to 66 cm in length, and the modal length was 16 cm.

Freshwater Drum

Freshwater drum collected by electrofishing ranged from 4 to 48 cm in length, and the modal length was 24 cm (Figure 1.17). Freshwater drum collected in fyke nets were from 2 to 54 cm in length, and the modal length was 30 cm (Figure 1.18).

Table 1.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 4 of the Mississippi River during 1997. Table entries are numbers of successfully completed standardized monitoring collections.

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	9		7	8	2					26
Fyke net	6				4				2	12
Gill net		3								3
Large hoop net			5	4	4				2	15
Small hoop net			5	4	4				2	15
Mini fyke net	6		6	4	3				2	20
Night electrofishing									4	4
Seine			10	14						24
Trammel net (set)		4								4
Tandem fyke net		10								10
Tandem mini fyke net		10								10
SUBTOTAL	21	27	32	34	17	0	0	0	12	144

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		8	9	3					28
Fyke net	6				4				2	12
Gill net		4								4
Large hoop net			5	5	4				2	16
Small hoop net			5	5	4				2	16
Mini fyke net	6		6	4	4				2	22
Night electrofishing									3	3
Seine			10	12						22
Trawling									4	4
Trammel net (set)		4								4
Tandem fyke net		10								10
Tandem mini fyke net		10								10
SUBTOTAL	20	28	34	35	19	0	0	0	15	151

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		8	8	4					28
Fyke net	6				4				2	12
Gill net		4								4
Large hoop net			7	4	4				2	17
Small hoop net			5	4	4				2	15
Mini fyke net	6		6	4	4				2	22
Night electrofishing									4	4
Seine			12	12						24
Trawling									4	4
Trammel net (set)		4								4
Tandem fyke net		10								10
Tandem mini fyke net		10								10
SUBTOTAL	20	28	38	32	20	0	0	0	16	154
	61	83	104	101	56	0	0	0	43	449

Strata: BWCS - Backwater, contiguous, shoreline.
BWCO - Backwater, contiguous, offshore.
IMPS - Impounded, shoreline.
IMPO - Impounded, offshore.
MCBU - Main channel border, unstructured.
MCBW - Main channel border, wing dam.
SBU - Side channel border.
TRI - Tributary mouth.
TWZ - Tailwater.

Table 1.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 4 of the Mississippi River. See Table 1.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	1	-	-	-	-	-	-	-	-	-	-	-	1
2	Silver lamprey	Ichthyomyzon unicuspis	4	1	-	1	-	-	-	-	-	-	-	-	6
3	Lake sturgeon	Acipenser fulvescens	-	-	1	-	-	-	-	-	-	-	-	3	4
4	Shovelnose sturgeon	Scaphirhynchus platorynchus	-	-	-	-	-	-	-	-	1	-	-	7	8
5	Paddlefish	Polyodon spathula	-	-	-	-	-	-	-	-	-	-	-	1	1
6	Longnose gar	Lepisosteus osseus	4	2	2	6	-	1	1	-	-	2	-	-	18
7	Shortnose gar	Lepisosteus platostomus	5	-	17	22	13	-	-	-	-	2	-	-	59
8	Bowfin	Amia calva	15	-	14	31	9	-	-	-	-	5	1	-	75
9	Goldeye	Hiodon alosoides	-	-	-	-	-	-	-	-	-	1	-	-	1
10	Mooneye	Hiodon tergisus	10	-	-	14	-	-	-	-	-	2	-	-	26
11	American eel	Anguilla rostrata	-	-	1	-	-	-	-	-	-	1	-	-	2
12	Gizzard shad	Dorosoma cepedianum	866	504	61	15	13	17	7	-	-	17	-	-	1500
13	Spotfin shiner	Cyprinella spiloptera	229	14	-	-	218	3	1519	-	-	-	-	-	1983
14	Common carp	Cyprinus carpio	548	74	39	151	149	12	4	74	190	84	38	-	1363
15	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	11	1	227	-	-	-	-	1	240
16	Silver chub	Macrhybopsis storeriana	6	-	-	-	3	1	4	-	-	-	-	-	14
17	Hornyhead chub	Nocomis biguttatus	1	-	-	-	-	-	-	-	-	-	-	-	1
18	Golden shiner	Notemigonus crysoleucas	44	-	-	-	7	3	-	-	-	-	-	-	54
19	Emerald shiner	Notropis atherinoides	5383	3007	-	-	734	98	9327	-	-	-	-	-	18549
20	River shiner	Notropis blennius	91	-	-	-	6	-	309	-	-	-	-	-	406
21	Bigmouth shiner	Notropis dorsalis	-	-	-	-	-	-	34	-	-	-	-	-	34
22	Spottail shiner	Notropis hudsonius	49	-	-	-	15	20	107	-	-	-	-	-	191
23	Sand shiner	Notropis stramineus	5	-	-	-	-	-	114	-	-	-	-	-	119
24	Mimic shiner	Notropis volucellus	84	4	-	-	654	1	976	-	-	-	-	-	1719
25	Pugnose minnow	Opsopoeodus emiliae	15	-	-	-	109	84	-	-	-	-	-	-	208
26	Bluntnose minnow	Pimephales notatus	2	-	-	-	28	-	10	-	-	-	-	-	40
27	Bullhead minnow	Pimephales vigilax	208	5	-	-	92	43	294	-	-	-	-	-	642
28	Blacknose dace	Rhinichthys atratulus	-	-	-	-	-	-	1	-	-	-	-	-	1
29	Unidentified minnow	Unidentified Cyprinidae	-	-	-	-	7	-	4	-	-	-	-	-	11
30	River carpsucker	Carpiodes carpio	6	2	-	2	-	1	-	-	-	-	-	-	11
31	Quillback	Carpiodes cyprinus	39	1	-	1	6	-	69	-	-	7	1	-	124
32	Highfin carpsucker	Carpiodes velifer	-	-	-	-	-	-	-	-	-	1	-	-	1
33	Unidentified carpsucker	Carpiodes sp.	9	-	-	-	28	-	904	-	-	-	-	-	941
34	White sucker	Catostomus commersoni	11	-	-	-	-	-	13	-	-	-	-	-	24
35	Blue sucker	Cycleptus elongatus	2	-	-	-	-	-	-	-	2	1	-	-	5
36	Northern hog sucker	Hypentelium nigricans	1	-	-	-	-	-	-	-	-	-	-	-	1
37	Smallmouth buffalo	Ictiobus bubalus	30	3	3	4	-	-	1	8	85	31	6	-	171
38	Bigmouth buffalo	Ictiobus cyprinellus	9	1	1	1	-	-	-	-	-	-	4	-	16
39	Spotted sucker	Minytrema melanops	63	-	3	3	1	-	-	-	-	2	-	-	72

Gears:
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X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 1.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 4 of the Mississippi River. See Table 1.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Silver redhorse	Moxostoma anisurum	95	4	31	78	2	2	-	-	2	7	-	-	221
41	River redhorse	Moxostoma carinatum	64	-	-	-	-	-	-	-	-	-	-	-	64
42	Golden redhorse	Moxostoma erythrurum	51	9	1	-	-	-	-	2	-	5	-	-	68
43	Shorthead redhorse	Moxostoma macrolepidotum	376	33	17	31	3	-	7	6	3	10	-	5	491
44	Unidentified redhorse	Moxostoma sp.	3	-	-	-	12	8	165	-	-	-	-	-	188
45	Unidentified sucker	Unidentified Catostomidae	-	-	-	-	-	-	154	-	-	-	-	-	154
46	Yellow bullhead	Ameiurus natalis	-	-	-	1	-	-	-	-	-	-	-	-	1
47	Channel catfish	Ictalurus punctatus	24	5	3	3	4	-	1	156	98	11	-	35	340
48	Tadpole madtom	Noturus gyrinus	-	-	-	-	16	1	2	-	-	-	-	-	19
49	Flathead catfish	Pylodictis olivaris	17	9	5	-	4	-	-	3	19	3	4	1	65
50	Northern pike	Esox lucius	35	3	13	4	4	1	4	-	3	11	2	-	80
51	Trout perch	Percopsis omiscomaycus	-	-	-	-	2	12	9	-	-	-	-	-	23
52	Burbot	Lota lota	4	1	-	-	-	-	-	-	-	-	-	-	5
53	Brook silverside	Labidesthes sicculus	2	-	-	-	-	-	1	-	-	-	-	-	3
54	White bass	Morone chrysops	163	229	35	55	277	28	116	-	6	44	-	-	953
55	Rock bass	Ambloplites rupestris	71	-	45	58	10	6	3	1	1	-	-	-	195
56	Green sunfish	Lepomis cyanellus	30	4	-	-	2	4	-	-	-	-	-	-	40
57	Pumpkinseed	Lepomis gibbosus	9	-	2	1	-	-	-	-	-	-	-	-	12
58	Orangespotted sunfish	Lepomis humilis	1	-	-	-	-	-	-	-	-	-	-	-	1
59	Bluegill	Lepomis macrochirus	532	152	135	174	176	42	11	5	1	-	-	-	1228
60	Green sunfish x bluegill	L. cyanellus x macrochirus	1	-	1	-	-	-	-	-	-	-	-	-	2
61	Pumpkinseed x bluegill	L. gibbosus x macrochirus	1	-	-	-	-	-	-	-	-	-	-	-	1
62	Orangespotted sunfish x bluegill	L. hunilis x macrochirus	-	1	-	-	-	-	-	-	-	-	-	-	1
63	Smallmouth bass	Micropterus dolomieu	298	62	-	-	1	3	21	-	-	1	-	-	386
64	Largemouth bass	Micropterus salmoides	224	12	2	-	4	-	6	-	-	-	-	-	248
65	White crappie	Pomoxis annularis	4	15	17	4	15	3	-	1	1	1	-	-	61
66	Black crappie	Pomoxis nigromaculatus	33	13	193	277	48	31	-	6	7	3	-	1	612
67	Unidentified sunfish	Unidentified Centrarchidae	-	-	-	-	1	2	-	-	-	-	-	-	3
68	Crystal darter	Ammocrypta asprella	1	-	-	-	-	-	-	-	-	-	-	-	1
69	Western sand darter	Ammocrypta clara	-	-	-	-	-	-	22	-	-	-	-	-	22
70	Mud darter	Etheostoma asprigene	1	-	-	-	-	1	2	-	-	-	-	-	4
71	Johnny darter	Etheostoma nigrum	11	-	-	-	43	44	75	-	-	-	-	-	173
72	Yellow perch	Perca flavescens	303	3	17	47	37	2	79	1	-	-	-	-	489
73	Logperch	Percina caprodes	75	16	-	-	126	15	35	-	-	-	-	-	267
74	Blackside darter	Percina maculata	1	-	-	-	-	-	-	-	-	-	-	-	1
75	Slenderhead darter	Percina phoxocephala	2	-	-	-	2	-	1	-	-	-	-	-	5
76	River darter	Percina shumardi	1	-	-	-	284	8	39	-	-	-	-	-	332
77	Sauger	Stizostedion canadense	121	419	6	5	6	8	21	-	-	2	1	16	605
78	Walleye	Stizostedion vitreum	107	167	4	11	2	4	18	-	-	9	-	1	323

Gears:
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- T - Trawling (4.8-m bottom trawl)

Table 1.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 4 of the Mississippi River. See Table 1.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
79	Sauger x walleye	S. canadense x vitreum	-	7	-	1	-	-	-	-	-	1	-	-	9
80	Unidentified Stizostedion	Stizostedion sp.	-	-	-	-	-	1	-	-	-	-	-	-	1
81	Freshwater drum	Aplodinotus grunniens	108	36	138	147	48	52	6	44	44	40	-	11	674
82	Larval fish	Unidentified	-	-	-	-	1	-	30	-	-	-	-	-	31
83	Unidentified	Unidentified	-	-	-	-	144	3	96	-	-	2	-	-	245
			10509	4818	807	1148	3377	566	14849	307	463	306	57	82	37289

Gears:
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TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 1.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	MCBW	SCB
Chestnut lamprey	0.01	0.00	0.04	0.00	0.00
	(0.01)	(0.00)	(0.04)	(0.00)	(0.00)
Silver lamprey	0.03	0.04	0.00	0.00	0.04
	(0.02)	(0.04)	(0.00)	(0.00)	(0.04)
Longnose gar	0.06	0.04	0.04	0.00	0.09
	(0.03)	(0.04)	(0.04)	(0.00)	(0.06)
Shortnose gar	0.08	0.12	0.04	0.00	0.04
	(0.04)	(0.09)	(0.04)	(0.00)	(0.04)
Bowfin	0.24	0.44	0.08	0.00	0.08
	(0.13)	(0.29)	(0.06)	(0.00)	(0.06)
Mooneye	0.11	0.00	0.08	0.33	0.26
	(0.04)	(0.00)	(0.06)	(0.33)	(0.11)
Gizzard shad	12.93	25.21	3.71	0.00	3.82
	(3.80)	(8.74)	(1.50)	(0.00)	(2.03)
Spotfin shiner	3.14	3.04	1.25	0.35	4.77
	(1.28)	(2.79)	(0.45)	(0.35)	(1.44)
Common carp	7.41	5.56	5.50	1.47	11.44
	(0.97)	(0.98)	(1.19)	(0.80)	(2.60)
Silver chub	0.05	0.00	0.04	0.00	0.13
	(0.03)	(0.00)	(0.04)	(0.00)	(0.10)
Golden shiner	0.75	1.76	0.00	0.00	0.00
	(0.49)	(1.15)	(0.00)	(0.00)	(0.00)
Emerald shiner	61.31	9.41	142.08	0.71	68.25
	(32.79)	(2.46)	(127.50)	(0.71)	(26.78)
River shiner	1.14	0.44	1.83	0.00	1.56
	(0.48)	(0.40)	(1.41)	(0.00)	(0.86)
Spottail shiner	0.80	1.55	0.08	0.00	0.35
	(0.36)	(0.81)	(0.06)	(0.00)	(0.35)
Sand shiner	0.07	0.08	0.04	0.00	0.09
	(0.05)	(0.08)	(0.04)	(0.00)	(0.09)
Mimic shiner	1.21	1.40	0.58	0.35	1.44
	(0.68)	(1.40)	(0.38)	(0.35)	(0.95)
Pugnose minnow	0.24	0.51	0.04	0.00	0.04
	(0.10)	(0.24)	(0.04)	(0.00)	(0.04)
Bluntnose minnow	0.03	0.08	0.00	0.00	0.00
	(0.02)	(0.06)	(0.00)	(0.00)	(0.00)
Bullhead minnow	3.22	6.16	1.13	0.00	0.96
	(1.15)	(2.66)	(0.59)	(0.00)	(0.36)
River carpsucker	0.08	0.00	0.04	0.00	0.22
	(0.04)	(0.00)	(0.04)	(0.00)	(0.11)
Quillback	0.51	0.27	0.50	0.00	0.83
	(0.15)	(0.11)	(0.16)	(0.00)	(0.42)
White sucker	0.15	0.23	0.13	0.00	0.08
	(0.06)	(0.11)	(0.13)	(0.00)	(0.06)
Blue sucker	0.01	0.00	0.00	0.17	0.04
	(0.01)	(0.00)	(0.00)	(0.17)	(0.04)
Northern hog sucker	0.01	0.00	0.04	0.00	0.00
	(0.01)	(0.00)	(0.04)	(0.00)	(0.00)
Smallmouth buffalo	0.36	0.32	0.33	0.52	0.42
	(0.10)	(0.14)	(0.22)	(0.36)	(0.18)
Bigmouth buffalo	0.10	0.00	0.13	0.17	0.22
	(0.06)	(0.00)	(0.07)	(0.17)	(0.18)
Spotted sucker	1.06	2.45	0.04	0.00	0.00
	(0.30)	(0.71)	(0.04)	(0.00)	(0.00)
Silver redhorse	1.15	0.91	1.08	2.63	1.50
	(0.18)	(0.32)	(0.28)	(1.13)	(0.32)
River redhorse	0.53	0.00	0.67	4.26	1.09
	(0.21)	(0.00)	(0.35)	(1.07)	(0.61)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
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TWZ - Tailwater

Table 1.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	MCBW	SCB
Golden redhorse	0.60	0.16	0.83	0.75	1.01
	(0.15)	(0.07)	(0.28)	(0.48)	(0.42)
Shorthead redhorse	3.46	1.70	4.21	14.71	5.14
	(0.36)	(0.48)	(0.74)	(4.87)	(0.71)
Channel catfish	0.30	0.24	0.21	0.00	0.46
	(0.09)	(0.13)	(0.10)	(0.00)	(0.19)
Flathead catfish	0.14	0.04	0.21	0.00	0.22
	(0.04)	(0.04)	(0.08)	(0.00)	(0.11)
Northern pike	0.45	0.48	0.54	0.42	0.35
	(0.11)	(0.17)	(0.22)	(0.42)	(0.18)
Burbot	0.01	0.00	0.00	0.17	0.04
	(0.01)	(0.00)	(0.00)	(0.17)	(0.04)
Brook silverside	0.03	0.04	0.00	0.00	0.04
	(0.02)	(0.04)	(0.00)	(0.00)	(0.04)
White bass	1.92	1.41	2.29	0.35	2.33
	(0.42)	(0.63)	(0.97)	(0.35)	(0.66)
Rock bass	0.90	0.48	1.46	0.00	1.03
	(0.21)	(0.22)	(0.55)	(0.00)	(0.39)
Green sunfish	0.31	0.56	0.13	0.00	0.13
	(0.19)	(0.44)	(0.09)	(0.00)	(0.07)
Pumpkinseed	0.14	0.24	0.08	0.00	0.04
	(0.06)	(0.12)	(0.08)	(0.00)	(0.04)
Orangespotted sunfish	0.02	0.04	0.00	0.00	0.00
	(0.02)	(0.04)	(0.00)	(0.00)	(0.00)
Bluegill	8.47	18.27	0.79	0.00	1.43
	(3.03)	(7.10)	(0.34)	(0.00)	(0.55)
Green sunfish x bluegill	0.02	0.04	0.00	0.00	0.00
	(0.02)	(0.04)	(0.00)	(0.00)	(0.00)
Pumpkinseed x bluegill	0.02	0.04	0.00	0.00	0.00
	(0.02)	(0.04)	(0.00)	(0.00)	(0.00)
Smallmouth bass	3.30	0.80	5.96	1.63	4.57
	(0.47)	(0.32)	(1.25)	(0.76)	(1.04)
Largemouth bass	3.65	7.58	0.58	0.00	0.82
	(1.08)	(2.53)	(0.25)	(0.00)	(0.24)
White crappie	0.07	0.12	0.00	0.00	0.04
	(0.04)	(0.09)	(0.00)	(0.00)	(0.04)
Black crappie	0.45	0.55	0.46	0.00	0.30
	(0.13)	(0.20)	(0.21)	(0.00)	(0.26)
Crystal darter	0.01	0.00	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.00)	(0.04)
Mud darter	0.01	0.00	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.00)	(0.04)
Johnny darter	0.16	0.12	0.04	0.00	0.30
	(0.08)	(0.12)	(0.04)	(0.00)	(0.18)
Yellow perch	4.51	7.01	2.46	0.42	2.80
	(0.95)	(1.63)	(0.89)	(0.42)	(1.90)
Logperch	0.59	0.52	1.17	2.08	0.22
	(0.18)	(0.33)	(0.45)	(2.08)	(0.11)
Blackside darter	0.01	0.00	0.04	0.00	0.00
	(0.01)	(0.00)	(0.04)	(0.00)	(0.00)
Slenderhead darter	0.00	0.00	0.00	0.33	0.00
	(0.00)	(0.00)	(0.00)	(0.33)	(0.00)
Sauger	1.65	1.92	1.33	0.00	1.57
	(0.32)	(0.56)	(0.55)	(0.00)	(0.53)
Walleye	1.13	0.50	1.54	0.63	1.67
	(0.20)	(0.17)	(0.51)	(0.40)	(0.41)
Freshwater drum	1.50	1.45	0.75	0.00	2.17
	(0.29)	(0.46)	(0.38)	(0.00)	(0.58)

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Table 1.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBW
Longnose gar	0.06	0.06	0.00
	(0.06)	(0.06)	(0.00)
Shortnose gar	0.84	0.85	0.00
	(0.78)	(0.79)	(0.00)
Bowfin	0.68	0.69	0.00
	(0.27)	(0.27)	(0.00)
Gizzard shad	3.22	3.24	0.00
	(2.35)	(2.37)	(0.00)
Common carp	2.04	2.06	0.00
	(0.47)	(0.48)	(0.00)
Smallmouth buffalo	0.17	0.17	0.00
	(0.09)	(0.10)	(0.00)
Bigmouth buffalo	0.05	0.05	0.00
	(0.05)	(0.05)	(0.00)
Spotted sucker	0.17	0.17	0.00
	(0.12)	(0.12)	(0.00)
Silver redhorse	1.82	1.83	0.00
	(0.54)	(0.54)	(0.00)
Golden redhorse	0.06	0.06	0.00
	(0.06)	(0.06)	(0.00)
Shorthead redhorse	0.97	0.97	0.00
	(0.47)	(0.48)	(0.00)
Channel catfish	0.06	0.07	0.00
	(0.06)	(0.07)	(0.00)
Northern pike	0.69	0.70	0.00
	(0.19)	(0.19)	(0.00)
White bass	0.65	0.66	0.00
	(0.41)	(0.41)	(0.00)
Rock bass	2.17	2.17	1.62
	(0.68)	(0.69)	(1.62)
Pumpkinseed	0.06	0.06	0.00
	(0.06)	(0.06)	(0.00)
Bluegill	6.52	6.57	0.16
	(2.10)	(2.12)	(0.16)
Green sunfish x bluegill	0.06	0.06	0.00
	(0.06)	(0.06)	(0.00)
Largemouth bass	0.11	0.11	0.00
	(0.07)	(0.07)	(0.00)
White crappie	0.67	0.68	0.00
	(0.36)	(0.36)	(0.00)
Black crappie	6.48	6.53	0.00
	(1.40)	(1.42)	(0.00)
Yellow perch	0.71	0.71	0.81
	(0.31)	(0.31)	(0.81)
Sauger	0.21	0.21	0.00
	(0.14)	(0.14)	(0.00)
Walleye	0.17	0.17	0.17
	(0.09)	(0.09)	(0.17)
Freshwater drum	1.14	1.14	1.37
	(0.33)	(0.33)	(1.37)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Silver lamprey	0.02	0.02
	(0.02)	(0.02)
Longnose gar	0.10	0.10
	(0.09)	(0.09)
Shortnose gar	0.37	0.37
	(0.17)	(0.17)
Bowfin	0.51	0.51
	(0.29)	(0.29)
Mooneye	0.23	0.23
	(0.18)	(0.18)
Gizzard shad	0.25	0.25
	(0.17)	(0.17)
Common carp	2.60	2.60
	(0.63)	(0.63)
River carpsucker	0.04	0.04
	(0.03)	(0.03)
Quillback	0.02	0.02
	(0.02)	(0.02)
Smallmouth buffalo	0.07	0.07
	(0.04)	(0.04)
Bigmouth buffalo	0.02	0.02
	(0.02)	(0.02)
Spotted sucker	0.05	0.05
	(0.05)	(0.05)
Silver redhorse	1.30	1.30
	(0.37)	(0.37)
Shorthead redhorse	0.52	0.52
	(0.19)	(0.19)
Yellow bullhead	0.02	0.02
	(0.02)	(0.02)
Channel catfish	0.05	0.05
	(0.04)	(0.04)
Northern pike	0.07	0.07
	(0.03)	(0.03)
White bass	0.96	0.96
	(0.32)	(0.32)
Rock bass	1.01	1.01
	(0.26)	(0.26)
Pumpkinseed	0.02	0.02
	(0.02)	(0.02)
Bluegill	2.89	2.89
	(0.84)	(0.84)
White crappie	0.06	0.06
	(0.04)	(0.04)
Black crappie	4.72	4.72
	(1.08)	(1.08)
Yellow perch	0.82	0.82
	(0.21)	(0.21)
Sauger	0.08	0.08
	(0.04)	(0.04)
Walleye	0.20	0.20
	(0.08)	(0.08)
Sauger x walleye	0.02	0.02
	(0.02)	(0.02)
Freshwater drum	2.51	2.51
	(0.92)	(0.92)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Shortnose gar	0.30	0.66	0.00	0.07
	(0.16)	(0.37)	(0.00)	(0.07)
Bowfin	0.16	0.38	0.00	0.00
	(0.11)	(0.25)	(0.00)	(0.00)
Gizzard shad	0.33	0.63	0.00	0.19
	(0.22)	(0.49)	(0.00)	(0.19)
Spotfin shiner	1.80	0.31	5.30	1.10
	(0.93)	(0.25)	(3.60)	(0.67)
Common carp	3.80	8.60	0.34	0.12
	(3.50)	(8.20)	(0.34)	(0.12)
Golden shiner	0.18	0.33	0.16	0.00
	(0.15)	(0.33)	(0.16)	(0.00)
Emerald shiner	5.03	1.58	11.47	4.66
	(2.37)	(0.62)	(8.93)	(2.41)
River shiner	0.02	0.00	0.08	0.00
	(0.02)	(0.00)	(0.08)	(0.00)
Spottail shiner	0.20	0.17	0.00	0.40
	(0.12)	(0.17)	(0.00)	(0.28)
Mimic shiner	0.54	0.12	1.23	0.56
	(0.23)	(0.08)	(0.65)	(0.50)
Pugnose minnow	2.77	6.15	0.49	0.06
	(1.57)	(3.68)	(0.40)	(0.06)
Bluntnose minnow	0.59	1.37	0.00	0.00
	(0.58)	(1.37)	(0.00)	(0.00)
Bullhead minnow	2.05	4.00	0.51	0.65
	(0.56)	(1.29)	(0.26)	(0.26)
Quillback	0.18	0.42	0.00	0.00
	(0.18)	(0.42)	(0.00)	(0.00)
Spotted sucker	0.03	0.07	0.00	0.00
	(0.03)	(0.07)	(0.00)	(0.00)
Silver redhorse	0.04	0.06	0.00	0.06
	(0.03)	(0.06)	(0.00)	(0.06)
Shorthead redhorse	0.06	0.00	0.17	0.06
	(0.03)	(0.00)	(0.12)	(0.06)
Channel catfish	0.02	0.00	0.00	0.06
	(0.02)	(0.00)	(0.00)	(0.06)
Tadpole madtom	0.36	0.66	0.18	0.11
	(0.23)	(0.53)	(0.18)	(0.08)
Flathead catfish	0.02	0.00	0.00	0.06
	(0.02)	(0.00)	(0.00)	(0.06)
Northern pike	0.09	0.11	0.18	0.00
	(0.06)	(0.11)	(0.12)	(0.00)
Trout perch	0.05	0.06	0.09	0.00
	(0.03)	(0.06)	(0.09)	(0.00)
White bass	6.88	10.74	0.45	6.81
	(4.88)	(10.42)	(0.37)	(6.32)
Rock bass	0.23	0.24	0.37	0.11
	(0.08)	(0.11)	(0.25)	(0.08)
Green sunfish	0.02	0.00	0.09	0.00
	(0.02)	(0.00)	(0.09)	(0.00)
Bluegill	4.19	7.66	1.03	2.05
	(1.66)	(3.83)	(0.53)	(0.85)
Smallmouth bass	0.02	0.00	0.09	0.00
	(0.02)	(0.00)	(0.09)	(0.00)
Largemouth bass	0.09	0.07	0.17	0.06
	(0.05)	(0.07)	(0.11)	(0.06)
White crappie	0.31	0.44	0.00	0.38
	(0.17)	(0.27)	(0.00)	(0.38)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Black crappie	1.21	2.47	0.25	0.29
	(0.61)	(1.42)	(0.13)	(0.14)
Johnny darter	0.92	0.13	3.15	0.24
	(0.76)	(0.09)	(3.05)	(0.14)
Yellow perch	0.86	0.78	1.45	0.51
	(0.43)	(0.60)	(1.27)	(0.40)
Logperch	2.71	0.18	2.54	6.24
	(2.00)	(0.18)	(2.37)	(6.00)
River darter	5.56	0.07	20.24	1.51
	(5.06)	(0.07)	(20.24)	(1.38)
Sauger	0.14	0.13	0.18	0.12
	(0.07)	(0.09)	(0.18)	(0.08)
Walleye	0.05	0.07	0.00	0.06
	(0.04)	(0.07)	(0.00)	(0.06)
Freshwater drum	0.97	2.23	0.00	0.06
	(0.89)	(2.09)	(0.00)	(0.06)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Longnose gar	0.02	0.02
	(0.02)	(0.02)
Gizzard shad	0.30	0.30
	(0.17)	(0.17)
Spotfin shiner	0.05	0.05
	(0.04)	(0.04)
Common carp	0.22	0.22
	(0.08)	(0.08)
Speckled chub	0.02	0.02
	(0.02)	(0.02)
Silver chub	0.02	0.02
	(0.02)	(0.02)
Golden shiner	0.05	0.05
	(0.04)	(0.04)
Emerald shiner	1.82	1.82
	(1.41)	(1.41)
Spottail shiner	0.35	0.35
	(0.17)	(0.17)
Mimic shiner	0.02	0.02
	(0.02)	(0.02)
Pugnose minnow	1.33	1.33
	(0.85)	(0.86)
Bullhead minnow	0.72	0.72
	(0.24)	(0.24)
River carpsucker	0.02	0.02
	(0.02)	(0.02)
Silver redhorse	0.04	0.04
	(0.03)	(0.03)
Tadpole madtom	0.02	0.02
	(0.02)	(0.02)
Northern pike	0.01	0.01
	(0.01)	(0.01)
Trout perch	0.21	0.21
	(0.12)	(0.12)
White bass	0.49	0.49
	(0.24)	(0.24)
Rock bass	0.11	0.11
	(0.05)	(0.05)
Green sunfish	0.07	0.07
	(0.05)	(0.05)
Bluegill	0.73	0.73
	(0.27)	(0.27)
Smallmouth bass	0.05	0.05
	(0.03)	(0.03)
White crappie	0.06	0.06
	(0.06)	(0.06)
Black crappie	0.52	0.52
	(0.21)	(0.21)
Mud darter	0.02	0.02
	(0.02)	(0.02)
Johnny darter	0.74	0.74
	(0.37)	(0.37)
Yellow perch	0.04	0.04
	(0.03)	(0.03)
Logperch	0.25	0.25
	(0.10)	(0.10)
River darter	0.14	0.14
	(0.06)	(0.06)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Sauger	0.14	0.14
	(0.06)	(0.06)
Walleye	0.07	0.07
	(0.06)	(0.06)
Freshwater drum	0.88	0.88
	(0.25)	(0.25)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Common carp	0.60	0.66	0.08	0.56
	(0.19)	(0.35)	(0.08)	(0.22)
Smallmouth buffalo	0.12	0.27	0.00	0.00
	(0.10)	(0.23)	(0.00)	(0.00)
Golden redhorse	0.04	0.00	0.00	0.07
	(0.04)	(0.00)	(0.00)	(0.07)
Shorthead redhorse	0.10	0.19	0.00	0.03
	(0.06)	(0.12)	(0.00)	(0.03)
Channel catfish	2.56	2.60	0.35	2.55
	(1.00)	(1.30)	(0.26)	(1.49)
Flathead catfish	0.02	0.00	0.00	0.04
	(0.02)	(0.00)	(0.00)	(0.04)
Rock bass	0.02	0.04	0.00	0.00
	(0.02)	(0.04)	(0.00)	(0.00)
Bluegill	0.08	0.04	0.00	0.10
	(0.06)	(0.04)	(0.00)	(0.10)
Black crappie	0.04	0.00	0.00	0.07
	(0.04)	(0.00)	(0.00)	(0.07)
Yellow perch	0.02	0.00	0.00	0.03
	(0.02)	(0.00)	(0.00)	(0.03)
Freshwater drum	0.18	0.23	0.08	0.13
	(0.07)	(0.14)	(0.08)	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Shovelnose sturgeon	0.02	0.04	0.00	0.00
	(0.02)	(0.04)	(0.00)	(0.00)
Common carp	1.21	1.43	0.29	1.04
	(0.35)	(0.62)	(0.19)	(0.41)
Blue sucker	0.03	0.00	0.00	0.06
	(0.03)	(0.00)	(0.00)	(0.06)
Smallmouth buffalo	0.99	1.12	0.51	0.88
	(0.31)	(0.47)	(0.25)	(0.42)
Silver redhorse	0.03	0.00	0.00	0.06
	(0.03)	(0.00)	(0.00)	(0.06)
Shorthead redhorse	0.05	0.08	0.00	0.03
	(0.03)	(0.05)	(0.00)	(0.03)
Channel catfish	1.07	1.30	2.03	0.88
	(0.28)	(0.47)	(1.11)	(0.34)
Flathead catfish	0.24	0.51	0.00	0.03
	(0.22)	(0.51)	(0.00)	(0.03)
Northern pike	0.05	0.04	0.00	0.06
	(0.04)	(0.04)	(0.00)	(0.06)
White bass	0.03	0.00	0.00	0.06
	(0.02)	(0.00)	(0.00)	(0.04)
Rock bass	0.02	0.04	0.00	0.00
	(0.02)	(0.04)	(0.00)	(0.00)
Bluegill	0.00	0.00	0.07	0.00
	(0.00)	(0.00)	(0.07)	(0.00)
Black crappie	0.10	0.16	0.00	0.06
	(0.06)	(0.12)	(0.00)	(0.04)
Freshwater drum	0.56	0.83	0.07	0.36
	(0.16)	(0.28)	(0.07)	(0.17)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Longnose gar	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
Gizzard shad	0.09	0.16	0.03
	(0.04)	(0.07)	(0.03)
Spotfin shiner	26.12	2.39	44.63
	(9.85)	(0.92)	(17.62)
Common carp	0.06	0.05	0.06
	(0.03)	(0.05)	(0.04)
Speckled chub	3.97	0.05	7.03
	(3.12)	(0.04)	(5.59)
Silver chub	0.06	0.03	0.09
	(0.05)	(0.03)	(0.09)
Emerald shiner	146.42	75.66	201.63
	(78.37)	(31.83)	(138.09)
River shiner	4.09	5.84	2.72
	(1.54)	(3.17)	(1.22)
Bigmouth shiner	0.60	0.00	1.06
	(0.37)	(0.00)	(0.66)
Spottail shiner	1.87	0.03	3.31
	(1.75)	(0.03)	(3.12)
Sand shiner	1.87	0.55	2.91
	(0.89)	(0.41)	(1.57)
Mimic shiner	16.09	4.55	25.09
	(7.55)	(3.94)	(13.17)
Bluntnose minnow	0.17	0.03	0.28
	(0.08)	(0.03)	(0.14)
Bullhead minnow	5.03	0.58	8.50
	(1.60)	(0.18)	(2.86)
Blacknose dace	0.02	0.00	0.03
	(0.02)	(0.00)	(0.03)
Quillback	1.06	0.66	1.38
	(0.58)	(0.63)	(0.91)
White sucker	0.15	0.34	0.00
	(0.13)	(0.29)	(0.00)
Smallmouth buffalo	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
Shorthead redhorse	0.12	0.03	0.19
	(0.05)	(0.03)	(0.08)
Channel catfish	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
Tadpole madtom	0.04	0.00	0.06
	(0.03)	(0.00)	(0.06)
Northern pike	0.07	0.00	0.13
	(0.05)	(0.00)	(0.09)
Trout perch	0.15	0.03	0.25
	(0.10)	(0.03)	(0.18)
Brook silverside	0.02	0.00	0.03
	(0.02)	(0.00)	(0.03)
White bass	1.36	2.97	0.09
	(0.78)	(1.79)	(0.05)
Rock bass	0.05	0.00	0.09
	(0.03)	(0.00)	(0.05)
Bluegill	0.19	0.00	0.34
	(0.08)	(0.00)	(0.14)
Smallmouth bass	0.27	0.42	0.16
	(0.09)	(0.17)	(0.08)
Largemouth bass	0.10	0.03	0.16
	(0.04)	(0.03)	(0.07)

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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Western sand darter	0.31	0.32	0.31
	(0.18)	(0.29)	(0.24)
Mud darter	0.04	0.00	0.06
	(0.02)	(0.00)	(0.04)
Johnny darter	1.20	0.50	1.75
	(0.44)	(0.25)	(0.76)
Yellow perch	1.29	0.42	1.97
	(0.96)	(0.19)	(1.72)
Logperch	0.60	0.08	1.00
	(0.34)	(0.04)	(0.61)
Slenderhead darter	0.02	0.00	0.03
	(0.02)	(0.00)	(0.03)
River darter	0.66	0.11	1.09
	(0.51)	(0.08)	(0.91)
Sauger	0.28	0.39	0.19
	(0.12)	(0.22)	(0.13)
Walleye	0.26	0.26	0.25
	(0.15)	(0.14)	(0.25)
Freshwater drum	0.08	0.13	0.03
	(0.06)	(0.13)	(0.03)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by using gill netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Longnose gar	0.18	0.18
	(0.12)	(0.12)
Shortnose gar	0.24	0.24
	(0.24)	(0.24)
Bowfin	0.53	0.53
	(0.36)	(0.36)
Goldeye	0.10	0.10
	(0.10)	(0.10)
Mooneye	0.20	0.20
	(0.13)	(0.13)
American eel	0.10	0.10
	(0.10)	(0.10)
Gizzard shad	1.75	1.75
	(0.92)	(0.92)
Common carp	7.93	7.93
	(2.46)	(2.47)
Quillback	0.64	0.64
	(0.46)	(0.46)
Highfin carpsucker	0.09	0.09
	(0.09)	(0.09)
Blue sucker	0.10	0.10
	(0.10)	(0.10)
Smallmouth buffalo	2.84	2.84
	(1.07)	(1.07)
Spotted sucker	0.19	0.19
	(0.19)	(0.19)
Silver redhorse	0.66	0.66
	(0.22)	(0.22)
Golden redhorse	0.47	0.47
	(0.29)	(0.29)
Shorthead redhorse	0.94	0.94
	(0.38)	(0.38)
Channel catfish	1.05	1.05
	(0.35)	(0.35)
Flathead catfish	0.26	0.26
	(0.13)	(0.13)
Northern pike	1.02	1.02
	(0.41)	(0.41)
White bass	4.58	4.58
	(2.22)	(2.23)
Smallmouth bass	0.10	0.10
	(0.10)	(0.10)
White crappie	0.09	0.09
	(0.09)	(0.09)
Black crappie	0.29	0.29
	(0.21)	(0.21)
Sauger	0.19	0.19
	(0.13)	(0.13)
Walleye	0.83	0.83
	(0.31)	(0.31)
Sauger x walleye	0.09	0.09
	(0.09)	(0.09)
Freshwater drum	3.76	3.76
	(1.43)	(1.43)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.3.10. Mean catch-per-unit-effort and (standard error) for fishes collected by using anchored trammel netting in Pool 4 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 1.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	ALL	BWCO
Bowfin	0.07	0.07
	(0.07)	(0.07)
Common carp	3.26	3.26
	(0.67)	(0.68)
Quillback	0.08	0.08
	(0.08)	(0.08)
Smallmouth buffalo	0.49	0.49
	(0.23)	(0.23)
Bigmouth buffalo	0.33	0.33
	(0.33)	(0.33)
Flathead catfish	0.36	0.36
	(0.22)	(0.22)
Northern pike	0.17	0.17
	(0.11)	(0.11)
Sauger	0.10	0.10
	(0.10)	(0.10)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBW
Silver lamprey	0.50
	(0.50)
Gizzard shad	14.02
	(13.14)
Spotfin shiner	3.49
	(2.77)
Common carp	1.83
	(0.60)
Silver chub	0.75
	(0.43)
Hornyhead chub	0.50
	(0.50)
Emerald shiner	50.67
	(50.67)
Bullhead minnow	2.49
	(2.49)
Smallmouth buffalo	0.50
	(0.50)
Golden redhorse	0.25
	(0.25)
Shorthead redhorse	16.40
	(2.08)
Channel catfish	0.83
	(0.44)
Flathead catfish	0.50
	(0.50)
Northern pike	0.25
	(0.25)
Burbot	0.50
	(0.50)
White bass	4.91
	(1.50)
Green sunfish	2.25
	(1.57)
Bluegill	8.71
	(8.34)
Smallmouth bass	9.06
	(5.43)
Largemouth bass	0.50
	(0.50)
Black crappie	0.33
	(0.33)
Logperch	5.56
	(3.95)
River darter	0.50
	(0.50)
Sauger	1.66
	(0.88)
Walleye	5.31
	(4.06)
Freshwater drum	0.50
	(0.50)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Silver lamprey	0.09 (0.09)
Longnose gar	0.18 (0.12)
Gizzard shad	45.82 (33.38)
Spotfin shiner	1.27 (0.86)
Common carp	6.73 (1.62)
Emerald shiner	273.36 (143.91)
Mimic shiner	0.36 (0.20)
Bullhead minnow	0.45 (0.45)
River carpsucker	0.18 (0.12)
Quillback	0.09 (0.09)
Smallmouth buffalo	0.27 (0.19)
Bigmouth buffalo	0.09 (0.09)
Silver redhorse	0.36 (0.28)
Golden redhorse	0.82 (0.55)
Shorthead redhorse	3.00 (1.91)
Channel catfish	0.45 (0.31)
Flathead catfish	0.82 (0.42)
Northern pike	0.27 (0.27)
Burbot	0.09 (0.09)
White bass	20.82 (5.42)
Green sunfish	0.36 (0.24)
Bluegill	13.82 (9.71)
Orangespotted sunfish x bluegill	0.09 (0.09)
Smallmouth bass	5.64 (1.46)
Largemouth bass	1.09 (0.44)
White crappie	1.36 (0.43)
Black crappie	1.18 (0.48)
Yellow perch	0.27 (0.14)
Logperch	1.45 (1.26)
Sauger	38.09 (20.09)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Walleye	15.18
	(5.95)
Sauger x walleye	0.64
	(0.34)
Freshwater drum	3.27
	(1.71)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
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MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBW	TWZ
Lake sturgeon	0.00	0.17
	(0.00)	(0.17)
Longnose gar	0.00	0.18
	(0.00)	(0.18)
Shortnose gar	0.00	0.35
	(0.00)	(0.35)
Bowfin	0.17	0.18
	(0.17)	(0.18)
American eel	0.00	0.17
	(0.00)	(0.17)
Common carp	0.37	0.35
	(0.37)	(0.22)
Channel catfish	0.00	0.34
	(0.00)	(0.21)
Flathead catfish	0.36	0.52
	(0.36)	(0.23)
Northern pike	0.18	0.00
	(0.18)	(0.00)
White bass	0.17	3.83
	(0.17)	(2.01)
Pumpkinseed	0.00	0.17
	(0.00)	(0.17)
Bluegill	1.09	2.57
	(1.09)	(1.55)
White crappie	0.36	0.54
	(0.23)	(0.38)
Black crappie	2.85	10.94
	(1.29)	(6.74)
Sauger	0.00	0.36
	(0.00)	(0.22)
Freshwater drum	13.31	5.67
	(5.44)	(3.26)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	MCBW	TWZ
Shortnose gar	0.00	0.35
	(0.00)	(0.35)
Bowfin	0.52	0.00
	(0.52)	(0.00)
Gizzard shad	0.00	0.17
	(0.00)	(0.17)
Spotfin shiner	11.12	11.98
	(8.92)	(8.06)
Speckled chub	1.02	0.87
	(0.83)	(0.49)
Silver chub	0.17	0.34
	(0.17)	(0.22)
Emerald shiner	8.95	74.58
	(7.20)	(51.52)
River shiner	0.00	0.88
	(0.00)	(0.88)
Spottail shiner	0.00	0.85
	(0.00)	(0.85)
Mimic shiner	26.98	81.13
	(26.77)	(50.95)
Bluntnose minnow	0.52	0.17
	(0.52)	(0.17)
Bullhead minnow	0.70	1.03
	(0.35)	(0.53)
Channel catfish	0.51	0.00
	(0.35)	(0.00)
Tadpole madtom	0.17	0.00
	(0.17)	(0.00)
Flathead catfish	0.00	0.51
	(0.00)	(0.35)
White bass	0.00	2.47
	(0.00)	(1.11)
Green sunfish	0.00	0.17
	(0.00)	(0.17)
Bluegill	0.18	0.68
	(0.18)	(0.68)
White crappie	0.00	0.34
	(0.00)	(0.34)
Slenderhead darter	0.17	0.17
	(0.17)	(0.17)
River darter	0.17	6.47
	(0.17)	(4.80)
Freshwater drum	2.21	0.35
	(1.26)	(0.22)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBW	TWZ
Common carp	0.34	2.94
	(0.17)	(1.40)
Smallmouth buffalo	0.00	0.08
	(0.00)	(0.08)
Channel catfish	0.68	0.17
	(0.36)	(0.17)
Flathead catfish	0.09	0.08
	(0.09)	(0.08)
Bluegill	0.09	0.00
	(0.09)	(0.00)
White crappie	0.09	0.00
	(0.09)	(0.00)
Black crappie	0.34	0.00
	(0.34)	(0.00)
Freshwater drum	0.00	2.77
	(0.00)	(2.39)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBW	TWZ
Common carp	3.33	6.71
	(1.55)	(2.40)
Smallmouth buffalo	0.51	1.27
	(0.32)	(1.07)
Channel catfish	0.31	0.33
	(0.20)	(0.17)
Flathead catfish	0.10	0.33
	(0.10)	(0.17)
White bass	0.41	0.00
	(0.41)	(0.00)
White crappie	0.00	0.08
	(0.00)	(0.08)
Black crappie	0.10	0.00
	(0.10)	(0.00)
Freshwater drum	0.41	0.50
	(0.30)	(0.26)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 1.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 4 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Lake sturgeon	0.38
	(0.26)
Shovelnose sturgeon	0.88
	(0.30)
Paddlefish	0.13
	(0.13)
Speckled chub	0.13
	(0.13)
Shorthead redhorse	0.63
	(0.50)
Channel catfish	4.38
	(1.34)
Flathead catfish	0.13
	(0.13)
Black crappie	0.13
	(0.13)
Sauger	2.00
	(1.86)
Walleye	0.13
	(0.13)
Freshwater drum	1.38
	(0.84)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

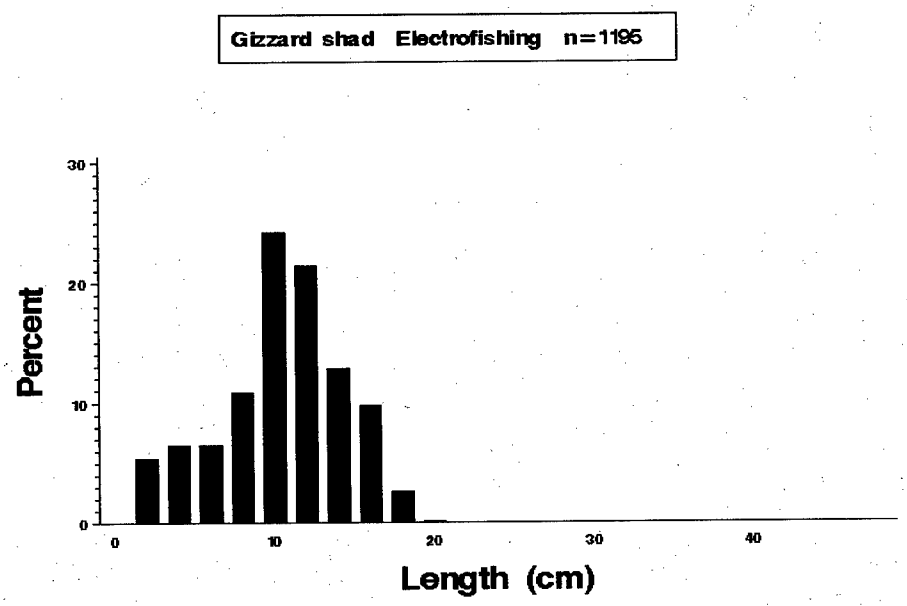

Figure 1.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

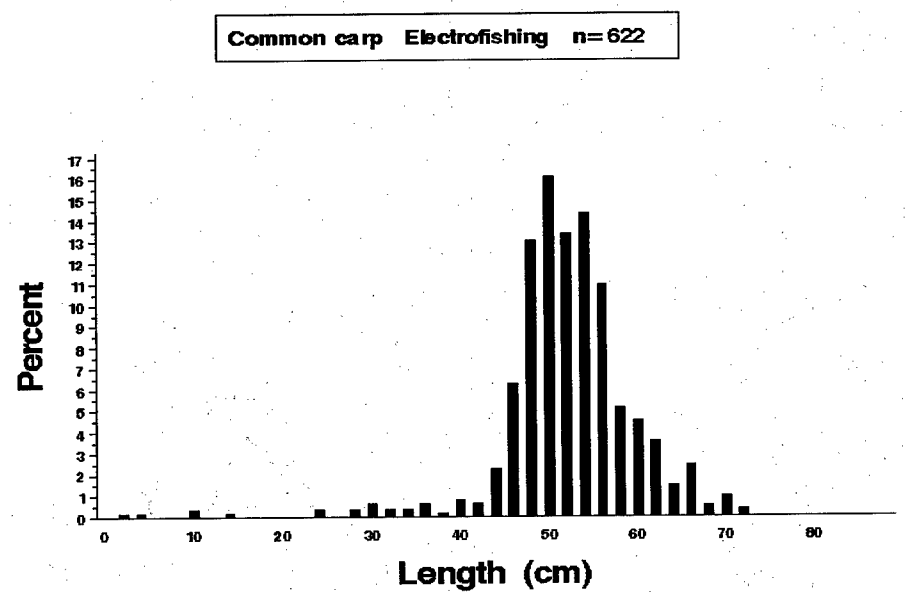

Figure 1.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

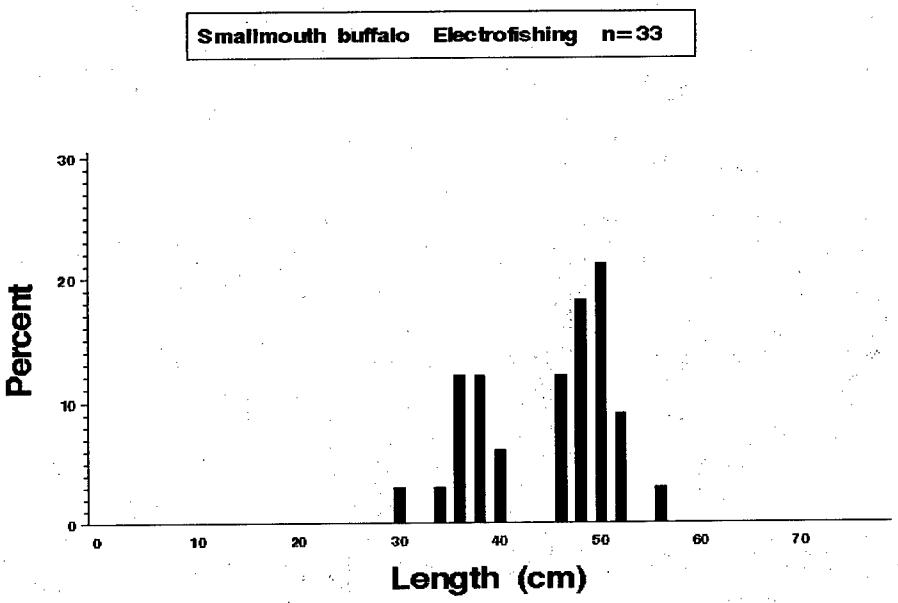

Figure 1.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

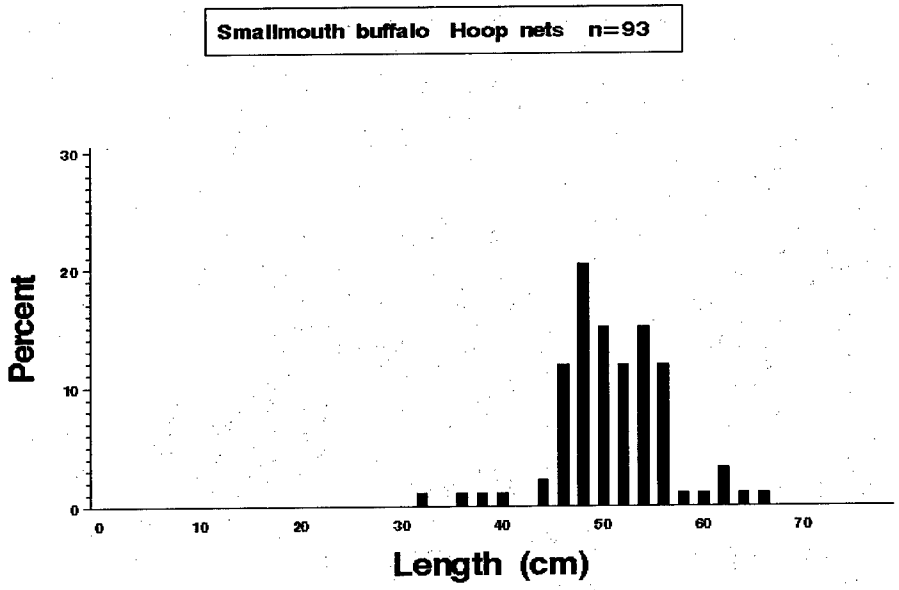

Figure 1.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 4 during 1997.

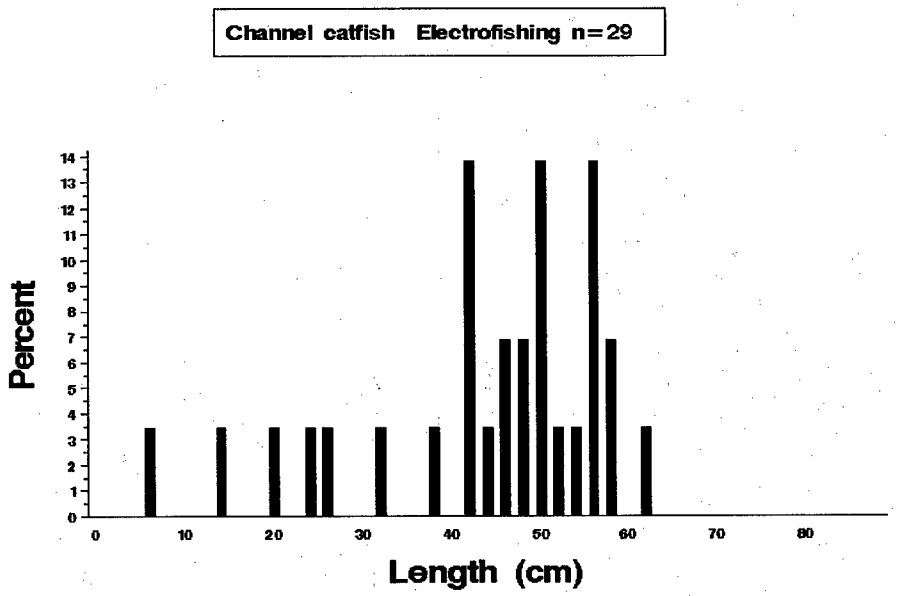

Figure 1.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

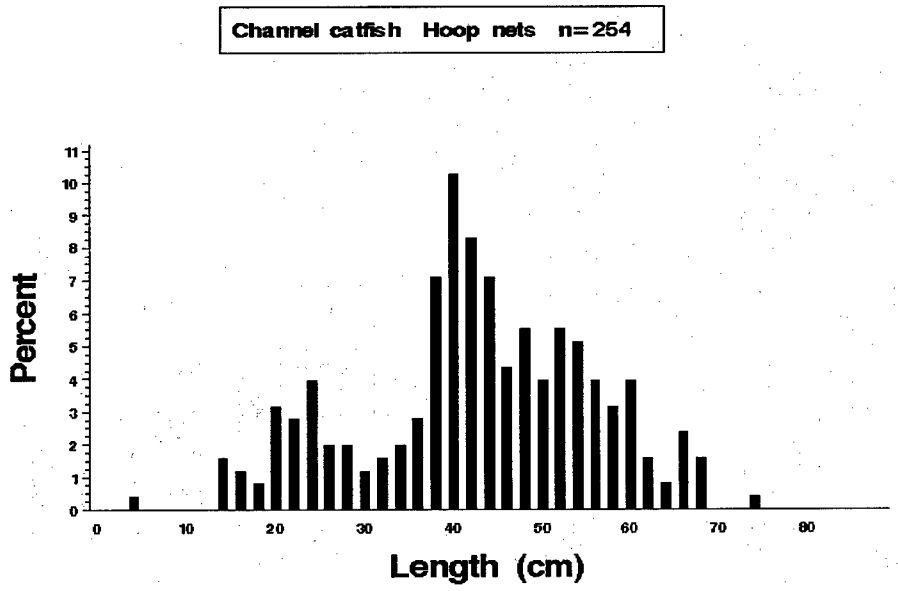

Figure 1.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 4 during 1997.

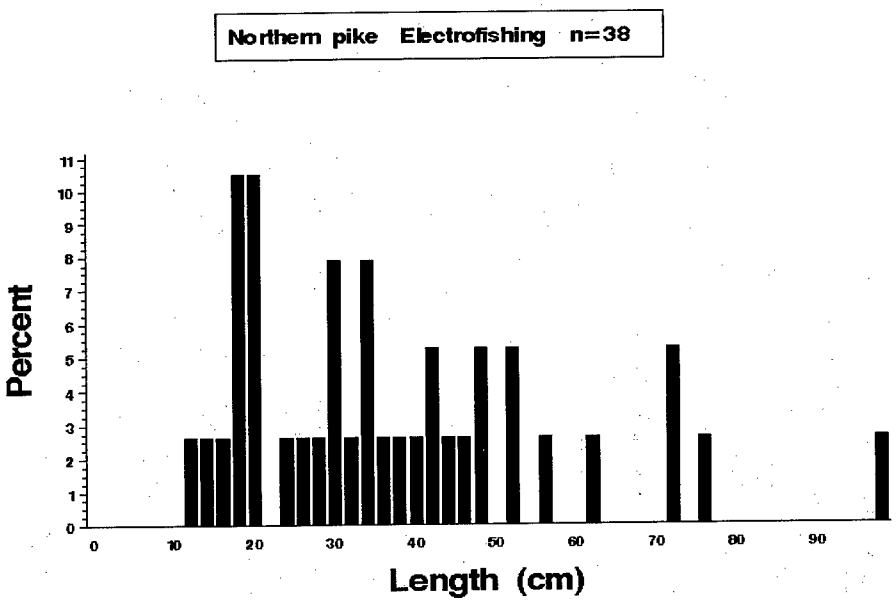

Figure 1.8. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

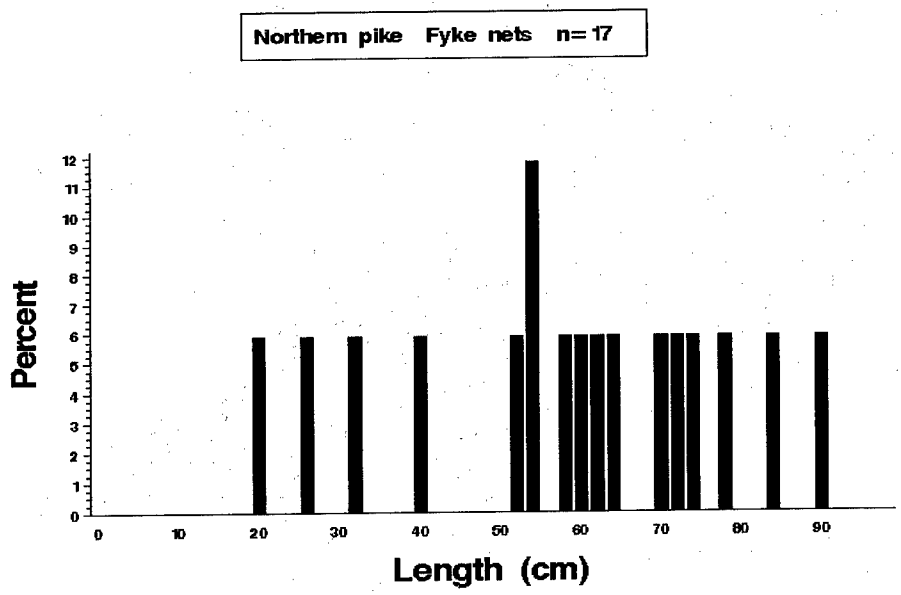

Figure 1.9. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 4 during 1997.

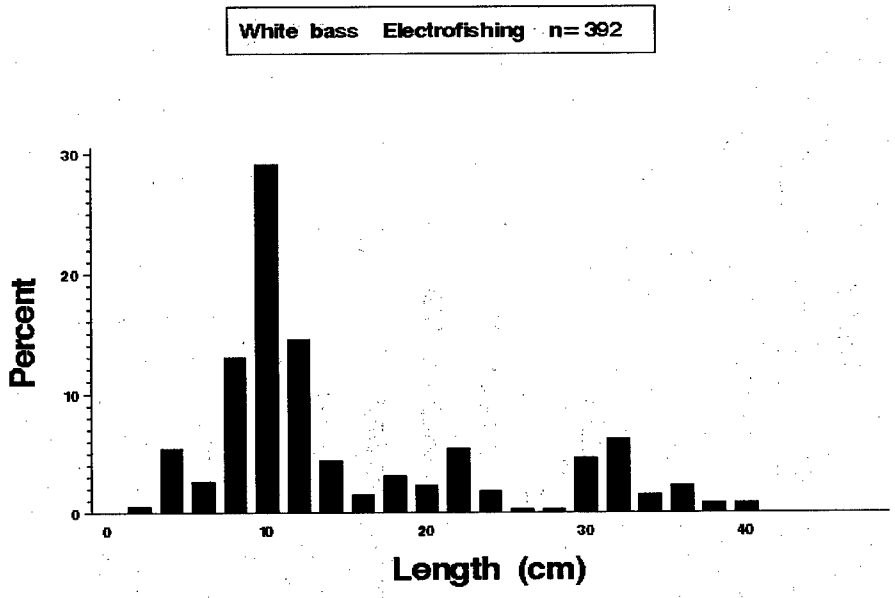

Figure 1.10. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

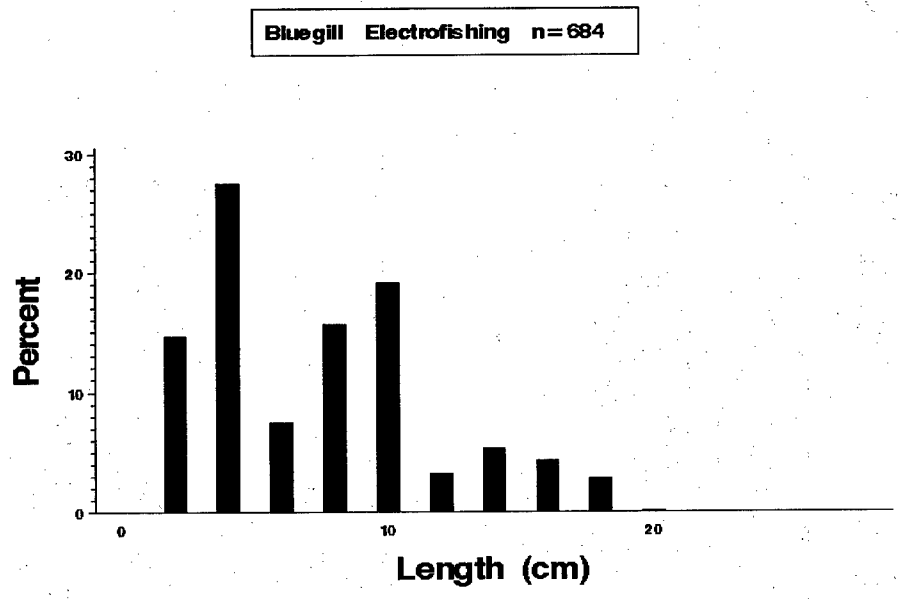

Figure 1.11. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

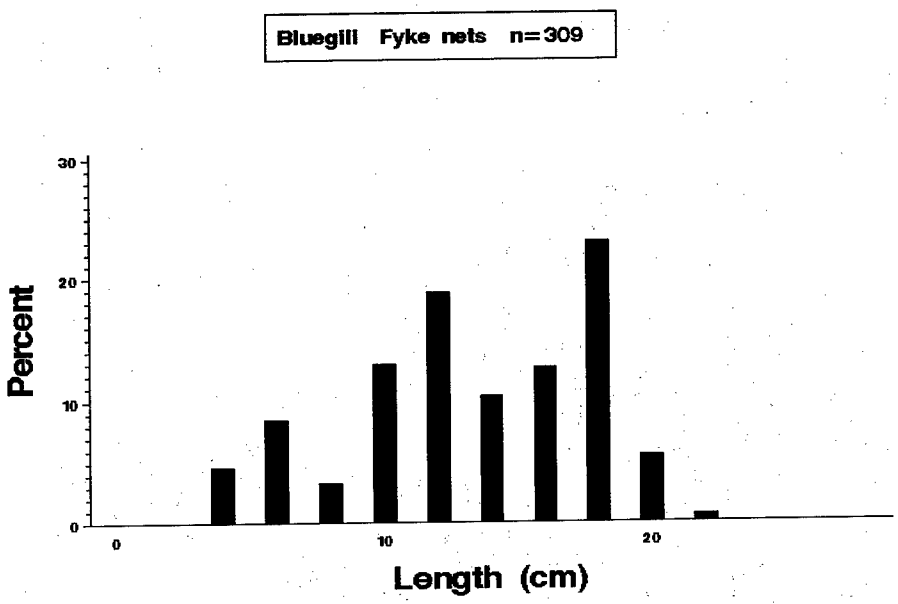

Figure 1.12. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 4 during 1997.

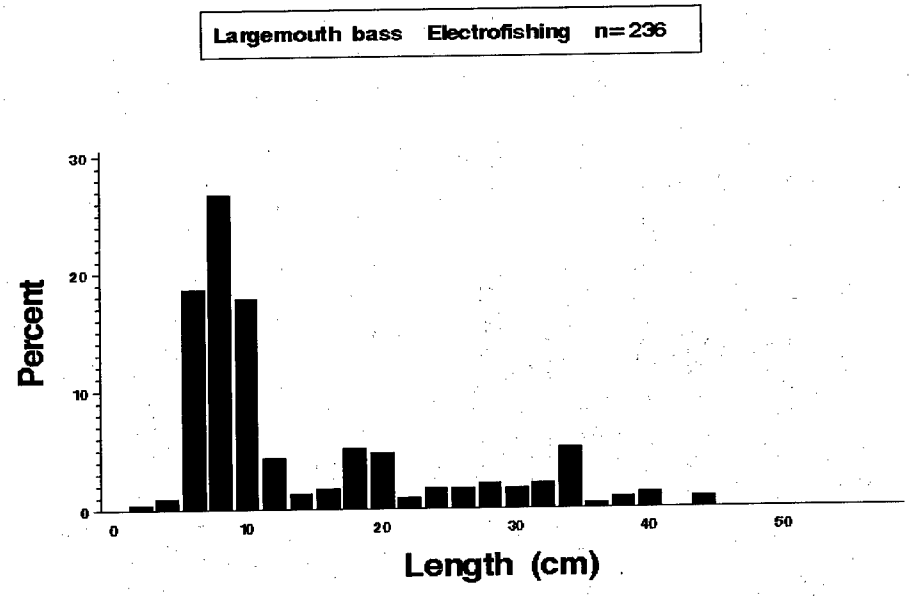

Figure 1.13. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

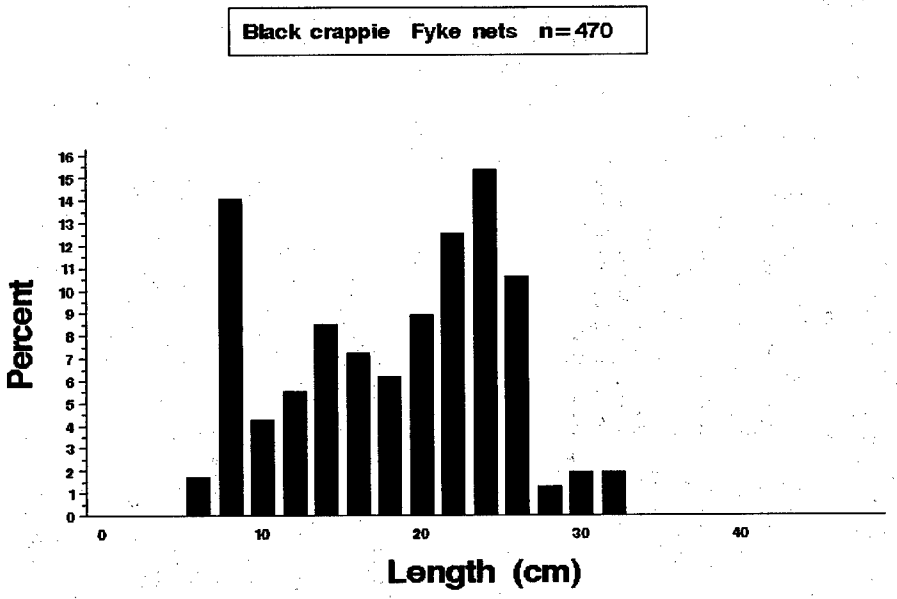

Figure 1.14. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

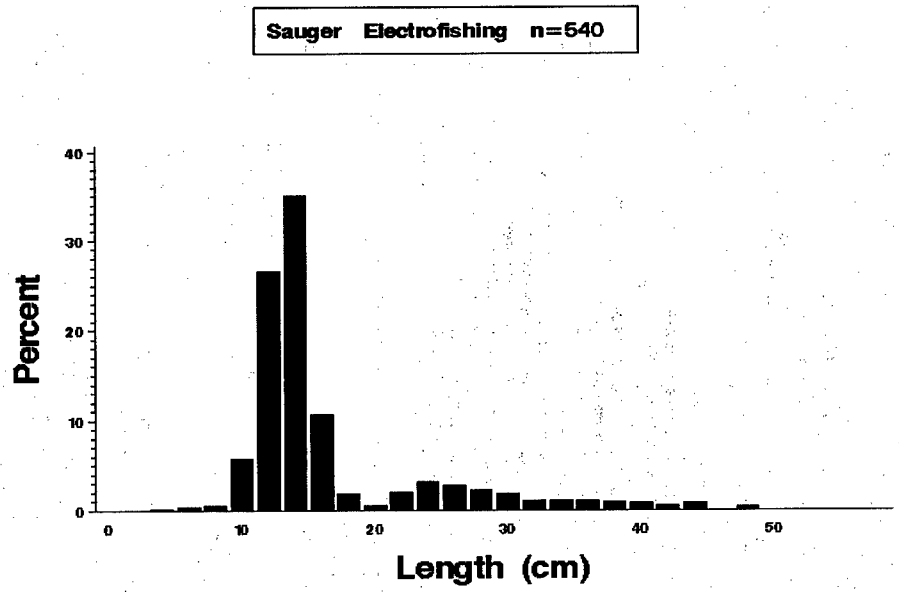

Figure 1.15. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

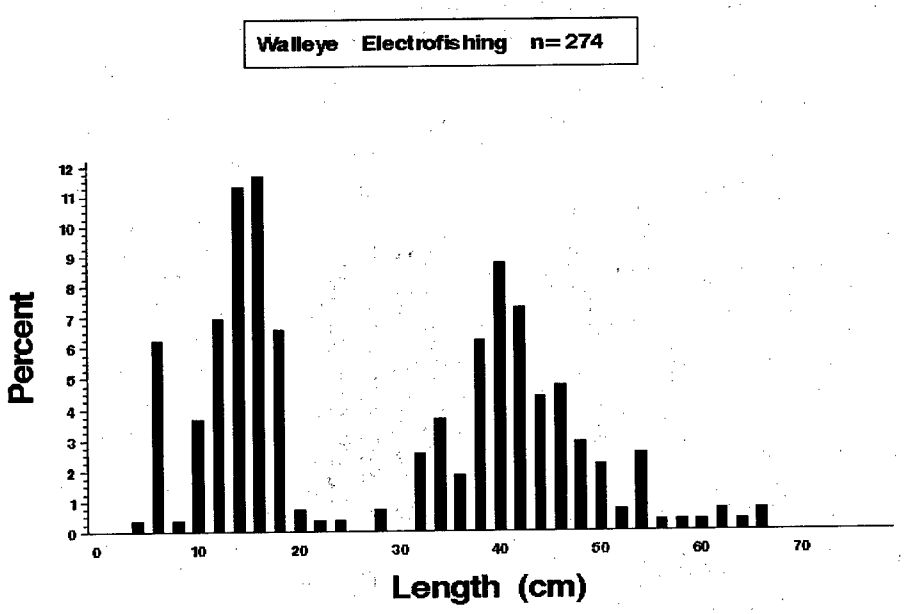

Figure 1.16. Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

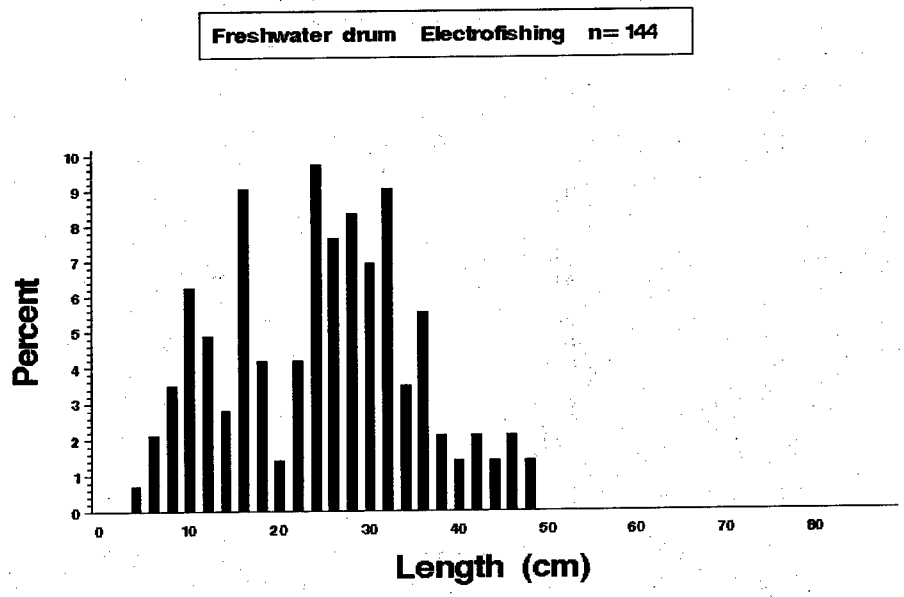

Figure 1.17. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 4 during 1997.

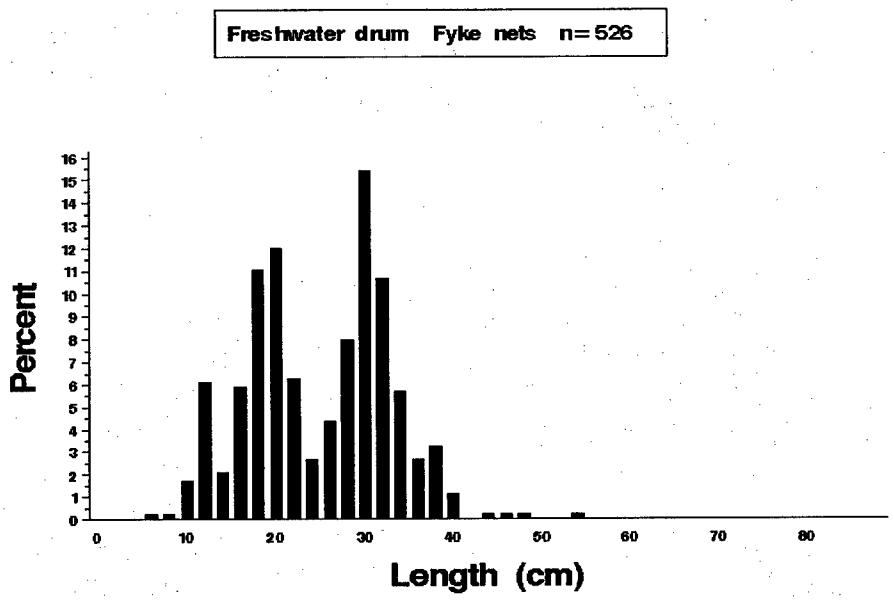

Figure 1.18. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 4 during 1997.

Chapter 2. Pool 8, Upper Mississippi River

by

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Hydrograph

The 1997 hydrograph for Pool 8 (Figure 2.1) featured both above and below normal water levels from late March through early August. Spring flooding peaked in mid-April and water elevations were among the five highest ever recorded for the area. Elevations were at or above flood stage for about 30 days. High water in April and May was immediately followed by lower than average water levels through June. Water levels in July and early August were slightly higher than average. Although water levels showed moderate fluctuation during sampling period 1, water levels in periods 2 and 3 followed the postimpoundment mean closely. Water levels did not negatively affect sampling activities in 1997. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

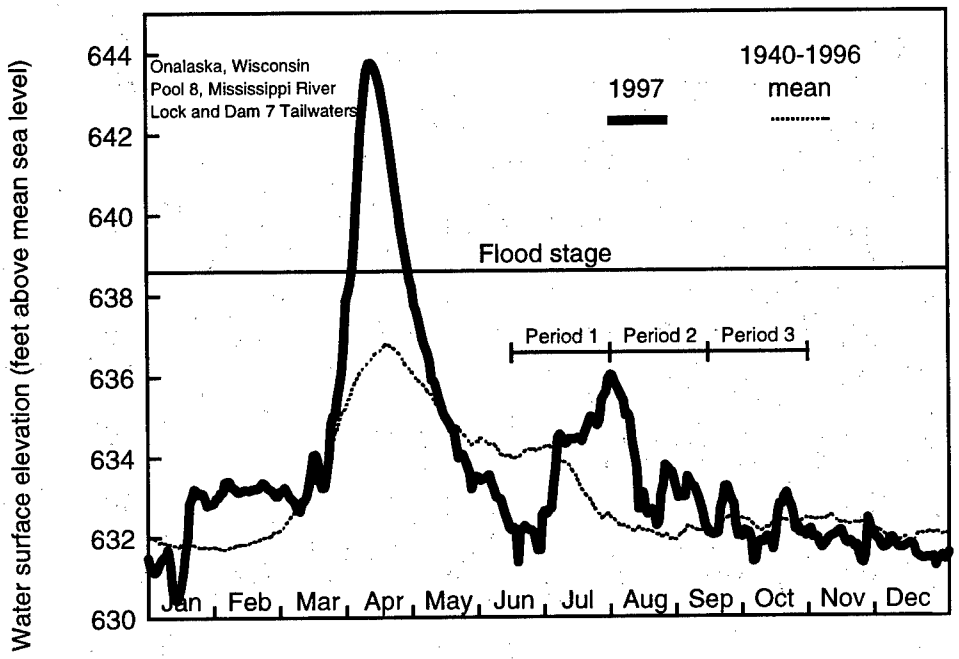

Figure 2.1. Daily water surface elevation from Lock and Dam 3 for Pool 8, Upper Mississippi River, during 1997 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

Summary of Sampling Effort

We made 552 fish collections in Pool 8 during 1997. Gear allocations across strata remained consistent for all three sampling periods at 184 collections per period (Table 2.1). Of the total number of collections, 462 were from randomly selected sites in the BWCO, BWCS, IMPO, IMPS, MCBU, MCBW, and SCB strata. Fifty-four collections were made at fixed TWZ sites, and 36 were from two fixed backwater sites. Backwaters, followed by SCB and MCBU, received the most sampling effort.

Total Catch by Gear

We collected 67,504 fish representing 76 species and 5 hybrid crosses in 1997 (Table 2.2). This total does not include 3,901 fish <30 mm long identified only to family or genus. The five most abundant species in our samples were the spotfin shiner (11,098), bluegill (9,899), emerald shiner (8,579), channel shiner (4,166), and bullhead minnow (3,817). Total species (excluding hybrids) collected by gear type were day electrofishing (57), night electrofishing (63), fyke netting (36), tandem fyke netting (34), mini fyke netting (51), tandem mini fyke netting (40), seining (47), small hoop netting (21), large hoop netting (20), and trawling (11). Fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 8. Our species total before the 1997 season was 89; two new species, the blackside darter and the banded darter, were added in 1997, bringing the cumulative total to 91. Although we collected no Wisconsin-listed endangered species in 1997, we collected 12 blue suckers and 88 river redhorse, both of which are threatened in Wisconsin.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing (Table 2.3.1), spotfin shiner had the highest poolwide mean catch-per-unit effort (*C/f*; 23.72), followed by bluegill (21.33) and bullhead minnow (16.16). Following are the fish species with the highest *C/f* within each stratum: bluegill (50.45, BWCS), common carp (11.17, IMPS), emerald shiner (24.78, MCBU), shorthead redhorse (11.86, MCBW), and spotfin shiner (30.54, SCB).

Night Electrofishing

For night electrofishing (Table 2.3.2), emerald shiner (51.18), channel shiner (34.67), and spotfin shiner (27.59) had the highest poolwide mean *C/f*s. Following are the fish species with the highest *C/f* within each stratum: emerald shiner (38.17, BWCS), channel shiner (78.83, MCBU), shorthead redhorse (11.44, MCBW), and emerald shiner (60.17, SCB).

Fyke Net

Poolwide mean *C/f*s for fyke netting (Table 2.3.3) were highest for bluegill (34.57), black crappie (15.26), and shortnose gar (4.96). Bluegill also had the highest *C/f* within the BWCS (38.85) and IMPS (5.17) strata.

Tandem Fyke Net

Poolwide mean *C/f*s for tandem fyke netting (Table 2.3.4) were highest for freshwater drum (9.17), followed by bluegill (3.69) and black crappie (2.30). These species had the highest *C/f* within each stratum: bluegill (29.95, BWCO) and freshwater drum (10.34, IMPO).

Mini Fyke Net

Spotfin shiner (55.35) had the highest poolwide mean *C/f* for mini fyke nets (Table 2.3.5), followed by bluegill (25.86) and pugnose minnow (24.61). Pugnose minnow (63.42) dominated the BWCS *C/f* for mini fyke nets. Common carp (35.58) was most abundant for mini fyke nets in the IMPS stratum. Channel shiner had the highest *C/f* in MCBU areas (83.09). Emerald shiner (92.55) was most abundant in the MCBW stratum, and spotfin shiner (63.27) had the highest *C/f* for the SCB stratum.

Tandem Mini Fyke Net

Pugnose minnow (4.06) had the highest poolwide mean *C/f* for tandem mini fyke netting (Table 2.3.6), followed by freshwater drum (4.05) and emerald shiner (3.28). Pugnose minnow had the highest mean *C/f* in the BWCS (32.90), and freshwater drum *C/f* (4.55) was the highest in the IMPO stratum.

Small Hoop Net

For small hoop nets (Table 2.3.7), channel catfish had the highest poolwide mean *C/f* (1.69) and the highest *C/f* for these strata: IMPO (1.58), MCBU (1.31), MCBW (0.69), and SCB (2.93). The next highest poolwide mean *C/f*s were held by freshwater drum (0.35) and yellow perch (0.09). The greatest *C/f* for the BWCO stratum was yellow perch (0.99).

Large Hoop Net

For large hoop nets (Table 2.3.8), smallmouth buffalo had the highest poolwide mean *C/f* (2.33), followed by channel catfish (1.57) and freshwater drum (0.86). Smallmouth buffalo had the highest stratumwide *C/f* for large hoop nets in the following strata: IMPO (1.93), MCBU (3.08), and SCB (4.08). Channel catfish was most abundant in MCBW areas (1.45). Black crappie had the highest mean *C/f* in the BWCO (2.91) strata.

Seine

Emerald shiner (64.93) had the highest poolwide mean *C/f* for seining (Table 2.3.9), followed by spotfin shiner (60.74) and bluegill (17.32). Following are the fish species with the highest *C/f* within each stratum: bluegill (47.42, BWCS), emerald shiner (61.33, MCBU), and spotfin shiner (131.83, SCB).

Fixed Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing in 1997 at the two BWCS fixed sites in Pool 8, the bluegill (52.54) had the highest mean *C/f* (Table 2.4.1), followed by bullhead minnow (21.16) and largemouth bass (12.37).

Night Electrofishing

Night electrofishing, conducted at four TWZ fixed sites in 1997 (Table 2.4.2), yielded sauger (*C/f* = 82.33) in greatest abundance. The next highest mean *C/f*s for TWZ night electrofishing were for freshwater drum (35.53) and white bass (31.41).

Fyke Net

The BWCS fyke nets at fixed sites (Table 2.4.3) produced the following catch rates: bluegill (63.09), black crappie (48.27), and pumpkinseed (3.76).

Mini Fyke Net

For mini fyke netting at TWZ fixed sites (Table 2.4.4), bluegill (67.16), spotfin shiner (26.07), and johnny darter (15.86) had the highest mean *C/f*s.

Small Hoop Net

Channel catfish had the highest mean *C/f* (8.14) for small hoop nets in the TWZ (Table 2.4.5), followed by smallmouth buffalo (0.24) and rock bass (0.16).

Large Hoop Net

In large hoop nets fished in the TWZ (Table 2.4.6), channel catfish (13.51), smallmouth buffalo (12.02), and black crappie (2.20) had the highest mean *C/f*s.

Seine

For fixed-site BWCS seining (Table 2.4.7), spotfin shiner (mean *C/f* = 172.08) was most abundant, followed by emerald shiner (48.00) and bullhead minnow (46.83). For TWZ fixed sites, emerald shiner (29.92) had the highest mean *C/f*. Spotfin shiner (20.50) and river shiner (12.33) had the next highest mean *C/f*s.

Trawl

Freshwater drum (2.00) had the highest mean *C/f* in TWZ trawls (Table 2.4.8), followed by channel catfish (0.92) and shorthead redhorse (0.42).

Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 2.2 to 2.19. The length distributions presented may be limited by the size selectiveness of the particular gear. Care should be used when trying to

interpret length distributions from samples <100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

Gizzard Shad

Virtually all gizzard shad collected by electrofishing in Pool 8 during 1997 were less than 20 cm long (Figure 2.2) indicating a population dominated by age-0 fish. Sample size was 1,441 fish. The largest gizzard shad we collected in 1997 was about 40 cm long.

Common Carp

The electrofishing length distribution of 672 common carp (Figure 2.3) showed a large group of fish from 40 to 70 cm long and another group less than 10 cm long indicating the presence of a successful year class. No common carp were collected that ranged in length between about 15 and 39 cm. Fish of this size, which we assume to be in the second year of life, are seldom sampled by LTRMP methods in Pool 8. We do not know if they are not susceptible to our gear or are lost from the population.

Smallmouth Buffalo

Smallmouth buffalo collected by electrofishing showed a similar picture to those collected by hoop nets. The 25 smallmouth buffalo collected by electrofishing (Figure 2.4) ranged mostly from 30 to 50 cm long. We collected 418 smallmouth buffalo in tandem hoop net sets (Figure 2.5) in 1997. Most smallmouth buffalo collected in hoop nets were about 32 cm long or longer. A substantial number of smallmouth buffalo between 32 and 40 cm are likely from a successful 1994 year class.

Channel Catfish

The length distributions of channel catfish caught by electrofishing (n = 50) and hoop netting (n = 618), Figures 2.6 and 2.7, respectively, both show a range of fish from 20 to 60 cm centered around a mode of 40 cm.

Northern Pike

The 1997 northern pike length distribution, represented as 52 fish collected by electrofishing (Figure 2.8), indicated that more than half the sample was less than 30 cm. The length distribution for 55 northern pike caught by fyke netting (Figure 2.9) shows a wider range of lengths indicating some recruitment of the 1996 year class, but the greatest percentage of the catch was from 60 to 80 cm long.

White Bass

The most abundant size of 1,193 white bass we collected with electrofishing in 1997 (Figure 2.10) was 8–13 cm long. Less than 5% of the white bass were greater than 20 cm in length.

Bluegill

We caught 3,004 bluegills during electrofishing in 1997 (Figure 2.11). The electrofishing distribution was skewed toward small fish, represented primarily by bluegills less than 12 cm long. The 3,049 bluegills collected in fyke nets (Figure 2.12) averaged much larger than those from electrofishing. The largest group of fish was between 8 and 12 cm long. The percentage of quality-sized fish (>15 cm long; Anderson 1978) was about 18%.

Largemouth Bass

The electrofishing length distribution of 529 largemouth bass (Figure 2.13) was widely distributed from 2 to 46 cm long. A large group was present from 6 to 14 cm, and a broader group occurred at 20–34 cm long. Fifteen percent of the largemouth bass we collected were longer than 30 cm.

White Crappie

The sample size for white crappies, collected in fyke nets, was 39 fish. The length distribution for white crappies (Figure 2.14) showed an even distribution of medium and large fish, but few juveniles. This fish is not abundant in Pool 8, so the lack of juveniles in the sample is not surprising, and should not be interpreted as an indication that the population is endangered.

Black Crappie

We caught 1,738 black crappies in fyke nets in 1997 (Figure 2.15). Most of the fish collected were from 14 to 25 cm long. Beyond 26 cm long, the percentage of catch quickly diminished.

Sauger

The sample size for sauger caught by electrofishing in 1997 was 1,909 (Figure 2.16). The length distribution was dominated by a large group of fish about 14–18 cm long. A small group also occurred at about 26 cm long.

Walleye

We caught 749 walleyes in 1997 by electrofishing. The length distribution for the walleye was dominated by young of the year centered around 17 cm (Figure 2.17). The complete length range of the walleye extended from 4 to 68 cm.

Freshwater Drum

The length distribution for freshwater drum collected by electrofishing represents 965 fish (Figure 2.18). The majority of freshwater drum in the electrofishing catch during 1997 were from 10 to 15 cm long. The same

picture was indicated by 211 freshwater drum collected in fyke nets (Figure 2.19). For both gears, the complete length range extended from about 10 to 50 cm.

Table 2.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 8 of the Mississippi River during 1997. Table entries are numbers of successfully completed standardized monitoring collections.

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		8	6	4	4				34
Fyke net	16					4				20
Large hoop net		4	4	4	4		4		2	22
Small hoop net		4	4	4	4		4		2	22
Mini fyke net	8		6	4	4	4			2	28
Night electrofishing	2		4	4	4				4	18
Seine	8		4	8					4	24
Trawling									4	4
Tandem fyke net		4					2			6
Tandem mini fyke net		4					2			6
SUBTOTAL	46	16	30	30	20	12	12	0	18	184

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		8	6	4	4				34
Fyke net	16					4				20
Large hoop net		4	4	4	4		4		2	22
Small hoop net		4	4	4	4		4		2	22
Mini fyke net	8		6	4	4	4			2	28
Night electrofishing	2		4	4	4				4	18
Seine	8		4	8					4	24
Trawling									4	4
Tandem fyke net		4					2			6
Tandem mini fyke net		4					2			6
SUBTOTAL	46	16	30	30	20	12	12	0	18	184

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		8	6	4	4				34
Fyke net	16					4				20
Large hoop net		4	4	4	4		4		2	22
Small hoop net		4	4	4	4		4		2	22
Mini fyke net	8		6	4	4	4			2	28
Night electrofishing	2		4	4	4				4	18
Seine	8		4	8					4	24
Trawling									4	4
Tandem fyke net		4					2			6
Tandem mini fyke net		4					2			6
SUBTOTAL	46	16	30	30	20	12	12	0	18	184
	138	48	90	90	60	36	36	0	54	552

Strata: BWCS - Backwater, contiguous, shoreline.
BWCO - Backwater, contiguous, offshore.
IMPS - Impounded, shoreline.
IMPO - Impounded, offshore.
MCBU - Main channel border, unstructured.
MCBW - Main channel border, wing dam.
SBU - Side channel border.
TRI - Tributary mouth.
TWZ - Tailwater.

Table 2.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 8 of the Mississippi River. See Table 2.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	6	6	1	-	1	-	-	1	-	-	-	-	15
2	Silver lamprey	Ichthyomyzon unicuspis	4	5	2	2	-	-	-	-	-	-	-	-	13
3	Shovelnose sturgeon	Scaphirhynchus platorynchus	-	-	-	-	-	-	-	-	-	-	-	4	4
4	Longnose gar	Lepisosteus osseus	11	17	46	11	38	-	2	1	2	-	-	-	128
5	Shortnose gar	Lepisosteus platostomus	20	8	251	20	24	4	1	-	2	-	-	-	330
6	Bowfin	Amia calva	16	7	30	17	4	-	1	1	-	-	-	-	76
7	Mooneye	Hiodon tergisus	1	44	1	1	-	1	1	-	-	-	-	-	49
8	Gizzard shad	Dorosoma cepedianum	677	764	45	18	17	28	485	-	-	-	-	1	2035
9	Spotfin shiner	Cyprinella spiloptera	1903	882	1	-	3865	15	4431	1	-	-	-	-	11098
10	Common carp	Cyprinus carpio	513	159	103	49	472	353	6	10	31	-	-	-	1696
11	Mississippi silvery minnow	Hybognathus nuchalis	-	1	-	-	-	-	-	-	-	-	-	-	1
12	Silver chub	Macrhybopsis storeriana	-	20	-	-	-	-	-	-	-	-	-	3	23
13	Golden shiner	Notemigonus crysoleucas	12	7	5	8	17	6	1	2	-	-	-	-	58
14	Emerald shiner	Notropis atherinoides	983	1984	-	-	1609	66	3937	-	-	-	-	-	8579
15	River shiner	Notropis blennius	472	855	-	-	738	1	821	-	-	-	-	-	2887
16	Spottail shiner	Notropis hudsonius	81	35	-	-	187	4	190	-	-	-	-	-	497
17	Sand shiner	Notropis stramineus	-	4	-	-	1	1	1	-	-	-	-	-	7
18	Weed shiner	Notropis texanus	3	-	-	-	19	-	-	-	-	-	-	-	22
19	Mimic shiner	Notropis volucellus	-	-	-	-	-	-	1	-	-	-	-	-	1
20	Channel shiner	Notropis wickliffi	393	1586	-	-	1064	-	1123	-	-	-	-	-	4166
21	Pugnose minnow	Opsopoeodus emiliae	55	37	-	-	1775	880	301	-	-	-	-	-	3048
22	Bluntnose minnow	Pimephales notatus	-	-	-	-	1	-	-	-	-	-	-	-	1
23	Fathead minnow	Pimephales promelas	3	2	-	-	2	-	3	-	-	-	-	-	10
24	Bullhead minnow	Pimephales vigilax	1458	647	-	-	574	122	1016	-	-	-	-	-	3817
25	Creek chub	Semotilus atromaculatus	-	-	-	-	1	-	-	-	-	-	-	-	1
26	Unidentified minnow	Unidentified Cyprinidae	17	2	-	-	5	1	3	-	-	-	-	-	28
27	River carpsucker	Carpiodes carpio	9	10	3	4	-	-	-	-	-	-	-	-	26
28	Quillback	Carpiodes cyprinus	98	78	-	1	34	-	33	-	1	-	-	2	247
29	Highfin carpsucker	Carpiodes velifer	2	4	-	1	-	-	-	-	-	-	-	-	7
30	Unidentified carpsucker	Carpiodes sp.	5	1	-	-	281	4	13	-	-	-	-	-	304
31	White sucker	Catostomus commersoni	1	2	1	-	1	-	1	-	-	-	-	-	6
32	Blue sucker	Cycleptus elongatus	3	7	-	-	1	-	1	-	-	-	-	-	12
33	Northern hog sucker	Hypentelium nigricans	11	6	-	-	-	-	-	-	-	-	-	-	17
34	Smallmouth buffalo	Ictiobus bubalus	13	12	2	2	2	-	-	12	406	-	-	-	449
35	Bigmouth buffalo	Ictiobus cyprinellus	3	4	-	-	-	-	-	-	-	-	-	-	7
36	Spotted sucker	Minytrema melanops	156	32	15	15	3	1	2	-	3	-	-	-	227
37	Silver redhorse	Moxostoma anisurum	297	202	65	75	30	4	27	2	13	-	-	1	716
38	River redhorse	Moxostoma carinatum	30	57	1	-	-	-	-	-	-	-	-	-	88
39	Golden redhorse	Moxostoma erythrurum	105	155	7	4	-	-	1	-	3	-	-	-	275

Gears:
D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 2.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 8 of the Mississippi River. See Table 2.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Shorthead redhorse	Moxostoma macrolepidotum	553	794	26	53	30	1	14	5	31	-	-	5	1512
41	Unidentified redhorse	Moxostoma sp.	111	236	-	-	92	29	7	-	-	-	-	-	475
42	Unidentified sucker	Unidentified Catostomidae	-	-	-	-	1	-	-	-	-	-	-	-	1
43	Black bullhead	Ameiurus melas	-	-	-	2	-	-	-	-	-	-	-	-	2
44	Yellow bullhead	Ameiurus natalis	-	-	1	3	3	-	-	1	-	-	-	-	8
45	Brown bullhead	Ameiurus nebulosus	-	-	-	3	-	-	-	-	-	-	-	-	3
46	Channel catfish	Ictalurus punctatus	27	23	6	10	-	1	-	268	350	-	-	11	696
47	Stonecat	Noturus flavus	-	-	-	-	1	2	-	-	-	-	-	-	3
48	Tadpole madtom	Noturus gyrinus	5	3	-	-	4	6	3	-	-	-	-	-	21
49	Flathead catfish	Pylodictis olivaris	10	38	21	7	3	-	-	2	16	-	-	-	97
50	Northern pike	Esox lucius	37	15	33	22	8	1	4	-	5	-	-	-	125
51	Central mudminnow	Umbra limi	-	1	-	-	-	-	-	-	-	-	-	-	1
52	Brown trout	Salmo trutta	-	1	-	-	-	-	-	-	-	-	-	-	1
53	Trout perch	Percopsis omiscomaycus	-	1	-	-	-	1	-	-	-	-	-	-	2
54	Burbot	Lota lota	2	3	-	-	-	-	-	-	-	-	-	-	5
55	Brook silverside	Labidesthes sicculus	29	118	-	-	54	-	144	-	-	-	-	-	345
56	White bass	Morone chrysops	161	1032	52	36	98	6	141	-	9	-	-	-	1535
57	Rock bass	Ambloplites rupestris	112	174	105	38	15	3	31	2	3	-	-	-	483
58	Green sunfish	Lepomis cyanellus	65	30	3	-	35	7	1	-	-	-	-	-	141
59	Pumpkinseed	Lepomis gibbosus	53	9	69	20	46	13	5	1	-	-	-	-	216
60	Warmouth	Lepomis gulosus	-	-	7	1	-	3	-	-	-	-	-	-	11
61	Orangespotted sunfish	Lepomis humilis	433	69	7	3	128	15	205	1	-	-	-	-	861
62	Bluegill	Lepomis macrochirus	2394	610	2301	748	1964	653	1145	16	68	-	-	-	9899
63	Green x pumpkinseed sunfish	L. cyanellus x gibbosus	6	-	3	-	-	-	-	-	-	-	-	-	9
64	Green sunfish x warmouth	L. cyanellus x gulosus	-	-	1	-	-	-	-	-	-	-	-	-	1
65	Green sunfish x bluegill	L. cyanellus x macrochirus	1	1	3	-	1	-	-	-	-	-	-	-	6
66	Orangespotted sunfish x bluegill	L. humilis x macrochirus	-	1	-	-	1	-	-	-	-	-	-	-	2
67	Unidentified Lepomis	Lepomis sp.	35	51	-	-	1957	311	562	-	-	-	-	-	2916
68	Smallmouth bass	Micropterus dolomieu	364	530	-	-	10	3	12	1	5	-	-	-	925
69	Largemouth bass	Micropterus salmoides	453	76	7	-	54	8	48	-	-	-	-	-	646
70	White crappie	Pomoxis annularis	3	-	15	24	2	3	6	2	4	-	-	-	59
71	Black crappie	Pomoxis nigromaculatus	106	85	1317	421	60	108	30	14	141	-	-	-	2282
72	Unidentified sunfish	Unidentified Centrarchidae	9	-	-	-	27	-	141	-	-	-	-	-	177
73	Western sand darter	Ammocrypta clara	-	45	-	-	-	-	219	-	-	-	-	-	264
74	Mud darter	Etheostoma asprigene	8	3	-	-	16	1	5	-	-	-	-	-	33
75	Iowa darter	Etheostoma exile	-	-	-	-	-	1	-	-	-	-	-	-	1
76	Fantail darter	Etheostoma flabellare	-	1	-	-	-	-	-	-	-	-	-	-	1
77	Johnny darter	Etheostoma nigrum	198	70	-	-	230	47	122	-	-	-	-	-	667
78	Banded darter	Etheostoma zonale	-	1	-	-	-	-	-	-	-	-	-	-	1

Gears:
D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 2.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 8 of the Mississippi River. See Table 2.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
79	Yellow perch	Perca flavescens	342	90	61	120	38	31	89	24	-	-	-	-	795
80	Logperch	Percina caprodes	457	210	-	-	112	21	94	-	-	-	-	-	894
81	Blackside darter	Percina maculata	1	-	-	-	-	-	-	-	-	-	-	-	1
82	Slenderhead darter	Percina phoxocephala	14	14	-	-	2	-	4	-	-	-	-	-	34
83	River darter	Percina shumardi	5	26	-	-	16	5	11	-	-	-	-	1	64
84	Sauger	Stizostedion canadense	113	1796	10	9	4	1	5	-	-	-	-	4	1942
85	Walleye	Stizostedion vitreum	120	629	8	8	8	1	27	-	1	-	-	1	803
86	Sauger x walleye	S. canadense x vitreum	1	4	-	-	-	-	-	-	-	-	-	-	5
87	Freshwater drum	Aplodinotus grunniens	121	844	58	153	74	73	32	20	64	-	-	24	1463
			13710	15276	4693	1909	15860	2846	15509	387	1158	0	0	57	71405

Gears:
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T - Trawling (4.8-m bottom trawl)

Table 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Chestnut lamprey	0.08	0.04	0.08	0.06	0.00	0.13
	(0.04)	(0.04)	(0.08)	(0.06)	(0.00)	(0.09)
Silver lamprey	0.05	0.00	0.08	0.11	0.00	0.04
	(0.02)	(0.00)	(0.08)	(0.08)	(0.00)	(0.04)
Longnose gar	0.13	0.08	0.00	0.11	0.04	0.21
	(0.05)	(0.08)	(0.00)	(0.08)	(0.04)	(0.10)
Shortnose gar	0.17	0.22	0.92	0.00	0.00	0.13
	(0.05)	(0.10)	(0.45)	(0.00)	(0.00)	(0.09)
Bowfin	0.17	0.22	0.33	0.00	0.00	0.21
	(0.06)	(0.10)	(0.19)	(0.00)	(0.00)	(0.12)
Mooneye	0.00	0.00	0.00	0.00	0.04	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
Gizzard shad	7.16	13.42	5.08	4.89	2.84	3.21
	(2.11)	(5.48)	(3.23)	(3.71)	(2.77)	(1.33)
Spotfin shiner	23.72	19.50	3.50	23.33	0.98	30.54
	(3.60)	(5.99)	(1.68)	(7.24)	(0.74)	(6.54)
Common carp	5.42	5.13	11.17	4.39	0.49	5.58
	(0.77)	(1.18)	(4.28)	(1.71)	(0.21)	(1.29)
Golden shiner	0.16	0.38	0.00	0.00	0.00	0.08
	(0.09)	(0.24)	(0.00)	(0.00)	(0.00)	(0.06)
Emerald shiner	10.23	4.54	11.08	24.78	1.91	6.50
	(2.89)	(1.77)	(5.82)	(11.90)	(1.24)	(1.97)
River shiner	5.72	1.69	2.50	15.56	0.90	3.83
	(1.23)	(1.05)	(1.33)	(4.75)	(0.75)	(1.24)
Spottail shiner	0.37	0.42	0.75	0.28	0.00	0.33
	(0.13)	(0.28)	(0.58)	(0.18)	(0.00)	(0.21)
Weed shiner	0.05	0.00	0.00	0.00	0.00	0.13
	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)
Channel shiner	3.54	0.15	0.08	8.06	0.07	4.33
	(1.27)	(0.09)	(0.08)	(4.86)	(0.07)	(1.64)
Pugnose minnow	0.59	1.42	0.25	0.06	0.00	0.21
	(0.15)	(0.42)	(0.18)	(0.06)	(0.00)	(0.12)
Fathead minnow	0.01	0.04	0.00	0.00	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Bullhead minnow	16.16	18.00	0.58	7.44	0.20	21.92
	(3.14)	(6.69)	(0.42)	(3.09)	(0.20)	(5.43)
River carpsucker	0.12	0.27	0.00	0.00	0.00	0.08
	(0.05)	(0.13)	(0.00)	(0.00)	(0.00)	(0.06)
Quillback	0.95	1.81	2.33	0.56	0.09	0.25
	(0.59)	(1.69)	(1.75)	(0.30)	(0.06)	(0.14)
Highfin carpsucker	0.02	0.00	0.00	0.00	0.00	0.04
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)
White sucker	0.01	0.00	0.00	0.06	0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)
Blue sucker	0.02	0.00	0.00	0.00	0.07	0.04
	(0.02)	(0.00)	(0.00)	(0.00)	(0.07)	(0.04)
Northern hog sucker	0.00	0.00	0.00	0.00	0.44	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.40)	(0.00)
Smallmouth buffalo	0.10	0.04	0.33	0.11	0.04	0.13
	(0.04)	(0.04)	(0.33)	(0.11)	(0.04)	(0.07)
Bigmouth buffalo	0.03	0.00	0.00	0.00	0.00	0.08
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)
Spotted sucker	1.48	3.41	0.00	0.00	0.00	0.83
	(0.40)	(1.15)	(0.00)	(0.00)	(0.00)	(0.28)
Silver redhorse	2.41	2.22	0.50	2.33	3.19	2.88
	(0.35)	(0.57)	(0.29)	(0.56)	(1.09)	(0.71)
River redhorse	0.06	0.04	0.00	0.06	1.18	0.08
	(0.04)	(0.04)	(0.00)	(0.06)	(0.28)	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
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Table 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Golden redhorse	0.93	0.58	0.33	1.39	0.69	1.04
	(0.18)	(0.19)	(0.26)	(0.39)	(0.25)	(0.38)
Shorthead redhorse	3.36	4.00	1.17	3.11	11.86	3.17
	(0.55)	(1.30)	(0.61)	(0.77)	(2.50)	(0.72)
Channel catfish	0.27	0.12	0.00	0.11	0.23	0.54
	(0.09)	(0.06)	(0.00)	(0.08)	(0.20)	(0.22)
Tadpole madtom	0.06	0.12	0.00	0.00	0.00	0.04
	(0.03)	(0.06)	(0.00)	(0.00)	(0.00)	(0.04)
Flathead catfish	0.10	0.12	0.08	0.06	0.04	0.13
	(0.04)	(0.06)	(0.08)	(0.06)	(0.04)	(0.07)
Northern pike	0.30	0.39	0.08	0.11	0.00	0.38
	(0.07)	(0.14)	(0.08)	(0.08)	(0.00)	(0.13)
Burbot	0.01	0.00	0.00	0.06	0.04	0.00
	(0.01)	(0.00)	(0.00)	(0.06)	(0.04)	(0.00)
Brook silverside	0.21	0.38	0.00	0.06	0.00	0.17
	(0.06)	(0.16)	(0.00)	(0.06)	(0.00)	(0.08)
White bass	1.55	1.12	2.58	2.50	0.04	1.25
	(0.30)	(0.51)	(1.35)	(0.71)	(0.04)	(0.44)
Rock bass	1.14	1.69	0.50	0.61	0.18	1.04
	(0.23)	(0.61)	(0.26)	(0.27)	(0.11)	(0.23)
Green sunfish	0.67	1.21	0.33	0.22	0.00	0.50
	(0.29)	(0.80)	(0.19)	(0.22)	(0.00)	(0.26)
Pumpkinseed	0.52	1.12	0.00	0.00	0.00	0.38
	(0.19)	(0.52)	(0.00)	(0.00)	(0.00)	(0.17)
Orangespotted sunfish	5.34	13.05	0.00	0.61	0.04	2.00
	(2.39)	(7.01)	(0.00)	(0.33)	(0.04)	(0.61)
Bluegill	21.33	50.45	0.92	2.61	0.49	9.29
	(7.46)	(21.77)	(0.43)	(0.98)	(0.32)	(2.67)
Green sunfish x pumpkinseed	0.07	0.19	0.00	0.00	0.00	0.00
	(0.07)	(0.19)	(0.00)	(0.00)	(0.00)	(0.00)
Green sunfish x bluegill	0.01	0.00	0.00	0.06	0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)
Smallmouth bass	3.36	1.42	4.00	7.39	3.02	2.58
	(0.52)	(0.89)	(1.58)	(1.25)	(0.60)	(0.81)
Largemouth bass	3.44	5.29	2.08	1.67	0.20	3.04
	(0.58)	(1.41)	(1.35)	(0.79)	(0.12)	(0.68)
White crappie	0.04	0.12	0.00	0.00	0.00	0.00
	(0.04)	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)
Black crappie	1.14	1.73	0.25	0.56	0.08	1.08
	(0.32)	(0.64)	(0.18)	(0.32)	(0.08)	(0.57)
Mud darter	0.07	0.12	0.00	0.00	0.00	0.08
	(0.03)	(0.06)	(0.00)	(0.00)	(0.00)	(0.06)
Johnny darter	2.04	2.08	2.33	1.61	0.05	2.25
	(0.45)	(0.61)	(1.33)	(0.80)	(0.05)	(0.92)
Yellow perch	2.92	5.72	1.42	0.17	0.00	2.29
	(0.92)	(2.61)	(1.15)	(0.09)	(0.00)	(0.64)
Logperch	4.59	4.09	3.17	8.67	1.09	2.79
	(1.04)	(2.51)	(1.92)	(2.01)	(0.49)	(1.00)
Blackside darter	0.01	0.04	0.00	0.00	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Slenderhead darter	0.15	0.15	0.08	0.33	0.09	0.04
	(0.05)	(0.09)	(0.08)	(0.14)	(0.06)	(0.04)
River darter	0.03	0.00	0.00	0.11	0.12	0.00
	(0.02)	(0.00)	(0.00)	(0.08)	(0.12)	(0.00)
Sauger	1.08	1.77	2.58	0.33	0.16	0.71
	(0.20)	(0.48)	(0.92)	(0.11)	(0.09)	(0.27)
Walleye	0.96	1.58	1.00	0.33	0.65	0.79
	(0.19)	(0.45)	(0.58)	(0.14)	(0.19)	(0.29)

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Table 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Sauger x walleye	0.00	0.00	0.00	0.00	0.05	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
Freshwater drum	1.10	1.33	3.25	1.22	0.31	0.54
	(0.32)	(0.46)	(1.93)	(1.11)	(0.12)	(0.19)

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Table 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	MCBW	SCB
Chestnut lamprey	0.00	0.00	0.00	0.03	0.00
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
Silver lamprey	0.00	0.00	0.00	0.07	0.00
	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)
Longnose gar	0.32	0.50	0.17	0.14	0.25
	(0.19)	(0.50)	(0.11)	(0.11)	(0.13)
Shortnose gar	0.30	0.50	0.08	0.08	0.25
	(0.21)	(0.50)	(0.08)	(0.08)	(0.25)
Bowfin	0.16	0.17	0.00	0.00	0.25
	(0.09)	(0.17)	(0.00)	(0.00)	(0.18)
Mooneye	0.42	0.00	1.17	0.44	0.33
	(0.15)	(0.00)	(0.56)	(0.10)	(0.19)
Gizzard shad	2.12	0.50	4.83	3.28	1.92
	(0.82)	(0.34)	(2.85)	(2.03)	(1.09)
Spotfin shiner	27.59	22.50	23.33	0.41	34.92
	(6.43)	(12.88)	(5.31)	(0.31)	(10.82)
Common carp	2.96	1.33	2.17	1.10	4.92
	(0.53)	(0.49)	(0.68)	(0.34)	(1.19)
Mississippi silvery minnow	0.03	0.00	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.00)	(0.08)
Silver chub	0.42	0.83	0.50	0.04	0.00
	(0.31)	(0.83)	(0.34)	(0.04)	(0.00)
Golden shiner	0.26	0.67	0.08	0.00	0.00
	(0.12)	(0.33)	(0.08)	(0.00)	(0.00)
Emerald shiner	51.18	38.17	56.17	4.25	60.17
	(10.67)	(20.31)	(11.39)	(1.41)	(18.39)
River shiner	22.23	13.50	33.08	0.20	23.67
	(10.14)	(13.30)	(11.48)	(0.16)	(21.41)
Spottail shiner	1.10	0.67	0.00	0.00	2.17
	(0.43)	(0.42)	(0.00)	(0.00)	(1.01)
Sand shiner	0.08	0.00	0.33	0.00	0.00
	(0.06)	(0.00)	(0.26)	(0.00)	(0.00)
Channel shiner	34.67	4.17	78.83	1.21	35.58
	(15.66)	(2.37)	(46.21)	(0.58)	(27.67)
Pugnose minnow	1.81	3.67	0.00	0.00	1.25
	(0.62)	(1.61)	(0.00)	(0.00)	(0.62)
Bullhead minnow	22.70	30.17	9.42	0.14	24.17
	(7.20)	(18.52)	(1.99)	(0.10)	(6.95)
River carpsucker	0.03	0.00	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.00)	(0.08)
Quillback	0.41	0.33	0.67	0.10	0.33
	(0.15)	(0.21)	(0.41)	(0.07)	(0.19)
Blue sucker	0.00	0.00	0.00	0.24	0.00
	(0.00)	(0.00)	(0.00)	(0.12)	(0.00)
Northern hog sucker	0.03	0.00	0.00	0.08	0.08
	(0.03)	(0.00)	(0.00)	(0.05)	(0.08)
Smallmouth buffalo	0.11	0.17	0.08	0.04	0.08
	(0.07)	(0.17)	(0.08)	(0.04)	(0.08)
Bigmouth buffalo	0.05	0.00	0.08	0.05	0.08
	(0.04)	(0.00)	(0.08)	(0.05)	(0.08)
Spotted sucker	1.69	4.17	0.00	0.00	0.50
	(0.71)	(1.94)	(0.00)	(0.00)	(0.34)
Silver redhorse	3.19	1.00	4.42	1.33	4.42
	(0.53)	(0.37)	(1.42)	(0.59)	(0.97)
River redhorse	0.11	0.00	0.42	1.79	0.00
	(0.06)	(0.00)	(0.26)	(0.45)	(0.00)
Golden redhorse	1.28	0.33	2.33	0.47	1.50
	(0.42)	(0.33)	(0.76)	(0.15)	(0.91)

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Common name	ALL	BWCS	MCBU	MCBW	SCB
Shorthead redhorse	5.07	3.50	8.83	11.44	4.17
	(0.91)	(1.06)	(2.31)	(2.53)	(1.55)
Channel catfish	0.25	0.17	0.08	0.41	0.42
	(0.10)	(0.17)	(0.08)	(0.15)	(0.19)
Tadpole madtom	0.03	0.00	0.00	0.08	0.08
	(0.03)	(0.00)	(0.00)	(0.08)	(0.08)
Flathead catfish	0.25	0.00	0.50	0.23	0.33
	(0.11)	(0.00)	(0.15)	(0.09)	(0.26)
Northern pike	0.34	0.67	0.00	0.00	0.25
	(0.18)	(0.49)	(0.00)	(0.00)	(0.13)
Central mudminnow	0.06	0.17	0.00	0.00	0.00
	(0.06)	(0.17)	(0.00)	(0.00)	(0.00)
Trout perch	0.03	0.00	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.00)	(0.08)
Burbot	0.00	0.00	0.00	0.03	0.00
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
Brook silverside	5.01	10.00	2.08	0.00	2.33
	(2.46)	(6.74)	(1.04)	(0.00)	(1.07)
White bass	10.21	1.33	15.58	0.55	15.00
	(4.36)	(0.80)	(8.61)	(0.46)	(9.63)
Rock bass	3.42	2.50	3.17	0.34	4.42
	(0.85)	(1.63)	(1.16)	(0.13)	(1.38)
Green sunfish	0.86	0.17	0.42	0.00	1.75
	(0.46)	(0.17)	(0.23)	(0.00)	(1.14)
Pumpkinseed	0.42	1.00	0.00	0.00	0.17
	(0.36)	(1.00)	(0.00)	(0.00)	(0.11)
Orangespotted sunfish	2.24	1.33	0.17	0.03	4.33
	(0.86)	(0.88)	(0.11)	(0.03)	(2.01)
Bluegill	14.93	18.50	5.50	2.98	17.50
	(4.22)	(10.75)	(1.57)	(2.79)	(4.25)
Green sunfish x bluegill	0.02	0.00	0.08	0.00	0.00
	(0.02)	(0.00)	(0.08)	(0.00)	(0.00)
Orangespotted sunfish x bluegill	0.02	0.00	0.08	0.00	0.00
	(0.02)	(0.00)	(0.08)	(0.00)	(0.00)
Smallmouth bass	6.42	0.67	6.17	5.07	11.75
	(2.04)	(0.49)	(1.43)	(1.18)	(5.04)
Largemouth bass	2.31	4.00	0.33	0.47	2.00
	(0.74)	(2.00)	(0.19)	(0.47)	(0.43)
Black crappie	1.74	1.50	0.83	0.52	2.50
	(0.34)	(0.56)	(0.30)	(0.24)	(0.67)
Western sand darter	0.96	2.33	0.50	0.00	0.00
	(0.84)	(2.33)	(0.26)	(0.00)	(0.00)
Mud darter	0.07	0.00	0.17	0.00	0.08
	(0.04)	(0.00)	(0.11)	(0.00)	(0.08)
Fantail darter	0.03	0.00	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.00)	(0.08)
Johnny darter	2.16	1.00	0.58	0.00	4.17
	(0.91)	(0.82)	(0.23)	(0.00)	(2.16)
Banded darter	0.02	0.00	0.08	0.00	0.00
	(0.02)	(0.00)	(0.08)	(0.00)	(0.00)
Yellow perch	2.30	2.50	0.17	0.11	3.42
	(0.95)	(1.06)	(0.11)	(0.08)	(2.18)
Logperch	2.02	0.00	3.92	3.79	2.67
	(0.55)	(0.00)	(1.93)	(3.65)	(0.76)
Slenderhead darter	0.12	0.00	0.08	0.23	0.25
	(0.06)	(0.00)	(0.08)	(0.23)	(0.13)
River darter	0.24	0.00	0.58	0.23	0.25
	(0.14)	(0.00)	(0.50)	(0.16)	(0.18)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	MCBW	SCB
Sauger	3.55	3.00	4.75	0.94	3.33
	(0.74)	(1.61)	(1.15)	(0.28)	(0.94)
Walleye	4.43	2.00	7.00	1.70	5.08
	(0.90)	(0.82)	(2.99)	(0.49)	(1.17)
Sauger x walleye	0.00	0.00	0.00	0.05	0.00
	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
Freshwater drum	1.64	1.00	3.08	2.05	1.33
	(0.45)	(0.82)	(1.15)	(0.78)	(0.51)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS
Chestnut lamprey	0.03	0.03	0.00
	(0.03)	(0.03)	(0.00)
Silver lamprey	0.03	0.03	0.08
	(0.02)	(0.03)	(0.08)
Longnose gar	0.82	0.79	1.02
	(0.30)	(0.33)	(0.77)
Shortnose gar	4.96	5.03	4.48
	(1.55)	(1.73)	(2.85)
Bowfin	0.49	0.48	0.51
	(0.11)	(0.12)	(0.24)
Mooneye	0.02	0.03	0.00
	(0.02)	(0.03)	(0.00)
Gizzard shad	0.92	0.96	0.63
	(0.69)	(0.80)	(0.29)
Spotfin shiner	0.01	0.00	0.08
	(0.01)	(0.00)	(0.08)
Common carp	1.75	1.81	1.30
	(0.37)	(0.42)	(0.42)
Golden shiner	0.09	0.10	0.00
	(0.06)	(0.07)	(0.00)
River carpsucker	0.07	0.08	0.00
	(0.05)	(0.06)	(0.00)
White sucker	0.02	0.02	0.00
	(0.02)	(0.02)	(0.00)
Smallmouth buffalo	0.04	0.05	0.00
	(0.03)	(0.04)	(0.00)
Spotted sucker	0.16	0.18	0.00
	(0.09)	(0.11)	(0.00)
Silver redhorse	1.25	1.33	0.70
	(0.26)	(0.30)	(0.46)
River redhorse	0.02	0.03	0.00
	(0.02)	(0.03)	(0.00)
Golden redhorse	0.14	0.16	0.00
	(0.06)	(0.07)	(0.00)
Shorthead redhorse	0.31	0.30	0.39
	(0.10)	(0.11)	(0.18)
Channel catfish	0.10	0.08	0.23
	(0.05)	(0.06)	(0.12)
Flathead catfish	0.40	0.44	0.09
	(0.12)	(0.14)	(0.09)
Northern pike	0.59	0.67	0.08
	(0.14)	(0.16)	(0.08)
White bass	0.56	0.20	3.00
	(0.23)	(0.11)	(1.65)
Rock bass	1.59	1.81	0.08
	(0.81)	(0.94)	(0.08)
Green sunfish	0.02	0.03	0.00
	(0.02)	(0.03)	(0.00)
Pumpkinseed	0.49	0.56	0.00
	(0.16)	(0.19)	(0.00)
Warmouth	0.16	0.19	0.00
	(0.16)	(0.19)	(0.00)
Orangespotted sunfish	0.12	0.13	0.00
	(0.06)	(0.07)	(0.00)
Bluegill	34.57	38.85	5.17
	(11.65)	(13.40)	(2.49)
Green sunfish x pumpkinseed	0.05	0.05	0.00
	(0.05)	(0.05)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS
Green sunfish x warmouth	0.02	0.03	0.00
	(0.02)	(0.03)	(0.00)
Largemouth bass	0.14	0.16	0.00
	(0.07)	(0.08)	(0.00)
White crappie	0.29	0.33	0.00
	(0.14)	(0.16)	(0.00)
Black crappie	15.26	16.75	5.00
	(2.64)	(3.02)	(2.07)
Yellow perch	0.67	0.77	0.00
	(0.28)	(0.32)	(0.00)
Sauger	0.15	0.11	0.40
	(0.06)	(0.05)	(0.25)
Walleye	0.14	0.14	0.16
	(0.06)	(0.07)	(0.11)
Freshwater drum	0.88	0.86	1.03
	(0.25)	(0.29)	(0.41)

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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Silver lamprey	0.01	0.08	0.00
	(0.01)	(0.08)	(0.00)
Longnose gar	0.05	0.41	0.00
	(0.02)	(0.16)	(0.00)
Shortnose gar	0.09	0.75	0.00
	(0.04)	(0.33)	(0.00)
Bowfin	0.08	0.65	0.00
	(0.03)	(0.21)	(0.00)
Mooneye	0.07	0.00	0.08
	(0.07)	(0.00)	(0.08)
Gizzard shad	0.16	0.70	0.08
	(0.10)	(0.55)	(0.08)
Common carp	0.43	1.74	0.24
	(0.18)	(0.77)	(0.17)
Golden shiner	0.04	0.31	0.00
	(0.02)	(0.17)	(0.00)
River carpsucker	0.02	0.15	0.00
	(0.01)	(0.09)	(0.00)
Quillback	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Highfin carpsucker	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Smallmouth buffalo	0.01	0.08	0.00
	(0.01)	(0.08)	(0.00)
Spotted sucker	0.07	0.60	0.00
	(0.03)	(0.24)	(0.00)
Silver redhorse	1.13	2.42	0.95
	(0.30)	(1.06)	(0.30)
Golden redhorse	0.08	0.11	0.08
	(0.07)	(0.11)	(0.08)
Shorthead redhorse	0.90	1.69	0.79
	(0.24)	(1.32)	(0.20)
Black bullhead	0.01	0.08	0.00
	(0.01)	(0.05)	(0.00)
Yellow bullhead	0.01	0.12	0.00
	(0.01)	(0.12)	(0.00)
Brown bullhead	0.01	0.12	0.00
	(0.01)	(0.12)	(0.00)
Channel catfish	0.18	0.30	0.17
	(0.15)	(0.13)	(0.17)
Flathead catfish	0.16	0.19	0.16
	(0.09)	(0.09)	(0.10)
Northern pike	0.10	0.84	0.00
	(0.04)	(0.30)	(0.00)
White bass	1.74	0.45	1.92
	(0.68)	(0.23)	(0.77)
Rock bass	0.18	1.43	0.00
	(0.14)	(1.16)	(0.00)
Pumpkinseed	0.09	0.76	0.00
	(0.07)	(0.60)	(0.00)
Warmouth	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Orangespotted sunfish	0.01	0.11	0.00
	(0.01)	(0.11)	(0.00)
Bluegill	3.69	29.95	0.00
	(1.57)	(12.75)	(0.00)
White crappie	0.12	0.95	0.00
	(0.09)	(0.70)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Black crappie	2.30	16.42	0.31
	(0.63)	(5.02)	(0.16)
Yellow perch	0.60	4.88	0.00
	(0.27)	(2.16)	(0.00)
Sauger	0.30	0.19	0.32
	(0.14)	(0.10)	(0.16)
Walleye	0.17	0.23	0.16
	(0.14)	(0.15)	(0.16)
Freshwater drum	9.17	0.82	10.34
	(4.18)	(0.25)	(4.77)

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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Chestnut lamprey	0.00	0.00	0.00	0.00	0.08	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)
Longnose gar	0.16	0.00	3.17	0.00	0.00	0.00
	(0.09)	(0.00)	(1.93)	(0.00)	(0.00)	(0.00)
Shortnose gar	0.32	0.37	0.46	0.49	0.00	0.16
	(0.13)	(0.15)	(0.26)	(0.49)	(0.00)	(0.09)
Bowfin	0.05	0.12	0.08	0.00	0.00	0.00
	(0.03)	(0.09)	(0.08)	(0.00)	(0.00)	(0.00)
Gizzard shad	0.21	0.24	0.40	0.38	0.00	0.05
	(0.08)	(0.13)	(0.19)	(0.26)	(0.00)	(0.05)
Spotfin shiner	55.35	36.16	9.70	80.79	45.34	63.27
	(16.28)	(17.65)	(3.83)	(44.82)	(38.01)	(29.51)
Common carp	2.26	0.73	35.58	0.08	0.00	0.62
	(0.85)	(0.34)	(16.83)	(0.08)	(0.00)	(0.41)
Golden shiner	0.23	0.55	0.00	0.00	0.00	0.11
	(0.15)	(0.44)	(0.00)	(0.00)	(0.00)	(0.07)
Emerald shiner	6.27	7.49	9.30	4.48	92.55	5.31
	(1.89)	(4.16)	(4.89)	(2.29)	(92.29)	(2.91)
River shiner	12.53	1.74	0.55	51.25	1.98	0.44
	(7.91)	(0.86)	(0.47)	(34.61)	(1.98)	(0.17)
Spottail shiner	3.53	0.79	0.91	1.36	0.16	7.67
	(2.50)	(0.70)	(0.50)	(0.98)	(0.16)	(6.55)
Sand shiner	0.02	0.00	0.00	0.08	0.00	0.00
	(0.02)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)
Weed shiner	0.26	0.40	0.24	0.21	0.00	0.16
	(0.11)	(0.26)	(0.13)	(0.21)	(0.00)	(0.12)
Channel shiner	19.29	0.13	0.00	83.09	1.49	0.56
	(17.27)	(0.07)	(0.00)	(75.57)	(0.93)	(0.28)
Pugnose minnow	24.61	63.42	0.90	0.08	0.00	7.80
	(15.48)	(45.32)	(0.61)	(0.08)	(0.00)	(4.76)
Bluntnose minnow	0.02	0.05	0.00	0.00	0.00	0.00
	(0.02)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)
Fathead minnow	0.01	0.04	0.00	0.00	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Bullhead minnow	8.37	9.66	2.07	3.94	4.19	10.75
	(2.24)	(2.41)	(1.53)	(1.81)	(3.10)	(5.40)
Quillback	0.21	0.00	2.43	0.40	0.00	0.00
	(0.11)	(0.00)	(1.13)	(0.40)	(0.00)	(0.00)
White sucker	0.00	0.00	0.08	0.00	0.00	0.00
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
Blue sucker	0.00	0.00	0.08	0.00	0.00	0.00
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
Smallmouth buffalo	0.01	0.00	0.17	0.00	0.00	0.00
	(0.01)	(0.00)	(0.17)	(0.00)	(0.00)	(0.00)
Spotted sucker	0.05	0.08	0.00	0.00	0.00	0.05
	(0.03)	(0.08)	(0.00)	(0.00)	(0.00)	(0.05)
Silver redhorse	0.44	0.48	0.08	1.08	0.08	0.05
	(0.22)	(0.39)	(0.08)	(0.73)	(0.08)	(0.05)
Shorthead redhorse	0.53	0.29	0.08	1.57	0.00	0.16
	(0.27)	(0.18)	(0.08)	(1.16)	(0.00)	(0.09)
Stonecat	0.02	0.00	0.00	0.07	0.00	0.00
	(0.02)	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)
Tadpole madtom	0.02	0.04	0.08	0.00	0.08	0.00
	(0.01)	(0.04)	(0.08)	(0.00)	(0.08)	(0.00)
Flathead catfish	0.05	0.00	0.07	0.00	0.00	0.11
	(0.03)	(0.00)	(0.07)	(0.00)	(0.00)	(0.08)
Northern pike	0.14	0.12	0.00	0.08	0.00	0.22
	(0.06)	(0.09)	(0.00)	(0.08)	(0.00)	(0.13)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Brook silverside	0.42	0.37	2.86	0.32	0.00	0.22
	(0.16)	(0.28)	(1.99)	(0.25)	(0.00)	(0.13)
White bass	0.46	0.49	5.08	0.08	0.25	0.06
	(0.23)	(0.39)	(3.71)	(0.08)	(0.18)	(0.06)
Rock bass	0.24	0.17	0.16	0.40	0.00	0.22
	(0.06)	(0.08)	(0.10)	(0.19)	(0.00)	(0.10)
Green sunfish	0.35	0.82	0.08	0.00	0.00	0.17
	(0.20)	(0.58)	(0.08)	(0.00)	(0.00)	(0.12)
Pumpkinseed	0.51	1.26	0.16	0.23	0.00	0.06
	(0.31)	(0.92)	(0.11)	(0.16)	(0.00)	(0.06)
Orangespotted sunfish	1.68	4.65	0.08	0.15	0.00	0.16
	(0.90)	(2.66)	(0.08)	(0.10)	(0.00)	(0.09)
Bluegill	25.86	36.29	3.08	6.42	0.46	31.39
	(9.91)	(16.52)	(2.16)	(3.34)	(0.27)	(21.55)
Green sunfish x bluegill	0.02	0.05	0.00	0.00	0.00	0.00
	(0.02)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)
Smallmouth bass	0.12	0.05	0.08	0.15	0.00	0.16
	(0.04)	(0.05)	(0.08)	(0.10)	(0.00)	(0.09)
Largemouth bass	0.38	0.42	2.34	0.17	0.00	0.21
	(0.13)	(0.27)	(1.62)	(0.11)	(0.00)	(0.12)
White crappie	0.03	0.08	0.00	0.00	0.00	0.00
	(0.03)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Black crappie	0.79	1.71	0.50	0.38	0.08	0.27
	(0.32)	(0.90)	(0.29)	(0.26)	(0.08)	(0.17)
Mud darter	0.19	0.48	0.08	0.00	0.08	0.05
	(0.12)	(0.36)	(0.08)	(0.00)	(0.08)	(0.05)
Johnny darter	1.78	2.93	1.50	2.74	0.09	0.21
	(0.73)	(1.66)	(0.74)	(2.02)	(0.09)	(0.10)
Yellow perch	0.50	0.32	0.24	1.32	0.00	0.21
	(0.20)	(0.12)	(0.13)	(0.85)	(0.00)	(0.10)
Logperch	1.36	1.30	1.42	3.42	0.15	0.16
	(0.67)	(0.92)	(0.98)	(2.57)	(0.15)	(0.09)
Slenderhead darter	0.03	0.04	0.00	0.00	0.00	0.05
	(0.02)	(0.04)	(0.00)	(0.00)	(0.00)	(0.05)
River darter	0.09	0.04	0.00	0.32	0.00	0.00
	(0.06)	(0.04)	(0.00)	(0.25)	(0.00)	(0.00)
Sauger	0.06	0.00	0.00	0.16	0.00	0.06
	(0.03)	(0.00)	(0.00)	(0.11)	(0.00)	(0.06)
Walleye	0.08	0.12	0.09	0.07	0.00	0.06
	(0.04)	(0.07)	(0.09)	(0.07)	(0.00)	(0.06)
Freshwater drum	0.47	0.28	5.09	0.08	0.00	0.28
	(0.26)	(0.14)	(4.99)	(0.08)	(0.00)	(0.20)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Shortnose gar	0.02	0.15	0.00
	(0.01)	(0.08)	(0.00)
Mooneye	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Gizzard shad	0.13	1.09	0.00
	(0.12)	(1.01)	(0.00)
Spotfin shiner	0.50	0.30	0.53
	(0.47)	(0.23)	(0.53)
Common carp	2.33	13.41	0.77
	(1.71)	(13.29)	(0.58)
Golden shiner	0.03	0.23	0.00
	(0.02)	(0.19)	(0.00)
Emerald shiner	3.28	0.89	3.62
	(3.01)	(0.40)	(3.44)
River shiner	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Spottail shiner	0.09	0.11	0.08
	(0.07)	(0.08)	(0.08)
Sand shiner	0.01	0.04	0.00
	(0.01)	(0.04)	(0.00)
Pugnose minnow	4.06	32.90	0.00
	(3.07)	(24.98)	(0.00)
Bullhead minnow	1.03	4.59	0.53
	(0.50)	(1.34)	(0.53)
Spotted sucker	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Silver redhorse	0.15	0.08	0.16
	(0.14)	(0.08)	(0.16)
Shorthead redhorse	0.01	0.04	0.00
	(0.01)	(0.04)	(0.00)
Channel catfish	0.07	0.00	0.08
	(0.07)	(0.00)	(0.08)
Stonecat	0.01	0.08	0.00
	(0.01)	(0.05)	(0.00)
Tadpole madtom	0.03	0.24	0.00
	(0.02)	(0.14)	(0.00)
Northern pike	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Trout perch	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
White bass	0.22	0.11	0.23
	(0.14)	(0.08)	(0.16)
Rock bass	0.01	0.12	0.00
	(0.01)	(0.06)	(0.00)
Green sunfish	0.03	0.26	0.00
	(0.03)	(0.26)	(0.00)
Pumpkinseed	0.06	0.48	0.00
	(0.05)	(0.44)	(0.00)
Warmouth	0.01	0.12	0.00
	(0.01)	(0.08)	(0.00)
Orangespotted sunfish	0.07	0.58	0.00
	(0.05)	(0.41)	(0.00)
Bluegill	3.04	24.62	0.00
	(1.70)	(13.79)	(0.00)
Smallmouth bass	0.01	0.12	0.00
	(0.01)	(0.12)	(0.00)
Largemouth bass	0.04	0.31	0.00
	(0.03)	(0.22)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
White crappie	0.01	0.11	0.00
	(0.01)	(0.11)	(0.00)
Black crappie	0.51	4.16	0.00
	(0.22)	(1.80)	(0.00)
Mud darter	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Iowa darter	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Johnny darter	0.67	1.59	0.54
	(0.32)	(0.92)	(0.35)
Yellow perch	0.21	1.18	0.08
	(0.09)	(0.48)	(0.08)
Logperch	0.29	0.70	0.23
	(0.20)	(0.36)	(0.23)
River darter	0.03	0.20	0.00
	(0.02)	(0.17)	(0.00)
Sauger	0.00	0.04	0.00
	(0.00)	(0.04)	(0.00)
Walleye	0.07	0.00	0.08
	(0.07)	(0.00)	(0.08)
Freshwater drum	4.05	0.57	4.55
	(2.11)	(0.32)	(2.40)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO	MCBU	MCBW	SCB
Chestnut lamprey	0.00	0.00	0.00	0.04	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Longnose gar	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Bowfin	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Spotfin shiner	0.01	0.00	0.00	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)
Common carp	0.06	0.13	0.00	0.00	0.00	0.26
	(0.03)	(0.07)	(0.00)	(0.00)	(0.00)	(0.17)
Golden shiner	0.01	0.08	0.00	0.00	0.00	0.00
	(0.01)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Smallmouth buffalo	0.05	0.00	0.00	0.16	0.04	0.16
	(0.03)	(0.00)	(0.00)	(0.12)	(0.04)	(0.16)
Silver redhorse	0.01	0.08	0.00	0.00	0.00	0.00
	(0.01)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Shorthead redhorse	0.04	0.00	0.04	0.08	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.08)	(0.04)	(0.00)
Yellow bullhead	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Channel catfish	1.69	0.32	1.58	1.31	0.69	2.93
	(0.44)	(0.21)	(0.61)	(0.49)	(0.39)	(1.21)
Flathead catfish	0.05	0.00	0.08	0.00	0.00	0.00
	(0.03)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)
Pumpkinseed	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Orangespotted sunfish	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Bluegill	0.07	0.37	0.00	0.00	0.04	0.20
	(0.03)	(0.21)	(0.00)	(0.00)	(0.04)	(0.09)
Smallmouth bass	0.01	0.00	0.00	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)
White crappie	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Black crappie	0.05	0.58	0.00	0.00	0.00	0.00
	(0.03)	(0.33)	(0.00)	(0.00)	(0.00)	(0.00)
Yellow perch	0.09	0.99	0.00	0.00	0.00	0.00
	(0.08)	(0.95)	(0.00)	(0.00)	(0.00)	(0.00)
Freshwater drum	0.35	0.08	0.53	0.12	0.00	0.04
	(0.13)	(0.08)	(0.21)	(0.09)	(0.00)	(0.04)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO	MCBU	MCBW	SCB
Longnose gar	0.03	0.00	0.04	0.00	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.00)	(0.04)	(0.00)
Shortnose gar	0.03	0.00	0.04	0.00	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.00)	(0.04)	(0.00)
Common carp	0.24	0.17	0.12	0.33	0.00	0.61
	(0.08)	(0.13)	(0.06)	(0.29)	(0.00)	(0.33)
Quillback	0.03	0.00	0.04	0.00	0.00	0.00
	(0.03)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)
Smallmouth buffalo	2.33	0.53	1.93	3.08	0.98	4.08
	(0.51)	(0.33)	(0.50)	(1.55)	(0.49)	(2.01)
Spotted sucker	0.01	0.12	0.00	0.00	0.00	0.00
	(0.01)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
Silver redhorse	0.07	0.29	0.04	0.00	0.12	0.08
	(0.03)	(0.21)	(0.04)	(0.00)	(0.06)	(0.08)
Golden redhorse	0.00	0.04	0.00	0.00	0.00	0.00
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Shorthead redhorse	0.18	0.20	0.20	0.20	0.33	0.08
	(0.07)	(0.09)	(0.11)	(0.16)	(0.25)	(0.06)
Channel catfish	1.57	0.66	1.44	1.31	1.45	2.56
	(0.34)	(0.27)	(0.49)	(0.56)	(0.78)	(0.74)
Flathead catfish	0.05	0.04	0.00	0.32	0.20	0.08
	(0.02)	(0.04)	(0.00)	(0.14)	(0.07)	(0.05)
Northern pike	0.02	0.12	0.00	0.00	0.04	0.04
	(0.01)	(0.06)	(0.00)	(0.00)	(0.04)	(0.04)
White bass	0.07	0.00	0.08	0.00	0.04	0.12
	(0.04)	(0.00)	(0.06)	(0.00)	(0.04)	(0.06)
Rock bass	0.00	0.00	0.00	0.04	0.08	0.00
	(0.00)	(0.00)	(0.00)	(0.04)	(0.08)	(0.00)
Bluegill	0.20	1.85	0.00	0.00	0.08	0.21
	(0.09)	(0.97)	(0.00)	(0.00)	(0.06)	(0.14)
Smallmouth bass	0.07	0.00	0.08	0.00	0.00	0.12
	(0.05)	(0.00)	(0.08)	(0.00)	(0.00)	(0.09)
White crappie	0.01	0.12	0.00	0.00	0.00	0.00
	(0.01)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Black crappie	0.34	2.91	0.00	0.16	1.22	0.37
	(0.13)	(1.43)	(0.00)	(0.09)	(0.65)	(0.23)
Walleye	0.03	0.00	0.04	0.00	0.00	0.00
	(0.03)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)
Freshwater drum	0.86	0.21	1.21	0.54	0.08	0.17
	(0.31)	(0.21)	(0.50)	(0.25)	(0.06)	(0.17)

Strata: BWCS - Backwater, contiguous, shoreline
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TRI - Tributary mouth
TWZ - Tailwater

Table 2.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Shortnose gar	0.03	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.08)
Bowfin	0.03	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.08)
Mooneye	0.01	0.00	0.04	0.00
	(0.01)	(0.00)	(0.04)	(0.00)
Gizzard shad	1.90	2.33	0.00	2.67
	(1.06)	(1.62)	(0.00)	(2.24)
Spotfin shiner	60.74	11.25	16.79	131.83
	(31.91)	(5.74)	(4.74)	(79.80)
Common carp	0.05	0.00	0.21	0.00
	(0.05)	(0.00)	(0.21)	(0.00)
Golden shiner	0.01	0.00	0.04	0.00
	(0.01)	(0.00)	(0.04)	(0.00)
Emerald shiner	64.93	19.92	61.33	107.58
	(19.14)	(13.72)	(26.43)	(43.58)
River shiner	10.16	0.00	20.96	12.75
	(2.54)	(0.00)	(6.88)	(4.84)
Spottail shiner	2.10	0.00	1.67	4.25
	(1.03)	(0.00)	(1.37)	(2.43)
Sand shiner	0.03	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.08)
Channel shiner	14.33	1.33	32.42	15.08
	(6.58)	(0.72)	(23.25)	(8.67)
Pugnose minnow	5.12	11.42	0.38	2.33
	(2.20)	(5.82)	(0.38)	(1.72)
Fathead minnow	0.02	0.00	0.08	0.00
	(0.02)	(0.00)	(0.08)	(0.00)
Bullhead minnow	9.17	7.42	6.00	12.67
	(1.87)	(3.36)	(1.57)	(3.46)
Quillback	0.28	0.00	1.04	0.08
	(0.13)	(0.00)	(0.54)	(0.08)
Blue sucker	0.01	0.00	0.04	0.00
	(0.01)	(0.00)	(0.04)	(0.00)
Spotted sucker	0.03	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.08)
Silver redhorse	0.62	0.00	0.38	1.33
	(0.30)	(0.00)	(0.30)	(0.74)
Shorthead redhorse	0.33	0.00	0.25	0.67
	(0.27)	(0.00)	(0.25)	(0.67)
Tadpole madtom	0.03	0.00	0.00	0.08
	(0.03)	(0.00)	(0.00)	(0.08)
Northern pike	0.09	0.25	0.00	0.00
	(0.06)	(0.18)	(0.00)	(0.00)
Brook silverside	1.51	0.50	0.67	2.92
	(0.98)	(0.50)	(0.43)	(2.41)
White bass	1.67	0.00	0.83	3.67
	(0.80)	(0.00)	(0.50)	(1.98)
Rock bass	0.12	0.00	0.21	0.17
	(0.08)	(0.00)	(0.17)	(0.17)
Pumpkinseed	0.09	0.25	0.00	0.00
	(0.09)	(0.25)	(0.00)	(0.00)
Orangespotted sunfish	5.10	13.75	0.00	0.42
	(4.00)	(11.16)	(0.00)	(0.34)
Bluegill	17.32	47.42	0.67	0.33
	(9.15)	(25.52)	(0.37)	(0.19)
Smallmouth bass	0.09	0.00	0.25	0.08
	(0.04)	(0.00)	(0.12)	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
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Table 2.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 8 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 2.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Largemouth bass	0.71	1.67	0.04	0.25
	(0.31)	(0.84)	(0.04)	(0.18)
White crappie	0.19	0.33	0.00	0.17
	(0.10)	(0.26)	(0.00)	(0.11)
Black crappie	0.79	0.25	0.00	1.75
	(0.48)	(0.25)	(0.00)	(1.18)
Western sand darter	3.20	0.17	6.54	3.92
	(1.29)	(0.17)	(2.37)	(2.90)
Mud darter	0.13	0.00	0.00	0.33
	(0.09)	(0.00)	(0.00)	(0.22)
Johnny darter	1.41	0.25	0.50	3.00
	(0.74)	(0.18)	(0.31)	(1.85)
Yellow perch	0.53	0.33	0.33	0.83
	(0.29)	(0.26)	(0.13)	(0.67)
Logperch	0.40	0.08	0.42	0.67
	(0.13)	(0.08)	(0.18)	(0.31)
Slenderhead darter	0.08	0.00	0.04	0.17
	(0.05)	(0.00)	(0.04)	(0.11)
River darter	0.23	0.00	0.00	0.58
	(0.16)	(0.00)	(0.00)	(0.40)
Sauger	0.08	0.17	0.08	0.00
	(0.06)	(0.17)	(0.06)	(0.00)
Walleye	0.30	0.08	0.58	0.33
	(0.13)	(0.08)	(0.32)	(0.26)
Freshwater drum	0.80	0.75	0.00	1.33
	(0.35)	(0.59)	(0.00)	(0.71)

Strata: BWCS - Backwater, contiguous, shoreline
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MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	BWCS
Longnose gar	0.07 (0.07)
Bowfin	0.06 (0.06)
Gizzard shad	1.96 (0.81)
Spotfin shiner	11.80 (4.36)
Common carp	1.28 (1.00)
Emerald shiner	5.72 (3.12)
River shiner	0.34 (0.15)
Spottail shiner	3.15 (1.58)
Channel shiner	10.16 (9.33)
Pugnose minnow	0.53 (0.35)
Fathead minnow	0.16 (0.16)
Bullhead minnow	21.16 (7.62)
Quillback	0.33 (0.23)
Highfin carpsucker	0.07 (0.07)
Smallmouth buffalo	0.13 (0.08)
Bigmouth buffalo	0.06 (0.06)
Spotted sucker	2.68 (0.96)
Silver redhorse	2.91 (0.90)
Golden redhorse	1.33 (0.46)
Shorthead redhorse	1.10 (0.54)
Channel catfish	0.20 (0.14)
Tadpole madtom	0.06 (0.06)
Flathead catfish	0.06 (0.06)
Northern pike	0.96 (0.41)
Brook silverside	0.94 (0.81)
White bass	1.70 (1.19)
Rock bass	1.49 (0.78)
Green sunfish	0.91 (0.32)
Pumpkinseed	1.02 (0.58)
Orangespotted sunfish	2.34 (1.32)

Strata: BWCS - Backwater, contiguous, shoreline
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SCB - Side channel border
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Table 2.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	BWCS
Bluegill	52.54
	(17.14)
Green sunfish x pumpkinseed	0.06
	(0.06)
Smallmouth bass	1.07
	(0.27)
Largemouth bass	12.37
	(4.19)
Black crappie	1.38
	(0.51)
Mud darter	0.20
	(0.10)
Johnny darter	2.03
	(1.27)
Yellow perch	7.77
	(1.46)
Logperch	4.38
	(2.02)
Sauger	0.60
	(0.21)
Walleye	1.77
	(0.67)
Freshwater drum	0.27
	(0.20)

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MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Chestnut lamprey	0.20 (0.11)
Silver lamprey	0.13 (0.09)
Longnose gar	0.21 (0.11)
Bowfin	0.14 (0.14)
Mooneye	0.65 (0.31)
Gizzard shad	27.91 (20.23)
Spotfin shiner	2.00 (0.81)
Common carp	1.70 (0.47)
Silver chub	0.38 (0.19)
Golden shiner	0.09 (0.09)
Emerald shiner	12.23 (10.10)
River shiner	4.36 (2.13)
Spottail shiner	0.24 (0.19)
Channel shiner	8.06 (4.71)
Fathead minnow	0.11 (0.07)
Bullhead minnow	2.86 (1.53)
River carpsucker	0.45 (0.17)
Quillback	2.97 (1.26)
Highfin carpsucker	0.19 (0.11)
White sucker	0.09 (0.06)
Northern hog sucker	0.14 (0.10)
Smallmouth buffalo	0.40 (0.25)
Bigmouth buffalo	0.05 (0.05)
Spotted sucker	0.05 (0.05)
Silver redhorse	3.12 (0.93)
Golden redhorse	4.79 (1.57)
Shorthead redhorse	15.53 (4.62)
Channel catfish	0.28 (0.11)
Tadpole madtom	0.06 (0.06)
Flathead catfish	1.03 (0.29)

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MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Northern pike	0.37
	(0.14)
Brown trout	0.04
	(0.04)
Burbot	0.09
	(0.06)
Brook silverside	0.24
	(0.13)
White bass	31.41
	(9.62)
Rock bass	3.00
	(1.05)
Green sunfish	0.14
	(0.08)
Pumpkinseed	0.06
	(0.06)
Orangespotted sunfish	0.27
	(0.18)
Bluegill	8.00
	(2.18)
Smallmouth bass	9.41
	(3.05)
Largemouth bass	0.85
	(0.26)
Black crappie	1.16
	(0.27)
Western sand darter	1.13
	(0.53)
Johnny darter	0.34
	(0.15)
Yellow perch	1.43
	(1.14)
Logperch	3.64
	(0.72)
Slenderhead darter	0.29
	(0.17)
River darter	0.55
	(0.38)
Sauger	82.33
	(32.51)
Walleye	20.83
	(4.50)
Sauger x walleye	0.14
	(0.14)
Freshwater drum	35.53
	(14.48)

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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

Common name	BWCS
Longnose gar	0.23
	(0.23)
Shortnose gar	0.61
	(0.61)
Bowfin	0.47
	(0.14)
Gizzard shad	0.15
	(0.15)
Common carp	1.36
	(0.64)
Golden shiner	0.08
	(0.08)
Spotted sucker	0.62
	(0.40)
Silver redhorse	0.62
	(0.21)
Golden redhorse	0.08
	(0.08)
Shorthead redhorse	0.77
	(0.32)
Yellow bullhead	0.08
	(0.08)
Flathead catfish	0.30
	(0.17)
Northern pike	0.54
	(0.27)
White bass	0.39
	(0.27)
Rock bass	3.01
	(1.39)
Green sunfish	0.16
	(0.11)
Pumpkinseed	3.76
	(1.68)
Orangespotted sunfish	0.16
	(0.11)
Bluegill	63.09
	(14.01)
Green sunfish x pumpkinseed	0.08
	(0.08)
Green sunfish x bluegill	0.23
	(0.12)
Largemouth bass	0.08
	(0.08)
White crappie	0.16
	(0.10)
Black crappie	48.27
	(12.67)
Yellow perch	2.50
	(0.92)
Sauger	0.08
	(0.08)
Walleye	0.08
	(0.08)
Freshwater drum	1.01
	(0.39)

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Table 2.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Spotfin shiner	26.07 (13.20)
Common carp	2.43 (2.06)
Golden shiner	0.16 (0.16)
Emerald shiner	1.94 (1.03)
River shiner	0.65 (0.48)
Spottail shiner	0.32 (0.20)
Channel shiner	3.25 (2.06)
Pugnose minnow	1.94 (1.94)
Fathead minnow	0.16 (0.16)
Bullhead minnow	2.43 (1.03)
Creek chub	0.16 (0.16)
Silver redhorse	0.33 (0.21)
Yellow bullhead	0.49 (0.49)
Tadpole madtom	0.16 (0.16)
Brook silverside	0.16 (0.16)
White bass	2.91 (2.19)
Green sunfish	1.62 (1.43)
Pumpkinseed	1.29 (1.29)
Orangespotted sunfish	0.49 (0.49)
Bluegill	67.16 (63.88)
Orangespotted sunfish x bluegill	0.16 (0.16)
Smallmouth bass	0.49 (0.49)
Largemouth bass	1.46 (1.27)
Black crappie	0.16 (0.16)
Mud darter	0.16 (0.16)
Johnny darter	15.86 (15.28)
Yellow perch	1.13 (1.13)
Logperch	2.59 (1.50)
River darter	1.78 (0.88)
Sauger	0.16 (0.16)

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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	TWZ
Walleye	0.32 (0.20)

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SCB - Side channel border
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Table 2.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Common carp	0.08
	(0.08)
Smallmouth buffalo	0.24
	(0.11)
Shorthead redhorse	0.08
	(0.08)
Channel catfish	8.14
	(6.82)
Rock bass	0.16
	(0.10)
Bluegill	0.08
	(0.08)
White crappie	0.08
	(0.08)
Freshwater drum	0.08
	(0.08)

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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Common carp	0.08
	(0.08)
Smallmouth buffalo	12.02
	(6.36)
Golden redhorse	0.16
	(0.10)
Shorthead redhorse	0.49
	(0.25)
Channel catfish	13.51
	(6.89)
White bass	0.24
	(0.17)
Bluegill	1.30
	(0.59)
White crappie	0.08
	(0.08)
Black crappie	2.20
	(0.89)
Freshwater drum	0.81
	(0.37)

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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	BWCS	TWZ
Longnose gar	0.08	0.08
	(0.08)	(0.08)
Gizzard shad	34.17	1.25
	(32.39)	(0.52)
Spotfin shiner	172.08	20.50
	(101.26)	(7.93)
Common carp	0.08	0.00
	(0.08)	(0.00)
Emerald shiner	48.00	29.92
	(43.45)	(16.52)
River shiner	1.42	12.33
	(0.60)	(5.17)
Spottail shiner	6.00	2.25
	(2.71)	(1.78)
Mimic shiner	0.00	0.08
	(0.00)	(0.08)
Channel shiner	2.00	10.33
	(1.48)	(6.10)
Pugnose minnow	10.50	0.08
	(7.64)	(0.08)
Fathead minnow	0.08	0.00
	(0.08)	(0.00)
Bullhead minnow	46.83	5.75
	(18.41)	(2.93)
Quillback	0.08	0.50
	(0.08)	(0.29)
White sucker	0.00	0.08
	(0.00)	(0.08)
Spotted sucker	0.08	0.00
	(0.08)	(0.00)
Silver redhorse	0.17	0.00
	(0.11)	(0.00)
Golden redhorse	0.00	0.08
	(0.00)	(0.08)
Tadpole madtom	0.17	0.00
	(0.17)	(0.00)
Northern pike	0.08	0.00
	(0.08)	(0.00)
Brook silverside	6.17	1.08
	(3.08)	(0.65)
White bass	1.75	4.67
	(1.75)	(2.03)
Rock bass	2.00	0.00
	(1.82)	(0.00)
Green sunfish	0.08	0.00
	(0.08)	(0.00)
Pumpkinseed	0.17	0.00
	(0.17)	(0.00)
Orangespotted sunfish	2.83	0.08
	(2.24)	(0.08)
Bluegill	45.25	1.08
	(21.14)	(0.51)
Smallmouth bass	0.42	0.00
	(0.23)	(0.00)
Largemouth bass	1.75	0.25
	(0.98)	(0.18)
Black crappie	0.50	0.00
	(0.29)	(0.00)
Western sand darter	0.00	1.08
	(0.00)	(0.60)

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Table 2.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	BWCS	TWZ
Mud darter	0.08	0.00
	(0.08)	(0.00)
Johnny darter	4.92	1.00
	(2.50)	(1.00)
Yellow perch	3.00	2.58
	(1.02)	(1.97)
Logperch	2.08	4.17
	(1.31)	(3.54)
Slenderhead darter	0.08	0.00
	(0.08)	(0.00)
River darter	0.00	0.33
	(0.00)	(0.19)
Sauger	0.00	0.08
	(0.00)	(0.08)
Walleye	0.33	0.33
	(0.19)	(0.22)
Freshwater drum	0.08	0.50
	(0.08)	(0.42)

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SCB - Side channel border
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TWZ - Tailwater

Table 2.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using bottom trawling in Pool 8 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Shovelnose sturgeon	0.33
	(0.14)
Gizzard shad	0.08
	(0.08)
Silver chub	0.25
	(0.25)
Quillback	0.17
	(0.17)
Silver redhorse	0.08
	(0.08)
Shorthead redhorse	0.42
	(0.34)
Channel catfish	0.92
	(0.58)
River darter	0.08
	(0.08)
Sauger	0.33
	(0.26)
Walleye	0.08
	(0.08)
Freshwater drum	2.00
	(1.34)

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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

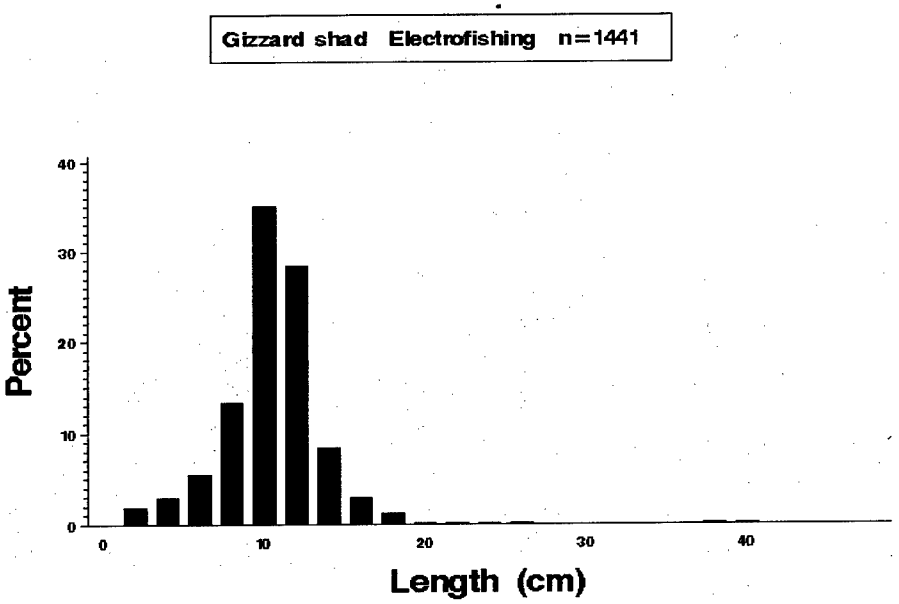

Figure 2.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

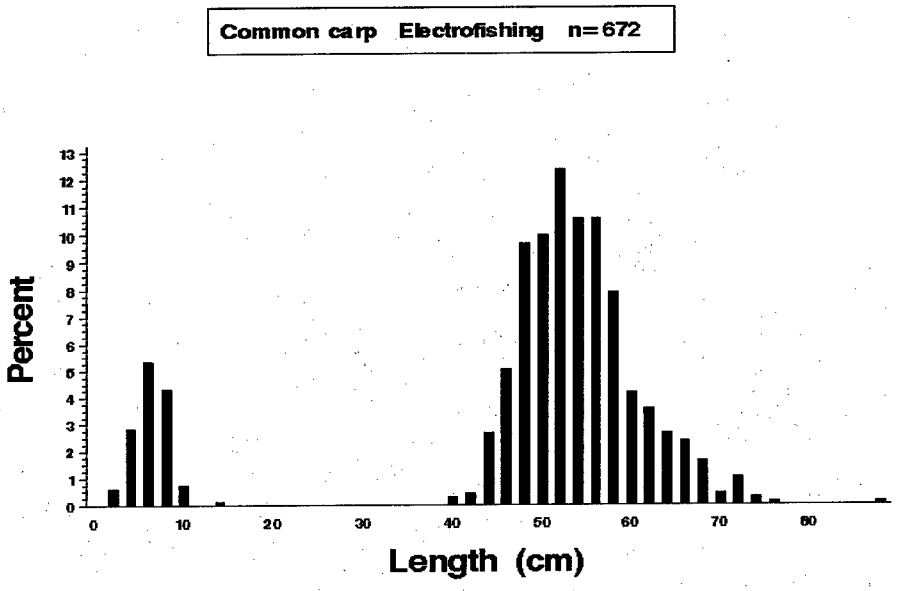

Figure 2.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

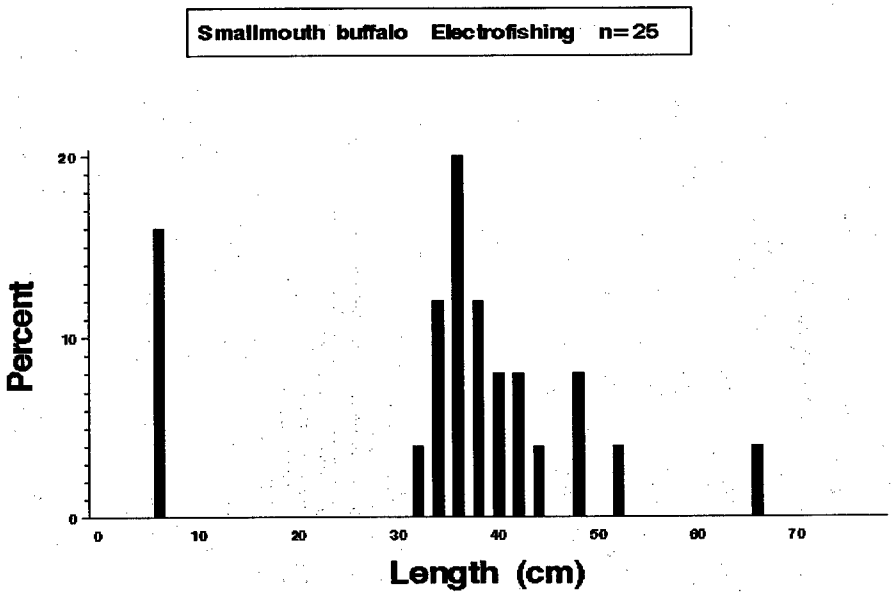

Figure 2.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

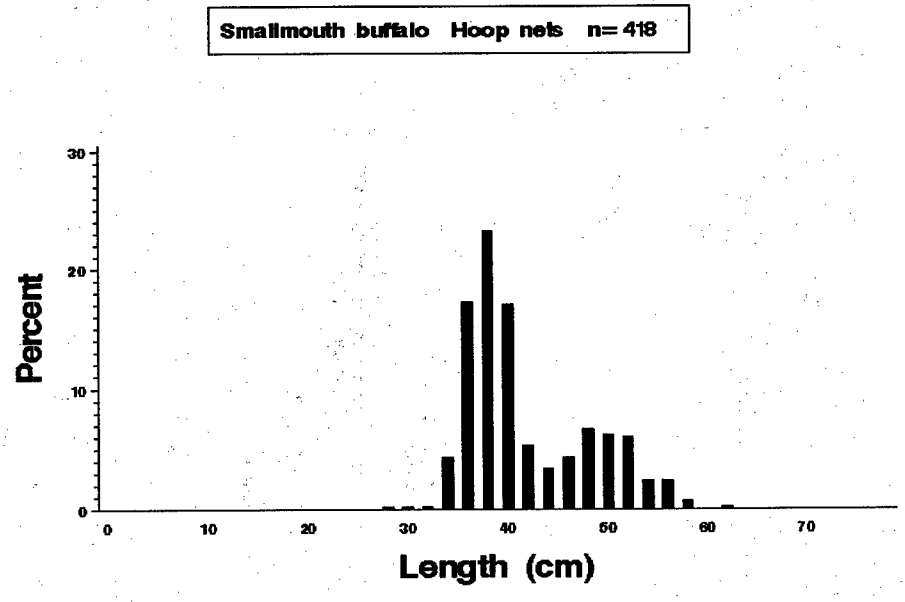

Figure 2.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 8 during 1997.

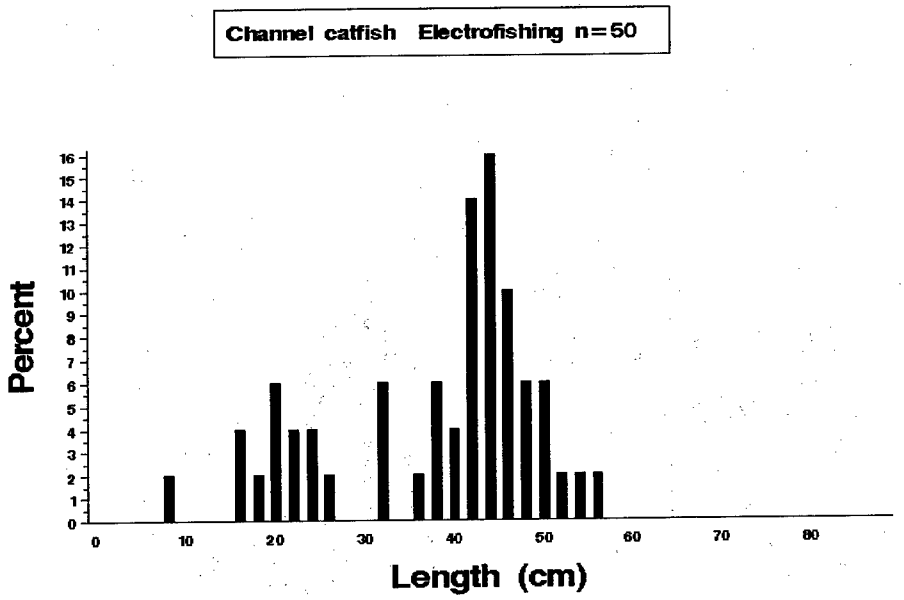

Figure 2.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

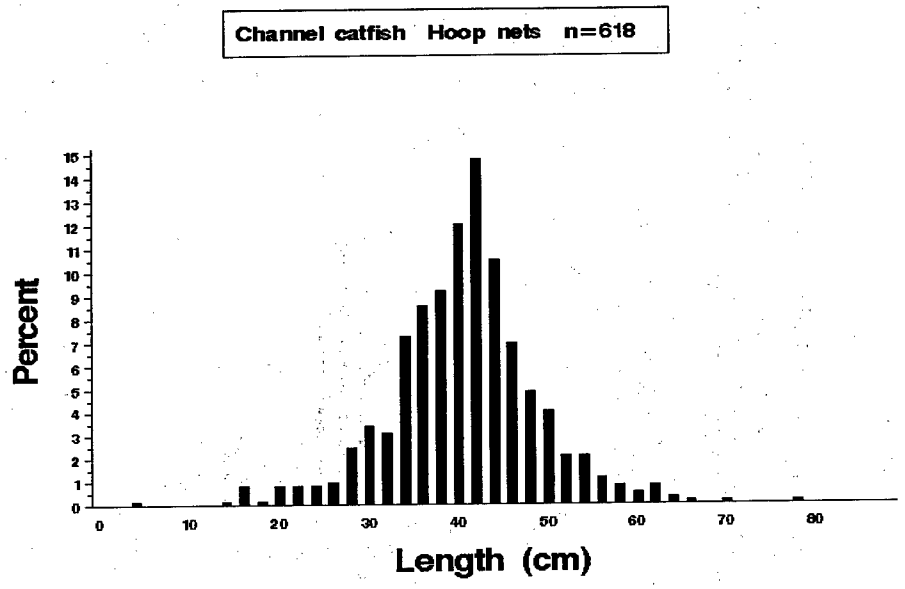

Figure 2.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 8 during 1997.

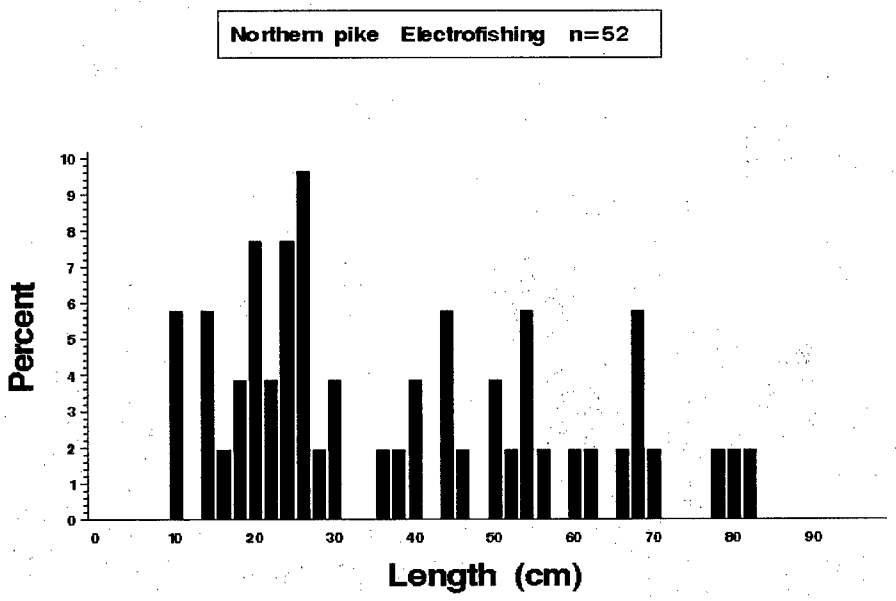

Figure 2.8. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

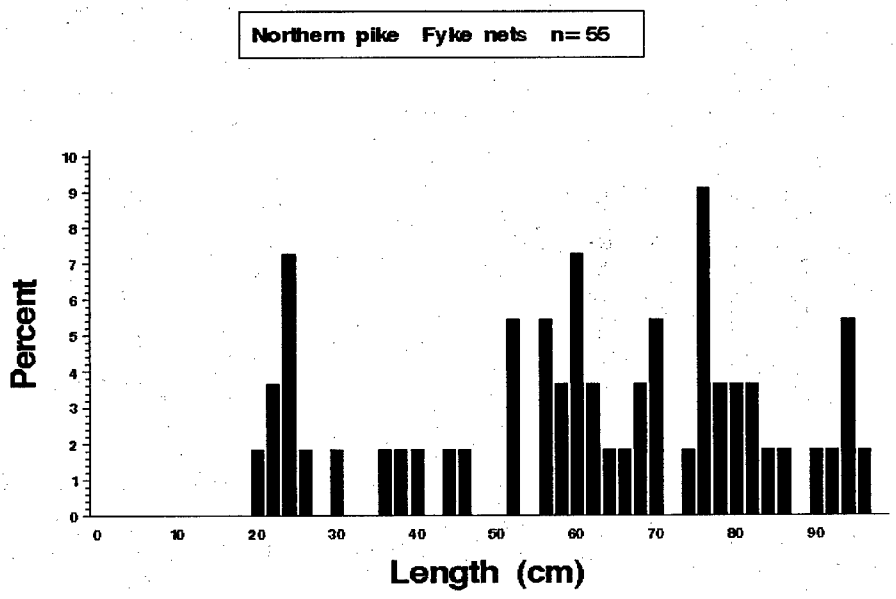

Figure 2.9. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 8 during 1997.

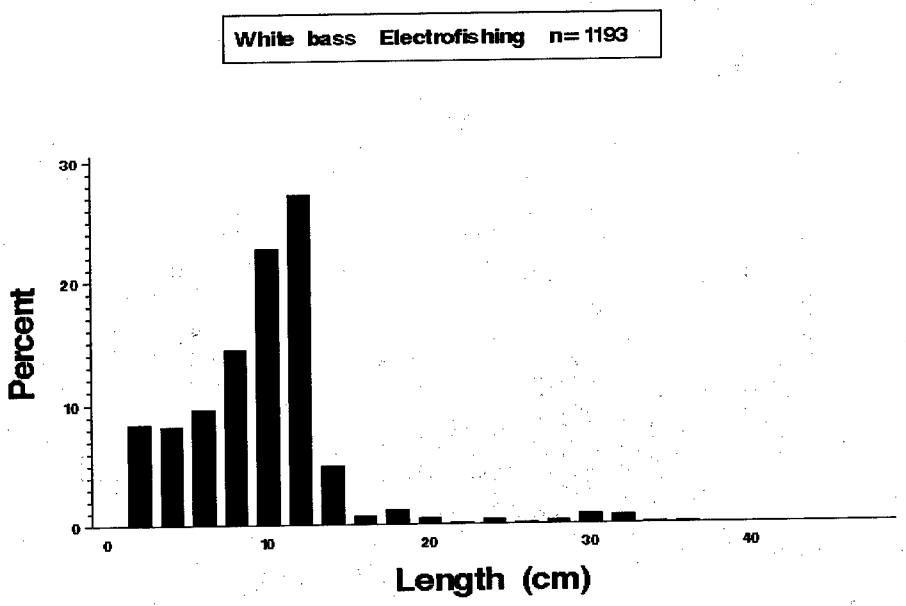

Figure 2.10. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

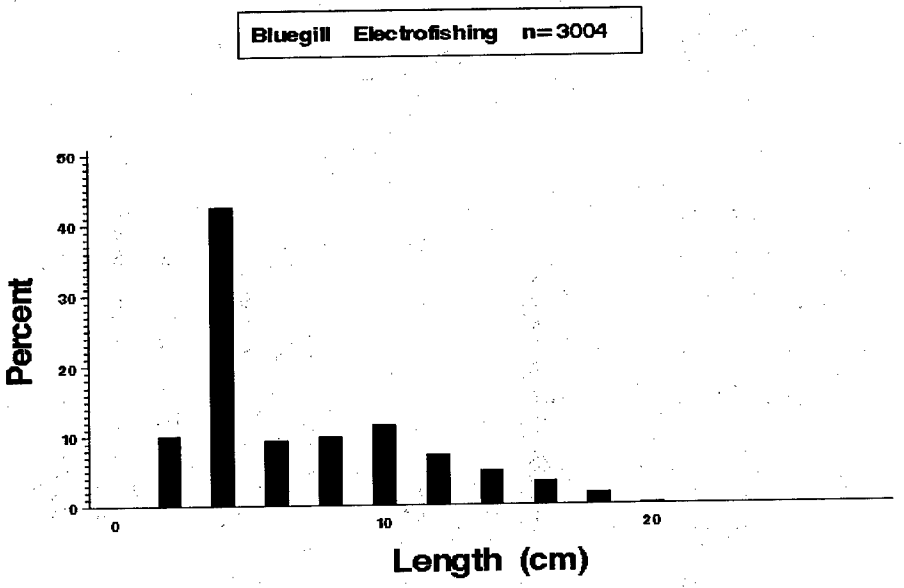

Figure 2.11. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

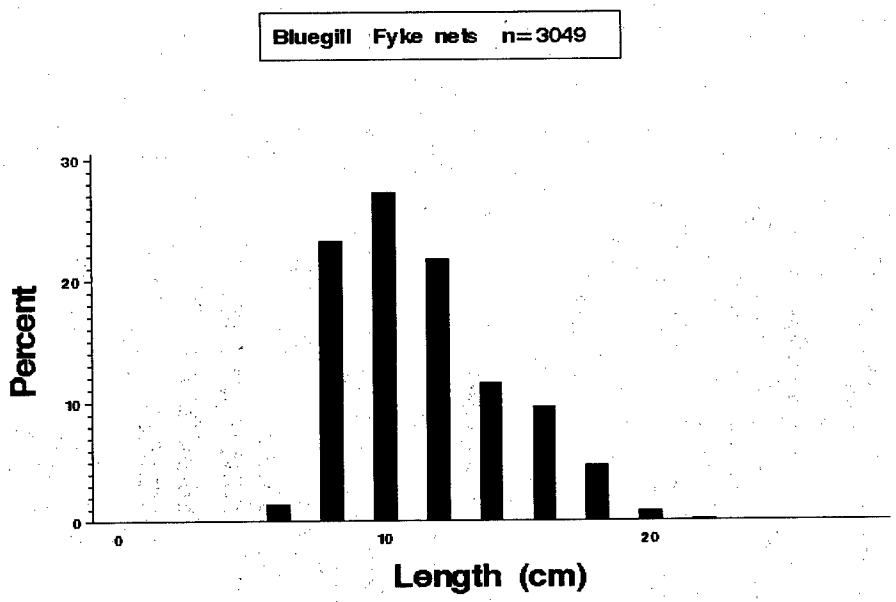

Figure 2.12. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 8 during 1997.

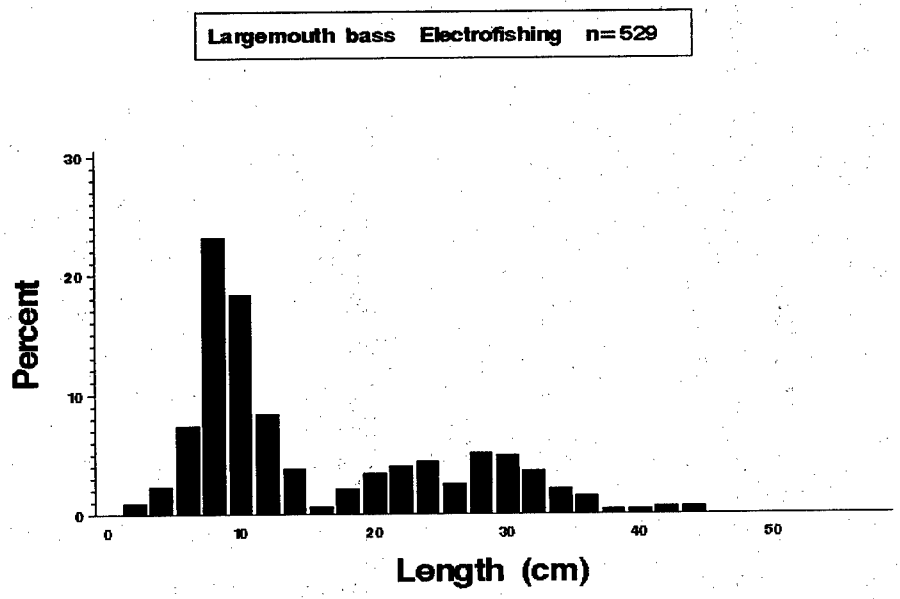

Figure 2.13. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

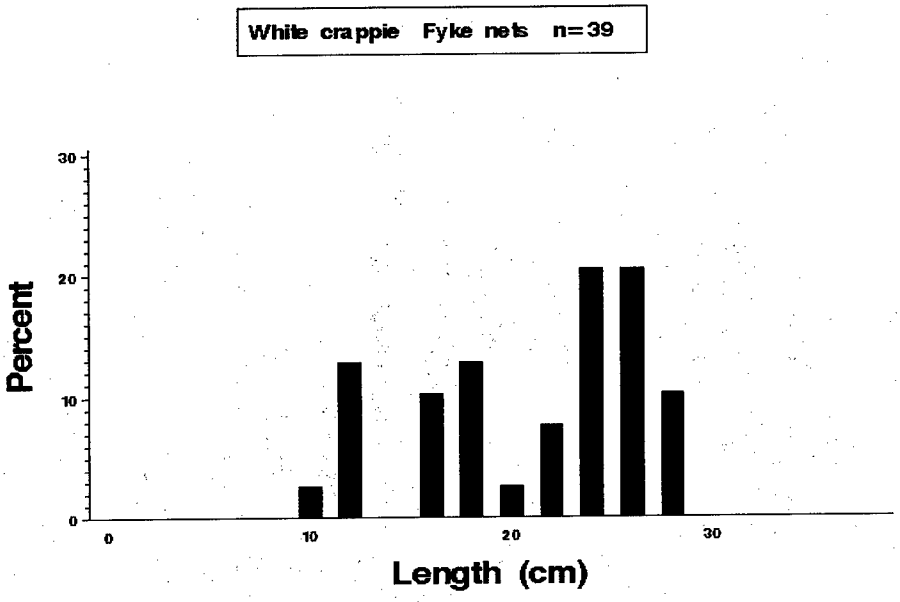

Figure 2.14. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

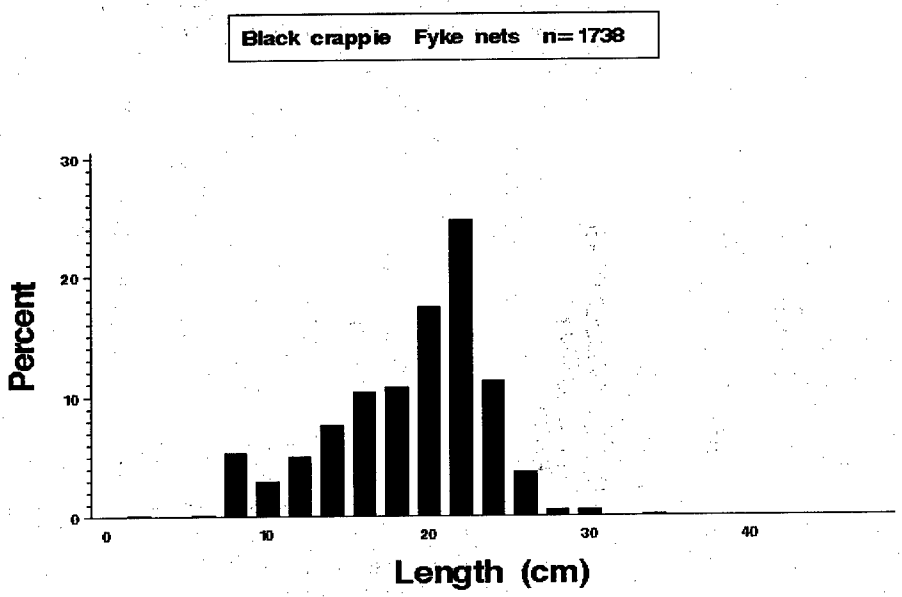

Figure 2.15. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

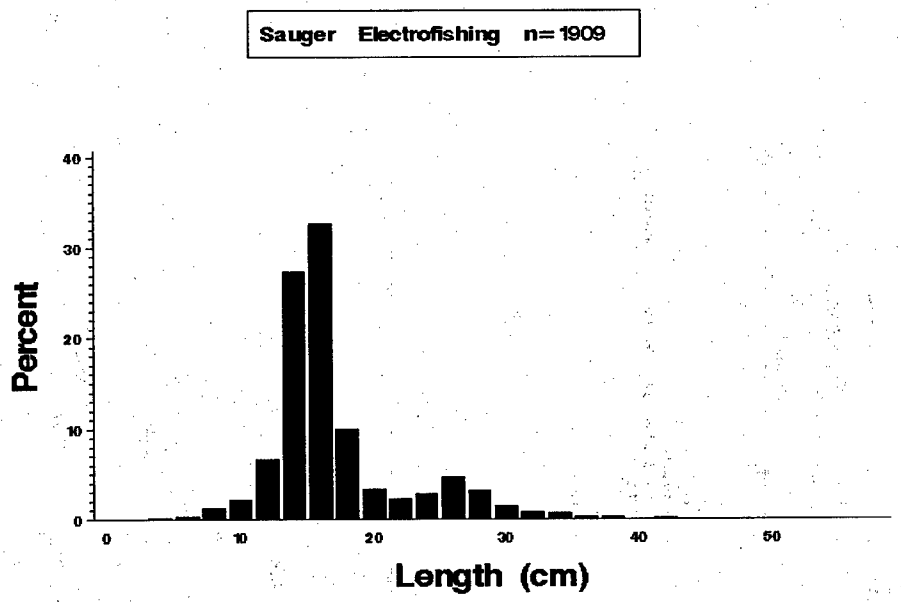

Figure 2.16. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

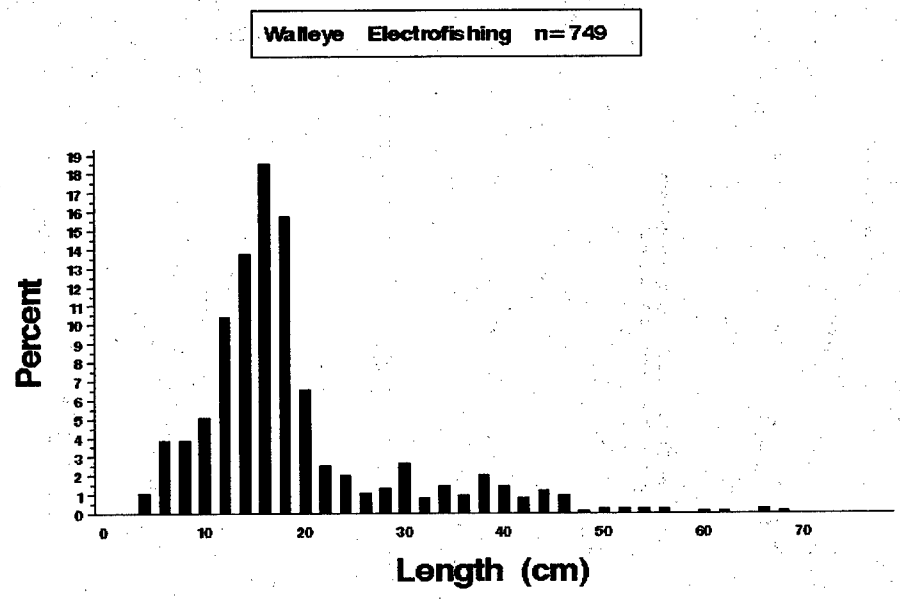

Figure 2.17. Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

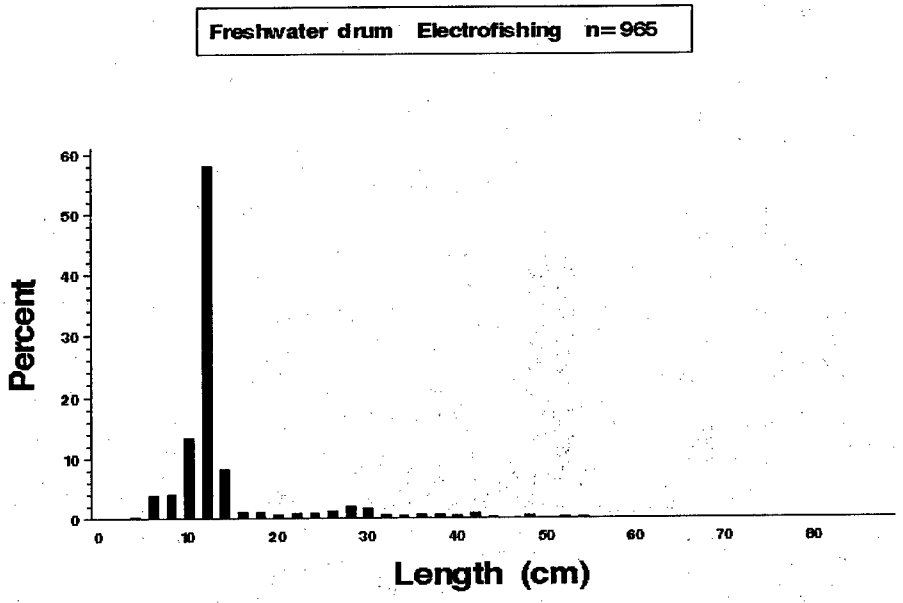

Figure 2.18. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 8 during 1997.

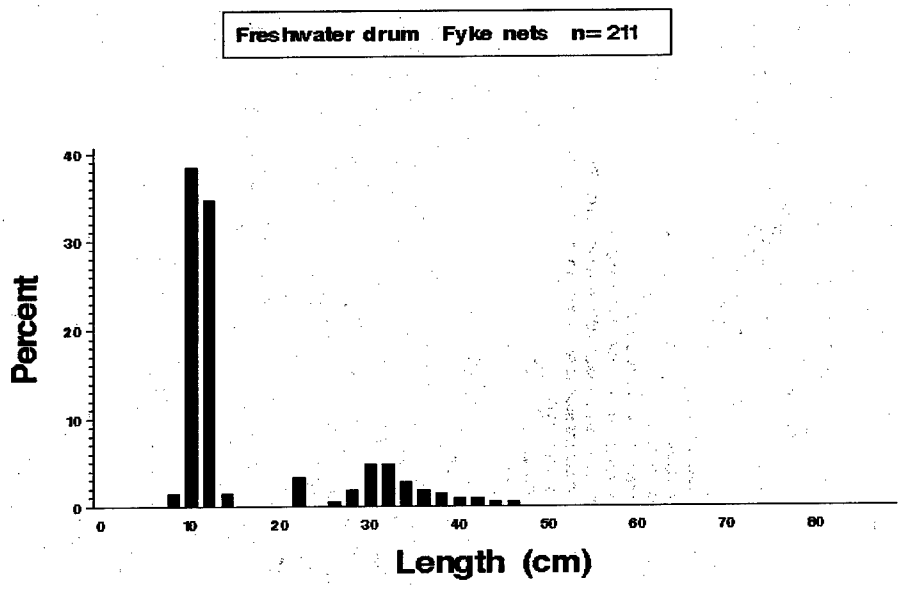

Figure 2.19. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 8 during 1997.

Chapter 3. Pool 13, Upper Mississippi River

by

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Hydrograph

Water levels throughout the sampling period followed the 56-year mean at the Lock and Dam 12 tailwater gage (Figure 3.1). We encountered highest water levels in the last week of the first period and the first week of the second period (July 28–August 7), and the lowest water levels in the first week of the first period (June 15–22). Water levels did not affect sampling effort in 1997. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

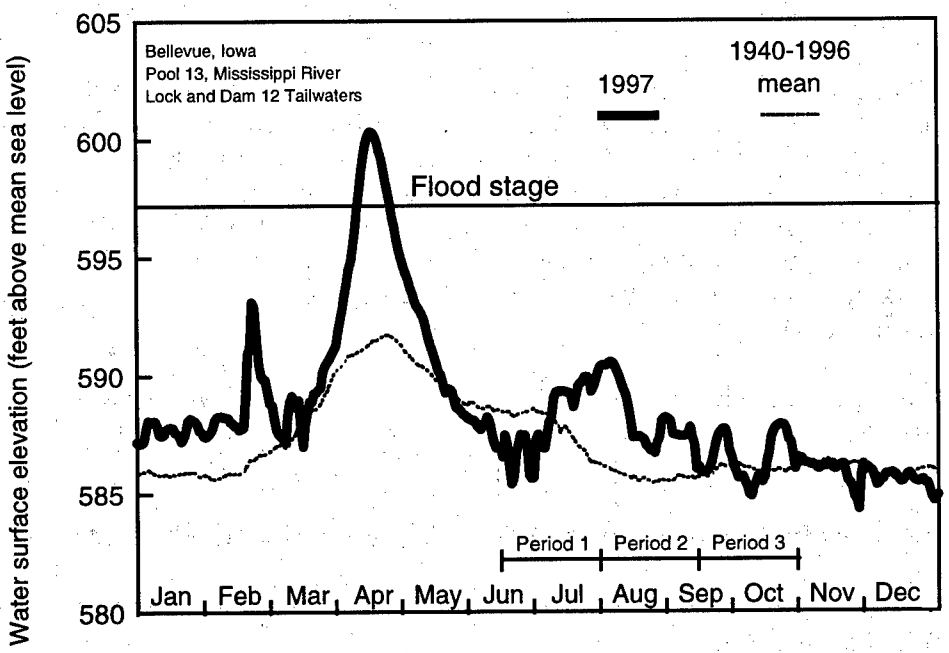

Figure 3.1. Daily water surface elevation from Lock and Dam 12 for Pool 13, Upper Mississippi River, during 1997 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

Summary of Sampling Effort

We sampled the fish population in Pool 13 in 1997 using 10 types of gear, which were deployed among eight stratum types. A total of 486 samples (162 per period) were allocated during the three periods and 479 samples were completed. Sampling effort was nearly uniform among all three periods. We completed 155 samples in the first period, 162 samples in the second period, and 162 samples in the third period (Table 3.1). Of the 486 samples collected, 431 were at stratified random sites and 48 were at fixed sites. Two-day electrofishing and 5-night electrofishing samples were not completed in period one because of a failure in our generator.

Total Catch by Gear

We collected a total of 50,082 fish represented by 67 species, 4 centrarchid hybrids, and 4 unidentified species. Unidentified species included 31 unidentified buffalo (*Ictiobus* sp. <15.0 cm), 7 unidentified redhorse (*Moxostoma* sp.), and 1 unidentified sucker (Catostomidae sp.). The top five species collected with all gears combined were the emerald shiner (11,498), bluegill (9,967), river shiner (8,995), gizzard shad (2,037), and river carpsucker (1,693).

We collected 5,648 fish (56 species) by day electrofishing, 3,299 fish (51 species) by night electrofishing, 1,518 fish (29 species) by fyke netting, 1,579 fish (31 species) by tandem fyke netting, 13,550 fish (45 species) by mini fyke netting, 2,754 fish (31 species) by tandem mini fyke netting, 20,438 fish (45 species) by seining, 472 fish (14 species) by small hoop netting, 753 fish (13 species) by large hoop netting, and 71 fish (12 species) by trawling (Table 3.2).

We collected no Federal or State endangered fishes in 1997; however, we collected 1 chestnut lamprey and 1 western sand darter. These fish are listed as threatened species in Iowa. Also, we collected 443 pugnose minnows—this species is listed as being of special concern in Iowa. Other notable species we collected were 2 Mississippi silvery minnows, 1 suckermouth minnow, 2 southern redbelly dace, 51 bluntnose minnows, 29 fathead minnows, 65 quillback, 1 white sucker, 2 blue suckers, 4 black buffalo, 7 silver redhorses, 8 green sunfish, 71 smallmouth bass, and 2 slenderhead darters. These species are listed as uncommon, rare, or tributary strays in Pool 13 by Pitlo et al. (1995) and are infrequently encountered in Long Term Resource Monitoring Program sampling.

One new species was sampled in 1997—2 brook stickleback—making a cumulative total of 74 species collected to date. This species is most likely a tributary stray or a discarded bait fish.

Random Sampling, Mean *C/f* by Gear and Stratum

Mean catch-per-unit-effort (*C/f*) of dominant fish species for random sampling by gear type and stratum is listed in Tables 3.3.1 to 3.3.9.

Day Electrofishing

Day electrofishing *C/f* (fish per 15 min) was highest for bluegills (46.92) in the BWCS stratum, pumpkinseed (10.70) in the IMPS stratum, emerald shiners (33.25) in the MCBU stratum, emerald shiners (8.00) in the MCBW stratum, common carp (23.17) in the SCB stratum, and emerald shiners (19.63) for all strata combined (Table 3.3.1).

Night Electrofishing

Night electrofishing *C/f* (fish per 15 min) was highest for bluegills (66.50) in the BWCS stratum, freshwater drum (15.50) in the MCBU stratum, shorthead redhorse (10.20) in the SCB stratum, and bluegills (24.55) for all strata combined (Table 3.3.2).

Fyke Net

Fyke netting *C/f* (fish per net-day) was highest for bluegills (13.04) in the BWCS stratum, (15.47) in the IMPS stratum, and (13.27) for all strata combined (Table 3.3.3).

Tandem Fyke Net

Tandem fyke netting *C/f* (fish per net-day) was highest for bluegills (21.09) in the BWCO stratum, (2.98) in the IMPO stratum, and (9.94) for all strata combined (Table 3.3.4).

Mini Fyke Net

Mini fyke netting *C/f* (fish per net-day) was highest for bluegills (114.27) in the BWCS stratum, river shiners (59.02) in the IMPS stratum, river shiners (87.92) in the MCBU stratum, emerald shiners (228.08) in the MCBW stratum, common carp (7.17) in the SCB stratum, and bluegills (41.92) for all strata combined (Table 3.3.5).

Tandem Mini Fyke Net

Tandem mini fyke netting *C/f* (fish per net-day) was highest for bluegills (42.14) in the BWCO stratum, emerald shiners (3.48) in the IMPO stratum, and bluegills (16.09) for all strata combined (Table 3.3.6).

Small Hoop Net

Small hoop netting *C/f* (fish per net-day) was highest for freshwater drum (0.33) in the IMPO stratum and for channel catfish (1.14) in the MCBU stratum, (2.54) in the MCBW stratum, (6.51) in the SCB stratum, and (1.42) for all strata combined (Table 3.3.7).

Large Hoop Net

Large hoop netting *C/f* (fish per net-day) was highest for smallmouth buffalo (4.51) in the IMPO stratum, (2.42) in the MCBU stratum, (5.58) in the MCBW stratum, (4.91) in the SCB stratum, and (4.06) for all strata combined (Table 3.3.8).

Seine

Seining *C/f* (fish per haul) was highest for emerald shiners (63.11) in the BWCS stratum, river shiners (222.67) in the IMPS stratum, emerald shiners (64.58) in the MCBU stratum, emerald shiners (77.25) in the SCB stratum, and emerald shiners (67.45) for all strata combined (Table 3.3.9).

Fixed Sampling, Mean *C/f* by Gear and Stratum

All fixed-site sampling was confined in the TWZ stratum using night electrofishing, mini fyke nets, small and large hoop nets, and trawls. Mean catch-per-unit-effort (*C/f*) of dominant fish species for fixed-site sampling by gear type is listed in Tables 3.4.1 to 3.4.5.

Night Electrofishing

Night electrofishing *C/f* (fish per 15 min) was highest for gizzard shad (56.67; Table 3.4.1).

Mini Fyke Net

Mini fyke netting *C/f* (fish per net-day) was highest for emerald shiners (14.09; Table 3.4.2).

Small Hoop Net

Small hoop netting *C/f* (fish per net-day) was highest for channel catfish (0.50; Table 3.4.3).

Large Hoop Net

Large hoop netting *C/f* (fish per net-day) was highest for smallmouth buffalo (15.96; Table 3.4.4).

Trawl

Trawling *C/f* (fish per haul) was highest for shovelnose sturgeons (1.17; Table 3.4.5).

Length Distributions of Selected Species

Length distributions (expressed as a percentage of total catch by species by gears) for gizzard shad, common carp, smallmouth buffalo, channel catfish, northern pike, white bass, bluegill, largemouth bass, white crappie, black crappie, sauger, walleye, and freshwater drum are illustrated in Figures 3.2 to 3.16. Because data within a single sampling season are taken over a long time and size ranges for certain species of fish can overlap (e.g., a 6-cm-long bluegill collected early in period 1 is not of the same cohort as a 6-cm-long bluegill collected late in period 3), interpretations in the length distributions should be made cautiously. Length distributions of small samples ($n < 100$) may be included but are not statistically meaningful (Anderson and Neumann 1996).

Gizzard Shad

We collected 1,288 gizzard shad from day and night electrofishing with lengths ranging from 2.0 to 36.0 cm (Figure 3.2). Mean length was 12.7 cm and peak distribution occurred at 14 cm. Minimal numbers were collected between 18 and 36 cm and none were collected between 24 and 34 cm.

Common Carp

We collected 575 common carp from day and night electrofishing with lengths ranging from 2.0 to 83.5 cm (Figure 3.3). Mean length was 47.7 cm, and a peak in the distribution occurred at 50 cm. The majority of fish were grouped between 46 and 56 cm. Young of the year (fish <1.4 cm long) constituted a small fraction of total catch. No common carp were collected between 16 and 32 cm.

Smallmouth Buffalo

We collected 624 smallmouth buffalo from small and large hoop netting with lengths ranging from 17.8 to 62.9 cm (Figure 3.4). Mean length was 36.6 cm, and peak distribution occurred at 34 cm with the majority of fish grouped around this peak.

Channel Catfish

We collected 382 channel catfish from small and large hoop netting with lengths ranging from 14.5 to 63.0 cm (Figure 3.5). Mean length was 24.5 cm, and peak distribution occurred at 18 cm. About 5% were greater than 38.1 cm (>15 inches).

Northern Pike

We collected only 33 northern pike from fyke netting with lengths ranging from 35.9 to 81.6 cm (Figure 3.6). Mean length of the northern pike collected was 63.1 cm.

White Bass

We collected 242 white bass from day and night electrofishing with lengths ranging from 4.8 to 39.3 cm (Figure 3.7). Mean length was 14.0, and peak distribution occurred at 12 cm. Fish less than 14.0 cm are probably age 0 and contributed to 64% of the total catch. About 7% were greater than 22.9 cm (>9 inches).

Bluegill

We collected 1,686 bluegills from day and night electrofishing with lengths ranging from 2.0 to 21.4 cm (Figure 3.8). Mean length was 8.5 cm, and peak distribution occurred at 4 cm. About 66% were less than 10 cm (<4 inches) and about 7% were greater than 15.2 cm (>6 inches). We also collected 1,233 bluegills from fyke netting with lengths ranging from 4.1 to 22.3 cm (Figure 3.9). Mean length was 12.5 cm and peak distribution occurred at 10 cm. About 23% were greater than 15.2 cm (>6 inches).

Largemouth Bass

We collected 543 largemouth bass from day and night electrofishing with lengths ranging from 1.9 to 47.0 cm (Figure 3.10). Mean length was 17.9 cm, and peak distribution occurred at 10 cm. Smaller peaks that probably represent different age classes occurred at 20–24 and 26–34 cm, and the number of largemouth bass

associated with these peaks suggest good recruitment from the past 2 years. Fish less than 12.0 cm are probably age 0 and contributed to 44% of the total catch. About 7% were greater than 35.5 cm (>14 inches).

White Crappie

We collected 110 white crappies from fyke netting with lengths ranging from 7.6 to 33.9 cm (Figure 3.11). Mean length was 19.3 cm, and peak distribution occurred at 16 cm. About 46% were greater than 20.3 cm (>8 inches).

Black Crappie

We collected 653 black crappies from fyke netting with lengths ranging from 7.0 to 33.1 cm (Figure 3.12). Mean length was 19.5 cm, and peak distribution occurred at 22 cm. About 50% were greater than 20.3 cm (>8 inches).

Sauger

We collected 477 saugers from day and night electrofishing with lengths ranging from 3.8 to 51.8 cm (Figure 3.13). Mean length was 18.7 cm, and peak distribution occurred at 16 cm. About 8% were greater than 30.5 cm (>12 inches).

Walleye

We collected 213 walleyes from day and night electrofishing with lengths ranging from 5.5 to 52.3 cm (Figure 3.14). Mean length was 18.2 cm, and peak distribution occurred at 14 cm. About 5% were greater than 38.1 cm (>15 inches).

Freshwater Drum

We collected 463 freshwater drum from day and night electrofishing with lengths ranging from 3.6 to 46.7 cm (Figure 3.15). Mean length was 14.7 cm, and peak distribution occurred at 10 cm; a smaller peak occurred at 28 cm. About 7% were greater than 30.5 cm (>12 inches). We also collected 123 freshwater drum from fyke netting with lengths ranging from 9.0 to 46.4 cm (Figure 3.16). Mean length was 20.8 cm, and peak distribution occurred at 10 cm. Smaller peaks occurred at 26–30 and 36–42 cm. About 14% were greater than 38.1 cm (>12 inches).

Table 3.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 13 of the Mississippi River during 1997. Table entries are numbers of successfully completed standardized monitoring collections.

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		2	4	3	2				19
Fyke net	10					4				14
Large hoop net			7	4	3		2		2	18
Small hoop net			7	4	3		2		2	18
Mini fyke net	10		2	4	3	4			2	25
Night electrofishing			1						2	3
Seine	12		4	12		8				36
Trawling									8	8
Tandem fyke net		5					2			7
Tandem mini fyke net		5					2			7
SUBTOTAL	40	10	23	28	12	18	8	0	16	155

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		2	4	3	4				21
Fyke net	10					4				14
Large hoop net			7	4	3		2		2	18
Small hoop net			7	4	3		2		2	18
Mini fyke net	10		2	4	3	4			2	25
Night electrofishing	2		2	2					2	8
Seine	12		4	12		8				36
Trawling									8	8
Tandem fyke net		5					2			7
Tandem mini fyke net		5					2			7
SUBTOTAL	42	10	24	30	12	20	8	0	16	162

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	8		2	4	3	4				21
Fyke net	10					4				14
Large hoop net			7	4	3		2		2	18
Small hoop net			7	4	3		2		2	18
Mini fyke net	10		2	4	3	4			2	25
Night electrofishing	2		2	2					2	8
Seine	12		4	12		8				36
Trawling									8	8
Tandem fyke net		5					2			7
Tandem mini fyke net		5					2			7
SUBTOTAL	42	10	24	30	12	20	8	0	16	162
	124	30	71	88	36	58	24	0	48	479

Strata: BWCS - Backwater, contiguous, shoreline. MCBW - Main channel border, wing dam.
BWCO - Backwater, contiguous, offshore. SBU - Side channel border.
IMPS - Impounded, shoreline. TRI - Tributary mouth.
IMPO - Impounded, offshore. TWZ - Tailwater.
MCBU - Main channel border, unstructured.

Table 3.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 13 of the Mississippi River. See Table 3.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	-	1	-	-	-	-	-	-	-	-	-	-	1
2	Silver lamprey	Ichthyomyzon unicuspis	2	2	-	-	-	-	-	-	1	-	-	-	5
3	Shovelnose sturgeon	Scaphirhynchus platorynchus	-	-	-	-	-	-	-	-	-	-	-	28	28
4	Longnose gar	Lepisosteus osseus	6	13	5	7	4	-	-	-	-	-	-	1	36
5	Shortnose gar	Lepisosteus platostomus	6	8	55	42	57	10	15	-	-	-	-	-	193
6	Bowfin	Amia calva	12	1	26	7	4	-	-	-	-	-	-	-	50
7	Mooneye	Hiodon tergisus	5	24	-	1	-	-	-	-	-	-	-	-	30
8	Gizzard shad	Dorosoma cepedianum	783	505	83	11	45	10	600	-	-	-	-	-	2037
9	Spotfin shiner	Cyprinella spiloptera	66	-	-	-	133	2	112	-	-	-	-	-	313
10	Common carp	Cyprinus carpio	489	86	63	51	402	92	201	2	10	-	-	2	1398
11	Mississippi silvery minnow	Hybognathus nuchalis	-	1	-	-	-	-	1	-	-	-	-	-	2
12	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	1	-	4	-	-	-	-	2	7
13	Silver chub	Macrhybopsis storeriana	10	52	-	1	6	9	3	5	-	-	-	-	86
14	Golden shiner	Notemigonus crysoleucas	10	3	11	17	42	6	23	-	-	-	-	-	112
15	Emerald shiner	Notropis atherinoides	836	82	-	-	3344	74	7162	-	-	-	-	-	11498
16	River shiner	Notropis blennius	193	268	-	-	1939	46	6549	-	-	-	-	-	8995
17	Spottail shiner	Notropis hudsonius	12	-	-	-	91	5	3	-	-	-	-	-	111
18	Sand shiner	Notropis stramineus	-	-	-	-	1	-	-	-	-	-	-	-	1
19	Channel shiner	Notropis wickliffi	128	7	-	-	561	24	587	-	-	-	-	2	1309
20	Pugnose minnow	Opsopoeodus emiliae	1	-	-	-	43	381	18	-	-	-	-	-	443
21	Suckermouth minnow	Phenacobius mirabilis	-	-	-	-	-	-	1	-	-	-	-	-	1
22	Southern redbelly dace	Phoxinus erythrogaster	-	-	-	-	2	-	-	-	-	-	-	-	2
23	Bluntnose minnow	Pimephales notatus	-	-	-	-	47	-	4	-	-	-	-	-	51
24	Fathead minnow	Pimephales promelas	2	-	-	-	24	-	3	-	-	-	-	-	29
25	Bullhead minnow	Pimephales vigilax	172	24	-	-	202	274	415	-	-	-	-	-	1087
26	River carpsucker	Carpiodes carpio	42	55	24	9	709	-	846	4	4	-	-	-	1693
27	Quillback	Carpiodes cyprinus	12	44	-	6	-	-	-	1	2	-	-	-	65
28	Highfin carpsucker	Carpiodes velifer	3	12	-	-	-	-	-	-	-	-	-	-	15
29	White sucker	Catostomus commersoni	-	-	-	1	-	-	-	-	-	-	-	-	1
30	Blue sucker	Cycleptus elongatus	1	1	-	-	-	-	-	-	-	-	-	-	2
31	Smallmouth buffalo	Ictiobus bubalus	28	49	2	17	-	-	2	15	609	-	-	-	722
32	Bigmouth buffalo	Ictiobus cyprinellus	31	16	2	10	-	-	-	-	-	-	-	-	59
33	Black buffalo	Ictiobus niger	2	1	1	-	-	-	-	-	-	-	-	-	4
34	Unidentified buffalo	Ictiobus sp.	1	-	-	-	18	11	1	-	-	-	-	-	31
35	Spotted sucker	Minytrema melanops	43	2	7	39	-	-	2	-	-	-	-	-	93
36	Silver redhorse	Moxostoma anisurum	1	6	-	-	-	-	-	-	-	-	-	-	7
37	Golden redhorse	Moxostoma erythrurum	4	7	-	-	-	-	-	-	-	-	-	-	11
38	Shorthead redhorse	Moxostoma macrolepidotum	54	90	14	15	8	-	7	-	13	-	-	2	203
39	Unidentified redhorse	Moxostoma sp.	-	-	-	-	-	-	7	-	-	-	-	-	7

Gears:
- D - Day electrofishing
- N - Night electrofishing
- F - Fyke netting
- X - Tandem fyke netting
- M - Mini fyke netting
- Y - Tandem mini fyke netting
- S - Seining
- HS - Small hoop netting
- HL - Large hoop netting
- G - Gill netting
- TA - Trammel netting, anchored sets
- T - Trawling (4.8-m bottom trawl)

Table 3.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in Pool 13 of the Mississippi River. See Table 3.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Unidentified sucker	Unidentified Catostomidae	-	-	-	-	-	-	1	-	-	-	-	-	1
41	Black bullhead	Ameiurus melas	1	-	-	1	6	2	27	-	-	-	-	-	37
42	Yellow bullhead	Ameiurus natalis	5	-	1	-	13	-	28	-	-	-	-	-	47
43	Channel catfish	Ictalurus punctatus	33	17	5	2	8	3	7	360	22	-	-	17	474
44	Tadpole madtom	Noturus gyrinus	2	-	-	-	9	4	28	1	-	-	-	-	44
45	Flathead catfish	Pylodictis olivaris	9	7	2	2	2	1	-	11	9	-	-	1	44
46	Northern pike	Esox lucius	10	2	20	13	-	-	2	-	-	-	-	-	47
47	Brook silverside	Labidesthes sicculus	7	5	-	-	6	-	803	-	-	-	-	-	821
48	Brook stickleback	Culaea inconstans	-	-	-	-	2	-	-	-	-	-	-	-	2
49	White bass	Morone chrysops	63	179	17	28	552	10	108	3	9	-	-	-	969
50	Yellow bass	Morone mississippiensis	3	17	1	2	-	-	-	-	-	-	-	-	23
51	Rock bass	Ambloplites rupestris	4	4	-	-	1	-	-	-	-	-	-	-	9
52	Green sunfish	Lepomis cyanellus	2	4	1	-	-	-	1	-	-	-	-	-	8
53	Pumpkinseed	Lepomis gibbosus	146	11	170	66	128	216	26	1	-	-	-	1	765
54	Warmouth	Lepomis gulosus	13	2	-	-	8	1	2	-	-	-	-	-	26
55	Orangespotted sunfish	Lepomis humilis	243	193	5	10	304	172	386	-	-	-	-	-	1313
56	Bluegill	Lepomis macrochirus	1274	412	554	679	3811	1262	1921	44	10	-	-	-	9967
57	Pumpkinseed x warmouth	L. gibbosus x gulosus	1	-	-	-	-	-	-	-	-	-	-	-	1
58	Pumpkinseed x orangespotted sunfish	L. gibbosus x humilis	1	-	-	-	-	-	-	-	-	-	-	-	1
59	Pumpkinseed x bluegill	L. gibbosus x macrochirus	-	-	9	-	1	-	-	-	-	-	-	-	10
60	Warmouth x bluegill	L. gulosus x macrochirus	-	-	-	-	-	-	1	-	-	-	-	-	1
61	Smallmouth bass	Micropterus dolomieu	10	55	-	-	-	-	6	-	-	-	-	-	71
62	Largemouth bass	Micropterus salmoides	451	92	14	16	95	2	191	-	-	-	-	-	861
63	White crappie	Pomoxis annularis	55	9	60	50	53	6	13	2	3	-	-	-	251
64	Black crappie	Pomoxis nigromaculatus	39	21	314	339	58	23	61	6	10	-	-	-	871
65	Western sand darter	Ammocrypta clara	-	1	-	-	-	-	-	-	-	-	-	-	1
66	Mud darter	Etheostoma asprigene	1	1	-	-	6	-	3	-	-	-	-	-	11
67	Johnny darter	Etheostoma nigrum	5	1	-	-	39	6	48	-	-	-	-	-	99
68	Yellow perch	Perca flavescens	7	1	22	19	3	1	72	-	-	-	-	-	125
69	Logperch	Percina caprodes	38	18	-	-	15	37	75	-	-	-	-	-	183
70	Slenderhead darter	Percina phoxocephala	2	-	-	-	-	-	-	-	-	-	-	-	2
71	River darter	Percina shumardi	1	1	-	-	29	7	14	-	-	-	-	1	53
72	Sauger	Stizostedion canadense	61	416	4	15	9	1	2	-	-	-	-	3	511
73	Walleye	Stizostedion vitreum	40	173	2	4	7	6	7	-	-	-	-	-	239
74	Freshwater drum	Aplodinotus grunniens	166	297	24	99	702	50	39	17	51	-	-	11	1456
			5648	3299	1518	1579	13550	2754	20438	472	753	0	0	71	50082

Gears:
- D - Day electrofishing
- N - Night electrofishing
- F - Fyke netting
- X - Tandem fyke netting
- M - Mini fyke netting
- Y - Tandem mini fyke netting
- S - Seining
- HS - Small hoop netting
- HL - Large hoop netting
- G - Gill netting
- TA - Trammel netting, anchored sets
- T - Trawling (4.8-m bottom trawl)

Table 3.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Silver lamprey	0.04	0.04	0.00	0.08	0.00	0.00
	(0.03)	(0.04)	(0.00)	(0.08)	(0.00)	(0.00)
Longnose gar	0.11	0.04	0.20	0.00	0.11	0.33
	(0.09)	(0.04)	(0.20)	(0.00)	(0.11)	(0.33)
Shortnose gar	0.07	0.08	0.30	0.08	0.00	0.00
	(0.04)	(0.06)	(0.21)	(0.08)	(0.00)	(0.00)
Bowfin	0.18	0.46	0.00	0.08	0.00	0.00
	(0.09)	(0.27)	(0.00)	(0.08)	(0.00)	(0.00)
Mooneye	0.04	0.00	0.00	0.00	0.44	0.17
	(0.04)	(0.00)	(0.00)	(0.00)	(0.34)	(0.17)
Gizzard shad	14.26	20.92	6.10	13.08	1.22	8.67
	(3.82)	(6.67)	(3.81)	(7.76)	(0.55)	(4.67)
Spotfin shiner	1.61	0.50	1.30	2.17	0.11	2.33
	(0.56)	(0.29)	(0.72)	(1.38)	(0.11)	(0.84)
Common carp	11.70	7.17	6.80	8.58	0.78	23.17
	(2.14)	(1.48)	(2.48)	(2.64)	(0.36)	(7.24)
Silver chub	0.18	0.13	0.20	0.25	0.11	0.17
	(0.08)	(0.07)	(0.13)	(0.18)	(0.11)	(0.17)
Golden shiner	0.11	0.29	0.30	0.00	0.00	0.00
	(0.04)	(0.11)	(0.30)	(0.00)	(0.00)	(0.00)
Emerald shiner	19.63	10.00	3.60	33.25	8.00	14.83
	(4.22)	(3.96)	(1.14)	(10.08)	(2.77)	(5.64)
River shiner	4.65	2.38	2.60	4.67	0.67	8.00
	(1.55)	(0.97)	(1.20)	(1.38)	(0.24)	(5.63)
Spottail shiner	0.08	0.17	0.80	0.00	0.00	0.00
	(0.04)	(0.10)	(0.42)	(0.00)	(0.00)	(0.00)
Channel shiner	2.95	2.71	0.10	4.25	0.00	1.83
	(1.01)	(1.45)	(0.10)	(2.31)	(0.00)	(0.87)
Pugnose minnow	0.04	0.00	0.00	0.00	0.00	0.17
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)
Fathead minnow	0.06	0.04	0.00	0.00	0.00	0.17
	(0.04)	(0.04)	(0.00)	(0.00)	(0.00)	(0.17)
Bullhead minnow	2.84	5.75	1.20	0.33	0.00	3.00
	(0.71)	(1.93)	(0.68)	(0.19)	(0.00)	(1.15)
River carpsucker	0.75	0.67	1.40	0.25	0.00	1.50
	(0.31)	(0.25)	(0.78)	(0.13)	(0.00)	(1.15)
Quillback	0.22	0.25	0.00	0.25	0.22	0.17
	(0.11)	(0.21)	(0.00)	(0.18)	(0.15)	(0.17)
Highfin carpsucker	0.04	0.13	0.00	0.00	0.00	0.00
	(0.03)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Blue sucker	0.03	0.00	0.00	0.08	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)
Smallmouth buffalo	0.49	0.54	0.40	0.33	0.33	0.67
	(0.15)	(0.30)	(0.27)	(0.19)	(0.17)	(0.33)
Bigmouth buffalo	1.01	0.08	0.10	1.50	0.00	1.67
	(0.53)	(0.06)	(0.10)	(1.12)	(0.00)	(1.28)
Black buffalo	0.05	0.00	0.10	0.00	0.00	0.17
	(0.04)	(0.00)	(0.10)	(0.00)	(0.00)	(0.17)
Spotted sucker	0.53	1.38	0.90	0.00	0.00	0.17
	(0.13)	(0.38)	(0.80)	(0.00)	(0.00)	(0.17)
Silver redhorse	0.00	0.00	0.00	0.00	0.11	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Golden redhorse	0.12	0.00	0.00	0.33	0.00	0.00
	(0.07)	(0.00)	(0.00)	(0.19)	(0.00)	(0.00)
Shorthead redhorse	1.12	0.17	0.30	1.67	1.89	1.67
	(0.29)	(0.08)	(0.15)	(0.64)	(0.48)	(0.61)
Black bullhead	0.01	0.04	0.00	0.00	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Yellow bullhead	0.04	0.08	0.30	0.00	0.00	0.00
	(0.03)	(0.08)	(0.30)	(0.00)	(0.00)	(0.00)
Channel catfish	0.80	0.25	0.50	1.08	0.22	1.17
	(0.17)	(0.14)	(0.27)	(0.40)	(0.22)	(0.31)
Tadpole madtom	0.02	0.04	0.10	0.00	0.00	0.00
	(0.01)	(0.04)	(0.10)	(0.00)	(0.00)	(0.00)
Flathead catfish	0.23	0.21	0.00	0.08	0.00	0.50
	(0.10)	(0.15)	(0.00)	(0.08)	(0.00)	(0.34)
Northern pike	0.19	0.17	0.20	0.33	0.00	0.00
	(0.08)	(0.10)	(0.13)	(0.19)	(0.00)	(0.00)
Brook silverside	0.13	0.25	0.00	0.00	0.00	0.17
	(0.07)	(0.17)	(0.00)	(0.00)	(0.00)	(0.17)
White bass	1.30	0.75	1.20	1.92	0.33	1.17
	(0.35)	(0.33)	(0.65)	(0.58)	(0.24)	(0.98)
Yellow bass	0.04	0.13	0.00	0.00	0.00	0.00
	(0.03)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Rock bass	0.13	0.00	0.10	0.00	0.00	0.50
	(0.13)	(0.00)	(0.10)	(0.00)	(0.00)	(0.50)
Green sunfish	0.03	0.08	0.00	0.00	0.00	0.00
	(0.02)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
Pumpkinseed	1.02	1.46	10.70	0.08	0.00	0.50
	(0.35)	(0.46)	(8.36)	(0.08)	(0.00)	(0.50)
Warmouth	0.20	0.50	0.00	0.08	0.00	0.00
	(0.08)	(0.23)	(0.00)	(0.08)	(0.00)	(0.00)
Orangespotted sunfish	4.20	8.63	0.20	0.58	0.11	4.33
	(0.98)	(2.27)	(0.13)	(0.29)	(0.11)	(2.43)
Bluegill	18.38	46.92	7.50	2.33	0.78	6.33
	(3.35)	(9.94)	(3.93)	(0.64)	(0.55)	(2.01)
Pumpkinseed x warmouth	0.00	0.00	0.10	0.00	0.00	0.00
	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)
Pumpkinseed x orangespotted sunfish	0.01	0.04	0.00	0.00	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Smallmouth bass	0.18	0.04	0.40	0.17	0.11	0.33
	(0.07)	(0.04)	(0.16)	(0.11)	(0.11)	(0.21)
Largemouth bass	7.04	13.21	6.20	3.08	0.56	5.00
	(0.97)	(2.74)	(2.06)	(0.70)	(0.34)	(0.68)
White crappie	0.83	2.17	0.00	0.17	0.00	0.17
	(0.31)	(0.90)	(0.00)	(0.11)	(0.00)	(0.17)
Black crappie	0.66	1.33	0.00	0.25	0.11	0.50
	(0.19)	(0.46)	(0.00)	(0.18)	(0.11)	(0.34)
Mud darter	0.03	0.00	0.00	0.08	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)
Johnny darter	0.07	0.08	0.20	0.08	0.00	0.00
	(0.04)	(0.06)	(0.20)	(0.08)	(0.00)	(0.00)
Yellow perch	0.07	0.17	0.30	0.00	0.00	0.00
	(0.03)	(0.10)	(0.21)	(0.00)	(0.00)	(0.00)
Logperch	0.80	0.63	0.20	1.00	0.44	0.83
	(0.32)	(0.34)	(0.13)	(0.72)	(0.18)	(0.54)
Slenderhead darter	0.06	0.00	0.00	0.17	0.00	0.00
	(0.04)	(0.00)	(0.00)	(0.11)	(0.00)	(0.00)
River darter	0.03	0.00	0.00	0.08	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)
Sauger	1.20	1.38	0.60	0.92	0.22	1.50
	(0.27)	(0.43)	(0.31)	(0.34)	(0.15)	(0.76)
Walleye	0.68	0.54	1.30	1.00	0.00	0.33
	(0.18)	(0.18)	(1.01)	(0.39)	(0.00)	(0.33)
Freshwater drum	2.57	2.46	5.70	3.25	0.33	1.33
	(0.43)	(0.62)	(1.52)	(0.77)	(0.24)	(0.95)

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Table 3.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Chestnut lamprey	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Silver lamprey	0.15	0.00	0.25	0.20
	(0.11)	(0.00)	(0.25)	(0.20)
Longnose gar	0.11	0.00	0.00	0.40
	(0.11)	(0.00)	(0.00)	(0.40)
Shortnose gar	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Bowfin	0.09	0.25	0.00	0.00
	(0.09)	(0.25)	(0.00)	(0.00)
Mooneye	2.04	0.00	5.00	0.40
	(1.68)	(0.00)	(4.34)	(0.24)
Gizzard shad	13.80	36.00	1.00	3.40
	(9.33)	(26.71)	(0.71)	(3.40)
Common carp	5.88	7.25	6.75	2.80
	(0.62)	(0.63)	(1.25)	(1.20)
Silver chub	0.52	0.75	0.25	0.60
	(0.30)	(0.75)	(0.25)	(0.40)
Emerald shiner	5.63	5.00	6.50	5.20
	(1.29)	(1.78)	(2.47)	(2.31)
River shiner	2.25	0.25	3.25	3.40
	(1.55)	(0.25)	(3.25)	(3.40)
Channel shiner	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Bullhead minnow	0.95	1.75	0.75	0.20
	(0.64)	(1.75)	(0.48)	(0.20)
River carpsucker	1.77	3.50	0.75	1.00
	(0.87)	(2.36)	(0.48)	(0.77)
Quillback	0.49	0.00	1.00	0.40
	(0.28)	(0.00)	(0.71)	(0.24)
Highfin carpsucker	0.61	0.00	0.75	1.20
	(0.32)	(0.00)	(0.48)	(0.97)
Blue sucker	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Smallmouth buffalo	1.70	2.25	1.00	2.00
	(0.88)	(2.25)	(1.00)	(0.55)
Bigmouth buffalo	1.13	0.50	1.25	1.80
	(0.57)	(0.29)	(0.75)	(1.80)
Black buffalo	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Spotted sucker	0.17	0.50	0.00	0.00
	(0.10)	(0.29)	(0.00)	(0.00)
Silver redhorse	0.30	0.00	0.50	0.40
	(0.22)	(0.00)	(0.50)	(0.40)
Golden redhorse	0.40	0.00	0.75	0.40
	(0.21)	(0.00)	(0.48)	(0.40)
Shorthead redhorse	4.87	1.50	4.25	10.20
	(1.58)	(1.19)	(2.14)	(4.83)
Channel catfish	1.27	0.50	2.00	1.20
	(0.52)	(0.50)	(1.08)	(0.97)
Flathead catfish	0.11	0.00	0.00	0.40
	(0.11)	(0.00)	(0.00)	(0.40)
Brook silverside	0.26	0.75	0.00	0.00
	(0.17)	(0.48)	(0.00)	(0.00)
White bass	3.98	4.75	4.50	2.20
	(1.01)	(2.14)	(1.50)	(1.32)
Yellow bass	0.87	2.50	0.00	0.00
	(0.76)	(2.18)	(0.00)	(0.00)

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Common name	ALL	BWCS	MCBU	SCB
Pumpkinseed	0.44	1.00	0.25	0.00
	(0.36)	(1.00)	(0.25)	(0.00)
Warmouth	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Orangespotted sunfish	3.54	9.75	0.25	0.20
	(1.24)	(3.57)	(0.25)	(0.20)
Bluegill	24.55	66.50	2.75	1.40
	(19.22)	(55.28)	(2.10)	(0.87)
Smallmouth bass	0.58	0.00	1.50	0.00
	(0.25)	(0.00)	(0.65)	(0.00)
Largemouth bass	2.63	7.00	0.50	0.00
	(1.76)	(5.05)	(0.29)	(0.00)
White crappie	0.35	1.00	0.00	0.00
	(0.25)	(0.71)	(0.00)	(0.00)
Black crappie	0.39	0.50	0.00	0.80
	(0.20)	(0.50)	(0.00)	(0.37)
Western sand darter	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Johnny darter	0.05	0.00	0.00	0.20
	(0.05)	(0.00)	(0.00)	(0.20)
Logperch	1.01	1.50	1.25	0.00
	(0.45)	(1.19)	(0.48)	(0.00)
Sauger	8.38	8.75	10.50	4.80
	(3.11)	(5.02)	(6.49)	(2.13)
Walleye	4.00	4.75	5.25	1.20
	(0.93)	(1.60)	(1.80)	(0.97)
Freshwater drum	11.56	12.00	15.50	5.20
	(3.02)	(5.83)	(5.69)	(1.36)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS
Longnose gar	0.16	0.17	0.00
	(0.08)	(0.09)	(0.00)
Shortnose gar	1.48	1.54	0.95
	(0.35)	(0.39)	(0.33)
Bowfin	0.74	0.78	0.35
	(0.22)	(0.25)	(0.24)
Gizzard shad	2.29	2.41	1.17
	(1.25)	(1.39)	(0.68)
Common carp	1.60	1.61	1.45
	(0.41)	(0.45)	(0.46)
Golden shiner	0.28	0.30	0.17
	(0.24)	(0.26)	(0.11)
River carpsucker	0.71	0.77	0.09
	(0.34)	(0.37)	(0.09)
Smallmouth buffalo	0.02	0.00	0.16
	(0.01)	(0.00)	(0.11)
Bigmouth buffalo	0.04	0.03	0.09
	(0.03)	(0.03)	(0.09)
Black buffalo	0.03	0.03	0.00
	(0.03)	(0.03)	(0.00)
Spotted sucker	0.22	0.24	0.00
	(0.11)	(0.12)	(0.00)
Shorthead redhorse	0.38	0.40	0.17
	(0.27)	(0.30)	(0.17)
Yellow bullhead	0.03	0.04	0.00
	(0.03)	(0.04)	(0.00)
Channel catfish	0.09	0.07	0.25
	(0.05)	(0.05)	(0.18)
Flathead catfish	0.06	0.07	0.00
	(0.04)	(0.05)	(0.00)
Northern pike	0.55	0.59	0.17
	(0.20)	(0.23)	(0.17)
White bass	0.39	0.38	0.50
	(0.16)	(0.17)	(0.29)
Yellow bass	0.03	0.03	0.00
	(0.03)	(0.03)	(0.00)
Green sunfish	0.01	0.00	0.09
	(0.01)	(0.00)	(0.09)
Pumpkinseed	1.85	0.65	13.15
	(0.72)	(0.21)	(7.36)
Orangespotted sunfish	0.15	0.17	0.00
	(0.07)	(0.08)	(0.00)
Bluegill	13.27	13.04	15.47
	(3.12)	(3.35)	(8.08)
Pumpkinseed x bluegill	0.09	0.03	0.71
	(0.06)	(0.03)	(0.62)
Largemouth bass	0.45	0.50	0.00
	(0.14)	(0.15)	(0.00)
White crappie	1.80	1.97	0.17
	(0.59)	(0.65)	(0.17)
Black crappie	9.15	9.93	1.80
	(2.67)	(2.96)	(0.81)
Yellow perch	0.21	0.03	1.86
	(0.18)	(0.03)	(1.86)
Sauger	0.08	0.07	0.16
	(0.05)	(0.05)	(0.11)
Walleye	0.06	0.07	0.00
	(0.04)	(0.05)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPO - Impounded, offshore
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS
Freshwater drum	0.64	0.66	0.42
	(0.22)	(0.24)	(0.29)

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IMPO - Impounded, offshore
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Longnose gar	0.17	0.17	0.16
	(0.07)	(0.06)	(0.10)
Shortnose gar	0.57	1.42	0.09
	(0.23)	(0.62)	(0.09)
Bowfin	0.09	0.24	0.00
	(0.04)	(0.12)	(0.00)
Mooneye	0.05	0.00	0.09
	(0.05)	(0.00)	(0.09)
Gizzard shad	0.26	0.27	0.26
	(0.13)	(0.16)	(0.17)
Common carp	0.72	1.67	0.16
	(0.22)	(0.56)	(0.10)
Silver chub	0.05	0.00	0.08
	(0.05)	(0.00)	(0.08)
Golden shiner	0.40	0.40	0.40
	(0.18)	(0.19)	(0.26)
River carpsucker	0.12	0.32	0.00
	(0.06)	(0.18)	(0.00)
Quillback	0.08	0.21	0.00
	(0.05)	(0.15)	(0.00)
White sucker	0.01	0.04	0.00
	(0.01)	(0.04)	(0.00)
Smallmouth buffalo	0.26	0.58	0.08
	(0.14)	(0.36)	(0.08)
Bigmouth buffalo	0.13	0.35	0.00
	(0.07)	(0.18)	(0.00)
Spotted sucker	0.49	1.32	0.00
	(0.23)	(0.62)	(0.00)
Shorthead redhorse	0.31	0.42	0.24
	(0.12)	(0.17)	(0.16)
Black bullhead	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
Channel catfish	0.03	0.07	0.00
	(0.03)	(0.07)	(0.00)
Flathead catfish	0.07	0.04	0.08
	(0.05)	(0.04)	(0.08)
Northern pike	0.16	0.44	0.00
	(0.08)	(0.22)	(0.00)
White bass	0.57	0.81	0.42
	(0.22)	(0.38)	(0.27)
Yellow bass	0.02	0.07	0.00
	(0.02)	(0.05)	(0.00)
Pumpkinseed	1.16	1.90	0.73
	(0.40)	(0.78)	(0.45)
Orangespotted sunfish	0.13	0.34	0.00
	(0.06)	(0.16)	(0.00)
Bluegill	9.94	21.90	2.98
	(3.68)	(9.43)	(1.97)
Largemouth bass	0.24	0.50	0.08
	(0.11)	(0.26)	(0.08)
White crappie	0.62	1.67	0.00
	(0.20)	(0.55)	(0.00)
Black crappie	4.51	11.16	0.64
	(1.52)	(4.07)	(0.45)
Yellow perch	0.24	0.66	0.00
	(0.10)	(0.27)	(0.00)
Sauger	0.24	0.50	0.08
	(0.11)	(0.25)	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Walleye	0.09	0.11	0.09
	(0.06)	(0.08)	(0.09)
Freshwater drum	2.53	2.36	2.63
	(0.68)	(1.02)	(0.89)

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Table 3.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Longnose gar	0.05	0.07	0.00	0.08	0.00	0.00
	(0.03)	(0.05)	(0.00)	(0.08)	(0.00)	(0.00)
Shortnose gar	0.80	1.06	0.50	1.15	0.86	0.00
	(0.28)	(0.43)	(0.25)	(0.64)	(0.86)	(0.00)
Bowfin	0.05	0.14	0.00	0.00	0.00	0.00
	(0.03)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Gizzard shad	0.45	1.33	0.33	0.00	0.00	0.00
	(0.21)	(0.63)	(0.14)	(0.00)	(0.00)	(0.00)
Spotfin shiner	2.14	0.39	0.08	4.17	5.62	1.66
	(0.78)	(0.25)	(0.08)	(1.96)	(3.61)	(1.07)
Common carp	5.28	2.50	15.09	5.57	4.37	7.17
	(2.47)	(1.38)	(11.24)	(4.21)	(3.48)	(7.17)
Silver chub	0.13	0.03	0.00	0.08	0.25	0.37
	(0.07)	(0.03)	(0.00)	(0.08)	(0.16)	(0.23)
Golden shiner	0.49	1.10	0.76	0.27	0.00	0.00
	(0.24)	(0.70)	(0.57)	(0.19)	(0.00)	(0.00)
Emerald shiner	26.59	28.26	13.54	38.90	228.08	3.53
	(6.72)	(11.13)	(5.66)	(14.66)	(215.13)	(2.66)
River shiner	37.47	5.74	59.02	87.92	6.96	2.94
	(25.11)	(3.20)	(30.39)	(67.49)	(3.75)	(2.56)
Spottail shiner	0.60	0.10	6.44	0.78	0.00	0.19
	(0.30)	(0.10)	(6.35)	(0.52)	(0.00)	(0.19)
Sand shiner	0.00	0.00	0.00	0.00	0.11	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Channel shiner	5.54	0.69	3.16	12.13	33.50	1.92
	(1.75)	(0.39)	(1.45)	(4.64)	(19.64)	(0.93)
Pugnose minnow	0.52	1.31	0.00	0.23	0.00	0.00
	(0.24)	(0.70)	(0.00)	(0.16)	(0.00)	(0.00)
Southern redbelly dace	0.04	0.00	0.00	0.00	0.12	0.17
	(0.04)	(0.00)	(0.00)	(0.00)	(0.12)	(0.17)
Bluntnose minnow	1.46	0.03	0.34	3.87	0.00	0.00
	(1.41)	(0.03)	(0.19)	(3.79)	(0.00)	(0.00)
Fathead minnow	0.05	0.00	0.00	0.09	2.75	0.00
	(0.04)	(0.00)	(0.00)	(0.09)	(2.62)	(0.00)
Bullhead minnow	3.71	1.97	1.16	6.41	3.46	2.41
	(1.40)	(0.85)	(0.98)	(3.59)	(1.42)	(1.20)
River carpsucker	20.84	0.28	8.77	54.34	1.43	0.87
	(20.04)	(0.19)	(5.88)	(53.95)	(1.30)	(0.87)
Shorthead redhorse	0.16	0.03	0.00	0.27	0.25	0.19
	(0.09)	(0.03)	(0.00)	(0.19)	(0.17)	(0.19)
Black bullhead	0.06	0.19	0.00	0.00	0.00	0.00
	(0.05)	(0.16)	(0.00)	(0.00)	(0.00)	(0.00)
Yellow bullhead	0.15	0.46	0.00	0.00	0.00	0.00
	(0.13)	(0.40)	(0.00)	(0.00)	(0.00)	(0.00)
Channel catfish	0.05	0.03	0.25	0.09	0.21	0.00
	(0.04)	(0.03)	(0.18)	(0.09)	(0.14)	(0.00)
Tadpole madtom	0.15	0.07	0.33	0.19	0.00	0.17
	(0.08)	(0.05)	(0.14)	(0.19)	(0.00)	(0.17)
Flathead catfish	0.04	0.00	0.00	0.00	0.12	0.17
	(0.04)	(0.00)	(0.00)	(0.00)	(0.12)	(0.17)
Brook silverside	0.06	0.07	0.25	0.09	0.00	0.00
	(0.04)	(0.05)	(0.18)	(0.09)	(0.00)	(0.00)
Brook stickleback	0.03	0.00	0.00	0.09	0.13	0.00
	(0.03)	(0.00)	(0.00)	(0.09)	(0.13)	(0.00)
White bass	9.02	11.69	0.52	13.54	4.58	0.17
	(5.65)	(8.51)	(0.24)	(13.16)	(4.30)	(0.17)
Rock bass	0.00	0.00	0.08	0.00	0.00	0.00
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)

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Table 3.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Pumpkinseed	0.77	0.85	7.95	0.55	0.00	0.00
	(0.32)	(0.42)	(6.57)	(0.46)	(0.00)	(0.00)
Warmouth	0.09	0.27	0.00	0.00	0.00	0.00
	(0.04)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)
Orangespotted sunfish	3.37	9.61	0.00	0.32	1.11	0.17
	(0.82)	(2.47)	(0.00)	(0.18)	(1.11)	(0.17)
Bluegill	41.92	114.27	12.93	5.01	12.36	5.69
	(16.49)	(49.50)	(7.61)	(2.49)	(9.13)	(3.31)
Pumpkinseed x bluegill	0.01	0.03	0.00	0.00	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
Largemouth bass	1.09	1.88	0.74	1.13	2.23	0.00
	(0.52)	(0.92)	(0.33)	(1.13)	(1.82)	(0.00)
White crappie	0.61	1.53	0.43	0.09	0.11	0.19
	(0.40)	(1.19)	(0.30)	(0.09)	(0.11)	(0.19)
Black crappie	0.48	0.95	1.47	0.17	1.08	0.15
	(0.09)	(0.21)	(0.76)	(0.12)	(0.84)	(0.15)
Mud darter	0.06	0.17	0.00	0.00	0.00	0.00
	(0.03)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Johnny darter	0.65	0.76	0.41	0.17	0.38	1.23
	(0.29)	(0.55)	(0.41)	(0.11)	(0.27)	(0.85)
Yellow perch	0.03	0.10	0.00	0.00	0.00	0.00
	(0.02)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
Logperch	0.21	0.14	0.00	0.16	0.75	0.39
	(0.11)	(0.08)	(0.00)	(0.11)	(0.42)	(0.39)
River darter	0.46	0.21	0.00	1.03	0.86	0.00
	(0.32)	(0.11)	(0.00)	(0.86)	(0.86)	(0.00)
Sauger	0.10	0.08	0.17	0.17	0.12	0.00
	(0.05)	(0.05)	(0.17)	(0.11)	(0.12)	(0.00)
Walleye	0.12	0.07	0.00	0.27	0.25	0.00
	(0.07)	(0.05)	(0.00)	(0.19)	(0.17)	(0.00)
Freshwater drum	7.81	3.17	1.37	16.20	47.33	1.58
	(5.19)	(2.09)	(0.68)	(13.82)	(37.77)	(1.05)

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Table 3.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Shortnose gar	0.12	0.33	0.00
	(0.06)	(0.17)	(0.00)
Gizzard shad	0.13	0.36	0.00
	(0.06)	(0.17)	(0.00)
Spotfin shiner	0.10	0.00	0.16
	(0.10)	(0.00)	(0.16)
Common carp	1.57	2.78	0.87
	(0.62)	(1.35)	(0.59)
Silver chub	0.23	0.22	0.24
	(0.16)	(0.13)	(0.24)
Golden shiner	0.07	0.20	0.00
	(0.05)	(0.14)	(0.00)
Emerald shiner	2.59	1.07	3.48
	(2.20)	(0.37)	(3.48)
River shiner	2.05	0.28	3.07
	(1.94)	(0.21)	(3.07)
Spottail shiner	0.23	0.03	0.34
	(0.21)	(0.03)	(0.34)
Channel shiner	0.42	0.74	0.24
	(0.20)	(0.35)	(0.24)
Pugnose minnow	4.81	13.06	0.00
	(3.64)	(9.91)	(0.00)
Bullhead minnow	3.65	9.64	0.16
	(1.96)	(5.33)	(0.16)
Black bullhead	0.03	0.07	0.00
	(0.02)	(0.05)	(0.00)
Channel catfish	0.16	0.00	0.25
	(0.07)	(0.00)	(0.11)
Tadpole madtom	0.17	0.03	0.25
	(0.07)	(0.03)	(0.11)
Flathead catfish	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
White bass	0.27	0.20	0.32
	(0.17)	(0.20)	(0.24)
Pumpkinseed	2.75	7.03	0.25
	(2.58)	(6.99)	(0.25)
Warmouth	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
Orangespotted sunfish	2.14	5.81	0.00
	(1.41)	(3.84)	(0.00)
Bluegill	16.09	42.14	0.92
	(9.90)	(26.91)	(0.64)
Largemouth bass	0.03	0.07	0.00
	(0.02)	(0.05)	(0.00)
White crappie	0.07	0.20	0.00
	(0.05)	(0.13)	(0.00)
Black crappie	0.34	0.77	0.09
	(0.15)	(0.39)	(0.09)
Johnny darter	0.16	0.15	0.16
	(0.07)	(0.10)	(0.10)
Yellow perch	0.01	0.03	0.00
	(0.01)	(0.03)	(0.00)
Logperch	0.48	1.30	0.00
	(0.24)	(0.64)	(0.00)
River darter	0.09	0.25	0.00
	(0.06)	(0.16)	(0.00)
Sauger	0.01	0.04	0.00
	(0.01)	(0.04)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Walleye	0.12	0.17	0.09
	(0.06)	(0.10)	(0.09)
Freshwater drum	1.65	0.82	2.13
	(0.89)	(0.33)	(1.40)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	IMPO	MCBU	MCBW	SCB
Common carp	0.01	0.00	0.00	0.00	0.05
	(0.01)	(0.00)	(0.00)	(0.00)	(0.03)
Silver chub	0.00	0.00	0.00	0.28	0.00
	(0.00)	(0.00)	(0.00)	(0.28)	(0.00)
River carpsucker	0.00	0.00	0.00	0.25	0.00
	(0.00)	(0.00)	(0.00)	(0.25)	(0.00)
Quillback	0.00	0.00	0.00	0.00	0.02
	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
Smallmouth buffalo	0.08	0.00	0.25	0.06	0.12
	(0.07)	(0.00)	(0.25)	(0.06)	(0.08)
Channel catfish	1.42	0.00	1.14	2.54	6.51
	(0.48)	(0.00)	(0.36)	(2.09)	(2.72)
Flathead catfish	0.03	0.00	0.05	0.17	0.10
	(0.01)	(0.00)	(0.05)	(0.12)	(0.04)
White bass	0.02	0.00	0.08	0.06	0.00
	(0.02)	(0.00)	(0.08)	(0.06)	(0.00)
Pumpkinseed	0.05	0.09	0.00	0.00	0.00
	(0.05)	(0.09)	(0.00)	(0.00)	(0.00)
Bluegill	0.22	0.16	0.13	0.70	0.51
	(0.08)	(0.10)	(0.09)	(0.52)	(0.30)
White crappie	0.01	0.00	0.00	0.00	0.05
	(0.01)	(0.00)	(0.00)	(0.00)	(0.05)
Black crappie	0.01	0.00	0.00	0.11	0.07
	(0.01)	(0.00)	(0.00)	(0.11)	(0.07)
Freshwater drum	0.27	0.33	0.21	0.00	0.16
	(0.07)	(0.10)	(0.11)	(0.00)	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	IMPO	MCBU	MCBW	SCB
Silver lamprey	0.00	0.00	0.00	0.00	0.03
	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)
Common carp	0.04	0.00	0.00	0.00	0.23
	(0.02)	(0.00)	(0.00)	(0.00)	(0.12)
River carpsucker	0.10	0.16	0.00	0.00	0.05
	(0.09)	(0.16)	(0.00)	(0.00)	(0.05)
Quillback	0.01	0.00	0.00	0.00	0.05
	(0.01)	(0.00)	(0.00)	(0.00)	(0.03)
Smallmouth buffalo	4.06	4.51	2.42	5.58	4.91
	(1.20)	(1.96)	(1.03)	(2.08)	(1.90)
Shorthead redhorse	0.05	0.00	0.04	0.12	0.24
	(0.02)	(0.00)	(0.04)	(0.12)	(0.09)
Channel catfish	0.11	0.00	0.17	0.11	0.36
	(0.04)	(0.00)	(0.13)	(0.11)	(0.15)
Flathead catfish	0.12	0.08	0.25	0.00	0.03
	(0.06)	(0.08)	(0.17)	(0.00)	(0.03)
White bass	0.03	0.00	0.09	0.00	0.05
	(0.02)	(0.00)	(0.09)	(0.00)	(0.03)
Bluegill	0.07	0.00	0.18	0.06	0.12
	(0.05)	(0.00)	(0.18)	(0.06)	(0.05)
White crappie	0.01	0.00	0.00	0.00	0.05
	(0.01)	(0.00)	(0.00)	(0.00)	(0.03)
Black crappie	0.02	0.00	0.04	0.12	0.07
	(0.01)	(0.00)	(0.04)	(0.08)	(0.04)
Freshwater drum	0.44	0.33	0.56	0.40	0.62
	(0.12)	(0.17)	(0.25)	(0.14)	(0.15)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	SCB
Shortnose gar	0.15	0.14	0.00	0.28	0.00
	(0.06)	(0.07)	(0.00)	(0.16)	(0.00)
Gizzard shad	5.70	16.14	0.00	0.31	0.67
	(3.66)	(10.96)	(0.00)	(0.15)	(0.22)
Spotfin shiner	1.17	0.06	1.21	1.56	2.08
	(0.49)	(0.04)	(1.08)	(1.06)	(1.13)
Common carp	1.79	3.11	1.92	0.61	1.75
	(0.54)	(1.27)	(0.91)	(0.35)	(1.22)
Mississippi silvery minnow	0.02	0.00	0.00	0.00	0.08
	(0.02)	(0.00)	(0.00)	(0.00)	(0.08)
Speckled chub	0.04	0.00	0.00	0.11	0.00
	(0.03)	(0.00)	(0.00)	(0.09)	(0.00)
Silver chub	0.04	0.00	0.00	0.06	0.08
	(0.03)	(0.00)	(0.00)	(0.06)	(0.08)
Golden shiner	0.20	0.58	0.08	0.00	0.00
	(0.08)	(0.25)	(0.08)	(0.00)	(0.00)
Emerald shiner	67.45	63.11	68.25	64.58	77.25
	(14.37)	(29.27)	(18.78)	(17.19)	(32.74)
River shiner	22.51	11.31	222.67	15.67	19.50
	(4.79)	(6.14)	(104.10)	(4.03)	(7.49)
Spottail shiner	0.01	0.03	0.08	0.00	0.00
	(0.01)	(0.03)	(0.08)	(0.00)	(0.00)
Channel shiner	4.92	1.92	10.33	4.67	8.50
	(0.87)	(1.15)	(5.11)	(1.24)	(2.37)
Pugnose minnow	0.17	0.50	0.00	0.00	0.00
	(0.13)	(0.37)	(0.00)	(0.00)	(0.00)
Suckermouth minnow	0.00	0.00	0.04	0.00	0.00
	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Bluntnose minnow	0.01	0.03	0.13	0.00	0.00
	(0.01)	(0.03)	(0.13)	(0.00)	(0.00)
Fathead minnow	0.02	0.00	0.04	0.06	0.00
	(0.01)	(0.00)	(0.04)	(0.04)	(0.00)
Bullhead minnow	2.49	3.25	9.29	1.33	2.25
	(0.65)	(1.63)	(6.47)	(0.51)	(0.80)
River carpsucker	3.61	0.08	24.25	7.22	0.08
	(1.45)	(0.08)	(12.55)	(3.72)	(0.08)
Smallmouth buffalo	0.00	0.00	0.08	0.00	0.00
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)
Spotted sucker	0.02	0.06	0.00	0.00	0.00
	(0.02)	(0.06)	(0.00)	(0.00)	(0.00)
Shorthead redhorse	0.05	0.00	0.17	0.06	0.08
	(0.03)	(0.00)	(0.13)	(0.04)	(0.08)
Black bullhead	0.25	0.75	0.00	0.00	0.00
	(0.18)	(0.55)	(0.00)	(0.00)	(0.00)
Yellow bullhead	0.26	0.78	0.00	0.00	0.00
	(0.18)	(0.55)	(0.00)	(0.00)	(0.00)
Channel catfish	0.09	0.00	0.04	0.11	0.17
	(0.05)	(0.00)	(0.04)	(0.09)	(0.17)
Tadpole madtom	0.11	0.17	0.83	0.06	0.00
	(0.03)	(0.07)	(0.42)	(0.04)	(0.00)
Northern pike	0.02	0.06	0.00	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)
Brook silverside	5.45	13.97	11.21	0.75	0.33
	(3.49)	(10.41)	(8.34)	(0.50)	(0.33)
White bass	0.97	2.33	0.46	0.28	0.25
	(0.55)	(1.63)	(0.22)	(0.12)	(0.18)
Green sunfish	0.00	0.00	0.04	0.00	0.00
	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in Pool 13 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 3.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	SCB
Pumpkinseed	0.08	0.08	0.88	0.06	0.00
	(0.03)	(0.06)	(0.66)	(0.04)	(0.00)
Warmouth	0.02	0.03	0.00	0.03	0.00
	(0.01)	(0.03)	(0.00)	(0.03)	(0.00)
Orangespotted sunfish	3.60	10.67	0.00	0.06	0.00
	(1.81)	(5.42)	(0.00)	(0.04)	(0.00)
Bluegill	16.91	48.86	5.63	0.64	0.33
	(5.24)	(15.68)	(2.09)	(0.33)	(0.19)
Warmouth x bluegill	0.01	0.03	0.00	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)
Smallmouth bass	0.04	0.00	0.17	0.03	0.08
	(0.02)	(0.00)	(0.08)	(0.03)	(0.08)
Largemouth bass	1.59	4.47	1.04	0.14	0.00
	(0.75)	(2.25)	(0.44)	(0.06)	(0.00)
White crappie	0.11	0.31	0.08	0.00	0.00
	(0.08)	(0.25)	(0.06)	(0.00)	(0.00)
Black crappie	0.53	1.56	0.21	0.00	0.00
	(0.23)	(0.67)	(0.17)	(0.00)	(0.00)
Mud darter	0.03	0.08	0.00	0.00	0.00
	(0.02)	(0.05)	(0.00)	(0.00)	(0.00)
Johnny darter	0.43	0.75	0.46	0.14	0.42
	(0.11)	(0.27)	(0.35)	(0.07)	(0.19)
Yellow perch	0.67	2.00	0.00	0.00	0.00
	(0.46)	(1.37)	(0.00)	(0.00)	(0.00)
Logperch	0.69	1.92	0.17	0.00	0.17
	(0.45)	(1.35)	(0.13)	(0.00)	(0.17)
River darter	0.17	0.17	0.00	0.14	0.25
	(0.07)	(0.07)	(0.00)	(0.07)	(0.25)
Sauger	0.01	0.03	0.04	0.00	0.00
	(0.01)	(0.03)	(0.04)	(0.00)	(0.00)
Walleye	0.07	0.17	0.00	0.03	0.00
	(0.04)	(0.12)	(0.00)	(0.03)	(0.00)
Freshwater drum	0.31	0.28	0.58	0.31	0.33
	(0.09)	(0.17)	(0.46)	(0.12)	(0.19)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 13 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Longnose gar	1.83
	(1.22)
Shortnose gar	1.17
	(0.98)
Mooneye	0.33
	(0.33)
Gizzard shad	56.67
	(47.65)
Common carp	2.67
	(1.36)
Mississippi silvery minnow	0.17
	(0.17)
Silver chub	7.50
	(2.00)
Golden shiner	0.50
	(0.34)
Emerald shiner	1.67
	(1.12)
River shiner	39.50
	(34.56)
Channel shiner	1.00
	(0.37)
Bullhead minnow	2.17
	(1.45)
River carpsucker	5.50
	(2.28)
Quillback	6.33
	(2.17)
Highfin carpsucker	0.50
	(0.50)
Smallmouth buffalo	4.33
	(1.99)
Silver redhorse	0.33
	(0.33)
Golden redhorse	0.33
	(0.21)
Shorthead redhorse	2.67
	(1.73)
Channel catfish	0.17
	(0.17)
Flathead catfish	0.83
	(0.65)
Northern pike	0.33
	(0.21)
Brook silverside	0.33
	(0.33)
White bass	21.83
	(4.42)
Yellow bass	1.17
	(0.31)
Rock bass	0.67
	(0.33)
Green sunfish	0.67
	(0.33)
Pumpkinseed	1.00
	(0.45)
Warmouth	0.17
	(0.17)
Orangespotted sunfish	25.33
	(16.32)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in Pool 13 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Bluegill	21.33
	(8.39)
Smallmouth bass	8.17
	(2.41)
Largemouth bass	10.33
	(3.32)
White crappie	0.83
	(0.40)
Black crappie	2.50
	(1.02)
Mud darter	0.17
	(0.17)
Yellow perch	0.17
	(0.17)
Logperch	1.17
	(0.48)
River darter	0.17
	(0.17)
Sauger	52.50
	(23.91)
Walleye	21.17
	(7.35)
Freshwater drum	26.83
	(14.22)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in Pool 13 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Longnose gar	0.17
	(0.17)
Shortnose gar	0.18
	(0.18)
Gizzard shad	0.35
	(0.22)
Spotfin shiner	3.12
	(1.47)
Common carp	1.83
	(1.16)
Speckled chub	0.17
	(0.17)
Emerald shiner	14.09
	(9.46)
River shiner	6.22
	(2.72)
Channel shiner	13.58
	(6.02)
Bullhead minnow	0.69
	(0.44)
Shorthead redhorse	0.18
	(0.18)
Channel catfish	0.17
	(0.17)
White bass	1.05
	(0.47)
Orangespotted sunfish	0.88
	(0.57)
Bluegill	5.81
	(2.07)
Mud darter	0.17
	(0.17)
Logperch	0.18
	(0.18)
River darter	0.72
	(0.72)
Sauger	0.36
	(0.23)
Freshwater drum	1.29
	(1.09)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in Pool 13 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Smallmouth buffalo	0.25
	(0.11)
Channel catfish	0.50
	(0.50)
Tadpole madtom	0.08
	(0.08)
Flathead catfish	0.25
	(0.17)
Bluegill	0.49
	(0.49)
Black crappie	0.08
	(0.08)
Freshwater drum	0.08
	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in Pool 13 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Common carp	0.08
	(0.08)
Smallmouth buffalo	15.96
	(10.05)
Channel catfish	0.08
	(0.08)
Flathead catfish	0.08
	(0.08)
White bass	0.41
	(0.33)
White crappie	0.08
	(0.08)
Black crappie	0.33
	(0.24)
Freshwater drum	0.08
	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 3.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using bottom trawling in Pool 13 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Shovelnose sturgeon	1.17
	(0.30)
Longnose gar	0.04
	(0.04)
Common carp	0.08
	(0.06)
Speckled chub	0.08
	(0.06)
Channel shiner	0.08
	(0.08)
Shorthead redhorse	0.08
	(0.06)
Channel catfish	0.71
	(0.31)
Flathead catfish	0.04
	(0.04)
Pumpkinseed	0.04
	(0.04)
River darter	0.04
	(0.04)
Sauger	0.13
	(0.13)
Freshwater drum	0.46
	(0.23)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

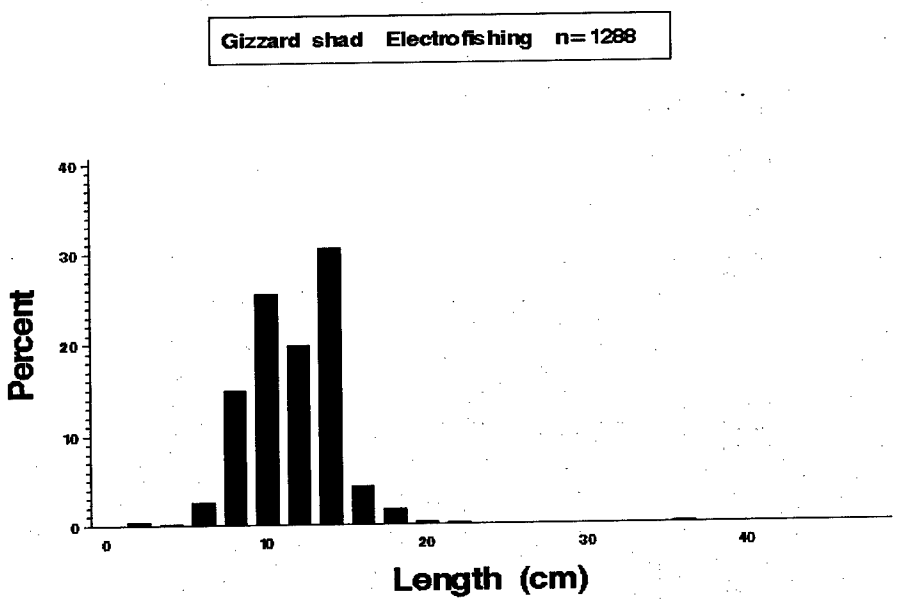

Figure 3.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

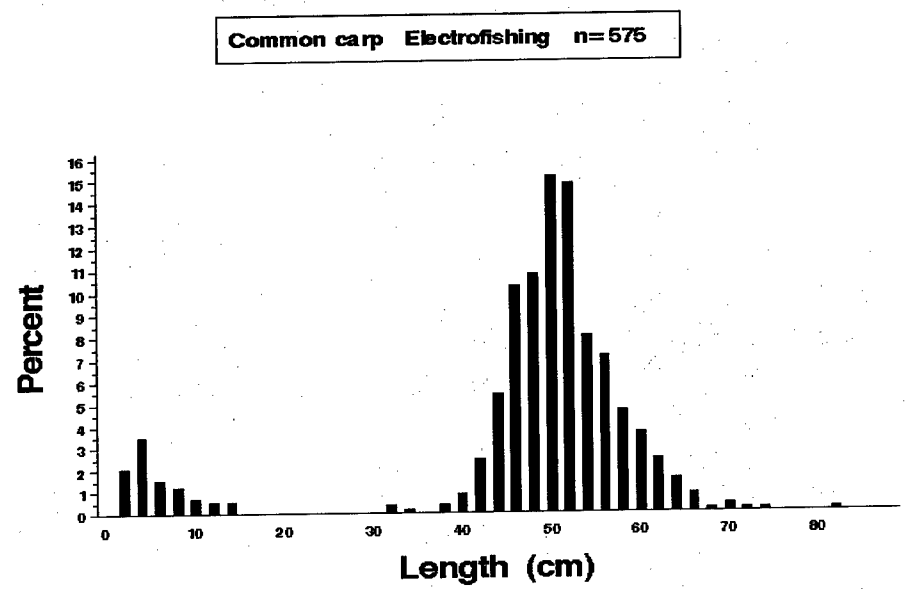

Figure 3.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

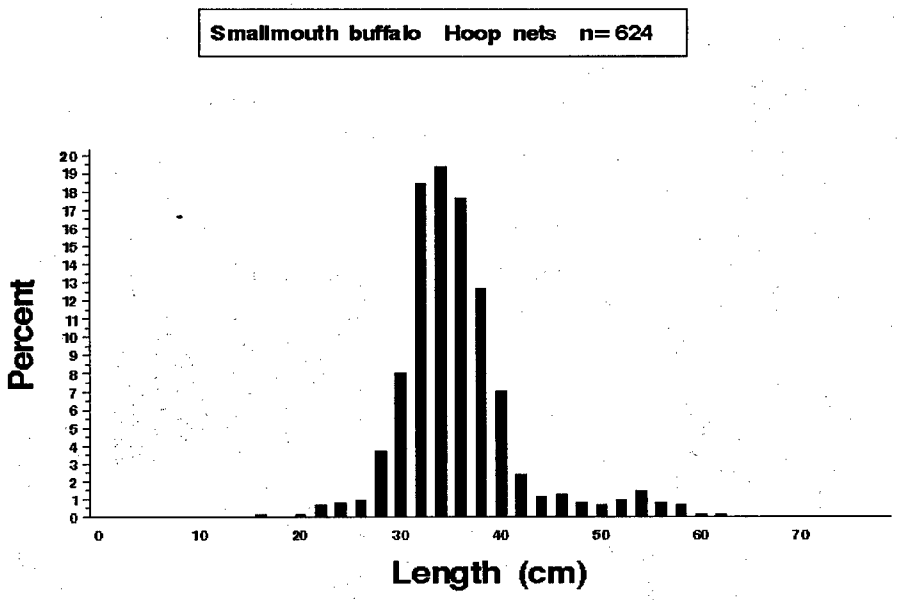

Figure 3.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 13 during 1997.

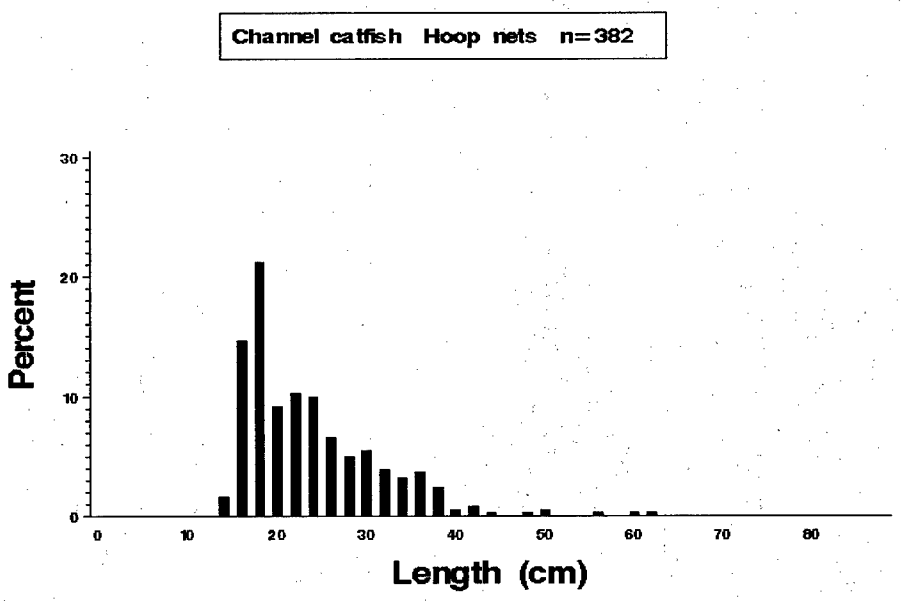

Figure 3.5. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 13 during 1997.

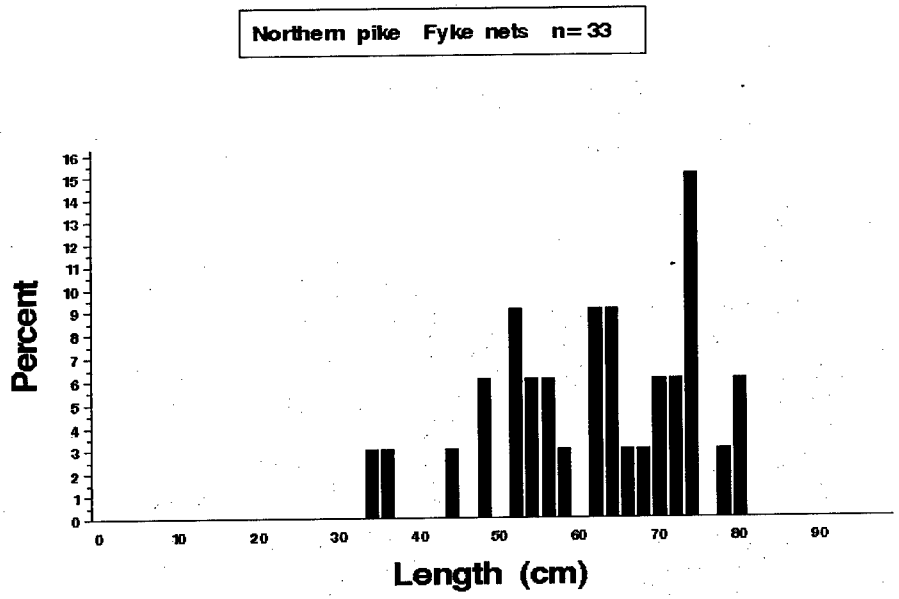

Figure 3.6. Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 13 during 1997.

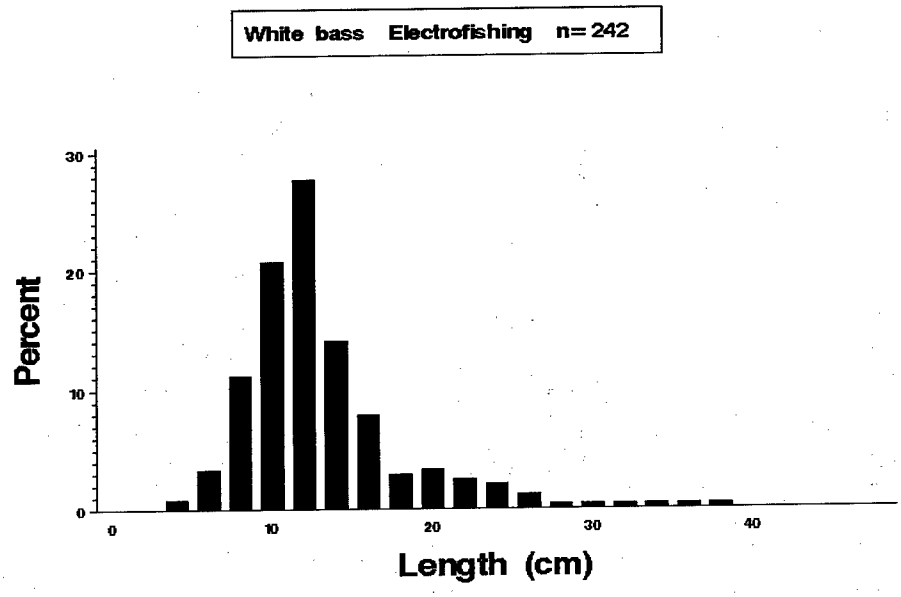

Figure 3.7. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

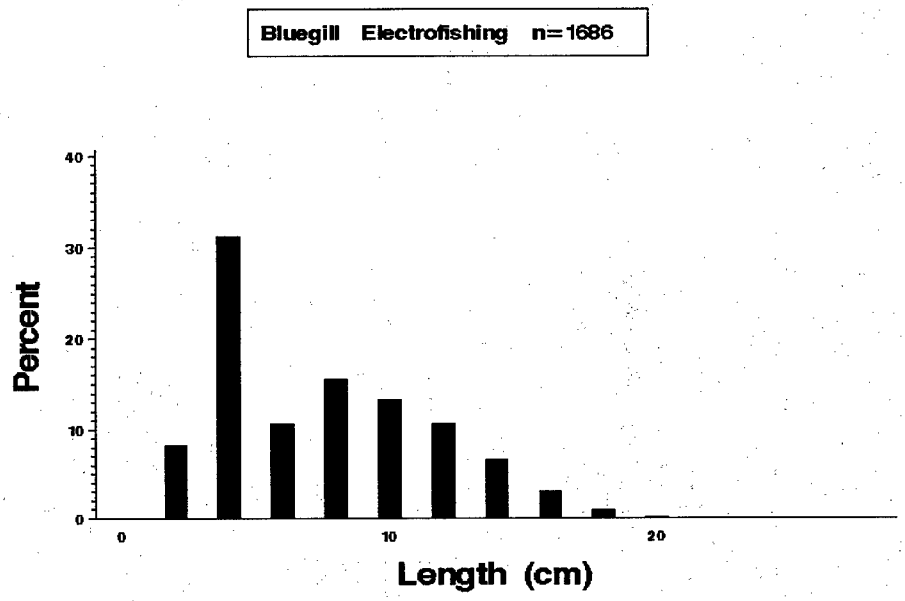

Figure 3.8. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

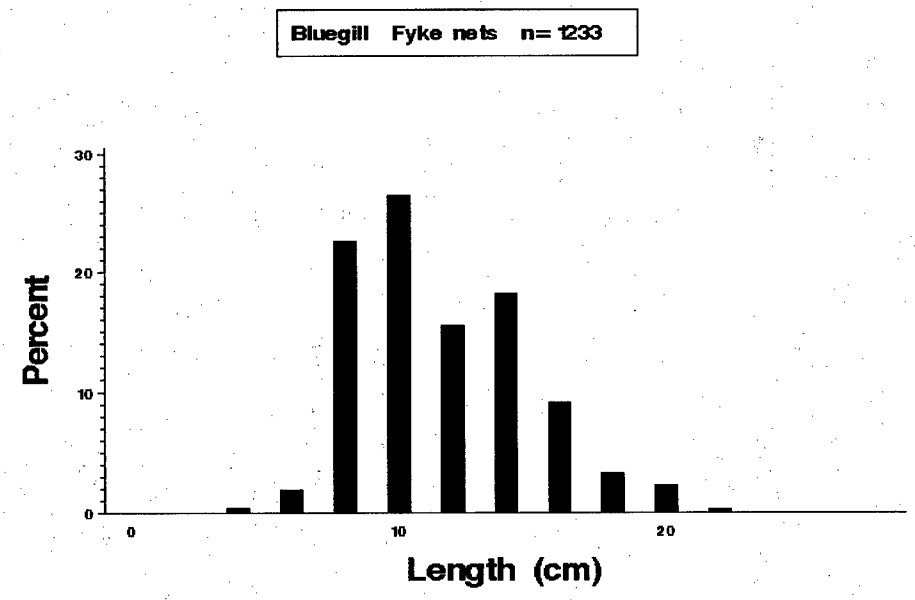

Figure 3.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1997.

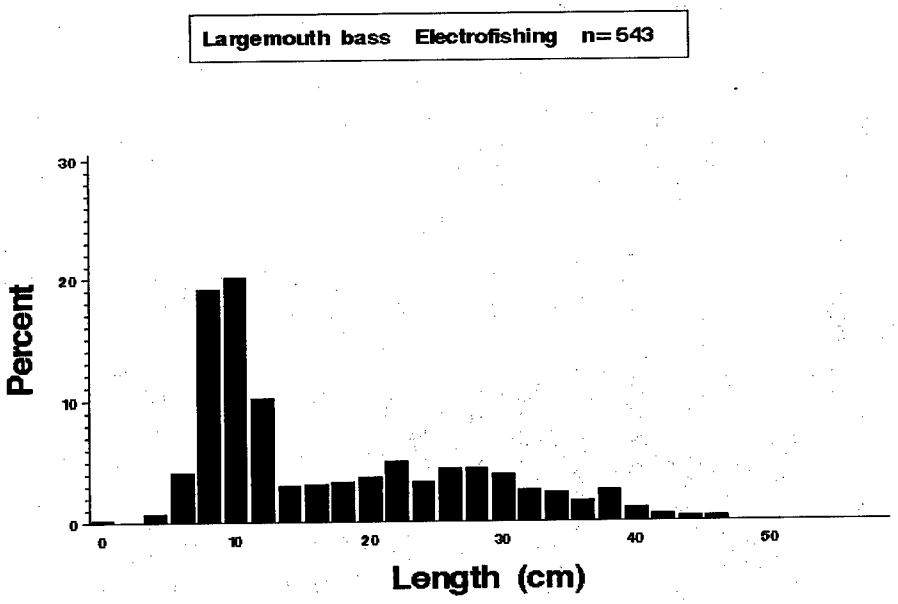

Figure 3.10. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

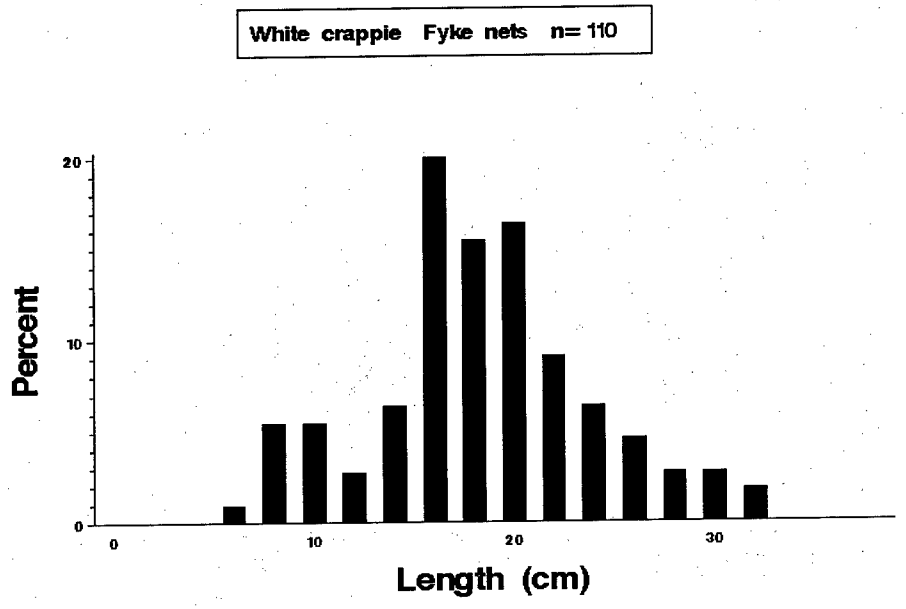

Figure 3.11. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1997.

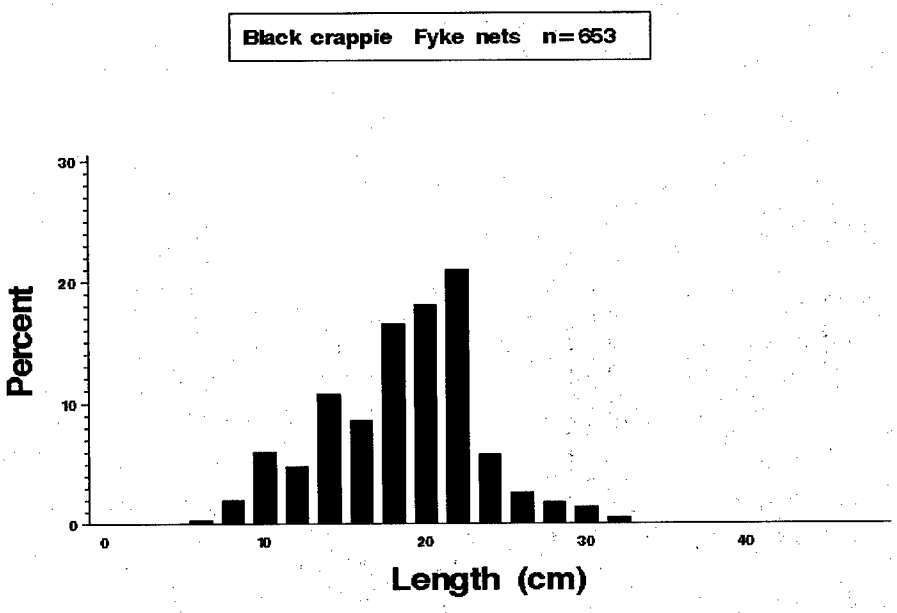

Figure 3.12. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1997.

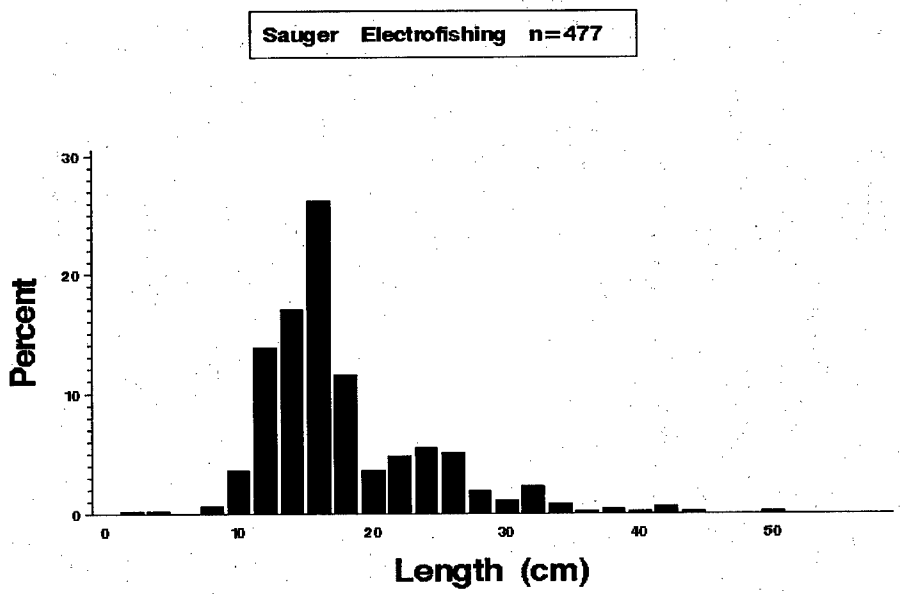

Figure 3.13. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

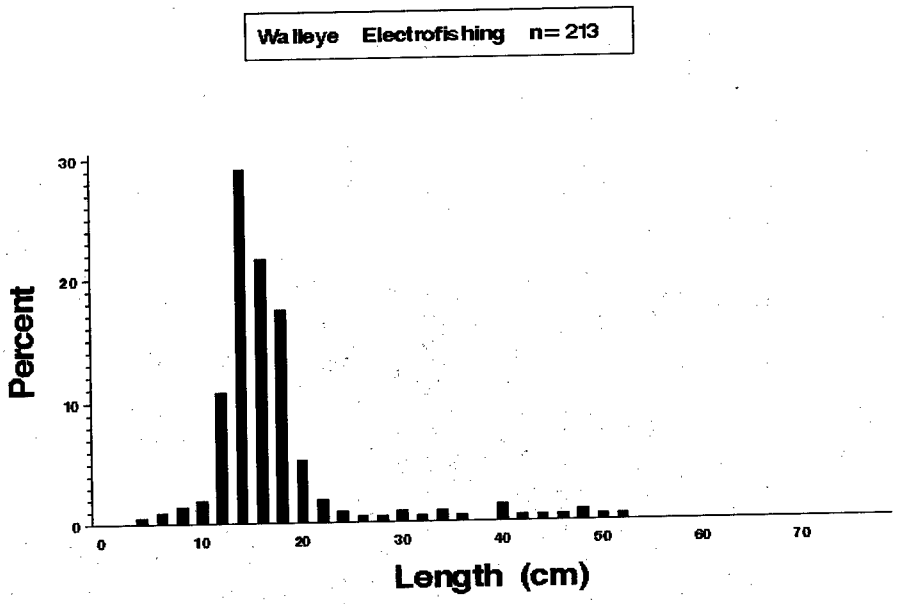

Figure 3.14. Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

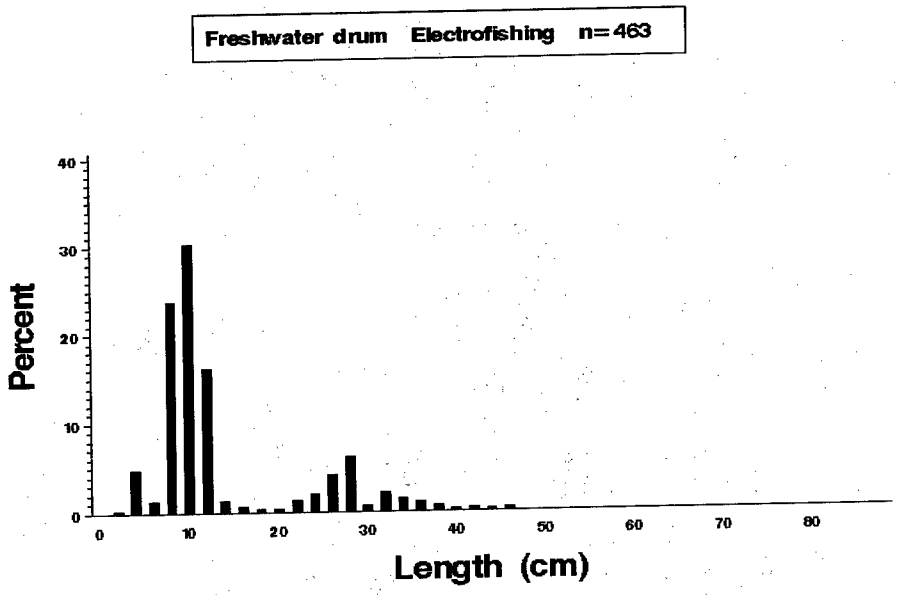

Figure 3.15. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 13 during 1997.

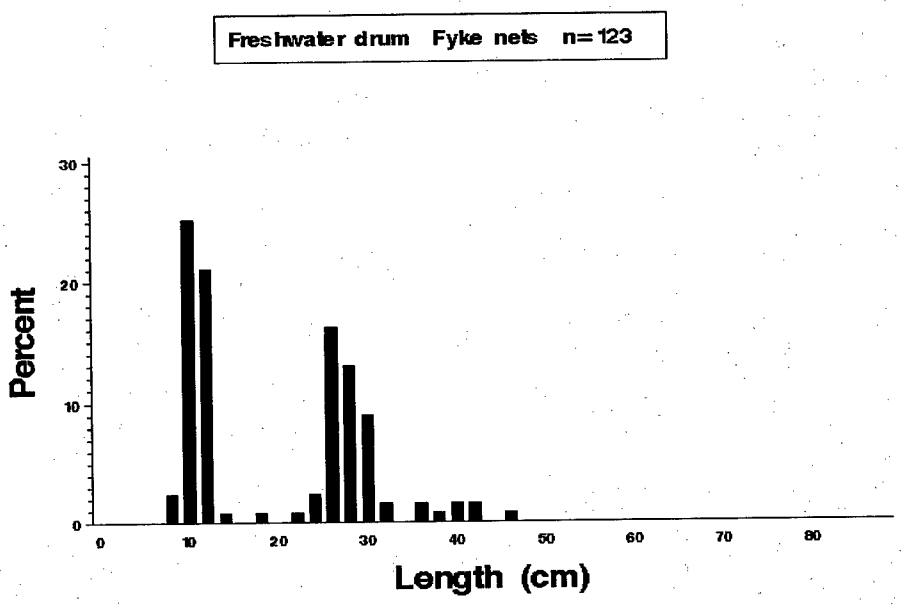

Figure 3.16. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 13 during 1997.

Chapter 4. Pool 26, Upper Mississippi River

by

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Hydrograph

Water levels at Pool 26 are influenced by discharge from the Mississippi, Illinois, and Missouri Rivers. The pool is regulated at a midpool control point by the U.S. Army Corps of Engineers. These factors combine to give Pool 26 a highly fluctuating hydrologic regime. Three sets of hydrographs are shown to accurately represent these fluctuations (Figure 4.1). Gages are located at Lock and Dam 25 tailwater (Winfield Gage), midreach (Grafton Gage), and Lock and Dam 26 impoundment (Alton Gage). Each graph shows 1940–96 daily means and 1997 daily water levels.

Daily water levels at the Winfield Gage show a significant flood pulse in late February through early March and another in late April through early May. Daily water levels fluctuated near the 1940–96 mean for the rest of the year. Daily water levels at the Grafton Gage show the same flood pulses as the Winfield Gage, with periods of low water (levels below the 1940–96 mean) following each flood pulse. The Alton Gage shows a similar pattern but with more pronounced periods of low water after the flood pulses. Water levels at all three gages had no major effects on the fisheries sampling season (June 15–October 30). Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

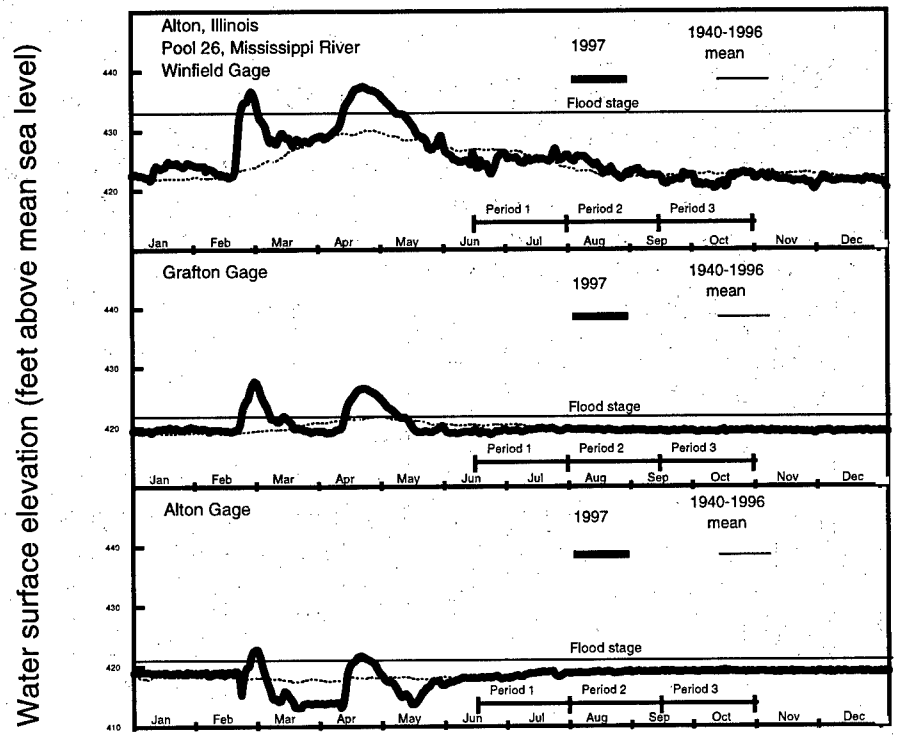

Figure 4.1. Daily water surface elevation from Winfield, Grafton, and Alton Gages for Pool 26, Upper Mississippi River, during 1997 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

Summary of Sampling Effort

We collected 391 samples in 1997—130 from period 1, 130 from period 2, and 131 from period 3 (Table 4.1). Of those, 373 were from randomly selected sites in the BWCS, BWCO, SCB, MCBU, MCBW, IMPS, and IMPO strata and 18 were from fixed sites in the TWZ stratum.

Total Catch by Gear

During the 1997 field season, we collected 26,122 fish representing 66 species and 2 hybrid crosses (Table 4.2). The five most abundant species numerically were the gizzard shad (11,904), emerald shiner (3,211), common carp (1,895), freshwater drum (1,428), and western mosquitofish (1,039). The total number of fish and species (excluding hybrids) collected by gear type were day electrofishing, 8,500 fish of 52 species; night electrofishing, 890 fish of 27 species; fyke nets, 327 fish of 21 species; tandem fyke nets, 908 fish of 12 species; mini fyke nets, 9,172 fish of 33 species; tandem mini fyke nets, 1,061 fish of 24 species; seines, 3,179 fish of 32 species; small hoop nets, 797 fish of 13 species; large hoop nets, 1,051 fish of 18 species; trammel nets, 31 fish of 9 species; and trawls, 206 fish of 7 species.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing (Table 4.3.1), the gizzard shad had the highest *C/f* in all strata combined (65.74), followed by common carp (20.68) and emerald shiner (3.25). Gizzard shad also had the highest *C/f* in the BWCS (26.11), followed by common carp (13.11) and orangespotted sunfish (10.28). Emerald shiner had the highest *C/f* in the IMPS stratum (29.67), followed by gizzard shad (29.33) and bluegill (15.83). Gizzard shad had the highest *C/f* in the MCBU stratum (68.29), followed by common carp (19.83) and channel catfish (3.79). Gizzard shad had the highest *C/f* in the MCBW stratum (72.83), followed by common carp (26.83) and emerald shiner (15.50). Gizzard shad had the highest *C/f* in the SCB stratum (66.47), followed by common carp (24.24) and emerald shiner (6.41).

Fyke Netting

For fyke netting (Table 4.3.2), shortnose gar had the highest *C/f* in all strata combined (2.71), followed by freshwater drum (2.14) and white bass (1.46). In the BWCS stratum, shortnose gar had the highest *C/f* with 4.97, followed by white bass (4.34) and bluegill (3.54). In the IMPS stratum, black crappie had the highest *C/f* (2.06), followed by bluegill (2.03) and white bass (1.34). In the SCB stratum, white bass and shortnose gar had the highest *C/f* (2.45), followed by white bass (1.06).

Tandem Fyke Net

For tandem fyke netting (Table 4.3.3), gizzard shad had the highest *C/f* in all strata combined (26.01), followed by white bass (2.15) and freshwater drum (1.75). In the BWCO stratum, gizzard shad had the highest *C/f* (48.55), followed by white bass (2.48) and shortnose gar (1.42). In the IMPO stratum, gizzard shad had the highest *C/f* (10.25), followed by freshwater drum (2.46) and white bass (1.91).

Mini Fyke Net

For mini fyke netting (Table 4.3.4), freshwater drum had the highest *C/f* in all strata combined (44.38), followed by emerald shiner (12.34) and gizzard shad (9.75). Western mosquitofish had the highest *C/f* in the BWCS stratum (83.32), followed by spotfin shiner (9.47) and gizzard shad (6.46). Gizzard shad had the highest *C/f* in the IMPS stratum (949.66), followed by emerald shiner (102.24) and bluegill (7.92). Freshwater drum had the highest *C/f* in the MCBU stratum (60.18), followed by emerald shiner (11.36) and white bass (1.64). Spotfin shiner had the highest *C/f* in the MCBW stratum (1.89), followed by bullhead minnow (1.88) and bluegill (1.52). Freshwater drum had the highest *C/f* in SCB stratum (14.93), followed by emerald shiner (12.76) and spotfin shiner (11.88).

Tandem Mini Fyke Net

For tandem mini fyke netting (Table 4.3.5), gizzard shad had the highest *C/f* in all strata combined (8.48), followed by orangespotted sunfish (7.06) and freshwater drum (6.78). Orangespotted sunfish had the highest *C/f* in the BWCO stratum (17.04), followed by gizzard shad (14.53) and emerald shiner (14.52). Freshwater drum had the highest *C/f* in the IMPO stratum (8.26), followed by gizzard shad (4.25) and bluegill (4.03).

Small Hoop Net

For small hoop netting (Table 4.3.6), channel catfish had the highest *C/f* in all strata combined (6.61), followed by common carp (0.68) and smallmouth buffalo (0.40). Black buffalo had the highest *C/f* in the BWCO stratum (0.18), followed by shortnose gar, gizzard shad, common carp, river carpsucker, channel catfish, white bass, and black crappie, each with 0.09. Common carp had the highest *C/f* in the IMPO stratum (1.66), followed by channel catfish (0.17), black buffalo (0.09), and freshwater drum (0.09). Channel catfish had the highest *C/f* in the MCBU stratum (3.57), followed by common carp (0.80) and smallmouth buffalo (0.52). Channel catfish had the highest *C/f* in the MCBW stratum (1.36), followed by common carp (1.24) and freshwater drum (0.35). Channel catfish had the highest *C/f* in the SCB stratum (14.70), followed by freshwater drum (0.37) and common carp (0.33).

Large Hoop Net

For large hoop netting (Table 4.3.7), smallmouth buffalo had the highest *C/f* in all strata combined (6.66), followed by common carp (1.46) and channel catfish (1.32). Common carp had the highest *C/f* in the BWCO stratum (1.79), followed by smallmouth buffalo (1.07) and white bass (0.80). Common carp had the highest *C/f* in the IMPO stratum (7.00), followed by black buffalo (2.00) and smallmouth buffalo (0.35). Smallmouth buffalo had the highest *C/f* in the MCBU stratum (7.87), followed by common carp (1.30) and channel catfish (1.20). Smallmouth buffalo had the highest *C/f* in the MCBW stratum (3.75), followed by common carp (2.10) and channel catfish (0.85). Smallmouth buffalo had the highest *C/f* in the SCB stratum (4.76), followed by channel catfish (1.80) and common carp (1.31).

Seine

For seining (Table 4.3.8), emerald shiner had the highest *C/f* in all strata combined (14.77), followed by gizzard shad (11.50) and river shiner (1.73). Emerald shiner also had the highest *C/f* in the MCBU stratum (8.94), followed by gizzard shad (8.67), spotfin shiner (1.29), and river shiner (1.29). In the SCB stratum, emerald shiner had the highest *C/f* (28.36), followed by gizzard shad (18.08) and channel shiner (3.22).

Trammel Net

For trammel netting (Table 4.3.9), the IMPO was the only stratum sampled. Common carp had the highest *C/f* (2.59), followed by freshwater drum (0.69) and shortnose gar (0.67).

Fixed Sampling, Mean *C/f* by Gear and Stratum

Night Electrofishing

For night electrofishing (Table 4.4.1), the TWZ was the only stratum sampled. Gizzard shad had the highest *C/f* (35.33), followed by common carp (34.67) and white bass (26.67).

Trawl

For trawling (Table 4.4.2), the TWZ was the only stratum sampled. Freshwater drum had the highest *C/f* (13.17), followed by shovelnose sturgeon (1.58) and channel catfish (1.00).

Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 4.2 to 4.14. The length distributions for some gears may be limited by the size selectiveness of the particular gear. Length distributions of small samples ($n < 100$) may be included but are not statistically meaningful (Anderson and Neumann 1996).

Gizzard Shad

The electrofishing length distribution of 4,240 gizzard shad (Figure 4.2) shows many fish between 8 and 12 cm with a mode of 10 cm.

Common Carp

The electrofishing length distribution of 1,546 common carp (Figure 4.3) indicates very few fish smaller than 30 cm with most fish between 30 and 50 cm.

Smallmouth Buffalo

The electrofishing length distribution of 277 smallmouth buffalo (Figure 4.4) shows a bimodal distribution. The first group represents young fish between 4 and 20 cm, with a mode of 12 cm and the other group represents larger fish between 20 and 50 cm, with a mode of 30–32 cm. The hoop net length distribution from 590 smallmouth buffalo (Figure 4.5) shows a similar group of larger fish with a mode of 32 cm.

Channel Catfish

The electrofishing length distribution of 186 channel catfish (Figure 4.6) shows a group of age 0 fish between 4 and 12 cm with a mode of 6 cm. The remainder are spread between 16 and 72 cm, with a mode of 36 cm. The hoop net length distribution of 751 channel catfish (Figure 4.7) shows many fish between 12 and 22 cm with a mode of 16 cm. There are also fish as long as 66 cm.

White Bass

The electrofishing length distribution of 315 white bass (Figure 4.8) shows most fish are between 2 and 24 cm, with a mode of 10 cm. There is another apparent size class between 26 and 38 cm.

Bluegill

The electrofishing length distribution of 369 bluegills (Figure 4.9) shows a distribution between 0 and 16 cm, with a mode of 60 cm. The fyke net length distribution of 76 bluegills (Figure 4.10) shows a distinctly larger size distribution, with fish ranging from 6 to 20 cm and a mode of 14 cm.

Largemouth Bass

The electrofishing length distribution of 36 largemouth bass (Figure 4.11) shows fish ranging from 6 to 44 cm, with no clear size groups.

Black Crappie

The fyke netting length distribution of 47 black crappies (Figure 4.12) shows most fish between 8 and 16 cm.

Sauger

The electrofishing length distribution of 47 saugers (Figure 4.13) shows fish between 4 and 40 cm, with a mode of 18 and 20 cm.

Freshwater Drum

The electrofishing length distribution of 348 freshwater drum (Figure 4.14) shows fish from 2 to 50 cm, with most fish in the smaller length groups between 4 and 16 cm.

Table 4.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in Pool 26 of the Mississippi River during 1997. Table entries are numbers of successfully completed standardized monitoring collections.

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	6		5	8	2	4				25
Fyke net	4		2			2				8
Large hoop net		2	5	8	2		2			19
Small hoop net		2	5	8	2		2			19
Mini fyke net	4		5	2	2	2				15
Night electrofishing									2	2
Seine			12	16						28
Trawling									4	4
Trammel net (set)							2			2
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
SUBTOTAL	14	8	34	42	8	8	10	0	6	130

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	6		6	8	2	4				26
Fyke net	4		2			2				8
Large hoop net		2	5	7	2		2			18
Small hoop net		2	5	8	2		2			19
Mini fyke net	4		5	2	2	2				15
Night electrofishing									2	2
Seine			12	16						28
Trawling									4	4
Trammel net (set)							2			2
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
SUBTOTAL	14	8	35	41	8	8	10	0	6	130

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	6		6	8	2	4				26
Fyke net	4		2			2				8
Large hoop net		2	5	8	2		2			19
Small hoop net		2	5	8	2		2			19
Mini fyke net	4		5	2	2	2				15
Night electrofishing									2	2
Seine			12	16						28
Trawling									4	4
Trammel net (set)							2			2
Tandem fyke net		2					2			4
Tandem mini fyke net		2					2			4
SUBTOTAL	14	8	35	42	8	8	10	0	6	131
	42	24	104	125	24	24	30	0	18	391

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SBU - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1997 in Pool 26 of the Mississippi River. See Table 4.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	1	-	-	-	-	-	-	-	-	-	-	-	1
2	Shovelnose sturgeon	Scaphirhynchus platorynchus	-	2	-	-	-	-	-	-	-	-	-	19	21
3	Paddlefish	Polyodon spathula	-	-	-	-	-	-	-	-	1	-	1	-	2
4	Spotted gar	Lepisosteus oculatus	6	-	3	-	5	-	-	-	-	-	-	-	14
5	Longnose gar	Lepisosteus osseus	2	7	-	-	2	-	-	-	-	-	-	-	11
6	Shortnose gar	Lepisosteus platostomus	122	63	79	21	39	10	2	2	1	-	4	-	343
7	Bowfin	Amia calva	1	1	2	-	1	-	-	-	-	-	-	-	5
8	Goldeye	Hiodon alosoides	1	25	-	-	-	-	-	-	-	-	1	-	27
9	Mooneye	Hiodon tergisus	-	-	-	-	1	2	-	-	-	-	-	1	4
10	American eel	Anguilla rostrata	-	-	-	-	-	-	-	1	-	-	-	-	1
11	Skipjack herring	Alosa chrysochloris	80	2	1	-	1	-	45	-	-	-	1	-	130
12	Gizzard shad	Dorosoma cepedianum	4028	212	35	720	5609	224	1067	2	7	-	-	-	11904
13	Threadfin shad	Dorosoma petenense	2	-	-	1	-	-	-	-	-	-	-	-	3
14	Grass carp	Ctenopharyngodon idella	3	1	-	-	21	-	1	-	-	-	-	-	26
15	Red shiner	Cyprinella lutrensis	3	-	-	-	3	-	3	-	-	-	-	-	9
16	Spotfin shiner	Cyprinella spiloptera	99	-	-	-	309	-	84	-	-	-	-	-	492
17	Common carp	Cyprinus carpio	1338	208	7	3	12	3	1	81	224	-	15	3	1895
18	Goldfish x carp	Cyprinus auratus x carpio	1	-	-	-	-	-	-	-	-	-	-	-	1
19	Bighead carp	Hypopthalmichthys nobilis	-	-	-	-	3	-	4	-	5	-	2	-	14
20	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	-	6	-	-	-	-	-	10	16
21	Silver chub	Macrhybopsis storeriana	8	-	-	-	-	1	7	-	-	-	-	-	16
22	Golden shiner	Notemigonus crysoleucas	1	-	-	-	-	-	-	-	-	-	-	-	1
23	Emerald shiner	Notropis atherinoides	646	4	-	-	928	183	1450	-	-	-	-	-	3211
24	River shiner	Notropis blennius	82	4	-	-	23	-	161	-	-	-	-	-	270
25	Bigeye shiner	Notropis boops	1	-	-	-	-	-	-	-	-	-	-	-	1
26	Spottail shiner	Notropis hudsonius	3	-	-	-	1	-	3	-	-	-	-	-	7
27	Silverband shiner	Notropis shumardi	7	-	-	-	32	16	1	-	-	-	-	-	56
28	Sand shiner	Notropis stramineus	1	-	-	-	-	-	3	-	-	-	-	-	4
29	Channel shiner	Notropis wickliffi	45	8	-	-	81	14	162	-	-	-	-	-	310
30	Suckermouth minnow	Phenacobius mirabilis	-	-	-	-	-	-	1	-	-	-	-	-	1
31	Bluntnose minnow	Pimephales notatus	2	-	-	-	7	-	-	-	-	-	-	-	9
32	Bullhead minnow	Pimephales vigilax	138	1	-	-	120	98	26	-	-	-	-	-	383
33	River carpsucker	Carpiodes carpio	61	9	7	7	1	1	23	1	7	-	-	-	117
34	Quillback	Carpiodes cyprinus	11	-	-	-	-	-	3	-	-	-	-	-	14
35	Blue sucker	Cycleptus elongatus	1	-	-	-	-	-	-	-	-	-	-	-	1
36	Smallmouth buffalo	Ictiobus bubalus	216	61	3	2	-	1	6	32	558	-	-	-	879
37	Bigmouth buffalo	Ictiobus cyprinellus	61	4	-	-	3	-	-	-	3	-	-	-	71
38	Black buffalo	Ictiobus niger	34	-	1	-	-	1	-	3	36	-	2	-	77
39	Unidentified buffalo	Ictiobus sp.	24	-	-	-	98	15	2	-	-	-	-	-	139

Gears:
D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoqp netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 4.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1997 in Pool 26 of the Mississippi River. See Table 4.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Golden redhorse	Moxostoma erythrurum	7	-	-	-	-	-	-	-	-	-	-	-	7
41	Shorthead redhorse	Moxostoma macrolepidotum	12	5	-	-	-	-	-	-	2	-	-	-	19
42	Yellow bullhead	Ameiurus natalis	1	-	-	-	-	-	-	-	-	-	-	-	1
43	Brown bullhead	Ameiurus nebulosus	-	-	1	-	-	-	-	-	1	-	-	-	2
44	Blue catfish	Ictalurus furcatus	-	-	-	-	-	-	-	-	-	-	-	3	3
45	Channel catfish	Ictalurus punctatus	178	8	1	2	18	7	25	631	120	-	-	12	1002
46	Stonecat	Noturus flavus	1	-	-	-	-	-	-	-	-	-	-	-	1
47	Freckled madtom	Noturus nocturnus	-	-	-	-	-	-	1	-	-	-	-	-	1
48	Flathead catfish	Pylodictis olivaris	49	6	3	-	-	-	1	5	7	-	1	-	72
49	Western mosquitofish	Gambusia affinis	25	-	-	-	1007	-	7	-	-	-	-	-	1039
50	Brook silverside	Labidesthes sicculus	-	-	-	-	-	-	1	-	-	-	-	-	1
51	White bass	Morone chrysops	155	160	69	53	41	42	44	7	16	-	-	-	587
52	Yellow bass	Morone mississippiensis	3	3	1	-	-	-	-	-	-	-	-	-	7
53	Green sunfish	Lepomis cyanellus	22	-	-	-	-	-	-	-	-	-	-	-	22
54	Warmouth	Lepomis gulosus	8	-	-	-	1	-	-	-	-	-	-	-	9
55	Orangespotted sunfish	Lepomis humilis	266	1	2	-	82	206	2	-	-	-	-	-	559
56	Bluegill	Lepomis macrochirus	356	13	55	21	104	57	7	1	2	-	-	-	616
57	Green sunfish x bluegill	L. cyanellus x L. macrochirus	2	1	-	-	-	-	-	-	-	-	-	-	3
58	Smallmouth bass	Micropterus dolomieu	2	-	-	-	-	-	-	-	-	-	-	-	2
59	Largemouth bass	Micropterus salmoides	36	-	1	-	4	-	-	-	-	-	-	-	41
60	White crappie	Pomoxis annularis	8	2	8	18	8	2	-	-	1	-	-	-	47
61	Black crappie	Pomoxis nigromaculatus	18	1	25	22	19	2	-	1	1	-	-	-	89
62	Western sand darter	Ammocrypta clara	-	-	-	-	-	-	1	-	-	-	-	-	1
63	Mud darter	Etheostoma asprigene	1	-	-	-	1	-	-	-	-	-	-	-	2
64	Yellow perch	Perca flavescens	-	-	-	-	-	1	-	-	-	-	-	-	1
65	Logperch	Percina caprodes	1	-	-	-	-	-	-	-	-	-	-	-	1
66	Slenderhead darter	Percina phoxocephala	3	-	-	-	-	1	-	-	-	-	-	-	4
67	River darter	Percina shumardi	-	-	-	-	-	5	1	-	-	-	-	-	6
68	Sauger	Stizostedion canadense	43	4	2	-	3	10	1	-	-	-	-	-	63
69	Freshwater drum	Aplodinotus grunniens	274	74	21	38	584	153	33	30	59	-	4	158	1428
			8500	890	327	908	9172	1061	3179	797	1051	0	31	206	26122

Gears: D - Day electrofishing
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T - Trawling (4.8-m bottom trawl)

Table 4.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Chestnut lamprey	0.02	0.00	0.00	0.00	0.00	0.06
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)
Spotted gar	0.03	0.28	0.00	0.00	0.00	0.06
	(0.02)	(0.14)	(0.00)	(0.00)	(0.00)	(0.06)
Longnose gar	0.02	0.06	0.00	0.00	0.00	0.06
	(0.02)	(0.06)	(0.00)	(0.00)	(0.00)	(0.06)
Shortnose gar	1.45	2.22	0.83	0.88	0.83	2.71
	(0.24)	(0.96)	(0.17)	(0.29)	(0.31)	(0.51)
Bowfin	0.00	0.06	0.00	0.00	0.00	0.00
	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
Goldeye	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Skipjack herring	1.47	0.33	0.25	1.71	1.83	1.12
	(0.35)	(0.14)	(0.18)	(0.46)	(1.45)	(0.61)
Gizzard shad	65.74	26.11	29.33	68.29	72.83	66.47
	(14.46)	(8.65)	(12.31)	(20.75)	(21.50)	(15.25)
Threadfin shad	0.03	0.00	0.08	0.04	0.00	0.00
	(0.03)	(0.00)	(0.08)	(0.04)	(0.00)	(0.00)
Grass carp	0.03	0.06	0.08	0.04	0.00	0.00
	(0.03)	(0.06)	(0.08)	(0.04)	(0.00)	(0.00)
Red shiner	0.02	0.00	0.08	0.00	0.17	0.06
	(0.02)	(0.00)	(0.08)	(0.00)	(0.17)	(0.06)
Spotfin shiner	1.15	1.17	1.08	0.83	2.17	1.88
	(0.31)	(0.43)	(0.47)	(0.42)	(1.64)	(0.51)
Common carp	20.68	13.11	4.42	19.83	26.83	24.24
	(3.66)	(3.68)	(1.07)	(4.55)	(9.24)	(7.24)
Goldfish x carp	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Silver chub	0.17	0.00	0.17	0.25	0.00	0.00
	(0.10)	(0.00)	(0.11)	(0.15)	(0.00)	(0.00)
Golden shiner	0.00	0.00	0.08	0.00	0.00	0.00
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
Emerald shiner	3.25	2.83	29.67	1.54	15.50	6.41
	(0.93)	(0.88)	(28.67)	(0.57)	(6.03)	(2.83)
River shiner	0.70	0.00	2.33	0.54	3.67	1.12
	(0.20)	(0.00)	(1.49)	(0.25)	(2.23)	(0.42)
Bigeye shiner	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Spottail shiner	0.00	0.00	0.25	0.00	0.00	0.00
	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)	(0.00)
Silverband shiner	0.01	0.00	0.58	0.00	0.00	0.00
	(0.00)	(0.00)	(0.40)	(0.00)	(0.00)	(0.00)
Sand shiner	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Channel shiner	0.41	0.11	1.08	0.17	1.50	1.00
	(0.18)	(0.08)	(1.00)	(0.13)	(0.92)	(0.55)
Bluntnose minnow	0.00	0.11	0.00	0.00	0.00	0.00
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Bullhead minnow	0.36	1.06	7.33	0.04	2.83	0.76
	(0.12)	(0.31)	(4.63)	(0.04)	(0.87)	(0.40)
River carpsucker	0.31	0.67	2.92	0.08	0.00	0.71
	(0.10)	(0.45)	(1.74)	(0.06)	(0.00)	(0.33)
Quillback	0.25	0.00	0.00	0.25	0.00	0.29
	(0.12)	(0.00)	(0.00)	(0.15)	(0.00)	(0.24)
Blue sucker	0.02	0.00	0.00	0.00	0.00	0.06
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)
Smallmouth buffalo	2.49	4.67	1.75	2.33	1.83	2.59
	(0.40)	(1.30)	(0.57)	(0.49)	(0.60)	(0.83)

Strata: BWCS - Backwater, contiguous, shoreline
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Table 4.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Bigmouth buffalo	0.23	2.06	0.75	0.21	1.67	0.00
	(0.08)	(0.99)	(0.66)	(0.10)	(0.84)	(0.00)
Black buffalo	0.27	1.11	0.00	0.21	0.67	0.29
	(0.08)	(0.44)	(0.00)	(0.10)	(0.33)	(0.14)
Golden redhorse	0.03	0.00	0.50	0.04	0.00	0.00
	(0.03)	(0.00)	(0.26)	(0.04)	(0.00)	(0.00)
Shorthead redhorse	0.11	0.00	0.33	0.17	0.67	0.00
	(0.07)	(0.00)	(0.26)	(0.10)	(0.49)	(0.00)
Yellow bullhead	0.00	0.00	0.08	0.00	0.00	0.00
	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
Channel catfish	3.23	1.06	0.58	3.79	3.67	2.29
	(0.83)	(0.47)	(0.26)	(1.23)	(1.41)	(0.59)
Stonecat	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Flathead catfish	0.89	0.11	0.17	1.21	1.83	0.29
	(0.19)	(0.08)	(0.11)	(0.29)	(0.70)	(0.11)
Western mosquitofish	0.05	1.33	0.08	0.00	0.00	0.00
	(0.03)	(0.75)	(0.08)	(0.00)	(0.00)	(0.00)
White bass	2.14	2.06	1.25	1.83	1.67	2.88
	(0.45)	(0.52)	(0.57)	(0.45)	(0.67)	(1.19)
Yellow bass	0.05	0.06	0.00	0.04	0.00	0.06
	(0.03)	(0.06)	(0.00)	(0.04)	(0.00)	(0.06)
Green sunfish	0.07	0.28	0.83	0.08	0.83	0.00
	(0.06)	(0.23)	(0.51)	(0.08)	(0.54)	(0.00)
Warmouth	0.04	0.22	0.25	0.04	0.00	0.00
	(0.03)	(0.17)	(0.13)	(0.04)	(0.00)	(0.00)
Orangespotted sunfish	0.61	10.28	5.92	0.04	0.33	0.41
	(0.19)	(4.20)	(1.63)	(0.04)	(0.21)	(0.30)
Bluegill	0.85	8.22	15.83	0.42	0.33	0.35
	(0.23)	(4.28)	(5.02)	(0.18)	(0.21)	(0.30)
Green sunfish x bluegill	0.00	0.00	0.17	0.00	0.00	0.00
	(0.00)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)
Smallmouth bass	0.03	0.00	0.08	0.04	0.00	0.00
	(0.03)	(0.00)	(0.08)	(0.04)	(0.00)	(0.00)
Largemouth bass	0.26	0.17	1.83	0.33	0.33	0.06
	(0.10)	(0.12)	(0.65)	(0.14)	(0.33)	(0.06)
White crappie	0.02	0.39	0.00	0.00	0.17	0.00
	(0.01)	(0.33)	(0.00)	(0.00)	(0.17)	(0.00)
Black crappie	0.12	0.22	0.08	0.04	1.17	0.29
	(0.06)	(0.13)	(0.08)	(0.04)	(0.31)	(0.17)
Mud darter	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Logperch	0.03	0.00	0.00	0.04	0.00	0.00
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
Slenderhead darter	0.05	0.00	0.08	0.04	0.00	0.06
	(0.03)	(0.00)	(0.08)	(0.04)	(0.00)	(0.06)
Sauger	0.80	0.06	1.00	1.08	0.00	0.24
	(0.31)	(0.06)	(0.39)	(0.47)	(0.00)	(0.16)
Freshwater drum	2.31	3.56	8.58	1.83	1.83	3.06
	(0.45)	(0.78)	(6.00)	(0.60)	(0.91)	(0.71)

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TWZ - Tailwater

Table 4.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	SCB
Spotted gar	0.04	0.30	0.00	0.00
	(0.03)	(0.23)	(0.00)	(0.00)
Shortnose gar	2.71	4.97	1.00	2.45
	(0.95)	(0.87)	(0.36)	(1.10)
Bowfin	0.02	0.17	0.00	0.00
	(0.02)	(0.17)	(0.00)	(0.00)
Skipjack herring	0.01	0.08	0.00	0.00
	(0.01)	(0.08)	(0.00)	(0.00)
Gizzard shad	0.74	2.46	0.00	0.53
	(0.36)	(1.62)	(0.00)	(0.36)
Common carp	0.34	0.15	0.48	0.36
	(0.19)	(0.10)	(0.22)	(0.23)
River carpsucker	0.07	0.55	0.00	0.00
	(0.05)	(0.39)	(0.00)	(0.00)
Smallmouth buffalo	0.03	0.24	0.00	0.00
	(0.01)	(0.13)	(0.00)	(0.00)
Black buffalo	0.01	0.08	0.00	0.00
	(0.01)	(0.08)	(0.00)	(0.00)
Brown bullhead	0.01	0.08	0.00	0.00
	(0.01)	(0.08)	(0.00)	(0.00)
Channel catfish	0.01	0.08	0.00	0.00
	(0.01)	(0.08)	(0.00)	(0.00)
Flathead catfish	0.18	0.17	0.00	0.19
	(0.16)	(0.17)	(0.00)	(0.19)
White bass	1.46	4.34	1.34	1.06
	(0.51)	(1.79)	(0.44)	(0.55)
Yellow bass	0.01	0.09	0.00	0.00
	(0.01)	(0.09)	(0.00)	(0.00)
Orangespotted sunfish	0.01	0.08	0.16	0.00
	(0.01)	(0.08)	(0.16)	(0.00)
Bluegill	0.48	3.54	2.03	0.00
	(0.17)	(1.40)	(0.95)	(0.00)
Largemouth bass	0.01	0.09	0.00	0.00
	(0.01)	(0.09)	(0.00)	(0.00)
White crappie	0.07	0.55	0.17	0.00
	(0.03)	(0.29)	(0.17)	(0.00)
Black crappie	0.60	0.81	2.06	0.52
	(0.45)	(0.29)	(1.29)	(0.52)
Sauger	0.01	0.00	0.35	0.00
	(0.01)	(0.00)	(0.35)	(0.00)
Freshwater drum	2.14	0.23	0.70	2.45
	(1.39)	(0.23)	(0.44)	(1.63)

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Table 4.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Shortnose gar	0.78	1.42	0.33
	(0.23)	(0.51)	(0.16)
Gizzard shad	26.01	48.55	10.25
	(13.59)	(31.79)	(6.94)
Threadfin shad	0.05	0.00	0.09
	(0.05)	(0.00)	(0.09)
Common carp	0.12	0.16	0.09
	(0.07)	(0.10)	(0.09)
River carpsucker	0.26	0.50	0.09
	(0.12)	(0.26)	(0.09)
Smallmouth buffalo	0.07	0.17	0.00
	(0.04)	(0.10)	(0.00)
Channel catfish	0.10	0.00	0.17
	(0.06)	(0.00)	(0.11)
White bass	2.15	2.48	1.91
	(0.58)	(1.02)	(0.69)
Bluegill	0.89	0.84	0.93
	(0.27)	(0.56)	(0.25)
White crappie	0.84	0.33	1.19
	(0.34)	(0.17)	(0.57)
Black crappie	1.02	0.41	1.44
	(0.68)	(0.20)	(1.15)
Freshwater drum	1.75	0.74	2.46
	(0.86)	(0.28)	(1.46)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Spotted gar	0.12	0.39	0.00	0.15	0.00	0.00
	(0.10)	(0.24)	(0.00)	(0.15)	(0.00)	(0.00)
Longnose gar	0.04	0.00	0.00	0.00	0.00	0.14
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)
Shortnose gar	0.49	3.22	0.00	0.49	0.00	0.14
	(0.22)	(0.95)	(0.00)	(0.32)	(0.00)	(0.10)
Bowfin	0.00	0.08	0.00	0.00	0.00	0.00
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Mooneye	0.00	0.08	0.00	0.00	0.00	0.00
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Skipjack herring	0.00	0.08	0.00	0.00	0.00	0.00
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Gizzard shad	9.75	6.46	949.66	1.05	0.00	0.29
	(8.58)	(4.03)	(949.45)	(0.88)	(0.00)	(0.17)
Grass carp	0.12	1.84	0.00	0.00	0.00	0.15
	(0.08)	(1.84)	(0.00)	(0.00)	(0.00)	(0.10)
Red shiner	0.05	0.08	0.00	0.00	0.00	0.15
	(0.04)	(0.08)	(0.00)	(0.00)	(0.00)	(0.15)
Spotfin shiner	4.58	9.47	0.49	1.21	1.89	11.88
	(2.68)	(8.58)	(0.32)	(0.69)	(1.89)	(9.19)
Common carp	0.54	0.52	0.00	0.72	0.00	0.15
	(0.48)	(0.30)	(0.00)	(0.72)	(0.00)	(0.15)
Bighead carp	0.01	0.19	0.17	0.00	0.00	0.00
	(0.01)	(0.19)	(0.17)	(0.00)	(0.00)	(0.00)
Emerald shiner	12.34	5.19	102.24	11.36	0.34	12.76
	(4.99)	(2.01)	(68.46)	(7.26)	(0.34)	(3.95)
River shiner	0.62	0.24	0.66	0.53	0.00	0.87
	(0.28)	(0.17)	(0.42)	(0.37)	(0.00)	(0.45)
Spottail shiner	0.02	0.00	0.00	0.00	0.00	0.07
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.07)
Silverband shiner	0.35	2.24	0.16	0.36	0.00	0.07
	(0.24)	(1.28)	(0.16)	(0.36)	(0.00)	(0.07)
Channel shiner	1.55	2.87	0.00	1.01	0.34	2.68
	(0.40)	(1.43)	(0.00)	(0.47)	(0.34)	(0.86)
Bluntnose minnow	0.10	0.00	0.34	0.00	0.00	0.35
	(0.10)	(0.00)	(0.34)	(0.00)	(0.00)	(0.35)
Bullhead minnow	1.70	1.35	4.09	0.51	1.88	4.46
	(0.66)	(0.69)	(3.50)	(0.35)	(1.17)	(2.15)
River carpsucker	0.00	0.08	0.00	0.00	0.00	0.00
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Bigmouth buffalo	0.01	0.24	0.00	0.00	0.00	0.00
	(0.01)	(0.18)	(0.00)	(0.00)	(0.00)	(0.00)
Channel catfish	0.84	0.11	0.00	1.08	0.34	0.41
	(0.72)	(0.11)	(0.00)	(1.08)	(0.34)	(0.21)
Western mosquitofish	4.41	83.32	0.34	1.39	0.00	0.60
	(2.44)	(60.19)	(0.34)	(0.85)	(0.00)	(0.33)
White bass	1.25	0.80	2.55	1.64	0.09	0.37
	(0.60)	(0.35)	(1.99)	(0.91)	(0.09)	(0.18)
Warmouth	0.00	0.00	0.00	0.00	0.17	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.00)
Orangespotted sunfish	0.31	6.15	0.93	0.00	0.00	0.20
	(0.14)	(3.28)	(0.93)	(0.00)	(0.00)	(0.15)
Bluegill	1.06	2.60	7.92	0.70	1.52	1.46
	(0.56)	(1.36)	(3.72)	(0.70)	(0.73)	(1.07)
Largemouth bass	0.05	0.00	0.33	0.00	0.00	0.15
	(0.03)	(0.00)	(0.21)	(0.00)	(0.00)	(0.10)
White crappie	0.14	0.50	0.00	0.18	0.17	0.00
	(0.12)	(0.28)	(0.00)	(0.18)	(0.17)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	IMPS	MCBU	MCBW	SCB
Black crappie	0.12	0.87	0.69	0.00	0.17	0.29
	(0.05)	(0.76)	(0.51)	(0.00)	(0.17)	(0.13)
Mud darter	0.00	0.08	0.00	0.00	0.00	0.00
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Sauger	0.02	0.00	0.34	0.00	0.00	0.08
	(0.02)	(0.00)	(0.22)	(0.00)	(0.00)	(0.08)
Freshwater drum	44.38	1.79	3.09	60.18	1.01	14.93
	(39.06)	(1.33)	(3.09)	(58.50)	(0.82)	(12.72)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO
Shortnose gar	0.34	0.83	0.00
	(0.26)	(0.64)	(0.00)
Mooneye	0.07	0.17	0.00
	(0.07)	(0.17)	(0.00)
Gizzard shad	8.48	14.53	4.25
	(3.42)	(7.88)	(2.00)
Common carp	0.10	0.25	0.00
	(0.05)	(0.11)	(0.00)
Speckled chub	0.21	0.50	0.00
	(0.17)	(0.41)	(0.00)
Silver chub	0.03	0.08	0.00
	(0.03)	(0.08)	(0.00)
Emerald shiner	6.41	14.52	0.74
	(2.09)	(5.07)	(0.48)
Silverband shiner	0.55	1.33	0.00
	(0.54)	(1.33)	(0.00)
Channel shiner	0.48	1.18	0.00
	(0.33)	(0.81)	(0.00)
Bullhead minnow	3.81	5.97	2.29
	(1.68)	(3.72)	(1.23)
River carpsucker	0.03	0.08	0.00
	(0.03)	(0.08)	(0.00)
Smallmouth buffalo	0.03	0.08	0.00
	(0.03)	(0.08)	(0.00)
Black buffalo	0.03	0.08	0.00
	(0.03)	(0.08)	(0.00)
Channel catfish	0.27	0.42	0.17
	(0.10)	(0.20)	(0.11)
White bass	1.54	3.01	0.52
	(0.84)	(2.02)	(0.33)
Orangespotted sunfish	7.06	17.04	0.08
	(3.17)	(7.76)	(0.08)
Bluegill	2.68	0.76	4.03
	(1.54)	(0.49)	(2.62)
White crappie	0.07	0.17	0.00
	(0.07)	(0.17)	(0.00)
Black crappie	0.09	0.00	0.16
	(0.09)	(0.00)	(0.16)
Yellow perch	0.03	0.08	0.00
	(0.03)	(0.08)	(0.00)
Slenderhead darter	0.03	0.08	0.00
	(0.03)	(0.08)	(0.00)
River darter	0.17	0.42	0.00
	(0.17)	(0.42)	(0.00)
Sauger	0.41	0.50	0.34
	(0.25)	(0.50)	(0.26)
Freshwater drum	6.78	4.65	8.26
	(3.38)	(1.97)	(5.61)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO	MCBU	MCBW	SCB
Shortnose gar	0.02	0.09	0.00	0.02	0.00	0.00
	(0.01)	(0.09)	(0.00)	(0.02)	(0.00)	(0.00)
American eel	0.00	0.00	0.00	0.00	0.09	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
Gizzard shad	0.02	0.09	0.00	0.02	0.00	0.00
	(0.01)	(0.09)	(0.00)	(0.02)	(0.00)	(0.00)
Common carp	0.68	0.09	1.66	0.80	1.24	0.33
	(0.22)	(0.09)	(1.01)	(0.32)	(0.84)	(0.14)
River carpsucker	0.00	0.09	0.00	0.00	0.00	0.00
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Smallmouth buffalo	0.40	0.00	0.00	0.52	0.17	0.20
	(0.11)	(0.00)	(0.00)	(0.15)	(0.11)	(0.17)
Black buffalo	0.01	0.18	0.09	0.00	0.00	0.00
	(0.00)	(0.18)	(0.09)	(0.00)	(0.00)	(0.00)
Channel catfish	6.61	0.09	0.17	3.57	1.36	14.70
	(1.68)	(0.09)	(0.17)	(1.63)	(0.73)	(4.47)
Flathead catfish	0.04	0.00	0.00	0.02	0.09	0.10
	(0.02)	(0.00)	(0.00)	(0.02)	(0.09)	(0.05)
White bass	0.07	0.09	0.00	0.09	0.09	0.03
	(0.04)	(0.09)	(0.00)	(0.05)	(0.09)	(0.03)
Bluegill	0.00	0.00	0.00	0.00	0.09	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
Black crappie	0.00	0.09	0.00	0.00	0.00	0.00
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Freshwater drum	0.31	0.00	0.09	0.30	0.35	0.37
	(0.08)	(0.00)	(0.09)	(0.10)	(0.18)	(0.16)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO	IMPO	MCBU	MCBW	SCB
Paddlefish	0.00	0.09	0.00	0.00	0.00	0.00
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Shortnose gar	0.00	0.09	0.00	0.00	0.00	0.00
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Gizzard shad	0.01	0.45	0.18	0.00	0.00	0.00
	(0.01)	(0.16)	(0.18)	(0.00)	(0.00)	(0.00)
Common carp	1.46	1.79	7.00	1.30	2.10	1.31
	(0.41)	(1.18)	(3.55)	(0.57)	(1.60)	(0.43)
Bighead carp	0.01	0.45	0.00	0.00	0.00	0.00
	(0.01)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)
River carpsucker	0.09	0.00	0.00	0.11	0.00	0.07
	(0.04)	(0.00)	(0.00)	(0.06)	(0.00)	(0.07)
Smallmouth buffalo	6.66	1.07	0.35	7.87	3.75	4.76
	(1.71)	(0.30)	(0.35)	(2.51)	(2.47)	(1.19)
Bigmouth buffalo	0.00	0.26	0.00	0.00	0.00	0.00
	(0.00)	(0.18)	(0.00)	(0.00)	(0.00)	(0.00)
Black buffalo	0.23	0.09	2.00	0.26	0.00	0.00
	(0.11)	(0.09)	(0.90)	(0.16)	(0.00)	(0.00)
Shorthead redhorse	0.02	0.00	0.00	0.02	0.00	0.03
	(0.02)	(0.00)	(0.00)	(0.02)	(0.00)	(0.03)
Brown bullhead	0.00	0.00	0.09	0.00	0.00	0.00
	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
Channel catfish	1.32	0.00	0.09	1.20	0.85	1.80
	(0.35)	(0.00)	(0.09)	(0.48)	(0.31)	(0.46)
Flathead catfish	0.09	0.00	0.00	0.09	0.00	0.10
	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)	(0.05)
White bass	0.11	0.80	0.00	0.11	0.00	0.07
	(0.06)	(0.30)	(0.00)	(0.09)	(0.00)	(0.05)
Bluegill	0.00	0.18	0.00	0.00	0.00	0.00
	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)
White crappie	0.00	0.00	0.09	0.00	0.00	0.00
	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
Black crappie	0.00	0.09	0.00	0.00	0.00	0.00
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
Freshwater drum	0.73	0.00	0.09	0.87	0.43	0.51
	(0.24)	(0.00)	(0.09)	(0.35)	(0.21)	(0.14)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Shortnose gar	0.02	0.02	0.03
	(0.02)	(0.02)	(0.03)
Skipjack herring	0.54	0.54	0.53
	(0.18)	(0.19)	(0.39)
Gizzard shad	11.50	8.67	18.08
	(3.20)	(2.52)	(8.93)
Grass carp	0.01	0.02	0.00
	(0.01)	(0.02)	(0.00)
Red shiner	0.04	0.04	0.03
	(0.02)	(0.03)	(0.03)
Spotfin shiner	1.09	1.29	0.61
	(0.49)	(0.70)	(0.17)
Common carp	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)
Bighead carp	0.06	0.08	0.00
	(0.03)	(0.05)	(0.00)
Silver chub	0.10	0.15	0.00
	(0.08)	(0.11)	(0.00)
Emerald shiner	14.77	8.94	28.36
	(4.03)	(4.38)	(8.73)
River shiner	1.73	1.29	2.75
	(0.36)	(0.42)	(0.71)
Spottail shiner	0.03	0.00	0.08
	(0.02)	(0.00)	(0.08)
Silverband shiner	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)
Sand shiner	0.04	0.06	0.00
	(0.04)	(0.06)	(0.00)
Channel shiner	1.64	0.96	3.22
	(0.77)	(0.82)	(1.71)
Suckermouth minnow	0.01	0.02	0.00
	(0.01)	(0.02)	(0.00)
Bullhead minnow	0.24	0.06	0.64
	(0.09)	(0.05)	(0.28)
River carpsucker	0.21	0.06	0.56
	(0.13)	(0.05)	(0.42)
Quillback	0.04	0.06	0.00
	(0.02)	(0.04)	(0.00)
Smallmouth buffalo	0.09	0.13	0.00
	(0.06)	(0.09)	(0.00)
Channel catfish	0.32	0.38	0.19
	(0.11)	(0.16)	(0.10)
Freckled madtom	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)
Flathead catfish	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)
Western mosquitofish	0.06	0.02	0.17
	(0.03)	(0.02)	(0.10)
Brook silverside	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)
White bass	0.42	0.17	1.00
	(0.15)	(0.07)	(0.49)
Orangespotted sunfish	0.03	0.04	0.00
	(0.02)	(0.03)	(0.00)
Bluegill	0.07	0.04	0.14
	(0.04)	(0.04)	(0.11)
Western sand darter	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
River darter	0.01	0.02	0.00
	(0.01)	(0.02)	(0.00)
Sauger	0.01	0.00	0.03
	(0.01)	(0.00)	(0.03)
Freshwater drum	0.32	0.15	0.72
	(0.12)	(0.08)	(0.36)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by anchored trammel netting in Pool 26 of the Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 4.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	IMPO
Paddlefish	0.17	0.17
	(0.17)	(0.17)
Shortnose gar	0.67	0.67
	(0.42)	(0.42)
Goldeye	0.17	0.17
	(0.17)	(0.17)
Skipjack herring	0.17	0.17
	(0.17)	(0.17)
Common carp	2.59	2.59
	(0.65)	(0.66)
Bighead carp	0.34	0.34
	(0.21)	(0.21)
Black buffalo	0.35	0.35
	(0.22)	(0.22)
Flathead catfish	0.18	0.18
	(0.18)	(0.18)
Freshwater drum	0.69	0.69
	(0.44)	(0.44)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 26 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Shovelnose sturgeon	0.33 (0.33)
Longnose gar	1.17 (0.60)
Shortnose gar	10.50 (2.35)
Bowfin	0.17 (0.17)
Goldeye	4.17 (3.60)
Skipjack herring	0.33 (0.21)
Gizzard shad	35.33 (5.98)
Grass carp	0.17 (0.17)
Common carp	34.67 (5.40)
Emerald shiner	0.67 (0.33)
River shiner	0.67 (0.49)
Channel shiner	1.33 (0.61)
Bullhead minnow	0.17 (0.17)
River carpsucker	1.50 (0.43)
Smallmouth buffalo	10.17 (2.74)
Bigmouth buffalo	0.67 (0.33)
Shorthead redhorse	0.83 (0.65)
Channel catfish	1.33 (0.56)
Flathead catfish	1.00 (0.52)
White bass	26.67 (4.86)
Yellow bass	0.50 (0.22)
Orangespotted sunfish	0.17 (0.17)
Bluegill	2.17 (0.95)
Green sunfish x bluegill	0.17 (0.17)
White crappie	0.33 (0.21)
Black crappie	0.17 (0.17)
Sauger	0.67 (0.42)
Freshwater drum	12.33 (3.39)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 4.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 26 of the Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Shovelnose sturgeon	1.58
	(0.70)
Mooneye	0.08
	(0.08)
Common carp	0.25
	(0.25)
Speckled chub	0.83
	(0.37)
Blue catfish	0.25
	(0.25)
Channel catfish	1.00
	(0.62)
Freshwater drum	13.17
	(8.99)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

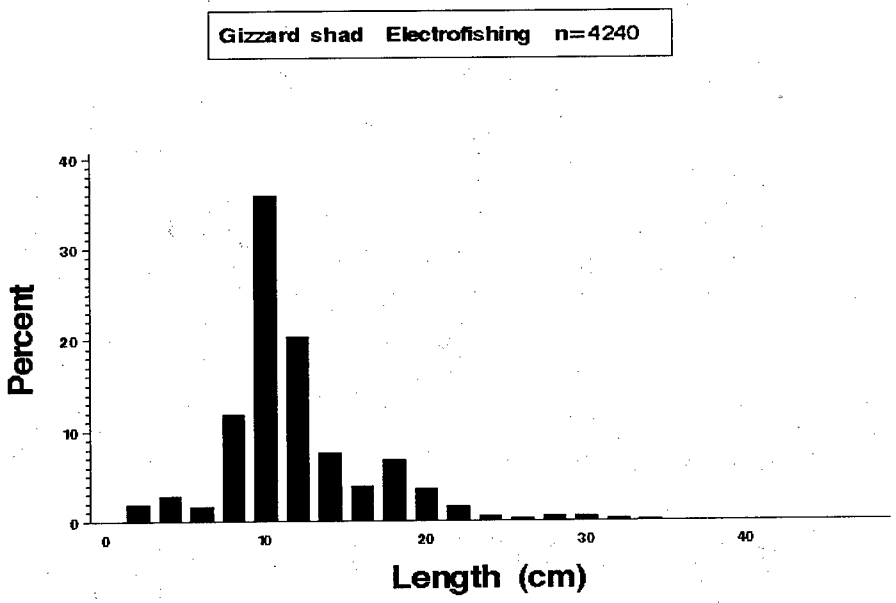

Figure 4.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

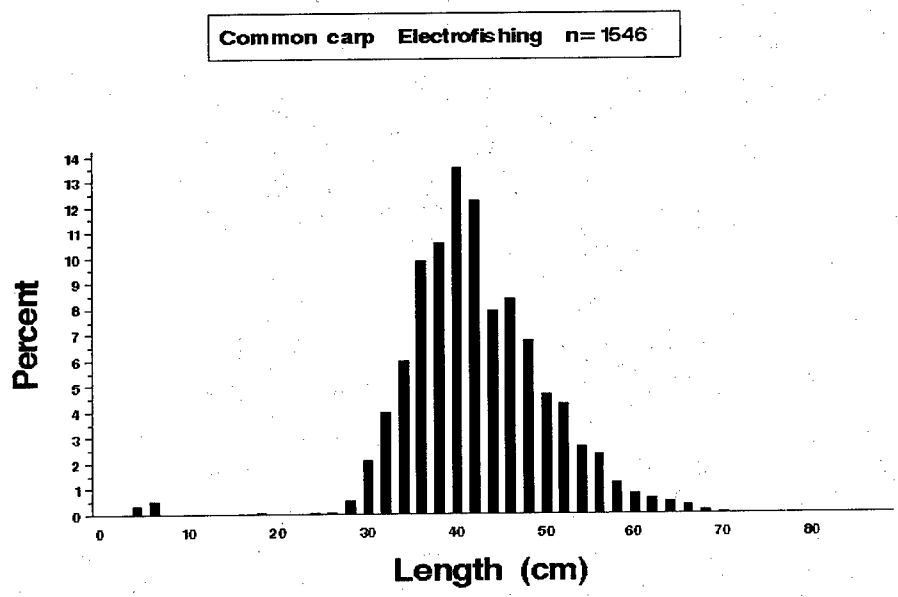

Figure 4.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

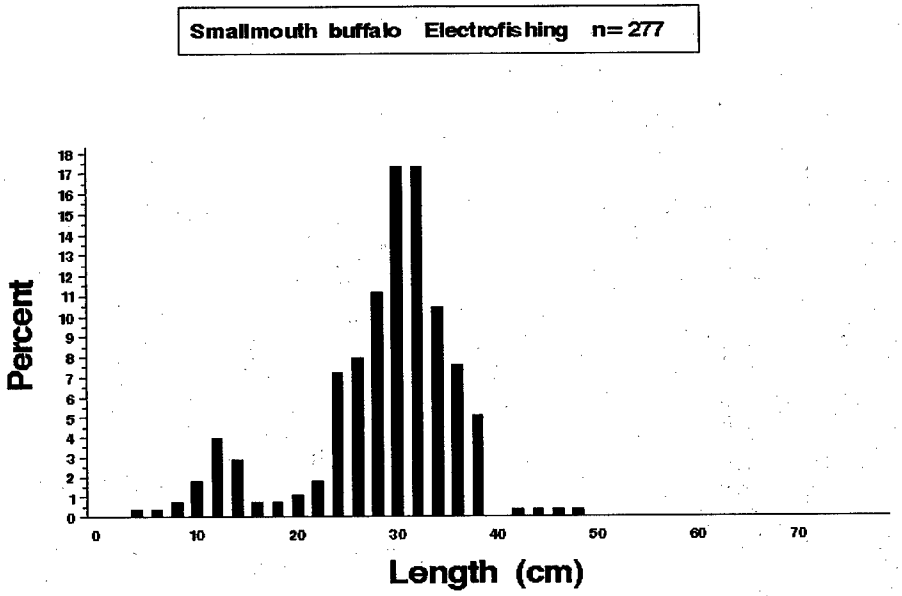

Figure 4.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

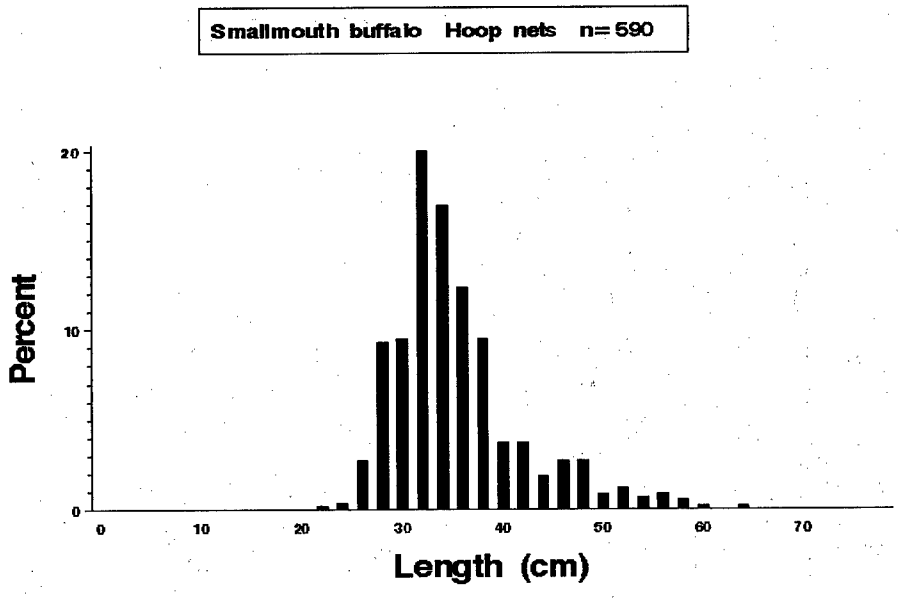

Figure 4.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 26 during 1997.

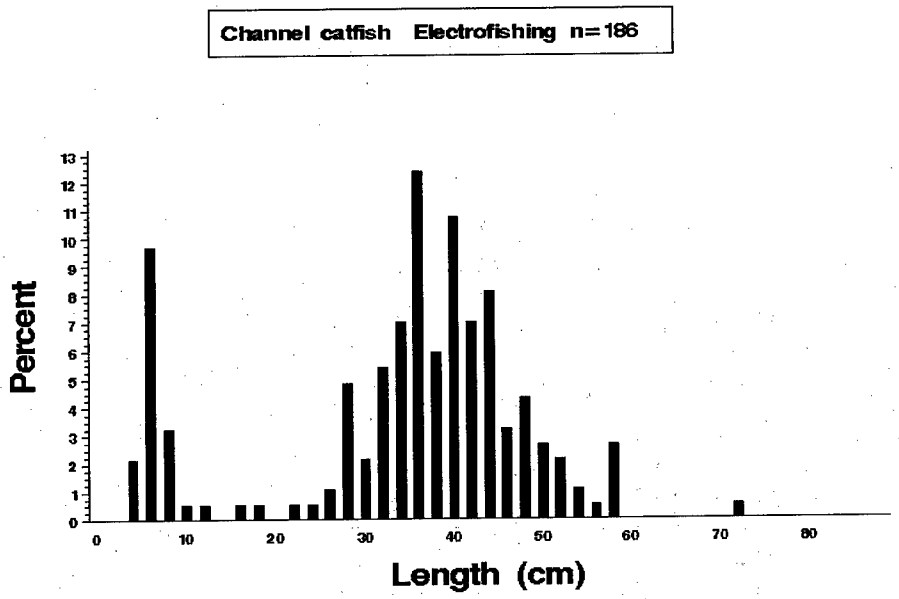

Figure 4.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

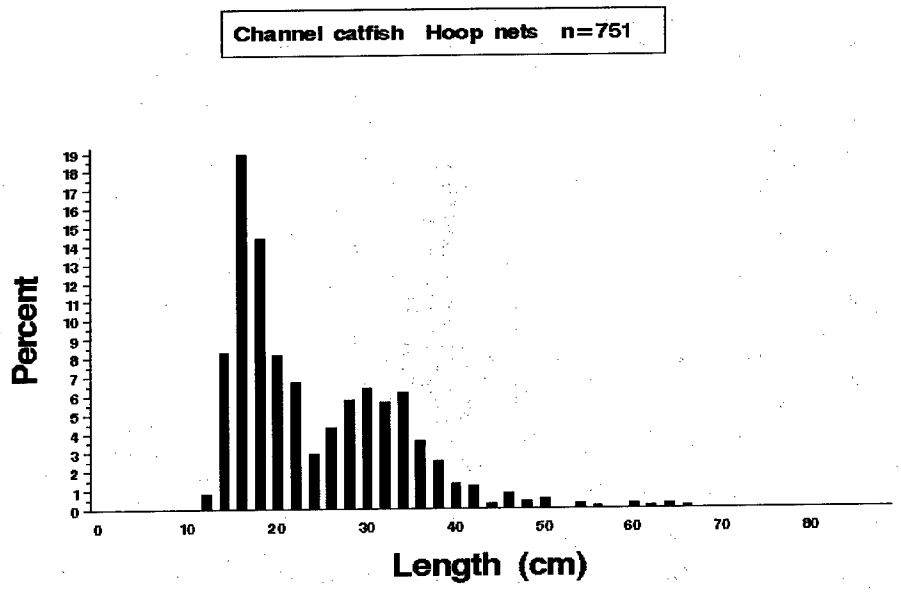

Figure 4.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 26 during 1997.

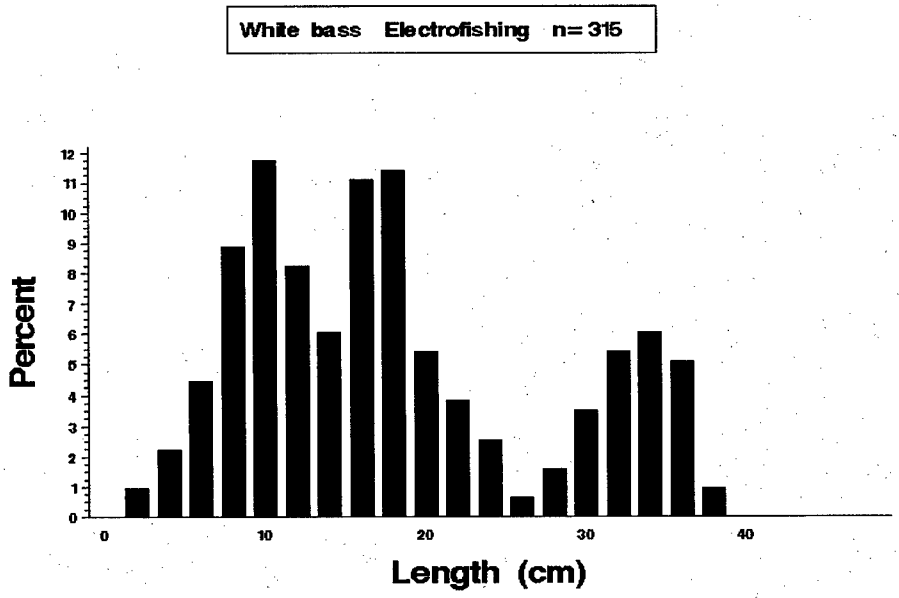

Figure 4.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

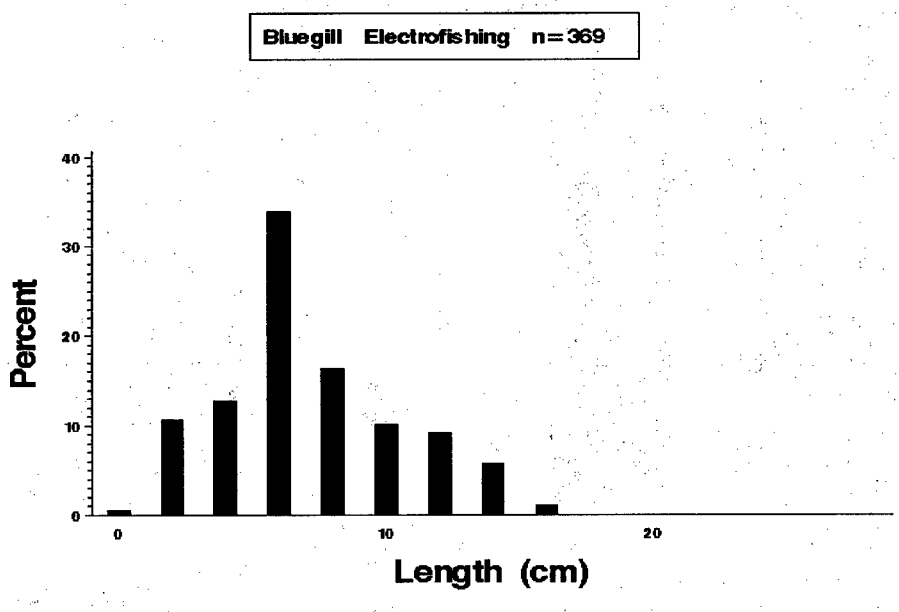

Figure 4.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

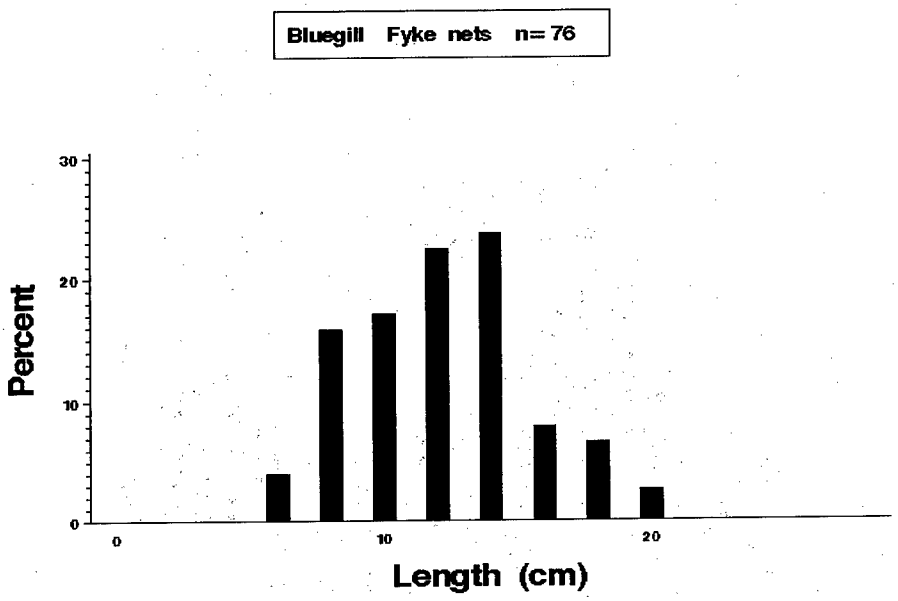

Figure 4.10. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 26 during 1997.

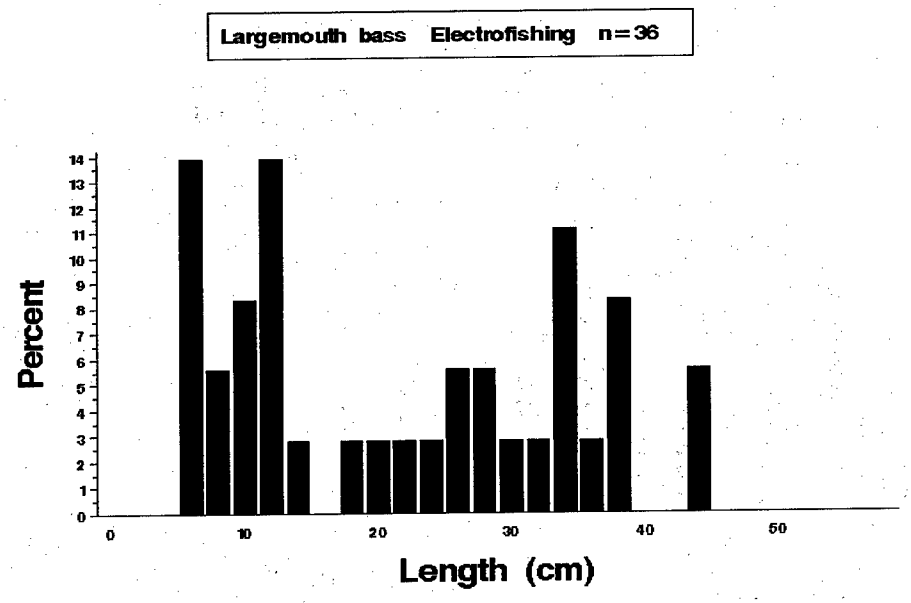

Figure 4.11. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

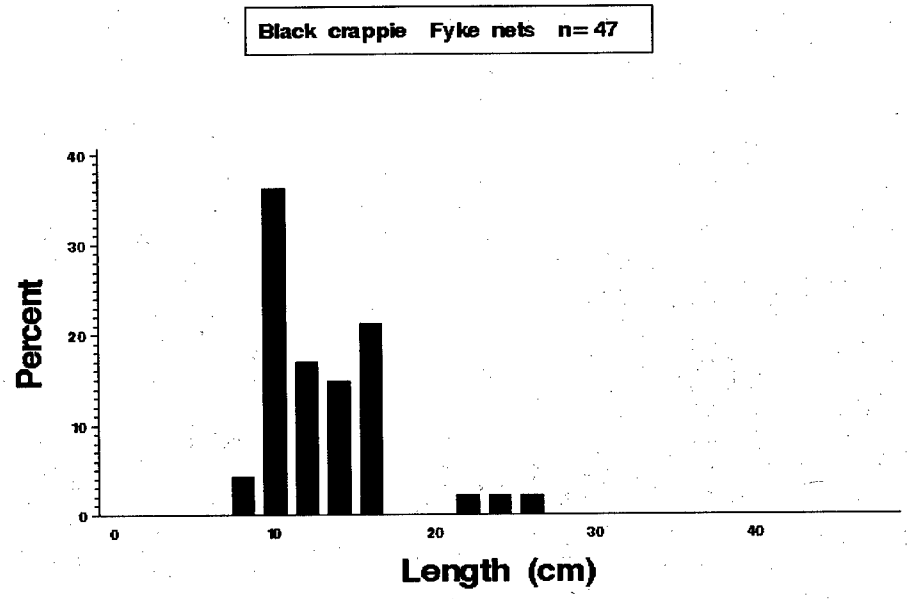

Figure 4.12. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 26 during 1997.

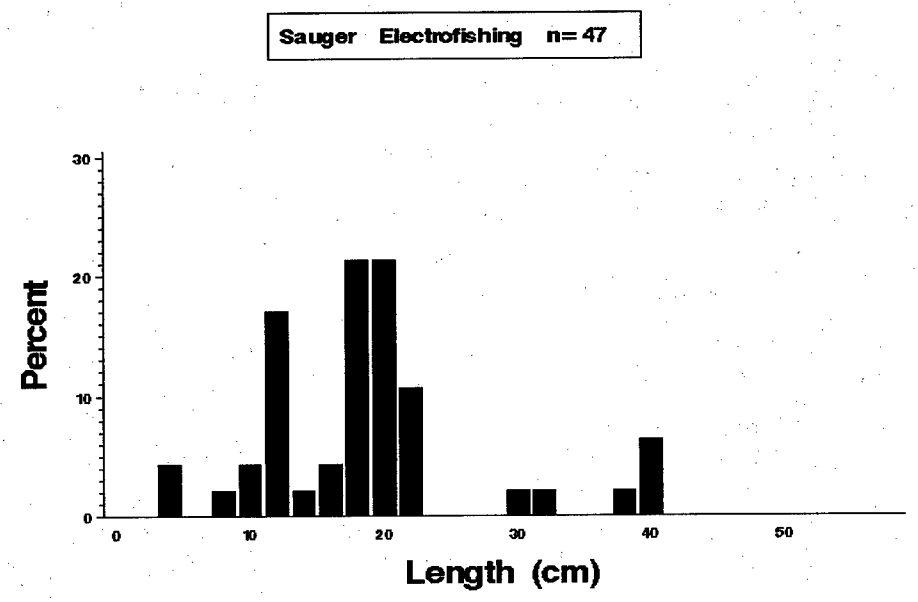

Figure 4.13. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

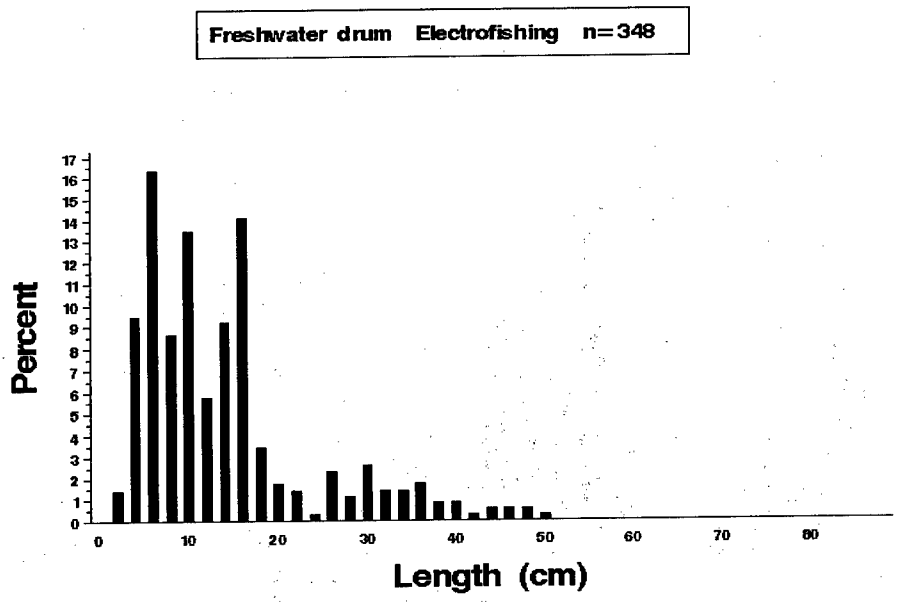

Figure 4.14. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 26 during 1997.

Chapter 5. Mississippi River Open Reach

by

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Hydrograph

Open Mississippi River water stages are influenced by discharges from the Upper Mississippi, Missouri, Illinois, and to a lesser extent, Ohio Rivers. Water stage may fluctuate in the open river by 3–5 feet/week and more than 20 feet/year. At stages above 22.0 feet, (Cape Girardeau Gage, 326 feet above mean sea level), successful gear sets are reduced by high water velocity and flooded riparian vegetation. At stages between 22.0 and 17.0 feet, wing dams become totally to partly submerged. Water velocity above submerged wing dams limits the use of most sampling gear. At stages below 17.0 feet, closing structures emerge making it difficult to access side channels. Gear must be carried in or private landowner permission must be granted to access isolated waters. The SCB is the most difficult stratum to sample, primarily because of access problems.

In 1997, water stages were higher than normal from late winter to late spring, with stages close to the historical mean (55-year daily mean) from July through the end of January. Fluctuations in water stage were typically 2–5 feet during 2-week periods. The lowest stage occurred on January 19 at 11.6 feet, and the highest stage occurred on March 3 at 39.6 feet. Water stages during LTRMP sampling in 1997 could be characterized as normal (Figure 5.1). Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

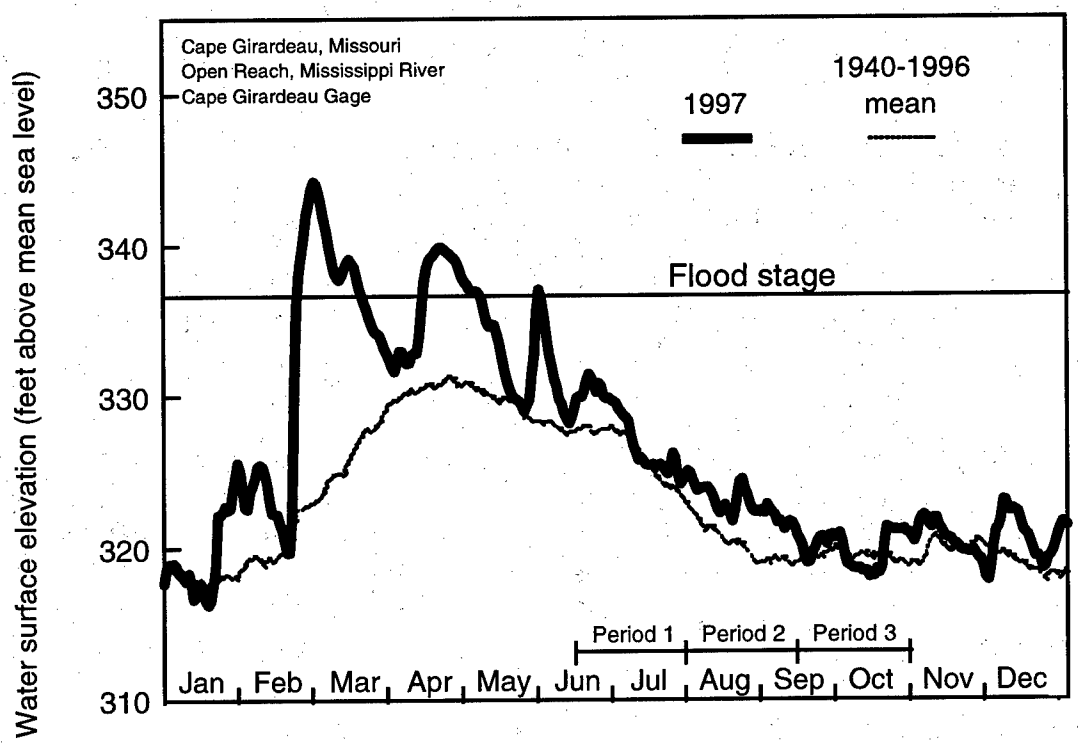

Figure 5.1. Daily water surface elevation from Cape Girardeau Gage for the Upper Mississippi River Open Reach, during 1997 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

Summary of Sampling Effort

In 1997, 405 random and fixed-site samples were planned consisting of 135 samples in each of three periods. We planned 336 random samples in three strata: MCBU (composing 27% of the total planned random sampling effort), MCBW (25%), and SCB (48%). We also planned 69 samples in three fixed sites—two TRI (52%) and one MCBU stratum (49%).

We completed 383 samples in 1997 consisting of 143, 119, and 121 samples in periods 1, 2, and 3, respectively (Table 5.1). We completed 279 random samples, 32 TRI fixed-site samples, 24 MCBU fixed-site samples, and 48 (MCBU, SCB) fixed-site trawling samples.

Total Catch by Gear

Historically, 129 fish species have been collected from the open river (Pitlo et al. 1995). Open River field station biologists have collected 97 species from 1991 to 1997. In 1997, we collected 67 species and 3 hybrids representing 22,392 fish (Table 5.2). This total does not include 798 fish <30 mm long identified only to genus or unidentified. The five most numerically abundant species were freshwater drum (12,313), gizzard shad (4,612), emerald shiner (1,566), channel catfish (1,161), and channel shiner (902).

The following summarizes total fish catch and number of species by gear: day electrofishing, 3,450 fish and 47 species; fyke netting, 245 fish and 16 species; mini fyke netting, 14,935 fish and 47 species; seining, 1,223 fish and 21 species; small hoop netting, 805 fish and 17 species; large hoop netting, 825 fish and 17 species; and trawling, 666 fish and 21 species.

In 1997, one new species was collected: river redhorse. Seven Missouri-listed species were collected: paddlefish, mooneye, Mississippi silvery minnow, sicklefin chub, blue sucker, western sand darter, and river darter. The sicklefin chub is a candidate for Federal listing.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

Gizzard shad (31.15 fish/15 min), emerald shiner (4.62), and common carp (4.07) had the highest day electrofishing *C/f* when combining all strata (Table 5.3.1). The highest *C/f* by stratum were MCBU: gizzard shad (31.50), emerald shiner (4.42), and common carp (3.92); MCBW: gizzard shad (29.42), common carp (8.83), emerald shiner (3.33); and SCB: gizzard shad (28.73), freshwater drum (6.73), and emerald shiner (6.23).

Fyke Net

Shortnose gar (1.63 fish/net-day), white bass (0.86), and gizzard shad (0.62) had the highest fyke netting *C/f* when combining all strata (Table 5.3.2). The highest *C/f* by stratum were MCBW: shortnose gar (4.60), white bass (4.59), freshwater drum (2.95); and SCB: shortnose gar (1.39), gizzard shad (0.64), and white bass (0.56).

Mini Fyke Net

Freshwater drum (373.94 fish/net-day), channel shiner (12.34), and emerald shiner (7.05) had the highest mini fyke netting *C/f* when combining all strata (Table 5.3.3). The highest *C/f* by stratum were MCBU: freshwater drum (402.16), channel shiner (11.76), and emerald shiner (7.23); MCBW: emerald shiner (27.95), red shiner (8.37), and channel shiner (5.79); and SCB: freshwater drum (196.45), channel shiner (17.14), and red shiner (9.50).

Small Hoop Net

Channel catfish (2.62 fish/net-day), common carp (1.18), and black buffalo (0.40) had the highest small hoop netting *C/f* when combining all strata (Table 5.3.4). Channel catfish also had the highest *C/f* in MCBU (1.76), MCBW (2.67), and SCB (8.97) strata, followed by common carp (1.23, 0.97, and 0.83, respectively).

Large Hoop Net

Smallmouth buffalo (2.11 fish/net-day), common carp (1.66), and channel catfish (0.58) had the highest large hoop netting *C/f* when combining all strata (Table 5.3.5). The highest *C/f* by stratum were MCBU: smallmouth buffalo (2.14), common carp (1.69), and channel catfish (0.48); MCBW: common carp (1.57), smallmouth buffalo (0.77), and channel catfish (0.21); and SCB: smallmouth buffalo (2.03), common carp (1.46), and channel catfish (1.38).

Seine

Emerald shiner (13.84 fish/haul), gizzard shad (2.12), and river shiner (0.94) had the highest seining *C/f* when combining all strata (Table 5.3.6). The highest *C/f* by stratum were MCBU: emerald shiner (14.69), gizzard shad (1.88), and red shiner (0.94); and SCB: emerald shiner (7.64), gizzard shad (3.89), and red shiner (2.46).

Gill Net

Shovelnose sturgeon (13.24 fish/net-day), gizzard shad (0.85), and common carp (0.28) had the highest gill netting *C/f* when combining all strata (Table 5.3.7). The highest *C/f* by stratum were MCBU: shovelnose sturgeon (15.00); and SCB: gizzard shad (7.06), common carp (2.32), and channel catfish (1.83).

Fixed Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

Gizzard shad (29.33 fish/15 min), freshwater drum (4.00), and emerald shiner (1.33) had the highest day electrofishing *C/f* in the MCBU stratum (Table 5.4.1). Gizzard shad (49.50), common carp (11.33), and bluegill (10.33) had the highest *C/f* in the TRI stratum.

Fyke Net

White bass (12.71 fish/net-day), shortnose gar (4.46), and freshwater drum (3.88) had the highest fyke netting *C/f* in the MCBU stratum (Table 5.4.2). Freshwater drum (6.63), shortnose gar (2.11), and common carp (2.01) had the highest *C/f* in the TRI stratum.

Mini Fyke Net

Freshwater drum (221.49 fish/net-day), emerald shiner (35.72), and Mississippi silvery minnow (2.38) had the highest mini fyke netting *C/f* in the MCBU stratum (Table 5.4.3). Freshwater drum (188.80), bluegill (6.30), and orangespotted sunfish (1.98) had the highest *C/f* in the TRI stratum.

Small Hoop Net

Common carp (0.34 fish/net-day), shortnose gar, smallmouth buffalo, and channel catfish (0.17) had the highest small hoop netting *C/f* in the MCBU stratum (Table 5.4.4). Common carp (3.14), channel catfish (1.34), and smallmouth buffalo and black buffalo (0.21) had the highest *C/f* in the TRI stratum.

Large Hoop Net

Channel catfish (7.35 fish/net-day), common carp (6.13), and smallmouth buffalo (2.86) had the highest large hoop netting *C/f* in the MCBU stratum (Table 5.4.5). Smallmouth buffalo (4.96), common carp (4.78), and black buffalo (4.03) had the highest *C/f* in the TRI stratum.

Trawl

Freshwater drum (5.13 fish/haul), channel catfish (2.88), and channel shiner (0.63) had the highest trawling *C/f* in the MCBU stratum (Table 5.4.6). Channel shiner (9.67), channel catfish (4.78), and freshwater drum (1.22) had the highest *C/f* in the SCB stratum.

Length Distributions of Selected Species

Length–frequency histograms are presented for selected species in Figures 5.2 to 5.12. Meaningful biological interpretation of the histograms is limited because of small sample size or size selectivity of the gear (Anderson and Neumann 1996). Despite these biases, some river managers may find the histograms useful, therefore we have included them in this report. No age–growth data are available at this time for the open Mississippi River study reach.

Gizzard Shad

We collected 1,748 gizzard shad by day electrofishing for length–frequency (Figure 5.2). The length–frequency distribution was composed largely of 6–12-cm-long fish and had a mode of 10 cm.

Common Carp

Three hundred twenty-eight common carp were collected by day electrofishing (Figure 5.3). Most common carp were 34–56 cm long.

Smallmouth Buffalo

Seventy-one smallmouth buffalo were collected by day electrofishing (Figure 5.4). The length–frequency distribution comprised 20–52-cm-long fish, with a mode of 28 cm. Two hundred fifty-nine smallmouth buffalo were collected with small and large hoop nets (Figure 5.5). The length–frequency distribution comprised 22–64-cm-long fish. Most smallmouth buffalo were 28–38 cm long.

Channel Catfish

One hundred twenty-two channel catfish were collected by day electrofishing (Figure 5.6). The length–frequency distribution comprised 4–62-cm-long fish. The greatest percentage of channel catfish were 34–56 cm long. Seven hundred twenty-three channel catfish were collected with small and large hoop nets (Figure 5.7). The length–frequency distribution comprised 12–68-cm-long fish. The greatest percentage of channel catfish were 16–42 cm long.

White Bass

Ninety-one white bass were collected by day electrofishing (Figure 5.8). The length–frequency distribution comprised 4–44-cm-long fish.

Bluegill

Seventy bluegills were collected by day electrofishing (Figure 5.9). The length–frequency distribution comprised 2–20-cm-long fish and had a mode of 40 mm.

Largemouth Bass

Fifteen largemouth bass were collected by day electrofishing (Figure 5.10). The length–frequency distribution comprised 4–40-cm-long fish.

Freshwater Drum

Two hundred twenty-six freshwater drum were collected by day electrofishing (Figure 5.11). The length–frequency distribution comprised 2–56-cm-long fish, with modes at 10, 26, and 34 cm. Fifty-three freshwater drum were collected with fyke nets (Figure 5.12). The length–frequency distribution comprised 10–44-cm-long fish, with modes at 12 and 32 cm.

Table 5.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in the open Mississippi River during 1997. Table entries are numbers of successfully completed standardized monitoring collections.

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing			8	5	4			2		19
Fyke net			4	1	3			2		10
Gill net			4					1		5
Large hoop net			8	5	4			2		19
Small hoop net			9	5	3			3		20
Mini fyke net			8	5	7			2		22
Seine			12	12						24
Trawling			4	20						24
SUBTOTAL	0	0	57	53	21	0	0	12	0	143

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing			8	5	4			2		19
Fyke net			4	1				2		7
Gill net			4							4
Large hoop net			8	5	7			2		22
Small hoop net			8	5	8			2		23
Mini fyke net			11	5	7			2		25
Seine			8							8
Trawling				11						11
SUBTOTAL	0	0	51	32	26	0	0	10	0	119

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing			6	5	4			2		17
Fyke net			3	1				2		6
Gill net			2	1						3
Large hoop net			8	5	4			2		19
Small hoop net			8	5	4			2		19
Mini fyke net			9	5	7			2		23
Seine			8	4						12
Trawling			5	17						22
SUBTOTAL	0	0	49	43	19	0	0	10	0	121
	0	0	157	128	66	0	0	32	0	383

Strata: BWCS - Backwater, contiguous, shoreline.
BWCO - Backwater, contiguous, offshore.
IMPS - Impounded, shoreline.
IMPO - Impounded, offshore.
MCBU - Main channel border, unstructured.
MCBW - Main channel border, wing dam.
SBU - Side channel border.
TRI - Tributary mouth.
TWZ - Tailwater.

Table 5.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in the open Mississippi River. See Table 5.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	1	-	-	-	-	-	-	1	-	-	-	-	2
2	Shovelnose sturgeon	Scaphirhynchus platorynchus	1	-	-	-	-	-	-	-	-	18	-	27	46
3	Shovelnose x pallid? sturgeon	Scaphirhynchus albus x plat	-	-	-	-	-	-	-	-	-	-	-	1	1
4	Unidentified sturgeon	Scaphirhynchus sp.	-	-	-	-	-	-	-	-	-	-	-	2	2
5	Paddlefish	Polyodon spathula	-	-	-	-	1	-	-	-	1	8	-	3	13
6	Spotted gar	Lepisosteus oculatus	3	-	-	-	1	-	-	-	-	-	-	-	4
7	Longnose gar	Lepisosteus osseus	1	-	-	-	2	-	-	-	2	-	-	-	5
8	Longnose x spotted gar	L. osseus x oculatus	1	-	-	-	-	-	-	-	-	-	-	-	1
9	Shortnose gar	Lepisosteus platostomus	84	-	52	-	38	-	1	6	-	11	-	-	192
10	Bowfin	Amia calva	1	-	-	-	-	-	-	2	-	2	-	-	5
11	Goldeye	Hiodon alosoides	25	-	-	-	1	-	-	-	-	2	-	-	28
12	Mooneye	Hiodon tergisus	4	-	-	-	-	-	-	-	-	-	-	2	6
13	American eel	Anguilla rostrata	2	-	1	-	-	-	-	-	-	-	-	-	3
14	Skipjack herring	Alosa chrysochloris	10	-	-	-	2	-	7	-	-	-	-	1	20
15	Gizzard shad	Dorosoma cepedianum	1748	-	11	-	113	-	139	-	17	69	-	-	2097
16	Central stoneroller	Campostoma anomalum	1	-	-	-	3	-	-	-	-	-	-	-	4
17	Grass carp	Ctenopharyngodon idella	2	-	-	-	-	-	-	1	2	-	-	-	5
18	Red shiner	Cyprinella lutrensis	115	-	-	-	491	-	77	-	-	-	-	-	683
19	Spotfin shiner	Cyprinella spiloptera	-	-	-	-	2	-	1	-	-	-	-	-	3
20	Blacktail shiner	Cyprinella venusta	2	-	-	-	12	-	-	-	-	-	-	-	14
21	Common carp	Cyprinus carpio	328	-	22	-	20	-	1	143	250	35	-	3	802
22	Mississippi silvery minnow	Hybognathus nuchalis	4	-	-	-	19	-	15	-	-	-	-	-	38
23	Bighead carp	Hypopthalmichthys nobilis	4	-	-	-	12	-	3	-	2	3	-	-	24
24	Speckled chub	Macrhybopsis aestivalis	-	-	-	-	5	-	4	-	-	-	-	26	35
25	Sicklefin chub	Macrhybopsis meeki	-	-	-	-	-	-	-	-	-	-	-	6	6
26	Silver chub	Macrhybopsis storeriana	-	-	-	-	1	-	1	-	-	-	-	1	3
27	Golden shiner	Notemigonus crysoleucas	-	-	-	-	1	-	-	-	-	-	-	-	1
28	Emerald shiner	Notropis atherinoides	236	-	-	-	878	-	449	-	-	-	-	1	1564
29	River shiner	Notropis blennius	8	-	-	-	12	-	43	-	-	-	-	1	64
30	Bigeye shiner	Notropis boops	-	-	-	-	2	-	-	-	-	-	-	-	2
31	Silverband shiner	Notropis shumardi	9	-	-	-	129	-	-	-	-	-	-	7	145
32	Mimic shiner	Notropis volucellus	-	-	-	-	1	-	-	-	-	-	-	-	1
33	Channel shiner	Notropis wickliffi	18	-	-	-	720	-	27	-	-	-	-	117	882
34	Unidentified shiner	Notropis sp.	-	-	-	-	6	-	-	-	-	-	-	-	6
35	Bluntnose minnow	Pimephales notatus	-	-	-	-	17	-	-	-	-	-	-	-	17
36	Bullhead minnow	Pimephales vigilax	-	-	-	-	34	-	-	-	-	-	-	-	34
37	River carpsucker	Carpiodes carpio	56	-	20	-	3	-	11	2	43	10	-	1	146
38	Quillback	Carpiodes cyprinus	-	-	1	-	-	-	-	-	1	-	-	-	2
39	Blue sucker	Cycleptus elongatus	3	-	-	-	2	-	-	-	-	-	-	1	6

Gears:
D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 5.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in the open Mississippi River. See Table 5.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Smallmouth buffalo	Ictiobus bubalus	71	-	-	-	-	-	-	11	248	13	-	-	343
41	Bigmouth buffalo	Ictiobus cyprinellus	13	-	1	-	-	-	-	1	4	11	-	-	30
42	Black buffalo	Ictiobus niger	24	-	-	-	-	-	-	15	67	6	-	-	112
43	Unidentified buffalo	Ictiobus sp.	7	-	-	-	338	-	384	-	-	-	-	-	729
44	River redhorse	Moxostoma carinatum	2	-	-	-	-	-	-	-	-	-	-	-	2
45	Shorthead redhorse	Moxostoma macrolepidotum	1	-	-	-	-	-	-	-	-	-	-	-	1
46	Blue catfish	Ictalurus furcatus	10	-	-	-	-	-	-	4	7	2	-	21	44
47	Channel catfish	Ictalurus punctatus	122	-	5	-	98	-	9	595	128	19	-	181	1157
48	Unidentified catfish	Ictalurus sp.	-	-	-	-	1	-	-	-	-	-	-	-	1
49	Stonecat	Noturus flavus	-	-	-	-	-	-	-	-	-	-	-	1	1
50	Freckled madtom	Noturus nocturnus	5	-	-	-	-	-	-	-	-	-	-	-	5
51	Flathead catfish	Pylodictis olivaris	48	-	5	-	6	-	1	9	19	3	-	3	94
52	Blackstripe topminnow	Fundulus notatus	1	-	-	-	2	-	-	-	-	-	-	-	3
53	Western mosquitofish	Gambusia affinis	-	-	-	-	12	-	-	-	-	-	-	-	12
54	Brook silverside	Labidesthes sicculus	4	-	-	-	4	-	2	-	-	-	-	-	10
55	White bass	Morone chrysops	92	-	57	-	40	-	13	4	11	14	-	1	232
56	Yellow bass	Morone mississippiensis	-	-	-	-	-	-	-	1	-	-	-	-	1
57	Striped bass	Morone saxatilis	-	-	1	-	-	-	-	-	-	-	-	-	1
58	Green sunfish	Lepomis cyanellus	3	-	-	-	4	-	-	-	-	-	-	-	7
59	Warmouth	Lepomis gulosus	1	-	-	-	1	-	-	-	-	-	-	-	2
60	Orangespotted sunfish	Lepomis humilis	17	-	-	-	22	-	-	-	-	-	-	-	39
61	Bluegill	Lepomis macrochirus	70	-	-	-	79	-	-	2	-	-	-	-	151
62	Longear sunfish	Lepomis megalotis	1	-	1	-	-	-	-	-	-	-	-	-	2
63	Green sunfish x bluegill	L. cyanellus x macrochirus	2	-	-	-	-	-	-	-	-	-	-	-	2
64	Unidentified Lepomis	Lepomis sp.	-	-	-	-	5	-	-	-	-	-	-	-	5
65	Spotted bass	Micropterus punctulatus	14	-	-	-	3	-	-	-	-	-	-	-	17
66	Largemouth bass	Micropterus salmoides	15	-	-	-	1	-	-	-	-	-	-	-	16
67	White crappie	Pomoxis annularis	11	-	9	-	33	-	-	-	1	-	-	-	54
68	Black crappie	Pomoxis nigromaculatus	19	-	2	-	4	-	-	2	-	-	-	-	27
69	Western sand darter	Ammocrypta clara	-	-	-	-	-	-	1	-	-	-	-	-	1
70	Bluntnose darter	Etheostoma chlorosomum	-	-	-	-	3	-	-	-	-	-	-	-	3
71	Logperch	Percina caprodes	-	-	-	-	5	-	-	-	-	-	-	-	5
72	Dusky darter	Percina sciera	-	-	-	-	1	-	-	-	-	-	-	-	1
73	River darter	Percina shumardi	-	-	-	-	1	-	-	-	-	-	-	-	1
74	Sauger	Stizostedion canadense	4	-	4	-	4	-	1	-	-	-	-	2	15
75	Freshwater drum	Aplodinotus grunniens	226	-	53	-	11691	-	27	6	22	17	-	257	12299
76	Unidentified	Unidentified	-	-	-	-	49	-	6	-	-	-	-	-	55
			3450	0	245	0	14935	0	1223	805	825	243	0	666	22392

Gears:
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T - Trawling (4.8-m bottom trawl)

Table 5.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Chestnut lamprey	0.00	0.00	0.08	0.00
	(0.00)	(0.00)	(0.08)	(0.00)
Shovelnose sturgeon	0.01	0.00	0.00	0.05
	(0.01)	(0.00)	(0.00)	(0.05)
Longnose gar	0.07	0.08	0.00	0.00
	(0.07)	(0.08)	(0.00)	(0.00)
Shortnose gar	1.43	1.42	1.42	1.55
	(0.49)	(0.56)	(0.58)	(0.49)
Goldeye	1.05	1.17	0.17	0.27
	(0.40)	(0.46)	(0.17)	(0.16)
Mooneye	0.16	0.17	0.00	0.09
	(0.10)	(0.11)	(0.00)	(0.09)
American eel	0.00	0.00	0.17	0.00
	(0.00)	(0.00)	(0.11)	(0.00)
Skipjack herring	0.16	0.17	0.17	0.14
	(0.10)	(0.11)	(0.11)	(0.10)
Gizzard shad	31.15	31.50	29.42	28.73
	(11.87)	(13.57)	(9.31)	(8.39)
Central stoneroller	0.00	0.00	0.08	0.00
	(0.00)	(0.00)	(0.08)	(0.00)
Grass carp	0.01	0.00	0.08	0.05
	(0.01)	(0.00)	(0.08)	(0.05)
Red shiner	1.31	0.92	0.25	4.27
	(0.53)	(0.56)	(0.13)	(1.85)
Common carp	4.07	3.92	8.83	4.82
	(1.03)	(1.17)	(2.72)	(0.97)
Mississippi silvery minnow	0.01	0.00	0.00	0.09
	(0.01)	(0.00)	(0.00)	(0.06)
Emerald shiner	4.62	4.42	3.33	6.23
	(1.94)	(2.21)	(1.44)	(2.16)
River shiner	0.11	0.08	0.00	0.32
	(0.08)	(0.08)	(0.00)	(0.19)
Silverband shiner	0.30	0.33	0.00	0.05
	(0.22)	(0.26)	(0.00)	(0.05)
Channel shiner	0.17	0.17	0.17	0.23
	(0.10)	(0.11)	(0.11)	(0.09)
River carpsucker	0.61	0.42	0.08	2.09
	(0.22)	(0.23)	(0.08)	(0.84)
Blue sucker	0.07	0.08	0.17	0.00
	(0.07)	(0.08)	(0.11)	(0.00)
Smallmouth buffalo	0.47	0.33	1.17	1.41
	(0.22)	(0.22)	(0.30)	(0.79)
Bigmouth buffalo	0.06	0.00	0.00	0.50
	(0.03)	(0.00)	(0.00)	(0.23)
Black buffalo	0.55	0.58	0.17	0.36
	(0.17)	(0.19)	(0.11)	(0.15)
River redhorse	0.08	0.08	0.00	0.05
	(0.07)	(0.08)	(0.00)	(0.05)
Blue catfish	0.08	0.08	0.75	0.00
	(0.07)	(0.08)	(0.45)	(0.00)
Channel catfish	2.23	2.17	2.00	2.73
	(0.45)	(0.51)	(0.86)	(0.77)
Freckled madtom	0.15	0.17	0.17	0.05
	(0.10)	(0.11)	(0.11)	(0.05)
Flathead catfish	1.10	1.17	1.42	0.59
	(0.86)	(0.99)	(0.50)	(0.22)
White bass	1.10	1.00	1.33	1.82
	(0.33)	(0.37)	(0.51)	(0.48)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Green sunfish	0.01	0.00	0.08	0.09
	(0.01)	(0.00)	(0.08)	(0.09)
Orangespotted sunfish	0.01	0.00	0.00	0.05
	(0.01)	(0.00)	(0.00)	(0.05)
Bluegill	0.03	0.00	0.17	0.27
	(0.02)	(0.00)	(0.11)	(0.16)
Longear sunfish	0.00	0.00	0.08	0.00
	(0.00)	(0.00)	(0.08)	(0.00)
Green sunfish x bluegill	0.01	0.00	0.00	0.09
	(0.01)	(0.00)	(0.00)	(0.09)
Spotted bass	0.03	0.00	0.50	0.23
	(0.02)	(0.00)	(0.19)	(0.15)
Largemouth bass	0.01	0.00	0.75	0.05
	(0.01)	(0.00)	(0.43)	(0.05)
Black crappie	0.15	0.17	0.08	0.00
	(0.15)	(0.17)	(0.08)	(0.00)
Sauger	0.01	0.00	0.00	0.09
	(0.01)	(0.00)	(0.00)	(0.06)
Freshwater drum	3.64	3.25	0.67	6.73
	(1.15)	(1.19)	(0.22)	(4.23)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
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IMPO - Impounded, offshore
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBW	SCB
Shortnose gar	1.63	4.60	1.39
	(0.60)	(1.83)	(0.63)
American eel	0.02	0.33	0.00
	(0.02)	(0.33)	(0.00)
Gizzard shad	0.62	0.33	0.64
	(0.45)	(0.33)	(0.49)
Common carp	0.37	1.64	0.27
	(0.14)	(0.87)	(0.14)
River carpsucker	0.40	1.97	0.27
	(0.15)	(1.13)	(0.14)
Bigmouth buffalo	0.07	0.00	0.07
	(0.07)	(0.00)	(0.07)
Channel catfish	0.10	0.33	0.08
	(0.08)	(0.33)	(0.08)
Flathead catfish	0.25	0.00	0.28
	(0.25)	(0.00)	(0.28)
White bass	0.86	4.59	0.56
	(0.35)	(2.67)	(0.32)
Striped bass	0.09	0.00	0.09
	(0.09)	(0.00)	(0.09)
Longear sunfish	0.02	0.33	0.00
	(0.02)	(0.33)	(0.00)
White crappie	0.19	0.33	0.18
	(0.12)	(0.33)	(0.12)
Freshwater drum	0.48	2.95	0.28
	(0.20)	(2.04)	(0.14)

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SCB - Side channel border
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TWZ - Tailwater

Table 5.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Paddlefish	0.06	0.07	0.00	0.00
	(0.06)	(0.07)	(0.00)	(0.00)
Spotted gar	0.00	0.00	0.05	0.00
	(0.00)	(0.00)	(0.05)	(0.00)
Longnose gar	0.00	0.00	0.05	0.04
	(0.00)	(0.00)	(0.05)	(0.04)
Shortnose gar	0.62	0.64	0.36	0.54
	(0.42)	(0.48)	(0.15)	(0.25)
Goldeye	0.01	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.04)
Skipjack herring	0.08	0.08	0.00	0.04
	(0.07)	(0.08)	(0.00)	(0.04)
Gizzard shad	2.29	2.44	2.18	1.17
	(1.24)	(1.42)	(0.67)	(0.49)
Central stoneroller	0.01	0.00	0.05	0.08
	(0.01)	(0.00)	(0.05)	(0.08)
Red shiner	4.93	4.28	8.37	9.50
	(1.59)	(1.66)	(2.64)	(5.44)
Spotfin shiner	0.00	0.00	0.08	0.00
	(0.00)	(0.00)	(0.08)	(0.00)
Blacktail shiner	0.15	0.16	0.42	0.04
	(0.14)	(0.16)	(0.37)	(0.04)
Common carp	0.65	0.68	0.00	0.43
	(0.48)	(0.55)	(0.00)	(0.21)
Mississippi silvery minnow	0.01	0.00	0.56	0.00
	(0.00)	(0.00)	(0.30)	(0.00)
Bighead carp	0.01	0.00	0.34	0.04
	(0.00)	(0.00)	(0.21)	(0.04)
Speckled chub	0.36	0.41	0.00	0.00
	(0.36)	(0.41)	(0.00)	(0.00)
Silver chub	0.07	0.08	0.00	0.00
	(0.07)	(0.08)	(0.00)	(0.00)
Emerald shiner	7.05	7.23	27.95	4.03
	(3.78)	(4.33)	(11.36)	(1.95)
River shiner	0.25	0.26	0.10	0.21
	(0.16)	(0.19)	(0.07)	(0.11)
Bigeye shiner	0.00	0.00	0.10	0.00
	(0.00)	(0.00)	(0.07)	(0.00)
Silverband shiner	1.50	1.26	1.05	3.24
	(0.75)	(0.82)	(0.37)	(1.90)
Mimic shiner	0.00	0.00	0.05	0.00
	(0.00)	(0.00)	(0.05)	(0.00)
Channel shiner	12.34	11.76	5.79	17.14
	(4.67)	(5.27)	(2.07)	(7.49)
Bluntnose minnow	0.32	0.34	0.37	0.15
	(0.22)	(0.25)	(0.15)	(0.10)
Bullhead minnow	0.91	0.99	0.43	0.37
	(0.35)	(0.40)	(0.30)	(0.23)
River carpsucker	0.00	0.00	0.00	0.04
	(0.00)	(0.00)	(0.00)	(0.04)
Blue sucker	0.06	0.07	0.00	0.04
	(0.06)	(0.07)	(0.00)	(0.04)
Channel catfish	2.29	2.46	1.96	1.08
	(0.97)	(1.12)	(0.55)	(0.25)
Flathead catfish	0.21	0.24	0.09	0.04
	(0.11)	(0.12)	(0.06)	(0.04)
Blackstripe topminnow	0.00	0.00	0.10	0.00
	(0.00)	(0.00)	(0.10)	(0.00)

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Table 5.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Western mosquitofish	0.09	0.08	0.33	0.15
	(0.07)	(0.08)	(0.17)	(0.12)
Brook silverside	0.00	0.00	0.10	0.03
	(0.00)	(0.00)	(0.07)	(0.03)
White bass	0.54	0.55	0.91	0.39
	(0.34)	(0.39)	(0.26)	(0.20)
Green sunfish	0.01	0.00	0.15	0.04
	(0.00)	(0.00)	(0.11)	(0.04)
Warmouth	0.01	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.04)
Orangespotted sunfish	0.08	0.07	0.28	0.15
	(0.06)	(0.07)	(0.20)	(0.09)
Bluegill	0.34	0.24	0.67	1.05
	(0.16)	(0.17)	(0.21)	(0.32)
Spotted bass	0.01	0.00	0.00	0.09
	(0.01)	(0.00)	(0.00)	(0.06)
White crappie	0.22	0.13	0.18	0.83
	(0.13)	(0.13)	(0.11)	(0.41)
Black crappie	0.08	0.08	0.00	0.07
	(0.07)	(0.08)	(0.00)	(0.05)
Bluntnose darter	0.08	0.08	0.05	0.04
	(0.07)	(0.08)	(0.05)	(0.04)
Logperch	0.02	0.00	0.00	0.21
	(0.01)	(0.00)	(0.00)	(0.08)
River darter	0.00	0.00	0.00	0.04
	(0.00)	(0.00)	(0.00)	(0.04)
Sauger	0.01	0.00	0.00	0.12
	(0.01)	(0.00)	(0.00)	(0.09)
Freshwater drum	373.94	402.16	5.05	196.45
	(347.93)	(398.43)	(1.73)	(192.20)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Chestnut lamprey	0.00	0.00	0.00	0.02
	(0.00)	(0.00)	(0.00)	(0.02)
Shortnose gar	0.04	0.04	0.00	0.06
	(0.04)	(0.04)	(0.00)	(0.05)
Common carp	1.18	1.23	0.97	0.83
	(0.43)	(0.49)	(0.47)	(0.28)
River carpsucker	0.07	0.08	0.00	0.00
	(0.07)	(0.08)	(0.00)	(0.00)
Smallmouth buffalo	0.12	0.13	0.04	0.06
	(0.06)	(0.07)	(0.04)	(0.04)
Bigmouth buffalo	0.00	0.00	0.00	0.02
	(0.00)	(0.00)	(0.00)	(0.02)
Black buffalo	0.40	0.46	0.04	0.00
	(0.25)	(0.29)	(0.04)	(0.00)
Blue catfish	0.01	0.00	0.00	0.08
	(0.01)	(0.00)	(0.00)	(0.05)
Channel catfish	2.62	1.76	2.67	8.97
	(0.65)	(0.53)	(1.58)	(3.90)
Flathead catfish	0.02	0.00	0.11	0.12
	(0.01)	(0.00)	(0.06)	(0.05)
White bass	0.04	0.04	0.00	0.06
	(0.04)	(0.04)	(0.00)	(0.04)
Yellow bass	0.04	0.04	0.00	0.00
	(0.04)	(0.04)	(0.00)	(0.00)
Bluegill	0.07	0.08	0.00	0.00
	(0.07)	(0.08)	(0.00)	(0.00)
Black crappie	0.04	0.04	0.00	0.00
	(0.04)	(0.04)	(0.00)	(0.00)
Freshwater drum	0.08	0.08	0.00	0.06
	(0.05)	(0.06)	(0.00)	(0.04)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	MCBW	SCB
Paddlefish	0.00	0.00	0.00	0.02
	(0.00)	(0.00)	(0.00)	(0.02)
Longnose gar	0.00	0.00	0.00	0.04
	(0.00)	(0.00)	(0.00)	(0.03)
Gizzard shad	0.04	0.00	0.00	0.32
	(0.03)	(0.00)	(0.00)	(0.25)
Common carp	1.66	1.69	1.57	1.46
	(0.71)	(0.81)	(0.85)	(0.55)
Bighead carp	0.04	0.04	0.00	0.00
	(0.04)	(0.04)	(0.00)	(0.00)
River carpsucker	0.10	0.08	0.10	0.21
	(0.05)	(0.06)	(0.10)	(0.12)
Quillback	0.00	0.00	0.00	0.02
	(0.00)	(0.00)	(0.00)	(0.02)
Smallmouth buffalo	2.11	2.14	0.77	2.03
	(0.63)	(0.72)	(0.59)	(0.53)
Bigmouth buffalo	0.01	0.00	0.00	0.04
	(0.01)	(0.00)	(0.00)	(0.04)
Black buffalo	0.17	0.17	0.17	0.19
	(0.11)	(0.13)	(0.13)	(0.08)
Blue catfish	0.05	0.04	0.00	0.13
	(0.04)	(0.04)	(0.00)	(0.08)
Channel catfish	0.58	0.48	0.21	1.38
	(0.17)	(0.19)	(0.16)	(0.49)
Flathead catfish	0.07	0.04	0.10	0.30
	(0.04)	(0.04)	(0.10)	(0.11)
White bass	0.05	0.04	0.13	0.10
	(0.04)	(0.04)	(0.08)	(0.05)
Freshwater drum	0.06	0.04	0.07	0.23
	(0.04)	(0.04)	(0.05)	(0.07)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Shortnose gar	0.00	0.00	0.04
	(0.00)	(0.00)	(0.04)
Skipjack herring	0.28	0.31	0.07
	(0.17)	(0.20)	(0.05)
Gizzard shad	2.12	1.88	3.89
	(1.11)	(1.25)	(1.38)
Red shiner	0.74	0.50	2.46
	(0.30)	(0.32)	(0.92)
Spotfin shiner	0.06	0.06	0.00
	(0.05)	(0.06)	(0.00)
Common carp	0.00	0.00	0.04
	(0.00)	(0.00)	(0.04)
Mississippi silvery minnow	0.52	0.56	0.21
	(0.24)	(0.27)	(0.16)
Bighead carp	0.17	0.19	0.00
	(0.12)	(0.14)	(0.00)
Speckled chub	0.07	0.06	0.11
	(0.06)	(0.06)	(0.08)
Silver chub	0.06	0.06	0.00
	(0.05)	(0.06)	(0.00)
Emerald shiner	13.84	14.69	7.64
	(6.33)	(7.17)	(3.81)
River shiner	0.94	0.94	1.00
	(0.48)	(0.54)	(0.49)
Channel shiner	0.32	0.25	0.82
	(0.14)	(0.14)	(0.40)
River carpsucker	0.05	0.00	0.39
	(0.02)	(0.00)	(0.20)
Channel catfish	0.09	0.06	0.29
	(0.06)	(0.06)	(0.13)
Flathead catfish	0.00	0.00	0.04
	(0.00)	(0.00)	(0.04)
Brook silverside	0.06	0.06	0.04
	(0.06)	(0.06)	(0.04)
White bass	0.56	0.63	0.11
	(0.23)	(0.26)	(0.08)
Western sand darter	0.06	0.06	0.00
	(0.05)	(0.06)	(0.00)
Sauger	0.06	0.06	0.00
	(0.05)	(0.06)	(0.00)
Freshwater drum	0.32	0.25	0.82
	(0.13)	(0.14)	(0.27)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using gill netting in the open Mississippi River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 5.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Shovelnose sturgeon	13.24	15.00	0.30
	(0.03)	()	(0.21)
Paddlefish	0.11	0.00	0.89
	(0.11)	(0.00)	(0.89)
Shortnose gar	0.10	0.00	0.86
	(0.05)	(0.00)	(0.41)
Bowfin	0.02	0.00	0.20
	(0.02)	(0.00)	(0.20)
Goldeye	0.02	0.00	0.20
	(0.02)	(0.00)	(0.13)
Gizzard shad	0.85	0.00	7.06
	(0.25)	(0.00)	(2.10)
Common carp	0.28	0.00	2.32
	(0.09)	(0.00)	(0.74)
Bighead carp	0.04	0.00	0.31
	(0.02)	(0.00)	(0.16)
River carpsucker	0.12	0.00	1.03
	(0.05)	(0.00)	(0.40)
Smallmouth buffalo	0.15	0.00	1.23
	(0.08)	(0.00)	(0.66)
Bigmouth buffalo	0.13	0.00	1.10
	(0.07)	(0.00)	(0.62)
Black buffalo	0.06	0.00	0.52
	(0.05)	(0.00)	(0.40)
Blue catfish	0.03	0.00	0.24
	(0.02)	(0.00)	(0.16)
Channel catfish	0.22	0.00	1.83
	(0.07)	(0.00)	(0.57)
Flathead catfish	0.04	0.00	0.30
	(0.02)	(0.00)	(0.15)
White bass	0.17	0.00	1.43
	(0.05)	(0.00)	(0.43)
Freshwater drum	0.19	0.00	1.57
	(0.06)	(0.00)	(0.51)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	TRI
Spotted gar	0.00	0.50
	(0.00)	(0.50)
Longnose x spotted gar	0.00	0.17
	(0.00)	(0.17)
Shortnose gar	0.00	2.67
	(0.00)	(0.95)
Bowfin	0.00	0.17
	(0.00)	(0.17)
Goldeye	1.00	0.00
	(1.00)	(0.00)
Skipjack herring	1.00	0.00
	(1.00)	(0.00)
Gizzard shad	29.33	49.50
	(21.07)	(38.98)
Red shiner	0.00	1.17
	(0.00)	(0.83)
Blacktail shiner	0.00	0.33
	(0.00)	(0.33)
Common carp	0.33	11.33
	(0.33)	(2.46)
Mississippi silvery minnow	0.67	0.00
	(0.67)	(0.00)
Bighead carp	0.00	0.67
	(0.00)	(0.49)
Emerald shiner	1.33	0.33
	(0.88)	(0.33)
Silverband shiner	0.00	0.67
	(0.00)	(0.49)
Channel shiner	0.00	1.50
	(0.00)	(1.31)
River carpsucker	0.00	0.67
	(0.00)	(0.67)
Smallmouth buffalo	0.33	3.50
	(0.33)	(1.12)
Bigmouth buffalo	0.00	0.33
	(0.00)	(0.33)
Black buffalo	0.00	1.17
	(0.00)	(0.83)
Shorthead redhorse	0.00	0.17
	(0.00)	(0.17)
Channel catfish	1.00	1.50
	(1.00)	(0.81)
Flathead catfish	0.00	0.67
	(0.00)	(0.33)
Blackstripe topminnow	0.00	0.17
	(0.00)	(0.17)
Brook silverside	0.00	0.67
	(0.00)	(0.42)
White bass	0.33	3.83
	(0.33)	(1.51)
Warmouth	0.00	0.17
	(0.00)	(0.17)
Orangespotted sunfish	0.00	2.67
	(0.00)	(0.76)
Bluegill	0.00	10.33
	(0.00)	(2.95)
Spotted bass	0.00	0.50
	(0.00)	(0.34)
Largemouth bass	0.00	0.83
	(0.00)	(0.40)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	TRI
White crappie	0.33	1.67
	(0.33)	(0.88)
Black crappie	0.00	2.67
	(0.00)	(1.54)
Sauger	0.33	0.17
	(0.33)	(0.17)
Freshwater drum	4.00	3.17
	(3.06)	(1.92)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	TRI
Shortnose gar	4.46	2.11
	(1.46)	(0.57)
Gizzard shad	0.71	0.22
	(0.71)	(0.22)
Common carp	1.77	2.01
	(1.77)	(1.10)
River carpsucker	1.39	1.27
	(0.70)	(1.27)
Quillback	0.00	0.22
	(0.00)	(0.22)
Channel catfish	0.69	0.18
	(0.35)	(0.18)
Flathead catfish	0.34	0.22
	(0.34)	(0.22)
White bass	12.71	0.00
	(4.33)	(0.00)
White crappie	0.69	0.83
	(0.35)	(0.83)
Black crappie	0.00	0.44
	(0.00)	(0.44)
Sauger	1.40	0.00
	(0.94)	(0.00)
Freshwater drum	3.88	6.63
	(2.91)	(3.03)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	TRI
Shortnose gar	1.37	0.70
	(0.69)	(0.51)
Gizzard shad	1.03	0.75
	(0.59)	(0.75)
Red shiner	1.02	0.00
	(0.59)	(0.00)
Mississippi silvery minnow	2.38	0.00
	(2.38)	(0.00)
Bighead carp	0.00	0.68
	(0.00)	(0.68)
Golden shiner	0.00	0.17
	(0.00)	(0.17)
Emerald shiner	35.72	0.19
	(34.19)	(0.19)
River shiner	0.69	0.00
	(0.69)	(0.00)
Silverband shiner	0.35	0.61
	(0.35)	(0.61)
Channel shiner	0.00	0.52
	(0.00)	(0.36)
Bluntnose minnow	0.00	0.17
	(0.00)	(0.17)
Bullhead minnow	0.00	0.51
	(0.00)	(0.35)
River carpsucker	0.68	0.00
	(0.68)	(0.00)
Channel catfish	0.34	0.00
	(0.34)	(0.00)
Brook silverside	0.34	0.00
	(0.34)	(0.00)
White bass	1.38	0.00
	(0.69)	(0.00)
Orangespotted sunfish	0.00	1.98
	(0.00)	(0.76)
Bluegill	0.00	6.30
	(0.00)	(5.50)
Spotted bass	0.35	0.00
	(0.35)	(0.00)
Largemouth bass	0.34	0.00
	(0.34)	(0.00)
White crappie	0.34	0.54
	(0.34)	(0.38)
Black crappie	0.35	0.00
	(0.35)	(0.00)
Dusky darter	0.00	0.19
	(0.00)	(0.19)
Sauger	0.35	0.00
	(0.35)	(0.00)
Freshwater drum	221.49	188.80
	(218.43)	(187.75)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	TRI
Shortnose gar	0.17	0.07
	(0.17)	(0.07)
Bowfin	0.00	0.14
	(0.00)	(0.14)
Grass carp	0.00	0.07
	(0.00)	(0.07)
Common carp	0.34	3.14
	(0.34)	(0.72)
Smallmouth buffalo	0.17	0.21
	(0.17)	(0.10)
Black buffalo	0.00	0.21
	(0.00)	(0.14)
Channel catfish	0.17	1.34
	(0.17)	(0.71)
Black crappie	0.00	0.07
	(0.00)	(0.07)
Freshwater drum	0.16	0.00
	(0.16)	(0.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	TRI
Gizzard shad	0.17	0.08
	(0.17)	(0.08)
Grass carp	0.17	0.08
	(0.17)	(0.08)
Common carp	6.13	4.78
	(5.13)	(1.50)
Bighead carp	0.00	0.08
	(0.00)	(0.08)
River carpsucker	0.17	2.24
	(0.17)	(0.91)
Smallmouth buffalo	2.86	4.96
	(1.30)	(2.33)
Bigmouth buffalo	0.00	0.17
	(0.00)	(0.11)
Black buffalo	0.00	4.03
	(0.00)	(2.33)
Channel catfish	7.35	0.17
	(7.35)	(0.17)
Flathead catfish	0.00	0.09
	(0.00)	(0.09)
White bass	0.17	0.00
	(0.17)	(0.00)
White crappie	0.00	0.08
	(0.00)	(0.08)
Freshwater drum	0.17	0.60
	(0.17)	(0.51)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 5.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using bottom trawling in the open Mississippi River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	MCBU	SCB
Shovelnose sturgeon	0.56	0.00
	(0.22)	(0.00)
Shovelnose x pallid? sturgeon	0.02	0.00
	(0.02)	(0.00)
Paddlefish	0.06	0.00
	(0.05)	(0.00)
Mooneye	0.04	0.00
	(0.03)	(0.00)
Skipjack herring	0.00	0.11
	(0.00)	(0.11)
Common carp	0.06	0.00
	(0.05)	(0.00)
Speckled chub	0.52	0.11
	(0.33)	(0.11)
Sicklefin chub	0.13	0.00
	(0.07)	(0.00)
Silver chub	0.02	0.00
	(0.02)	(0.00)
Emerald shiner	0.00	0.11
	(0.00)	(0.11)
River shiner	0.02	0.00
	(0.02)	(0.00)
Silverband shiner	0.10	0.22
	(0.09)	(0.22)
Channel shiner	0.63	9.67
	(0.44)	(9.54)
River carpsucker	0.00	0.11
	(0.00)	(0.11)
Blue sucker	0.02	0.00
	(0.02)	(0.00)
Blue catfish	0.44	0.00
	(0.13)	(0.00)
Channel catfish	2.88	4.78
	(0.95)	(2.95)
Stonecat	0.02	0.00
	(0.02)	(0.00)
Flathead catfish	0.06	0.00
	(0.04)	(0.00)
White bass	0.02	0.00
	(0.02)	(0.00)
Sauger	0.04	0.00
	(0.03)	(0.00)
Freshwater drum	5.13	1.22
	(3.85)	(0.88)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

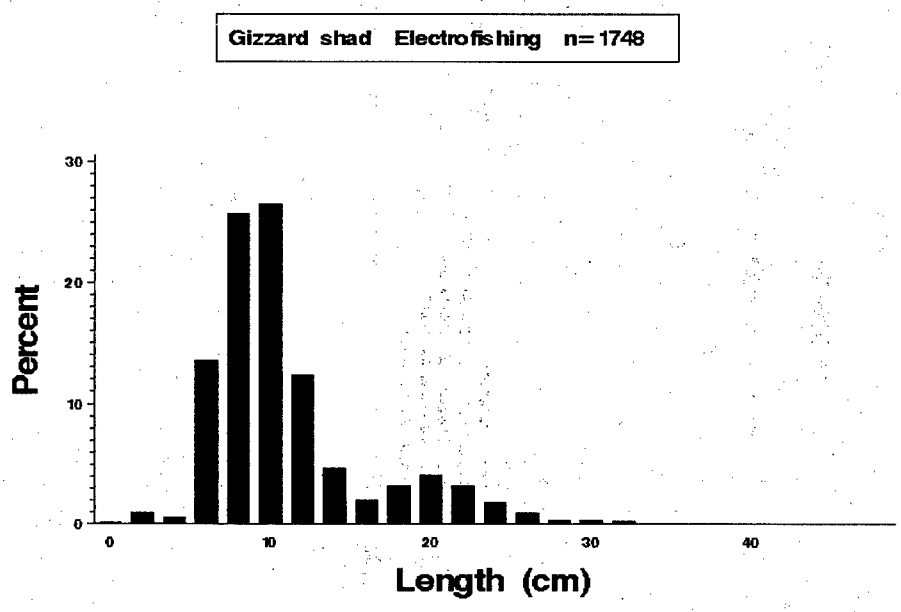

Figure 5.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

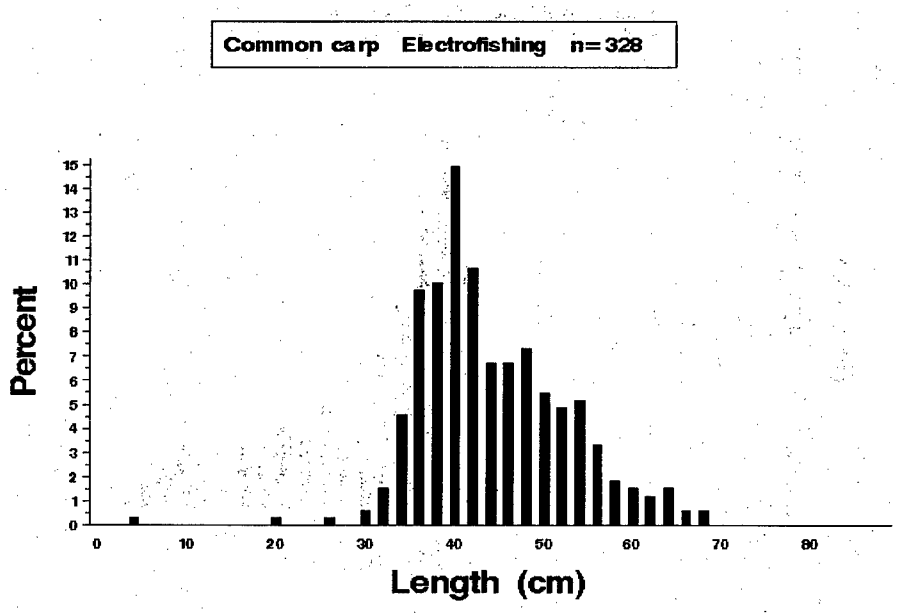

Figure 5.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

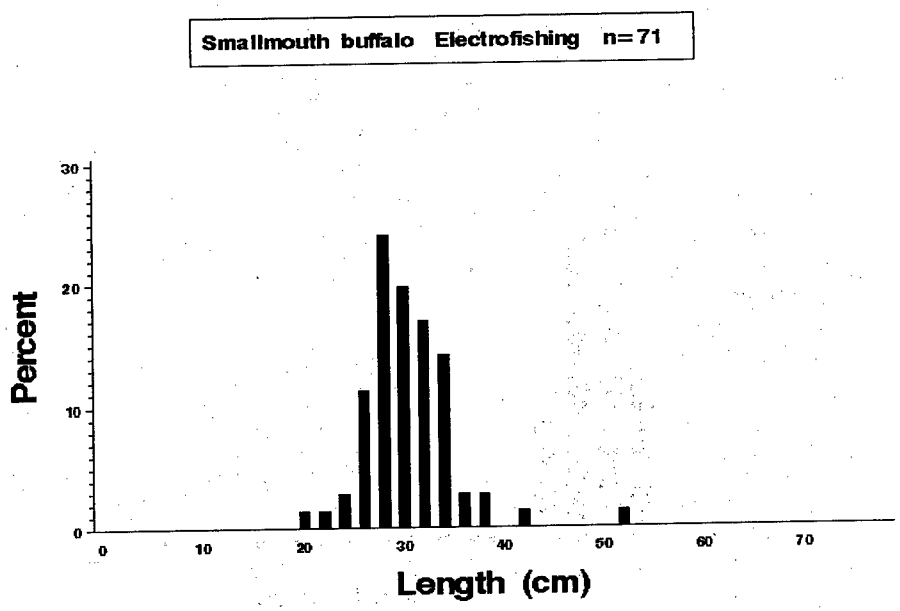

Figure 5.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

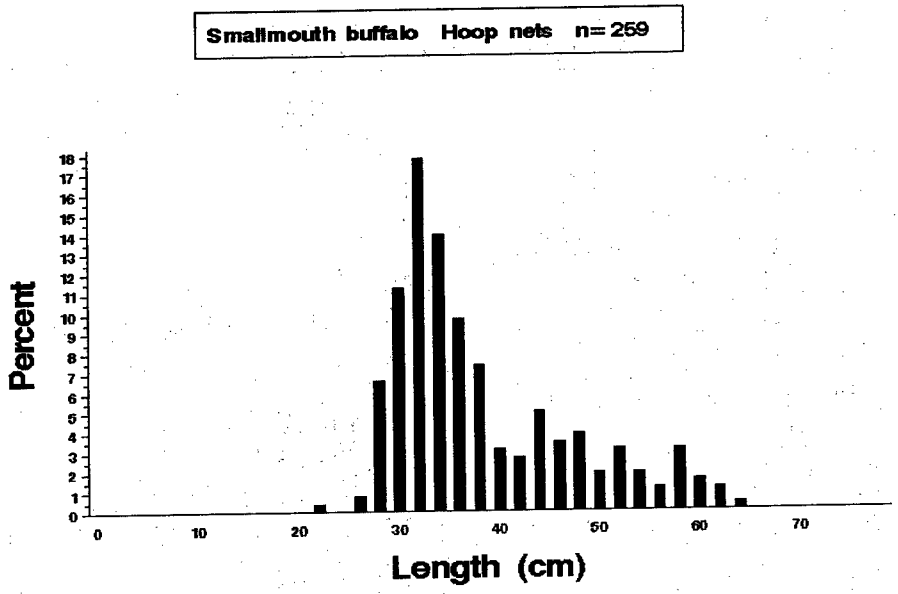

Figure 5.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in the Upper Mississippi River Open Reach during 1997.

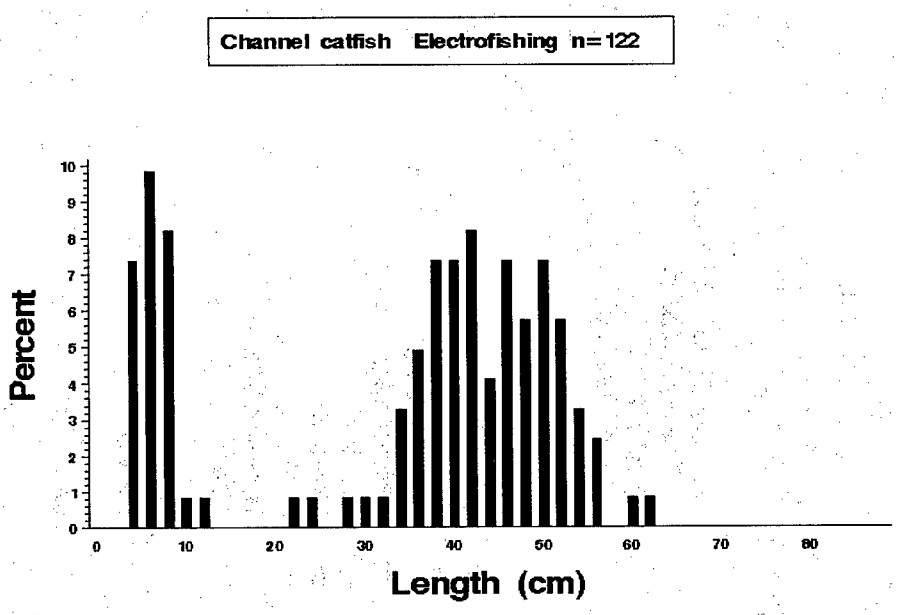

Figure 5.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

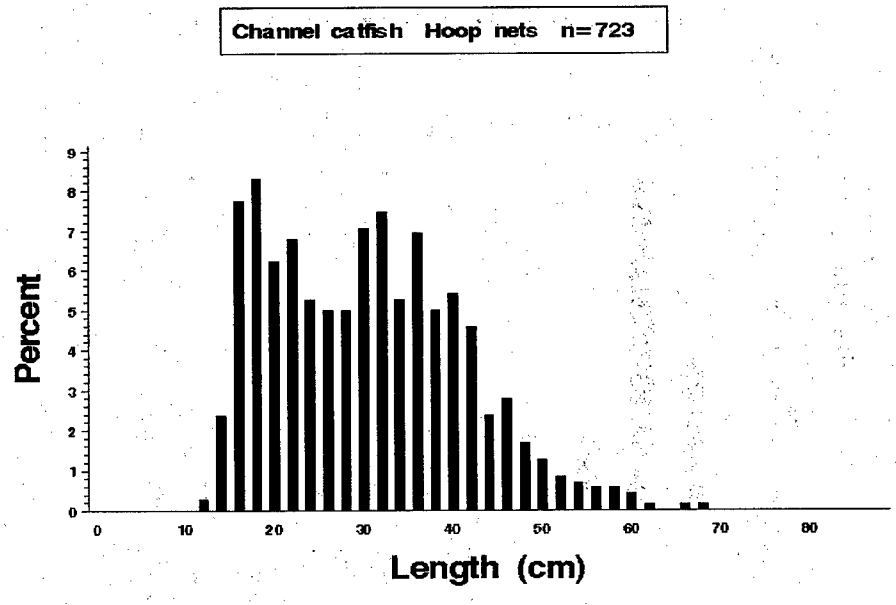

Figure 5.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in the Upper Mississippi River Open Reach during 1997.

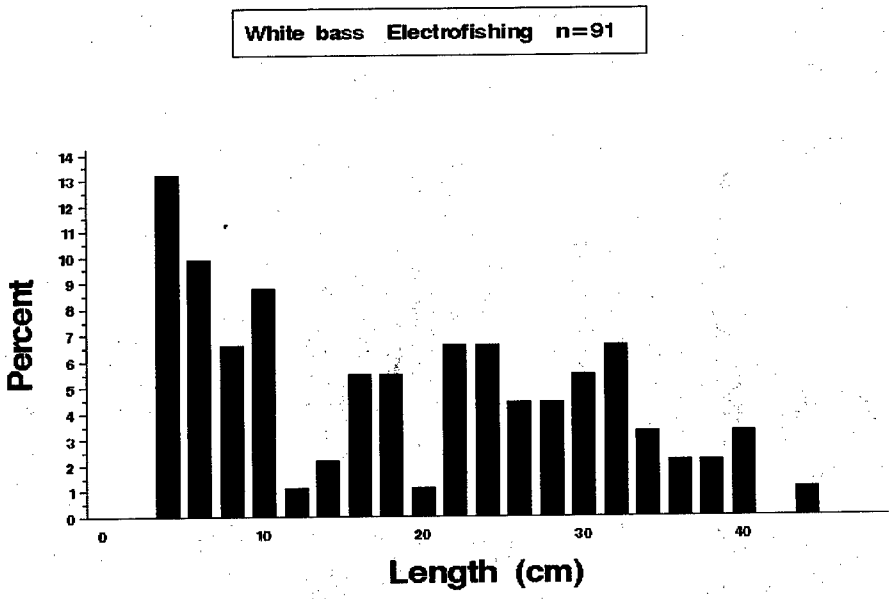

Figure 5.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

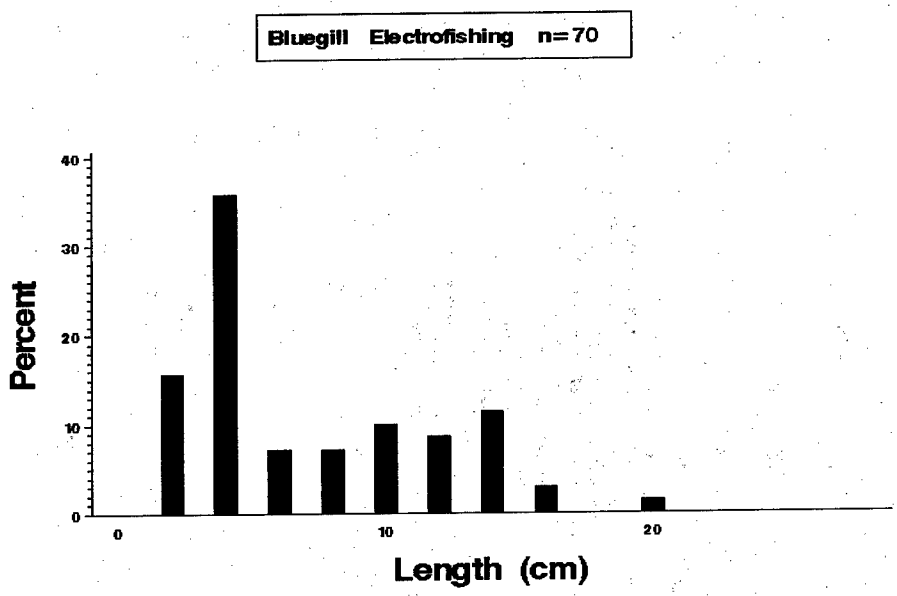

Figure 5.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

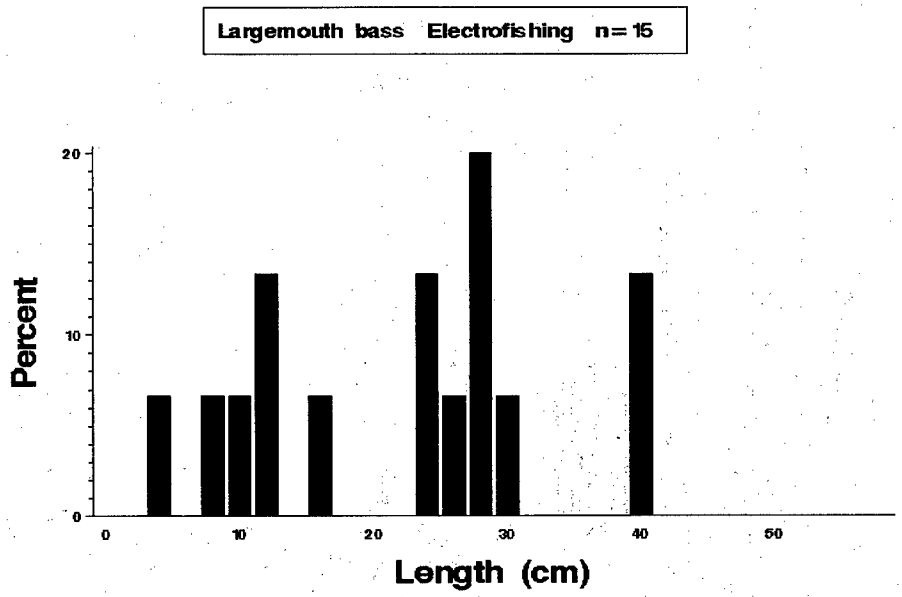

Figure 5.10. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus* salmoides) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

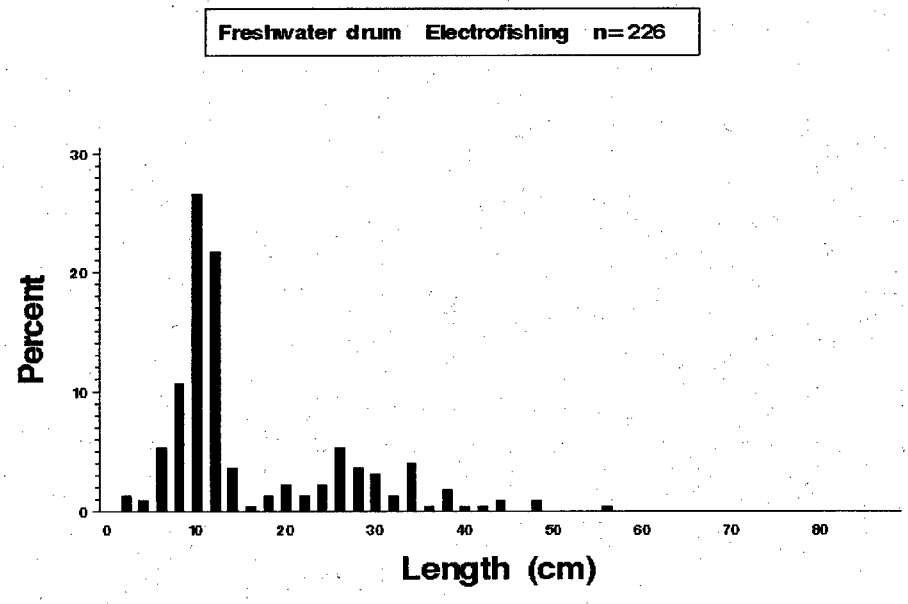

Figure 5.11. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in the Upper Mississippi River Open Reach during 1997.

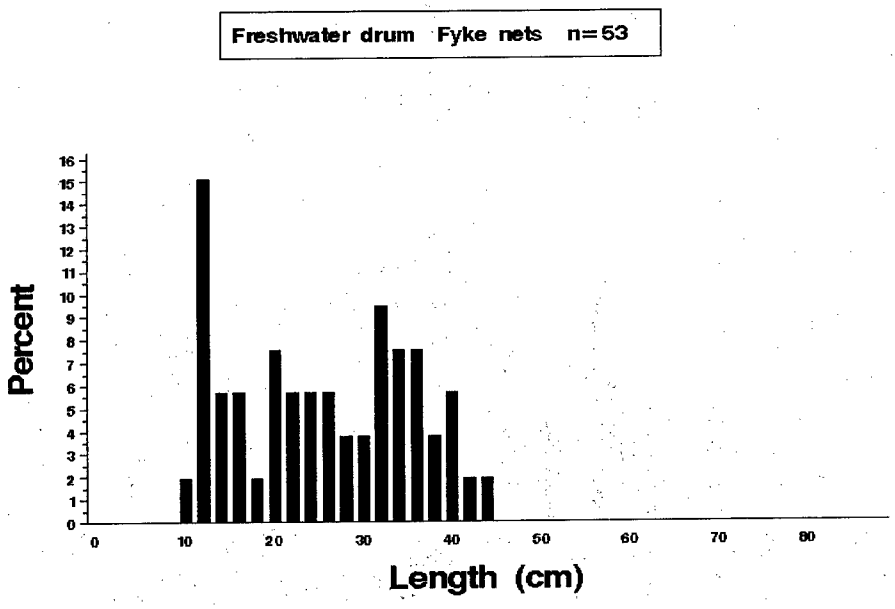

Figure 5.12. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in the Upper Mississippi River Open Reach during 1997.

Chapter 6. La Grange Pool, Illinois River

by

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Hydrograph

River levels were below flood stage from January through mid-February. The water surface elevation climbed above flood stage on February 22 and remained high throughout March (Figure 6.1). After declining in early April, river levels continued below flood stage for the three periods and the rest of the year. There were two increases in river levels in periods 1 and 2 that allowed access into backwaters. In period 3, river levels fell below the mean, which represents extremely low water levels, and backwater access was limited. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

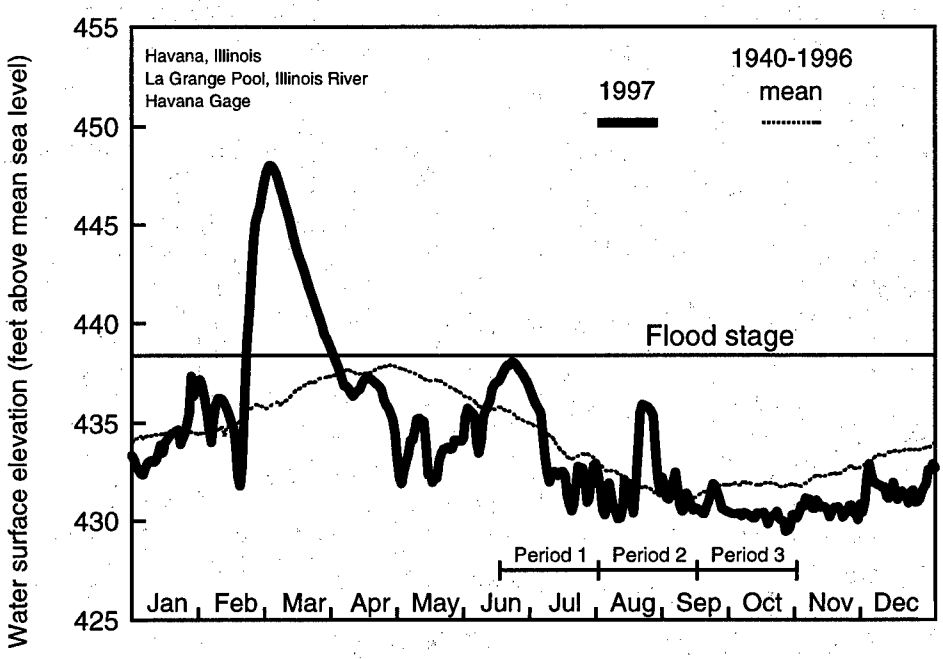

Figure 6.1. Daily water surface elevation from Havana Gage for La Grange Pool, Illinois River, during 1997 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with the Environmental Management Technical Center established procedures (Wlosinski et al. 1995).

Summary of Sampling Effort

We made 543 collections in 1997—177 in period 1, 182 in period 2, and 184 in period 3 (Table 6.1). Of those, 412 were from randomly selected sites in BWCS, BWCO, SCB, and MCBU strata. Of the 131 collections from fixed sites, 94 were from two TWZ fixed sites and 37 were from one SCB fixed site. We continued to sample the TWZ site below La Grange Lock and Dam; data from both TWZ sites were combined.

Total Catch

Historical records indicate 115 fish species and 3 hybrid crosses have been collected from La Grange Pool since the late 1800s (Smith 1979). In 1997, we collected 166,588 fish representing 66 species and 3 hybrid crosses (Table 6.2). The five most abundant species numerically were the gizzard shad (117,597), emerald shiner (16,807), freshwater drum (6,738), common carp (5,517), and bluegill (4,214). Total species collected, excluding hybrids, by gear type were 53 by day and night electrofishing combined, 40 by fyke netting, 30 by tandem fyke netting, 48 by mini fyke netting, 24 by tandem mini fyke netting, 41 by seining, 9 by small hoop nets, 13 by large hoop netting, and 7 by trawling. Our combined catch for 1990 through 1997 consisted of 537,792 fish representing 80 species and 6 hybrid crosses.

Random Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

For day electrofishing (Table 6.3.1), the gizzard shad had the highest poolwide mean catch-per-unit-effort (*C/f*) of 850.29, followed by common carp (15.34) and emerald shiner (14.59). Gizzard shad also had the highest *C/f* in BWCS (62.47), MCBU (1190.83), and SCB (100.39) strata. Species with the second and third highest *C/f* by stratum were common carp (36.53) and bluegill (33.94) in the BWCS, emerald shiner (18.89) and common carp (7.00) in the MCBU, and common carp (22.97) and emerald shiner (13.22) in the SCB. Night electrofishing was not conducted at random sites in 1997.

Fyke Net

Poolwide mean *C/f* for fyke netting (Table 6.3.2), based solely on BWCS collections in La Grange Pool, was highest for black crappies (31.84), followed by bluegills (14.15) and gizzard shad (10.98).

Tandem Fyke Net

Poolwide mean *C/f* for tandem fyke netting (Table 6.3.3), based solely on BWCO collections, was highest for gizzard shad (20.47), followed by black crappies (12.61) and white bass (11.25).

Mini Fyke Net

For mini fyke nets (Table 6.3.4), gizzard shad had the highest poolwide mean *C/f* (1,602.02), followed by emerald shiners (55.33) and freshwater drum (22.23). Gizzard shad also had the highest *C/f* in BWCS (49.67), MCBU (2268.08), and SCB (200.33) strata. The second and third highest *C/f* by stratum was bluegills (18.09) and freshwater drum (6.87) in the BWCS, emerald shiners (75.41) and freshwater drum (19.72) in the MCBU, and freshwater drum (147.59) and emerald shiners (34.24) in the SCB.

Tandem Mini Fyke Net

Poolwide mean *C/f* for tandem mini fyke netting (Table 6.3.5), based solely on BWCO collections, was highest for freshwater drum (61.74), followed by gizzard shad (21.76) and emerald shiners (8.55).

Small Hoop Net

For small hoop nets (Table 6.3.6), common carp had the highest poolwide mean *C/f* (6.86), followed by channel catfish (1.94) and freshwater drum (0.08). Common carp had the highest *C/f* in both MCB (6.94) and SCB (5.78) strata, followed by channel catfish (MCBU, 1.79; SCB, 4.32), freshwater drum (MCBU, 0.08), and smallmouth buffalo (SCB, 0.08).

Large Hoop Net

For large hoop nets (Table 6.3.7), common carp had the highest poolwide mean *C/f* (10.23), followed by smallmouth buffalo (4.11) and channel catfish (0.85). Common carp had the highest *C/f* in both MCBU (9.93) and SCB (14.81) strata, followed by smallmouth buffalo (MCBU, 4.17; SCB, 3.30) and channel catfish (MCBU, 0.87; SCB, 0.48).

Seine

Gizzard shad had the highest poolwide mean *C/f* (40.20) for seining (Table 6.3.8), followed by emerald shiners (15.84) and bluegills (7.37). Catch rates in all strata types were also highest for gizzard shad (BWCS, 29.13; MCBU, 44.50; and SCB, 37.21) followed by bluegills (26.33) in the BWCS stratum and emerald shiners (MCBU, 18.72; SCB, 19.29). Bluegills had the third highest poolwide mean *C/f* (7.37) and western mosquitofish had the third highest *C/f* in BWCS (14.04) and SCB (1.88) strata; skipjack herring (9.08) was third highest in the MCBU stratum.

Fixed Sampling, Mean *C/f* by Gear and Stratum

Day Electrofishing

Gizzard shad had the highest mean *C/f* (30.67) for day electrofishing (Table 6.4.1) at the SCB fixed site, followed by bluegills (22.00) and common carp (19.50). At the TWZ sites, gizzard shad had the highest *C/f* (87.00), followed by white bass (36.10) and common carp (14.30).

Night Electrofishing

For night electrofishing at the SCB site (Table 6.4.2), common carp had the highest *C/f* (27.17), followed by gizzard shad (26.17) and bluegills (18.83). Gizzard shad had the highest *C/f* (162.00) at the TWZ sites, followed by white bass (48.33) and smallmouth buffalo (12.92).

Fyke Net

Black crappies had the highest *C/f* (45.37) in TWZ fyke nets (Table 6.4.3), followed by white bass (17.60) and bluegills (13.59).

Mini Fyke Net

For mini fyke netting at the SCB site (Table 6.4.4), emerald shiner had the highest *C/f* (53.44), followed by bluegills (3.02) and freshwater drum (1.21). At the TWZ sites, emerald shiners had the highest *C/f* (873.83), followed by gizzard shad (16.32) and white bass (3.14).

Small Hoop Net

Common carp had the highest *C/f* (4.71) for small hoop nets at the SCB site (Table 6.4.5). No other species were caught in small hoop nets at the SCB site. At the TWZ sites, common carp had the highest *C/f* (6.18), followed by channel catfish (3.99), brown bullhead (0.04), flathead catfish (0.04), and white perch (0.04).

Large Hoop Net

Common carp had the highest *C/f* (9.93) for large hoop nets at the SCB site (Table 6.4.6), followed by smallmouth buffalo (0.81) and freshwater drum (0.60). At the TWZ sites, common carp had the highest *C/f* (10.47), followed by smallmouth buffalo (2.71) and white bass (0.96).

Seine

For SCB seining (Table 6.4.7), gizzard shad had the highest *C/f* (120.80), followed by emerald shiners (44.70) and red shiners (2.40).

Trawl

Freshwater drum had the highest *C/f* (2.17) in TWZ trawls (Table 6.4.8), followed by channel catfish (0.21) and yellow bass (0.08).

Length Distributions of Selected Species

Gizzard Shad

Gizzard shad production was exceptional in 1997, as the total catch of 51,763 fish from day and night electrofishing combined illustrates (Table 6.2). Sixty-four percent of the gizzard shad collected were in the 4-cm length group, suggesting a strong 1997 year class.

Common Carp

The electrofishing length distribution of 2,890 common carp (Figure 6.3) indicated abundant fish from 36 to 44 cm with relatively few fish outside this range. Some fish <10 cm were present, as were some >60 cm.

Smallmouth Buffalo

Of the 1,019 smallmouth buffalo collected by electrofishing in 1997 (Figure 6.4), only one major peak was evident. This peak was at 20 cm; most of the smallmouth buffalo were between 16 and 36 cm.

Hoop net length distributions of 392 smallmouth buffalo (Figure 6.5) show a histogram with about 17% of the fish in the 32-cm length group. None of these fish was less than 20 cm.

Channel Catfish

The electrofishing length distribution of 400 channel catfish shows three groups at 8, 28, and 50 cm (Figure 6.6). Electrofishing showed a wide range of sizes and cohorts.

The length distribution of almost 35% of the channel catfish caught in hoop nets in 1997 was at 16 cm (Figure 6.7). The 396 fish in the distribution ranged from 10 to 60 cm.

Northern Pike

No northern pike were collected from La Grange Pool by LTRMP in 1997.

White Bass

More than 68% of 1,476 white bass had a length distribution of 18 to 38 cm from electrofishing in 1997 (Figure 6.8). There were two peaks present in the distribution; the first group of fish was at 10 cm and the second was at 26 cm.

Bluegill

We caught 1,800 bluegills during electrofishing in 1997 (Figure 6.9); the fish were almost normally distributed from 0 to 18 cm. The peak was at 12 cm, where it composed 28% of the distribution.

We combined catches from fyke and tandem fyke net sets in a length distribution of 814 bluegills (Figure 6.10). The distribution was similar to that of electrofishing (Figure 6.9) with the peak being at 12 cm.

Largemouth Bass

The electrofishing length distribution of 460 largemouth bass (Figure 6.11) indicated fish were distributed from 4 to 50 cm, with peaks evident at 8, 18, 28, and 34 cm.

White Crappie

In 1997, we collected 385 white crappies from fyke and tandem fyke nets (Figure 6.12); 26% of the white crappies were 16 cm long and about 22% were longer than 20 cm.

Black Crappie

We caught 1,960 black crappies in fyke and tandem fyke nets in 1997 (Figure 6.13). Fish were distributed from 8 to 30 cm with 30% of the black crappies at 12 cm.

Sauger

We caught 142 saugers during electrofishing in 1997 (Figure 6.14). Fish lengths ranged from 4 to 54 cm with two major peaks in the distribution, one at 18 cm and the other at 32 cm.

Walleye

Eight walleyes ranging from 12 to 50 cm were collected by electrofishing. Because of the small sample size, length distributions were not included for this report.

Freshwater Drum

The electrofishing length distribution (Figure 6.15) for freshwater drum illustrates a distribution of fish from 2 to 54 cm. Two peaks were evident; the first was at 8 cm and consisted of 15% of the total fish and the second was at 26 cm and consisted of 9% of the distribution.

We caught 400 freshwater drum in fyke and tandem fyke nets. These fish were distributed from about 8 to 42 cm, with peaks at 14, 26, and 32 cm (Figure 6.16).

Table 6.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in the La Grange Pool of the Illinois River during 1997. Table entries are numbers of successfully completed standardized monitoring collections.

Sampling period=1: June 15 - July 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		14	12					2	40
Fyke net	10								4	14
Large hoop net			7	8					4	19
Small hoop net			7	8					4	19
Mini fyke net	10		7	8					4	29
Night electrofishing			2						4	6
Seine	8		10	12						30
Trawling									8	8
Tandem fyke net		6								6
Tandem mini fyke net		6								6
SUBTOTAL	40	12	47	48	0	0	0	0	30	177

Sampling period=2: August 1 - September 14

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	10		14	12					4	40
Fyke net	10								4	14
Large hoop net			8	8					4	20
Small hoop net			8	8					4	20
Mini fyke net	10		8	8					4	30
Night electrofishing			2						4	6
Seine	8		12	12						32
Trawling									8	8
Tandem fyke net		6								6
Tandem mini fyke net		6								6
SUBTOTAL	38	12	52	48	0	0	0	0	32	182

Sampling period=3: September 15 - October 31

Sampling gear	BWCS	BWCO	SCB	MCBU	MCBW	IMPS	IMPO	TRI	TWZ	TOTAL
Day electrofishing	12		14	12					4	42
Fyke net	10								4	14
Large hoop net			8	8					4	20
Small hoop net			8	8					4	20
Mini fyke net	10		8	8					4	30
Night electrofishing			2						4	6
Seine	8		12	12						32
Trawling									8	8
Tandem fyke net		6								6
Tandem mini fyke net		6								6
SUBTOTAL	40	12	52	48	0	0	0	0	32	184
	118	36	151	144	0	0	0	0	94	543

Strata: BWCS - Backwater, contiguous, shoreline.
BWCO - Backwater, contiguous, offshore.
IMPS - Impounded, shoreline.
IMPO - Impounded, offshore.
MCBU - Main channel border, unstructured.
MCBW - Main channel border, wing dam.
SBU - Side channel border.
TRI - Tributary mouth.
TWZ - Tailwater.

Table 6.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in the La Grange Pool of the Illinois River. See Table 6.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
1	Chestnut lamprey	Ichthyomyzon castaneus	1	-	-	-	-	-	-	-	-	-	-	-	1
2	Spotted gar	Lepisosteus oculatus	3	1	14	-	3	-	-	-	-	-	-	-	21
3	Longnose gar	Lepisosteus osseus	1	1	4	1	4	-	1	-	-	-	-	-	12
4	Shortnose gar	Lepisosteus platostomus	24	9	151	31	57	8	4	-	-	-	-	-	284
5	Bowfin	Amia calva	12	5	38	2	12	1	1	-	-	-	-	-	71
6	Goldeye	Hiodon alosoides	2	-	1	1	-	-	-	-	-	-	-	-	4
7	American eel	Anguilla rostrata	-	-	-	-	1	-	-	-	-	-	-	-	1
8	Skipjack herring	Alosa chrysochloris	317	7	155	2	25	207	331	-	-	-	-	-	1044
9	Gizzard shad	Dorosoma cepedianum	49662	2101	416	714	59555	726	4402	1	20	-	-	-	117597
10	Threadfin shad	Dorosoma petenense	31	13	20	1	30	1	12	-	-	-	-	-	108
11	Central stoneroller	Campostoma anomalum	-	-	-	-	-	-	1	-	-	-	-	-	1
12	Goldfish	Carassius auratus	8	6	7	-	2	-	-	-	-	-	-	-	23
13	Grass carp	Ctenopharyngodon idella	7	-	1	-	185	-	27	-	-	-	-	-	220
14	Red shiner	Cyprinella lutrensis	60	14	-	-	174	-	125	-	-	-	-	-	373
15	Common carp	Cyprinus carpio	2581	309	191	55	264	15	26	727	1348	-	-	1	5517
16	Goldfish x carp	Cyprinus auratus x carpio	30	-	4	-	3	-	1	-	1	-	-	-	39
17	Bighead carp	Hypopthalmichthys nobilis	1	-	2	-	-	-	-	-	-	-	-	-	3
18	Silver chub	Macrhybopsis storeriana	21	-	-	-	17	-	12	-	-	-	-	-	50
19	Golden shiner	Notemigonus crysoleucas	3	1	-	-	6	-	4	-	-	-	-	-	14
20	Emerald shiner	Notropis atherinoides	1418	144	-	-	13187	295	1763	-	-	-	-	-	16807
21	River shiner	Notropis blennius	1	-	-	-	-	-	-	-	-	-	-	-	1
22	Spottail shiner	Notropis hudsonius	-	1	-	-	24	-	36	-	-	-	-	-	61
23	Silverband shiner	Notropis shumardi	32	2	-	-	97	-	54	-	-	-	-	-	185
24	Sand shiner	Notropis stramineus	-	-	-	-	68	-	5	-	-	-	-	-	73
25	Unidentified shiner	Notropis sp.	-	-	-	-	-	-	32	-	-	-	-	-	32
26	Bluntnose minnow	Pimephales notatus	-	-	-	-	14	-	15	-	-	-	-	-	29
27	Fathead minnow	Pimephales promelas	1	-	-	-	1	1	-	-	-	-	-	-	3
28	Bullhead minnow	Pimephales vigilax	24	1	-	-	169	1	90	-	-	-	-	-	285
29	Blacknose dace	Rhinichthys atratulus	-	-	-	-	-	-	1	-	-	-	-	-	1
30	River carpsucker	Carpiodes carpio	77	13	89	53	15	2	27	-	3	-	-	1	280
31	Quillback	Carpiodes cyprinus	11	2	13	-	-	-	3	-	-	-	-	-	29
32	Highfin carpsucker	Carpiodes velifer	3	-	4	2	-	-	1	-	-	-	-	-	10
33	White sucker	Catostomus commersoni	-	-	1	-	-	-	-	-	-	-	-	-	1
34	Smallmouth buffalo	Ictiobus bubalus	800	219	137	45	11	6	5	5	387	-	-	-	1615
35	Bigmouth buffalo	Ictiobus cyprinellus	678	36	15	11	2	3	-	-	3	-	-	-	748
36	Black buffalo	Ictiobus niger	28	3	4	2	-	-	-	-	3	-	-	-	40
37	Unidentified buffalo	Ictiobus sp.	4	-	-	-	125	1	137	-	-	-	-	-	267
38	Silver redhorse	Moxostoma anisurum	1	-	1	1	-	-	-	-	-	-	-	-	3
39	Golden redhorse	Moxostoma erythrurum	9	1	16	-	2	-	1	-	-	-	-	-	29

Gears:
D - Day electrofishing
N - Night electrofishing
F - Fyke netting
X - Tandem fyke netting
M - Mini fyke netting
Y - Tandem mini fyke netting
S - Seining
HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 6.2. Total catches, by gear type, of fishes captured by the Long Term Resource Program during 1997 in the La Grange Pool of the Illinois River. See Table 6.1 for the list of sampling gears actually deployed in this study reach.

Species	Common name	Scientific name	D	N	F	X	M	Y	S	HS	HL	G	TA	T	TOTAL
40	Shorthead redhorse	Moxostoma macrolepidotum	41	4	51	29	2	-	3	-	2	-	-	1	133
41	Black bullhead	Ameiurus melas	4	1	18	4	43	-	-	-	-	-	-	-	70
42	Yellow bullhead	Ameiurus natalis	11	1	27	54	12	2	-	-	-	-	-	-	107
43	Brown bullhead	Ameiurus nebulosus	2	-	26	50	5	4	-	3	-	-	-	-	90
44	Channel catfish	Ictalurus punctatus	331	69	6	11	79	8	15	331	65	-	-	5	920
45	Stonecat	Noturus flavus	-	-	-	-	-	-	1	-	-	-	-	-	1
46	Freckled madtom	Noturus nocturnus	-	-	-	-	1	-	-	-	-	-	-	-	1
47	Flathead catfish	Pylodictis olivaris	39	7	1	-	4	-	-	2	12	-	-	1	66
48	Grass pickerel	Esox americanus vermiculatus	-	-	-	-	1	-	-	-	-	-	-	-	1
49	Tiger muskellunge	Esox masquinongy x lucius	-	1	-	-	1	-	-	-	-	-	-	-	2
50	Blackstripe topminnow	Fundulus notatus	2	1	-	-	22	-	3	-	-	-	-	-	28
51	Western mosquitofish	Gambusia affinis	7	1	-	-	96	2	385	-	-	-	-	-	491
52	Brook silverside	Labidesthes sicculus	3	1	-	-	3	-	14	-	-	-	-	-	21
53	White perch	Morone americana	-	-	7	2	-	-	-	1	-	-	-	-	10
54	White bass	Morone chrysops	870	606	489	402	411	24	100	2	37	-	-	-	2941
55	Yellow bass	Morone mississippiensis	33	15	76	41	10	27	-	-	-	-	-	2	204
56	Striped bass	Morone saxatilis	-	-	1	-	-	-	-	-	-	-	-	-	1
57	Striped x white bass	M. saxatilis x chrysops	3	14	-	-	-	-	-	-	-	-	-	-	17
58	Green sunfish	Lepomis cyanellus	35	1	-	1	15	2	-	-	-	-	-	-	54
59	Warmouth	Lepomis gulosus	33	-	1	2	8	-	1	-	-	-	-	-	45
60	Orangespotted sunfish	Lepomis humilis	25	3	3	-	40	2	6	-	-	-	-	-	79
61	Bluegill	Lepomis macrochirus	1537	263	597	217	827	60	713	-	-	-	-	-	4214
62	Green sunfish x bluegill	L. cyanellus x macrochirus	5	1	-	1	1	-	2	-	-	-	-	-	10
63	Smallmouth bass	Micropterus dolomieu	3	9	-	-	-	-	-	-	-	-	-	-	12
64	Largemouth bass	Micropterus salmoides	396	64	23	3	69	-	333	-	-	-	-	-	888
65	White crappie	Pomoxis annularis	208	29	247	138	72	14	10	-	-	-	-	-	718
66	Black crappie	Pomoxis nigromaculatus	395	47	1509	451	168	17	22	-	3	-	-	-	2612
67	Unidentified sunfish	Unidentified Centrarchidae	-	-	-	-	6	-	-	-	-	-	-	-	6
68	Logperch	Percina caprodes	12	-	-	-	21	-	2	-	-	-	-	-	35
69	Slenderhead darter	Percina phoxocephala	-	-	-	-	-	-	1	-	-	-	-	-	1
70	Sauger	Stizostedion canadense	75	67	22	11	4	-	1	-	1	-	-	-	181
71	Walleye	Stizostedion vitreum	3	5	1	-	-	-	-	-	-	-	-	-	9
72	Freshwater drum	Aplodinotus grunniens	592	95	226	174	3236	2181	123	5	54	-	-	52	6738
			60516	4194	4615	2512	79210	3610	8852	1077	1939	0	0	63	166588

Gears:
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- M - Mini fyke netting
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- S - Seining
- HS - Small hoop netting
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- G - Gill netting
- TA - Trammel netting, anchored sets
- T - Trawling (4.8-m bottom trawl)

Table 6.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Spotted gar	0.01	0.03	0.00	0.03
	(0.01)	(0.03)	(0.00)	(0.03)
Longnose gar	0.00	0.00	0.00	0.03
	(0.00)	(0.00)	(0.00)	(0.03)
Shortnose gar	0.11	0.24	0.06	0.31
	(0.04)	(0.10)	(0.04)	(0.11)
Bowfin	0.07	0.26	0.00	0.03
	(0.03)	(0.13)	(0.00)	(0.03)
Goldeye	0.02	0.00	0.03	0.03
	(0.02)	(0.00)	(0.03)	(0.03)
Skipjack herring	5.13	0.12	7.28	0.69
	(2.51)	(0.08)	(3.61)	(0.30)
Gizzard shad	850.29	62.47	1190.83	100.39
	(457.41)	(14.33)	(657.76)	(23.19)
Threadfin shad	0.19	0.15	0.22	0.03
	(0.07)	(0.12)	(0.09)	(0.03)
Goldfish	0.02	0.06	0.00	0.03
	(0.01)	(0.04)	(0.00)	(0.03)
Grass carp	0.05	0.12	0.03	0.06
	(0.03)	(0.07)	(0.03)	(0.04)
Red shiner	0.19	0.38	0.11	0.28
	(0.08)	(0.21)	(0.08)	(0.09)
Common carp	15.34	36.53	7.00	22.97
	(2.17)	(6.78)	(1.85)	(4.80)
Goldfish x carp	0.19	0.56	0.06	0.17
	(0.06)	(0.20)	(0.04)	(0.07)
Silver chub	0.28	0.09	0.36	0.11
	(0.13)	(0.05)	(0.18)	(0.09)
Golden shiner	0.01	0.03	0.00	0.06
	(0.01)	(0.03)	(0.00)	(0.04)
Emerald shiner	14.59	3.21	18.89	13.22
	(4.70)	(1.55)	(6.73)	(4.03)
Silverband shiner	0.43	0.06	0.58	0.22
	(0.16)	(0.04)	(0.23)	(0.15)
Fathead minnow	0.01	0.03	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)
Bullhead minnow	0.22	0.47	0.14	0.08
	(0.09)	(0.25)	(0.09)	(0.05)
River carpsucker	0.58	1.09	0.39	0.56
	(0.13)	(0.39)	(0.11)	(0.18)
Quillback	0.08	0.32	0.00	0.00
	(0.06)	(0.24)	(0.00)	(0.00)
Highfin carpsucker	0.02	0.00	0.03	0.00
	(0.02)	(0.00)	(0.03)	(0.00)
Smallmouth buffalo	5.67	13.97	2.78	2.89
	(0.75)	(2.16)	(0.74)	(0.46)
Bigmouth buffalo	4.42	14.79	0.64	3.47
	(1.21)	(4.68)	(0.24)	(1.25)
Black buffalo	0.15	0.44	0.03	0.28
	(0.04)	(0.14)	(0.03)	(0.15)
Silver redhorse	0.02	0.00	0.03	0.00
	(0.02)	(0.00)	(0.03)	(0.00)
Golden redhorse	0.06	0.24	0.00	0.00
	(0.03)	(0.12)	(0.00)	(0.00)
Shorthead redhorse	0.24	0.35	0.19	0.33
	(0.07)	(0.15)	(0.08)	(0.10)
Black bullhead	0.05	0.03	0.06	0.03
	(0.04)	(0.03)	(0.06)	(0.03)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Yellow bullhead	0.06	0.21	0.00	0.11
	(0.03)	(0.13)	(0.00)	(0.11)
Brown bullhead	0.01	0.03	0.00	0.03
	(0.01)	(0.03)	(0.00)	(0.03)
Channel catfish	2.82	3.94	2.44	2.14
	(0.54)	(1.60)	(0.51)	(0.35)
Flathead catfish	0.21	0.09	0.22	0.61
	(0.05)	(0.05)	(0.07)	(0.15)
Blackstripe topminnow	0.01	0.03	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)
Western mosquitofish	0.04	0.15	0.00	0.06
	(0.02)	(0.07)	(0.00)	(0.04)
Brook silverside	0.02	0.09	0.00	0.00
	(0.01)	(0.05)	(0.00)	(0.00)
White bass	4.55	5.88	4.14	3.33
	(0.64)	(1.66)	(0.69)	(0.60)
Yellow bass	0.08	0.29	0.00	0.11
	(0.04)	(0.15)	(0.00)	(0.09)
Striped x white bass	0.02	0.06	0.00	0.03
	(0.02)	(0.06)	(0.00)	(0.03)
Green sunfish	0.23	0.88	0.00	0.06
	(0.09)	(0.35)	(0.00)	(0.04)
Warmouth	0.24	0.91	0.00	0.06
	(0.08)	(0.30)	(0.00)	(0.04)
Orangespotted sunfish	0.14	0.53	0.00	0.08
	(0.06)	(0.22)	(0.00)	(0.05)
Bluegill	9.17	33.94	0.42	2.92
	(1.79)	(6.96)	(0.20)	(0.65)
Green sunfish x bluegill	0.01	0.03	0.00	0.06
	(0.01)	(0.03)	(0.00)	(0.04)
Smallmouth bass	0.00	0.00	0.00	0.03
	(0.00)	(0.00)	(0.00)	(0.03)
Largemouth bass	2.10	7.32	0.19	1.75
	(0.31)	(1.20)	(0.09)	(0.44)
White crappie	0.99	3.65	0.06	0.33
	(0.24)	(0.93)	(0.04)	(0.11)
Black crappie	2.40	8.62	0.17	1.44
	(0.52)	(2.01)	(0.07)	(0.33)
Logperch	0.16	0.09	0.19	0.03
	(0.07)	(0.06)	(0.10)	(0.03)
Sauger	0.68	0.47	0.78	0.47
	(0.14)	(0.18)	(0.20)	(0.19)
Walleye	0.01	0.03	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)
Freshwater drum	5.59	8.62	4.61	3.33
	(1.30)	(3.86)	(1.21)	(0.74)

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Table 6.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS
Spotted gar	0.47	0.47
	(0.25)	(0.25)
Longnose gar	0.11	0.11
	(0.08)	(0.08)
Shortnose gar	4.67	4.67
	(2.26)	(2.27)
Bowfin	1.27	1.27
	(0.97)	(0.97)
Skipjack herring	0.27	0.27
	(0.12)	(0.12)
Gizzard shad	10.98	10.98
	(4.44)	(4.46)
Threadfin shad	0.28	0.28
	(0.11)	(0.11)
Goldfish	0.17	0.17
	(0.17)	(0.17)
Common carp	5.96	5.96
	(2.97)	(2.99)
Goldfish x carp	0.10	0.10
	(0.10)	(0.10)
Bighead carp	0.07	0.07
	(0.05)	(0.05)
River carpsucker	2.90	2.90
	(0.70)	(0.70)
Quillback	0.43	0.43
	(0.16)	(0.16)
Highfin carpsucker	0.13	0.13
	(0.10)	(0.10)
White sucker	0.03	0.03
	(0.03)	(0.03)
Smallmouth buffalo	3.37	3.37
	(0.78)	(0.78)
Bigmouth buffalo	0.46	0.46
	(0.13)	(0.13)
Black buffalo	0.14	0.14
	(0.08)	(0.08)
Silver redhorse	0.03	0.03
	(0.03)	(0.03)
Golden redhorse	0.52	0.52
	(0.37)	(0.37)
Shorthead redhorse	1.40	1.40
	(0.75)	(0.75)
Black bullhead	0.62	0.62
	(0.45)	(0.46)
Yellow bullhead	0.90	0.90
	(0.42)	(0.42)
Brown bullhead	0.77	0.77
	(0.34)	(0.34)
Channel catfish	0.10	0.10
	(0.07)	(0.07)
Flathead catfish	0.03	0.03
	(0.03)	(0.03)
White perch	0.03	0.03
	(0.03)	(0.03)
White bass	9.29	9.29
	(2.40)	(2.41)
Yellow bass	1.17	1.17
	(0.60)	(0.61)

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Table 6.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error. Table page: 2

Common name	ALL	BWCS
Warmouth	0.03	0.03
	(0.03)	(0.03)
Orangespotted sunfish	0.07	0.07
	(0.07)	(0.07)
Bluegill	14.15	14.15
	(3.75)	(3.77)
Largemouth bass	0.74	0.74
	(0.25)	(0.25)
White crappie	5.95	5.95
	(1.30)	(1.31)
Black crappie	31.84	31.84
	(9.53)	(9.57)
Sauger	0.63	0.63
	(0.34)	(0.34)
Walleye	0.03	0.03
	(0.03)	(0.03)
Freshwater drum	5.61	5.61
	(1.44)	(1.44)

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Table 6.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Longnose gar	0.03	0.03
	(0.03)	(0.03)
Shortnose gar	0.87	0.87
	(0.35)	(0.35)
Bowfin	0.06	0.06
	(0.04)	(0.04)
Goldeye	0.03	0.03
	(0.03)	(0.03)
Skipjack herring	0.06	0.06
	(0.04)	(0.04)
Gizzard shad	20.47	20.47
	(7.47)	(7.48)
Threadfin shad	0.03	0.03
	(0.03)	(0.03)
Common carp	1.58	1.58
	(0.43)	(0.43)
River carpsucker	1.49	1.49
	(0.78)	(0.78)
Highfin carpsucker	0.06	0.06
	(0.06)	(0.06)
Smallmouth buffalo	1.28	1.28
	(0.36)	(0.36)
Bigmouth buffalo	0.32	0.32
	(0.15)	(0.15)
Black buffalo	0.06	0.06
	(0.04)	(0.04)
Silver redhorse	0.03	0.03
	(0.03)	(0.03)
Shorthead redhorse	0.83	0.83
	(0.42)	(0.42)
Black bullhead	0.11	0.11
	(0.07)	(0.07)
Yellow bullhead	1.54	1.54
	(1.13)	(1.13)
Brown bullhead	1.41	1.41
	(0.61)	(0.61)
Channel catfish	0.31	0.31
	(0.13)	(0.13)
White perch	0.05	0.05
	(0.05)	(0.05)
White bass	11.25	11.25
	(5.27)	(5.28)
Yellow bass	1.15	1.15
	(0.47)	(0.47)
Green sunfish	0.03	0.03
	(0.03)	(0.03)
Warmouth	0.06	0.06
	(0.04)	(0.04)
Bluegill	6.16	6.16
	(2.34)	(2.34)
Green sunfish x bluegill	0.03	0.03
	(0.03)	(0.03)
Largemouth bass	0.08	0.08
	(0.06)	(0.06)
White crappie	3.88	3.88
	(0.99)	(0.99)
Black crappie	12.61	12.61
	(5.75)	(5.76)

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Table 6.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Sauger	0.31	0.31
	(0.16)	(0.16)
Freshwater drum	4.98	4.98
	(0.92)	(0.92)

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TWZ - Tailwater

Table 6.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Spotted gar	0.01	0.03	0.00	0.11
	(0.01)	(0.03)	(0.00)	(0.08)
Longnose gar	0.01	0.00	0.00	0.17
	(0.01)	(0.00)	(0.00)	(0.12)
Shortnose gar	0.85	0.88	0.85	0.61
	(0.39)	(0.48)	(0.53)	(0.35)
Bowfin	0.11	0.16	0.09	0.17
	(0.07)	(0.10)	(0.09)	(0.09)
American eel	0.03	0.00	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.00)
Skipjack herring	0.53	0.03	0.75	0.06
	(0.49)	(0.03)	(0.71)	(0.06)
Gizzard shad	1602.02	49.67	2268.08	200.33
	(1075.66)	(20.96)	(1545.87)	(138.95)
Threadfin shad	0.25	0.54	0.13	0.46
	(0.15)	(0.51)	(0.09)	(0.27)
Goldfish	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Grass carp	5.49	0.04	7.87	0.00
	(4.80)	(0.04)	(6.90)	(0.00)
Red shiner	1.24	1.92	0.96	1.58
	(0.40)	(0.88)	(0.47)	(0.83)
Common carp	2.49	0.60	2.67	10.47
	(1.07)	(0.18)	(1.42)	(8.99)
Goldfish x carp	0.00	0.00	0.00	0.05
	(0.00)	(0.00)	(0.00)	(0.05)
Silver chub	0.36	0.07	0.49	0.11
	(0.20)	(0.05)	(0.28)	(0.08)
Golden shiner	0.07	0.14	0.04	0.06
	(0.04)	(0.11)	(0.04)	(0.06)
Emerald shiner	55.33	4.82	75.41	34.24
	(16.41)	(1.41)	(23.56)	(11.21)
Spottail shiner	0.11	0.00	0.09	1.13
	(0.08)	(0.00)	(0.09)	(1.13)
Silverband shiner	1.74	0.26	2.32	1.28
	(0.79)	(0.18)	(1.13)	(0.77)
Sand shiner	0.66	1.68	0.29	0.60
	(0.33)	(1.14)	(0.20)	(0.54)
Bluntnose minnow	0.17	0.10	0.21	0.11
	(0.08)	(0.05)	(0.12)	(0.11)
Fathead minnow	0.01	0.03	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)
Bullhead minnow	2.48	2.34	2.63	0.81
	(1.16)	(0.91)	(1.64)	(0.43)
River carpsucker	0.19	0.24	0.17	0.17
	(0.08)	(0.12)	(0.10)	(0.09)
Smallmouth buffalo	0.10	0.27	0.04	0.11
	(0.05)	(0.15)	(0.04)	(0.08)
Bigmouth buffalo	0.02	0.07	0.00	0.00
	(0.02)	(0.07)	(0.00)	(0.00)
Golden redhorse	0.01	0.00	0.00	0.11
	(0.00)	(0.00)	(0.00)	(0.11)
Black bullhead	0.38	1.34	0.04	0.11
	(0.29)	(1.11)	(0.04)	(0.11)
Yellow bullhead	0.09	0.37	0.00	0.00
	(0.05)	(0.21)	(0.00)	(0.00)
Brown bullhead	0.04	0.13	0.00	0.06
	(0.03)	(0.10)	(0.00)	(0.06)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Channel catfish	0.78	0.27	0.84	2.75
	(0.24)	(0.11)	(0.33)	(1.34)
Freckled madtom	0.03	0.00	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.00)
Flathead catfish	0.03	0.00	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.00)
Grass pickerel	0.00	0.00	0.00	0.06
	(0.00)	(0.00)	(0.00)	(0.06)
Tiger muskellunge	0.03	0.00	0.04	0.00
	(0.03)	(0.00)	(0.04)	(0.00)
Blackstripe topminnow	0.11	0.31	0.00	0.62
	(0.04)	(0.16)	(0.00)	(0.39)
Western mosquitofish	1.12	0.88	1.11	2.46
	(0.74)	(0.59)	(1.03)	(1.50)
Brook silverside	0.02	0.07	0.00	0.00
	(0.02)	(0.07)	(0.00)	(0.00)
White bass	6.75	0.64	8.94	7.92
	(2.20)	(0.18)	(3.15)	(3.63)
Yellow bass	0.12	0.14	0.12	0.00
	(0.09)	(0.09)	(0.12)	(0.00)
Green sunfish	0.13	0.28	0.09	0.06
	(0.07)	(0.22)	(0.06)	(0.06)
Warmouth	0.06	0.23	0.00	0.05
	(0.05)	(0.18)	(0.00)	(0.05)
Orangespotted sunfish	0.34	1.20	0.04	0.17
	(0.17)	(0.64)	(0.04)	(0.12)
Bluegill	6.74	18.09	2.31	10.20
	(2.12)	(7.94)	(0.76)	(5.98)
Green sunfish x bluegill	0.01	0.03	0.00	0.00
	(0.01)	(0.03)	(0.00)	(0.00)
Largemouth bass	1.54	0.37	2.05	0.28
	(1.14)	(0.16)	(1.64)	(0.14)
White crappie	0.55	0.70	0.47	0.97
	(0.16)	(0.19)	(0.21)	(0.34)
Black crappie	1.68	2.69	1.34	1.10
	(0.52)	(1.28)	(0.58)	(0.44)
Logperch	0.37	0.00	0.50	0.45
	(0.23)	(0.00)	(0.33)	(0.25)
Sauger	0.03	0.00	0.04	0.05
	(0.03)	(0.00)	(0.04)	(0.05)
Freshwater drum	22.23	6.87	19.72	147.59
	(9.44)	(3.34)	(10.49)	(132.00)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using tandem mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCO
Shortnose gar	0.22	0.22
	(0.14)	(0.14)
Bowfin	0.03	0.03
	(0.03)	(0.03)
Skipjack herring	5.87	5.87
	(5.83)	(5.84)
Gizzard shad	21.76	21.76
	(9.69)	(9.70)
Threadfin shad	0.03	0.03
	(0.03)	(0.03)
Common carp	0.42	0.42
	(0.30)	(0.30)
Emerald shiner	8.55	8.55
	(7.62)	(7.63)
Fathead minnow	0.03	0.03
	(0.03)	(0.03)
Bullhead minnow	0.03	0.03
	(0.03)	(0.03)
River carpsucker	0.06	0.06
	(0.04)	(0.04)
Smallmouth buffalo	0.18	0.18
	(0.08)	(0.08)
Bigmouth buffalo	0.09	0.09
	(0.06)	(0.06)
Yellow bullhead	0.05	0.05
	(0.04)	(0.04)
Brown bullhead	0.11	0.11
	(0.11)	(0.11)
Channel catfish	0.22	0.22
	(0.14)	(0.14)
Western mosquitofish	0.06	0.06
	(0.04)	(0.04)
White bass	0.68	0.68
	(0.39)	(0.39)
Yellow bass	0.74	0.74
	(0.66)	(0.66)
Green sunfish	0.06	0.06
	(0.04)	(0.04)
Orangespotted sunfish	0.06	0.06
	(0.04)	(0.04)
Bluegill	1.68	1.68
	(0.58)	(0.58)
White crappie	0.40	0.40
	(0.14)	(0.14)
Black crappie	0.45	0.45
	(0.29)	(0.29)
Freshwater drum	61.74	61.74
	(54.96)	(55.03)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Gizzard shad	0.02	0.02	0.00
	(0.02)	(0.02)	(0.00)
Common carp	6.86	6.94	5.78
	(1.37)	(1.45)	(1.83)
Smallmouth buffalo	0.04	0.04	0.08
	(0.03)	(0.03)	(0.06)
Brown bullhead	0.00	0.00	0.06
	(0.00)	(0.00)	(0.06)
Channel catfish	1.94	1.79	4.32
	(0.50)	(0.47)	(3.88)
Flathead catfish	0.02	0.02	0.00
	(0.02)	(0.02)	(0.00)
White bass	0.02	0.02	0.03
	(0.02)	(0.02)	(0.03)
Freshwater drum	0.08	0.08	0.03
	(0.08)	(0.08)	(0.03)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	MCBU	SCB
Gizzard shad	0.08	0.08	0.08
	(0.05)	(0.05)	(0.05)
Common carp	10.23	9.93	14.81
	(2.01)	(2.13)	(3.08)
Goldfish x carp	0.00	0.00	0.03
	(0.00)	(0.00)	(0.03)
River carpsucker	0.02	0.02	0.03
	(0.02)	(0.02)	(0.03)
Smallmouth buffalo	4.11	4.17	3.30
	(1.05)	(1.12)	(1.00)
Bigmouth buffalo	0.04	0.04	0.00
	(0.03)	(0.03)	(0.00)
Black buffalo	0.04	0.04	0.00
	(0.03)	(0.03)	(0.00)
Shorthead redhorse	0.02	0.02	0.03
	(0.02)	(0.02)	(0.03)
Channel catfish	0.85	0.87	0.48
	(0.48)	(0.52)	(0.16)
Flathead catfish	0.14	0.15	0.09
	(0.07)	(0.07)	(0.05)
White bass	0.19	0.19	0.14
	(0.11)	(0.12)	(0.10)
Black crappie	0.06	0.06	0.00
	(0.06)	(0.06)	(0.00)
Freshwater drum	0.54	0.55	0.36
	(0.19)	(0.20)	(0.17)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Longnose gar	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Shortnose gar	0.01	0.04	0.00	0.08
	(0.01)	(0.04)	(0.00)	(0.08)
Bowfin	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Skipjack herring	6.35	0.08	9.08	0.00
	(3.77)	(0.06)	(5.42)	(0.00)
Gizzard shad	40.20	29.13	44.50	37.21
	(11.48)	(12.27)	(15.84)	(14.06)
Threadfin shad	0.14	0.38	0.06	0.00
	(0.07)	(0.23)	(0.04)	(0.00)
Central stoneroller	0.02	0.00	0.03	0.00
	(0.02)	(0.00)	(0.03)	(0.00)
Grass carp	0.38	0.46	0.36	0.13
	(0.19)	(0.18)	(0.26)	(0.07)
Red shiner	1.25	1.54	1.17	0.92
	(0.42)	(0.66)	(0.56)	(0.33)
Common carp	0.29	0.79	0.11	0.08
	(0.11)	(0.41)	(0.05)	(0.06)
Goldfish x carp	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Silver chub	0.07	0.04	0.08	0.08
	(0.03)	(0.04)	(0.05)	(0.06)
Golden shiner	0.03	0.13	0.00	0.04
	(0.02)	(0.07)	(0.00)	(0.04)
Emerald shiner	15.84	7.46	18.72	19.29
	(4.75)	(2.46)	(6.75)	(7.72)
Spottail shiner	0.34	1.04	0.08	0.21
	(0.19)	(0.72)	(0.05)	(0.21)
Silverband shiner	0.50	0.25	0.58	0.63
	(0.14)	(0.18)	(0.19)	(0.42)
Sand shiner	0.04	0.17	0.00	0.04
	(0.04)	(0.17)	(0.00)	(0.04)
Bluntnose minnow	0.14	0.17	0.14	0.08
	(0.07)	(0.13)	(0.09)	(0.06)
Bullhead minnow	0.84	2.96	0.08	0.38
	(0.22)	(0.85)	(0.06)	(0.18)
Blacknose dace	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
River carpsucker	0.27	0.79	0.08	0.13
	(0.09)	(0.31)	(0.05)	(0.07)
Quillback	0.03	0.13	0.00	0.00
	(0.02)	(0.09)	(0.00)	(0.00)
Highfin carpsucker	0.02	0.00	0.03	0.00
	(0.02)	(0.00)	(0.03)	(0.00)
Smallmouth buffalo	0.06	0.08	0.06	0.00
	(0.03)	(0.06)	(0.04)	(0.00)
Shorthead redhorse	0.01	0.04	0.00	0.04
	(0.01)	(0.04)	(0.00)	(0.04)
Channel catfish	0.22	0.08	0.28	0.13
	(0.11)	(0.06)	(0.16)	(0.13)
Stonecat	0.02	0.00	0.03	0.00
	(0.02)	(0.00)	(0.03)	(0.00)
Blackstripe topminnow	0.03	0.13	0.00	0.00
	(0.02)	(0.09)	(0.00)	(0.00)
Western mosquitofish	3.74	14.04	0.06	1.88
	(2.60)	(10.14)	(0.04)	(0.90)

Strata: BWCS - Backwater, contiguous, shoreline
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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in the La Grange Pool of the Illinois River using stratified random sampling during 1997. The statistics under ALL pertain to unbiased means over all strata sampled using this gear (as indicated by nonmissing entries below and by Table 6.1). See text for definitions of catch-per-unit-effort and standard error.

Common name	ALL	BWCS	MCBU	SCB
Brook silverside	0.12	0.46	0.00	0.04
	(0.06)	(0.23)	(0.00)	(0.04)
White bass	1.25	0.38	1.58	1.13
	(0.39)	(0.20)	(0.55)	(0.41)
Warmouth	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Orangespotted sunfish	0.06	0.21	0.00	0.04
	(0.03)	(0.10)	(0.00)	(0.04)
Bluegill	7.37	26.33	0.72	1.75
	(2.80)	(10.88)	(0.26)	(0.67)
Green sunfish x bluegill	0.02	0.08	0.00	0.00
	(0.02)	(0.08)	(0.00)	(0.00)
Largemouth bass	3.50	13.46	0.03	0.25
	(2.57)	(10.01)	(0.03)	(0.12)
White crappie	0.11	0.42	0.00	0.00
	(0.10)	(0.38)	(0.00)	(0.00)
Black crappie	0.23	0.88	0.00	0.00
	(0.19)	(0.75)	(0.00)	(0.00)
Logperch	0.04	0.00	0.06	0.00
	(0.03)	(0.00)	(0.04)	(0.00)
Slenderhead darter	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Sauger	0.01	0.04	0.00	0.00
	(0.01)	(0.04)	(0.00)	(0.00)
Freshwater drum	1.71	0.79	2.11	0.83
	(0.65)	(0.41)	(0.92)	(0.27)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Chestnut lamprey	0.00	0.10
	(0.00)	(0.10)
Spotted gar	0.00	0.10
	(0.00)	(0.10)
Shortnose gar	0.00	0.30
	(0.00)	(0.21)
Bowfin	0.00	0.20
	(0.00)	(0.20)
Skipjack herring	0.17	2.50
	(0.17)	(1.01)
Gizzard shad	30.67	87.00
	(14.63)	(37.27)
Threadfin shad	0.17	1.60
	(0.17)	(0.69)
Goldfish	0.00	0.50
	(0.00)	(0.27)
Red shiner	4.67	0.50
	(1.71)	(0.31)
Common carp	19.50	14.30
	(7.23)	(6.04)
Goldfish x carp	0.33	0.10
	(0.21)	(0.10)
Bighead carp	0.00	0.10
	(0.00)	(0.10)
Silver chub	0.17	0.00
	(0.17)	(0.00)
Emerald shiner	16.67	5.30
	(11.31)	(3.99)
River shiner	0.17	0.00
	(0.17)	(0.00)
Silverband shiner	0.00	0.10
	(0.00)	(0.10)
River carpsucker	0.00	0.60
	(0.00)	(0.31)
Highfin carpsucker	0.00	0.20
	(0.00)	(0.20)
Smallmouth buffalo	3.83	9.80
	(0.98)	(4.63)
Bigmouth buffalo	3.50	0.60
	(2.31)	(0.43)
Black buffalo	0.17	0.10
	(0.17)	(0.10)
Golden redhorse	0.00	0.10
	(0.00)	(0.10)
Shorthead redhorse	1.33	0.20
	(0.49)	(0.13)
Channel catfish	1.50	2.30
	(0.56)	(1.98)
Flathead catfish	0.67	0.20
	(0.33)	(0.13)
Blackstripe topminnow	0.17	0.00
	(0.17)	(0.00)
White bass	6.67	36.10
	(1.99)	(14.88)
Yellow bass	0.00	1.90
	(0.00)	(0.66)
Green sunfish	0.33	0.10
	(0.21)	(0.10)
Orangespotted sunfish	0.33	0.20
	(0.33)	(0.13)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by using day electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Bluegill	22.00	13.10
	(6.09)	(4.31)
Green sunfish x bluegill	0.00	0.20
	(0.00)	(0.13)
Smallmouth bass	0.00	0.20
	(0.00)	(0.13)
Largemouth bass	4.67	4.90
	(1.78)	(1.86)
White crappie	1.33	6.20
	(0.61)	(4.02)
Black crappie	1.50	3.50
	(0.50)	(0.91)
Logperch	0.17	0.00
	(0.17)	(0.00)
Sauger	0.00	1.40
	(0.00)	(0.60)
Walleye	0.00	0.20
	(0.00)	(0.13)
Freshwater drum	1.17	0.60
	(0.31)	(0.27)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Spotted gar	0.17	0.00
	(0.17)	(0.00)
Longnose gar	0.00	0.08
	(0.00)	(0.08)
Shortnose gar	0.00	0.75
	(0.00)	(0.25)
Bowfin	0.00	0.42
	(0.00)	(0.23)
Skipjack herring	0.17	0.50
	(0.17)	(0.29)
Gizzard shad	26.17	162.00
	(6.17)	(50.99)
Threadfin shad	0.00	1.08
	(0.00)	(0.67)
Goldfish	0.00	0.50
	(0.00)	(0.23)
Red shiner	2.33	0.00
	(0.49)	(0.00)
Common carp	27.17	12.17
	(4.51)	(3.19)
Golden shiner	0.00	0.08
	(0.00)	(0.08)
Emerald shiner	7.83	8.08
	(3.13)	(5.40)
Spottail shiner	0.17	0.00
	(0.17)	(0.00)
Silverband shiner	0.00	0.17
	(0.00)	(0.11)
Bullhead minnow	0.17	0.00
	(0.17)	(0.00)
River carpsucker	0.67	0.75
	(0.33)	(0.25)
Quillback	0.00	0.17
	(0.00)	(0.11)
Smallmouth buffalo	10.67	12.92
	(2.38)	(3.89)
Bigmouth buffalo	3.00	1.50
	(1.37)	(0.58)
Black buffalo	0.17	0.17
	(0.17)	(0.17)
Golden redhorse	0.00	0.08
	(0.00)	(0.08)
Shorthead redhorse	0.17	0.25
	(0.17)	(0.18)
Black bullhead	0.00	0.08
	(0.00)	(0.08)
Yellow bullhead	0.00	0.08
	(0.00)	(0.08)
Channel catfish	0.33	5.58
	(0.21)	(3.69)
Flathead catfish	0.67	0.25
	(0.21)	(0.18)
Tiger muskellunge	0.00	0.08
	(0.00)	(0.08)
Blackstripe topminnow	0.17	0.00
	(0.17)	(0.00)
Western mosquitofish	0.17	0.00
	(0.17)	(0.00)
Brook silverside	0.00	0.08
	(0.00)	(0.08)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by using night electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
White bass	4.33	48.33
	(2.44)	(11.23)
Yellow bass	0.00	1.25
	(0.00)	(0.63)
Striped x white bass	0.00	1.17
	(0.00)	(0.39)
Green sunfish	0.00	0.08
	(0.00)	(0.08)
Orangespotted sunfish	0.17	0.17
	(0.17)	(0.11)
Bluegill	18.83	12.50
	(4.56)	(6.75)
Green sunfish x bluegill	0.00	0.08
	(0.00)	(0.08)
Smallmouth bass	0.00	0.75
	(0.00)	(0.22)
Largemouth bass	2.83	3.92
	(1.14)	(1.59)
White crappie	0.50	2.17
	(0.34)	(0.82)
Black crappie	1.50	3.17
	(0.67)	(1.12)
Sauger	0.83	5.17
	(0.83)	(3.27)
Walleye	0.00	0.42
	(0.00)	(0.19)
Freshwater drum	8.17	3.83
	(1.62)	(1.54)

Strata: BWCS - Backwater, contiguous, shoreline
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by using fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Longnose gar	0.08
	(0.08)
Shortnose gar	1.17
	(0.56)
Goldeye	0.09
	(0.09)
Skipjack herring	12.43
	(6.96)
Gizzard shad	8.26
	(3.31)
Threadfin shad	1.02
	(0.84)
Goldfish	0.17
	(0.11)
Grass carp	0.09
	(0.09)
Common carp	1.26
	(0.90)
Goldfish x carp	0.09
	(0.09)
River carpsucker	0.17
	(0.11)
Smallmouth buffalo	2.97
	(1.83)
Bigmouth buffalo	0.08
	(0.08)
Shorthead redhorse	0.75
	(0.43)
Brown bullhead	0.25
	(0.18)
Channel catfish	0.26
	(0.13)
White perch	0.50
	(0.29)
White bass	17.60
	(5.58)
Yellow bass	3.42
	(1.41)
Striped bass	0.08
	(0.08)
Orangespotted sunfish	0.08
	(0.08)
Bluegill	13.59
	(9.07)
Largemouth bass	0.08
	(0.08)
White crappie	5.70
	(2.89)
Black crappie	45.37
	(31.98)
Sauger	0.25
	(0.13)
Freshwater drum	4.57
	(2.40)

Strata: BWCS - Backwater, contiguous, shoreline
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MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Longnose gar	0.21	0.00
	(0.21)	(0.00)
Bowfin	0.00	0.17
	(0.00)	(0.12)
Skipjack herring	0.00	0.43
	(0.00)	(0.27)
Gizzard shad	0.97	16.32
	(0.97)	(8.81)
Threadfin shad	0.00	0.17
	(0.00)	(0.17)
Goldfish	0.00	0.08
	(0.00)	(0.08)
Red shiner	0.39	5.46
	(0.39)	(4.15)
Common carp	0.21	0.17
	(0.21)	(0.17)
Goldfish x carp	0.00	0.17
	(0.00)	(0.17)
Silver chub	0.00	0.09
	(0.00)	(0.09)
Emerald shiner	53.44	873.83
	(52.66)	(701.62)
Spottail shiner	0.00	0.08
	(0.00)	(0.08)
Silverband shiner	0.19	0.93
	(0.19)	(0.68)
Bluntnose minnow	0.00	0.34
	(0.00)	(0.19)
Bullhead minnow	0.00	1.96
	(0.00)	(0.82)
River carpsucker	0.00	0.08
	(0.00)	(0.08)
Shorthead redhorse	0.19	0.09
	(0.19)	(0.09)
Yellow bullhead	0.00	0.08
	(0.00)	(0.08)
Channel catfish	0.21	0.09
	(0.21)	(0.09)
Flathead catfish	0.21	0.17
	(0.21)	(0.17)
Blackstripe topminnow	0.00	0.17
	(0.00)	(0.12)
Brook silverside	0.00	0.08
	(0.00)	(0.08)
White bass	0.39	3.14
	(0.39)	(1.72)
Yellow bass	0.00	0.26
	(0.00)	(0.18)
Green sunfish	0.00	0.35
	(0.00)	(0.15)
Orangespotted sunfish	0.21	0.00
	(0.21)	(0.00)
Bluegill	3.02	1.73
	(1.70)	(0.75)
Largemouth bass	0.00	0.34
	(0.00)	(0.26)
White crappie	0.00	1.94
	(0.00)	(0.96)
Black crappie	0.00	2.96
	(0.00)	(1.35)

Strata: BWCS - Backwater, contiguous, shoreline
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SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by using mini fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Logperch	0.00	0.08
	(0.00)	(0.08)
Sauger	0.00	0.17
	(0.00)	(0.17)
Freshwater drum	1.21	1.52
	(0.82)	(0.75)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
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IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by using small hoop netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Common carp	4.71	6.18
	(1.77)	(2.73)
Brown bullhead	0.00	0.04
	(0.00)	(0.04)
Channel catfish	0.00	3.99
	(0.00)	(3.99)
Flathead catfish	0.00	0.04
	(0.00)	(0.04)
White perch	0.00	0.04
	(0.00)	(0.04)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by using large hoop netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB	TWZ
Gizzard shad	0.00	0.55
	(0.00)	(0.51)
Common carp	9.93	10.47
	(3.12)	(2.98)
River carpsucker	0.00	0.04
	(0.00)	(0.04)
Smallmouth buffalo	0.81	2.71
	(0.41)	(1.23)
Bigmouth buffalo	0.00	0.04
	(0.00)	(0.04)
Black buffalo	0.00	0.04
	(0.00)	(0.04)
Channel catfish	0.10	0.25
	(0.10)	(0.14)
Flathead catfish	0.00	0.09
	(0.00)	(0.09)
White bass	0.00	0.96
	(0.00)	(0.55)
Sauger	0.00	0.04
	(0.00)	(0.04)
Freshwater drum	0.60	0.38
	(0.37)	(0.18)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by using seining in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	SCB
Shortnose gar	0.10 (0.10)
Skipjack herring	0.20 (0.20)
Gizzard shad	120.80 (105.57)
Threadfin shad	0.10 (0.10)
Red shiner	2.40 (0.67)
Common carp	0.10 (0.10)
Silver chub	0.60 (0.22)
Emerald shiner	44.70 (12.58)
Spottail shiner	0.30 (0.30)
Silverband shiner	1.20 (0.55)
Bluntnose minnow	0.40 (0.40)
Bullhead minnow	0.70 (0.26)
River carpsucker	0.20 (0.13)
Smallmouth buffalo	0.10 (0.10)
Golden redhorse	0.10 (0.10)
Shorthead redhorse	0.10 (0.10)
Western mosquitofish	0.10 (0.10)
Brook silverside	0.20 (0.20)
White bass	0.70 (0.42)
Bluegill	1.30 (0.47)
Largemouth bass	0.30 (0.15)
Black crappie	0.10 (0.10)
Freshwater drum	0.80 (0.51)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by using bottom trawling in the La Grange Pool of the Illinois River using fixed-site sampling during 1997. See text for definitions of catch-per-unit-effort and standard error.

Common name	TWZ
Common carp	0.04 (0.04)
River carpsucker	0.04 (0.04)
Shorthead redhorse	0.04 (0.04)
Channel catfish	0.21 (0.08)
Flathead catfish	0.04 (0.04)
Yellow bass	0.08 (0.06)
Freshwater drum	2.17 (1.95)

Strata: BWCS - Backwater, contiguous, shoreline
BWCO - Backwater, contiguous, offshore
IMPS - Impounded, shoreline
IMPO - Impounded, offshore
MCBU - Main channel border, unstructured
MCBW - Main channel border, wing dam
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

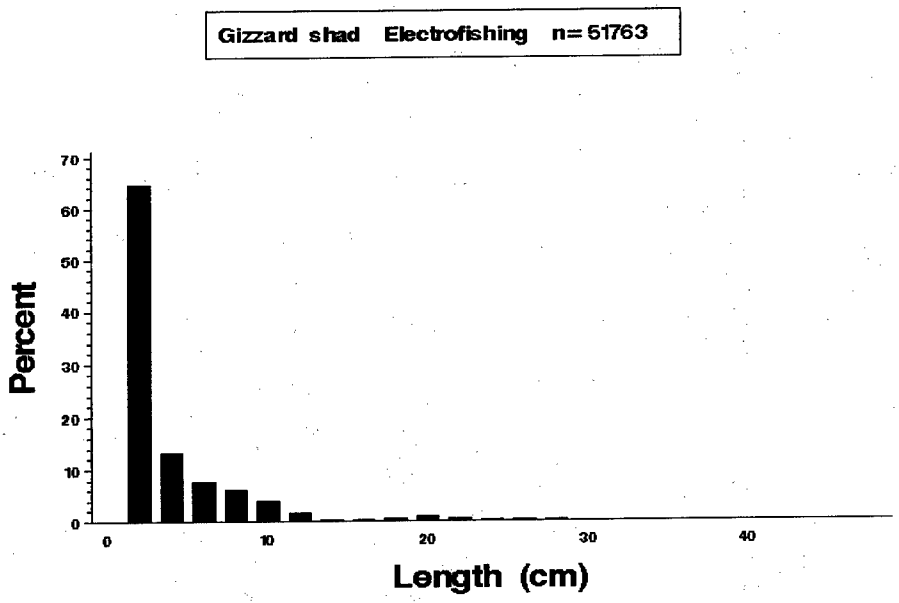

Figure 6.2. Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

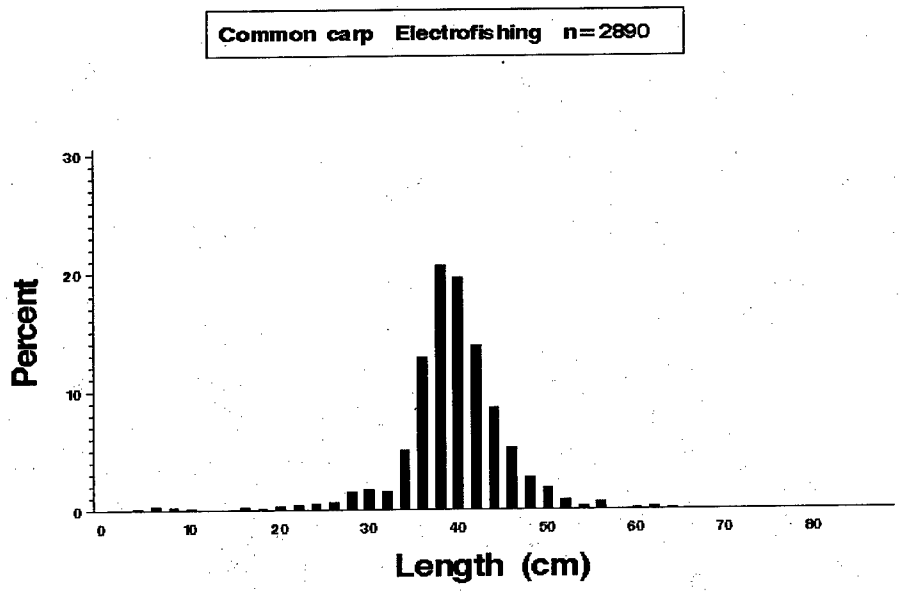

Figure 6.3. Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

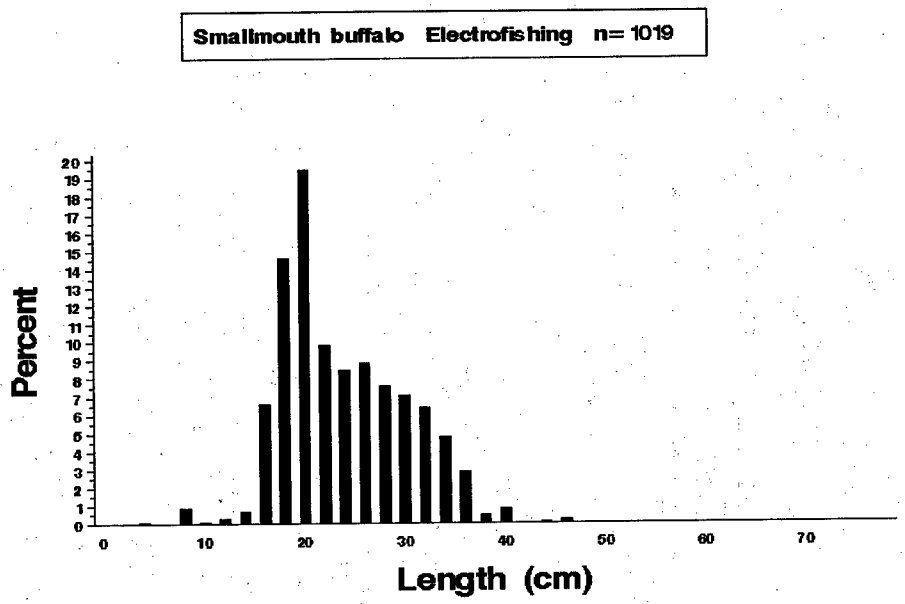

Figure 6.4. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

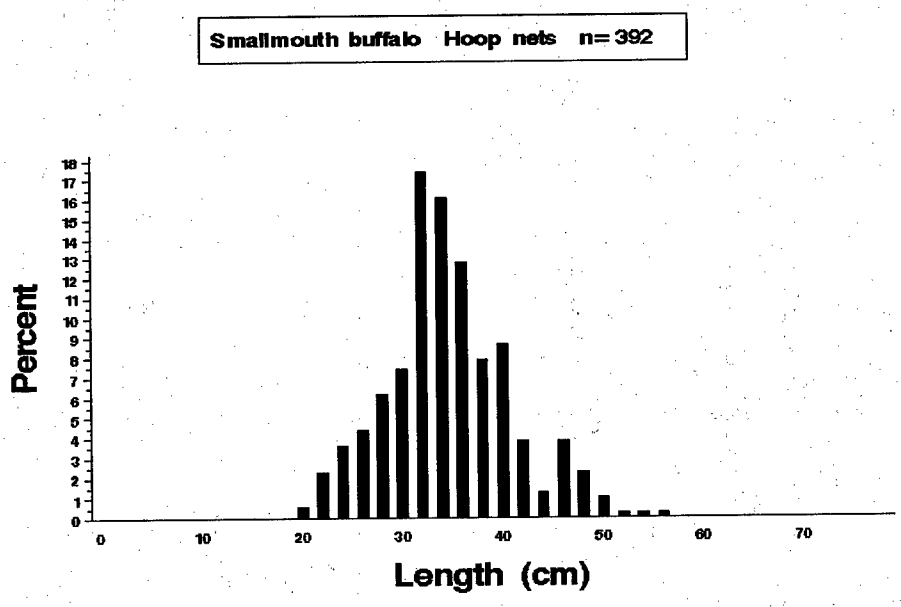

Figure 6.5. Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in the Illinois River, La Grange Pool during 1997.

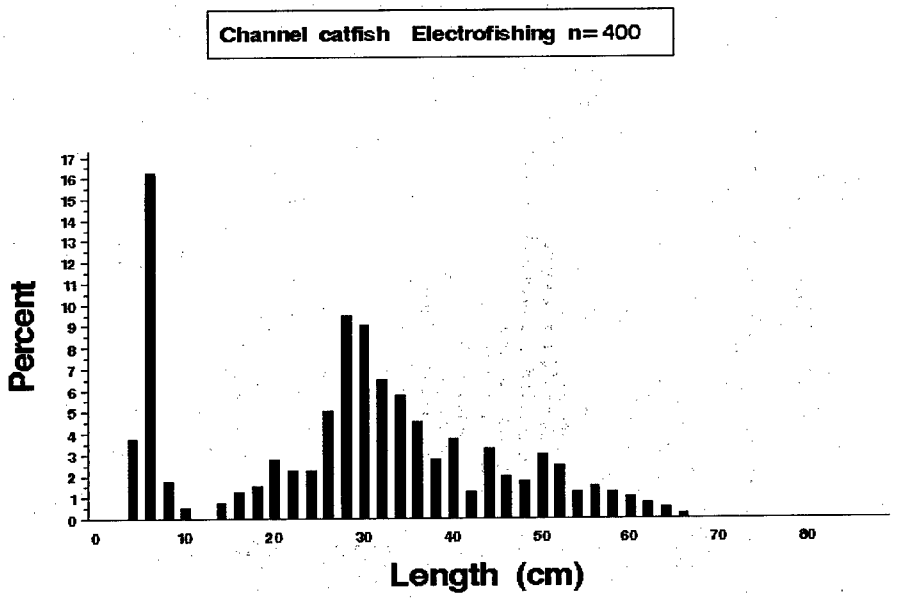

Figure 6.6. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

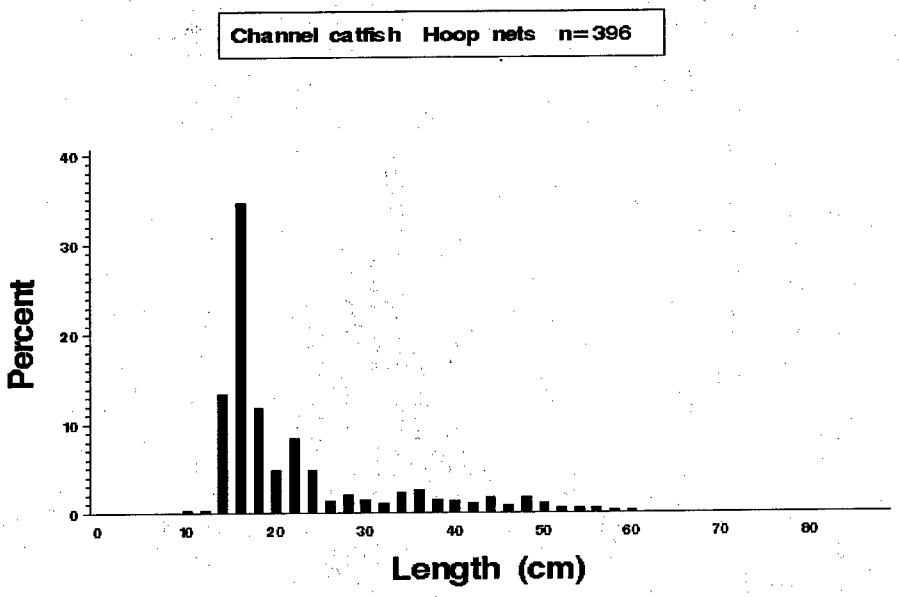

Figure 6.7. Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in the Illinois River, La Grange Pool during 1997.

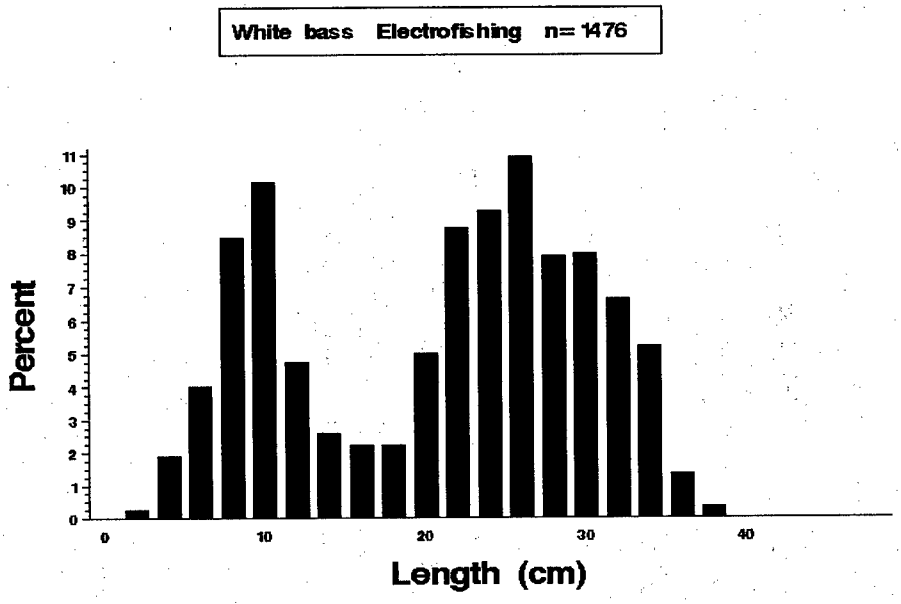

Figure 6.8. Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

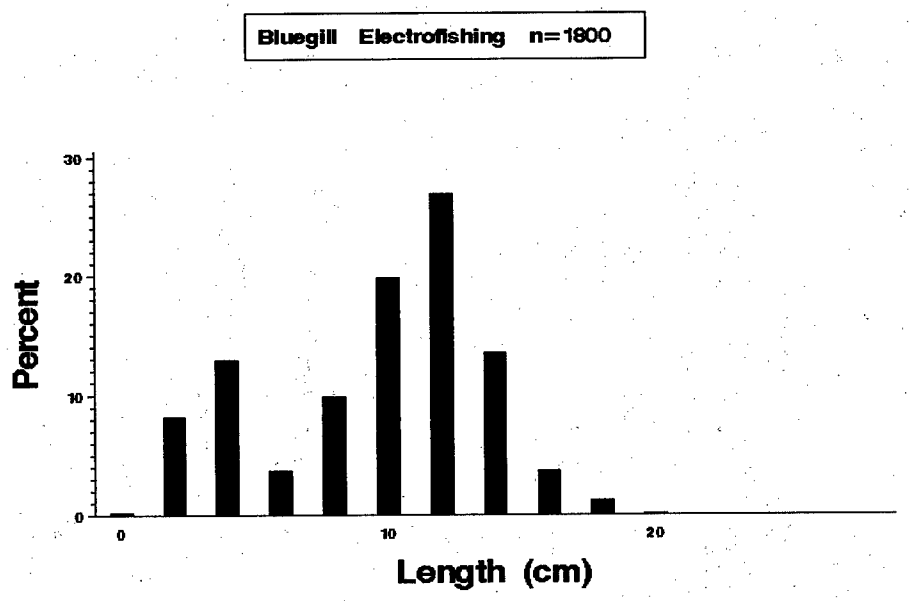

Figure 6.9. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

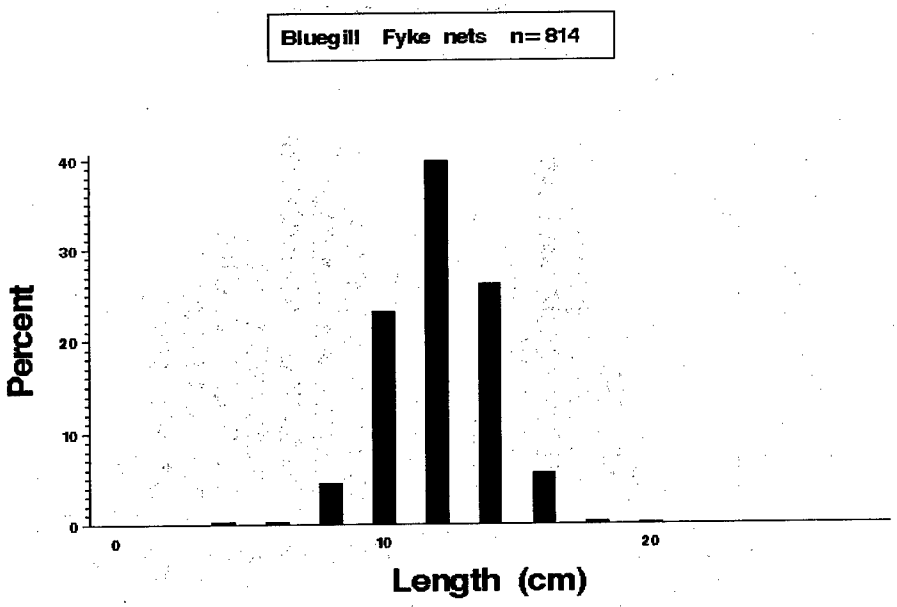

Figure 6.10. Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in the Illinois River, La Grange Pool during 1997.

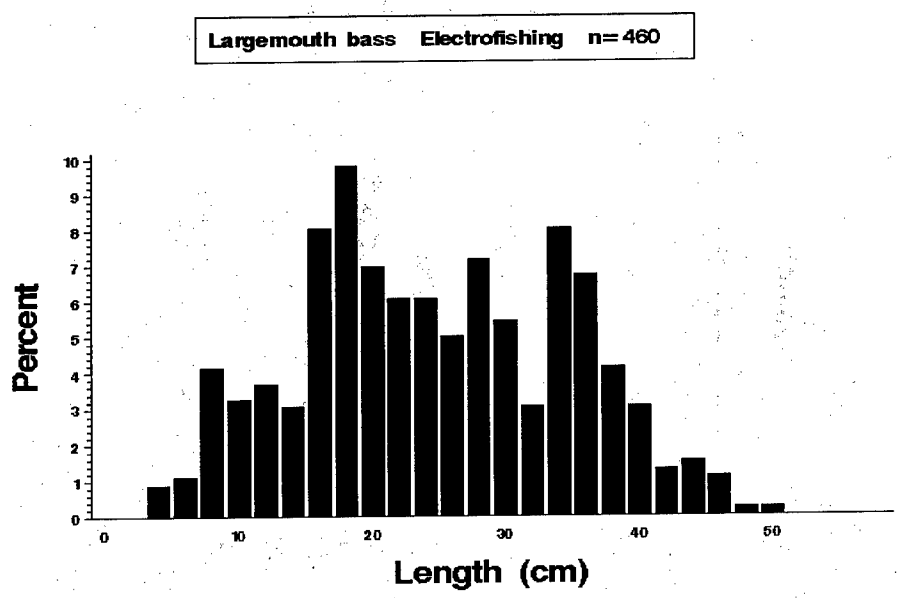

Figure 6.11. Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

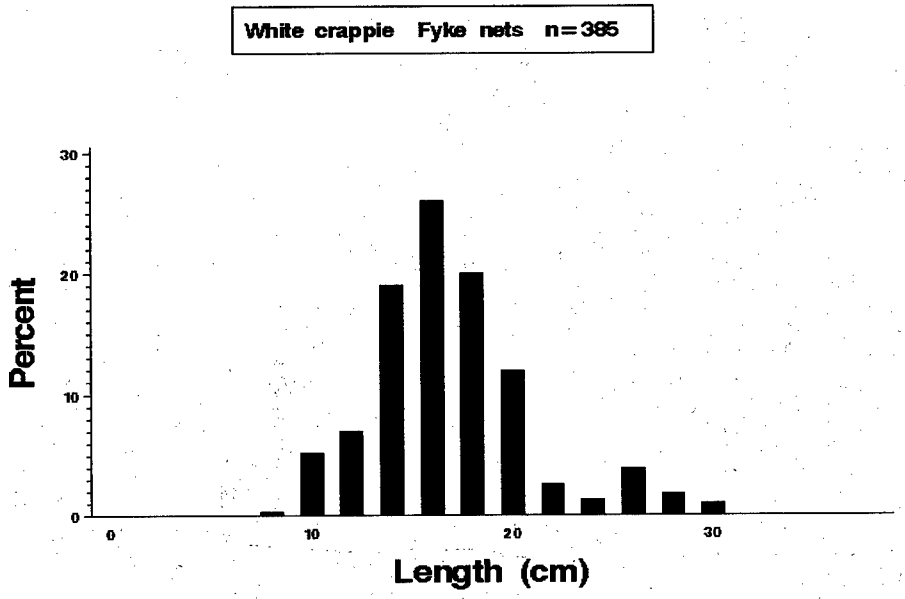

Figure 6.12. Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularus*) collected by fyke netting in the Illinois River, La Grange Pool during 1997.

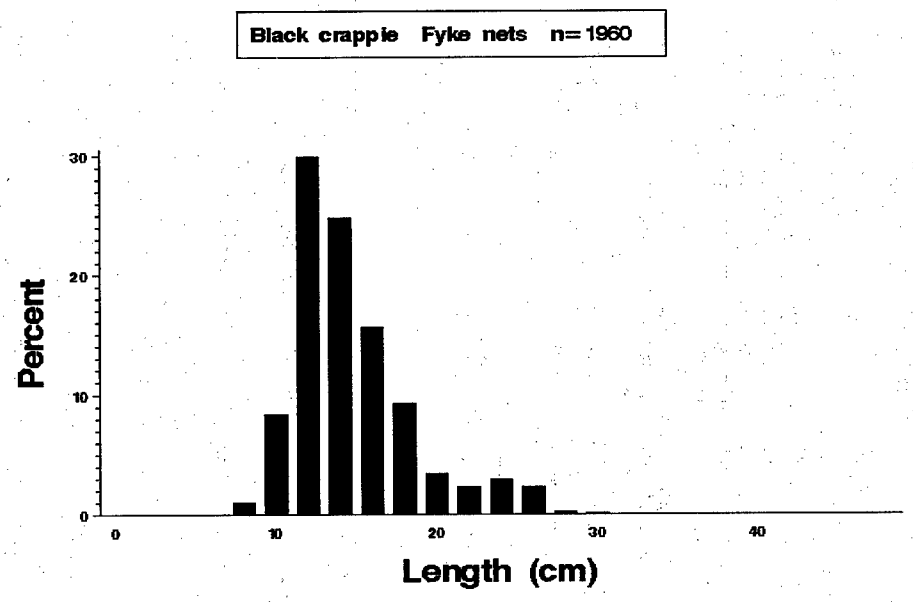

Figure 6.13. Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in the Illinois River, La Grange Pool during 1997.

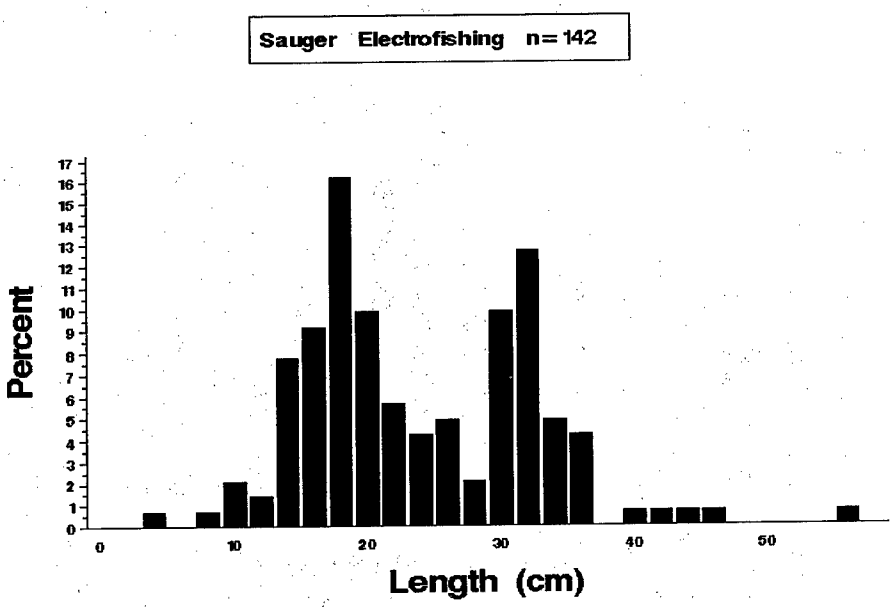

Figure 6.14. Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

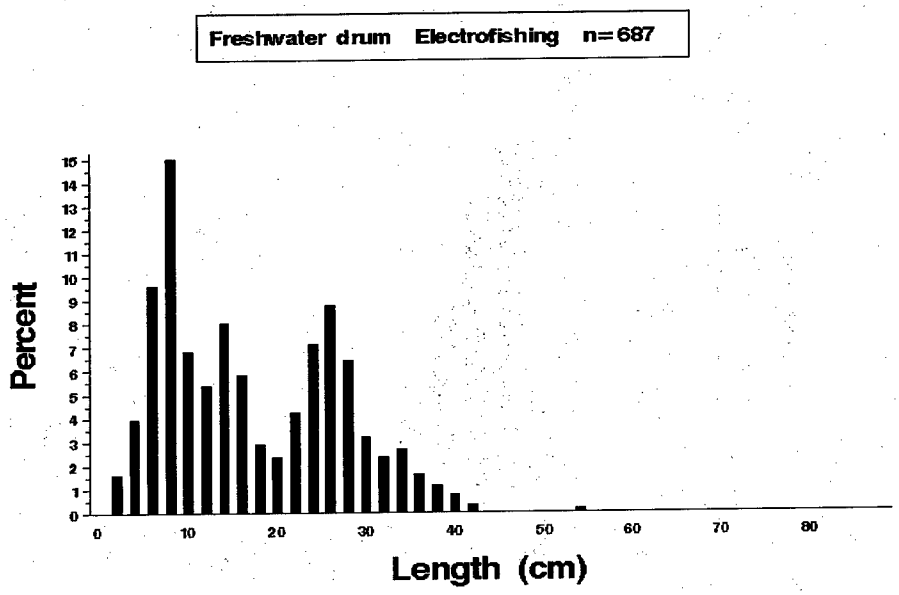

Figure 6.15. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in the Illinois River, La Grange Pool during 1997.

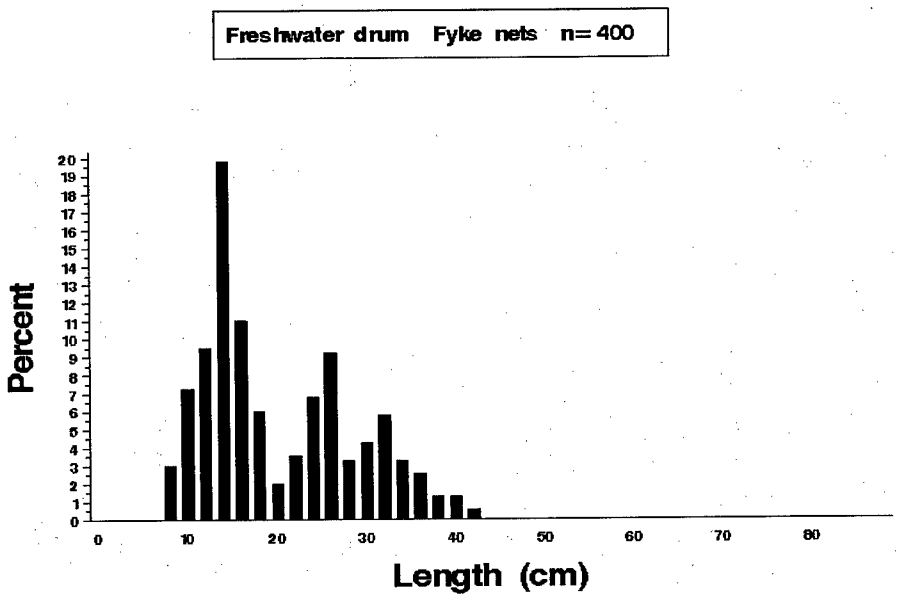

Figure 6.16. Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in the Illinois River, La Grange Pool during 1997.

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	June 1998	

4. TITLE AND SUBTITLE

1997 Annual Status Report: A summary of fish data in six reaches of the Upper Mississippi River System

5. FUNDING NUMBERS

6. AUTHOR(S)

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8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Geological Survey
Environmental Management Technical Center
575 Lester Avenue
Onalaska, Wisconsin 54650

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

98-P008

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Release unlimited. Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (1-800-553-6847 or 703-487-4650). Available to registered users from the Defense Technical Information Center, Attn: Help Desk, 8725 Kingman Road, Suite 0944, Fort Belvoir, VA 22060-6218 (1-800-225-3842 or 703-767-9050).

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

The Long Term Resource Monitoring Program (LTRMP) completed 2,797 collections of fishes from stratified random and permanently fixed sampling locations in six study reaches of the Upper Mississippi River System during 1997. Collection methods included day and night electrofishing, hoop netting, fyke netting (two net sizes), gill netting, seining, and trawling in select aquatic area classes. The six LTRMP study reaches are Pools 4 (excluding Lake Pepin), 8, 13, and 26 of the Upper Mississippi River, an unimpounded reach of the Mississippi River near Cape Girardeau, Missouri, and the La Grange Pool of the Illinois River. A total of 66–76 fish species were detected in each study reach. For each of the six LTRMP study reaches, this report contains summaries of: (1) sampling efforts for each combination of gear type and aquatic area class, (2) total catches of each species from each gear type, (3) mean catch-per-unit of effort statistics and standard errors for common species from each combination of aquatic area class and selected gear type, and (4) length distributions of common species from selected gear types.

14. SUBJECT TERMS

1997 annual report, fish, LTRMP, Mississippi River

15. NUMBER OF PAGES

15 pp. + Chapters 1–6

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	