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# 1999 Annual Status Report

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



**July 2001**

*The Upper Midwest Environmental Sciences 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*

by

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July 2001

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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 Upper Midwest Environmental Sciences 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 Upper Midwest Environmental Sciences 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 1999, containing a synthesis of data from fish populations and communities in the Upper Mississippi River System. This report satisfies, for 1999, 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 Upper Midwest Environmental Sciences Center.

# 1999 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 2,692 collections of fishes from stratified random and permanently fixed sampling locations in six study reaches of the Upper Mississippi River System during 1999. Collection methods included day and night electrofishing, hoop netting, fyke netting (two net sizes), gill netting, seining, anchored trammel netting, and bottom trawling in selected 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.

**Key words:** 1999 annual report, fish, LTRMP, Mississippi River

## 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 UMRS, 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

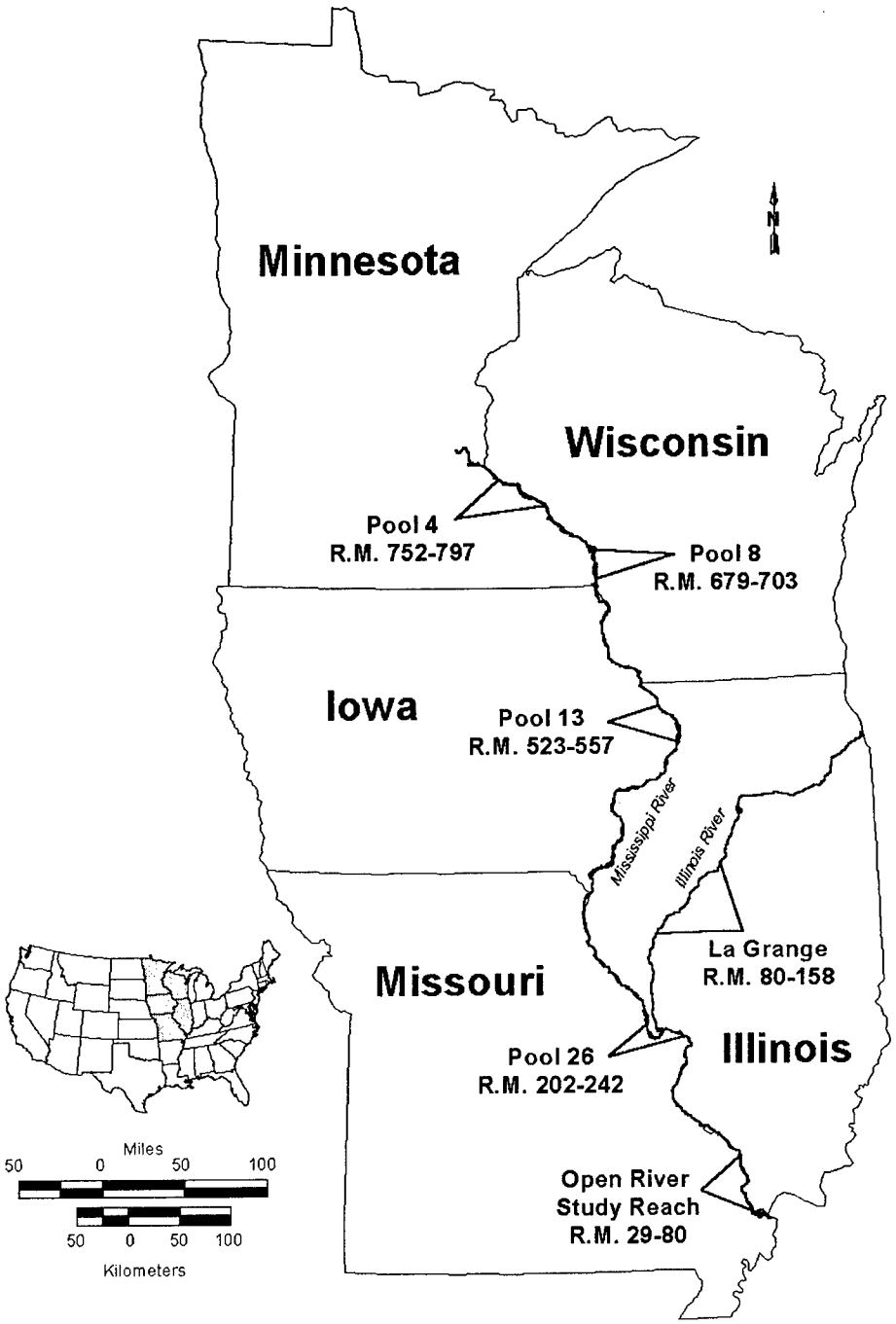


**Figure.** Long Term Resource Monitoring Program study reaches.

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.

**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 |

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.

# 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.

**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* |
| Silver lamprey | | *I. unicuspis* |
| American brook lamprey | | *L. appendix* |
| | **Acipenseridae** | |
| Lake sturgeon | | *Acipenser fulvescens* |
| Pallid sturgeon | | *Scaphirhynchus albus* |
| Shovelnose sturgeon | | *S. platorynchus* |
| Pallid sturgeon × Shovelnose sturgeon | | S. *albus* × *S. platorynchus* |
| | **Polyodontidae** | |
| Paddlefish | | *Polyodon spathula* |
| | **Lepisosteidae** | |
| Spotted gar | | *Lepisosteus oculatus* |
| Longnose gar | | *L. osseus* |
| Shortnose gar | | *L. platostomus* |
| | **Amiidae** | |
| Bowfin | | *Amia calva* |
| | **Hiodontidae** | |
| Goldeye | | *Hiodon alosoides* |
| Mooneye | | *H. tergisus* |
| | **Anguillidae** | |
| American eel | | *Anguilla rostrata* |
| | **Clupeidae** | |
| Skipjack herring | | *A. chrysochloris* |
| Gizzard shad | | *Dorosoma cepedianum* |
| Threadfin shad | | *D. petenense* |

**Table 2.** Continued.

| Common name | Family name | Scientific name |
|---|---|---|
| | **Cyprinidae** | |
| Central stoneroller | | *Campostoma anomalum* |
| Goldfish | | *Carassius auratus* |
| Grass carp | | *Ctenopharyngodon idella* |
| Red shiner | | *Cyprinella lutrensis* |
| Spotfin shiner | | *C. spiloptera* |
| Blacktail shiner | | *C. venusta* |
| Common carp | | *Cyprinus carpio* |
| Goldfish × common carp | | *Carassius auratus* × *C. carpio* |
| 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* |
| Bleeding shiner | | *Luxilus zonatus* |
| Speckled chub | | *Macrhybopsis aestivalis* |
| Sturgeon chub | | *M. gelida* |
| Sicklefin chub | | *M. meeki* |
| Silver chub | | *M. storeriana* |
| Hornyhead chub | | *Nocomis biguttatus* |
| Golden shiner | | *Notemigonus crysoleucas* |
| Bigeye chub | | *Notropis amblops* |
| Pallid shiner | | *N. amnis* |
| Emerald shiner | | *N. atherinoides* |
| River shiner | | *N. blennius* |
| Bigeye shiner | | *N. boops* |
| Ghost shiner | | *N. buchanani* |
| Spottail shiner | | *N. hudsonius* |
| Ozark minnow | | *N. nubilus* |
| Silverband shiner | | *N. shumardi* |
| Sand shiner | | *N. stramineus* |
| Weed shiner | | *N. texanus* |
| Mimic shiner | | *N. volucellus* |
| Channel shiner | | *N. wickliffi* |
| Pugnose minnow | | *Opsopoeodus emiliae* |
| Suckermouth minnow | | *Phenacobius mirabilis* |
| Southern redbelly dace | | *P. erythrogaster* |
| Bluntnose minnow | | *Pimephales notatus* |
| Fathead minnow | | *P. promelas* |
| Bullhead minnow | | *P. vigilax* |
| Blacknose dace | | *Rhinichthys atratulus* |
| Creek chub | | *Semotilus atromaculatus* |
| | **Catostomidae** | |
| River carpsucker | | *Carpiodes carpio* |
| Quillback | | *C. cyprinus* |
| Highfin carpsucker | | *C. velifer* |
| White sucker | | *C. commersoni* |
| Blue sucker | | *Cycleptus elongatus* |

**Table 2.** Continued.

| Common name | Family name | Scientific name |
|---|---|---|
| Creek chubsucker | | *Erimyzon oblongus* |
| 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* |
| Golden redhorse | | *M. erythrurum* |
| Shorthead redhorse | | *M. macrolepidotum* |
| | **Ictaluridae** | |
| Black bullhead | | *A. melas* |
| Yellow bullhead | | *A. natalis* |
| Brown bullhead | | *A. nebulosus* |
| Blue catfish | | *Ictalurus furcatus* |
| Channel catfish | | *I. punctatus* |
| Slender madtom | | *N. exilis* |
| Stonecat | | *N. flavus* |
| Tadpole madtom | | *N. gyrinus* |
| Freckled madtom | | *N. nocturnus* |
| Flathead catfish | | *Pylodictis olivaris* |
| | **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** | |
| Brown trout | | *Salmo trutta* |
| | **Percopsidae** | |
| Trout-perch | | *Percopsis omiscomaycus* |
| | **Aphredoderidae** | |
| Pirate perch | | *Aphredoderus sayanus* |

**Table 2.** Continued.

| Common name | Family name | Scientific name |
|---|---|---|
| | **Gadidae** | |
| Burbot | | *Lota lota* |
| | **Cyprinodontidae** | |
| Northern studfish | | *Fundulus catenatus* |
| Starhead topminnow | | *F. dispar* |
| Blackstripe topminnow | | *F. notatus* |
| Blackspotted topminnow | | *F. olivaceus* |
| | **Poeciliidae** | |
| Western mosquitofish | | *Gambusia affinis* |
| | **Atherinidae** | |
| Brook silverside | | *Labidesthes sicculus* |
| Inland silverside | | *M. beryllina* |
| | **Gasterosteidae** | |
| Brook stickleback | | *Culaea inconstans* |
| | **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* |
| 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* |
| 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* |
| 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* |

**Table 2.** Continued.

| Common name | Family name | Scientific name |
|---|---|---|
| Bluegill × orangespotted sunfish | | *L. macrochirus* × *L. humilis* |
| Bluegill × longear sunfish | | *L. macrochirus* × *L. megalotis* |
| Bluegill × redear sunfish | | *L. macrochirus* × *L. microlophus* |
| 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 | | *Crystallaria asprella* |
| Western sand darter | | *A. clara* |
| Mud darter | | *Etheostoma asprigene* |
| Greenside darter | | *E. blennioides* |
| Bluntnose darter | | *E. chlorosomum* |
| Iowa darter | | *E. exile* |
| Fantail darter | | *E. flabellare* |
| Slough darter | | *E. gracile* |
| Johnny darter | | *E. nigrum* |
| 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* |

In this report, we summarize the annual increment of fish data obtained by the LTRMP from stratified random and fixed-site sampling during 1999. 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. 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.

Since 1990, the LTRMP uses day and night electrofishing, fyke nets, mini fyke nets, gill nets, small and large hoop nets, seines, anchored trammel nets, and bottom 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 x 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.

### Fyke Net

The LTRMP uses Wisconsin-type fyke nets (trap nets) that contain three sections: the lead, frame, and cab. All netting is 1.8-cm mesh (bar measure). 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 netting and tandem fyke netting data were combined for length–frequency distribution analysis.

### Mini Fyke Net

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.

### Gill Net

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 29.5-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.

### Hoop Net

The LTRMP uses two sizes of hoop nets. The large nets are composed of seven fiberglass hoops with diameters of 1.1–1.2 m. These nets are 4.8 m long, contain two finger-style throats, and are constructed of 3.7-cm nylon mesh (bar measure). 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 nylon mesh (bar measure). 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 1999. 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.

### Seine

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.

### Anchored Trammel Net

In 1994, anchored 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. The net wall size is 35.56-cm bar of No. 9 multifilament twine hung 61 m per 30.48 yards of finished net. The net float line is 1.27-cm foam-core (two strands on the floating nets, one strand on the bottom set nets), and the lead line is lead-core (No. 20 on the floating net, No. 65 on the sinking net).

### Bottom Trawl

Bottom trawl 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 trawling effort is a haul. A minimum of six hauls are collected in main or side channel sites and four hauls at tailwater sites.

## *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 netting 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 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

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

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

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

where

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

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 *C/f* 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; small and large hoop netting), channel catfish (electrofishing; small and large 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. 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. 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).

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# Chapter 1. Pool 4, Upper Mississippi River

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## Hydrograph

Water levels were above the long-term mean during much of spring and summer, with peaks in April and late May (Figure 1.1). Water levels dropped slightly below the mean in late June, but then rose again above the mean until late September. Water levels remained below the mean during a substantial portion of the third sampling period. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

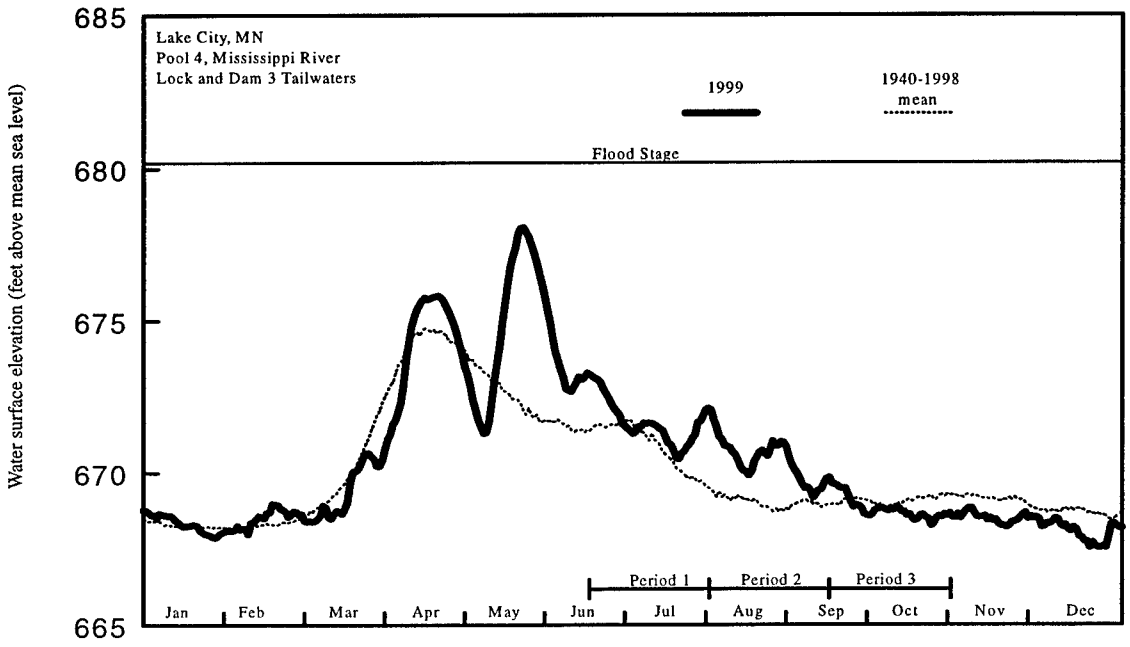


**Figure 1.1.** Daily water surface elevation from Lock and Dam 3 for Pool 4, Upper Mississippi River, during 1999 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

## Summary of Sampling Effort

We made 462 fish collections in Pool 4 during 1999 using 12 gear types (Table 1.1). Gear allocations among strata remained consistent for all three sampling periods. Of the total number of collections, 384 were from randomly selected sites in the BWCO, BWCS, MCBU, MCBW, and SCB strata. Forty-eight collections were made at fixed TWZ sites and 30 were from fixed MCBW sites. Backwaters, followed by the SCB and MCBU, received the most sampling effort.

## Total Catch by Gear

We collected 141,347 fish, representing 73 species and 2 hybrids in 1999 (Table 1.2). The five most abundant species collected in our samples were the emerald shiner (121,501), bluegill (3,450), gizzard shad (2,264), spotfin shiner (1,932), and mimic shiner (1,534). Total species (excluding hybrids) collected by gear

type were as follows: day electrofishing (51), night electrofishing (33), fyke netting (28 ), tandem fyke netting (30), mini fyke netting (39), tandem mini fyke netting (31), seining (44), small hoop netting (14), large hoop netting (16), bottom trawling (11), gill netting (26), and anchored trammel netting (7). Historical fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 4.

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

### *Day Electrofishing*

Poolwide mean catch-per-unit-effort (*C/f*) by day electrofishing was highest for emerald shiner (94), gizzard shad (15), and bluegill (14; Table 1.3.1). By stratum, emerald shiner had the highest *C/f* in the BWCS (25), MCBU (265), and SCB (54) and shorthead redhorse had the highest *C/f* in the MCBW (8).

### *Fyke Net*

Poolwide mean *C/f* by fyke netting was highest for bluegill (25), black crappie (11), and silver redhorse (4; Table 1.3.2). By stratum, bluegill had the highest *C/f* in the BWCS (25) and MCBW (5).

### *Tandem Fyke Net*

Poolwide mean *C/f* by tandem fyke netting was highest for bluegill (14), black crappie (10), and gizzard shad (3; Table 1.3.3).

### *Mini Fyke Net*

Poolwide mean *C/f* by mini fyke netting was highest for emerald shiner (174), bluegill (14), and gizzard shad (3; Table 1.3.4). By stratum, emerald shiner had the highest *C/f* in the BWCS (164), MCBU (302), MCBW (0.9), and SCB (89).

### *Tandem Mini Fyke Net*

Poolwide mean *C/f* by tandem mini fyke netting was highest for bluegill (6), emerald shiner (6), and bullhead minnow (2; Table 1.3.5).

### *Small Hoop Net*

Poolwide mean *C/f* by small hoop netting was highest for channel catfish (1.0) and common carp (0.2; Table 1.3.6). By stratum, common carp had the highest *C/f* in the MCBU (0.3), and channel catfish had the highest *C/f* in the MCBW (0.2) and SCB (1.6).

### *Large Hoop Net*

Poolwide mean *C/f* by large hoop netting was highest for smallmouth buffalo (1.3), channel catfish (0.5), and common carp (0.3; Table 1.3.7). By stratum, smallmouth buffalo had the highest *C/f* in the MCBU (1.2), MCBW (1.5), and SCB (1.4).

### *Seine*

Poolwide mean *C/f* by seining was highest for emerald shiner (132), spotfin shiner (23), and mimic shiner (20; Table 1.3.8). By stratum, emerald shiner had the highest *C/f* in the MCBU (153) and SCB (116).

### *Gill Net*

Poolwide mean *C/f* by gill netting was highest for gizzard shad (15), white bass (4), and common carp (4; Table 1.3.9).

### *Anchored Trammel Net*

Poolwide mean *C/f* by anchored trammel netting was highest for common carp (2) and smallmouth buffalo (1.0; Table 1.3.10).

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

All fixed-site sampling was confined to the TWZ and MCBW (upper pool wing dams are fixed sites because there are only two) strata using a combination of day and night electrofishing, fyke netting, mini fyke netting, small and large hoop netting, and bottom trawling.

### *Day Electrofishing*

At the MCBW fixed sites, *C/f* by day electrofishing was highest for emerald shiner (250), gizzard shad (12), and shorthead redhorse (9; Table 1.4.1).

### *Night Electrofishing*

At the TWZ fixed sites, *C/f* by night electrofishing was highest for emerald shiner (803), gizzard shad (37), and sauger (32; Table 1.4.2).

### *Fyke Net*

At the MCBW fixed sites, *C/f* by fyke netting was highest for freshwater drum (48), black crappie (7), and channel catfish (0.8; Table 1.4.3). At the TWZ fixed sites, *C/f* was highest for freshwater drum (20), white bass (9), and black crappie (4).

### *Mini Fyke Net*

At the MCBW fixed sites, *C/f* by mini fyke netting was highest for freshwater drum (7), white bass (0.5), and bluegill (0.4; Table 1.4.4). At the TWZ fixed sites, *C/f* was highest for emerald shiner (17,730), gizzard shad (16), and mimic shiner (6).

### *Small Hoop Net*

At the MCBW fixed sites, *C/f* by small hoop netting was highest for channel catfish (1.0), common carp (0.5), and freshwater drum (0.4; Table 1.4.5). At the TWZ fixed sites, *C/f* was highest for common carp (1.6) and freshwater drum (0.4).

### *Large Hoop Net*

At the MCBW fixed sites, *C/f* by large hoop netting was highest for common carp (2), freshwater drum (1.6), and smallmouth buffalo (1.4; Table 1.4.6). At the TWZ fixed sites, *C/f* was highest for common carp (9), smallmouth buffalo (4), and freshwater drum (3).

### *Bottom Trawl*

At the TWZ fixed sites, *C/f* by bottom trawling was highest for freshwater drum (3), speckled chub (3), and channel catfish (2; Table 1.4.7).

## Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 1.2 to 1.18. 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 of fewer than 100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

### *Gizzard Shad*

The length distribution of 1,610 gizzard shad collected by electrofishing during 1999 was dominated by age-0 fish. The maximum length increment was 46 cm (Figure 1.2). Few fish longer than 36 cm were collected.

### *Common Carp*

The length distribution of 798 common carp collected by electrofishing during 1999 was dominated by fish between 46 and 64 cm (Figure 1.3). The maximum length increment was 86 cm. No common carp less than 22 cm and few less than 28 cm were collected.

### *Smallmouth Buffalo*

The length distribution of 24 smallmouth buffalo collected by electrofishing during 1999 showed fish mainly in the 42–52-cm range (Figure 1.4). The length distribution of 59 smallmouth buffalo collected by small and large hoop netting during 1999 was predominantly from 44 to 56 cm (Figure 1.5).

### *Channel Catfish*

The length distribution of 20 channel catfish collected by electrofishing during 1999 ranged in length from 14 to 64 cm (Figure 1.6). The length distribution of 123 channel catfish collected by small and large hoop netting during 1999 ranged from 6 to 72 cm (Figure 1.7).

### *Northern Pike*

The length distribution of 35 northern pike collected by electrofishing during 1999 ranged from 18 to 88 cm (Figure 1.8). The length distribution of 28 northern pike collected by fyke netting during 1999 ranged from 20 to 88 cm, with almost all of the fish longer than 36 cm (Figure 1.9).

### *White Bass*

The length distribution of 341 white bass collected by electrofishing during 1999 ranged from 1 to 44 cm (Figure 1.10).

### *Bluegill*

The length distribution of 1,165 bluegills collected by electrofishing during 1999 ranged from 2 to 20 cm (Figure 1.11). The length distribution of 1,245 bluegills collected by fyke netting during 1999 ranged from 2 to 22 cm, with few fish less than 8 cm (Figure 1.12).

### *Largemouth Bass*

The length distribution of 264 largemouth bass collected by electrofishing during 1999 ranged from 4 to 50 cm (Figure 1.13). Only 5.7% of largemouth bass collected were 36 cm (14 inches) or greater, which is the harvestable size limit for the Minnesota–Wisconsin boundary waters.

### *Black Crappie*

The length distribution of 872 black crappies collected by fyke netting during 1999 ranged from 6 to 32 cm (Figure 1.14). Most of the black crappies were between 10 and 22 cm.

### *Sauger*

The length distribution of 521 saugers collected by electrofishing during 1999 ranged from 10 to 52 cm (Figure 1.15). About 59% of all saugers collected were between 22 and 30 cm. Only 7% of saugers collected were 38 cm (15 inches) or greater.

### *Walleye*

The length distribution of 149 walleyes collected by electrofishing during 1999 ranged from 20 to 70 cm (Figure 1.16). About 66% of all walleyes collected were 38 cm (15 inches) or greater, which is the harvestable size limit for Minnesota–Wisconsin boundary waters.

### *Freshwater Drum*

The length distribution of 290 freshwater drum collected by electrofishing during 1999 ranged from 8 to 50 cm (Figure 1.17). The length distribution of 525 freshwater drum collected by fyke netting during 1999 ranged from 8 to 42 cm, with the majority of fish between 24 and 36 cm long (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 1999. 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 | | 8 | 8 | 4 | | | | | 28 |
| Fyke net | 6 | | | | 4 | | | | 2 | 12 |
| Gill net | | 4 | | | | | | | | 4 |
| Large hoop net | | | 6 | 4 | 4 | | | | 2 | 16 |
| Small hoop net | | | 6 | 4 | 4 | | | | 2 | 16 |
| 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 |

Sampling period=2: August 1 - September 14

| 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 | | | 6 | 4 | 4 | | | | 2 | 16 |
| Small hoop net | | | 6 | 4 | 4 | | | | 2 | 16 |
| 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 |

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 | | | 6 | 4 | 4 | | | | 2 | 16 |
| Small hoop net | | | 6 | 4 | 4 | | | | 2 | 16 |
| 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 |
| | 60 | 84 | 114 | 96 | 60 | 0 | 0 | 0 | 48 | 462 |

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 1.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | Silver lamprey | Ichthyomyzon unicuspis | 1 | - | - | - | - | 1 | - | - | - | - | - | - | 2 |
| 2 | Lake sturgeon | Acipenser fulvescens | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 |
| 3 | Shovelnose sturgeon | Scaphirhynchus platorynchus | - | - | - | - | - | - | - | - | 1 | - | - | 13 | 14 |
| 4 | Paddlefish | Polyodon spathula | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 |
| 5 | Longnose gar | Lepisosteus osseus | 5 | 4 | 6 | 5 | 4 | - | 1 | - | - | 2 | - | - | 27 |
| 6 | Shortnose gar | Lepisosteus platostomus | - | 1 | 13 | 1 | 4 | - | - | - | - | - | - | - | 19 |
| 7 | Bowfin | Amia calva | 10 | - | 14 | 19 | 5 | 1 | - | - | - | 9 | 1 | - | 59 |
| 8 | Goldeye | Hiodon alosoides | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 |
| 9 | Mooneye | Hiodon tergisus | 17 | - | - | 4 | - | - | - | - | 6 | 1 | - | - | 28 |
| 10 | American eel | Anguilla rostrata | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| 11 | Gizzard shad | Dorosoma cepedianum | 1172 | 438 | 24 | 172 | 193 | 62 | 38 | 1 | 1 | 163 | - | - | 2264 |
| 12 | Spotfin shiner | Cyprinella spiloptera | 128 | 4 | - | - | 55 | 37 | 1708 | - | - | - | - | - | 1932 |
| 13 | Common carp | Cyprinus carpio | 647 | 151 | 33 | 84 | 13 | 10 | 3 | 37 | 141 | 41 | 25 | - | 1185 |
| 14 | Speckled chub | Macrhybopsis aestivalis | - | - | - | - | - | - | 2 | - | - | - | - | 30 | 32 |
| 15 | Silver chub | Macrhybopsis storeriana | 11 | 3 | 2 | 1 | 9 | 1 | 8 | 1 | - | - | - | 2 | 38 |
| 16 | Golden shiner | Notemigonus crysoleucas | 5 | - | - | - | - | - | - | - | - | - | - | - | 5 |
| 17 | Emerald shiner | Notropis atherinoides | 9272 | 9631 | - | - | 92625 | 304 | 9668 | - | - | - | - | 1 | 121501 |
| 18 | River shiner | Notropis blennius | 8 | - | - | - | 1 | - | 46 | - | - | - | - | - | 55 |
| 19 | Bigmouth shiner | Notropis dorsalis | - | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| 20 | Spottail shiner | Notropis hudsonius | 10 | - | - | - | 40 | 36 | 2 | - | - | - | - | - | 88 |
| 21 | Sand shiner | Notropis stramineus | - | - | - | - | - | - | 113 | - | - | - | - | - | 113 |
| 22 | Weed shiner | Notropis texanus | - | - | - | - | 2 | - | 2 | - | - | - | - | - | 4 |
| 23 | Mimic shiner | Notropis volucellus | 8 | 7 | - | - | 120 | 8 | 1391 | - | - | - | - | - | 1534 |
| 24 | Pugnose minnow | Opsopoeodus emiliae | 7 | - | - | - | 10 | 65 | - | - | - | - | - | - | 82 |
| 25 | Bluntnose minnow | Pimephales notatus | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 26 | Fathead minnow | Pimephales promelas | 2 | - | - | - | - | 1 | - | - | - | - | - | - | 3 |
| 27 | Bullhead minnow | Pimephales vigilax | 28 | 1 | - | - | 117 | 123 | 975 | - | - | - | - | - | 1244 |
| 28 | Unidentified minnow | Unidentified Cyprinidae | 3 | - | - | - | 66 | - | 76 | - | - | - | - | - | 145 |
| 29 | River carpsucker | Carpiodes carpio | 8 | - | 2 | 22 | - | 1 | - | - | - | 3 | - | - | 36 |
| 30 | Quillback | Carpiodes cyprinus | 37 | 4 | - | 2 | - | - | 6 | - | - | 18 | - | - | 67 |
| 31 | White sucker | Catostomus commersoni | 5 | - | 3 | 2 | - | - | 1 | - | - | 1 | - | - | 12 |
| 32 | Blue sucker | Cycleptus elongatus | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 33 | Northern hog sucker | Hypentelium nigricans | 2 | - | - | - | - | - | 2 | - | - | - | - | - | 4 |
| 34 | Smallmouth buffalo | Ictiobus bubalus | 18 | 6 | 9 | 12 | - | - | - | 4 | 155 | 17 | 10 | - | 231 |
| 35 | Bigmouth buffalo | Ictiobus cyprinellus | 9 | 1 | - | 1 | - | - | - | - | - | 10 | 10 | - | 31 |
| 36 | Black buffalo | Ictiobus niger | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 |
| 37 | Unidentified buffalo | Ictiobus sp. | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 38 | Spotted sucker | Minytrema melanops | 95 | - | 10 | 5 | - | 1 | 1 | - | - | 2 | - | - | 114 |
| 39 | Silver redhorse | Moxostoma anisurum | 154 | 2 | 60 | 108 | 13 | 7 | 2 | 5 | 12 | 16 | - | - | 379 |

Gears:
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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 collected by the Long Term Resource Program during 1999 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 | River redhorse | Moxostoma carinatum | 51 | - | - | - | - | - | - | - | - | - | - | - | 51 |
| 41 | Golden redhorse | Moxostoma erythrurum | 67 | - | 2 | 4 | 1 | 1 | 1 | - | - | 7 | - | - | 83 |
| 42 | Shorthead redhorse | Moxostoma macrolepidotum | 298 | 49 | 33 | 31 | 2 | - | 6 | 10 | 8 | 14 | - | 1 | 452 |
| 43 | Unidentified sucker | Unidentified Catostomidae | - | - | - | - | - | - | 16 | - | - | - | - | - | 16 |
| 44 | Black bullhead | Ameiurus melas | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 45 | Yellow bullhead | Ameiurus natalis | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 46 | Channel catfish | Ictalurus punctatus | 11 | 9 | 9 | 1 | 1 | - | - | 78 | 45 | 26 | - | 29 | 209 |
| 47 | Tadpole madtom | Noturus gyrinus | - | - | - | - | 6 | 1 | 1 | - | - | - | - | - | 8 |
| 48 | Flathead catfish | Pylodictis olivaris | 28 | 17 | 4 | 1 | 4 | 6 | - | 4 | 13 | - | 4 | 3 | 84 |
| 49 | Northern pike | Esox lucius | 31 | 4 | 11 | 17 | 6 | 2 | 4 | - | - | 23 | 2 | - | 100 |
| 50 | Central mudminnow | Umbra limi | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 51 | Trout perch | Percopsis omiscomaycus | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 52 | Burbot | Lota lota | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 53 | Brook silverside | Labidesthes sicculus | 9 | 1 | - | - | 4 | - | 62 | - | - | - | - | - | 76 |
| 54 | Brook stickleback | Culaea inconstans | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 55 | White bass | Morone chrysops | 202 | 139 | 77 | 53 | 20 | 4 | 23 | 1 | 2 | 44 | - | - | 565 |
| 56 | Rock bass | Ambloplites rupestris | 81 | 1 | 66 | 76 | 43 | 21 | 19 | 9 | 1 | - | - | - | 317 |
| 57 | Green sunfish | Lepomis cyanellus | 5 | 12 | - | - | 1 | - | - | - | - | - | - | - | 18 |
| 58 | Pumpkinseed | Lepomis gibbosus | 18 | - | 12 | 11 | 5 | 2 | 1 | - | - | - | - | - | 49 |
| 59 | Orangespotted sunfish | Lepomis humilis | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 60 | Bluegill | Lepomis macrochirus | 872 | 293 | 435 | 810 | 570 | 314 | 139 | 12 | 5 | - | - | - | 3450 |
| 61 | Green x bluegill sunfish | L. cyanellus x macrochirus | 2 | - | - | 1 | - | - | - | - | - | - | - | - | 3 |
| 62 | Smallmouth bass | Micropterus dolomieu | 247 | 75 | 2 | - | 2 | - | 38 | - | - | 3 | - | - | 367 |
| 63 | Largemouth bass | Micropterus salmoides | 222 | 42 | 3 | 1 | 12 | 1 | 23 | - | - | 5 | - | - | 309 |
| 64 | White crappie | Pomoxis annularis | 20 | 4 | 5 | 22 | 8 | 12 | - | - | - | - | - | - | 71 |
| 65 | Black crappie | Pomoxis nigromaculatus | 109 | 50 | 275 | 597 | 43 | 20 | 3 | 5 | 9 | 1 | - | - | 1112 |
| 66 | Western sand darter | Ammocrypta clara | - | - | - | - | - | - | 10 | - | - | - | - | - | 10 |
| 67 | Mud darter | Etheostoma asprigene | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| 68 | Johnny darter | Etheostoma nigrum | 5 | - | - | - | 2 | - | 51 | - | - | - | - | - | 58 |
| 69 | Banded darter | Etheostoma zonale | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 70 | Yellow perch | Perca flavescens | 113 | - | 19 | 157 | 2 | 7 | 11 | - | - | - | - | - | 309 |
| 71 | Logperch | Percina caprodes | 24 | 8 | - | - | 7 | 1 | 76 | - | - | - | - | - | 116 |
| 72 | Blackside darter | Percina maculata | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 73 | Slenderhead darter | Percina phoxocephala | 1 | 1 | - | - | - | - | - | - | - | - | - | - | 2 |
| 74 | River darter | Percina shumardi | 6 | 2 | - | - | 4 | 1 | 16 | - | - | - | - | 2 | 31 |
| 75 | Sauger | Stizostedion canadense | 137 | 384 | 15 | 19 | 3 | 4 | 8 | 1 | - | 1 | - | 1 | 573 |
| 76 | Walleye | Stizostedion vitreum | 61 | 88 | 6 | 6 | - | - | - | - | 2 | 11 | - | - | 174 |
| 77 | Sauger x walleye hybrid | S. canadense x vitreum | 1 | 2 | - | 1 | - | - | - | - | - | - | - | - | 4 |
| 78 | Unidentified Stizostedion | Stizostedion sp. | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |

Gears:
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Table 1.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | Freshwater drum | Aplodinotus grunniens | 141 | 149 | 365 | 160 | 63 | 42 | 10 | 16 | 63 | 28 | 2 | 38 | 1077 |
| 80 | Larval fish | Unidentified | 1 | - | - | - | - | 1 | 350 | - | - | - | - | - | 352 |
| 81 | Unidentified | Unidentified | - | - | - | - | 28 | - | - | - | - | - | - | - | 28 |
| | | | 14429 | 11584 | 1515 | 2406 | 94116 | 1098 | 14926 | 184 | 465 | 449 | 54 | 121 | 141347 |

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 day electrofishing in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Silver lamprey | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.04) |
| Longnose gar | 0.08 | 0.13 | 0.04 | 0.00 | 0.04 |
| | (0.04) | (0.09) | (0.04) | (0.00) | (0.04) |
| Bowfin | 0.17 | 0.33 | 0.04 | 0.00 | 0.04 |
| | (0.07) | (0.16) | (0.04) | (0.00) | (0.04) |
| Mooneye | 0.27 | 0.58 | 0.04 | 0.31 | 0.04 |
| | (0.25) | (0.58) | (0.04) | (0.31) | (0.04) |
| Gizzard shad | 14.68 | 13.92 | 23.67 | 1.06 | 8.83 |
| | (3.89) | (4.05) | (13.50) | (0.93) | (2.98) |
| Spotfin shiner | 1.56 | 0.25 | 1.50 | 0.00 | 3.38 |
| | (0.32) | (0.11) | (0.50) | (0.00) | (0.91) |
| Common carp | 8.33 | 5.71 | 9.17 | 0.91 | 11.25 |
| | (1.06) | (1.19) | (2.24) | (0.45) | (2.35) |
| Silver chub | 0.10 | 0.00 | 0.42 | 0.00 | 0.00 |
| | (0.05) | (0.00) | (0.19) | (0.00) | (0.00) |
| Golden shiner | 0.09 | 0.21 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.12) | (0.00) | (0.00) | (0.00) |
| Emerald shiner | 93.67 | 26.00 | 265.25 | 0.00 | 51.17 |
| | (28.57) | (20.01) | (108.16) | (0.00) | (15.13) |
| River shiner | 0.09 | 0.04 | 0.29 | 0.00 | 0.00 |
| | (0.06) | (0.04) | (0.21) | (0.00) | (0.00) |
| Spottail shiner | 0.16 | 0.25 | 0.00 | 0.00 | 0.17 |
| | (0.06) | (0.12) | (0.00) | (0.00) | (0.12) |
| Mimic shiner | 0.07 | 0.00 | 0.29 | 0.00 | 0.00 |
| | (0.04) | (0.00) | (0.18) | (0.00) | (0.00) |
| Pugnose minnow | 0.12 | 0.25 | 0.00 | 0.00 | 0.04 |
| | (0.07) | (0.15) | (0.00) | (0.00) | (0.04) |
| Fathead minnow | 0.03 | 0.04 | 0.00 | 0.00 | 0.04 |
| | (0.02) | (0.04) | (0.00) | (0.00) | (0.04) |
| Bullhead minnow | 0.46 | 0.79 | 0.00 | 0.00 | 0.38 |
| | (0.18) | (0.39) | (0.00) | (0.00) | (0.16) |
| Unidentified minnow | 0.05 | 0.13 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.13) | (0.00) | (0.00) | (0.00) |
| River carpsucker | 0.11 | 0.13 | 0.17 | 0.00 | 0.04 |
| | (0.04) | (0.07) | (0.10) | (0.00) | (0.04) |
| Quillback | 0.51 | 0.79 | 0.63 | 0.32 | 0.04 |
| | (0.16) | (0.34) | (0.22) | (0.22) | (0.04) |
| White sucker | 0.08 | 0.17 | 0.00 | 0.00 | 0.04 |
| | (0.04) | (0.08) | (0.00) | (0.00) | (0.04) |
| Blue sucker | 0.01 | 0.00 | 0.00 | 0.21 | 0.04 |
| | (0.01) | (0.00) | (0.00) | (0.21) | (0.04) |
| Northern hog sucker | 0.02 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.08) | (0.00) | (0.00) |
| Smallmouth buffalo | 0.29 | 0.63 | 0.04 | 0.19 | 0.04 |
| | (0.12) | (0.27) | (0.04) | (0.19) | (0.04) |
| Bigmouth buffalo | 0.13 | 0.17 | 0.17 | 0.00 | 0.04 |
| | (0.05) | (0.10) | (0.08) | (0.00) | (0.04) |
| Spotted sucker | 1.69 | 3.92 | 0.00 | 0.00 | 0.04 |
| | (0.49) | (1.15) | (0.00) | (0.00) | (0.04) |
| Silver redhorse | 2.09 | 2.42 | 1.67 | 1.29 | 2.00 |
| | (0.33) | (0.63) | (0.52) | (0.87) | (0.46) |
| River redhorse | 0.37 | 0.04 | 0.83 | 3.94 | 0.42 |
| | (0.14) | (0.04) | (0.35) | (1.43) | (0.33) |
| Golden redhorse | 0.90 | 0.92 | 1.08 | 0.00 | 0.75 |
| | (0.25) | (0.39) | (0.65) | (0.00) | (0.27) |
| Shorthead redhorse | 2.84 | 1.88 | 3.04 | 7.54 | 3.92 |
| | (0.42) | (0.47) | (0.77) | (2.48) | (0.98) |

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 1.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Yellow bullhead | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.04) | (0.00) | (0.00) | (0.00) |
| Channel catfish | 0.11 | 0.08 | 0.04 | 0.11 | 0.21 |
| | (0.04) | (0.06) | (0.04) | (0.11) | (0.08) |
| Flathead catfish | 0.23 | 0.04 | 0.63 | 0.00 | 0.17 |
| | (0.10) | (0.04) | (0.37) | (0.00) | (0.08) |
| Northern pike | 0.46 | 0.79 | 0.29 | 0.00 | 0.17 |
| | (0.11) | (0.23) | (0.13) | (0.00) | (0.10) |
| Brook silverside | 0.14 | 0.21 | 0.00 | 0.00 | 0.17 |
| | (0.07) | (0.15) | (0.00) | (0.00) | (0.10) |
| White bass | 2.15 | 1.42 | 3.46 | 0.19 | 2.13 |
| | (0.52) | (0.88) | (1.02) | (0.19) | (0.77) |
| Rock bass | 1.14 | 1.17 | 0.88 | 0.00 | 1.33 |
| | (0.24) | (0.34) | (0.40) | (0.00) | (0.49) |
| Green sunfish | 0.07 | 0.04 | 0.08 | 0.00 | 0.08 |
| | (0.03) | (0.04) | (0.06) | (0.00) | (0.06) |
| Pumpkinseed | 0.29 | 0.58 | 0.13 | 0.00 | 0.04 |
| | (0.15) | (0.36) | (0.07) | (0.00) | (0.04) |
| Orangespotted sunfish | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.04) |
| Bluegill | 13.64 | 22.83 | 1.96 | 0.00 | 10.58 |
| | (3.19) | (6.39) | (0.51) | (0.00) | (5.22) |
| Green sunfish x bluegill | 0.04 | 0.08 | 0.00 | 0.00 | 0.00 |
| | (0.04) | (0.08) | (0.00) | (0.00) | (0.00) |
| Smallmouth bass | 2.70 | 0.63 | 5.63 | 0.73 | 3.21 |
| | (0.40) | (0.20) | (1.05) | (0.48) | (0.93) |
| Largemouth bass | 3.57 | 6.50 | 0.75 | 0.00 | 1.88 |
| | (0.62) | (1.39) | (0.36) | (0.00) | (0.51) |
| White crappie | 0.27 | 0.25 | 0.08 | 0.00 | 0.46 |
| | (0.16) | (0.15) | (0.08) | (0.00) | (0.46) |
| Black crappie | 1.44 | 1.46 | 0.54 | 0.00 | 2.13 |
| | (0.35) | (0.35) | (0.19) | (0.00) | (0.97) |
| Johnny darter | 0.08 | 0.08 | 0.00 | 0.00 | 0.13 |
| | (0.04) | (0.06) | (0.00) | (0.00) | (0.09) |
| Yellow perch | 1.89 | 3.71 | 0.29 | 0.00 | 0.71 |
| | (0.37) | (0.83) | (0.14) | (0.00) | (0.29) |
| Logperch | 0.27 | 0.08 | 0.71 | 0.00 | 0.17 |
| | (0.07) | (0.06) | (0.23) | (0.00) | (0.10) |
| Slenderhead darter | 0.01 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) | (0.00) |
| River darter | 0.04 | 0.00 | 0.17 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.13) | (0.00) | (0.00) |
| Sauger | 1.50 | 0.96 | 1.58 | 0.00 | 2.17 |
| | (0.28) | (0.29) | (0.52) | (0.00) | (0.68) |
| Walleye | 0.67 | 0.79 | 0.58 | 0.89 | 0.58 |
| | (0.22) | (0.42) | (0.21) | (0.67) | (0.38) |
| Sauger x walleye | 0.01 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) | (0.00) |
| Freshwater drum | 1.87 | 2.33 | 1.33 | 0.76 | 1.67 |
| | (0.27) | (0.49) | (0.29) | (0.55) | (0.51) |
| Larval fish | 0.01 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) | (0.00) |

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Table 1.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.35 | 0.36 | 0.00 |
| | (0.24) | (0.25) | (0.00) |
| Shortnose gar | 0.75 | 0.76 | 0.00 |
| | (0.31) | (0.31) | (0.00) |
| Bowfin | 0.79 | 0.80 | 0.00 |
| | (0.38) | (0.39) | (0.00) |
| Gizzard shad | 1.37 | 1.38 | 0.00 |
| | (0.44) | (0.44) | (0.00) |
| Common carp | 1.35 | 1.36 | 0.00 |
| | (0.85) | (0.86) | (0.00) |
| White sucker | 0.18 | 0.18 | 0.00 |
| | (0.10) | (0.10) | (0.00) |
| Smallmouth buffalo | 0.46 | 0.46 | 0.00 |
| | (0.28) | (0.29) | (0.00) |
| Spotted sucker | 0.61 | 0.61 | 0.00 |
| | (0.30) | (0.31) | (0.00) |
| Silver redhorse | 3.57 | 3.60 | 0.00 |
| | (1.21) | (1.22) | (0.00) |
| Golden redhorse | 0.10 | 0.10 | 0.00 |
| | (0.10) | (0.10) | (0.00) |
| Shorthead redhorse | 1.44 | 1.44 | 0.88 |
| | (0.66) | (0.67) | (0.49) |
| Channel catfish | 0.31 | 0.32 | 0.00 |
| | (0.16) | (0.16) | (0.00) |
| Flathead catfish | 0.00 | 0.00 | 0.36 |
| | (0.00) | (0.00) | (0.23) |
| Northern pike | 0.68 | 0.69 | 0.00 |
| | (0.19) | (0.19) | (0.00) |
| White bass | 1.54 | 1.55 | 0.00 |
| | (0.58) | (0.59) | (0.00) |
| Rock bass | 3.13 | 3.13 | 3.14 |
| | (1.41) | (1.42) | (1.57) |
| Pumpkinseed | 0.79 | 0.79 | 0.00 |
| | (0.43) | (0.44) | (0.00) |
| Bluegill | 24.66 | 24.80 | 5.53 |
| | (8.98) | (9.07) | (3.05) |
| Smallmouth bass | 0.13 | 0.13 | 0.00 |
| | (0.09) | (0.09) | (0.00) |
| Largemouth bass | 0.18 | 0.18 | 0.00 |
| | (0.10) | (0.10) | (0.00) |
| White crappie | 0.18 | 0.18 | 0.00 |
| | (0.10) | (0.10) | (0.00) |
| Black crappie | 11.19 | 11.23 | 5.21 |
| | (2.41) | (2.43) | (3.16) |
| Yellow perch | 1.09 | 1.10 | 0.17 |
| | (0.26) | (0.26) | (0.17) |
| Sauger | 0.29 | 0.29 | 0.69 |
| | (0.13) | (0.14) | (0.69) |
| Walleye | 0.23 | 0.23 | 0.00 |
| | (0.11) | (0.11) | (0.00) |
| Freshwater drum | 1.14 | 1.13 | 1.37 |
| | (0.27) | (0.27) | (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 1.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.09 | 0.09 |
| | (0.04) | (0.04) |
| Shortnose gar | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Bowfin | 0.32 | 0.32 |
| | (0.09) | (0.09) |
| Mooneye | 0.07 | 0.07 |
| | (0.07) | (0.07) |
| Gizzard shad | 2.98 | 2.98 |
| | (1.57) | (1.57) |
| Common carp | 1.40 | 1.40 |
| | (0.45) | (0.45) |
| Silver chub | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| River carpsucker | 0.37 | 0.37 |
| | (0.26) | (0.26) |
| Quillback | 0.03 | 0.03 |
| | (0.02) | (0.02) |
| White sucker | 0.04 | 0.04 |
| | (0.03) | (0.03) |
| Smallmouth buffalo | 0.19 | 0.19 |
| | (0.10) | (0.10) |
| Bigmouth buffalo | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Spotted sucker | 0.09 | 0.09 |
| | (0.06) | (0.06) |
| Silver redhorse | 1.81 | 1.81 |
| | (0.60) | (0.60) |
| Golden redhorse | 0.07 | 0.07 |
| | (0.04) | (0.04) |
| Shorthead redhorse | 0.54 | 0.54 |
| | (0.14) | (0.14) |
| Channel catfish | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Flathead catfish | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Northern pike | 0.30 | 0.30 |
| | (0.09) | (0.09) |
| White bass | 0.93 | 0.93 |
| | (0.19) | (0.19) |
| Rock bass | 1.32 | 1.32 |
| | (0.36) | (0.36) |
| Pumpkinseed | 0.19 | 0.19 |
| | (0.08) | (0.08) |
| Bluegill | 14.08 | 14.08 |
| | (4.08) | (4.09) |
| Green sunfish x bluegill | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Largemouth bass | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| White crappie | 0.39 | 0.39 |
| | (0.21) | (0.21) |
| Black crappie | 10.52 | 10.52 |
| | (2.02) | (2.03) |
| Yellow perch | 2.70 | 2.70 |
| | (0.70) | (0.70) |
| Sauger | 0.32 | 0.32 |
| | (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 1.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|
| Walleye | 0.11 | 0.11 |
| | (0.06) | (0.06) |
| Sauger x walleye | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Freshwater drum | 2.72 | 2.72 |
| | (0.64) | (0.64) |

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 mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Longnose gar | 0.10 | 0.19 | 0.00 | 0.00 | 0.06 |
| | (0.05) | (0.10) | (0.00) | (0.00) | (0.06) |
| Shortnose gar | 0.04 | 0.06 | 0.00 | 0.00 | 0.06 |
| | (0.03) | (0.06) | (0.00) | (0.00) | (0.06) |
| Bowfin | 0.12 | 0.19 | 0.00 | 0.00 | 0.13 |
| | (0.05) | (0.10) | (0.00) | (0.00) | (0.09) |
| Gizzard shad | 2.59 | 1.24 | 7.03 | 0.00 | 0.97 |
| | (1.05) | (0.59) | (3.97) | (0.00) | (0.86) |
| Spotfin shiner | 1.09 | 1.43 | 0.10 | 0.17 | 1.42 |
| | (0.50) | (1.06) | (0.10) | (0.17) | (0.70) |
| Common carp | 0.18 | 0.34 | 0.00 | 0.00 | 0.12 |
| | (0.12) | (0.28) | (0.00) | (0.00) | (0.08) |
| Silver chub | 0.10 | 0.06 | 0.08 | 0.00 | 0.18 |
| | (0.05) | (0.06) | (0.08) | (0.00) | (0.12) |
| Emerald shiner | 174.00 | 164.31 | 302.00 | 0.91 | 88.74 |
| | (81.05) | (135.93) | (214.37) | (0.91) | (59.52) |
| Spottail shiner | 0.91 | 1.80 | 0.00 | 0.00 | 0.43 |
| | (0.70) | (1.61) | (0.00) | (0.00) | (0.31) |
| Weed shiner | 0.04 | 0.00 | 0.15 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.10) | (0.00) | (0.00) |
| Mimic shiner | 2.24 | 4.47 | 0.85 | 0.00 | 0.35 |
| | (1.76) | (4.11) | (0.43) | (0.00) | (0.19) |
| Pugnose minnow | 0.23 | 0.29 | 0.44 | 0.00 | 0.00 |
| | (0.15) | (0.24) | (0.44) | (0.00) | (0.00) |
| Bullhead minnow | 2.53 | 2.84 | 0.39 | 0.00 | 3.81 |
| | (1.02) | (1.46) | (0.31) | (0.00) | (2.54) |
| Unidentified minnow | 1.27 | 0.00 | 5.09 | 0.00 | 0.00 |
| | (1.27) | (0.00) | (5.09) | (0.00) | (0.00) |
| Silver redhorse | 0.32 | 0.65 | 0.00 | 0.00 | 0.12 |
| | (0.08) | (0.17) | (0.00) | (0.00) | (0.12) |
| Golden redhorse | 0.02 | 0.06 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.00) | (0.00) | (0.00) |
| Shorthead redhorse | 0.04 | 0.05 | 0.00 | 0.00 | 0.07 |
| | (0.03) | (0.05) | (0.00) | (0.00) | (0.07) |
| Channel catfish | 0.02 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.08) | (0.00) | (0.00) |
| Tadpole madtom | 0.14 | 0.18 | 0.17 | 0.00 | 0.07 |
| | (0.06) | (0.10) | (0.11) | (0.00) | (0.07) |
| Flathead catfish | 0.04 | 0.00 | 0.00 | 0.00 | 0.12 |
| | (0.03) | (0.00) | (0.00) | (0.00) | (0.08) |
| Northern pike | 0.15 | 0.31 | 0.00 | 0.00 | 0.06 |
| | (0.07) | (0.15) | (0.00) | (0.00) | (0.06) |
| Central mudminnow | 0.02 | 0.00 | 0.00 | 0.00 | 0.06 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.06) |
| Brook silverside | 0.10 | 0.00 | 0.41 | 0.00 | 0.00 |
| | (0.10) | (0.00) | (0.41) | (0.00) | (0.00) |
| White bass | 0.13 | 0.00 | 0.31 | 0.00 | 0.17 |
| | (0.07) | (0.00) | (0.24) | (0.00) | (0.12) |
| Rock bass | 0.84 | 0.47 | 1.69 | 0.72 | 0.68 |
| | (0.23) | (0.17) | (0.79) | (0.72) | (0.30) |
| Green sunfish | 0.02 | 0.06 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.00) | (0.00) | (0.00) |
| Pumpkinseed | 0.13 | 0.25 | 0.00 | 0.00 | 0.06 |
| | (0.07) | (0.15) | (0.00) | (0.00) | (0.06) |
| Bluegill | 14.03 | 26.14 | 5.45 | 0.54 | 4.68 |
| | (5.72) | (13.11) | (2.98) | (0.54) | (2.81) |
| Smallmouth bass | 0.03 | 0.00 | 0.00 | 0.00 | 0.11 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.08) |

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 mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Largemouth bass | 0.23 | 0.12 | 0.50 | 0.00 | 0.17 |
| | (0.08) | (0.08) | (0.26) | (0.00) | (0.09) |
| White crappie | 0.16 | 0.28 | 0.00 | 0.00 | 0.13 |
| | (0.07) | (0.14) | (0.00) | (0.00) | (0.13) |
| Black crappie | 0.86 | 1.11 | 0.55 | 0.00 | 0.76 |
| | (0.22) | (0.35) | (0.37) | (0.00) | (0.42) |
| Johnny darter | 0.05 | 0.07 | 0.08 | 0.00 | 0.00 |
| | (0.04) | (0.07) | (0.08) | (0.00) | (0.00) |
| Yellow perch | 0.05 | 0.11 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.11) | (0.00) | (0.00) | (0.00) |
| Logperch | 0.16 | 0.22 | 0.26 | 0.00 | 0.00 |
| | (0.06) | (0.13) | (0.14) | (0.00) | (0.00) |
| River darter | 0.07 | 0.00 | 0.00 | 0.00 | 0.23 |
| | (0.06) | (0.00) | (0.00) | (0.00) | (0.17) |
| Sauger | 0.07 | 0.07 | 0.16 | 0.00 | 0.00 |
| | (0.04) | (0.07) | (0.11) | (0.00) | (0.00) |
| Freshwater drum | 0.15 | 0.21 | 0.00 | 0.00 | 0.18 |
| | (0.09) | (0.21) | (0.00) | (0.00) | (0.10) |
| Unidentified | 0.53 | 0.00 | 0.00 | 0.00 | 1.65 |
| | (0.53) | (0.00) | (0.00) | (0.00) | (1.65) |

Strata: BWCS - Backwater, contiguous, shoreline
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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 tandem mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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) |
| Bowfin | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Gizzard shad | 1.19 | 1.19 |
| | (0.76) | (0.77) |
| Spotfin shiner | 0.63 | 0.63 |
| | (0.61) | (0.61) |
| Common carp | 0.18 | 0.18 |
| | (0.08) | (0.08) |
| Silver chub | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Emerald shiner | 5.82 | 5.82 |
| | (3.86) | (3.87) |
| Spottail shiner | 0.64 | 0.64 |
| | (0.22) | (0.22) |
| Mimic shiner | 0.14 | 0.14 |
| | (0.09) | (0.09) |
| Pugnose minnow | 1.17 | 1.17 |
| | (1.17) | (1.17) |
| Fathead minnow | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Bullhead minnow | 2.29 | 2.29 |
| | (1.27) | (1.27) |
| River carpsucker | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Spotted sucker | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Silver redhorse | 0.13 | 0.13 |
| | (0.06) | (0.06) |
| Golden redhorse | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Tadpole madtom | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| Flathead catfish | 0.10 | 0.10 |
| | (0.07) | (0.07) |
| Northern pike | 0.04 | 0.04 |
| | (0.03) | (0.03) |
| White bass | 0.07 | 0.07 |
| | (0.05) | (0.05) |
| Rock bass | 0.38 | 0.38 |
| | (0.14) | (0.14) |
| Pumpkinseed | 0.04 | 0.04 |
| | (0.04) | (0.04) |
| Bluegill | 5.86 | 5.86 |
| | (1.86) | (1.87) |
| Largemouth bass | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| White crappie | 0.23 | 0.23 |
| | (0.18) | (0.18) |
| Black crappie | 0.38 | 0.38 |
| | (0.15) | (0.15) |
| Yellow perch | 0.13 | 0.13 |
| | (0.10) | (0.10) |
| Logperch | 0.02 | 0.02 |
| | (0.02) | (0.02) |
| River darter | 0.02 | 0.02 |
| | (0.02) | (0.02) |

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 tandem mini fyke netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.08 | 0.08 |
| | (0.06) | (0.06) |
| Freshwater drum | 0.75 | 0.75 |
| | (0.33) | (0.33) |
| Larval fish | 0.02 | 0.02 |
| | (0.02) | (0.02) |

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 small hoop netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Gizzard shad | 0.02 | 0.00 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.00) | (0.03) |
| Common carp | 0.20 | 0.34 | 0.09 | 0.08 |
| | (0.10) | (0.21) | (0.09) | (0.05) |
| Silver chub | 0.02 | 0.00 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.00) | (0.03) |
| Smallmouth buffalo | 0.05 | 0.00 | 0.09 | 0.09 |
| | (0.05) | (0.00) | (0.09) | (0.09) |
| Silver redhorse | 0.09 | 0.08 | 0.00 | 0.09 |
| | (0.06) | (0.06) | (0.00) | (0.09) |
| Shorthead redhorse | 0.17 | 0.13 | 0.00 | 0.21 |
| | (0.09) | (0.09) | (0.00) | (0.15) |
| Channel catfish | 0.98 | 0.20 | 0.17 | 1.59 |
| | (0.39) | (0.09) | (0.17) | (0.69) |
| White bass | 0.02 | 0.00 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.00) | (0.03) |
| Rock bass | 0.14 | 0.04 | 0.00 | 0.21 |
| | (0.09) | (0.04) | (0.00) | (0.16) |
| Bluegill | 0.16 | 0.16 | 0.09 | 0.16 |
| | (0.08) | (0.12) | (0.09) | (0.10) |
| Black crappie | 0.08 | 0.00 | 0.00 | 0.14 |
| | (0.06) | (0.00) | (0.00) | (0.11) |
| Sauger | 0.02 | 0.04 | 0.00 | 0.00 |
| | (0.02) | (0.04) | (0.00) | (0.00) |
| Freshwater drum | 0.14 | 0.21 | 0.00 | 0.08 |
| | (0.10) | (0.21) | (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 1.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Mooneye | 0.10 | 0.00 | 0.00 | 0.17 |
| | (0.06) | (0.00) | (0.00) | (0.12) |
| Common carp | 0.32 | 0.47 | 0.09 | 0.21 |
| | (0.18) | (0.39) | (0.09) | (0.11) |
| Smallmouth buffalo | 1.32 | 1.22 | 1.46 | 1.39 |
| | (0.41) | (0.49) | (0.94) | (0.63) |
| Silver redhorse | 0.20 | 0.08 | 0.00 | 0.30 |
| | (0.11) | (0.05) | (0.00) | (0.19) |
| Shorthead redhorse | 0.12 | 0.04 | 0.09 | 0.18 |
| | (0.05) | (0.04) | (0.09) | (0.08) |
| Channel catfish | 0.45 | 0.20 | 0.17 | 0.65 |
| | (0.15) | (0.13) | (0.11) | (0.24) |
| 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 | 0.09 | 0.12 | 0.00 | 0.06 |
| | (0.06) | (0.12) | (0.00) | (0.06) |
| Black crappie | 0.12 | 0.16 | 0.00 | 0.09 |
| | (0.05) | (0.09) | (0.00) | (0.05) |
| Walleye | 0.04 | 0.04 | 0.00 | 0.03 |
| | (0.03) | (0.04) | (0.00) | (0.03) |
| Freshwater drum | 0.25 | 0.20 | 0.09 | 0.29 |
| | (0.11) | (0.16) | (0.09) | (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 1.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.50 | 0.75 | 0.31 |
| | (0.24) | (0.52) | (0.18) |
| Spotfin shiner | 22.77 | 31.44 | 16.00 |
| | (8.55) | (18.53) | (5.11) |
| Common carp | 0.04 | 0.03 | 0.06 |
| | (0.02) | (0.03) | (0.04) |
| Speckled chub | 0.03 | 0.00 | 0.06 |
| | (0.03) | (0.00) | (0.06) |
| Silver chub | 0.12 | 0.03 | 0.19 |
| | (0.08) | (0.03) | (0.15) |
| Emerald shiner | 131.97 | 152.94 | 115.61 |
| | (39.72) | (61.71) | (52.48) |
| River shiner | 0.67 | 0.36 | 0.92 |
| | (0.33) | (0.20) | (0.57) |
| Bigmouth shiner | 0.05 | 0.00 | 0.08 |
| | (0.03) | (0.00) | (0.06) |
| Spottail shiner | 0.03 | 0.03 | 0.03 |
| | (0.02) | (0.03) | (0.03) |
| Sand shiner | 1.48 | 2.28 | 0.86 |
| | (0.60) | (1.21) | (0.52) |
| Weed shiner | 0.03 | 0.03 | 0.03 |
| | (0.02) | (0.03) | (0.03) |
| Mimic shiner | 20.07 | 13.22 | 25.42 |
| | (6.52) | (6.00) | (10.70) |
| Bluntnose minnow | 0.02 | 0.06 | 0.00 |
| | (0.02) | (0.04) | (0.00) |
| Bullhead minnow | 12.79 | 19.64 | 7.44 |
| | (3.68) | (7.98) | (2.20) |
| Unidentified minnow | 0.93 | 2.11 | 0.00 |
| | (0.56) | (1.30) | (0.00) |
| Quillback | 0.07 | 0.17 | 0.00 |
| | (0.06) | (0.14) | (0.00) |
| White sucker | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Northern hog sucker | 0.02 | 0.06 | 0.00 |
| | (0.02) | (0.06) | (0.00) |
| Unidentified buffalo | 0.01 | 0.03 | 0.00 |
| | (0.01) | (0.03) | (0.00) |
| Spotted sucker | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Silver redhorse | 0.03 | 0.03 | 0.03 |
| | (0.02) | (0.03) | (0.03) |
| Golden redhorse | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Shorthead redhorse | 0.09 | 0.00 | 0.17 |
| | (0.08) | (0.00) | (0.14) |
| Unidentified sucker | 0.24 | 0.11 | 0.33 |
| | (0.14) | (0.11) | (0.23) |
| Tadpole madtom | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Northern pike | 0.06 | 0.00 | 0.11 |
| | (0.04) | (0.00) | (0.07) |
| Trout perch | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Brook silverside | 0.94 | 0.25 | 1.47 |
| | (0.37) | (0.12) | (0.65) |

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 seining in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Brook stickleback | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| White bass | 0.30 | 0.50 | 0.14 |
| | (0.11) | (0.24) | (0.07) |
| Rock bass | 0.28 | 0.11 | 0.42 |
| | (0.10) | (0.07) | (0.18) |
| Pumpkinseed | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Bluegill | 2.06 | 0.89 | 2.97 |
| | (1.04) | (0.54) | (1.82) |
| Smallmouth bass | 0.48 | 0.89 | 0.17 |
| | (0.18) | (0.38) | (0.14) |
| Largemouth bass | 0.32 | 0.28 | 0.36 |
| | (0.10) | (0.16) | (0.13) |
| Black crappie | 0.04 | 0.03 | 0.06 |
| | (0.02) | (0.03) | (0.04) |
| Western sand darter | 0.12 | 0.28 | 0.00 |
| | (0.10) | (0.22) | (0.00) |
| Mud darter | 0.02 | 0.06 | 0.00 |
| | (0.02) | (0.04) | (0.00) |
| Johnny darter | 0.71 | 0.72 | 0.69 |
| | (0.23) | (0.35) | (0.30) |
| Banded darter | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Yellow perch | 0.16 | 0.08 | 0.22 |
| | (0.06) | (0.06) | (0.10) |
| Logperch | 1.09 | 0.81 | 1.31 |
| | (0.41) | (0.38) | (0.68) |
| Blackside darter | 0.01 | 0.03 | 0.00 |
| | (0.01) | (0.03) | (0.00) |
| River darter | 0.24 | 0.06 | 0.39 |
| | (0.09) | (0.04) | (0.17) |
| Sauger | 0.12 | 0.03 | 0.19 |
| | (0.06) | (0.03) | (0.11) |
| Unidentified Stizostedion | 0.02 | 0.00 | 0.03 |
| | (0.02) | (0.00) | (0.03) |
| Freshwater drum | 0.15 | 0.08 | 0.19 |
| | (0.06) | (0.05) | (0.10) |
| Larval fish | 4.32 | 9.25 | 0.47 |
| | (3.85) | (8.85) | (0.33) |

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 gill netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|
| Lake sturgeon | 0.09 | 0.09 |
| | (0.08) | (0.09) |
| Paddlefish | 0.09 | 0.09 |
| | (0.09) | (0.09) |
| Longnose gar | 0.19 | 0.19 |
| | (0.13) | (0.13) |
| Bowfin | 0.79 | 0.79 |
| | (0.27) | (0.27) |
| Goldeye | 0.09 | 0.09 |
| | (0.09) | (0.09) |
| Mooneye | 0.09 | 0.09 |
| | (0.09) | (0.09) |
| Gizzard shad | 14.76 | 14.76 |
| | (2.73) | (2.74) |
| Common carp | 3.58 | 3.58 |
| | (1.29) | (1.29) |
| River carpsucker | 0.25 | 0.25 |
| | (0.13) | (0.13) |
| Quillback | 1.58 | 1.58 |
| | (0.88) | (0.88) |
| White sucker | 0.09 | 0.09 |
| | (0.08) | (0.09) |
| Smallmouth buffalo | 1.44 | 1.44 |
| | (0.55) | (0.55) |
| Bigmouth buffalo | 0.88 | 0.88 |
| | (0.56) | (0.56) |
| Spotted sucker | 0.20 | 0.20 |
| | (0.20) | (0.20) |
| Silver redhorse | 1.42 | 1.42 |
| | (0.53) | (0.53) |
| Golden redhorse | 0.64 | 0.64 |
| | (0.39) | (0.39) |
| Shorthead redhorse | 1.26 | 1.26 |
| | (0.53) | (0.53) |
| Channel catfish | 2.37 | 2.37 |
| | (0.57) | (0.57) |
| Northern pike | 2.03 | 2.03 |
| | (0.81) | (0.81) |
| White bass | 4.02 | 4.02 |
| | (1.54) | (1.55) |
| Smallmouth bass | 0.23 | 0.23 |
| | (0.23) | (0.23) |
| Largemouth bass | 0.39 | 0.39 |
| | (0.39) | (0.39) |
| Black crappie | 0.12 | 0.12 |
| | (0.12) | (0.12) |
| Sauger | 0.09 | 0.09 |
| | (0.09) | (0.09) |
| Walleye | 0.97 | 0.97 |
| | (0.55) | (0.55) |
| Freshwater drum | 2.45 | 2.45 |
| | (0.86) | (0.86) |

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 anchored trammel netting in Pool 4 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|
| Bowfin | 0.09 | 0.09 |
| | (0.09) | (0.09) |
| Common carp | 2.36 | 2.36 |
| | (0.97) | (0.97) |
| Smallmouth buffalo | 0.98 | 0.98 |
| | (0.27) | (0.27) |
| Bigmouth buffalo | 0.90 | 0.90 |
| | (0.71) | (0.71) |
| Flathead catfish | 0.35 | 0.35 |
| | (0.15) | (0.15) |
| Northern pike | 0.17 | 0.17 |
| | (0.11) | (0.11) |
| Freshwater drum | 0.19 | 0.19 |
| | (0.13) | (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 1.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBW |
|---|---|
| Gizzard shad | 11.93 (5.14) |
| Spotfin shiner | 0.90 (0.90) |
| Common carp | 3.53 (1.18) |
| Silver chub | 0.21 (0.21) |
| Emerald shiner | 249.88 (119.55) |
| Mimic shiner | 0.18 (0.18) |
| Golden redhorse | 0.21 (0.21) |
| Shorthead redhorse | 8.80 (2.86) |
| Channel catfish | 0.36 (0.36) |
| Flathead catfish | 2.45 (2.17) |
| Northern pike | 0.21 (0.21) |
| White bass | 7.80 (2.01) |
| Bluegill | 4.95 (2.97) |
| Smallmouth bass | 3.20 (1.66) |
| Largemouth bass | 0.63 (0.63) |
| White crappie | 0.21 (0.21) |
| Black crappie | 2.09 (1.36) |
| Logperch | 0.25 (0.25) |
| River darter | 0.50 (0.50) |
| Sauger | 4.95 (2.72) |
| Walleye | 1.55 (0.83) |
| Freshwater drum | 2.29 (0.82) |

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 1.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Longnose gar | 0.33 (0.26) |
| Shortnose gar | 0.08 (0.08) |
| American eel | 0.08 (0.08) |
| Gizzard shad | 36.50 (10.31) |
| Spotfin shiner | 0.33 (0.19) |
| Common carp | 12.58 (1.86) |
| Silver chub | 0.25 (0.25) |
| Emerald shiner | 802.58 (447.65) |
| Mimic shiner | 0.58 (0.50) |
| Bullhead minnow | 0.08 (0.08) |
| Quillback | 0.33 (0.26) |
| Smallmouth buffalo | 0.50 (0.19) |
| Bigmouth buffalo | 0.08 (0.08) |
| Silver redhorse | 0.17 (0.11) |
| Shorthead redhorse | 4.08 (2.38) |
| Channel catfish | 0.75 (0.35) |
| Flathead catfish | 1.42 (0.53) |
| Northern pike | 0.33 (0.33) |
| Brook silverside | 0.08 (0.08) |
| White bass | 11.58 (2.66) |
| Rock bass | 0.08 (0.08) |
| Green sunfish | 1.00 (0.30) |
| Bluegill | 24.42 (11.05) |
| Smallmouth bass | 6.25 (1.50) |
| Largemouth bass | 3.50 (1.51) |
| White crappie | 0.33 (0.19) |
| Black crappie | 4.17 (2.12) |
| Logperch | 0.67 (0.38) |
| Slenderhead darter | 0.08 (0.08) |
| River darter | 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 1.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 4 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| | (0.17) |
| Sauger | 32.00 |
| | (20.36) |
| Walleye | 7.33 |
| | (3.88) |
| Sauger x walleye | 0.17 |
| | (0.17) |
| Freshwater drum | 12.42 |
| | (4.24) |

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 1.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 4 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBW | TWZ |
|---|---|---|
| Gizzard shad | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| Common carp | 0.68 | 0.98 |
| | (0.43) | (0.66) |
| Silver chub | 0.00 | 0.34 |
| | (0.00) | (0.22) |
| River carpsucker | 0.38 | 0.00 |
| | (0.24) | (0.00) |
| Smallmouth buffalo | 0.21 | 0.00 |
| | (0.21) | (0.00) |
| Shorthead redhorse | 0.21 | 0.35 |
| | (0.21) | (0.35) |
| Channel catfish | 0.84 | 0.00 |
| | (0.84) | (0.00) |
| Flathead catfish | 0.17 | 0.21 |
| | (0.17) | (0.21) |
| White bass | 0.80 | 8.58 |
| | (0.62) | (3.52) |
| Bluegill | 0.00 | 1.25 |
| | (0.00) | (1.02) |
| White crappie | 0.00 | 0.38 |
| | (0.00) | (0.24) |
| Black crappie | 7.39 | 3.72 |
| | (7.39) | (2.11) |
| Sauger | 0.17 | 0.98 |
| | (0.17) | (0.66) |
| Walleye | 0.17 | 0.17 |
| | (0.17) | (0.17) |
| Freshwater drum | 47.98 | 19.67 |
| | (31.73) | (12.40) |

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 1.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 4 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBW | TWZ |
|---|---|---|
| Shortnose gar | 0.00 | 0.35 |
| | (0.00) | (0.35) |
| Gizzard shad | 0.00 | 16.01 |
| | (0.00) | (15.55) |
| Spotfin shiner | 0.00 | 0.75 |
| | (0.00) | (0.53) |
| Common carp | 0.00 | 1.14 |
| | (0.00) | (0.42) |
| Silver chub | 0.18 | 0.51 |
| | (0.18) | (0.23) |
| Emerald shiner | 0.00 | 17730.5 |
| | (0.00) | (16277.2) |
| River shiner | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| Mimic shiner | 0.00 | 5.67 |
| | (0.00) | (5.26) |
| Bullhead minnow | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| Black bullhead | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| Flathead catfish | 0.21 | 0.21 |
| | (0.21) | (0.21) |
| White bass | 0.52 | 1.99 |
| | (0.36) | (1.45) |
| Bluegill | 0.35 | 1.10 |
| | (0.35) | (0.42) |
| Largemouth bass | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| White crappie | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| Black crappie | 0.00 | 1.19 |
| | (0.00) | (0.99) |
| Freshwater drum | 7.15 | 4.45 |
| | (5.86) | (2.73) |

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 small hoop netting in Pool 4 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBW | TWZ |
|---|---|---|
| Common carp | 0.45 | 1.63 |
| | (0.22) | (0.73) |
| Channel catfish | 1.04 | 0.27 |
| | (0.85) | (0.19) |
| Flathead catfish | 0.09 | 0.27 |
| | (0.09) | (0.12) |
| Bluegill | 0.08 | 0.00 |
| | (0.08) | (0.00) |
| Freshwater drum | 0.37 | 0.36 |
| | (0.24) | (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

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 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBW | TWZ |
|---|---|---|
| Shovelnose sturgeon | 0.00 | 0.09 |
| | (0.00) | (0.09) |
| Gizzard shad | 0.08 | 0.00 |
| | (0.08) | (0.00) |
| Common carp | 1.98 | 8.78 |
| | (1.16) | (3.77) |
| Smallmouth buffalo | 1.40 | 3.87 |
| | (0.89) | (2.33) |
| Black buffalo | 0.00 | 0.09 |
| | (0.00) | (0.09) |
| Channel catfish | 0.87 | 0.65 |
| | (0.66) | (0.34) |
| Flathead catfish | 0.23 | 0.85 |
| | (0.23) | (0.48) |
| Black crappie | 0.16 | 0.00 |
| | (0.16) | (0.00) |
| Freshwater drum | 1.56 | 2.70 |
| | (0.88) | (1.75) |

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 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 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Shovelnose sturgeon | 1.08 (0.58) |
| Speckled chub | 2.50 (1.42) |
| Silver chub | 0.17 (0.11) |
| Emerald shiner | 0.08 (0.08) |
| Shorthead redhorse | 0.08 (0.08) |
| Channel catfish | 2.42 (0.94) |
| Flathead catfish | 0.25 (0.13) |
| Burbot | 0.08 (0.08) |
| River darter | 0.17 (0.11) |
| Sauger | 0.08 (0.08) |
| Freshwater drum | 3.17 (2.63) |

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

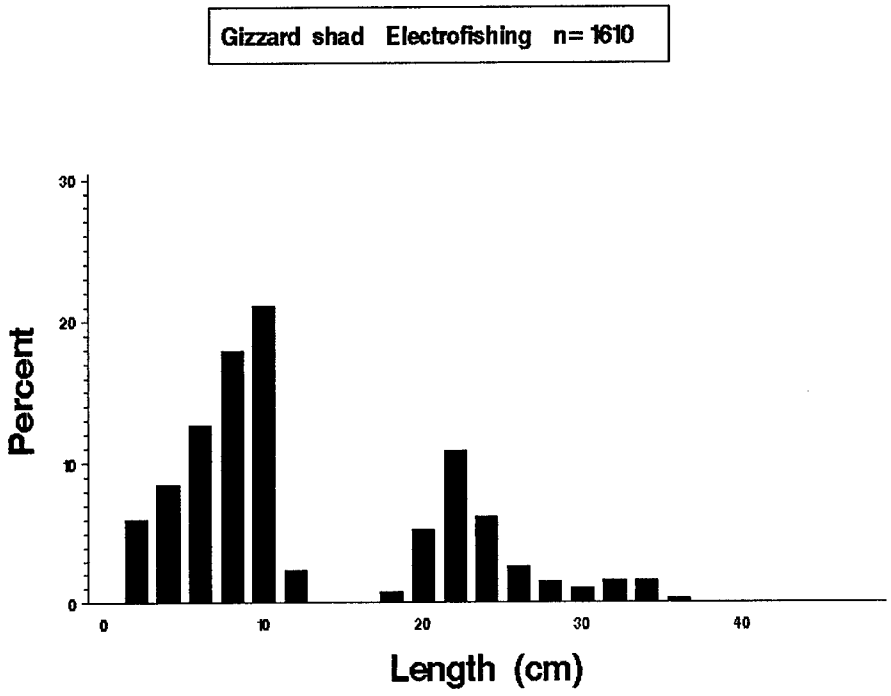


**Figure 1.2.** Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

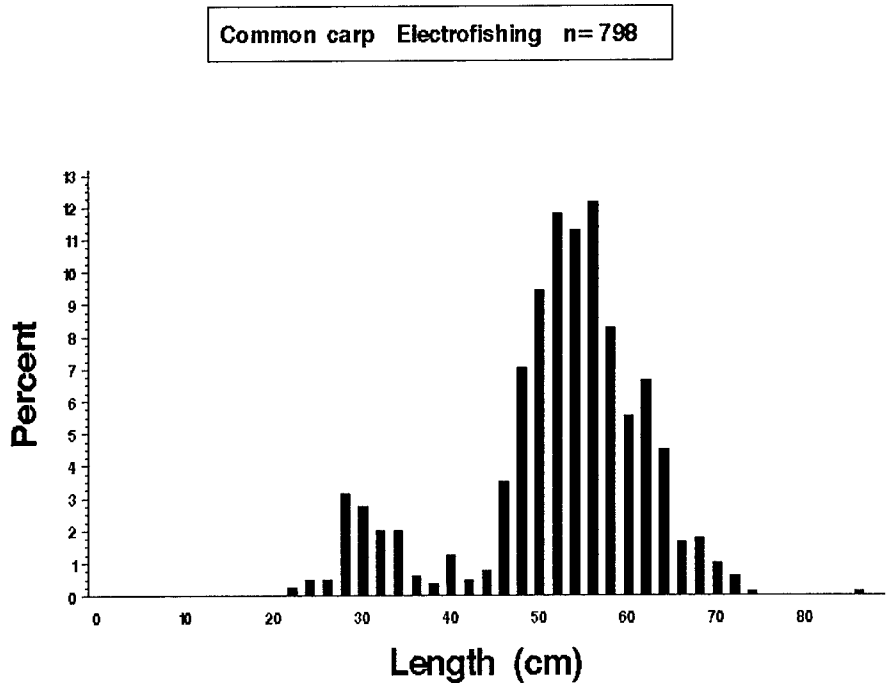


**Figure 1.3.** Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

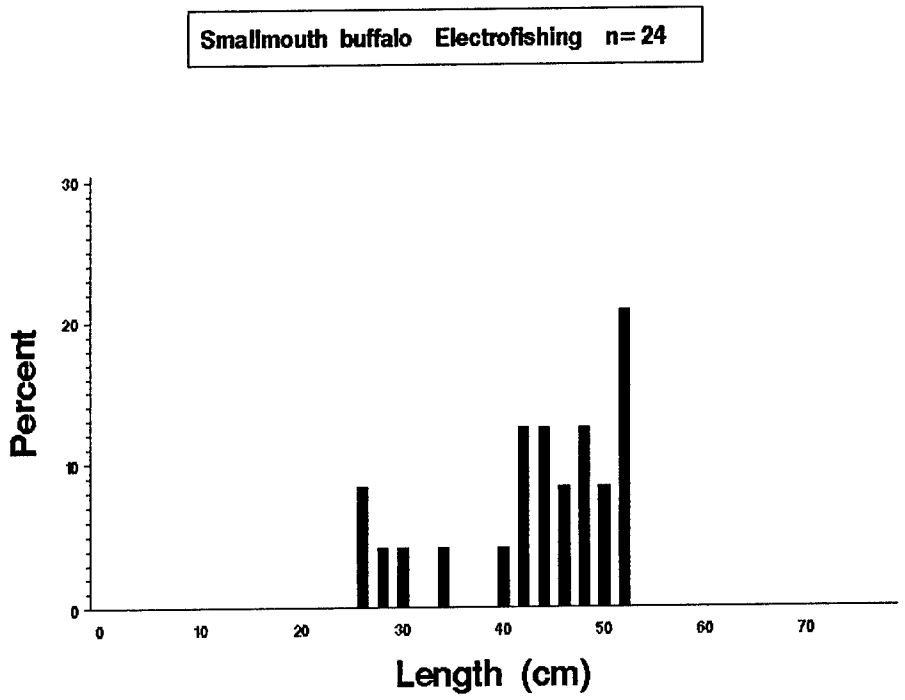


**Figure 1.4.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

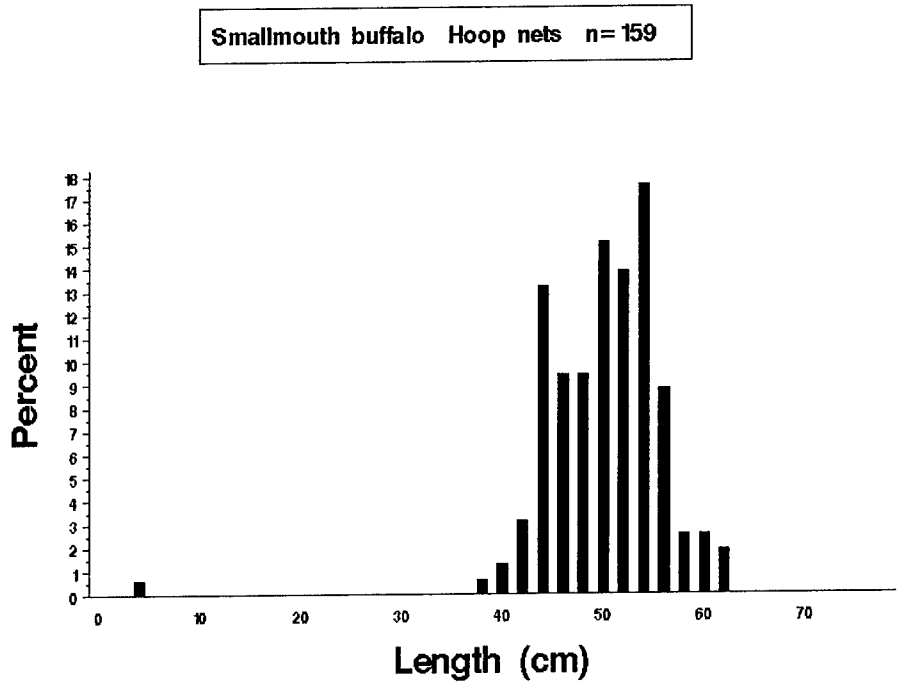


**Figure 1.5.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 4 during 1999.

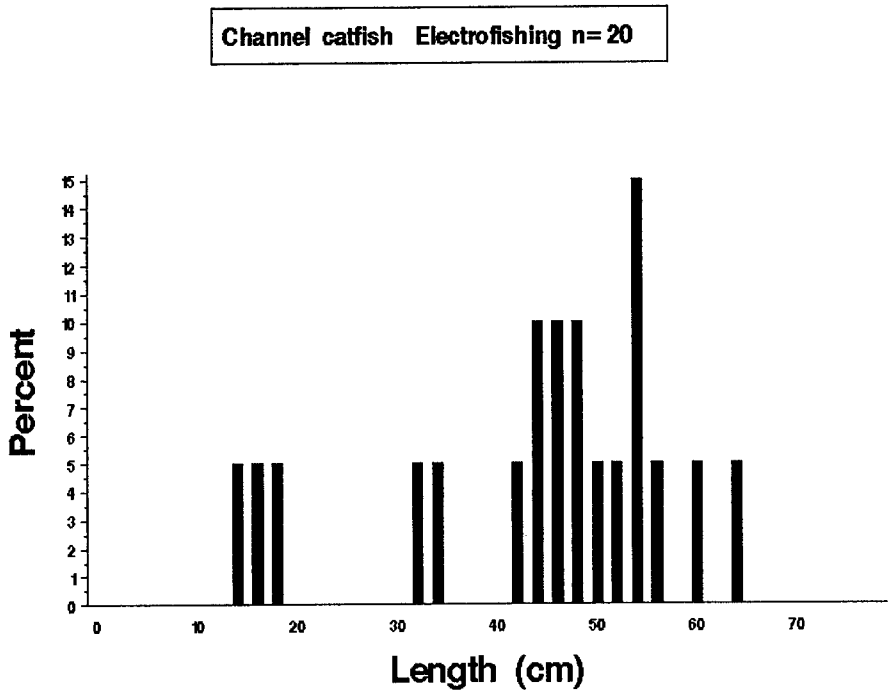


**Figure 1.6.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

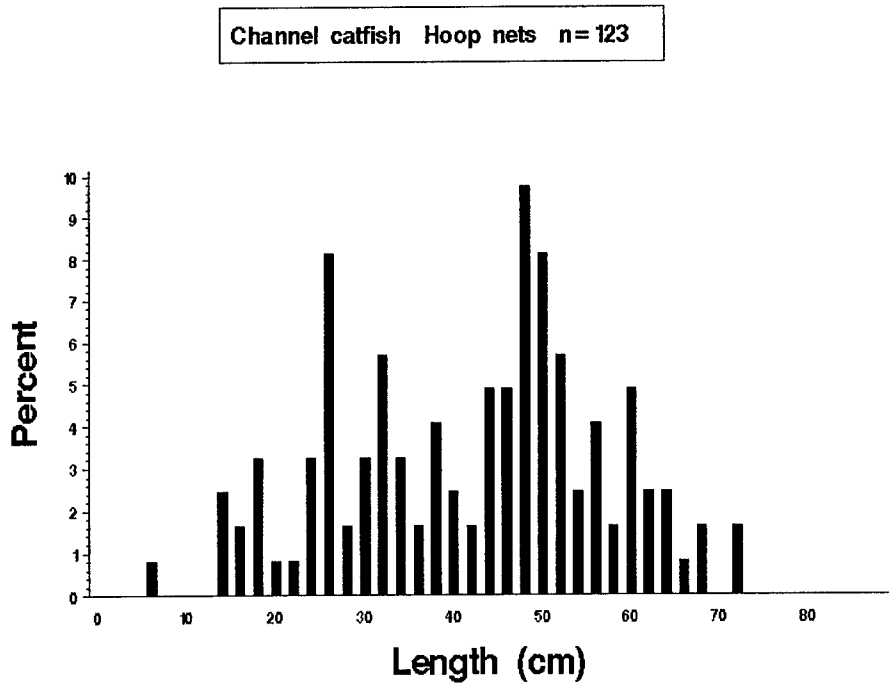


**Figure 1.7.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 4 during 1999.

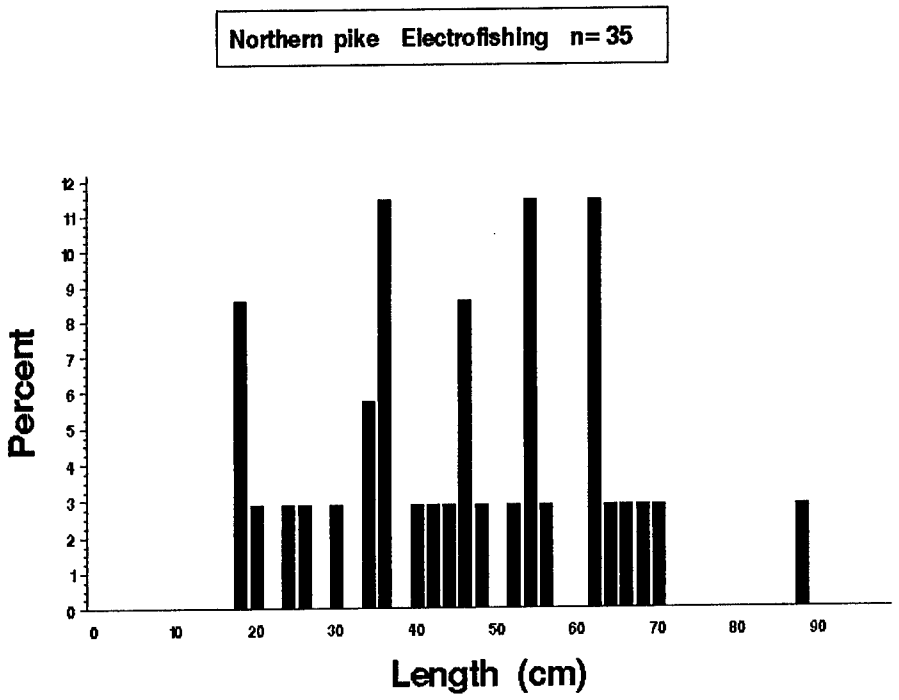


**Figure 1.8.** Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

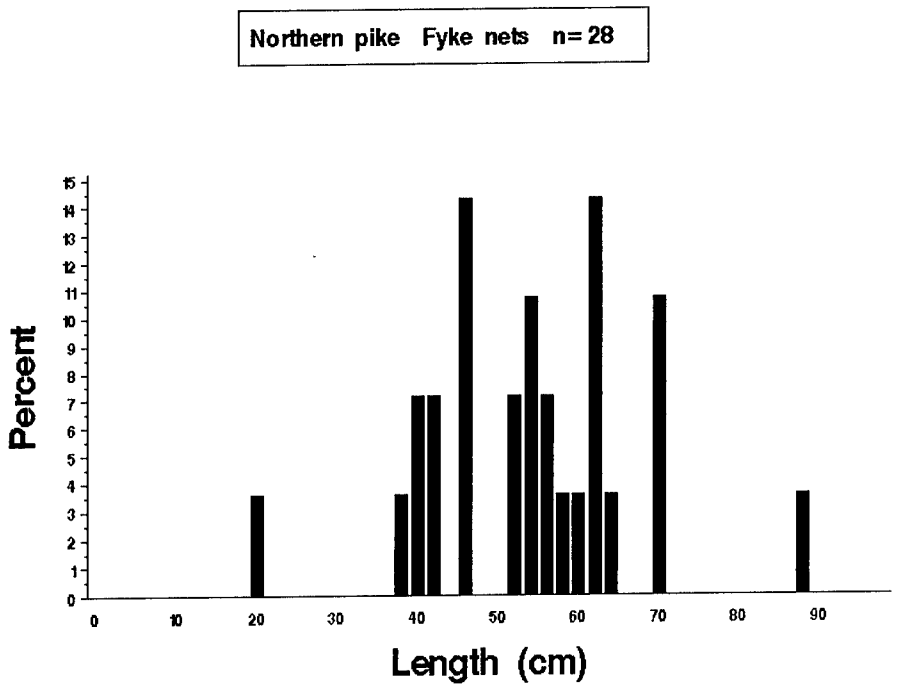


**Figure 1.9.** Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 4 during 1999.

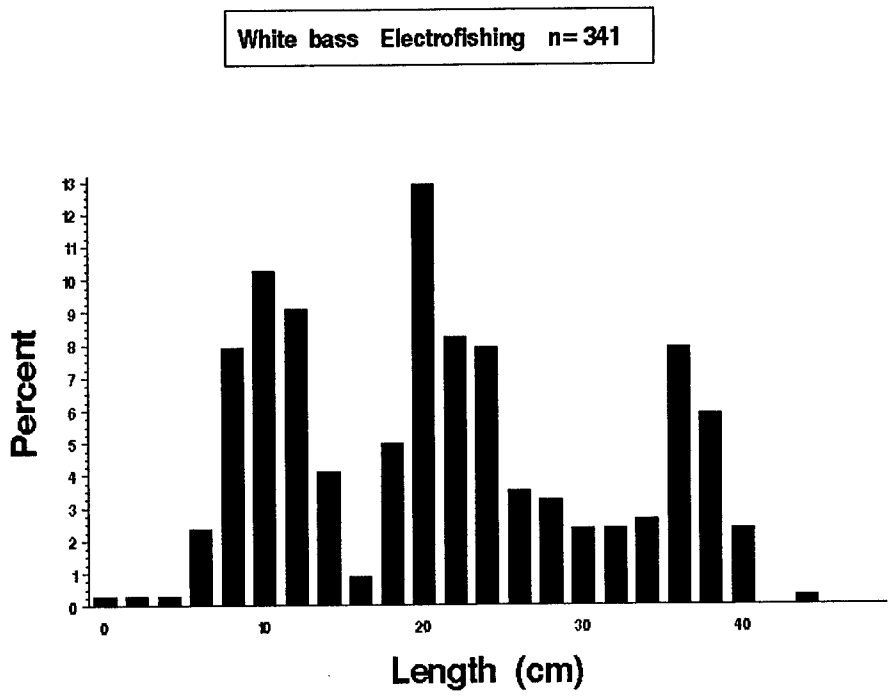


**Figure 1.10.** Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

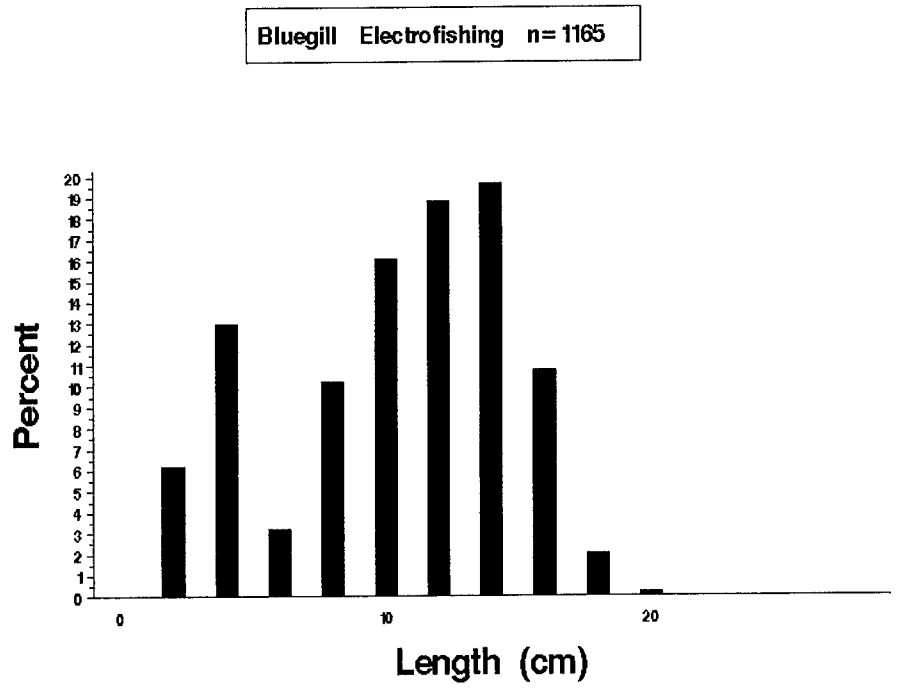


**Figure 1.11.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

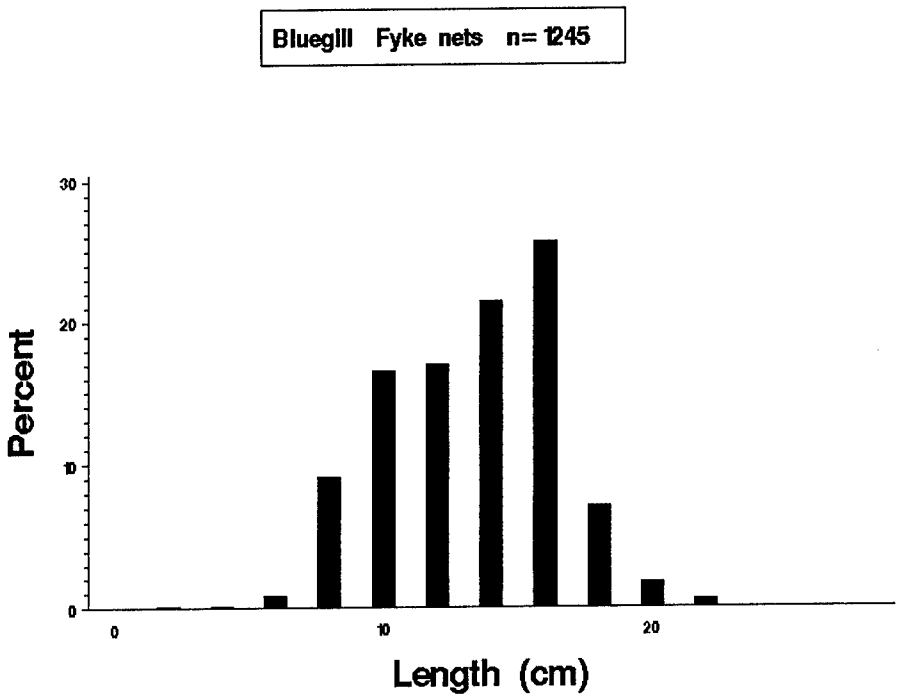


**Figure 1.12.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 4 during 1999.

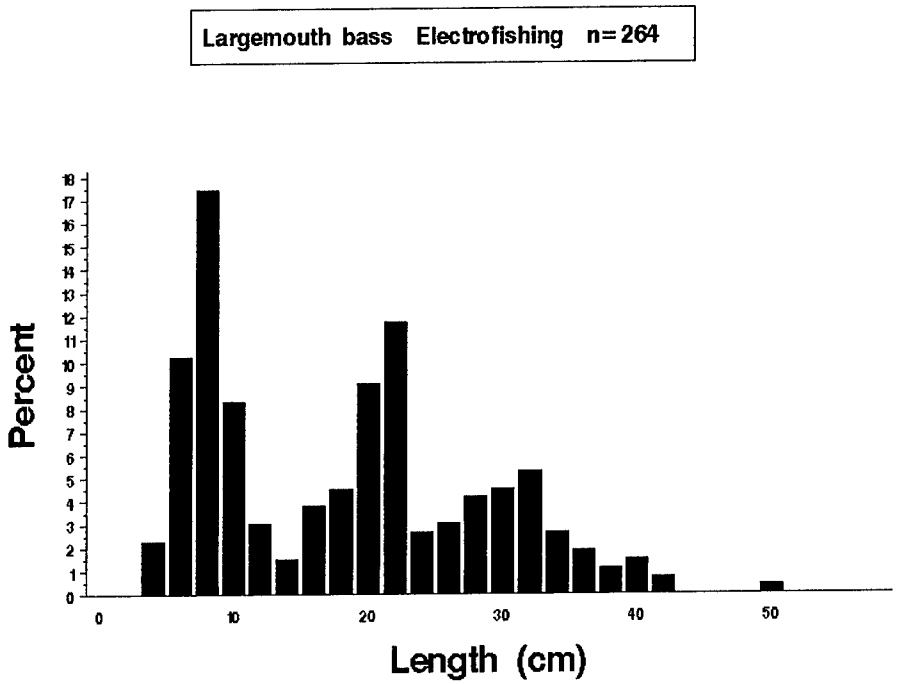


**Figure 1.13.** Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

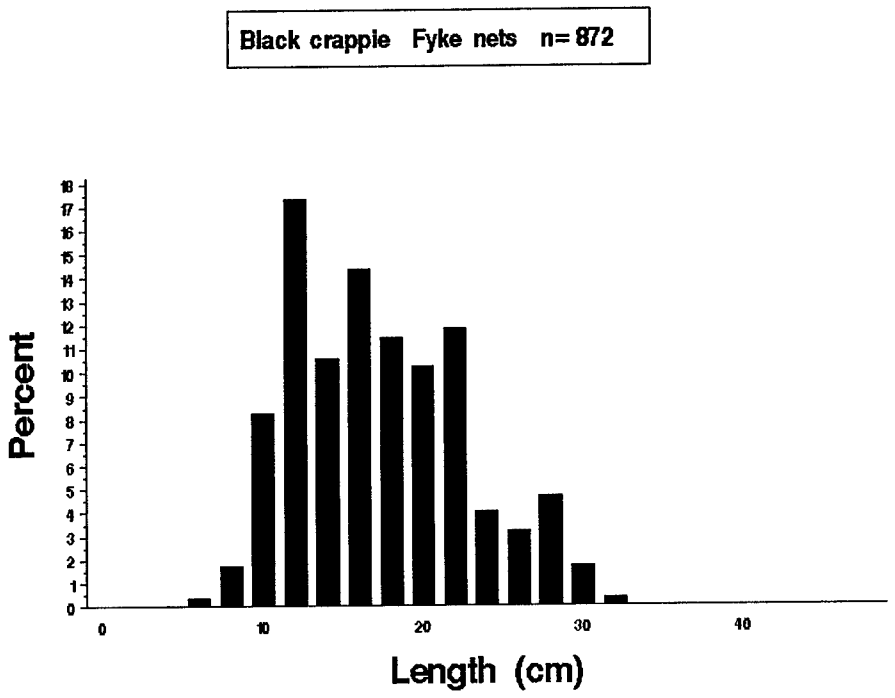


**Figure 1.14.** Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 4 during 1999.

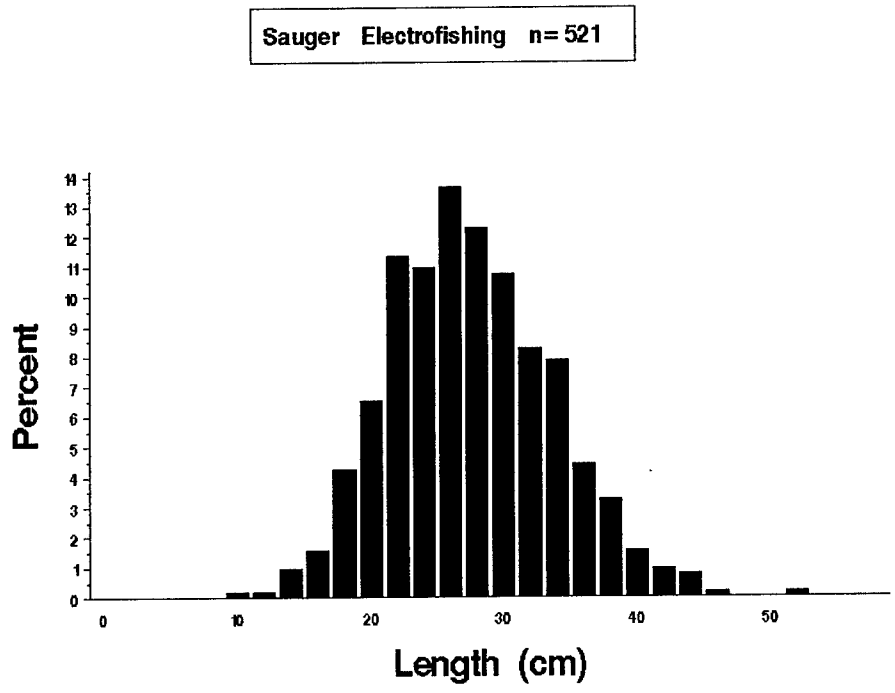


**Figure 1.15.** Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

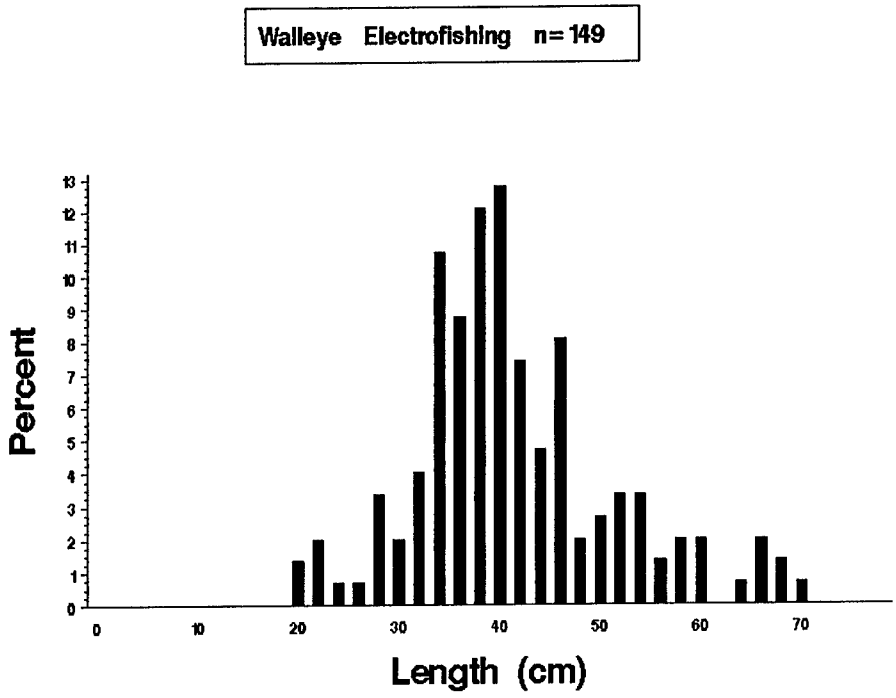


**Figure 1.16.** Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

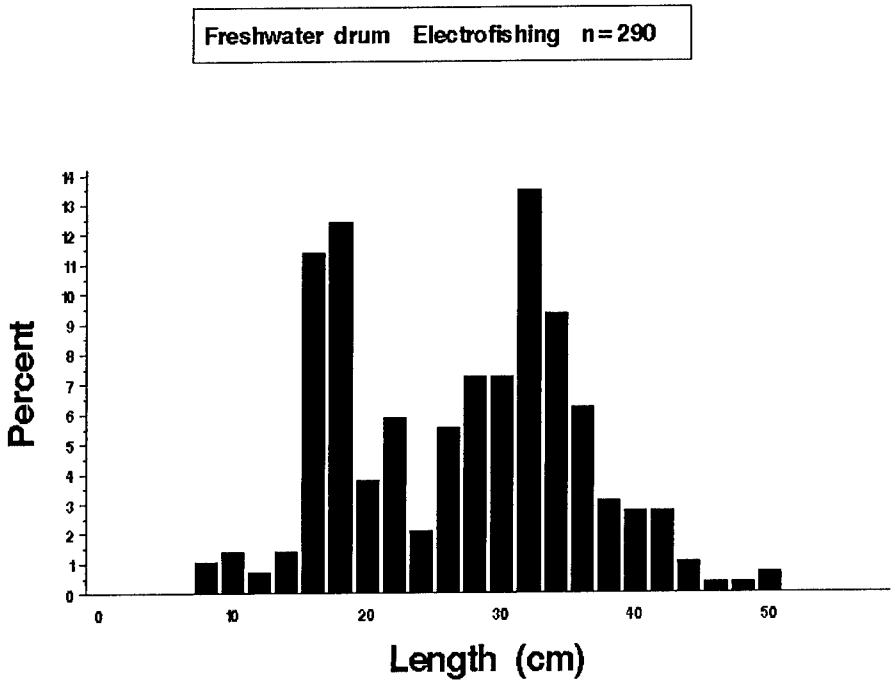


**Figure 1.17.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 4 during 1999.

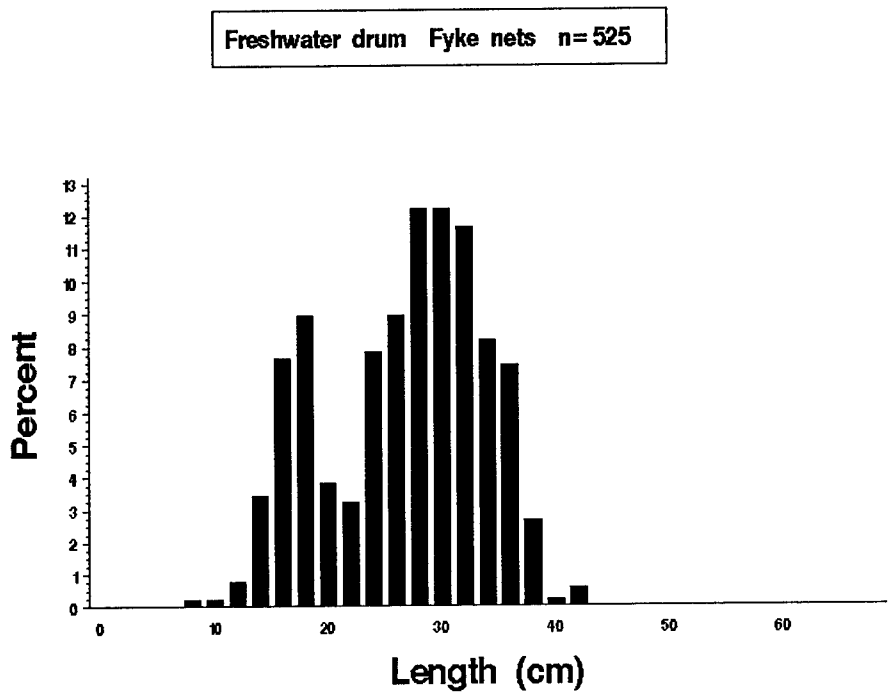


**Figure 1.18.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 4 during 1999.

# Chapter 2. Pool 8, Upper Mississippi River

by

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## Hydrograph

The 1999 hydrograph for Pool 8 (Figure 2.1) featured two spring peaks, one in April that coincided with the postimpoundment mean and one in late May during a period when water levels are typically receding. Except for a short period of lower-than- normal water elevations in late June, high water levels persisted until late August. Elevations for the remainder of the year were slightly below the long-term (58-year) postimpoundment mean. Sampling activities were not adversely effected by water elevations in 1999. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

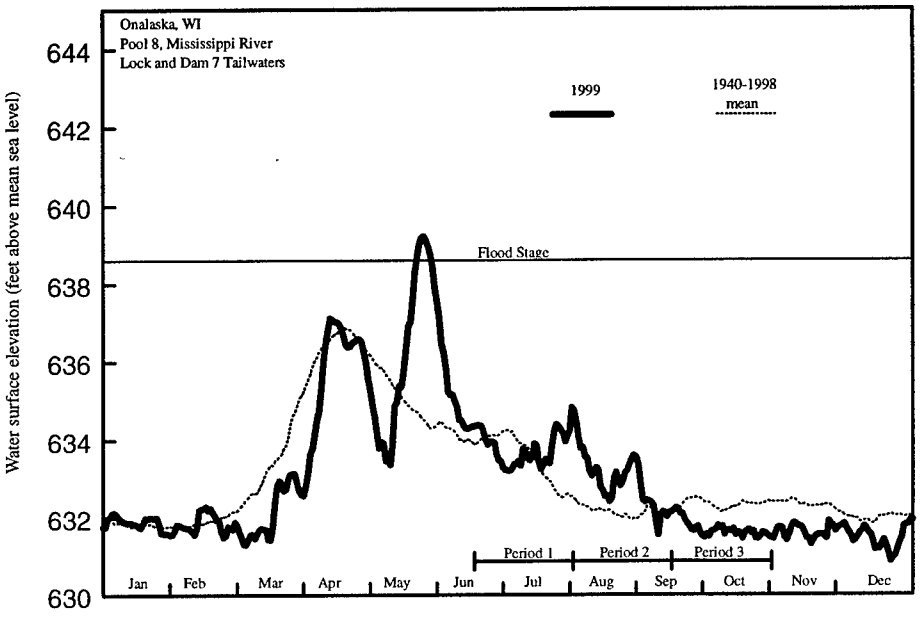


**Figure 2.1.** Daily water surface elevation from Lock and Dam 7 for Pool 8, Upper Mississippi River, during 1999 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

## Summary of Sampling Effort

We made 550 fish collections in Pool 8 during 1999 using 10 gear types (Table 2.1). Gear allocations among strata remained nearly consistent for all three sampling periods, although one SCB seining collection was missed in period 3, and one mini fyke netting was collected in the wrong stratum (MCBU instead of SCB; Table 2.1). Of the total number of collections, 460 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 the MCBU and SCB, received the most sampling effort.

## Total Catch by Gear

A total of 54,631 fish were collected representing 72 species and 6 hybrids in 1999 (Table 2.2). This total does not include 2,132 fish (<30 mm long) identified only to family or genus. The five most abundant species in our samples were emerald shiner (13,030), bluegill (9,961), spotfin shiner (6,256), mimic shiner (3,805), and river shiner (2,450). Total species (excluding hybrids) collected by gear type were as follows: day electrofishing (57), night electrofishing (60), fyke netting (31), tandem fyke netting (34), mini fyke netting (46), tandem mini fyke netting (34), seining (41), small hoop netting (24), large hoop netting (24), and bottom trawling (6). Fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 8. Our species total before the 1999 season was 91; no new species were added to this total during 1999. No Wisconsin-listed endangered species were encountered in 1999, but we collected 6 blue suckers, 59 river redhorse, and 6 speckled chubs—all of which are threatened in Wisconsin.

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

### *Day Electrofishing*

Poolwide mean catch-per-unit-effort (*C/f*) by day electrofishing was highest for emerald shiner (52.24), bluegill (18.08), and spotfin shiner (16.29; Table 2.3.1). By stratum, bluegill had the highest *C/f* in the BWCS (29.79), gizzard shad had the highest *C/f* in the IMPS (11.92) and MCBW (14.82), and emerald shiner had the highest *C/f* in the MCBU (158.78) and SCB (30.25).

### *Night Electrofishing*

Poolwide mean *C/f* by night electrofishing was highest for emerald shiner (63.98), bluegill (31.33), and spotfin shiner (23.32; Table 2.3.2). By stratum, bluegill had the highest *C/f* in the BWCS (29.67), emerald shiner had the highest *C/f* in the MCBU (110.92), MCBW (11.12), and SCB (84.00).

### *Fyke Net*

Poolwide mean *C/f* by fyke netting was highest for bluegill (33.69), black crappie (14.51), and silver redhorse (2.84; Table 2.3.3). By stratum, bluegill had the highest *C/f* in the BWCS (37.97) and IMPS (4.27).

### *Tandem Fyke Net*

Poolwide mean *C/f* by tandem fyke netting was highest for bluegill (5.94), black crappie (2.39), and white bass (2.04; Table 2.3.4). By stratum, bluegill had the highest *C/f* in the BWCO (29.07) and IMPO (2.69).

### *Mini Fyke Net*

Poolwide mean *C/f* by mini fyke netting was highest for bluegill (23.36), unidentified *Lepomis* sp. (13.41), and spotfin shiner (11.77; Table 2.3.5). By stratum, bluegill had the highest *C/f* in the BWCS (28.94), MCBU (9.32), and SCB (26.77), bullhead minnow had the highest *C/f* in the IMPS (28.69), and spotfin shiner had the highest *C/f* in the MCBW (44.62).

### *Tandem Mini Fyke Net*

Poolwide mean *C/f* by tandem mini fyke netting was highest for mimic shiner (53.23), spotfin shiner (4.58), and bluegill (4.52; Table 2.3.6). By stratum, bluegill had the highest *C/f* in the BWCO (30.35) and mimic shiner had the highest *C/f* in the IMPO (60.37).

### *Small Hoop Net*

Poolwide mean *C/f* by small hoop netting was highest for channel catfish (0.56), shorthead redhorse (0.35), and bluegill (0.33; Table 2.3.7). By stratum, bluegill had the highest *C/f* in the BWCO (3.07), shorthead redhorse had the highest *C/f* in the IMPO (0.24), and channel catfish had the highest *C/f* in the MCBU (2.15), MCBW (1.05), and SCB (1.39).

### *Large Hoop Net*

Poolwide mean *C/f* by large hoop netting was highest for channel catfish (1.11), bluegill (0.69), and shorthead redhorse (0.65; Table 2.3.8). By stratum, bluegill had the highest *C/f* in the BWCO (5.18), shorthead redhorse had the highest *C/f* in the IMPO (0.24), channel catfish had the highest *C/f* in the IMPO (1.01) and SCB (1.39), smallmouth buffalo had the highest *C/f* in the MCBU (1.54), and silver redhorse had the highest *C/f* in the MCBW (1.30).

### *Seine*

Poolwide mean *C/f* by seining was highest for emerald shiner (63.36), spotfin shiner (26.35), and mimic shiner (16.55; Table 2.3.9). By stratum, emerald shiner had the highest *C/f* in the BWCS (80.17) and MCBU (111.88), and bluegill had the highest *C/f* in the SCB (29.60).

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

All fixed-site sampling was confined to the BWCS and TWZ strata using a combination of day and night electrofishing, fyke netting, mini fyke netting, small and large hoop netting, and bottom trawling.

### *Day Electrofishing*

At the two fixed BWCS sites, *C/f* by day electrofishing was highest for bluegill (40.84), largemouth bass (21.44), and emerald shiner (19.09; Table 2.4.1).

### *Night Electrofishing*

At the four fixed TWZ sites, *C/f* by night electrofishing was highest for sauger ( 40.79), bluegill (29.79), and largemouth bass (15.99; Table 2.4.2).

### *Fyke Net*

At the two fixed BWCS sites, *C/f* by fyke netting was highest for bluegill (89.68), black crappie (12.39), and yellow perch (4.47; Table 2.4.3).

### *Mini Fyke Net*

At the two fixed TWZ sites, *C/f* by mini fyke netting was highest for spotfin shiner (30.60), emerald shiner (24.85), and weed shiner (20.50; Table 2.4.4).

### *Small Hoop Net*

At the two fixed TWZ sites, *C/f* by small hoop netting was highest for channel catfish (2.50), common carp (0.93), and shorthead redhorse (0.50; Table 2.4.5).

### *Large Hoop Net*

At the two fixed TWZ sites, *C/f* by large hoop netting was highest for black crappie (4.84), bluegill (1.73), and channel catfish (1.65; Table 2.4.6).

### *Seine*

At the two fixed BWCS sites, *C/f* by seining was highest for emerald shiner (49.67), spotfin shiner (18.75), and bluegill (14.75; Table 2.4.7). At the two fixed TWZ sites, *C/f* was highest for spotfin shiner (60.92), river shiner (49.67), and emerald shiner (40.42).

### *Bottom Trawl*

At the fixed TWZ site, *C/f* by bottom trawling was highest for sauger (1.00), channel catfish (0.42), and freshwater drum (0.25; Table 2.4.8).

## 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 of fewer than 100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

### *Gizzard Shad*

The length distribution of 1,415 gizzard shad collected by electrofishing during 1999 (Figure 2.2) was dominated by age-0 fish. About 80% of gizzard shad collected were less than 15 cm in total length. The largest gizzard shad collected was about 46 cm long.

### *Common Carp*

The length distribution of 563 common carp collected by electrofishing during 1999 (Figure 2.3) showed a large group of fish between 48 and 70 cm in total length. Few common carp were collected that ranged in length between about 15 and 35 cm long. Fish of this size may not be susceptible to our gear or are lost from the population, as they are seldom sampled by LTRMP methods in Pool 8.

### *Smallmouth Buffalo*

The length distribution of 17 smallmouth buffalo collected by electrofishing during 1999 (Figure 2.4) indicated the presence of fish mainly between 24 and 32 cm long. Detectable year classes for this large river species seem inconsistent, occurring in only 1 out of 3 or 4 years. The length distribution of 67 smallmouth buffalo collected by small and large hoop netting (Figure 2.5) in 1999 was dominated by smallmouth buffalo greater than 40 cm in total length. A substantial number of smallmouth buffalo between 44 and 48 cm long were probably from a successful 1994 year class.

### *Channel Catfish*

The length distribution of 44 channel catfish collected by electrofishing and 303 channel catfish collected by small and large hoop netting during 1999 (Figures 2.6 and 2.7, respectively) showed a range of fish between 20 and 64 cm long. Hoop netting indicated the presence of many channel catfish between 34 and 40 cm long. Fifty-six percent of channel catfish collected by hoop netting were greater than ~38 cm (15 inches) in length.

### *Northern Pike*

The length distribution of 101 northern pike collected by electrofishing (Figure 2.8) and 85 northern pike collected by fyke netting (Figure 2.9) showed fish of all sizes present between 10 and 90 cm. Twenty-eight percent of northern pike collected by fyke netting were greater than 66 cm (26 inches), which is the minimum legal size for northern pike in most inland waters in southern Wisconsin.

### *White Bass*

The length distribution of 437 white bass collected by electrofishing during 1999 (Figure 2.10) showed many fish between 14 and 22 cm long. More than 20% of white bass collected were greater than ~20 cm (8 inches) in length.

### *Bluegill*

The length distribution of 3,295 bluegills collected by electrofishing during 1999 (Figure 2.11) was skewed toward small fish, with about 75% of the catch less than 12 cm long. The length distribution of 3,301 bluegills collected by fyke netting during 1999 (Figure 2.12) averaged much larger than that from electrofishing. Most of these fish ranged between 8 and 18 cm long. The percentage of quality-sized fish (>15 cm or 6 inches long; Anderson 1978) collected by fyke netting was about 37%.

### *Largemouth Bass*

The length distribution of 1,279 largemouth bass collected by electrofishing during 1999 (Figure 2.13) was widely distributed between 4 and 40 cm long. Large groups present in the catch consisted of young-of-the-year largemouth bass ranging from 4 to 10 cm long, and also the 1998 cohort centered around 19 cm. Only about 5% of largemouth bass collected were greater than 35 cm (~14 inches), which is the minimum legal size for anglers to keep in this reach of the Mississippi River.

### *White Crappie*

The length distribution of 33 white crappies collected by fyke netting during 1999 (Figure 2.14) showed an even distribution of medium and large fish, but few juveniles. White crappies are 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*

The length distribution of 954 black crappies collected by fyke netting during 1999 (Figure 2.15) showed that most of the fish ranged between 12 and 26 cm long. About 36% of black crappies collected were greater than ~20 cm (8 inches) in total length.

### *Sauger*

The length distribution of 1,202 saugers collected by electrofishing during 1999 (Figure 2.16) was dominated by a large group of fish about 16–22 cm long. Only 2% of saugers collected were greater than ~30 cm (12 inches) in length.

### *Walleye*

The length distribution of 234 walleyes collected by electrofishing during 1999 (Figure 2.17) was dominated by young-of-the-year and age 1+ fish. The complete size range of walleye extended between 8 and 70 cm long. Fifteen percent of walleyes collected were greater than ~38 cm (15 inches) in total length, which is the minimum legal size for anglers to keep in this reach of the Mississippi River.

### *Freshwater Drum*

The length distributions of 181 freshwater drum collected by electrofishing (Figure 2.18) and 195 freshwater drum collected by fyke netting during 1999 (Figure 2.19) were nearly identical. Both showed peaks around 200, 280, and 360 cm. For both gears, the complete fish size range extended between about 10 and 50 cm long.

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 1999. 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 | | 5 | 5 | 4 | 4 | | | 2 | 28 |
| Night electrofishing | 2 | | 4 | 4 | 4 | | | | 4 | 18 |
| Seine | 8 | | 2 | 8 | | | | | 4 | 22 |
| Trawling | | | | | | | | | 4 | 4 |
| Tandem fyke net | | 4 | | | | | 2 | | | 6 |
| Tandem mini fyke net | | 4 | | | | | 2 | | | 6 |
| SUBTOTAL | 46 | 16 | 27 | 31 | 20 | 12 | 12 | 0 | 18 | 182 |
| | 138 | 48 | 87 | 91 | 60 | 36 | 36 | 0 | 54 | 550 |

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 2.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | 5 | 5 | 2 | - | - | - | - | - | - | - | - | - | 12 |
| 2 | Silver lamprey | Ichthyomyzon unicuspis | 8 | 1 | - | - | - | - | - | 1 | - | - | - | - | 10 |
| 3 | Unidentified lamprey | Petromyzontidae | 1 | 2 | - | - | - | - | - | - | - | - | - | - | 3 |
| 4 | Shovelnose sturgeon | Scaphirhynchus platorynchus | - | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 |
| 5 | Longnose gar | Lepisosteus osseus | 22 | 23 | 62 | 33 | 3 | 7 | 1 | - | 3 | - | - | - | 154 |
| 6 | Shortnose gar | Lepisosteus platostomus | 9 | 4 | 130 | 56 | 37 | 4 | - | 1 | 2 | - | - | - | 243 |
| 7 | Bowfin | Amia calva | 15 | 4 | 32 | 14 | 2 | - | 1 | 3 | 5 | - | - | - | 76 |
| 8 | Mooneye | Hiodon tergisus | 1 | 19 | - | 1 | - | - | - | - | - | - | - | - | 21 |
| 9 | Gizzard shad | Dorosoma cepedianum | 1063 | 352 | 48 | 7 | 196 | 12 | 110 | - | - | - | - | - | 1788 |
| 10 | Spotfin shiner | Cyprinella spiloptera | 1280 | 870 | - | - | 1392 | 79 | 2635 | - | - | - | - | - | 6256 |
| 11 | Common carp | Cyprinus carpio | 380 | 183 | 90 | 37 | 14 | 4 | 1 | 16 | 22 | - | - | - | 747 |
| 12 | Mississippi silvery minnow | Hybognathus nuchalis | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| 13 | Speckled chub | Macrhybopsis aestivalis | - | - | - | - | 5 | 1 | - | - | - | - | - | - | 6 |
| 14 | Silver chub | Macrhybopsis storeriana | - | 5 | - | - | - | - | - | 3 | - | - | - | - | 8 |
| 15 | Golden shiner | Notemigonus crysoleucas | 33 | 1 | 1 | 8 | 20 | - | 11 | - | - | - | - | - | 74 |
| 16 | Emerald shiner | Notropis atherinoides | 4290 | 2868 | - | - | 775 | 180 | 4917 | - | - | - | - | - | 13030 |
| 17 | River shiner | Notropis blennius | 426 | 518 | - | - | 82 | 13 | 1411 | - | - | - | - | - | 2450 |
| 18 | Spottail shiner | Notropis hudsonius | 19 | 12 | - | - | 29 | 1 | 25 | - | - | - | - | - | 86 |
| 19 | Sand shiner | Notropis stramineus | 3 | 2 | - | - | - | - | 4 | - | - | - | - | - | 9 |
| 20 | Weed shiner | Notropis texanus | 25 | 6 | - | - | 293 | 6 | 120 | - | - | - | - | - | 450 |
| 21 | Mimic shiner | Notropis volucellus | 276 | 788 | - | - | 217 | 771 | 1753 | - | - | - | - | - | 3805 |
| 22 | Pugnose minnow | Opsopoeodus emiliae | 32 | 16 | - | - | 373 | 248 | 73 | - | - | - | - | - | 742 |
| 23 | Bluntnose minnow | Pimephales notatus | 2 | - | - | - | 2 | - | - | - | - | - | - | - | 4 |
| 24 | Fathead minnow | Pimephales promelas | - | - | - | - | 2 | 1 | - | - | - | - | - | - | 3 |
| 25 | Bullhead minnow | Pimephales vigilax | 528 | 366 | - | - | 654 | 79 | 402 | - | - | - | - | - | 2029 |
| 26 | Unidentified minnow | Unidentified Cyprinidae | - | 1 | - | - | 65 | - | 125 | - | - | - | - | - | 191 |
| 27 | River carpsucker | Carpiodes carpio | 11 | - | 6 | 2 | - | - | - | - | 5 | - | - | - | 24 |
| 28 | Quillback | Carpiodes cyprinus | 5 | 11 | 5 | - | - | - | 1 | - | - | - | - | - | 22 |
| 29 | Highfin carpsucker | Carpiodes velifer | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 30 | White sucker | Catostomus commersoni | 1 | 2 | 1 | - | - | - | - | 1 | - | - | - | - | 5 |
| 31 | Blue sucker | Cycleptus elongatus | 2 | 4 | - | - | - | - | - | - | - | - | - | - | 6 |
| 32 | Northern hog sucker | Hypentelium nigricans | - | 1 | - | - | - | - | 1 | - | - | - | - | - | 2 |
| 33 | Smallmouth buffalo | Ictiobus bubalus | 12 | 5 | 3 | 3 | - | - | - | 1 | 66 | - | - | - | 90 |
| 34 | Bigmouth buffalo | Ictiobus cyprinellus | 4 | 2 | - | - | - | - | - | - | - | - | - | - | 6 |
| 35 | Spotted sucker | Minytrema melanops | 129 | 46 | 19 | 15 | 2 | - | - | 1 | 10 | - | - | - | 222 |
| 36 | Silver redhorse | Moxostoma anisurum | 263 | 207 | 163 | 67 | 4 | 1 | 5 | 6 | 69 | - | - | 2 | 787 |
| 37 | River redhorse | Moxostoma carinatum | 31 | 28 | - | - | - | - | - | - | - | - | - | - | 59 |
| 38 | Golden redhorse | Moxostoma erythrurum | 217 | 173 | 12 | 5 | - | - | - | 3 | 7 | - | - | - | 417 |
| 39 | Shorthead redhorse | Moxostoma macrolepidotum | 575 | 593 | 89 | 58 | 5 | 2 | 3 | 45 | 94 | - | - | 2 | 1466 |

Gears:
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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 collected by the Long Term Resource Program during 1999 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 | Unidentified redhorse | Moxostoma sp. | 2 | 2 | - | - | 5 | - | 1 | - | - | - | - | - | 10 |
| 41 | Black bullhead | Ameiurus melas | - | - | - | 2 | 3 | - | - | - | - | - | - | - | 5 |
| 42 | Yellow bullhead | Ameiurus natalis | - | - | - | 4 | - | - | - | 1 | 1 | - | - | - | 6 |
| 43 | Brown bullhead | Ameiurus nebulosus | - | - | - | 5 | - | - | - | - | - | - | - | - | 5 |
| 44 | Channel catfish | Ictalurus punctatus | 30 | 14 | 3 | 3 | 1 | 2 | 1 | 148 | 155 | - | - | 5 | 362 |
| 45 | Tadpole madtom | Noturus gyrinus | - | 7 | - | - | 63 | 3 | 6 | - | - | - | - | - | 79 |
| 46 | Flathead catfish | Pylodictis olivaris | 5 | 5 | 18 | 7 | 12 | 14 | 1 | 3 | 19 | - | - | - | 84 |
| 47 | Northern pike | Esox lucius | 57 | 44 | 57 | 28 | 3 | - | 5 | - | 10 | - | - | - | 204 |
| 48 | Central mudminnow | Umbra limi | - | - | - | - | 4 | - | - | - | - | - | - | - | 4 |
| 49 | Trout perch | Percopsis omiscomaycus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 50 | Pirate perch | Aphredoderus sayanus | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 51 | Burbot | Lota lota | - | 3 | - | - | - | - | - | - | - | - | - | - | 3 |
| 52 | Brook silverside | Labidesthes sicculus | 61 | 143 | - | - | 23 | - | 232 | - | - | - | - | - | 459 |
| 53 | White bass | Morone chrysops | 38 | 399 | 81 | 54 | 7 | 5 | 29 | 4 | 8 | - | - | - | 625 |
| 54 | Yellow bass | Morone mississippiensis | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| 55 | Rock bass | Ambloplites rupestris | 159 | 209 | 48 | 18 | 37 | 12 | 36 | 10 | - | - | - | - | 529 |
| 56 | Green sunfish | Lepomis cyanellus | 44 | 12 | 5 | 1 | 24 | - | 1 | - | - | - | - | - | 87 |
| 57 | Pumpkinseed | Lepomis gibbosus | 36 | 6 | 57 | 13 | 85 | 10 | 2 | - | 3 | - | - | - | 212 |
| 58 | Warmouth | Lepomis gulosus | 2 | 1 | - | 30 | 7 | 7 | - | 1 | - | - | - | - | 48 |
| 59 | Orangespotted sunfish | Lepomis humilis | 48 | 21 | 1 | 1 | 5 | 9 | 6 | 1 | - | - | - | - | 92 |
| 60 | Bluegill | Lepomis macrochirus | 1879 | 1416 | 2559 | 742 | 1630 | 804 | 641 | 92 | 198 | - | - | - | 9961 |
| 61 | Green x pumpkinseed sunfish | L. cyanellus x gibbosus | 1 | 3 | - | - | 3 | - | - | - | - | - | - | - | 7 |
| 62 | Green x bluegill sunfish | L. cyanellus x macrochirus | 1 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | 5 |
| 63 | Pumpkinseed x warmouth | L. gibbosus x gulosus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 64 | Pumpkinseed x bluegill | L. gibbosus x macrochirus | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 |
| 65 | Unidentified Lepomis | Lepomis sp. | 92 | 81 | - | - | 761 | 357 | 637 | - | - | - | - | - | 1928 |
| 66 | Smallmouth bass | Micropterus dolomieu | 335 | 425 | - | 1 | 7 | - | 9 | - | 5 | - | - | - | 782 |
| 67 | Largemouth bass | Micropterus salmoides | 779 | 500 | 30 | 7 | 64 | 2 | 146 | 1 | 4 | - | - | - | 1533 |
| 68 | White crappie | Pomoxis annularis | 2 | 1 | 29 | 4 | - | 4 | 1 | - | 3 | - | - | - | 44 |
| 69 | Black crappie | Pomoxis nigromaculatus | 111 | 100 | 763 | 191 | 28 | 41 | 23 | 10 | 186 | - | - | - | 1453 |
| 70 | Black x white crappie | P. nigromaculatus x annularis | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 |
| 71 | Western sand darter | Ammocrypta clara | 4 | 19 | - | - | 1 | - | 91 | - | - | - | - | - | 115 |
| 72 | Mud darter | Etheostoma asprigene | 7 | 3 | - | - | 4 | 1 | 9 | - | - | - | - | - | 24 |
| 73 | Iowa darter | Etheostoma exile | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 74 | Johnny darter | Etheostoma nigrum | 38 | 16 | - | - | 19 | 4 | 59 | - | - | - | - | - | 136 |
| 75 | Yellow perch | Perca flavescens | 76 | 105 | 138 | 166 | - | 11 | 5 | 25 | 2 | - | - | - | 528 |
| 76 | Logperch | Percina caprodes | 56 | 26 | - | - | 5 | - | 27 | - | - | - | - | - | 114 |
| 77 | Slenderhead darter | Percina phoxocephala | 2 | 1 | - | - | - | - | 1 | - | - | - | - | - | 4 |
| 78 | River darter | Percina shumardi | 1 | 2 | - | - | - | 2 | - | - | - | - | - | - | 5 |

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

Table 2.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | Sauger | Stizostedion canadense | 114 | 1088 | 37 | 20 | 12 | 1 | - | 3 | - | - | - | 12 | 1287 |
| 80 | Walleye | Stizostedion vitreum | 24 | 210 | 12 | 13 | 2 | - | 2 | - | 3 | - | - | - | 266 |
| 81 | Sauger x walleye hybrid | S. canadense x vitreum | - | 2 | 1 | 2 | - | - | - | - | - | - | - | - | 5 |
| 82 | Freshwater drum | Aplodinotus grunniens | 38 | 143 | 116 | 79 | 8 | 5 | 2 | 13 | 30 | - | - | 3 | 437 |
| | | | 13712 | 12129 | 4622 | 1697 | 6999 | 2703 | 13572 | 393 | 911 | 0 | 0 | 25 | 56763 |

Gears:
D - Day electrofishing
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HS - Small hoop netting
HL - Large hoop netting
G - Gill netting
TA - Trammel netting, anchored sets
T - Trawling (4.8-m bottom trawl)

Table 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.07 | 0.00 | 0.00 | 0.11 | 0.00 | 0.13 |
| | (0.04) | (0.00) | (0.00) | (0.08) | (0.00) | (0.09) |
| Silver lamprey | 0.11 | 0.04 | 0.08 | 0.11 | 0.00 | 0.17 |
| | (0.05) | (0.04) | (0.08) | (0.08) | (0.00) | (0.13) |
| Unidentified lamprey | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.04) |
| Longnose gar | 0.17 | 0.13 | 0.33 | 0.22 | 0.21 | 0.17 |
| | (0.05) | (0.07) | (0.19) | (0.13) | (0.21) | (0.10) |
| Shortnose gar | 0.08 | 0.04 | 0.33 | 0.06 | 0.04 | 0.08 |
| | (0.03) | (0.04) | (0.26) | (0.06) | (0.04) | (0.06) |
| Bowfin | 0.18 | 0.33 | 0.17 | 0.00 | 0.00 | 0.17 |
| | (0.06) | (0.16) | (0.11) | (0.00) | (0.00) | (0.08) |
| Mooneye | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.04) |
| Gizzard shad | 7.30 | 10.67 | 11.92 | 4.00 | 14.82 | 5.63 |
| | (2.48) | (5.92) | (4.62) | (2.09) | (14.42) | (3.57) |
| Spotfin shiner | 16.29 | 14.92 | 10.00 | 10.50 | 0.08 | 21.96 |
| | (2.65) | (3.55) | (8.23) | (2.53) | (0.05) | (5.96) |
| Common carp | 4.34 | 2.58 | 8.00 | 3.11 | 0.27 | 6.21 |
| | (0.64) | (0.64) | (5.95) | (0.96) | (0.08) | (1.28) |
| Golden shiner | 0.46 | 1.29 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.12) | (0.35) | (0.00) | (0.00) | (0.00) | (0.04) |
| Emerald shiner | 52.24 | 11.79 | 8.17 | 158.78 | 1.35 | 30.25 |
| | (31.19) | (4.29) | (3.33) | (134.62) | (0.78) | (13.76) |
| River shiner | 5.32 | 0.88 | 1.17 | 17.67 | 0.00 | 2.42 |
| | (1.54) | (0.46) | (1.00) | (6.61) | (0.00) | (0.73) |
| Spottail shiner | 0.16 | 0.29 | 0.17 | 0.11 | 0.00 | 0.08 |
| | (0.07) | (0.19) | (0.11) | (0.08) | (0.00) | (0.06) |
| Sand shiner | 0.04 | 0.00 | 0.00 | 0.06 | 0.00 | 0.08 |
| | (0.03) | (0.00) | (0.00) | (0.06) | (0.00) | (0.08) |
| Weed shiner | 0.32 | 0.46 | 0.17 | 0.39 | 0.04 | 0.17 |
| | (0.09) | (0.16) | (0.17) | (0.27) | (0.04) | (0.12) |
| Mimic shiner | 2.73 | 0.67 | 4.33 | 6.39 | 0.04 | 2.17 |
| | (0.75) | (0.41) | (3.89) | (2.60) | (0.04) | (1.03) |
| Pugnose minnow | 0.35 | 0.75 | 0.00 | 0.06 | 0.00 | 0.21 |
| | (0.09) | (0.22) | (0.00) | (0.06) | (0.00) | (0.15) |
| Bluntnose minnow | 0.03 | 0.00 | 0.00 | 0.06 | 0.00 | 0.04 |
| | (0.02) | (0.00) | (0.00) | (0.06) | (0.00) | (0.04) |
| Bullhead minnow | 6.64 | 8.79 | 2.83 | 2.78 | 0.08 | 7.58 |
| | (1.52) | (2.95) | (1.87) | (1.05) | (0.08) | (2.95) |
| River carpsucker | 0.09 | 0.17 | 0.08 | 0.00 | 0.04 | 0.08 |
| | (0.04) | (0.12) | (0.08) | (0.00) | (0.04) | (0.06) |
| Quillback | 0.03 | 0.08 | 0.00 | 0.00 | 0.05 | 0.00 |
| | (0.03) | (0.08) | (0.00) | (0.00) | (0.05) | (0.00) |
| Blue sucker | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.07) | (0.00) |
| Smallmouth buffalo | 0.03 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.03) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) |
| Bigmouth buffalo | 0.04 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.03) | (0.09) | (0.00) | (0.00) | (0.00) | (0.00) |
| Spotted sucker | 1.23 | 2.42 | 0.00 | 0.06 | 0.00 | 1.04 |
| | (0.24) | (0.59) | (0.00) | (0.06) | (0.00) | (0.35) |
| Silver redhorse | 2.38 | 1.92 | 0.67 | 2.22 | 2.90 | 3.13 |
| | (0.35) | (0.47) | (0.36) | (0.56) | (0.83) | (0.75) |
| River redhorse | 0.02 | 0.00 | 0.00 | 0.06 | 1.25 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.06) | (0.42) | (0.00) |
| Golden redhorse | 1.84 | 1.00 | 0.25 | 3.44 | 2.84 | 1.83 |
| | (0.29) | (0.32) | (0.18) | (0.90) | (0.85) | (0.46) |

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 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Shorthead redhorse | 3.23 | 3.33 | 1.50 | 3.61 | 12.79 | 3.08 |
| | (0.45) | (0.95) | (0.51) | (0.98) | (2.52) | (0.56) |
| Unidentified redhorse | 0.01 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.17) | (0.00) | (0.00) | (0.00) |
| Channel catfish | 0.28 | 0.08 | 0.17 | 0.11 | 0.36 | 0.58 |
| | (0.09) | (0.06) | (0.11) | (0.08) | (0.16) | (0.24) |
| Flathead catfish | 0.07 | 0.04 | 0.00 | 0.11 | 0.00 | 0.08 |
| | (0.03) | (0.04) | (0.00) | (0.08) | (0.00) | (0.06) |
| Northern pike | 0.55 | 0.71 | 0.00 | 0.06 | 0.00 | 0.79 |
| | (0.17) | (0.22) | (0.00) | (0.06) | (0.00) | (0.42) |
| Pirate perch | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) | (0.00) |
| Brook silverside | 0.69 | 1.58 | 0.17 | 0.28 | 0.00 | 0.21 |
| | (0.20) | (0.56) | (0.11) | (0.18) | (0.00) | (0.08) |
| White bass | 0.35 | 0.33 | 0.75 | 0.67 | 0.04 | 0.13 |
| | (0.13) | (0.25) | (0.51) | (0.40) | (0.04) | (0.09) |
| Rock bass | 1.86 | 0.79 | 1.00 | 0.94 | 0.00 | 3.50 |
| | (0.31) | (0.21) | (0.66) | (0.47) | (0.00) | (0.75) |
| Green sunfish | 0.45 | 0.54 | 0.00 | 0.06 | 0.00 | 0.67 |
| | (0.13) | (0.22) | (0.00) | (0.06) | (0.00) | (0.27) |
| Pumpkinseed | 0.30 | 0.50 | 0.00 | 0.00 | 0.00 | 0.33 |
| | (0.09) | (0.18) | (0.00) | (0.00) | (0.00) | (0.19) |
| Warmouth | 0.03 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.03) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) |
| Orangespotted sunfish | 0.68 | 1.67 | 0.00 | 0.00 | 0.00 | 0.29 |
| | (0.44) | (1.27) | (0.00) | (0.00) | (0.00) | (0.21) |
| Bluegill | 18.08 | 29.79 | 3.42 | 4.67 | 0.33 | 17.71 |
| | (1.90) | (4.26) | (1.38) | (1.11) | (0.21) | (3.19) |
| Green sunfish x pumpkinseed | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) | (0.00) |
| Unidentified Lepomis | 0.97 | 1.83 | 0.00 | 0.06 | 0.00 | 0.88 |
| | (0.32) | (0.67) | (0.00) | (0.06) | (0.00) | (0.59) |
| Smallmouth bass | 3.52 | 0.63 | 2.75 | 7.00 | 2.20 | 4.13 |
| | (0.60) | (0.19) | (0.69) | (1.88) | (0.64) | (1.09) |
| Largemouth bass | 6.59 | 10.63 | 1.42 | 0.61 | 0.04 | 7.29 |
| | (0.93) | (1.99) | (0.80) | (0.22) | (0.04) | (1.70) |
| 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 | 0.80 | 1.38 | 0.08 | 0.06 | 0.37 | 0.83 |
| | (0.19) | (0.42) | (0.08) | (0.06) | (0.33) | (0.32) |
| Western sand darter | 0.05 | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.13) | (0.00) | (0.00) |
| Mud darter | 0.07 | 0.13 | 0.00 | 0.00 | 0.00 | 0.08 |
| | (0.03) | (0.07) | (0.00) | (0.00) | (0.00) | (0.06) |
| Johnny darter | 0.30 | 0.25 | 0.25 | 0.11 | 0.00 | 0.46 |
| | (0.09) | (0.11) | (0.13) | (0.08) | (0.00) | (0.21) |
| Yellow perch | 0.68 | 1.42 | 0.17 | 0.00 | 0.04 | 0.50 |
| | (0.15) | (0.39) | (0.17) | (0.00) | (0.04) | (0.18) |
| Logperch | 0.45 | 0.21 | 0.50 | 1.00 | 0.10 | 0.33 |
| | (0.10) | (0.12) | (0.23) | (0.28) | (0.07) | (0.17) |
| Slenderhead darter | 0.03 | 0.00 | 0.00 | 0.06 | 0.00 | 0.04 |
| | (0.02) | (0.00) | (0.00) | (0.06) | (0.00) | (0.04) |
| River darter | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.04) |
| Sauger | 1.18 | 1.71 | 1.08 | 0.50 | 0.34 | 1.13 |
| | (0.17) | (0.39) | (0.40) | (0.20) | (0.21) | (0.26) |
| Walleye | 0.23 | 0.50 | 0.08 | 0.06 | 0.19 | 0.13 |
| | (0.07) | (0.18) | (0.08) | (0.06) | (0.09) | (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 2.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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. Table page: 3

| Common name | ALL | BWCS | IMPS | MCBU | MCBW | SCB |
|---|---|---|---|---|---|---|
| Freshwater drum | 0.32 (0.12) | 0.63 (0.34) | 0.42 (0.26) | 0.11 (0.08) | 0.07 (0.05) | 0.17 (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 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.02 | 0.00 | 0.08 | 0.03 | 0.00 |
| | (0.02) | (0.00) | (0.08) | (0.03) | (0.00) |
| Unidentified lamprey | 0.04 | 0.00 | 0.17 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.11) | (0.00) | (0.00) |
| Shovelnose sturgeon | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.07) | (0.00) |
| Longnose gar | 0.37 | 0.17 | 0.33 | 0.44 | 0.58 |
| | (0.12) | (0.17) | (0.26) | (0.28) | (0.19) |
| Shortnose gar | 0.09 | 0.17 | 0.00 | 0.04 | 0.08 |
| | (0.07) | (0.17) | (0.00) | (0.04) | (0.08) |
| Mooneye | 0.04 | 0.00 | 0.17 | 0.38 | 0.00 |
| | (0.04) | (0.00) | (0.17) | (0.20) | (0.00) |
| Gizzard shad | 7.01 | 4.83 | 15.42 | 1.20 | 3.92 |
| | (2.98) | (2.51) | (11.56) | (0.28) | (1.48) |
| Spotfin shiner | 23.32 | 3.83 | 18.92 | 0.31 | 43.67 |
| | (10.27) | (1.51) | (14.76) | (0.20) | (24.20) |
| Common carp | 4.89 | 3.83 | 4.00 | 0.22 | 6.42 |
| | (1.15) | (2.04) | (1.60) | (0.08) | (2.00) |
| 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 | 0.14 | 0.17 | 0.33 | 0.00 | 0.00 |
| | (0.09) | (0.17) | (0.26) | (0.00) | (0.00) |
| Golden shiner | 0.03 | 0.00 | 0.00 | 0.00 | 0.08 |
| | (0.03) | (0.00) | (0.00) | (0.00) | (0.08) |
| Emerald shiner | 63.98 | 10.50 | 110.92 | 11.12 | 84.00 |
| | (15.30) | (4.28) | (33.88) | (8.95) | (32.34) |
| River shiner | 5.82 | 0.17 | 13.17 | 0.35 | 6.50 |
| | (2.48) | (0.17) | (4.50) | (0.24) | (5.61) |
| Spottail shiner | 0.29 | 0.17 | 0.00 | 0.00 | 0.58 |
| | (0.15) | (0.17) | (0.00) | (0.00) | (0.34) |
| Sand shiner | 0.04 | 0.00 | 0.17 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.11) | (0.00) | (0.00) |
| Weed shiner | 0.20 | 0.00 | 0.00 | 0.00 | 0.50 |
| | (0.09) | (0.00) | (0.00) | (0.00) | (0.23) |
| Mimic shiner | 13.57 | 0.17 | 25.33 | 2.35 | 18.58 |
| | (5.18) | (0.17) | (7.73) | (1.37) | (12.15) |
| Pugnose minnow | 0.57 | 0.67 | 0.00 | 0.00 | 0.83 |
| | (0.25) | (0.49) | (0.00) | (0.00) | (0.46) |
| Bullhead minnow | 12.53 | 11.00 | 4.50 | 0.00 | 18.83 |
| | (3.60) | (3.25) | (3.03) | (0.00) | (8.36) |
| Unidentified minnow | 0.02 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.08) | (0.00) | (0.00) |
| Quillback | 0.11 | 0.00 | 0.33 | 0.00 | 0.08 |
| | (0.09) | (0.00) | (0.33) | (0.00) | (0.08) |
| White sucker | 0.06 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.06) | (0.17) | (0.00) | (0.00) | (0.00) |
| Blue sucker | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.09) | (0.00) |
| Northern hog sucker | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.03) | (0.00) |
| Smallmouth buffalo | 0.09 | 0.00 | 0.08 | 0.04 | 0.17 |
| | (0.07) | (0.00) | (0.08) | (0.04) | (0.17) |
| Spotted sucker | 1.11 | 1.33 | 0.00 | 0.00 | 1.58 |
| | (0.43) | (0.95) | (0.00) | (0.00) | (0.67) |
| Silver redhorse | 4.51 | 7.00 | 2.50 | 1.56 | 3.50 |
| | (1.04) | (2.66) | (0.65) | (0.33) | (0.96) |
| River redhorse | 0.04 | 0.00 | 0.17 | 0.99 | 0.00 |
| | (0.03) | (0.00) | (0.11) | (0.34) | (0.00) |

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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 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Golden redhorse | 2.35 | 3.50 | 2.17 | 3.14 | 1.42 |
| | (0.67) | (1.59) | (0.89) | (1.53) | (0.72) |
| Shorthead redhorse | 7.59 | 7.33 | 12.25 | 8.79 | 5.00 |
| | (1.48) | (2.70) | (4.24) | (1.84) | (1.19) |
| Unidentified redhorse | 0.07 | 0.00 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.00) | (0.00) | (0.00) | (0.11) |
| Channel catfish | 0.12 | 0.00 | 0.08 | 0.17 | 0.25 |
| | (0.06) | (0.00) | (0.08) | (0.11) | (0.13) |
| Tadpole madtom | 0.22 | 0.33 | 0.00 | 0.00 | 0.25 |
| | (0.10) | (0.21) | (0.00) | (0.00) | (0.18) |
| Flathead catfish | 0.22 | 0.33 | 0.00 | 0.00 | 0.25 |
| | (0.09) | (0.21) | (0.00) | (0.00) | (0.13) |
| Northern pike | 0.41 | 0.00 | 0.17 | 0.00 | 0.92 |
| | (0.13) | (0.00) | (0.11) | (0.00) | (0.31) |
| Brook silverside | 2.85 | 1.67 | 3.00 | 0.23 | 3.83 |
| | (0.53) | (0.76) | (1.48) | (0.19) | (0.69) |
| White bass | 2.32 | 0.67 | 6.17 | 0.91 | 1.50 |
| | (0.49) | (0.49) | (1.67) | (0.29) | (0.56) |
| Rock bass | 4.68 | 3.83 | 2.00 | 0.20 | 7.08 |
| | (1.03) | (2.17) | (0.75) | (0.16) | (1.65) |
| Green sunfish | 0.29 | 0.33 | 0.00 | 0.00 | 0.42 |
| | (0.12) | (0.21) | (0.00) | (0.00) | (0.23) |
| Pumpkinseed | 0.16 | 0.17 | 0.00 | 0.00 | 0.25 |
| | (0.08) | (0.17) | (0.00) | (0.00) | (0.13) |
| Orangespotted sunfish | 1.02 | 2.00 | 0.00 | 0.00 | 0.75 |
| | (0.73) | (2.00) | (0.00) | (0.00) | (0.30) |
| Bluegill | 31.33 | 29.67 | 11.83 | 0.39 | 44.83 |
| | (5.92) | (9.94) | (4.28) | (0.24) | (11.62) |
| Green sunfish x pumpkinseed | 0.06 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.06) | (0.17) | (0.00) | (0.00) | (0.00) |
| Unidentified Lepomis | 2.94 | 3.33 | 0.08 | 0.09 | 4.33 |
| | (1.10) | (2.19) | (0.08) | (0.06) | (1.94) |
| Smallmouth bass | 4.35 | 1.00 | 8.42 | 3.27 | 4.92 |
| | (1.28) | (0.82) | (4.01) | (1.26) | (2.01) |
| Largemouth bass | 7.25 | 6.67 | 0.50 | 0.11 | 11.92 |
| | (1.42) | (1.94) | (0.29) | (0.08) | (3.12) |
| White crappie | 0.06 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.06) | (0.17) | (0.00) | (0.00) | (0.00) |
| Black crappie | 1.89 | 2.33 | 0.67 | 0.19 | 2.25 |
| | (0.39) | (0.76) | (0.36) | (0.11) | (0.65) |
| Western sand darter | 0.30 | 0.00 | 1.25 | 0.00 | 0.00 |
| | (0.21) | (0.00) | (0.86) | (0.00) | (0.00) |
| Mud darter | 0.13 | 0.17 | 0.00 | 0.00 | 0.17 |
| | (0.07) | (0.17) | (0.00) | (0.00) | (0.11) |
| Johnny darter | 0.43 | 0.33 | 0.33 | 0.07 | 0.58 |
| | (0.15) | (0.21) | (0.19) | (0.07) | (0.31) |
| Yellow perch | 0.94 | 1.00 | 0.08 | 0.00 | 1.42 |
| | (0.36) | (0.45) | (0.08) | (0.00) | (0.82) |
| Logperch | 0.39 | 0.33 | 0.58 | 0.21 | 0.33 |
| | (0.17) | (0.33) | (0.42) | (0.15) | (0.19) |
| Slenderhead darter | 0.06 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.06) | (0.17) | (0.00) | (0.00) | (0.00) |
| Sauger | 9.35 | 7.83 | 10.75 | 2.40 | 9.92 |
| | (1.56) | (2.79) | (2.71) | (0.56) | (2.53) |
| Walleye | 2.23 | 2.67 | 2.08 | 1.75 | 1.92 |
| | (0.36) | (0.76) | (0.57) | (0.55) | (0.48) |
| Sauger x walleye | 0.05 | 0.00 | 0.08 | 0.00 | 0.08 |
| | (0.04) | (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 2.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Freshwater drum | 2.59 (0.89) | 2.83 (2.09) | 1.42 (0.91) | 0.88 (0.25) | 3.08 (1.08) |

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 2.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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) |
| Longnose gar | 1.33 | 1.41 | 0.81 |
| | (0.42) | (0.47) | (0.81) |
| Shortnose gar | 2.53 | 2.45 | 3.08 |
| | (0.60) | (0.66) | (1.42) |
| Bowfin | 0.58 | 0.62 | 0.32 |
| | (0.21) | (0.24) | (0.22) |
| Gizzard shad | 0.61 | 0.23 | 3.25 |
| | (0.26) | (0.11) | (1.93) |
| Common carp | 1.67 | 1.68 | 1.62 |
| | (0.29) | (0.30) | (1.01) |
| Golden shiner | 0.03 | 0.03 | 0.00 |
| | (0.03) | (0.03) | (0.00) |
| River carpsucker | 0.10 | 0.09 | 0.18 |
| | (0.05) | (0.05) | (0.18) |
| Quillback | 0.08 | 0.06 | 0.27 |
| | (0.04) | (0.04) | (0.19) |
| White sucker | 0.01 | 0.00 | 0.08 |
| | (0.01) | (0.00) | (0.08) |
| Smallmouth buffalo | 0.06 | 0.06 | 0.08 |
| | (0.04) | (0.04) | (0.08) |
| Spotted sucker | 0.34 | 0.37 | 0.16 |
| | (0.10) | (0.11) | (0.11) |
| Silver redhorse | 2.84 | 2.89 | 2.50 |
| | (0.49) | (0.55) | (0.93) |
| Golden redhorse | 0.23 | 0.25 | 0.09 |
| | (0.06) | (0.07) | (0.09) |
| Shorthead redhorse | 1.52 | 1.59 | 1.01 |
| | (0.32) | (0.36) | (0.48) |
| Channel catfish | 0.04 | 0.05 | 0.00 |
| | (0.04) | (0.05) | (0.00) |
| Flathead catfish | 0.28 | 0.30 | 0.09 |
| | (0.09) | (0.10) | (0.09) |
| Northern pike | 0.79 | 0.85 | 0.33 |
| | (0.17) | (0.19) | (0.19) |
| White bass | 1.52 | 1.32 | 2.90 |
| | (0.39) | (0.41) | (1.32) |
| Rock bass | 0.87 | 0.86 | 0.97 |
| | (0.26) | (0.28) | (0.62) |
| Green sunfish | 0.05 | 0.00 | 0.37 |
| | (0.03) | (0.00) | (0.23) |
| Pumpkinseed | 0.85 | 0.96 | 0.08 |
| | (0.46) | (0.52) | (0.08) |
| Orangespotted sunfish | 0.03 | 0.03 | 0.00 |
| | (0.03) | (0.03) | (0.00) |
| Bluegill | 33.69 | 37.97 | 4.27 |
| | (5.83) | (6.71) | (1.59) |
| Green sunfish x bluegill | 0.02 | 0.03 | 0.00 |
| | (0.02) | (0.03) | (0.00) |
| Pumpkinseed x bluegill | 0.05 | 0.06 | 0.00 |
| | (0.04) | (0.04) | (0.00) |
| Largemouth bass | 0.40 | 0.33 | 0.88 |
| | (0.21) | (0.22) | (0.63) |
| White crappie | 0.70 | 0.80 | 0.00 |
| | (0.41) | (0.48) | (0.00) |
| Black crappie | 14.51 | 16.21 | 2.86 |
| | (3.39) | (3.89) | (1.05) |

Strata: BWCS - Backwater, contiguous, shoreline
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IMPO - Impounded, offshore
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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 fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Yellow perch | 1.95 (0.57) | 2.17 (0.66) | 0.42 (0.20) |
| Sauger | 0.50 (0.14) | 0.30 (0.12) | 1.89 (0.80) |
| Walleye | 0.14 (0.06) | 0.12 (0.07) | 0.31 (0.18) |
| Sauger x walleye | 0.02 (0.02) | 0.03 (0.03) | 0.00 (0.00) |
| Freshwater drum | 2.57 (1.95) | 2.88 (2.25) | 0.41 (0.29) |

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 2.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Longnose gar | 0.12 | 0.99 | 0.00 |
| | (0.06) | (0.45) | (0.00) |
| Shortnose gar | 0.43 | 2.41 | 0.15 |
| | (0.20) | (1.25) | (0.15) |
| Bowfin | 0.08 | 0.63 | 0.00 |
| | (0.03) | (0.24) | (0.00) |
| Mooneye | 0.07 | 0.00 | 0.08 |
| | (0.07) | (0.00) | (0.08) |
| Gizzard shad | 0.28 | 0.09 | 0.31 |
| | (0.14) | (0.06) | (0.16) |
| Common carp | 0.35 | 1.21 | 0.23 |
| | (0.14) | (0.27) | (0.16) |
| Golden shiner | 0.04 | 0.36 | 0.00 |
| | (0.04) | (0.32) | (0.00) |
| River carpsucker | 0.01 | 0.09 | 0.00 |
| | (0.01) | (0.06) | (0.00) |
| Smallmouth buffalo | 0.01 | 0.05 | 0.00 |
| | (0.01) | (0.05) | (0.00) |
| Spotted sucker | 0.08 | 0.63 | 0.00 |
| | (0.05) | (0.37) | (0.00) |
| Silver redhorse | 1.52 | 1.95 | 1.46 |
| | (0.49) | (0.71) | (0.56) |
| Golden redhorse | 0.01 | 0.09 | 0.00 |
| | (0.01) | (0.06) | (0.00) |
| Shorthead redhorse | 0.95 | 1.91 | 0.81 |
| | (0.28) | (1.04) | (0.28) |
| Black bullhead | 0.01 | 0.09 | 0.00 |
| | (0.01) | (0.09) | (0.00) |
| Yellow bullhead | 0.02 | 0.19 | 0.00 |
| | (0.02) | (0.19) | (0.00) |
| Brown bullhead | 0.03 | 0.23 | 0.00 |
| | (0.02) | (0.19) | (0.00) |
| Channel catfish | 0.15 | 0.05 | 0.17 |
| | (0.15) | (0.05) | (0.17) |
| Flathead catfish | 0.29 | 0.13 | 0.31 |
| | (0.13) | (0.09) | (0.15) |
| Northern pike | 0.21 | 1.18 | 0.07 |
| | (0.09) | (0.53) | (0.07) |
| White bass | 2.04 | 1.14 | 2.16 |
| | (1.31) | (0.53) | (1.49) |
| Rock bass | 0.52 | 0.35 | 0.54 |
| | (0.34) | (0.15) | (0.39) |
| Green sunfish | 0.01 | 0.05 | 0.00 |
| | (0.01) | (0.05) | (0.00) |
| Pumpkinseed | 0.07 | 0.59 | 0.00 |
| | (0.03) | (0.21) | (0.00) |
| Warmouth | 0.17 | 1.40 | 0.00 |
| | (0.15) | (1.21) | (0.00) |
| Orangespotted sunfish | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Bluegill | 5.94 | 29.07 | 2.69 |
| | (2.81) | (13.46) | (2.59) |
| Smallmouth bass | 0.01 | 0.05 | 0.00 |
| | (0.01) | (0.05) | (0.00) |
| Largemouth bass | 0.04 | 0.32 | 0.00 |
| | (0.02) | (0.12) | (0.00) |
| White crappie | 0.02 | 0.18 | 0.00 |
| | (0.01) | (0.10) | (0.00) |

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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 tandem fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 2.39 | 7.21 | 1.71 |
| | (1.52) | (2.16) | (1.71) |
| Yellow perch | 1.06 | 7.53 | 0.15 |
| | (0.46) | (3.58) | (0.15) |
| Sauger | 0.90 | 0.30 | 0.98 |
| | (0.45) | (0.15) | (0.51) |
| Walleye | 0.40 | 0.32 | 0.42 |
| | (0.18) | (0.20) | (0.20) |
| Sauger x walleye | 0.08 | 0.04 | 0.08 |
| | (0.07) | (0.04) | (0.08) |
| Freshwater drum | 1.90 | 2.34 | 1.84 |
| | (0.64) | (1.61) | (0.69) |

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 mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Longnose gar | 0.04 | 0.04 | 0.08 | 0.00 | 0.00 | 0.06 |
| | (0.03) | (0.04) | (0.08) | (0.00) | (0.00) | (0.06) |
| Shortnose gar | 0.38 | 0.57 | 1.52 | 0.00 | 0.00 | 0.29 |
| | (0.12) | (0.26) | (1.16) | (0.00) | (0.00) | (0.14) |
| Bowfin | 0.02 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) |
| Gizzard shad | 1.02 | 0.04 | 15.21 | 0.53 | 0.00 | 0.34 |
| | (0.74) | (0.04) | (14.74) | (0.37) | (0.00) | (0.34) |
| Spotfin shiner | 11.77 | 3.13 | 7.52 | 4.55 | 44.62 | 24.26 |
| | (4.28) | (2.00) | (3.87) | (1.71) | (43.36) | (11.14) |
| Common carp | 0.08 | 0.08 | 0.95 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.08) | (0.72) | (0.00) | (0.00) | (0.00) |
| Golden shiner | 0.32 | 0.54 | 0.00 | 0.00 | 0.00 | 0.36 |
| | (0.18) | (0.49) | (0.00) | (0.00) | (0.00) | (0.17) |
| Emerald shiner | 10.51 | 12.74 | 2.53 | 8.14 | 0.25 | 11.04 |
| | (4.35) | (11.34) | (1.54) | (3.63) | (0.13) | (4.93) |
| River shiner | 1.40 | 0.25 | 0.34 | 0.80 | 0.00 | 2.95 |
| | (0.59) | (0.17) | (0.19) | (0.38) | (0.00) | (1.55) |
| Spottail shiner | 0.50 | 0.16 | 0.34 | 0.00 | 0.00 | 1.13 |
| | (0.19) | (0.08) | (0.19) | (0.00) | (0.00) | (0.51) |
| Weed shiner | 3.36 | 1.55 | 0.26 | 0.00 | 0.00 | 7.44 |
| | (1.78) | (0.99) | (0.26) | (0.00) | (0.00) | (4.63) |
| Mimic shiner | 2.80 | 2.59 | 2.57 | 4.34 | 0.83 | 2.11 |
| | (1.15) | (2.51) | (1.97) | (2.40) | (0.74) | (1.40) |
| Pugnose minnow | 7.44 | 3.97 | 0.17 | 0.00 | 0.00 | 16.08 |
| | (2.70) | (1.73) | (0.11) | (0.00) | (0.00) | (6.96) |
| Bluntnose minnow | 0.03 | 0.04 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.02) | (0.04) | (0.00) | (0.08) | (0.00) | (0.00) |
| Fathead minnow | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) | (0.08) |
| Bullhead minnow | 6.36 | 6.88 | 28.69 | 1.58 | 1.12 | 5.89 |
| | (1.93) | (3.56) | (26.13) | (0.69) | (0.69) | (2.05) |
| Unidentified minnow | 0.64 | 0.00 | 0.00 | 2.81 | 0.00 | 0.00 |
| | (0.64) | (0.00) | (0.00) | (2.81) | (0.00) | (0.00) |
| Spotted sucker | 0.03 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.00) | (0.00) | (0.00) | (0.00) |
| Silver redhorse | 0.06 | 0.00 | 0.08 | 0.24 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.08) | (0.13) | (0.00) | (0.00) |
| Shorthead redhorse | 0.06 | 0.08 | 0.18 | 0.00 | 0.00 | 0.06 |
| | (0.04) | (0.08) | (0.18) | (0.00) | (0.00) | (0.06) |
| Unidentified redhorse | 0.07 | 0.00 | 0.00 | 0.00 | 0.17 | 0.18 |
| | (0.04) | (0.00) | (0.00) | (0.00) | (0.11) | (0.10) |
| Black bullhead | 0.01 | 0.00 | 0.16 | 0.00 | 0.09 | 0.00 |
| | (0.01) | (0.00) | (0.16) | (0.00) | (0.09) | (0.00) |
| Channel catfish | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.08) | (0.00) |
| Tadpole madtom | 0.44 | 0.21 | 3.60 | 0.07 | 0.00 | 0.47 |
| | (0.11) | (0.11) | (1.56) | (0.07) | (0.00) | (0.17) |
| Flathead catfish | 0.13 | 0.34 | 0.00 | 0.07 | 0.00 | 0.00 |
| | (0.12) | (0.34) | (0.00) | (0.07) | (0.00) | (0.00) |
| Northern pike | 0.04 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.07) | (0.00) | (0.00) | (0.00) | (0.00) |
| Central mudminnow | 0.05 | 0.00 | 0.08 | 0.22 | 0.00 | 0.00 |
| | (0.05) | (0.00) | (0.08) | (0.22) | (0.00) | (0.00) |
| Trout perch | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) |
| Brook silverside | 0.32 | 0.28 | 0.32 | 0.16 | 0.00 | 0.47 |
| | (0.12) | (0.14) | (0.32) | (0.16) | (0.00) | (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 2.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| White bass | 0.04 | 0.00 | 0.34 | 0.09 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.19) | (0.09) | (0.00) | (0.00) |
| Rock bass | 0.55 | 0.35 | 0.50 | 0.32 | 0.00 | 0.89 |
| | (0.16) | (0.23) | (0.23) | (0.18) | (0.00) | (0.36) |
| Green sunfish | 0.23 | 0.20 | 1.04 | 0.00 | 0.08 | 0.29 |
| | (0.10) | (0.10) | (0.68) | (0.00) | (0.08) | (0.24) |
| Pumpkinseed | 1.11 | 2.93 | 0.64 | 0.07 | 0.00 | 0.17 |
| | (0.70) | (2.05) | (0.41) | (0.07) | (0.00) | (0.13) |
| Warmouth | 0.08 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.15) | (0.00) | (0.00) | (0.00) | (0.00) |
| Orangespotted sunfish | 0.09 | 0.09 | 0.00 | 0.08 | 0.00 | 0.12 |
| | (0.06) | (0.09) | (0.00) | (0.08) | (0.00) | (0.12) |
| Bluegill | 23.36 | 28.94 | 25.08 | 9.32 | 0.33 | 26.77 |
| | (6.61) | (15.64) | (10.65) | (5.85) | (0.14) | (9.70) |
| Green sunfish x pumpkinseed | 0.01 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.17) | (0.00) | (0.00) | (0.00) |
| Pumpkinseed x warmouth | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) | (0.00) |
| Unidentified Lepomis | 13.41 | 12.09 | 0.58 | 4.97 | 0.52 | 21.46 |
| | (6.56) | (11.40) | (0.26) | (4.24) | (0.45) | (13.77) |
| Smallmouth bass | 0.09 | 0.13 | 0.09 | 0.00 | 0.08 | 0.12 |
| | (0.04) | (0.09) | (0.09) | (0.00) | (0.08) | (0.08) |
| Largemouth bass | 0.68 | 1.12 | 2.23 | 0.35 | 0.00 | 0.30 |
| | (0.22) | (0.55) | (1.47) | (0.35) | (0.00) | (0.17) |
| Black crappie | 0.41 | 0.54 | 0.17 | 0.38 | 0.09 | 0.35 |
| | (0.13) | (0.27) | (0.11) | (0.24) | (0.09) | (0.19) |
| Western sand darter | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.08) | (0.00) |
| Mud darter | 0.04 | 0.08 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.11) | (0.00) | (0.00) | (0.00) |
| Iowa 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) |
| Johnny darter | 0.30 | 0.16 | 0.32 | 0.32 | 0.00 | 0.41 |
| | (0.08) | (0.09) | (0.32) | (0.18) | (0.00) | (0.17) |
| Logperch | 0.05 | 0.08 | 0.00 | 0.08 | 0.08 | 0.00 |
| | (0.03) | (0.08) | (0.00) | (0.08) | (0.08) | (0.00) |
| Sauger | 0.09 | 0.12 | 0.50 | 0.00 | 0.00 | 0.06 |
| | (0.03) | (0.07) | (0.29) | (0.00) | (0.00) | (0.06) |
| Walleye | 0.01 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.16) | (0.00) | (0.00) | (0.00) |
| Freshwater drum | 0.08 | 0.00 | 0.26 | 0.30 | 0.00 | 0.00 |
| | (0.05) | (0.00) | (0.19) | (0.23) | (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 2.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Longnose gar | 0.04 | 0.29 | 0.00 |
| | (0.02) | (0.20) | (0.00) |
| Shortnose gar | 0.09 | 0.12 | 0.09 |
| | (0.07) | (0.06) | (0.09) |
| Gizzard shad | 0.48 | 0.24 | 0.51 |
| | (0.45) | (0.21) | (0.51) |
| Spotfin shiner | 4.58 | 0.71 | 5.12 |
| | (3.96) | (0.43) | (4.52) |
| Common carp | 0.16 | 0.08 | 0.17 |
| | (0.15) | (0.05) | (0.17) |
| Speckled chub | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Emerald shiner | 1.61 | 6.72 | 0.89 |
| | (0.56) | (3.82) | (0.34) |
| River shiner | 0.84 | 0.04 | 0.96 |
| | (0.54) | (0.04) | (0.61) |
| Spottail shiner | 0.07 | 0.00 | 0.09 |
| | (0.07) | (0.00) | (0.09) |
| Weed shiner | 0.03 | 0.23 | 0.00 |
| | (0.02) | (0.17) | (0.00) |
| Mimic shiner | 53.23 | 2.52 | 60.37 |
| | (52.74) | (1.79) | (60.17) |
| Pugnose minnow | 1.24 | 10.04 | 0.00 |
| | (1.00) | (8.16) | (0.00) |
| Fathead minnow | 0.07 | 0.00 | 0.09 |
| | (0.07) | (0.00) | (0.09) |
| Bullhead minnow | 0.60 | 3.09 | 0.25 |
| | (0.18) | (1.24) | (0.11) |
| Silver redhorse | 0.00 | 0.04 | 0.00 |
| | (0.00) | (0.04) | (0.00) |
| Shorthead redhorse | 0.07 | 0.04 | 0.08 |
| | (0.07) | (0.04) | (0.08) |
| Channel catfish | 0.01 | 0.09 | 0.00 |
| | (0.01) | (0.09) | (0.00) |
| Tadpole madtom | 0.08 | 0.08 | 0.08 |
| | (0.07) | (0.05) | (0.08) |
| Flathead catfish | 0.08 | 0.62 | 0.00 |
| | (0.07) | (0.57) | (0.00) |
| White bass | 0.30 | 0.04 | 0.34 |
| | (0.30) | (0.04) | (0.34) |
| Rock bass | 0.13 | 0.43 | 0.09 |
| | (0.08) | (0.26) | (0.09) |
| Pumpkinseed | 0.05 | 0.38 | 0.00 |
| | (0.03) | (0.27) | (0.00) |
| Warmouth | 0.03 | 0.28 | 0.00 |
| | (0.02) | (0.17) | (0.00) |
| Orangespotted sunfish | 0.05 | 0.36 | 0.00 |
| | (0.03) | (0.25) | (0.00) |
| Bluegill | 4.52 | 30.35 | 0.88 |
| | (2.80) | (22.37) | (0.62) |
| Unidentified Lepomis | 1.84 | 14.92 | 0.00 |
| | (1.26) | (10.25) | (0.00) |
| Largemouth bass | 0.08 | 0.04 | 0.09 |
| | (0.07) | (0.04) | (0.09) |
| White crappie | 0.02 | 0.18 | 0.00 |
| | (0.02) | (0.18) | (0.00) |
| Black crappie | 0.20 | 1.65 | 0.00 |
| | (0.10) | (0.80) | (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 tandem mini fyke netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Mud darter | 0.07 | 0.00 | 0.09 |
| | (0.07) | (0.00) | (0.09) |
| Johnny darter | 0.02 | 0.15 | 0.00 |
| | (0.01) | (0.09) | (0.00) |
| Yellow perch | 0.05 | 0.44 | 0.00 |
| | (0.03) | (0.24) | (0.00) |
| River darter | 0.01 | 0.08 | 0.00 |
| | (0.01) | (0.06) | (0.00) |
| Sauger | 0.07 | 0.00 | 0.09 |
| | (0.07) | (0.00) | (0.09) |
| Freshwater drum | 0.09 | 0.17 | 0.08 |
| | (0.07) | (0.11) | (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 2.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Shortnose gar | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Bowfin | 0.01 (0.00) | 0.08 (0.05) | 0.00 (0.00) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) |
| Common carp | 0.02 (0.01) | 0.04 (0.04) | 0.00 (0.00) | 0.04 (0.04) | 0.04 (0.04) | 0.04 (0.04) |
| Silver chub | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.13 (0.13) | 0.00 (0.00) | 0.00 (0.00) |
| White sucker | 0.03 (0.03) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Smallmouth buffalo | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) |
| Spotted sucker | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Silver redhorse | 0.03 (0.02) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.04 (0.04) | 0.16 (0.09) |
| Golden redhorse | 0.01 (0.01) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.04 (0.04) | 0.04 (0.04) |
| Shorthead redhorse | 0.35 (0.13) | 0.08 (0.05) | 0.24 (0.17) | 0.25 (0.17) | 0.08 (0.06) | 0.92 (0.39) |
| Yellow bullhead | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Channel catfish | 0.56 (0.18) | 0.20 (0.09) | 0.08 (0.08) | 2.15 (1.28) | 1.05 (0.52) | 1.39 (0.48) |
| Flathead catfish | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.04 (0.04) |
| White bass | 0.10 (0.07) | 0.00 (0.00) | 0.16 (0.11) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Rock bass | 0.09 (0.05) | 0.04 (0.04) | 0.08 (0.08) | 0.04 (0.04) | 0.00 (0.00) | 0.16 (0.07) |
| Warmouth | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Orangespotted sunfish | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Bluegill | 0.33 (0.09) | 3.07 (0.90) | 0.00 (0.00) | 0.00 (0.00) | 0.13 (0.07) | 0.32 (0.24) |
| Largemouth bass | 0.03 (0.03) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Black crappie | 0.03 (0.02) | 0.36 (0.21) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Yellow perch | 0.13 (0.04) | 0.75 (0.27) | 0.08 (0.06) | 0.00 (0.00) | 0.00 (0.00) | 0.08 (0.08) |
| Sauger | 0.02 (0.02) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.08 (0.06) | 0.00 (0.00) |
| Freshwater drum | 0.18 (0.11) | 0.12 (0.09) | 0.25 (0.18) | 0.12 (0.09) | 0.04 (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 2.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.06 | 0.00 | 0.08 | 0.00 | 0.00 | 0.04 |
| | (0.05) | (0.00) | (0.08) | (0.00) | (0.00) | (0.04) |
| Shortnose gar | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) |
| Bowfin | 0.02 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.11) | (0.00) | (0.00) | (0.00) | (0.00) |
| Common carp | 0.06 | 0.28 | 0.00 | 0.00 | 0.13 | 0.20 |
| | (0.02) | (0.12) | (0.00) | (0.00) | (0.13) | (0.12) |
| River carpsucker | 0.02 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.21) | (0.00) | (0.00) | (0.00) | (0.00) |
| Smallmouth buffalo | 0.28 | 0.12 | 0.12 | 1.54 | 0.75 | 0.08 |
| | (0.09) | (0.09) | (0.09) | (0.61) | (0.34) | (0.06) |
| Spotted sucker | 0.03 | 0.40 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.28) | (0.00) | (0.00) | (0.00) | (0.00) |
| Silver redhorse | 0.36 | 0.08 | 0.32 | 0.34 | 1.30 | 0.60 |
| | (0.12) | (0.08) | (0.17) | (0.19) | (0.50) | (0.27) |
| Golden redhorse | 0.04 | 0.00 | 0.04 | 0.08 | 0.17 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.08) | (0.10) | (0.00) |
| Shorthead redhorse | 0.65 | 0.79 | 0.53 | 0.58 | 0.50 | 1.02 |
| | (0.16) | (0.42) | (0.16) | (0.21) | (0.17) | (0.63) |
| 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 | 1.11 | 0.92 | 1.01 | 0.63 | 1.10 | 1.83 |
| | (0.35) | (0.38) | (0.54) | (0.32) | (0.44) | (0.49) |
| Flathead catfish | 0.05 | 0.00 | 0.04 | 0.20 | 0.08 | 0.04 |
| | (0.03) | (0.00) | (0.04) | (0.09) | (0.06) | (0.04) |
| Northern pike | 0.05 | 0.24 | 0.04 | 0.00 | 0.04 | 0.04 |
| | (0.03) | (0.07) | (0.04) | (0.00) | (0.04) | (0.04) |
| White bass | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.00 |
| | (0.03) | (0.04) | (0.04) | (0.04) | (0.04) | (0.00) |
| Pumpkinseed | 0.01 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.09) | (0.00) | (0.00) | (0.00) | (0.00) |
| Bluegill | 0.69 | 5.18 | 0.12 | 0.54 | 0.60 | 0.59 |
| | (0.19) | (2.01) | (0.09) | (0.33) | (0.39) | (0.26) |
| Smallmouth bass | 0.08 | 0.00 | 0.12 | 0.04 | 0.00 | 0.00 |
| | (0.04) | (0.00) | (0.06) | (0.04) | (0.00) | (0.00) |
| Largemouth bass | 0.01 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.07) | (0.00) | (0.00) | (0.00) | (0.00) |
| 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 | 0.45 | 4.36 | 0.08 | 0.08 | 0.34 | 0.08 |
| | (0.14) | (1.52) | (0.05) | (0.06) | (0.16) | (0.06) |
| White x black 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) |
| Yellow perch | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.05) | (0.00) | (0.00) | (0.00) | (0.00) |
| Walleye | 0.03 | 0.00 | 0.04 | 0.04 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.04) | (0.04) | (0.00) | (0.00) |
| Freshwater drum | 0.18 | 0.32 | 0.16 | 0.29 | 0.17 | 0.08 |
| | (0.08) | (0.21) | (0.11) | (0.21) | (0.07) | (0.05) |

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 2.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Gizzard shad | 0.96 | 1.83 | 0.75 | 0.30 |
| | (0.47) | (1.23) | (0.59) | (0.21) |
| Spotfin shiner | 26.35 | 14.58 | 54.33 | 20.00 |
| | (7.97) | (6.69) | (26.85) | (10.08) |
| Common carp | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Golden shiner | 0.23 | 0.42 | 0.00 | 0.20 |
| | (0.11) | (0.23) | (0.00) | (0.20) |
| Emerald shiner | 63.36 | 80.17 | 111.88 | 18.90 |
| | (21.96) | (55.72) | (33.99) | (10.18) |
| River shiner | 10.88 | 6.33 | 27.04 | 5.20 |
| | (2.69) | (3.25) | (8.12) | (3.61) |
| Spottail shiner | 0.41 | 0.08 | 0.08 | 0.90 |
| | (0.26) | (0.08) | (0.08) | (0.64) |
| Sand shiner | 0.04 | 0.00 | 0.17 | 0.00 |
| | (0.02) | (0.00) | (0.10) | (0.00) |
| Weed shiner | 1.12 | 0.67 | 0.00 | 2.20 |
| | (0.90) | (0.58) | (0.00) | (2.20) |
| Mimic shiner | 16.55 | 8.08 | 56.33 | 0.10 |
| | (6.02) | (6.08) | (23.34) | (0.10) |
| Pugnose minnow | 1.84 | 4.08 | 0.04 | 0.90 |
| | (1.03) | (2.86) | (0.04) | (0.31) |
| Bullhead minnow | 6.46 | 7.08 | 9.75 | 3.90 |
| | (1.58) | (2.63) | (4.22) | (1.88) |
| Unidentified minnow | 1.29 | 0.00 | 5.17 | 0.10 |
| | (1.20) | (0.00) | (4.99) | (0.10) |
| Quillback | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Northern hog sucker | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Silver redhorse | 0.07 | 0.08 | 0.17 | 0.00 |
| | (0.04) | (0.08) | (0.10) | (0.00) |
| Shorthead redhorse | 0.02 | 0.00 | 0.08 | 0.00 |
| | (0.01) | (0.00) | (0.06) | (0.00) |
| Unidentified redhorse | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Channel catfish | 0.04 | 0.00 | 0.00 | 0.10 |
| | (0.04) | (0.00) | (0.00) | (0.10) |
| Tadpole madtom | 0.15 | 0.08 | 0.00 | 0.30 |
| | (0.07) | (0.08) | (0.00) | (0.15) |
| Flathead catfish | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Northern pike | 0.10 | 0.17 | 0.00 | 0.10 |
| | (0.06) | (0.11) | (0.00) | (0.10) |
| Brook silverside | 1.68 | 1.25 | 1.13 | 2.40 |
| | (0.71) | (1.07) | (0.59) | (1.45) |
| White bass | 0.69 | 1.67 | 0.38 | 0.00 |
| | (0.48) | (1.33) | (0.24) | (0.00) |
| Rock bass | 1.11 | 0.08 | 0.00 | 2.70 |
| | (0.62) | (0.08) | (0.00) | (1.56) |
| Green sunfish | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Pumpkinseed | 0.04 | 0.08 | 0.04 | 0.00 |
| | (0.03) | (0.08) | (0.04) | (0.00) |
| Orangespotted sunfish | 0.15 | 0.42 | 0.00 | 0.00 |
| | (0.10) | (0.29) | (0.00) | (0.00) |
| Bluegill | 14.74 | 7.58 | 0.83 | 29.60 |
| | (5.20) | (3.12) | (0.34) | (12.74) |

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 2.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 8 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Unidentified Lepomis | 13.81 | 22.00 | 0.17 | 14.70 |
| | (6.04) | (13.91) | (0.10) | (8.53) |
| Smallmouth bass | 0.17 | 0.00 | 0.21 | 0.30 |
| | (0.09) | (0.00) | (0.08) | (0.21) |
| Largemouth bass | 3.86 | 6.92 | 0.25 | 3.30 |
| | (1.36) | (3.21) | (0.14) | (1.80) |
| White crappie | 0.04 | 0.00 | 0.00 | 0.10 |
| | (0.04) | (0.00) | (0.00) | (0.10) |
| Black crappie | 0.71 | 1.25 | 0.08 | 0.60 |
| | (0.35) | (0.84) | (0.06) | (0.43) |
| Western sand darter | 0.97 | 0.00 | 3.21 | 0.50 |
| | (0.44) | (0.00) | (1.62) | (0.50) |
| Mud darter | 0.16 | 0.33 | 0.00 | 0.10 |
| | (0.10) | (0.26) | (0.00) | (0.10) |
| Johnny darter | 1.31 | 0.67 | 0.46 | 2.40 |
| | (0.51) | (0.28) | (0.31) | (1.25) |
| Yellow perch | 0.06 | 0.17 | 0.00 | 0.00 |
| | (0.04) | (0.11) | (0.00) | (0.00) |
| Logperch | 0.59 | 0.75 | 0.17 | 0.70 |
| | (0.29) | (0.58) | (0.10) | (0.50) |
| Slenderhead darter | 0.01 | 0.00 | 0.04 | 0.00 |
| | (0.01) | (0.00) | (0.04) | (0.00) |
| Walleye | 0.06 | 0.17 | 0.00 | 0.00 |
| | (0.04) | (0.11) | (0.00) | (0.00) |
| Freshwater drum | 0.07 | 0.08 | 0.00 | 0.10 |
| | (0.05) | (0.08) | (0.00) | (0.10) |

Strata: BWCS - Backwater, contiguous, shoreline
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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 day electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | BWCS |
|---|---|
| Longnose gar | 0.13 (0.09) |
| Bowfin | 0.07 (0.07) |
| Gizzard shad | 2.81 (1.21) |
| Spotfin shiner | 5.44 (2.29) |
| Common carp | 0.70 (0.28) |
| Golden shiner | 0.08 (0.08) |
| Emerald shiner | 19.09 (15.07) |
| River shiner | 0.84 (0.66) |
| Spottail shiner | 0.38 (0.17) |
| Mimic shiner | 2.77 (2.56) |
| Pugnose minnow | 0.54 (0.25) |
| Bullhead minnow | 3.33 (1.55) |
| River carpsucker | 0.19 (0.14) |
| Quillback | 0.14 (0.09) |
| Highfin carpsucker | 0.07 (0.07) |
| White sucker | 0.06 (0.06) |
| Smallmouth buffalo | 0.66 (0.36) |
| Bigmouth buffalo | 0.07 (0.07) |
| Spotted sucker | 3.03 (0.97) |
| Silver redhorse | 1.28 (0.66) |
| Golden redhorse | 0.59 (0.16) |
| Shorthead redhorse | 1.76 (0.56) |
| Channel catfish | 0.06 (0.06) |
| Northern pike | 1.28 (0.48) |
| Brook silverside | 0.71 (0.28) |
| White bass | 0.33 (0.16) |
| Rock bass | 1.73 (0.94) |
| Green sunfish | 0.99 (0.50) |
| Pumpkinseed | 1.12 (0.57) |
| Orangespotted sunfish | 0.07 |

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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 day electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. Table page: 2

| Common name | BWCS |
|---|---|
| | (0.07) |
| Bluegill | 40.84 |
| | (9.02) |
| Green sunfish x bluegill | 0.07 |
| | (0.07) |
| Unidentified Lepomis | 1.72 |
| | (0.68) |
| Smallmouth bass | 0.50 |
| | (0.33) |
| Largemouth bass | 21.44 |
| | (5.06) |
| Black crappie | 3.03 |
| | (1.23) |
| Mud darter | 0.12 |
| | (0.08) |
| Johnny darter | 1.04 |
| | (0.53) |
| Yellow perch | 1.77 |
| | (0.72) |
| Logperch | 1.03 |
| | (0.49) |
| Sauger | 1.02 |
| | (0.30) |
| Walleye | 0.14 |
| | (0.09) |
| Freshwater drum | 0.63 |
| | (0.51) |

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Table 2.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Chestnut lamprey | 0.16 (0.11) |
| Silver lamprey | 0.05 (0.05) |
| Longnose gar | 0.06 (0.06) |
| Shortnose gar | 0.05 (0.05) |
| Bowfin | 0.21 (0.12) |
| Mooneye | 0.46 (0.22) |
| Gizzard shad | 3.33 (1.37) |
| Spotfin shiner | 4.66 (4.13) |
| Common carp | 1.69 (0.42) |
| Emerald shiner | 12.30 (4.45) |
| River shiner | 14.31 (12.56) |
| Spottail shiner | 0.23 (0.13) |
| Mimic shiner | 11.17 (8.37) |
| Pugnose minnow | 0.11 (0.11) |
| Bullhead minnow | 1.15 (0.66) |
| Quillback | 0.35 (0.19) |
| White sucker | 0.05 (0.05) |
| Smallmouth buffalo | 0.06 (0.06) |
| Bigmouth buffalo | 0.10 (0.07) |
| Spotted sucker | 1.13 (0.64) |
| Silver redhorse | 3.25 (1.16) |
| River redhorse | 0.05 (0.05) |
| Golden redhorse | 2.34 (0.71) |
| Shorthead redhorse | 8.27 (3.06) |
| Channel catfish | 0.34 (0.16) |
| Tadpole madtom | 0.11 (0.11) |
| Northern pike | 1.74 (0.54) |
| Burbot | 0.16 (0.08) |
| Brook silverside | 2.76 (1.68) |
| White bass | 14.90 |

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TRI - Tributary mouth
TWZ - Tailwater

Table 2.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| | (4.86) |
| Yellow bass | 0.05 |
| | (0.05) |
| Rock bass | 4.09 |
| | (1.45) |
| Green sunfish | 0.29 |
| | (0.18) |
| Pumpkinseed | 0.10 |
| | (0.07) |
| Warmouth | 0.05 |
| | (0.05) |
| Bluegill | 29.79 |
| | (7.66) |
| Green sunfish x pumpkinseed | 0.11 |
| | (0.07) |
| Green sunfish x bluegill | 0.06 |
| | (0.06) |
| Unidentified Lepomis | 0.34 |
| | (0.34) |
| Smallmouth bass | 9.76 |
| | (3.05) |
| Largemouth bass | 15.99 |
| | (6.14) |
| Black crappie | 2.69 |
| | (0.73) |
| Western sand darter | 0.22 |
| | (0.12) |
| Johnny darter | 0.13 |
| | (0.13) |
| Yellow perch | 4.38 |
| | (2.49) |
| Logperch | 0.50 |
| | (0.24) |
| River darter | 0.10 |
| | (0.10) |
| Sauger | 40.79 |
| | (7.74) |
| Walleye | 5.89 |
| | (1.25) |
| Freshwater drum | 2.87 |
| | (1.20) |

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TWZ - Tailwater

Table 2.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | BWCS |
|---|---|
| Chestnut lamprey | 0.09 (0.09) |
| Longnose gar | 0.09 (0.09) |
| Shortnose gar | 0.16 (0.16) |
| Bowfin | 0.40 (0.18) |
| Gizzard shad | 0.18 (0.12) |
| Common carp | 0.80 (0.39) |
| River carpsucker | 0.08 (0.08) |
| Spotted sucker | 0.31 (0.18) |
| Silver redhorse | 2.28 (0.74) |
| Golden redhorse | 0.15 (0.10) |
| Shorthead redhorse | 1.56 (0.60) |
| Channel catfish | 0.08 (0.08) |
| Flathead catfish | 0.48 (0.25) |
| Northern pike | 1.79 (0.51) |
| Rock bass | 0.27 (0.19) |
| Pumpkinseed | 1.74 (0.79) |
| Bluegill | 89.68 (20.04) |
| Green sunfish x bluegill | 0.08 (0.08) |
| Largemouth bass | 0.47 (0.34) |
| White crappie | 0.16 (0.10) |
| Black crappie | 12.39 (2.38) |
| Yellow perch | 4.47 (1.55) |
| Sauger | 0.31 (0.23) |
| Walleye | 0.35 (0.27) |
| Freshwater drum | 0.47 (0.27) |

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 2.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Bowfin | 0.16 (0.16) |
| Gizzard shad | 0.88 (0.53) |
| Spotfin shiner | 30.60 (15.96) |
| Speckled chub | 0.83 (0.83) |
| Golden shiner | 0.19 (0.19) |
| Emerald shiner | 24.85 (18.37) |
| River shiner | 1.94 (1.32) |
| Spottail shiner | 0.32 (0.20) |
| Weed shiner | 20.50 (20.50) |
| Mimic shiner | 4.41 (2.43) |
| Bullhead minnow | 3.04 (2.60) |
| Unidentified minnow | 4.33 (4.33) |
| Tadpole madtom | 1.11 (1.11) |
| Flathead catfish | 0.48 (0.33) |
| Brook silverside | 0.37 (0.37) |
| White bass | 0.32 (0.20) |
| Rock bass | 0.56 (0.56) |
| Warmouth | 0.16 (0.16) |
| Bluegill | 6.41 (2.87) |
| Green sunfish x bluegill | 0.16 (0.16) |
| Unidentified Lepomis | 6.61 (4.08) |
| Largemouth bass | 0.16 (0.16) |
| Black crappie | 0.17 (0.17) |
| Logperch | 0.16 (0.16) |
| Sauger | 0.34 (0.22) |
| Freshwater drum | 0.17 (0.17) |

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 2.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | TWZ |
|---|---|
| Silver lamprey | 0.08 (0.08) |
| Common carp | 0.93 (0.65) |
| Shorthead redhorse | 0.50 (0.34) |
| Channel catfish | 2.50 (1.75) |
| Flathead catfish | 0.08 (0.08) |
| Rock bass | 0.15 (0.15) |
| Bluegill | 0.32 (0.10) |
| Black crappie | 0.08 (0.08) |
| Yellow perch | 0.17 (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 2.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

| Common name | TWZ |
|---|---|
| Common carp | 0.54 |
| | (0.36) |
| Smallmouth buffalo | 0.25 |
| | (0.11) |
| Silver redhorse | 0.42 |
| | (0.20) |
| Shorthead redhorse | 0.84 |
| | (0.55) |
| Channel catfish | 1.65 |
| | (0.39) |
| Flathead catfish | 0.82 |
| | (0.50) |
| Northern pike | 0.09 |
| | (0.09) |
| White bass | 0.33 |
| | (0.17) |
| Bluegill | 1.73 |
| | (0.73) |
| Smallmouth bass | 0.08 |
| | (0.08) |
| Black crappie | 4.84 |
| | (3.43) |
| Walleye | 0.08 |
| | (0.08) |
| Freshwater drum | 0.39 |
| | (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 2.4.7. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | BWCS | TWZ |
|---|---|---|
| Longnose gar | 0.08 | 0.00 |
| | (0.08) | (0.00) |
| Bowfin | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Gizzard shad | 2.92 | 2.67 |
| | (2.29) | (1.54) |
| Spotfin shiner | 18.75 | 60.92 |
| | (7.36) | (52.29) |
| Golden shiner | 0.33 | 0.00 |
| | (0.22) | (0.00) |
| Emerald shiner | 49.67 | 40.42 |
| | (46.33) | (21.45) |
| River shiner | 3.17 | 49.67 |
| | (2.26) | (24.13) |
| Spottail shiner | 0.25 | 0.83 |
| | (0.18) | (0.75) |
| Weed shiner | 0.25 | 7.25 |
| | (0.18) | (6.24) |
| Mimic shiner | 8.33 | 16.92 |
| | (8.06) | (12.54) |
| Pugnose minnow | 0.42 | 0.75 |
| | (0.23) | (0.75) |
| Bullhead minnow | 2.25 | 1.42 |
| | (0.60) | (0.92) |
| Shorthead redhorse | 0.08 | 0.00 |
| | (0.08) | (0.00) |
| Tadpole madtom | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| Northern pike | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| Brook silverside | 10.75 | 3.08 |
| | (4.94) | (1.97) |
| Rock bass | 0.50 | 0.17 |
| | (0.29) | (0.11) |
| Orangespotted sunfish | 0.08 | 0.00 |
| | (0.08) | (0.00) |
| Bluegill | 14.75 | 4.75 |
| | (6.27) | (3.52) |
| Unidentified Lepomis | 3.42 | 15.08 |
| | (1.82) | (13.23) |
| Smallmouth bass | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Largemouth bass | 1.92 | 0.08 |
| | (0.54) | (0.08) |
| Western sand darter | 0.00 | 0.75 |
| | (0.00) | (0.66) |
| Mud darter | 0.25 | 0.08 |
| | (0.18) | (0.08) |
| Johnny darter | 1.00 | 0.33 |
| | (0.58) | (0.22) |
| Yellow perch | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Logperch | 0.25 | 0.33 |
| | (0.13) | (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 2.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 8 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Shovelnose sturgeon | 0.08 (0.08) |
| Silver redhorse | 0.17 (0.11) |
| Shorthead redhorse | 0.17 (0.11) |
| Channel catfish | 0.42 (0.26) |
| Sauger | 1.00 (0.69) |
| Freshwater drum | 0.25 (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

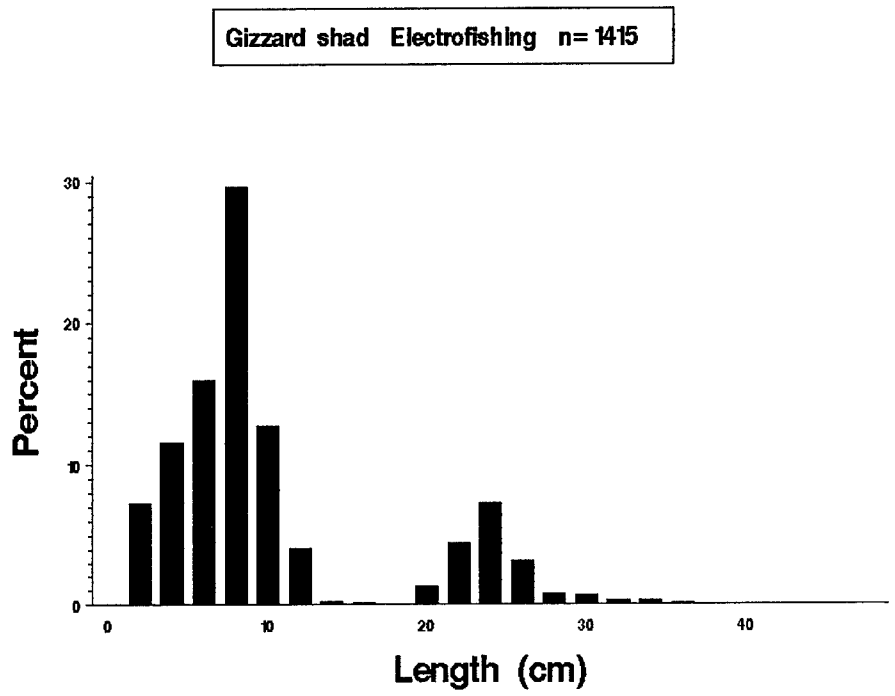


**Figure 2.2.** Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

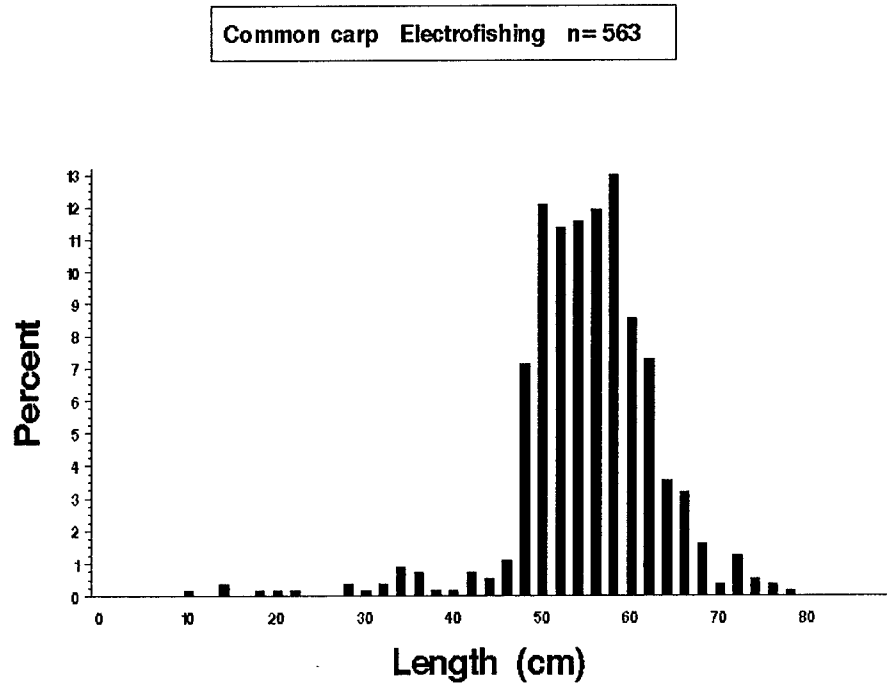


**Figure 2.3.** Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

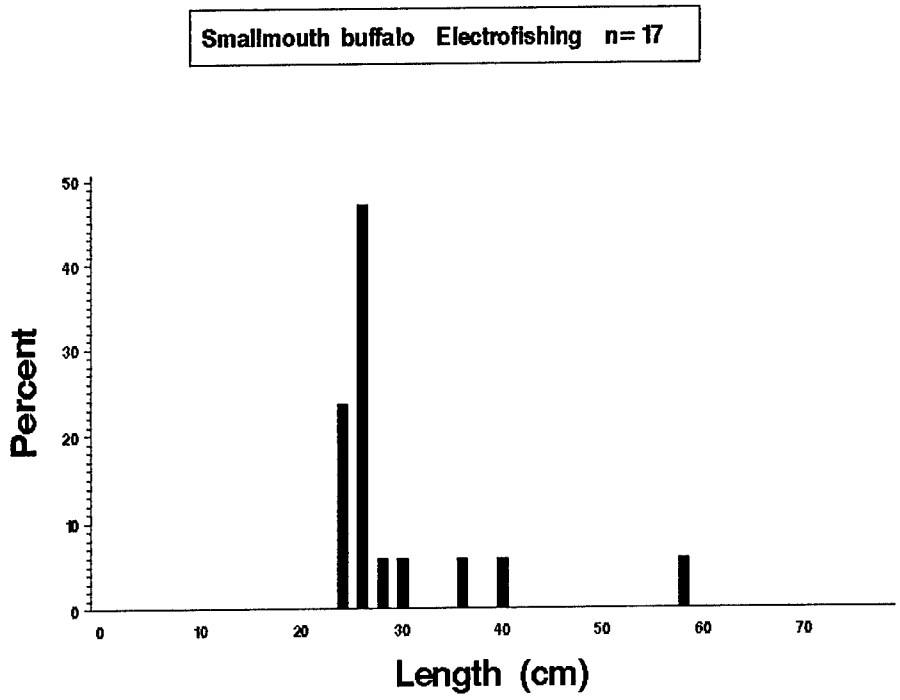


**Figure 2.4.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

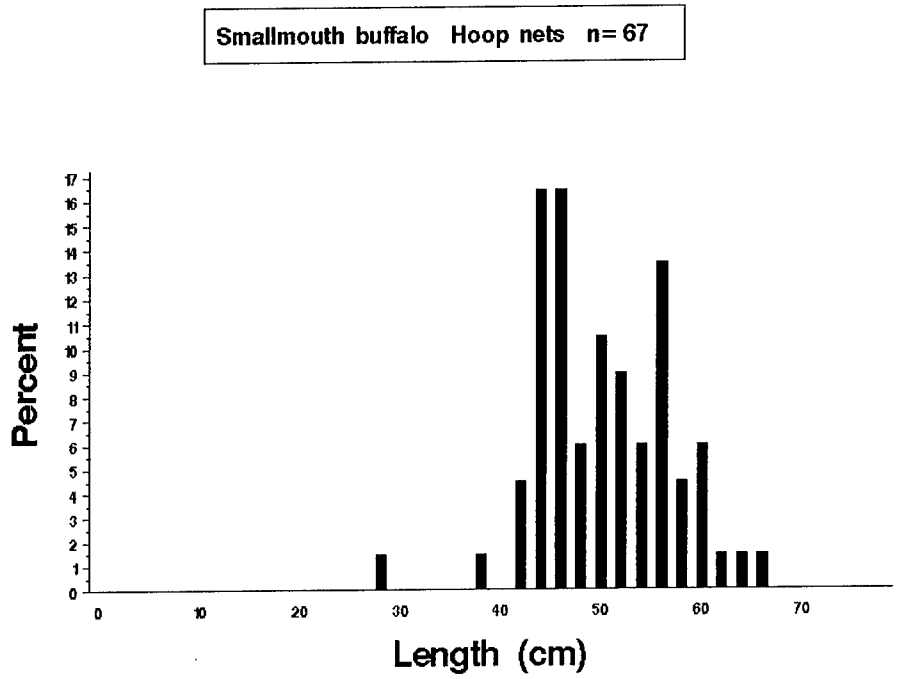


**Figure 2.5.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 8 during 1999.

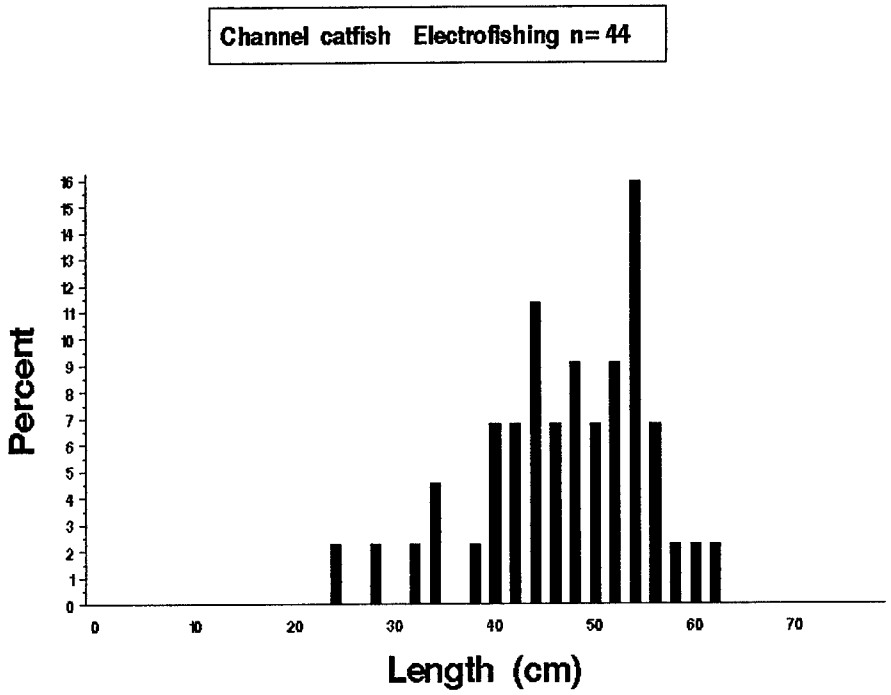


**Figure 2.6.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

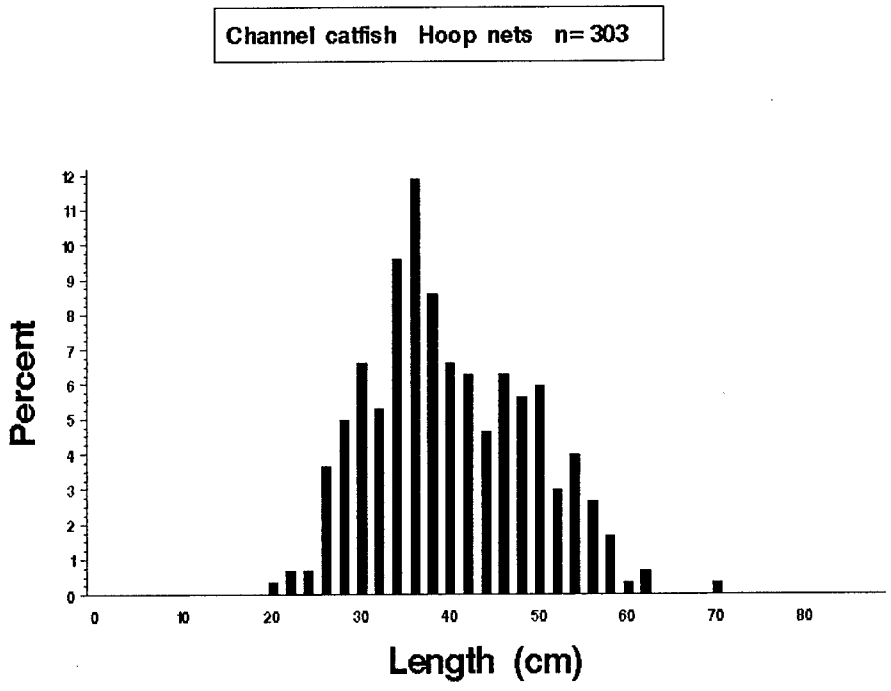


**Figure 2.7.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 8 during 1999.

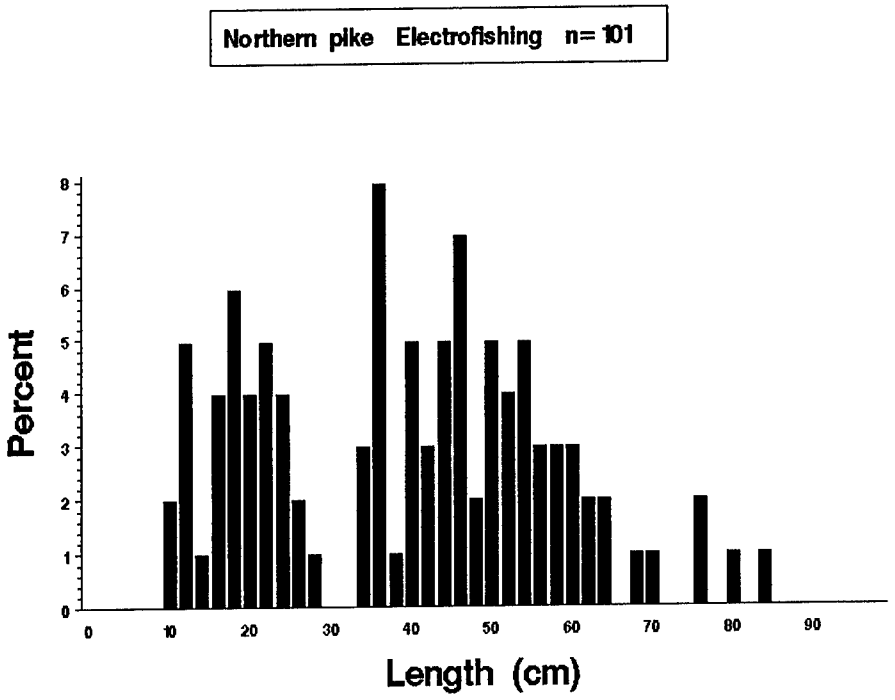


**Figure 2.8.** Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

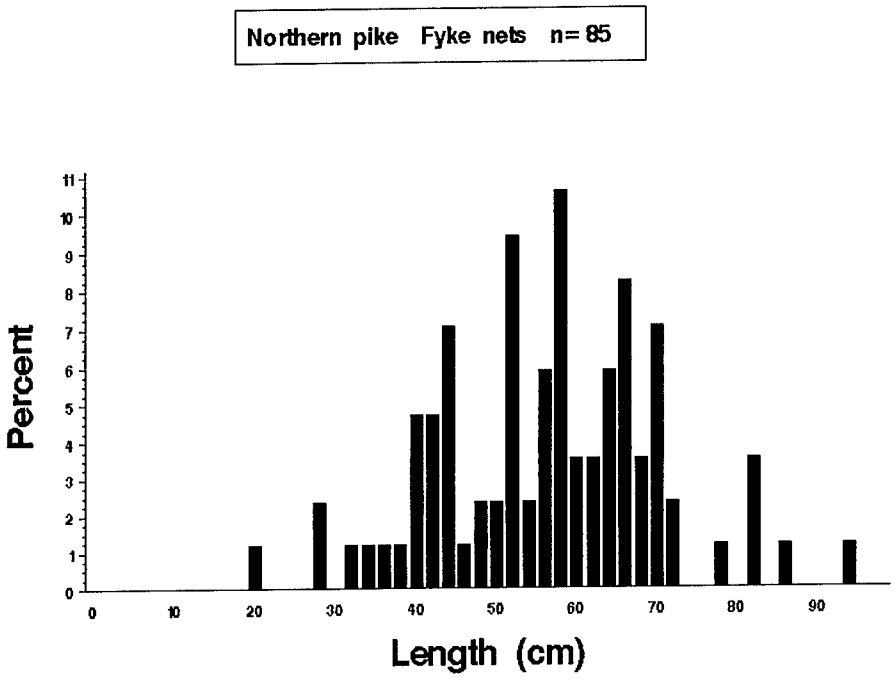


**Figure 2.9.** Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 8 during 1999.

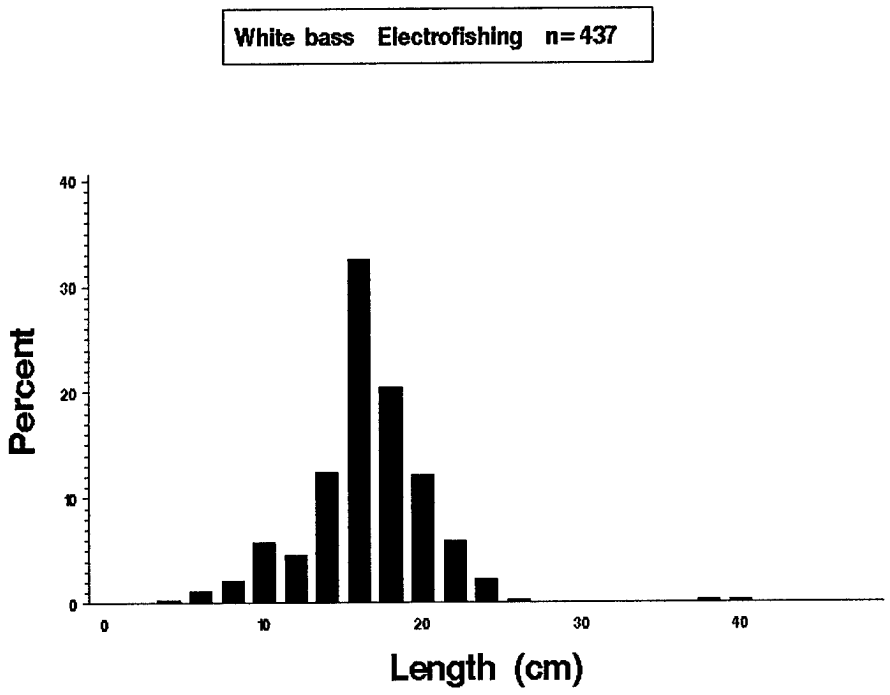


**Figure 2.10.** Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chrysops*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

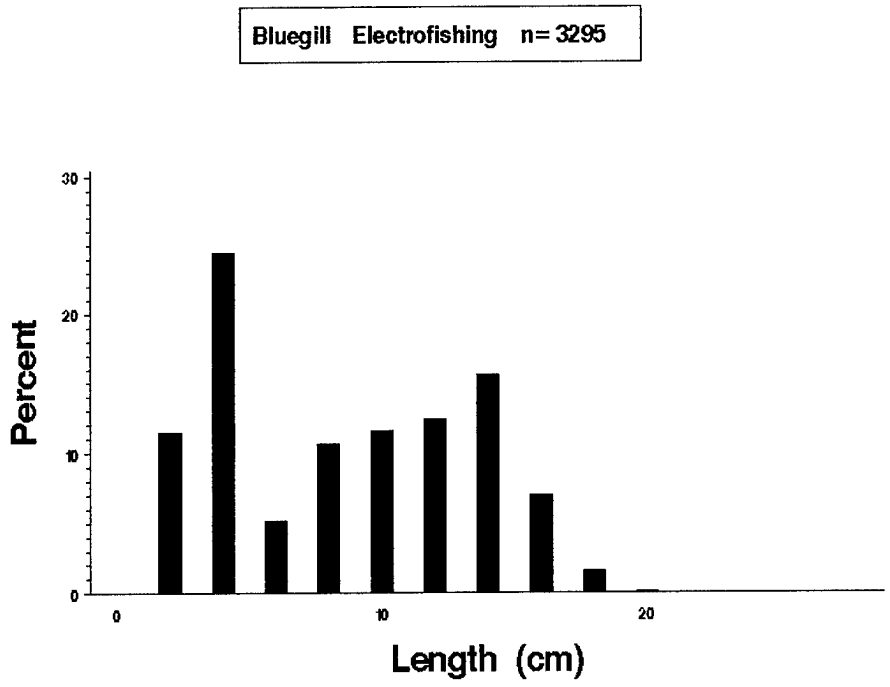


**Figure 2.11.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

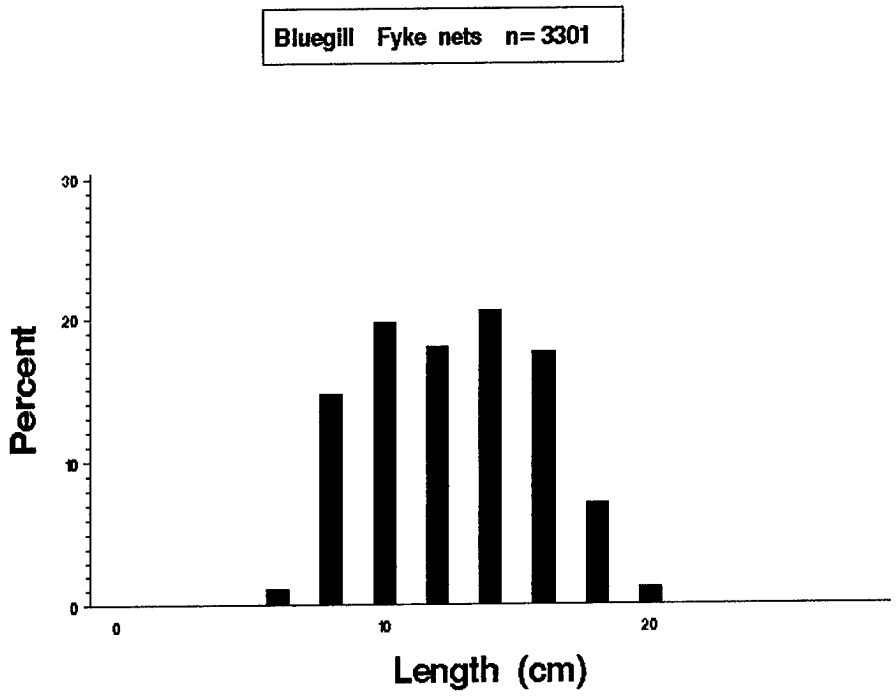


**Figure 2.12.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 8 during 1999.

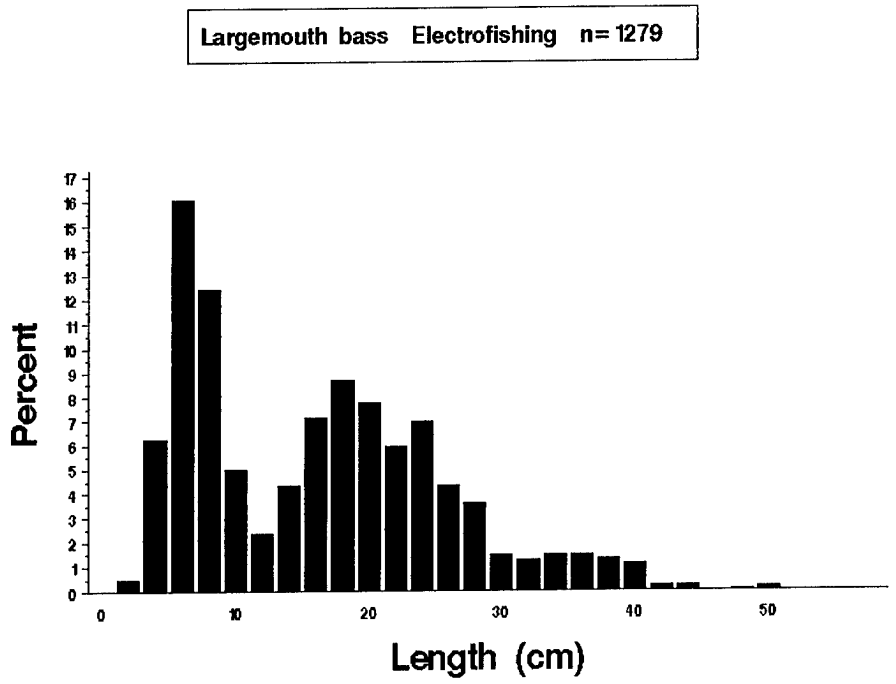


**Figure 2.13.** Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

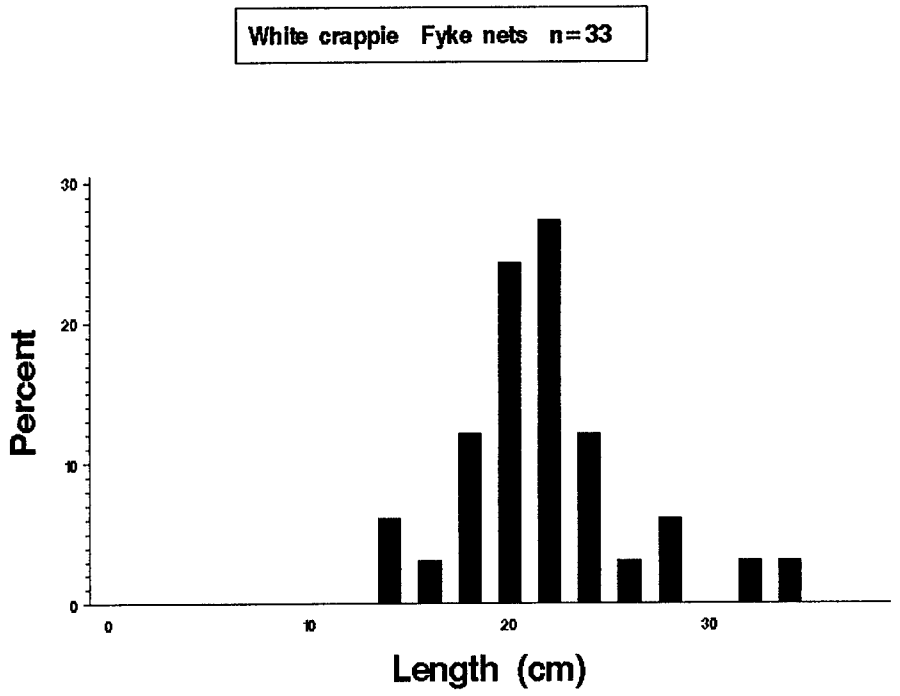


**Figure 2.14.** Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularus*) collected by fyke netting in Upper Mississippi River Pool 8 during 1999.

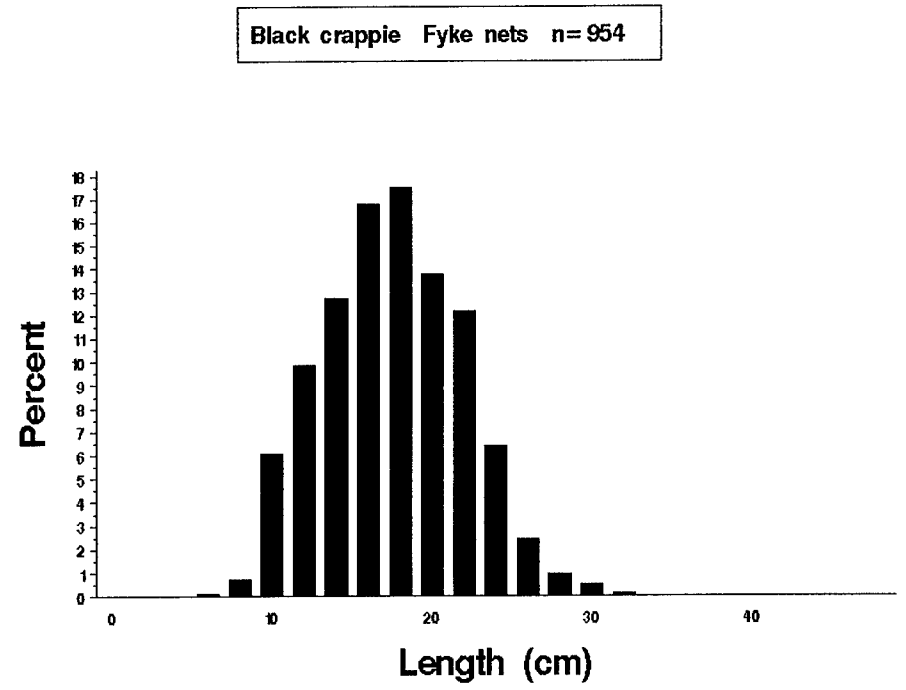


**Figure 2.15.** Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 8 during 1999.

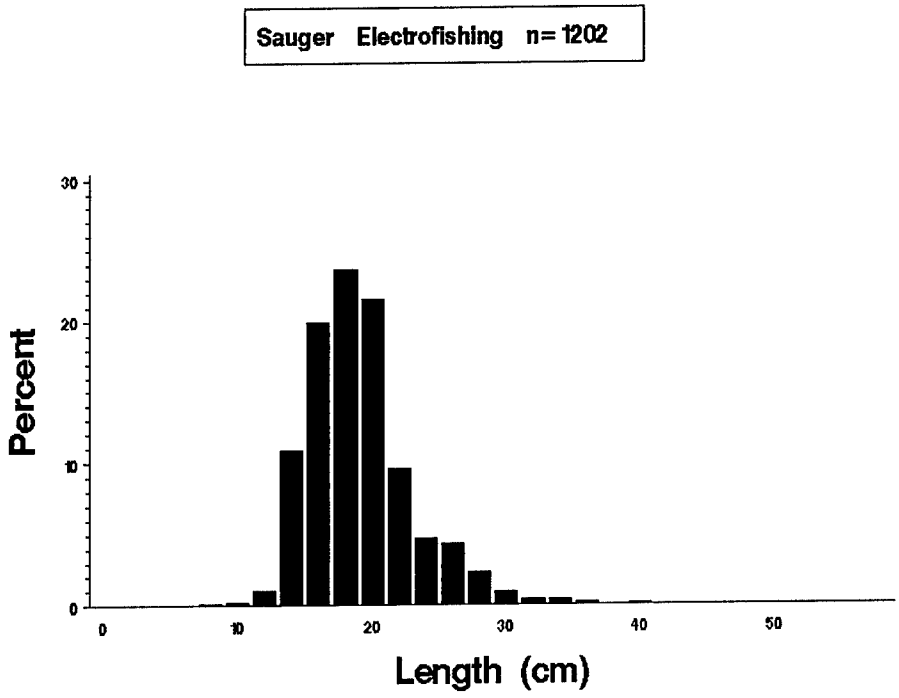


**Figure 2.16.** Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

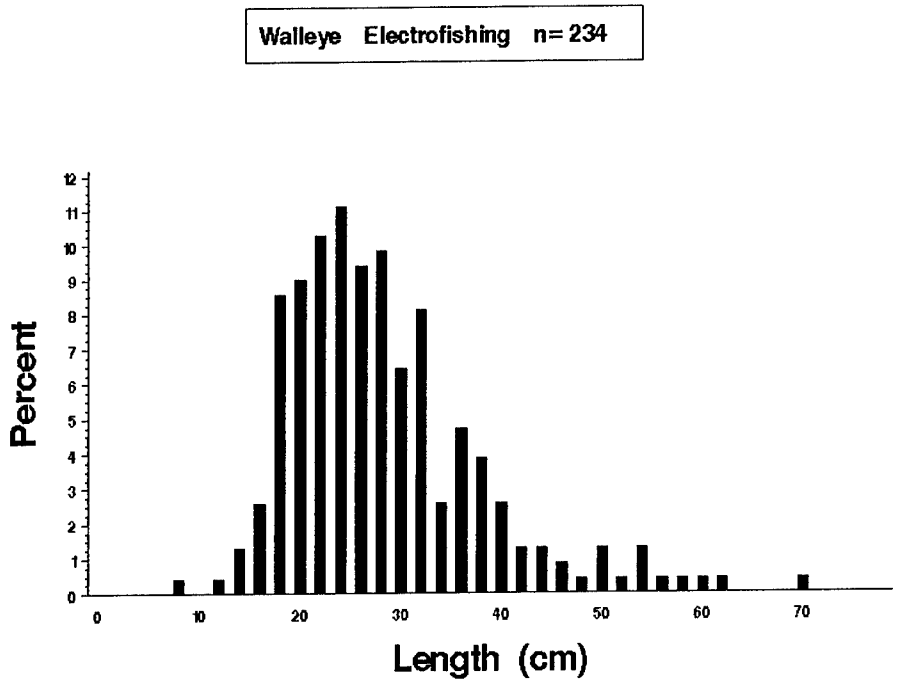


**Figure 2.17.** Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

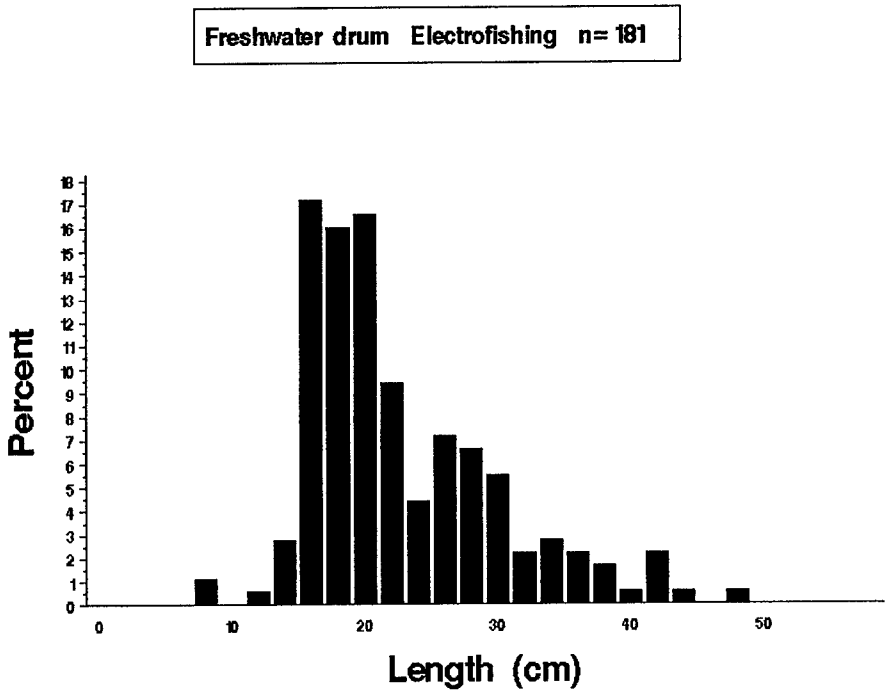


**Figure 2.18.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 8 during 1999.

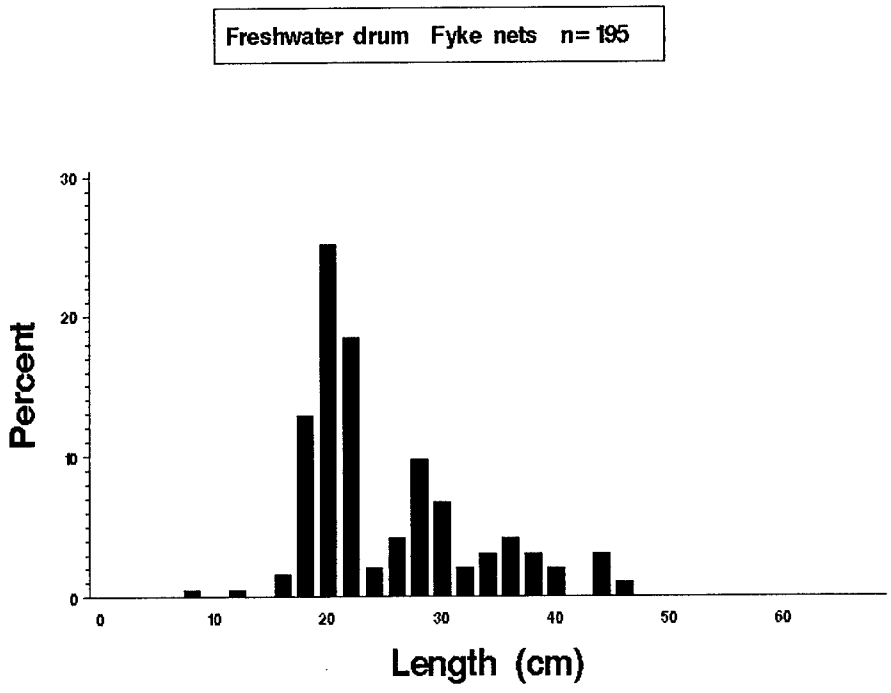


**Figure 2.19.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 8 during 1999.

# Chapter 3. Pool 13, Upper Mississippi River

by

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## Hydrograph

Water levels were higher than the 58-year mean at the Lock and Dam 12 tailwater gage (Figure 3.1) for most of the sampling periods except period 3. The highest water levels were encountered in a 2-week period from the last week of July through the first week of August. The lowest water levels were encountered throughout the month of October. Water levels did not affect sampling effort in 1999. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

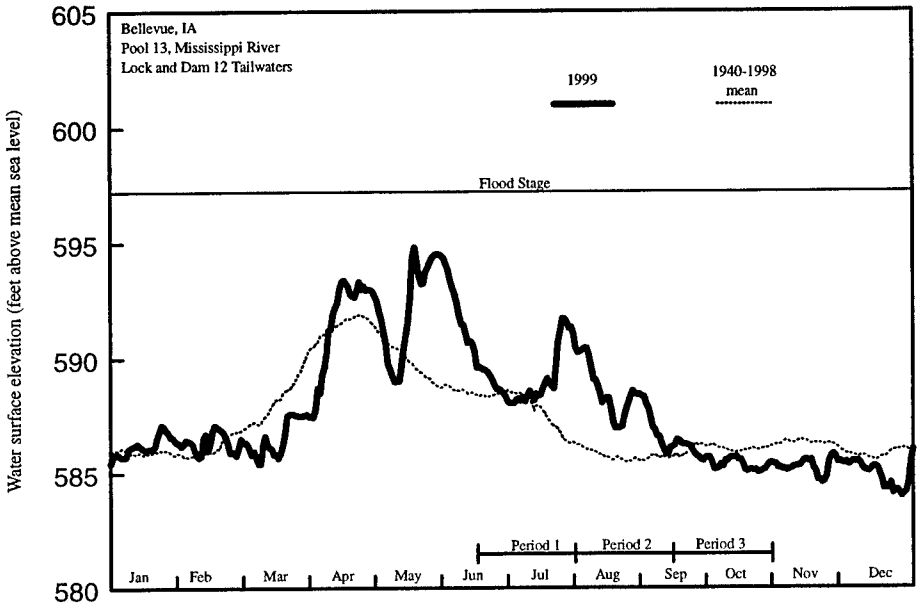


**Figure 3.1.** Daily water surface elevation from Lock and Dam 12 for Pool 13, Upper Mississippi River, during 1999 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

## Summary of Sampling Effort

We made a total of 486 fish collections in Pool 13 during 1999 using 10 gear types (Table 3.1). Gear allocations among strata remained consistent for all three sampling periods. Of the total number of collections, 438 were from randomly selected sites in the BWCO, BWCS, IMPO, IMPS, MCBU, MCBW, and SCB strata. Forty-eight collections were made at fixed TWZ sites. Backwaters, followed by the MCBU and SCB, received the most sampling effort.

## Total Catch by Gear

A total of 55,944 fish were collected representing 69 species and 4 hybrids in 1999 (Table 3.2). This total does not include 15 fish less than 30 mm long identified only to family or genus. The five most abundant species in our samples were the emerald shiner (19,097), gizzard shad (9,113), bluegill (7,753), mimic shiner (5,635), and river shiner (2,642). Total species (excluding hybrids) collected by gear type were as follows: day electrofishing (54), night electrofishing (48), fyke netting (32), tandem fyke netting (27), mini fyke

netting (46), tandem mini fyke netting (28), seining (46), small hoop netting (17), large hoop netting (15), and bottom trawling (6). Our species total before the 1999 season was 79; three new species were added to this total during 1999: rudd (presumed), goldeye, and bigmouth shiner. However, verification of the rudd species identification is pending. Two presumed rudd specimens were collected in the impounded shoreline stratum from Pool 13. The rudd is an exotic Eurasian species that was imported into the southeastern United States as a bait fish; it closely resembles the golden shiner. This would be the first documentation of rudd for the Long Term Resource Monitoring Program and perhaps the entire Mississippi River.

The one Iowa-listed endangered species collected in 1999 was the bluntnose darter (1). Two Iowa-listed threatened species were collected—the chestnut lamprey (2) and the western sand darter (4)—and one Iowa-listed species of special concern was collected—the pugnose minnow (40). Other species that are noted as uncommon, rare, or probably strays from tributaries (Pitlo et al. 1995) in Pool 13 were the goldeye, Mississippi silvery minnow, bigmouth shiner, sand shiner, suckermouth minnow, bluntnose minnow, fathead minnow, quillback, black buffalo, silver redhorse, stonecat, green sunfish, smallmouth bass, and slenderhead darter.

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

### *Day Electrofishing*

Reachwide mean catch-per-unit effort (*C/f*) by day electrofishing was highest for gizzard shad (79.88), emerald shiner (32.72), and bluegill (24.71; Table 3.3.1). By stratum, gizzard shad had the highest *C/f* in the BWCS (199.08), IMPS (20.08), and MCBU (23.17), and emerald shiner had the highest *C/f* in the MCBW (12.11) and SCB (67.33).

### *Night Electrofishing*

Reachwide mean *C/f* by night electrofishing was highest for emerald shiner (106.32), gizzard shad (61.48), and bluegill (40.90; Table 3.3.2). By stratum, emerald shiner had the highest *C/f* in the BWCS (259.00), MCBU (14.00), and SCB (14.00).

### *Fyke Net*

Reachwide mean *C/f* by fyke netting was highest for bluegill (10.10), black crappie (6.36), and white crappie (3.69; Table 3.3.3). By stratum, bluegill had the highest *C/f* in the BWCS (10.70) and IMPS (4.41).

### *Tandem Fyke Net*

Reachwide mean *C/f* by tandem fyke netting was highest for bluegill (7.18), black crappie (2.22), and gizzard shad (1.77; Table 3.3.4). By stratum, bluegill had the highest *C/f* in the BWCO (15.36) and IMPO (2.41).

### *Mini Fyke Net*

Reachwide mean *C/f* by mini fyke netting was highest for bluegill (35.87), mimic shiner (27.74), and gizzard shad (13.17; Table 3.3.5). By stratum, bluegill had the highest *C/f* in the BWCS (86.68) and IMPS (51.12), mimic shiner had the highest *C/f* in the MCBU (56.36) and SCB (6.14), and emerald shiner had the highest *C/f* in the MCBW (158.04).

### *Tandem Mini Fyke Net*

Reachwide mean *C/f* by tandem mini fyke netting was highest for bullhead minnow (2.99), bluegill (2.44), and emerald shiner (1.76; Table 3.3.6). By stratum, bullhead minnow had the highest *C/f* in the BWCO (7.79) and bluegill had the highest *C/f* in the IMPO (1.81).

### *Small Hoop Net*

Reachwide mean *C/f* by small hoop netting was highest for channel catfish (0.34), black crappie (0.15), and bluegill (0.13; Table 3.3.7). By stratum, black crappie had the highest *C/f* in the IMPO (0.23) and channel catfish had the highest *C/f* in the MCBU (0.79), MCBW (0.38), and SCB (0.82).

### *Large Hoop Net*

Reachwide mean *C/f* by small hoop netting was highest for smallmouth buffalo (0.99), freshwater drum (0.56), and white bass (0.19; Table 3.3.8). By stratum, freshwater drum had the highest *C/f* in the IMPO (0.63) and smallmouth buffalo had the highest *C/f* in the MCBU (1.10), MCBW (4.70), and SCB (2.07).

### *Seine*

Reachwide mean *C/f* by seining was highest for emerald shiner (100.80), river shiner (18.95), and mimic shiner (31.76; Table 3.3.9). By stratum, emerald shiner had the highest *C/f* in the BWCS (104.50), IMPS (65.54), and MCBU (114.64) and mimic shiner had the highest *C/f* in the SCB (49.17).

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

All fixed-site sampling was confined to the TWZ stratum using a combination of night electrofishing, fyke netting, mini fyke netting, small and large hoop netting, and bottom trawling.

### *Night Electrofishing*

At the TWZ fixed sites, *C/f* by night electrofishing was highest for emerald shiner (469.00), sauger (44.67), and bluegill (20.67; Table 3.4.1).

### *Mini Fyke Net*

At the TWZ fixed sites, *C/f* by mini fyke netting was highest for mimic shiner (8.16), bluegill (5.25), and emerald shiner (4.10; Table 3.4.2).

### *Small Hoop Net*

At the TWZ fixed sites, *C/f* by small hoop netting was highest for bluegill (0.50), common carp (0.49), and channel catfish (0.16; Table 3.4.3).

### *Large Hoop Net*

At the TWZ fixed sites, *C/f* by large hoop netting was highest for smallmouth buffalo (7.76), common carp (0.49), and freshwater drum (0.57; Table 3.4.4).

### *Bottom Trawl*

At the TWZ fixed sites, *C/f* by bottom trawling was highest for shovelnose sturgeon (2.79), channel catfish (2.00), and speckled chub (0.46; Table 3.4.5).

## Length Distributions of Selected Species

Length distributions (expressed as a percentage of the total catch for various gears) for the 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. Length distributions of small samples ($n < 100$) may be included but are not statistically meaningful (Anderson and Neumann 1996).

### *Gizzard Shad*

The length distribution of 7,168 gizzard shad collected by electrofishing during 1999 (Figure 3.2) was dominated by age-0 fish. About 90% of the gizzard shad collected were less than 15 cm in total length.

### *Common Carp*

The length distribution of 493 common carp collected by electrofishing during 1999 (Figure 3.3) showed a large group of fish between 48 and 64 cm in total length. Few common carp were collected that ranged in length between about 15 and 35 cm long. Fish of this size may not be susceptible to our gear or are lost from the population, as they are seldom sampled by LTRMP methods in Pool 13.

### *Smallmouth Buffalo*

The length distribution of 299 smallmouth buffalo collected by small and large hoop netting (Figure 3.4) in 1999 was dominated by fish between 32 and 46 cm in total length. Less than 15% of smallmouth buffalo collected had lengths outside this range, which may indicate a size bias by hoop netting.

### *Channel Catfish*

The length distribution of 70 channel catfish collected by small and large hoop netting during 1999 (Figure 3.5) showed a range of fish between 14 and 58 cm long. Hoop netting indicated the presence of many channel catfish between 18 and 30 cm long. More than 90% of channel catfish collected by hoop netting were less than ~38 cm (15 inches) in length, which may indicate the size selectivity of this gear.

### *Northern Pike*

The length distribution of nine northern pike collected by fyke netting (Figure 3.6) showed a range of fish between 16 and 88 cm long. Mean length of the northern pike collected was 56.7 cm.

### *White Bass*

The length distribution of 305 white bass collected by electrofishing during 1999 (Figure 3.7) showed many fish between 14 and 20 cm long. Fish less than 14.0 cm contributed to 37% of the total catch, whereas more than 10% of white bass collected were greater than ~20 cm (8 inches) in total length.

### *Bluegill*

The length distribution of 2,637 bluegills collected by electrofishing during 1999 (Figure 3.8) showed that 37% of the catch comprised fish less than 8 cm long. The length distribution of 831 bluegills collected by fyke netting during 1999 (Figure 3.9) showed no fish less than 8 cm long, which is not surprising in view of the size of mesh used. However, the percentage of quality-sized fish (>15 cm or 6 inches long; Anderson 1978) collected by fyke netting was about 32% compared with less than 10% collected by electrofishing.

### *Largemouth Bass*

The length distribution of 795 largemouth bass collected by electrofishing during 1999 (Figure 3.10) was widely distributed between 4 and 48 cm. Large groups present in the catch consisted of young-of-the-year largemouth bass ranging between 4 and 10 cm long; the 1998 cohort was centered around 19 cm. About 12% of largemouth bass collected were greater than 35 cm (~14 inches).

### *White Crappie*

The length distribution of 201 white crappies collected by fyke netting during 1999 (Figure 3.11) showed an even distribution of medium and large fish but few juveniles. About 57% of white crappies collected were greater than 20.3 cm (>8 inches) in total length.

### *Black Crappie*

The length distribution of 364 black crappies collected by fyke netting during 1999 (Figure 3.12) showed that most of the fish ranged between 12 and 24 cm long. About 30% of black crappies collected were greater than ~20 cm (8 inches) in total length.

### *Sauger*

The length distribution of 456 saugers collected by electrofishing during 1999 (Figure 3.13) was dominated by a large group of fish about 14–28 cm long. About 9% of saugers collected were greater than ~30 cm (12 inches) in total length.

### *Walleye*

The length distribution of 66 walleyes collected by electrofishing during 1999 (Figure 3.14) was dominated by young-of-the-year and age 1+ fish. The complete size range of walleyes extended from 6 to 68 cm long. Twenty-one percent of walleyes collected were greater than ~38 cm (15 inches) in total length.

### *Freshwater Drum*

The length distribution of 301 freshwater drum collected by electrofishing (Figure 3.15) showed the presence of young-of-the-year and age 1+ fish. About 5% of freshwater drum collected were greater than 30.5 cm (>12 inches). The length distribution of 97 freshwater drum collected by fyke netting during 1999 (Figure 3.16) showed the presence of larger fish, with about 32% greater than 30.5 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 1999. 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 | 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=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 |
| | 126 | 30 | 72 | 90 | 36 | 60 | 24 | 0 | 48 | 486 |

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 3.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 2 | Shovelnose sturgeon | Scaphirhynchus platorynchus | 2 | - | - | - | - | - | - | - | - | - | - | 67 | 69 |
| 3 | Longnose gar | Lepisosteus osseus | 13 | 11 | 7 | 2 | 3 | - | 1 | - | - | - | - | - | 37 |
| 4 | Shortnose gar | Lepisosteus platostomus | 8 | 7 | 60 | 42 | 20 | - | 1 | 1 | - | - | - | - | 139 |
| 5 | Bowfin | Amia calva | 3 | - | 15 | 3 | 8 | 1 | - | - | - | - | - | - | 30 |
| 6 | Goldeye | Hiodon alosoides | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| 7 | Mooneye | Hiodon tergisus | 1 | 12 | - | - | - | - | 1 | - | - | - | - | - | 14 |
| 8 | Gizzard shad | Dorosoma cepedianum | 5407 | 1761 | 63 | 83 | 1254 | 34 | 508 | - | 3 | - | - | - | 9113 |
| 9 | Spotfin shiner | Cyprinella spiloptera | 91 | 12 | - | - | 77 | - | 242 | - | - | - | - | - | 422 |
| 10 | Common carp | Cyprinus carpio | 297 | 198 | 33 | 10 | 11 | 109 | 8 | 9 | 19 | - | - | - | 694 |
| 11 | Mississippi silvery minnow | Hybognathus nuchalis | - | - | - | - | 1 | - | 3 | - | - | - | - | - | 4 |
| 12 | Speckled chub | Macrhybopsis aestivalis | - | - | - | - | - | 2 | 1 | - | - | - | - | 11 | 14 |
| 13 | Silver chub | Macrhybopsis storeriana | 7 | 19 | - | 2 | 3 | 3 | 16 | 4 | - | - | - | - | 54 |
| 14 | Golden shiner | Notemigonus crysoleucas | 95 | 18 | 6 | 16 | 107 | 1 | 11 | - | - | - | - | - | 254 |
| 15 | Emerald shiner | Notropis atherinoides | 1365 | 4698 | - | - | 1766 | 111 | 11157 | - | - | - | - | - | 19097 |
| 16 | River shiner | Notropis blennius | 140 | 48 | - | - | 119 | 3 | 2332 | - | - | - | - | - | 2642 |
| 17 | Bigmouth shiner | Notropis dorsalis | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 18 | Spottail shiner | Notropis hudsonius | 29 | 1 | - | - | 12 | - | 790 | 1 | - | - | - | - | 833 |
| 19 | Sand shiner | Notropis stramineus | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 2 |
| 20 | Mimic shiner | Notropis volucellus | 201 | 250 | - | - | 1509 | 64 | 3611 | - | - | - | - | - | 5635 |
| 21 | Channel shiner | Notropis wickliffi | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 22 | Pugnose minnow | Opsopoeodus emiliae | 8 | - | - | - | 26 | 1 | 5 | - | - | - | - | - | 40 |
| 23 | Suckermouth minnow | Phenacobius mirabilis | - | - | - | - | 1 | - | 2 | - | - | - | - | - | 3 |
| 24 | Bluntnose minnow | Pimephales notatus | - | - | - | - | 1 | - | 42 | - | - | - | - | - | 43 |
| 25 | Fathead minnow | Pimephales promelas | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 26 | Bullhead minnow | Pimephales vigilax | 72 | 27 | - | - | 147 | 216 | 386 | - | - | - | - | - | 848 |
| 27 | River carpsucker | Carpiodes carpio | 8 | 10 | 12 | 4 | - | - | 5 | - | 2 | - | - | - | 41 |
| 28 | Quillback | Carpiodes cyprinus | 6 | 9 | 1 | - | - | - | - | - | 2 | - | - | - | 18 |
| 29 | Highfin carpsucker | Carpiodes velifer | 1 | 8 | - | - | - | - | - | - | - | - | - | - | 9 |
| 30 | White sucker | Catostomus commersoni | - | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 |
| 31 | Smallmouth buffalo | Ictiobus bubalus | 27 | 21 | 2 | 8 | - | - | - | 5 | 294 | - | - | - | 357 |
| 32 | Bigmouth buffalo | Ictiobus cyprinellus | 3 | 11 | - | 2 | - | - | - | - | - | - | - | - | 16 |
| 33 | Black buffalo | Ictiobus niger | 1 | 1 | 1 | - | - | - | - | - | 1 | - | - | - | 4 |
| 34 | Unidentified buffalo | Ictiobus sp. | - | - | - | - | 6 | 1 | 3 | - | - | - | - | - | 10 |
| 35 | Spotted sucker | Minytrema melanops | 18 | 18 | 19 | 11 | 1 | - | - | - | - | - | - | - | 67 |
| 36 | Silver redhorse | Moxostoma anisurum | 1 | - | - | - | 1 | - | - | - | - | - | - | - | 2 |
| 37 | Golden redhorse | Moxostoma erythrurum | 4 | 1 | - | 1 | - | - | - | 1 | 2 | - | - | - | 9 |
| 38 | Shorthead redhorse | Moxostoma macrolepidotum | 71 | 169 | 14 | 28 | 1 | - | 1 | 6 | 11 | - | - | - | 301 |
| 39 | Unidentified redhorse | Moxostoma sp. | - | - | - | - | 2 | - | 1 | - | - | - | - | - | 3 |

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 collected by the Long Term Resource Program during 1999 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 | Black bullhead | Ameiurus melas | - | - | 6 | - | - | - | - | - | - | - | - | - | 6 |
| 41 | Yellow bullhead | Ameiurus natalis | - | - | 1 | - | 1 | - | - | 1 | - | - | - | - | 3 |
| 42 | Channel catfish | Ictalurus punctatus | 19 | 19 | 4 | 1 | 7 | 20 | 20 | 61 | 9 | - | - | 48 | 208 |
| 43 | Stonecat | Noturus flavus | - | - | - | - | - | 1 | - | 1 | - | - | - | 3 | 5 |
| 44 | Tadpole madtom | Noturus gyrinus | 7 | 6 | - | - | 55 | 13 | 70 | - | - | - | - | - | 151 |
| 45 | Flathead catfish | Pylodictis olivaris | 7 | 21 | 2 | - | - | 3 | - | 7 | - | - | - | 3 | 43 |
| 46 | Northern pike | Esox lucius | 5 | 3 | 6 | 3 | 3 | - | 1 | - | - | - | - | - | 21 |
| 47 | Brook silverside | Labidesthes sicculus | 53 | 44 | - | - | 16 | - | 520 | - | - | - | - | - | 633 |
| 48 | White bass | Morone chrysops | 43 | 262 | 38 | 157 | 502 | 2 | 47 | 1 | 14 | - | - | - | 1066 |
| 49 | Yellow bass | Morone mississippiensis | 1 | 96 | 1 | 2 | 10 | 1 | 7 | - | - | - | - | - | 118 |
| 50 | Rock bass | Ambloplites rupestris | 4 | 14 | 2 | - | 1 | - | - | - | - | - | - | - | 21 |
| 51 | Green sunfish | Lepomis cyanellus | 1 | 1 | - | - | - | - | - | - | - | - | - | - | 2 |
| 52 | Pumpkinseed | Lepomis gibbosus | 64 | 33 | 123 | 117 | 451 | 16 | 61 | - | - | - | - | - | 865 |
| 53 | Warmouth | Lepomis gulosus | 15 | 2 | 7 | - | 4 | - | 1 | - | - | - | - | - | 29 |
| 54 | Orangespotted sunfish | Lepomis humilis | 132 | 61 | 11 | 33 | 302 | 105 | 163 | 1 | - | - | - | - | 808 |
| 55 | Bluegill | Lepomis macrochirus | 1792 | 845 | 356 | 475 | 3268 | 125 | 852 | 25 | 15 | - | - | - | 7753 |
| 56 | Green x warmouth sunfish | L. cyanellus x gulosus | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| 57 | Pumpkinseed x warmouth | L. gibbosus x gulosus | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 58 | Pumpkinseed x orangespotted sunfish | L. gibbosus x humilis | 2 | - | - | 6 | - | 4 | - | - | - | - | - | - | 12 |
| 59 | Bluegill x orangespotted sunfish | L. macrochirus x humilis | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 60 | Unidentified Lepomis | Lepomis sp. | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 61 | Smallmouth bass | Micropterus dolomieu | 8 | 61 | - | - | 1 | - | 7 | - | - | - | - | - | 77 |
| 62 | Largemouth bass | Micropterus salmoides | 522 | 273 | 33 | 16 | 106 | 2 | 67 | - | - | - | - | - | 1019 |
| 63 | White crappie | Pomoxis annularis | 82 | 31 | 121 | 80 | 64 | 5 | 30 | 1 | 4 | - | - | - | 418 |
| 64 | Black crappie | Pomoxis nigromaculatus | 94 | 40 | 211 | 153 | 33 | 3 | 13 | 5 | 12 | - | - | - | 564 |
| 65 | Western sand darter | Ammocrypta clara | - | - | - | - | - | - | 4 | - | - | - | - | - | 4 |
| 66 | Mud darter | Etheostoma asprigene | 5 | 2 | - | - | 9 | 2 | 4 | - | - | - | - | - | 22 |
| 67 | Bluntnose darter | Etheostoma chlorosomum | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 68 | Johnny darter | Etheostoma nigrum | 4 | 1 | - | - | 6 | 3 | 41 | - | - | - | - | - | 55 |
| 69 | Yellow perch | Perca flavescens | 27 | 2 | 11 | 25 | - | 1 | 1 | - | - | - | - | - | 67 |
| 70 | Logperch | Percina caprodes | 28 | 10 | - | - | 1 | 1 | 3 | - | - | - | - | - | 43 |
| 71 | Slenderhead darter | Percina phoxocephala | 3 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| 72 | River darter | Percina shumardi | 1 | - | - | - | 12 | - | - | - | - | - | - | - | 13 |
| 73 | Sauger | Stizostedion canadense | 51 | 405 | 11 | 27 | 3 | - | 2 | - | - | - | - | - | 499 |
| 74 | Walleye | Stizostedion vitreum | 17 | 49 | 1 | 3 | 1 | - | 2 | - | 2 | - | - | - | 75 |
| 75 | Freshwater drum | Aplodinotus grunniens | 70 | 231 | 18 | 79 | 5 | 8 | 9 | 17 | 57 | - | - | 6 | 500 |
| 76 | Rudd | Scardinius erythrophthalmus | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 |
| | | | 10941 | 9826 | 1197 | 1389 | 9941 | 861 | 21057 | 147 | 447 | 0 | 0 | 138 | 55944 |

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

Table 3.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Chestnut lamprey | 0.06 | 0.04 | 0.00 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.04) | (0.00) | (0.00) | (0.00) | (0.17) |
| Shovelnose sturgeon | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.22) | (0.00) |
| Longnose gar | 0.31 | 0.17 | 0.17 | 0.33 | 0.00 | 0.50 |
| | (0.10) | (0.08) | (0.11) | (0.14) | (0.00) | (0.34) |
| Shortnose gar | 0.08 | 0.13 | 0.25 | 0.08 | 0.11 | 0.00 |
| | (0.04) | (0.09) | (0.13) | (0.08) | (0.11) | (0.00) |
| Bowfin | 0.04 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.07) | (0.00) | (0.00) | (0.00) | (0.00) |
| Mooneye | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) |
| Gizzard shad | 79.88 | 199.08 | 20.08 | 23.17 | 1.22 | 16.50 |
| | (22.94) | (67.75) | (8.86) | (10.13) | (0.62) | (8.67) |
| Spotfin shiner | 2.56 | 1.21 | 0.25 | 2.58 | 0.00 | 4.67 |
| | (0.61) | (0.49) | (0.25) | (1.03) | (0.00) | (1.78) |
| Common carp | 6.51 | 5.83 | 1.58 | 7.33 | 0.89 | 7.00 |
| | (0.91) | (1.00) | (0.76) | (1.60) | (0.65) | (2.39) |
| Silver chub | 0.20 | 0.04 | 0.00 | 0.50 | 0.00 | 0.00 |
| | (0.16) | (0.04) | (0.00) | (0.42) | (0.00) | (0.00) |
| Golden shiner | 0.85 | 1.88 | 4.00 | 0.00 | 0.00 | 0.33 |
| | (0.32) | (0.90) | (2.29) | (0.00) | (0.00) | (0.33) |
| Emerald shiner | 32.72 | 20.88 | 6.75 | 22.50 | 12.11 | 67.33 |
| | (12.67) | (11.84) | (2.69) | (8.47) | (11.61) | (45.87) |
| River shiner | 3.08 | 3.25 | 0.58 | 2.25 | 0.11 | 4.50 |
| | (0.78) | (2.03) | (0.50) | (0.63) | (0.11) | (1.20) |
| Spottail shiner | 0.33 | 0.92 | 0.58 | 0.00 | 0.00 | 0.00 |
| | (0.23) | (0.68) | (0.36) | (0.00) | (0.00) | (0.00) |
| Mimic shiner | 6.83 | 1.13 | 0.67 | 3.08 | 0.44 | 20.83 |
| | (3.42) | (0.60) | (0.47) | (1.18) | (0.34) | (13.38) |
| Pugnose minnow | 0.09 | 0.25 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.14) | (0.17) | (0.00) | (0.00) | (0.00) |
| Bullhead minnow | 1.64 | 1.96 | 0.08 | 0.25 | 0.00 | 3.50 |
| | (0.58) | (0.78) | (0.08) | (0.18) | (0.00) | (2.03) |
| River carpsucker | 0.16 | 0.21 | 0.08 | 0.00 | 0.00 | 0.33 |
| | (0.10) | (0.13) | (0.08) | (0.00) | (0.00) | (0.33) |
| Quillback | 0.14 | 0.17 | 0.00 | 0.00 | 0.00 | 0.33 |
| | (0.10) | (0.17) | (0.00) | (0.00) | (0.00) | (0.33) |
| Highfin carpsucker | 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 buffalo | 0.35 | 1.04 | 0.08 | 0.00 | 0.11 | 0.00 |
| | (0.16) | (0.47) | (0.08) | (0.00) | (0.11) | (0.00) |
| Bigmouth buffalo | 0.03 | 0.08 | 0.00 | 0.00 | 0.11 | 0.00 |
| | (0.03) | (0.08) | (0.00) | (0.00) | (0.11) | (0.00) |
| Black buffalo | 0.03 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) |
| Spotted sucker | 0.25 | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.09) | (0.28) | (0.00) | (0.00) | (0.00) | (0.00) |
| 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 | 0.02 | 0.04 | 0.00 | 0.00 | 0.33 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.24) | (0.00) |
| Shorthead redhorse | 0.54 | 0.21 | 0.08 | 0.25 | 6.00 | 1.33 |
| | (0.15) | (0.10) | (0.08) | (0.18) | (2.27) | (0.49) |
| Channel catfish | 0.29 | 0.50 | 0.17 | 0.08 | 0.22 | 0.33 |
| | (0.09) | (0.20) | (0.11) | (0.08) | (0.15) | (0.21) |
| Tadpole madtom | 0.11 | 0.21 | 0.08 | 0.00 | 0.00 | 0.17 |
| | (0.05) | (0.10) | (0.08) | (0.00) | (0.00) | (0.17) |

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 3.3.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Flathead catfish | 0.14 | 0.04 | 0.08 | 0.33 | 0.11 | 0.00 |
| | (0.07) | (0.04) | (0.08) | (0.19) | (0.11) | (0.00) |
| Northern pike | 0.08 | 0.08 | 0.17 | 0.00 | 0.00 | 0.17 |
| | (0.05) | (0.06) | (0.11) | (0.00) | (0.00) | (0.17) |
| Brook silverside | 0.88 | 1.58 | 0.50 | 0.33 | 0.00 | 0.83 |
| | (0.29) | (0.85) | (0.34) | (0.19) | (0.00) | (0.17) |
| White bass | 0.88 | 0.83 | 0.58 | 0.67 | 0.00 | 1.33 |
| | (0.23) | (0.32) | (0.36) | (0.28) | (0.00) | (0.71) |
| Yellow bass | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) | (0.00) |
| Rock bass | 0.08 | 0.04 | 0.08 | 0.17 | 0.00 | 0.00 |
| | (0.04) | (0.04) | (0.08) | (0.11) | (0.00) | (0.00) |
| Green sunfish | 0.03 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) |
| Pumpkinseed | 0.64 | 1.46 | 2.25 | 0.08 | 0.00 | 0.17 |
| | (0.25) | (0.73) | (0.70) | (0.08) | (0.00) | (0.17) |
| Warmouth | 0.21 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.10) | (0.29) | (0.00) | (0.00) | (0.00) | (0.00) |
| Orangespotted sunfish | 2.43 | 4.42 | 0.08 | 0.17 | 0.22 | 3.50 |
| | (0.67) | (1.51) | (0.08) | (0.11) | (0.15) | (1.77) |
| Bluegill | 24.71 | 63.38 | 16.25 | 0.58 | 0.33 | 11.00 |
| | (10.59) | (31.72) | (5.74) | (0.34) | (0.24) | (3.97) |
| Pumpkinseed x warmouth | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) | (0.00) |
| Pumpkinseed x orangespotted sunfish | 0.06 | 0.04 | 0.00 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.04) | (0.00) | (0.00) | (0.00) | (0.17) |
| Unidentified Lepomis | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 |
| | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) | (0.33) |
| Smallmouth bass | 0.18 | 0.17 | 0.00 | 0.33 | 0.00 | 0.00 |
| | (0.09) | (0.10) | (0.00) | (0.22) | (0.00) | (0.00) |
| Largemouth bass | 7.67 | 15.29 | 7.25 | 2.00 | 0.78 | 6.17 |
| | (1.38) | (3.75) | (1.98) | (0.54) | (0.66) | (2.15) |
| White crappie | 1.17 | 3.38 | 0.00 | 0.00 | 0.00 | 0.17 |
| | (0.52) | (1.55) | (0.00) | (0.00) | (0.00) | (0.17) |
| Black crappie | 1.42 | 3.75 | 0.00 | 0.00 | 0.00 | 0.67 |
| | (0.68) | (1.98) | (0.00) | (0.00) | (0.00) | (0.67) |
| Mud darter | 0.11 | 0.13 | 0.00 | 0.08 | 0.00 | 0.17 |
| | (0.06) | (0.07) | (0.00) | (0.08) | (0.00) | (0.17) |
| Johnny darter | 0.06 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 |
| | (0.04) | (0.08) | (0.08) | (0.08) | (0.00) | (0.00) |
| Yellow perch | 0.38 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.27) | (0.81) | (0.00) | (0.00) | (0.00) | (0.00) |
| Logperch | 0.25 | 0.50 | 1.08 | 0.00 | 0.22 | 0.17 |
| | (0.13) | (0.38) | (0.56) | (0.00) | (0.15) | (0.17) |
| Slenderhead darter | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.33) | (0.00) |
| River 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) |
| Sauger | 0.89 | 1.29 | 0.42 | 0.75 | 0.22 | 0.67 |
| | (0.19) | (0.40) | (0.26) | (0.28) | (0.15) | (0.33) |
| Walleye | 0.21 | 0.17 | 0.33 | 0.25 | 0.56 | 0.17 |
| | (0.09) | (0.10) | (0.19) | (0.18) | (0.34) | (0.17) |
| Freshwater drum | 1.35 | 1.83 | 0.33 | 1.50 | 0.00 | 0.67 |
| | (0.48) | (0.85) | (0.19) | (0.98) | (0.00) | (0.49) |

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 3.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Longnose gar | 0.24 | 0.00 | 0.17 | 0.67 |
| | (0.11) | (0.00) | (0.17) | (0.33) |
| Shortnose gar | 0.22 | 0.33 | 0.17 | 0.17 |
| | (0.14) | (0.33) | (0.17) | (0.17) |
| Goldeye | 0.04 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.00) | (0.00) | (0.17) |
| Mooneye | 0.71 | 0.00 | 1.50 | 0.50 |
| | (0.60) | (0.00) | (1.50) | (0.50) |
| Gizzard shad | 61.48 | 167.17 | 5.50 | 4.67 |
| | (31.96) | (91.91) | (3.41) | (1.76) |
| Spotfin shiner | 0.53 | 0.33 | 0.17 | 1.33 |
| | (0.21) | (0.21) | (0.17) | (0.71) |
| Common carp | 9.05 | 4.67 | 4.83 | 21.00 |
| | (2.76) | (1.02) | (1.68) | (10.07) |
| Silver chub | 0.81 | 0.33 | 1.00 | 1.17 |
| | (0.34) | (0.21) | (0.68) | (0.75) |
| Golden shiner | 1.02 | 2.67 | 0.00 | 0.33 |
| | (0.80) | (2.29) | (0.00) | (0.33) |
| Emerald shiner | 106.32 | 259.00 | 14.00 | 41.00 |
| | (77.00) | (220.40) | (8.73) | (28.11) |
| River shiner | 0.29 | 0.33 | 0.00 | 0.67 |
| | (0.15) | (0.33) | (0.00) | (0.33) |
| Spottail shiner | 0.04 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.00) | (0.00) | (0.17) |
| Mimic shiner | 7.25 | 8.00 | 5.17 | 9.33 |
| | (2.04) | (5.11) | (1.76) | (2.78) |
| Bullhead minnow | 1.41 | 1.67 | 1.00 | 1.67 |
| | (0.58) | (1.48) | (0.37) | (0.92) |
| River carpsucker | 0.45 | 0.67 | 0.00 | 0.83 |
| | (0.20) | (0.49) | (0.00) | (0.40) |
| Quillback | 0.45 | 0.17 | 1.00 | 0.00 |
| | (0.32) | (0.17) | (0.82) | (0.00) |
| Highfin carpsucker | 0.34 | 0.17 | 0.50 | 0.33 |
| | (0.21) | (0.17) | (0.50) | (0.21) |
| Smallmouth buffalo | 1.11 | 2.50 | 0.17 | 0.67 |
| | (0.24) | (0.62) | (0.17) | (0.33) |
| Bigmouth buffalo | 0.55 | 0.50 | 0.17 | 1.17 |
| | (0.24) | (0.22) | (0.17) | (0.83) |
| Black buffalo | 0.04 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.00) | (0.00) | (0.17) |
| Spotted sucker | 1.04 | 3.00 | 0.00 | 0.00 |
| | (0.36) | (1.03) | (0.00) | (0.00) |
| Shorthead redhorse | 5.63 | 0.67 | 7.67 | 9.17 |
| | (1.12) | (0.67) | (1.67) | (3.33) |
| Channel catfish | 0.91 | 0.17 | 1.17 | 1.50 |
| | (0.28) | (0.17) | (0.48) | (0.76) |
| Tadpole madtom | 0.34 | 0.67 | 0.17 | 0.17 |
| | (0.24) | (0.67) | (0.17) | (0.17) |
| Flathead catfish | 1.00 | 0.00 | 2.00 | 0.83 |
| | (0.43) | (0.00) | (1.10) | (0.31) |
| Northern pike | 0.06 | 0.17 | 0.00 | 0.00 |
| | (0.06) | (0.17) | (0.00) | (0.00) |
| Brook silverside | 2.15 | 3.50 | 1.50 | 1.33 |
| | (0.65) | (1.59) | (0.76) | (0.71) |
| White bass | 5.20 | 7.00 | 4.17 | 4.33 |
| | (1.15) | (2.54) | (1.54) | (1.67) |
| Yellow bass | 5.43 | 15.00 | 0.33 | 0.33 |
| | (4.66) | (13.42) | (0.33) | (0.21) |

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 3.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Rock bass | 0.06 | 0.00 | 0.17 | 0.00 |
| | (0.06) | (0.00) | (0.17) | (0.00) |
| Pumpkinseed | 0.84 | 2.17 | 0.00 | 0.33 |
| | (0.44) | (1.25) | (0.00) | (0.33) |
| Warmouth | 0.12 | 0.33 | 0.00 | 0.00 |
| | (0.07) | (0.21) | (0.00) | (0.00) |
| Orangespotted sunfish | 2.67 | 7.17 | 0.00 | 0.67 |
| | (1.61) | (4.62) | (0.00) | (0.42) |
| Bluegill | 40.90 | 104.67 | 3.33 | 12.17 |
| | (11.23) | (31.93) | (0.80) | (6.60) |
| Green sunfish x warmouth | 0.06 | 0.17 | 0.00 | 0.00 |
| | (0.06) | (0.17) | (0.00) | (0.00) |
| Smallmouth bass | 0.89 | 0.00 | 1.83 | 0.67 |
| | (0.27) | (0.00) | (0.65) | (0.33) |
| Largemouth bass | 9.76 | 22.33 | 3.33 | 2.67 |
| | (2.39) | (6.69) | (1.12) | (1.38) |
| White crappie | 1.62 | 4.17 | 0.00 | 0.67 |
| | (0.69) | (1.96) | (0.00) | (0.49) |
| Black crappie | 2.09 | 4.50 | 0.67 | 1.00 |
| | (1.11) | (3.16) | (0.33) | (0.52) |
| Mud darter | 0.09 | 0.00 | 0.00 | 0.33 |
| | (0.09) | (0.00) | (0.00) | (0.33) |
| Johnny darter | 0.04 | 0.00 | 0.00 | 0.17 |
| | (0.04) | (0.00) | (0.00) | (0.17) |
| Yellow perch | 0.12 | 0.33 | 0.00 | 0.00 |
| | (0.07) | (0.21) | (0.00) | (0.00) |
| Logperch | 0.38 | 0.17 | 0.50 | 0.50 |
| | (0.14) | (0.17) | (0.22) | (0.34) |
| Sauger | 7.67 | 11.17 | 5.67 | 6.00 |
| | (1.38) | (3.53) | (1.17) | (1.63) |
| Walleye | 1.41 | 3.50 | 0.17 | 0.50 |
| | (0.76) | (2.16) | (0.17) | (0.50) |
| Freshwater drum | 6.83 | 3.00 | 10.50 | 6.50 |
| | (2.22) | (1.63) | (5.28) | (2.51) |

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 3.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.16 | 0.17 |
| | (0.11) | (0.13) | (0.12) |
| Shortnose gar | 1.49 | 1.49 | 1.48 |
| | (0.79) | (0.88) | (0.45) |
| Bowfin | 0.38 | 0.39 | 0.26 |
| | (0.19) | (0.21) | (0.13) |
| Gizzard shad | 1.52 | 1.49 | 1.81 |
| | (0.37) | (0.40) | (0.90) |
| Common carp | 0.87 | 0.91 | 0.53 |
| | (0.48) | (0.54) | (0.21) |
| Golden shiner | 0.14 | 0.14 | 0.17 |
| | (0.06) | (0.07) | (0.17) |
| River carpsucker | 0.32 | 0.34 | 0.17 |
| | (0.14) | (0.16) | (0.17) |
| Quillback | 0.01 | 0.00 | 0.09 |
| | (0.01) | (0.00) | (0.09) |
| White sucker | 0.03 | 0.04 | 0.00 |
| | (0.03) | (0.04) | (0.00) |
| Smallmouth buffalo | 0.06 | 0.07 | 0.00 |
| | (0.04) | (0.05) | (0.00) |
| Black buffalo | 0.03 | 0.04 | 0.00 |
| | (0.03) | (0.04) | (0.00) |
| Spotted sucker | 0.59 | 0.64 | 0.09 |
| | (0.25) | (0.28) | (0.09) |
| Shorthead redhorse | 0.34 | 0.33 | 0.43 |
| | (0.17) | (0.19) | (0.24) |
| Black bullhead | 0.20 | 0.22 | 0.00 |
| | (0.15) | (0.16) | (0.00) |
| Yellow bullhead | 0.03 | 0.04 | 0.00 |
| | (0.03) | (0.04) | (0.00) |
| Channel catfish | 0.08 | 0.07 | 0.17 |
| | (0.05) | (0.05) | (0.17) |
| Flathead catfish | 0.04 | 0.03 | 0.09 |
| | (0.03) | (0.03) | (0.09) |
| Northern pike | 0.14 | 0.13 | 0.18 |
| | (0.07) | (0.08) | (0.18) |
| White bass | 0.87 | 0.85 | 1.03 |
| | (0.25) | (0.27) | (0.53) |
| Yellow bass | 0.03 | 0.04 | 0.00 |
| | (0.03) | (0.04) | (0.00) |
| Rock bass | 0.04 | 0.03 | 0.09 |
| | (0.03) | (0.03) | (0.09) |
| Pumpkinseed | 2.82 | 2.67 | 4.17 |
| | (1.90) | (2.09) | (1.89) |
| Warmouth | 0.23 | 0.25 | 0.00 |
| | (0.17) | (0.19) | (0.00) |
| Orangespotted sunfish | 0.35 | 0.39 | 0.00 |
| | (0.12) | (0.13) | (0.00) |
| Bluegill | 10.10 | 10.70 | 4.41 |
| | (2.26) | (2.50) | (2.33) |
| Largemouth bass | 0.81 | 0.81 | 0.87 |
| | (0.16) | (0.17) | (0.43) |
| White crappie | 3.69 | 3.98 | 0.94 |
| | (2.02) | (2.24) | (0.94) |
| Black crappie | 6.36 | 6.85 | 1.70 |
| | (2.80) | (3.11) | (1.18) |
| Yellow perch | 0.14 | 0.07 | 0.79 |
| | (0.08) | (0.05) | (0.70) |

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 3.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Sauger | 0.22 | 0.20 | 0.43 |
| | (0.08) | (0.09) | (0.23) |
| Walleye | 0.01 | 0.00 | 0.09 |
| | (0.01) | (0.00) | (0.09) |
| Freshwater drum | 0.52 | 0.56 | 0.17 |
| | (0.18) | (0.20) | (0.12) |

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 tandem fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.03 | 0.07 | 0.00 |
| | (0.02) | (0.05) | (0.00) |
| Shortnose gar | 0.52 | 1.40 | 0.00 |
| | (0.21) | (0.57) | (0.00) |
| Bowfin | 0.04 | 0.11 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| Gizzard shad | 1.77 | 2.37 | 1.42 |
| | (0.79) | (1.21) | (1.03) |
| Common carp | 0.13 | 0.36 | 0.00 |
| | (0.09) | (0.24) | (0.00) |
| Silver chub | 0.06 | 0.03 | 0.08 |
| | (0.05) | (0.03) | (0.08) |
| Golden shiner | 0.30 | 0.49 | 0.19 |
| | (0.14) | (0.20) | (0.19) |
| River carpsucker | 0.13 | 0.06 | 0.17 |
| | (0.07) | (0.04) | (0.11) |
| Smallmouth buffalo | 0.11 | 0.30 | 0.00 |
| | (0.07) | (0.19) | (0.00) |
| Bigmouth buffalo | 0.03 | 0.08 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| Spotted sucker | 0.15 | 0.41 | 0.00 |
| | (0.11) | (0.30) | (0.00) |
| Golden redhorse | 0.01 | 0.03 | 0.00 |
| | (0.01) | (0.03) | (0.00) |
| Shorthead redhorse | 0.69 | 0.66 | 0.71 |
| | (0.31) | (0.38) | (0.44) |
| Channel catfish | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Northern pike | 0.04 | 0.10 | 0.00 |
| | (0.02) | (0.05) | (0.00) |
| White bass | 2.99 | 4.49 | 2.12 |
| | (1.02) | (1.79) | (1.23) |
| Yellow bass | 0.02 | 0.07 | 0.00 |
| | (0.02) | (0.07) | (0.00) |
| Pumpkinseed | 1.58 | 3.98 | 0.19 |
| | (0.67) | (1.79) | (0.19) |
| Orangespotted sunfish | 0.43 | 1.17 | 0.00 |
| | (0.12) | (0.33) | (0.00) |
| Bluegill | 7.18 | 15.36 | 2.41 |
| | (2.16) | (4.19) | (2.41) |
| Pumpkinseed x orangespotted sunfish | 0.07 | 0.20 | 0.00 |
| | (0.07) | (0.20) | (0.00) |
| Largemouth bass | 0.25 | 0.52 | 0.09 |
| | (0.09) | (0.20) | (0.09) |
| White crappie | 1.06 | 2.71 | 0.09 |
| | (0.27) | (0.72) | (0.09) |
| Black crappie | 2.22 | 5.09 | 0.55 |
| | (0.70) | (1.73) | (0.45) |
| Yellow perch | 0.31 | 0.85 | 0.00 |
| | (0.13) | (0.35) | (0.00) |
| Sauger | 0.54 | 0.73 | 0.42 |
| | (0.19) | (0.34) | (0.24) |
| Walleye | 0.04 | 0.11 | 0.00 |
| | (0.02) | (0.06) | (0.00) |
| Freshwater drum | 1.91 | 1.93 | 1.90 |
| | (0.53) | (0.49) | (0.79) |

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 3.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.03 | 0.07 | 0.09 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.05) | (0.09) | (0.00) | (0.00) | (0.00) |
| Shortnose gar | 0.23 | 0.52 | 0.34 | 0.00 | 0.00 | 0.17 |
| | (0.08) | (0.20) | (0.15) | (0.00) | (0.00) | (0.17) |
| Bowfin | 0.10 | 0.21 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.04) | (0.09) | (0.00) | (0.08) | (0.00) | (0.00) |
| Gizzard shad | 13.17 | 38.78 | 2.36 | 0.34 | 5.08 | 0.00 |
| | (10.67) | (32.13) | (2.18) | (0.15) | (3.65) | (0.00) |
| Spotfin shiner | 1.09 | 0.76 | 0.00 | 2.09 | 2.85 | 0.17 |
| | (0.32) | (0.45) | (0.00) | (0.76) | (1.59) | (0.17) |
| Common carp | 0.09 | 0.24 | 0.34 | 0.00 | 0.00 | 0.00 |
| | (0.04) | (0.13) | (0.23) | (0.00) | (0.00) | (0.00) |
| Mississippi silvery minnow | 0.03 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.09) | (0.00) | (0.00) |
| Silver chub | 0.01 | 0.03 | 0.00 | 0.00 | 0.26 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.26) | (0.00) |
| Golden shiner | 0.55 | 0.73 | 6.66 | 0.09 | 0.24 | 0.15 |
| | (0.26) | (0.40) | (6.40) | (0.09) | (0.16) | (0.15) |
| Emerald shiner | 11.16 | 8.57 | 0.67 | 18.49 | 158.04 | 1.90 |
| | (3.86) | (3.98) | (0.67) | (9.63) | (88.30) | (1.22) |
| River shiner | 1.35 | 0.77 | 1.90 | 2.45 | 4.88 | 0.34 |
| | (0.44) | (0.39) | (1.16) | (1.10) | (3.15) | (0.34) |
| Spottail shiner | 0.10 | 0.10 | 0.09 | 0.17 | 0.00 | 0.00 |
| | (0.05) | (0.06) | (0.09) | (0.12) | (0.00) | (0.00) |
| Sand shiner | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.12) | (0.00) |
| Mimic shiner | 27.74 | 14.70 | 2.90 | 56.36 | 39.33 | 6.14 |
| | (9.76) | (8.90) | (1.44) | (24.95) | (31.20) | (3.19) |
| Channel shiner | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.12) | (0.00) |
| Pugnose minnow | 0.39 | 0.81 | 0.00 | 0.00 | 0.00 | 0.48 |
| | (0.13) | (0.36) | (0.00) | (0.00) | (0.00) | (0.22) |
| Suckermouth minnow | 0.03 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.09) | (0.00) | (0.00) |
| Bluntnose minnow | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.11) | (0.00) |
| Bullhead minnow | 2.39 | 2.95 | 1.28 | 2.65 | 0.99 | 1.44 |
| | (0.64) | (1.53) | (0.92) | (0.95) | (0.86) | (0.68) |
| Unidentified buffalo | 0.03 | 0.04 | 0.43 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.04) | (0.43) | (0.00) | (0.00) | (0.00) |
| Spotted sucker | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) |
| Silver redhorse | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.13) | (0.00) |
| Shorthead redhorse | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) |
| Unidentified redhorse | 0.02 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.07) | (0.00) | (0.00) | (0.00) | (0.00) |
| Yellow bullhead | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) |
| Channel catfish | 0.08 | 0.03 | 0.08 | 0.17 | 0.38 | 0.00 |
| | (0.04) | (0.03) | (0.08) | (0.11) | (0.19) | (0.00) |
| Tadpole madtom | 0.29 | 0.18 | 4.09 | 0.00 | 0.00 | 0.34 |
| | (0.12) | (0.09) | (2.17) | (0.00) | (0.00) | (0.34) |
| Northern pike | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) |
| Brook silverside | 0.22 | 0.07 | 0.00 | 0.51 | 0.98 | 0.00 |
| | (0.19) | (0.05) | (0.00) | (0.51) | (0.86) | (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 3.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| White bass | 5.52 | 16.35 | 0.00 | 0.17 | 1.24 | 0.00 |
| | (4.22) | (12.72) | (0.00) | (0.12) | (0.86) | (0.00) |
| Yellow bass | 0.13 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.09) | (0.27) | (0.00) | (0.00) | (0.00) | (0.00) |
| Rock bass | 0.01 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) | (0.00) |
| Pumpkinseed | 2.23 | 3.40 | 29.55 | 0.17 | 0.00 | 0.00 |
| | (0.89) | (2.11) | (15.70) | (0.17) | (0.00) | (0.00) |
| Warmouth | 0.04 | 0.11 | 0.08 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.08) | (0.00) | (0.00) | (0.00) |
| Orangespotted sunfish | 3.78 | 10.02 | 0.00 | 0.51 | 0.34 | 0.95 |
| | (1.98) | (5.92) | (0.00) | (0.43) | (0.24) | (0.60) |
| Bluegill | 35.87 | 86.68 | 51.12 | 10.40 | 5.84 | 5.00 |
| | (16.21) | (48.45) | (24.76) | (4.00) | (2.21) | (3.44) |
| Bluegill x orangespotted sunfish | 0.03 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.09) | (0.00) | (0.00) |
| Smallmouth bass | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.13) | (0.00) |
| Largemouth bass | 1.38 | 2.86 | 1.18 | 0.68 | 0.32 | 0.51 |
| | (0.63) | (1.83) | (0.52) | (0.29) | (0.32) | (0.51) |
| White crappie | 0.82 | 1.50 | 0.17 | 0.25 | 0.99 | 0.85 |
| | (0.27) | (0.46) | (0.17) | (0.13) | (0.86) | (0.85) |
| Black crappie | 0.33 | 0.98 | 0.08 | 0.00 | 0.32 | 0.00 |
| | (0.11) | (0.34) | (0.08) | (0.00) | (0.32) | (0.00) |
| Mud darter | 0.13 | 0.27 | 0.00 | 0.00 | 0.00 | 0.17 |
| | (0.07) | (0.15) | (0.00) | (0.00) | (0.00) | (0.17) |
| Bluntnose darter | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) |
| Johnny darter | 0.14 | 0.07 | 0.08 | 0.08 | 0.00 | 0.32 |
| | (0.06) | (0.05) | (0.08) | (0.08) | (0.00) | (0.20) |
| Logperch | 0.03 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.09) | (0.00) | (0.00) |
| River darter | 0.17 | 0.38 | 0.00 | 0.00 | 0.00 | 0.17 |
| | (0.11) | (0.29) | (0.00) | (0.00) | (0.00) | (0.17) |
| Sauger | 0.03 | 0.00 | 0.00 | 0.08 | 0.12 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.08) | (0.12) | (0.00) |
| Walleye | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.09) | (0.00) | (0.00) | (0.00) |
| Freshwater drum | 0.08 | 0.04 | 0.08 | 0.17 | 0.00 | 0.00 |
| | (0.04) | (0.04) | (0.08) | (0.12) | (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 3.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Bowfin | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Gizzard shad | 0.42 | 1.15 | 0.00 |
| | (0.12) | (0.34) | (0.00) |
| Common carp | 1.28 | 3.48 | 0.00 |
| | (1.17) | (3.19) | (0.00) |
| Speckled chub | 0.10 | 0.00 | 0.16 |
| | (0.10) | (0.00) | (0.16) |
| Silver chub | 0.08 | 0.07 | 0.08 |
| | (0.06) | (0.07) | (0.08) |
| Golden shiner | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Emerald shiner | 1.76 | 3.71 | 0.63 |
| | (0.94) | (2.51) | (0.29) |
| River shiner | 0.08 | 0.07 | 0.09 |
| | (0.06) | (0.05) | (0.09) |
| Mimic shiner | 1.29 | 1.99 | 0.89 |
| | (0.55) | (1.24) | (0.49) |
| Pugnose minnow | 0.01 | 0.03 | 0.00 |
| | (0.01) | (0.03) | (0.00) |
| Bullhead minnow | 2.99 | 7.79 | 0.19 |
| | (1.85) | (5.02) | (0.19) |
| Unidentified buffalo | 0.06 | 0.00 | 0.09 |
| | (0.06) | (0.00) | (0.09) |
| Channel catfish | 0.85 | 0.23 | 1.21 |
| | (0.47) | (0.15) | (0.74) |
| Stonecat | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Tadpole madtom | 0.54 | 0.13 | 0.78 |
| | (0.20) | (0.07) | (0.31) |
| Flathead catfish | 0.14 | 0.04 | 0.19 |
| | (0.12) | (0.04) | (0.19) |
| White bass | 0.03 | 0.07 | 0.00 |
| | (0.02) | (0.05) | (0.00) |
| Yellow bass | 0.01 | 0.04 | 0.00 |
| | (0.01) | (0.04) | (0.00) |
| Pumpkinseed | 0.43 | 0.31 | 0.49 |
| | (0.32) | (0.21) | (0.49) |
| Orangespotted sunfish | 1.35 | 3.50 | 0.10 |
| | (0.67) | (1.81) | (0.10) |
| Bluegill | 2.44 | 3.54 | 1.81 |
| | (1.22) | (1.19) | (1.81) |
| Pumpkinseed x orangespotted sunfish | 0.04 | 0.12 | 0.00 |
| | (0.04) | (0.12) | (0.00) |
| Largemouth bass | 0.06 | 0.03 | 0.08 |
| | (0.05) | (0.03) | (0.08) |
| White crappie | 0.06 | 0.18 | 0.00 |
| | (0.03) | (0.09) | (0.00) |
| Black crappie | 0.04 | 0.11 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| Mud darter | 0.02 | 0.07 | 0.00 |
| | (0.02) | (0.04) | (0.00) |
| Johnny darter | 0.04 | 0.11 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| Yellow perch | 0.01 | 0.03 | 0.00 |
| | (0.01) | (0.03) | (0.00) |
| Logperch | 0.05 | 0.00 | 0.08 |
| | (0.05) | (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 3.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Freshwater drum | 0.23 | 0.19 | 0.25 |
| | (0.17) | (0.12) | (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 3.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Shortnose gar | 0.01 (0.01) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) |
| Common carp | 0.02 (0.01) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.05 (0.03) |
| Silver chub | 0.04 (0.02) | 0.00 (0.00) | 0.13 (0.07) | 0.00 (0.00) | 0.02 (0.02) |
| Spottail shiner | 0.05 (0.05) | 0.08 (0.08) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) |
| Smallmouth buffalo | 0.04 (0.02) | 0.00 (0.00) | 0.09 (0.06) | 0.00 (0.00) | 0.07 (0.04) |
| Golden redhorse | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.03 (0.03) |
| Shorthead redhorse | 0.05 (0.03) | 0.00 (0.00) | 0.18 (0.10) | 0.00 (0.00) | 0.05 (0.05) |
| Channel catfish | 0.34 (0.16) | 0.00 (0.00) | 0.79 (0.61) | 0.38 (0.26) | 0.82 (0.25) |
| Stonecat | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.02 (0.02) |
| Flathead catfish | 0.02 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.14 (0.06) |
| White bass | 0.01 (0.01) | 0.00 (0.00) | 0.04 (0.04) | 0.00 (0.00) | 0.00 (0.00) |
| Orangespotted sunfish | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.02 (0.02) |
| Bluegill | 0.13 (0.06) | 0.00 (0.00) | 0.31 (0.23) | 0.00 (0.00) | 0.30 (0.16) |
| White crappie | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.00 (0.00) | 0.02 (0.02) |
| Black crappie | 0.15 (0.13) | 0.23 (0.23) | 0.04 (0.04) | 0.00 (0.00) | 0.02 (0.02) |
| Freshwater drum | 0.07 (0.03) | 0.00 (0.00) | 0.09 (0.09) | 0.22 (0.12) | 0.24 (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 3.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Gizzard shad | 0.06 | 0.08 | 0.04 | 0.00 | 0.02 |
| | (0.05) | (0.08) | (0.04) | (0.00) | (0.02) |
| Common carp | 0.03 | 0.00 | 0.08 | 0.05 | 0.05 |
| | (0.02) | (0.00) | (0.08) | (0.05) | (0.03) |
| River carpsucker | 0.02 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.02) | (0.00) | (0.09) | (0.00) | (0.00) |
| Quillback | 0.01 | 0.00 | 0.00 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.03) |
| Smallmouth buffalo | 0.99 | 0.59 | 1.10 | 4.70 | 2.07 |
| | (0.27) | (0.38) | (0.43) | (1.34) | (0.69) |
| Black buffalo | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.06) | (0.00) |
| Golden redhorse | 0.01 | 0.00 | 0.00 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.05) |
| Shorthead redhorse | 0.08 | 0.09 | 0.04 | 0.17 | 0.13 |
| | (0.05) | (0.09) | (0.04) | (0.12) | (0.07) |
| Channel catfish | 0.04 | 0.00 | 0.04 | 0.11 | 0.14 |
| | (0.02) | (0.00) | (0.04) | (0.11) | (0.09) |
| White bass | 0.19 | 0.17 | 0.30 | 0.05 | 0.08 |
| | (0.08) | (0.11) | (0.19) | (0.05) | (0.04) |
| Bluegill | 0.06 | 0.00 | 0.09 | 0.00 | 0.24 |
| | (0.02) | (0.00) | (0.06) | (0.00) | (0.11) |
| White crappie | 0.02 | 0.00 | 0.04 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.04) | (0.00) | (0.03) |
| Black crappie | 0.10 | 0.08 | 0.09 | 0.00 | 0.22 |
| | (0.05) | (0.08) | (0.09) | (0.00) | (0.14) |
| Walleye | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 |
| | (0.00) | (0.00) | (0.00) | (0.06) | (0.02) |
| Freshwater drum | 0.56 | 0.63 | 0.26 | 0.28 | 0.76 |
| | (0.26) | (0.44) | (0.15) | (0.12) | (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

Table 3.3.9. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| Longnose gar | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.03) | (0.00) |
| Shortnose gar | 0.02 | 0.00 | 0.00 | 0.00 | 0.08 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.08) |
| Mooneye | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.03) | (0.00) |
| Gizzard shad | 4.75 | 8.47 | 3.04 | 2.47 | 3.42 |
| | (1.42) | (3.74) | (2.66) | (1.56) | (1.36) |
| Spotfin shiner | 1.41 | 1.22 | 6.25 | 0.61 | 2.17 |
| | (0.32) | (0.58) | (3.40) | (0.20) | (0.81) |
| Common carp | 0.15 | 0.00 | 0.04 | 0.00 | 0.58 |
| | (0.11) | (0.00) | (0.04) | (0.00) | (0.43) |
| Mississippi silvery minnow | 0.03 | 0.06 | 0.00 | 0.03 | 0.00 |
| | (0.02) | (0.04) | (0.00) | (0.03) | (0.00) |
| Speckled chub | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.03) | (0.00) |
| Silver chub | 0.17 | 0.28 | 0.00 | 0.14 | 0.08 |
| | (0.06) | (0.12) | (0.00) | (0.09) | (0.08) |
| Golden shiner | 0.11 | 0.08 | 0.17 | 0.03 | 0.25 |
| | (0.05) | (0.06) | (0.10) | (0.03) | (0.18) |
| Emerald shiner | 100.80 | 140.50 | 65.54 | 114.64 | 33.25 |
| | (36.76) | (99.65) | (36.08) | (41.01) | (12.17) |
| River shiner | 18.95 | 7.67 | 42.29 | 18.53 | 31.17 |
| | (3.36) | (3.45) | (12.62) | (4.86) | (10.03) |
| Bigmouth shiner | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.04) | (0.00) | (0.00) |
| Spottail shiner | 1.41 | 0.81 | 31.67 | 0.00 | 0.08 |
| | (1.03) | (0.34) | (29.69) | (0.00) | (0.08) |
| Sand shiner | 0.02 | 0.00 | 0.00 | 0.00 | 0.08 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.08) |
| Mimic shiner | 31.76 | 21.97 | 52.92 | 26.67 | 49.17 |
| | (5.82) | (6.80) | (17.25) | (7.07) | (18.17) |
| Pugnose minnow | 0.05 | 0.14 | 0.00 | 0.00 | 0.00 |
| | (0.02) | (0.07) | (0.00) | (0.00) | (0.00) |
| Suckermouth minnow | 0.02 | 0.00 | 0.00 | 0.06 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.04) | (0.00) |
| Bluntnose minnow | 0.85 | 0.00 | 0.08 | 0.00 | 3.33 |
| | (0.70) | (0.00) | (0.08) | (0.00) | (2.76) |
| Fathead minnow | 0.02 | 0.00 | 0.00 | 0.00 | 0.08 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.08) |
| Bullhead minnow | 3.60 | 5.56 | 3.79 | 1.06 | 4.75 |
| | (0.72) | (1.32) | (1.54) | (0.38) | (2.16) |
| River carpsucker | 0.03 | 0.00 | 0.17 | 0.00 | 0.08 |
| | (0.02) | (0.00) | (0.17) | (0.00) | (0.08) |
| Unidentified buffalo | 0.01 | 0.03 | 0.08 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.08) | (0.00) | (0.00) |
| Shorthead redhorse | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) |
| Unidentified redhorse | 0.02 | 0.00 | 0.00 | 0.00 | 0.08 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.08) |
| Channel catfish | 0.20 | 0.06 | 0.04 | 0.47 | 0.00 |
| | (0.12) | (0.06) | (0.04) | (0.32) | (0.00) |
| Tadpole madtom | 0.43 | 0.03 | 2.17 | 0.06 | 1.25 |
| | (0.18) | (0.03) | (1.72) | (0.06) | (0.66) |
| Northern pike | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.03) | (0.00) |
| Brook silverside | 3.92 | 9.25 | 6.21 | 0.53 | 1.58 |
| | (2.10) | (6.24) | (3.76) | (0.21) | (0.63) |

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 seining in Pool 13 of the Mississippi River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|
| White bass | 0.52 | 0.44 | 0.04 | 0.69 | 0.42 |
| | (0.14) | (0.13) | (0.04) | (0.26) | (0.34) |
| Yellow bass | 0.07 | 0.19 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (0.14) | (0.00) | (0.00) | (0.00) |
| Pumpkinseed | 0.35 | 0.36 | 1.67 | 0.00 | 0.67 |
| | (0.14) | (0.31) | (1.28) | (0.00) | (0.36) |
| Warmouth | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.04) | (0.00) | (0.00) |
| Orangespotted sunfish | 1.56 | 4.25 | 0.00 | 0.19 | 0.25 |
| | (0.43) | (1.27) | (0.00) | (0.09) | (0.18) |
| Bluegill | 8.84 | 20.17 | 1.04 | 0.28 | 7.58 |
| | (1.73) | (4.67) | (0.55) | (0.12) | (2.92) |
| Smallmouth bass | 0.03 | 0.03 | 0.21 | 0.03 | 0.00 |
| | (0.01) | (0.03) | (0.12) | (0.03) | (0.00) |
| Largemouth bass | 0.85 | 1.11 | 0.17 | 0.06 | 1.75 |
| | (0.20) | (0.34) | (0.10) | (0.04) | (0.64) |
| White crappie | 0.28 | 0.83 | 0.00 | 0.00 | 0.00 |
| | (0.12) | (0.35) | (0.00) | (0.00) | (0.00) |
| Black crappie | 0.12 | 0.33 | 0.00 | 0.03 | 0.00 |
| | (0.07) | (0.21) | (0.00) | (0.03) | (0.00) |
| Western sand darter | 0.06 | 0.00 | 0.00 | 0.06 | 0.17 |
| | (0.04) | (0.00) | (0.00) | (0.06) | (0.11) |
| Mud darter | 0.05 | 0.08 | 0.00 | 0.00 | 0.08 |
| | (0.03) | (0.05) | (0.00) | (0.00) | (0.08) |
| Johnny darter | 0.55 | 0.31 | 0.29 | 0.14 | 1.50 |
| | (0.23) | (0.10) | (0.18) | (0.07) | (0.89) |
| Yellow perch | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) | (0.00) |
| Logperch | 0.04 | 0.06 | 0.00 | 0.00 | 0.08 |
| | (0.03) | (0.06) | (0.00) | (0.00) | (0.08) |
| Sauger | 0.02 | 0.06 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) | (0.00) |
| Walleye | 0.02 | 0.00 | 0.00 | 0.06 | 0.00 |
| | (0.01) | (0.00) | (0.00) | (0.04) | (0.00) |
| Freshwater drum | 0.12 | 0.06 | 0.00 | 0.11 | 0.25 |
| | (0.06) | (0.04) | (0.00) | (0.08) | (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 3.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Longnose gar | 1.00 (0.63) |
| Shortnose gar | 0.50 (0.22) |
| Gizzard shad | 116.17 (50.62) |
| Spotfin shiner | 0.17 (0.17) |
| Common carp | 2.50 (0.72) |
| Silver chub | 0.67 (0.33) |
| Emerald shiner | 469.00 (419.32) |
| River shiner | 7.00 (4.43) |
| Mimic shiner | 19.17 (15.41) |
| Bullhead minnow | 0.17 (0.17) |
| River carpsucker | 0.17 (0.17) |
| Quillback | 0.33 (0.33) |
| Highfin carpsucker | 0.33 (0.21) |
| White sucker | 0.33 (0.33) |
| Smallmouth buffalo | 0.17 (0.17) |
| Golden redhorse | 0.17 (0.17) |
| Shorthead redhorse | 10.67 (4.45) |
| Channel catfish | 0.33 (0.21) |
| Flathead catfish | 0.67 (0.49) |
| Northern pike | 0.33 (0.21) |
| Brook silverside | 1.00 (0.68) |
| White bass | 28.17 (10.75) |
| Yellow bass | 0.33 (0.33) |
| Rock bass | 2.17 (1.19) |
| Green sunfish | 0.17 (0.17) |
| Pumpkinseed | 3.00 (1.59) |
| Orangespotted sunfish | 2.33 (1.17) |
| Bluegill | 20.67 (7.62) |
| Smallmouth bass | 7.67 (2.09) |
| Largemouth bass | 17.17 |

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 3.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in Pool 13 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | TWZ |
|---|---|
| | (8.03) |
| White crappie | 0.33 |
| | (0.21) |
| Black crappie | 0.50 |
| | (0.22) |
| Logperch | 0.50 |
| | (0.34) |
| Sauger | 44.67 |
| | (25.75) |
| Walleye | 4.00 |
| | (1.29) |
| Freshwater drum | 18.50 |
| | (12.04) |

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 3.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in Pool 13 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Bowfin | 0.16 (0.16) |
| Gizzard shad | 0.16 (0.16) |
| Spotfin shiner | 0.98 (0.67) |
| Golden shiner | 0.33 (0.33) |
| Emerald shiner | 4.10 (1.67) |
| River shiner | 0.98 (0.98) |
| Spottail shiner | 0.98 (0.98) |
| Mimic shiner | 8.16 (6.82) |
| Bullhead minnow | 0.17 (0.17) |
| Northern pike | 0.33 (0.21) |
| White bass | 2.45 (2.07) |
| Orangespotted sunfish | 0.49 (0.33) |
| Bluegill | 5.25 (2.19) |
| Largemouth bass | 0.17 (0.17) |
| White crappie | 0.33 (0.21) |
| Black crappie | 0.17 (0.17) |
| River darter | 0.16 (0.16) |
| Sauger | 0.16 (0.16) |
| Freshwater drum | 0.16 (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 3.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in Pool 13 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Common carp | 0.49 |
| | (0.25) |
| Yellow bullhead | 0.08 |
| | (0.08) |
| Channel catfish | 0.16 |
| | (0.10) |
| Flathead catfish | 0.08 |
| | (0.08) |
| Bluegill | 0.50 |
| | (0.50) |
| 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 large hoop netting in Pool 13 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Common carp | 1.14 (0.61) |
| Smallmouth buffalo | 7.76 (3.15) |
| Shorthead redhorse | 0.08 (0.08) |
| White bass | 0.08 (0.08) |
| Bluegill | 0.25 (0.17) |
| White crappie | 0.08 (0.08) |
| Freshwater drum | 0.57 (0.37) |

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 3.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in Pool 13 of the Mississippi River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | TWZ |
|---|---|
| Shovelnose sturgeon | 2.79 |
| | (0.75) |
| Speckled chub | 0.46 |
| | (0.23) |
| Channel catfish | 2.00 |
| | (0.51) |
| Stonecat | 0.13 |
| | (0.07) |
| Flathead catfish | 0.13 |
| | (0.09) |
| Freshwater drum | 0.25 |
| | (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

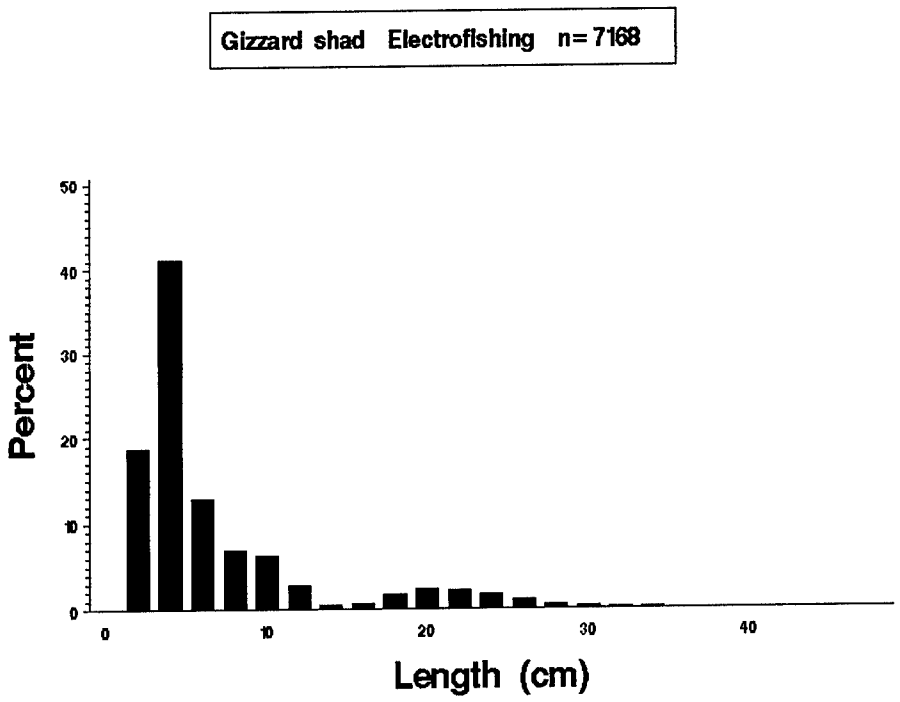


**Figure 3.2.** Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

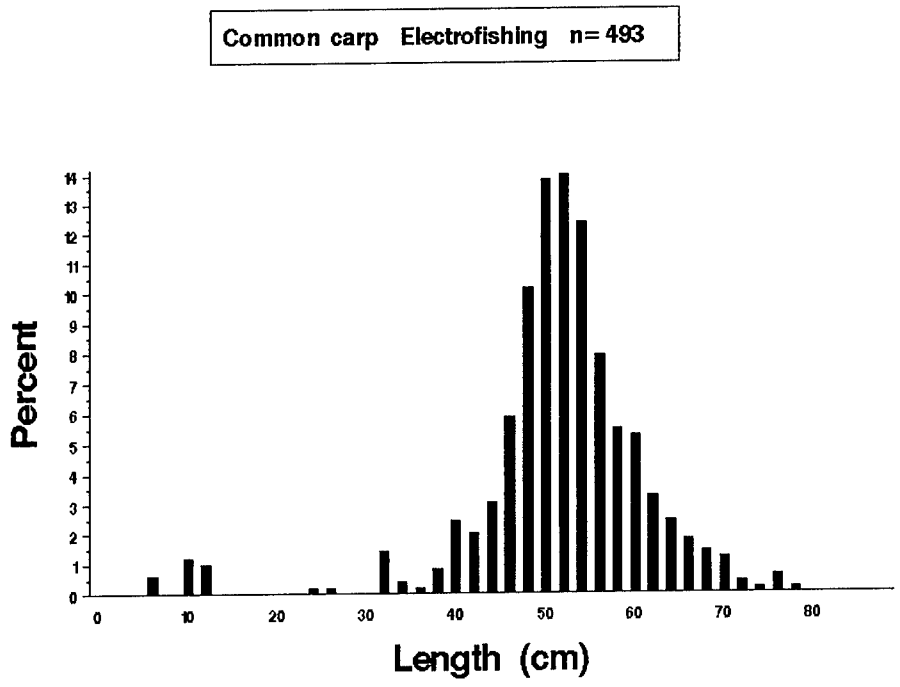


**Figure 3.3.** Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

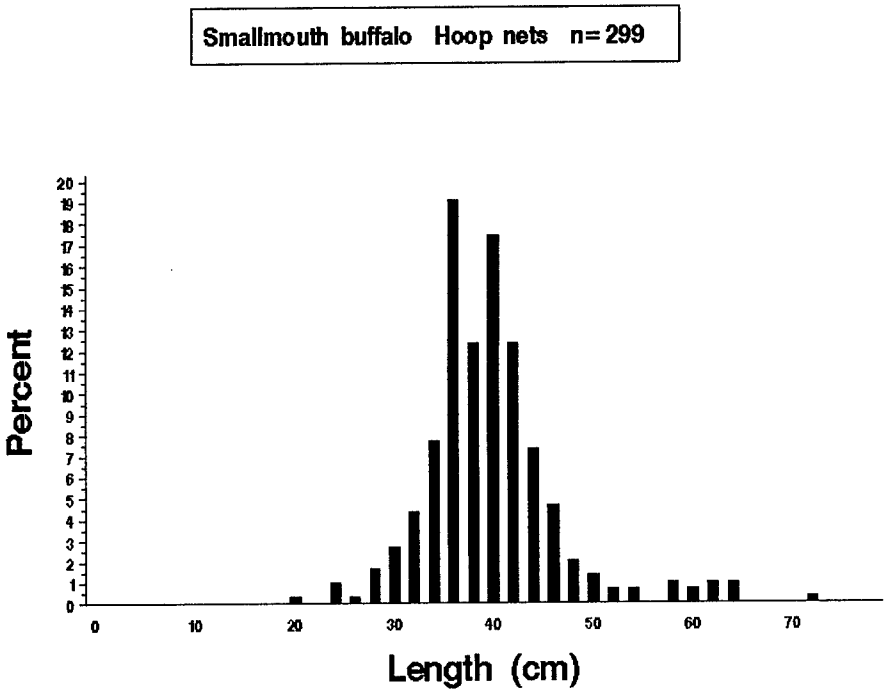


**Figure 3.4.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 13 during 1999.

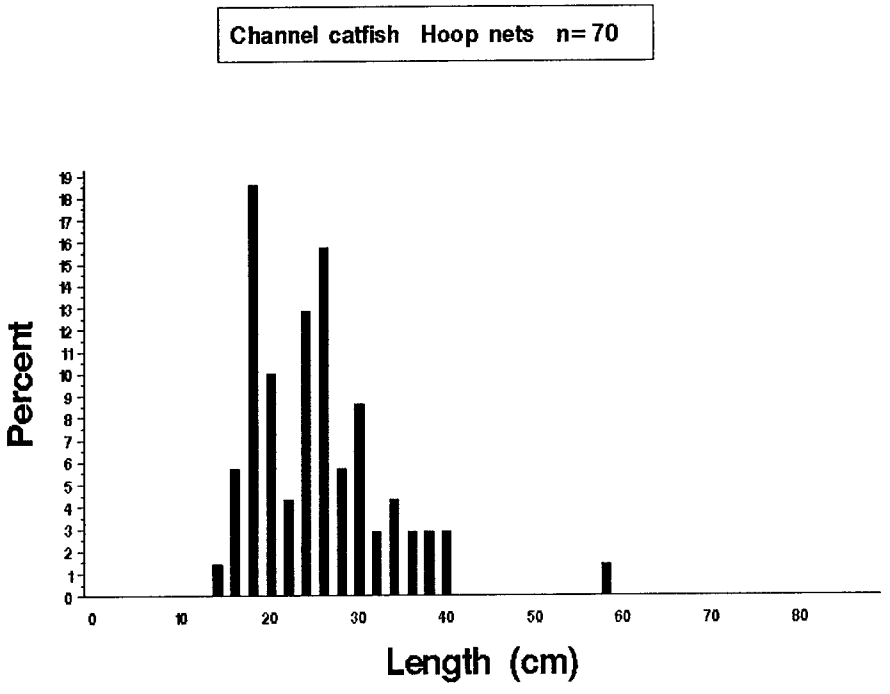


**Figure 3.5.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 13 during 1999.

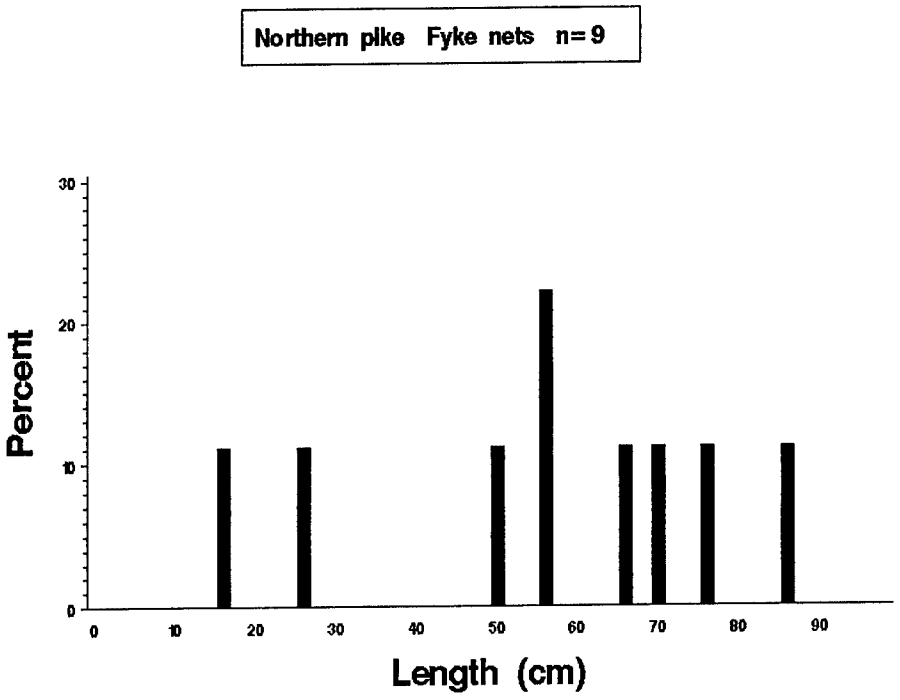


**Figure 3.6.** Length distributions (*length*) as a percentage of catch (*percent*) for northern pike (*Esox lucius*) collected by fyke netting in Upper Mississippi River Pool 13 during 1999.

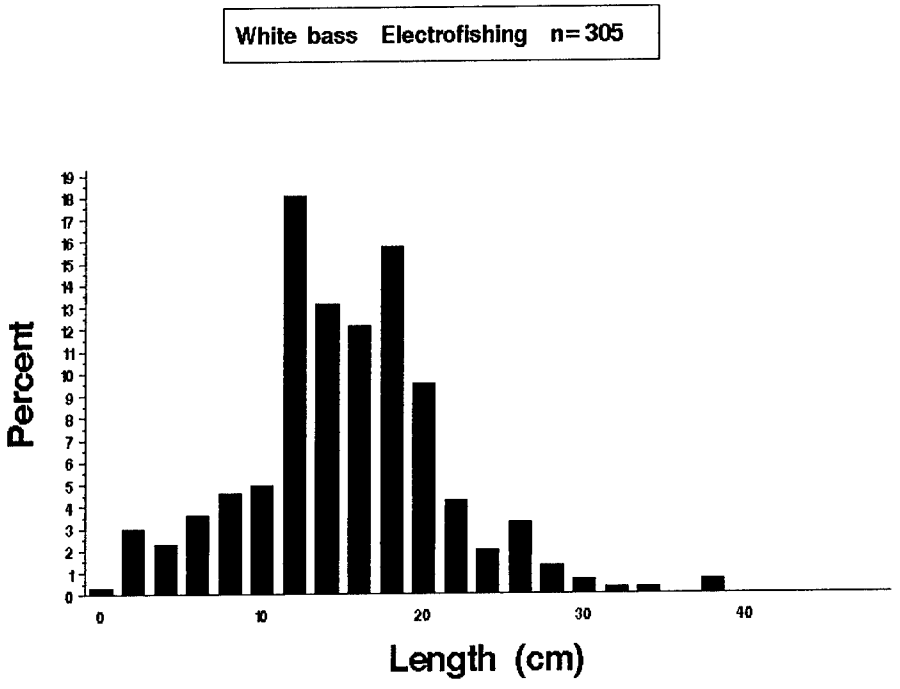


**Figure 3.7.** Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

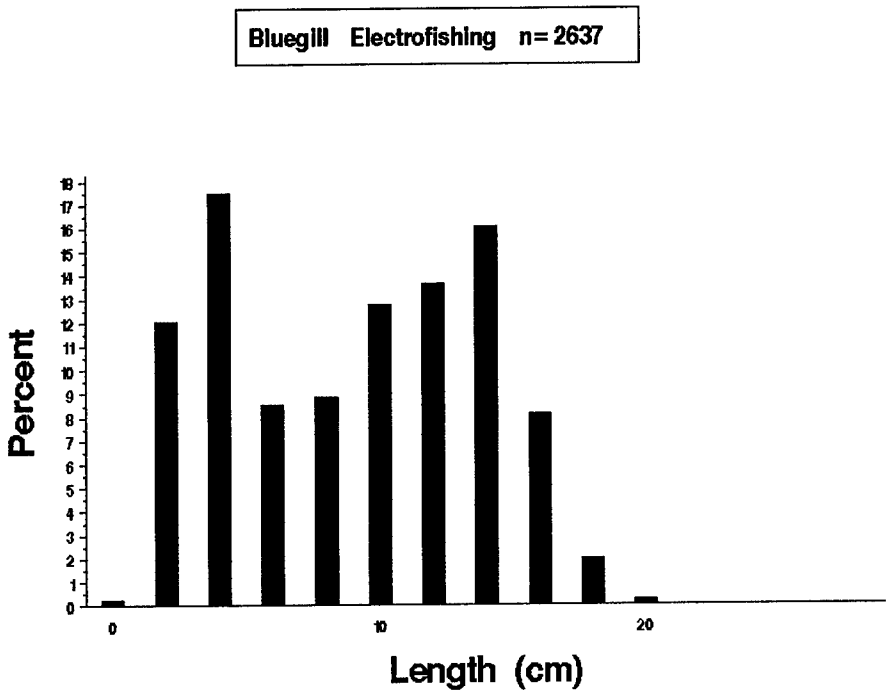


**Figure 3.8.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

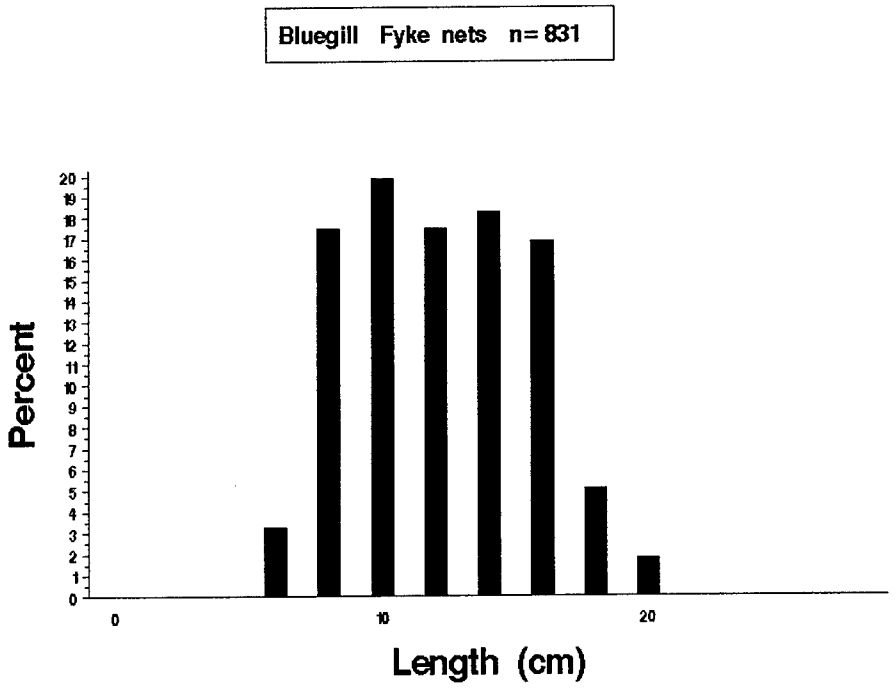


**Figure 3.9.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1999.

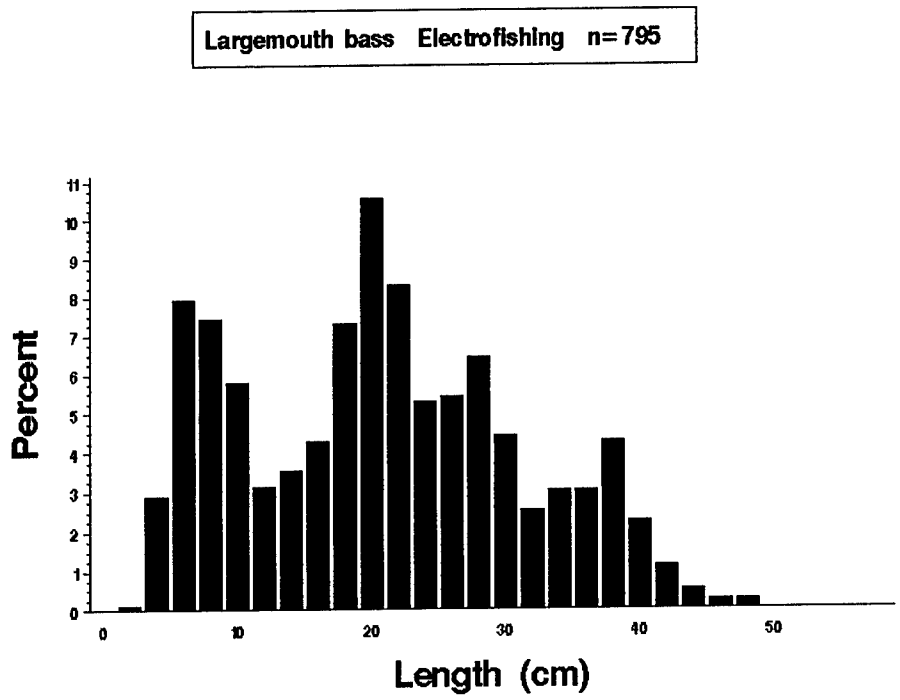


**Figure 3.10.** Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

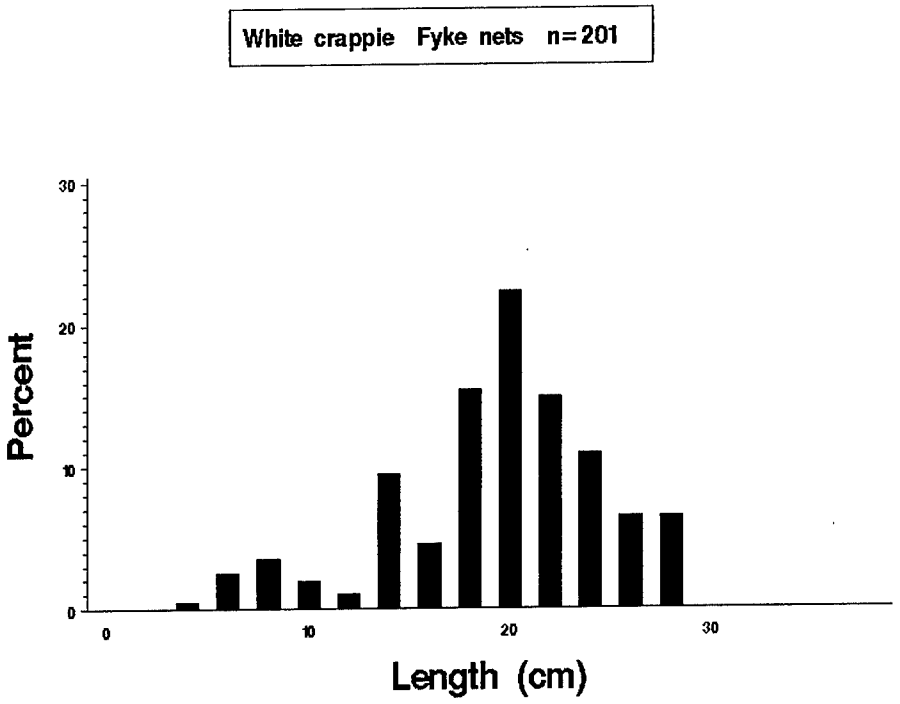


**Figure 3.11.** Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1999.

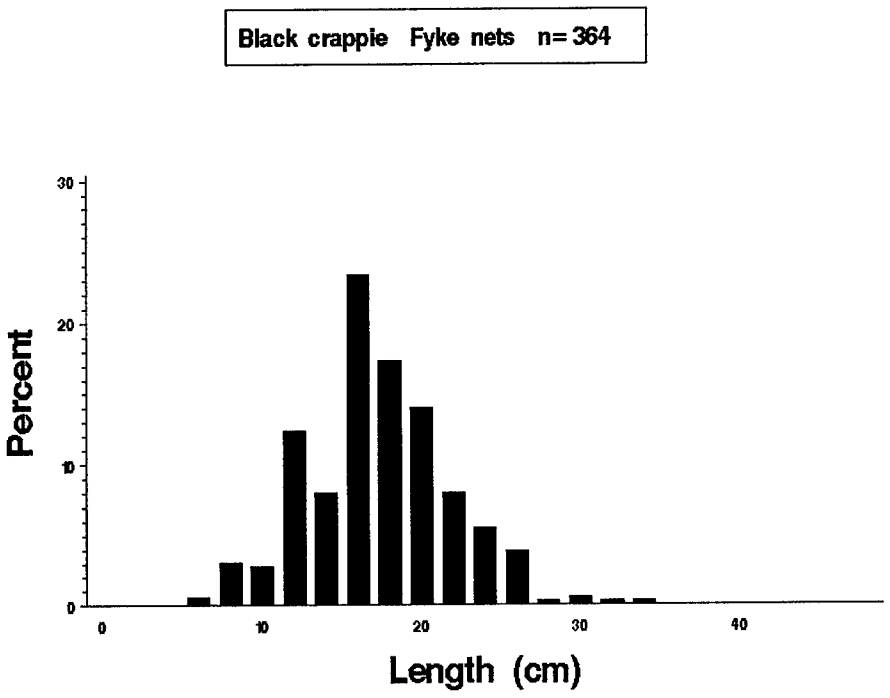


**Figure 3.12.** Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 13 during 1999.

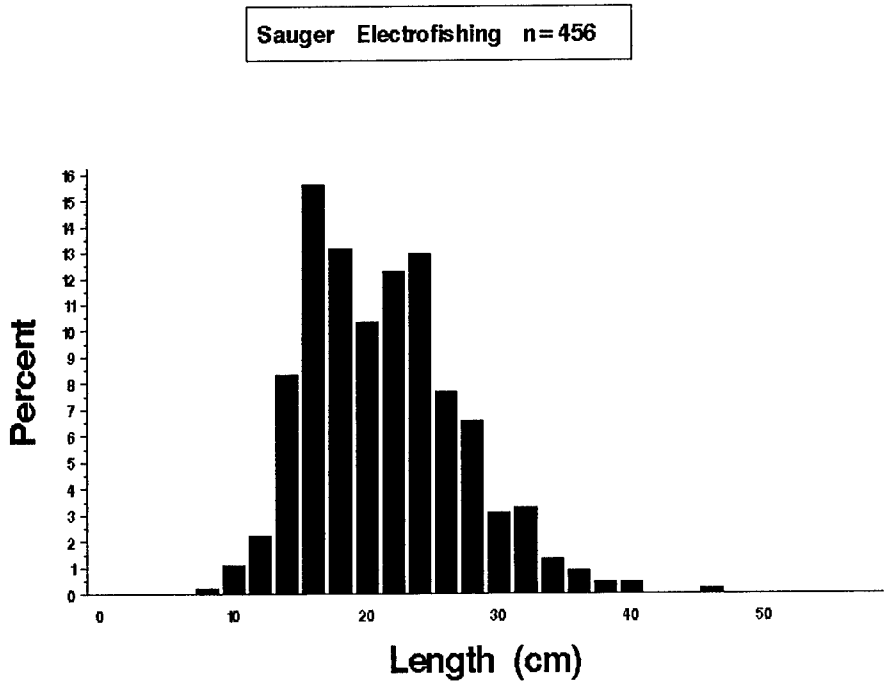


**Figure 3.13.** Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

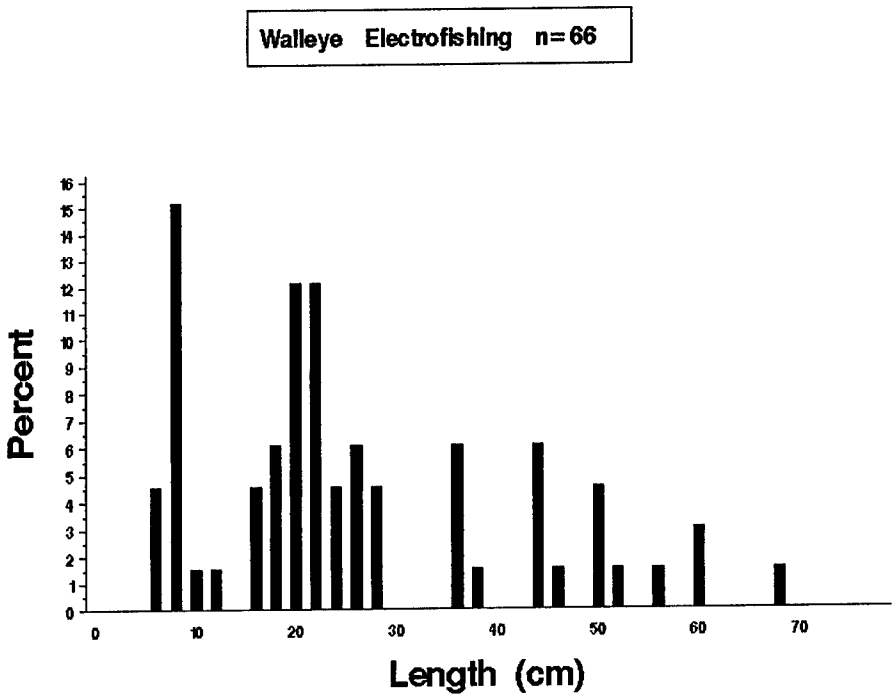


**Figure 3.14.** Length distributions (*length*) as a percentage of catch (*percent*) for walleye (*Stizostedion vitreum*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

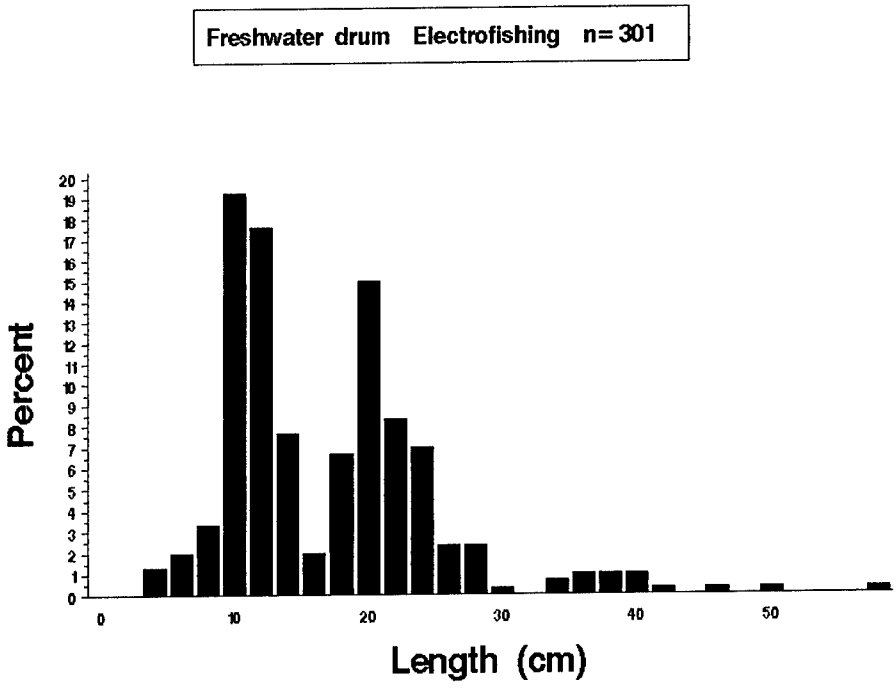


**Figure 3.15.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 13 during 1999.

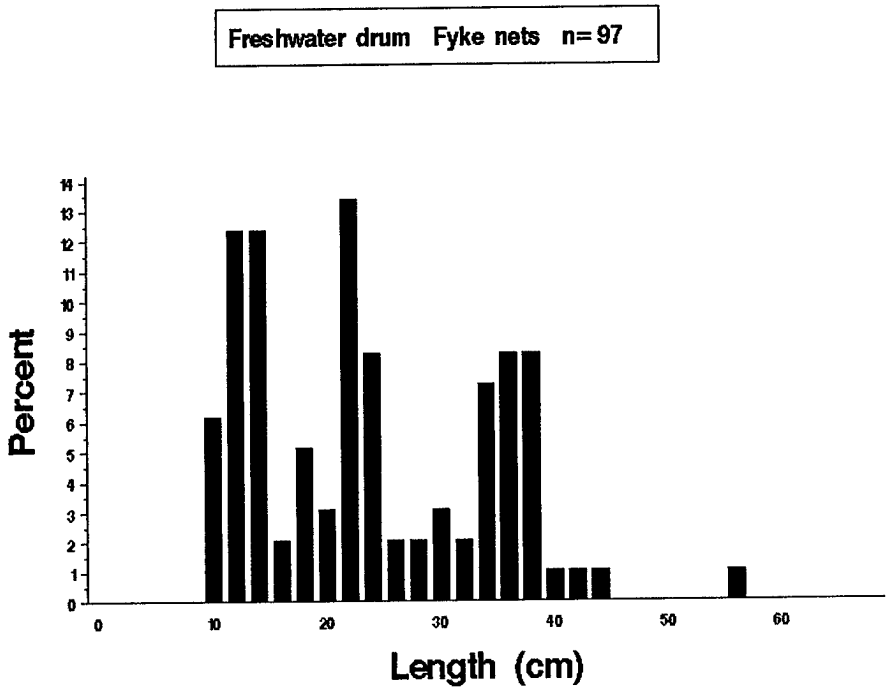


**Figure 3.16.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Upper Mississippi River Pool 13 during 1999.

# Chapter 4. Pool 26, Upper Mississippi River

by

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## Hydrograph

Water levels at Pool 26 are influenced by discharge from the Illinois, Mississippi, 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). The gages represented are located at Lock and Dam 25 tailwater (Winfield Gage), midpool (Grafton Gage), and Lock and Dam 26 impoundment (Alton Gage). Each hydrograph includes 1940–98 daily means and 1999 daily water levels.

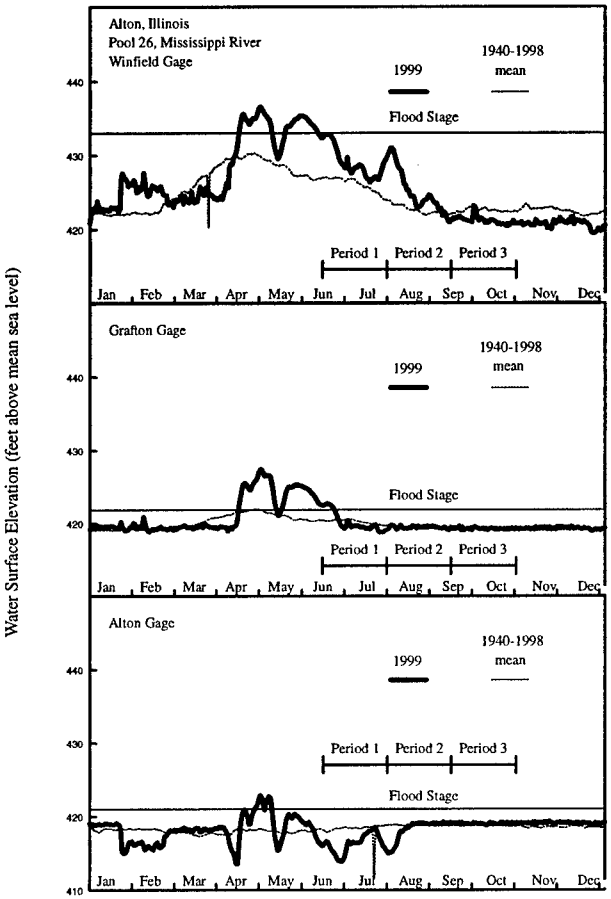


**Figure 4.1.** Daily water surface elevation from Winfield, Grafton, and Alton Gages for Pool 26, Upper Mississippi River, during 1999 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

Daily water levels at the Winfield Gage indicated two spring flood pulses. Daily water levels fluctuated downward during summer and were generally below the 1940–98 mean throughout fall. Daily water levels at the Grafton Gage reflect the same two spring flood pulses as the Winfield Gage, and relatively stable water levels near the 1940–98 mean for the rest of the year. The two spring flood pulses also appeared at the Alton Gage but were attenuated. Daily water levels at the Alton Gage were slightly above flood stage during the first pulse and slightly below flood stage during the second pulse. From early June to mid-August, daily water levels were generally well below the 1940–98 mean and then stabilized near the mean for the rest of the year.

High water levels in the upper reach of Pool 26 caused minor sampling problems in the first period and part of the second period. Seining in particular was problematic because of deep water. The U.S. Army Corps of Engineers discharge data were obtained in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

## Summary of Sampling Effort

We made 371 fish collections in Pool 26 during 1999. Several collections were not successfully completed during period 1 because of high water and swift current. This included two MCBW day electrofishing collections, two MCBW large hoop netting collections, two MCBW small hoop netting collections, one MCBU large hoop netting collection, and six MCBU seining collections (Table 4.1). Two seining collections were made in the wrong stratum (SCB instead of MCBU). Allocations among strata were nearly consistent for periods 2 and 3, although one SCB large hoop netting was lost or stolen in period 2, and in period 3, a MCBU large hoop netting seemingly was stolen and the partner netting (small hoop netting) tampered with. Of the total number of collections, 353 were from randomly selected sites in the BWCO, BWCS, IMPO, IMPS, MCBU, MCBW, and SCB strata. Eighteen collections were made at fixed TWZ sites. The MCBU stratum, followed by the SCB and BWCS, received the most sampling effort.

## Total Catch by Gear

A total of 27,645 fish were collected representing 67 species and 1 hybrid. This total does not include 265 fish identified only to family or genus (Table 4.2). The five most abundant species in our samples were gizzard shad (14,333), emerald shiner (2,319), freshwater drum (1,661), common carp (1,470), and channel shiner (1,301). Total species (excluding hybrids) collected by gear type were as follows: day electrofishing (55), night electrofishing (31), fyke netting (24), tandem fyke netting (18), mini fyke netting (44), tandem mini fyke netting (27), seining (33), small hoop netting (14), large hoop netting (16), and bottom trawling (8). Fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 26. The LTRMP Pool 26 species total to date was 87; no new species were added during 1999. Thirty-six bighead carp were collected in 1999, the most collected to date. This exotic species was first collected by the LTRMP Pool 26 field crew in 1991 (one specimen). Another exotic, silver carp (three specimens), was also collected in 1999 for the second straight year. Two Illinois-listed endangered species were collected in 1999, including two lake sturgeon and three bigeye shiners. No Illinois-threatened species were collected.

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

### *Day Electrofishing*

For day electrofishing (Table 4.3.1), gizzard shad had the highest poolwide mean catch-per-unit effort (*C/f*; 49.94), followed by common carp (18.17) and emerald shiner (6.22). Gizzard shad also had the highest *C/f* by stratum: BWCS (59.89), IMPS (108.25), MCBU (55.67), MCBW (116.00), and SCB (33.28).

### *Fyke Net*

Poolwide mean *C/f* by fyke netting (Table 4.3.2) was highest for freshwater drum (3.67), shortnose gar (3.03), and common carp (1.68). Following are the fish species with the highest *C/f* by stratum: bluegill (4.88, BWCS), gizzard shad (9.71, IMPS), and freshwater drum (4.43, SCB).

### *Tandem Fyke Net*

Poolwide mean *C/f* by tandem fyke netting (Table 4.3.3) was highest for gizzard shad (3.08), followed by freshwater drum (2.55) and black crappie (1.38). Gizzard shad had the highest *C/f* in the BWCO stratum (3.05) and freshwater drum had the highest *C/f* in the IMPO stratum (3.82).

### *Mini Fyke Net*

Freshwater drum (60.10) had the highest poolwide mean *C/f* by mini fyke netting (Table 4.3.4), followed by gizzard shad (29.27) and emerald shiner (18.96). Gizzard shad (580.62) dominated the BWCS *C/f* by mini fyke netting. The bullhead minnow (9.72) was most abundant by mini fyke netting in the IMPS stratum. Freshwater drum had the highest *C/f* in the MCBU areas (73.38). Spotfin shiner (8.12) was most abundant in the MCBW stratum, and emerald shiner (50.24) had the highest *C/f* for the SCB stratum.

### *Tandem Mini Fyke Net*

Gizzard shad (5.96) had the highest poolwide mean *C/f* by tandem mini fyke netting (Table 4.3.5), followed by orangespotted sunfish (5.31) and emerald shiner (4.95). Gizzard shad had the highest mean *C/f* in the BWCO stratum (13.76), and freshwater drum had the highest *C/f* in the IMPO stratum (6.26).

### *Small Hoop Net*

For small hoop netting (Table 4.3.6), channel catfish had the highest poolwide mean *C/f* (4.92) and the highest *C/f* for these strata: IMPO (1.50), MCBU (5.76), MCBW (0.53), and SCB (3.60). The next highest poolwide mean *C/f* by hoop netting was held by smallmouth buffalo (0.27) and common carp (0.24). Common carp (1.04) had the highest *C/f* in the BWCO stratum.

### *Large Hoop Net*

For large hoop netting (Table 4.3.7), smallmouth buffalo had the highest poolwide mean *C/f* (2.40) and the highest *C/f* for these strata: IMPO (2.05), MCBU (2.52), MCBW (6.51), and SCB (2.22). The next highest poolwide mean *C/f* by large hoop netting was held by common carp (0.37) and freshwater drum (0.29). Gizzard shad had the highest *C/f* in the BWCO stratum (1.61).

### *Seine*

Gizzard shad (17.82) had the highest poolwide mean *C/f* by seining (Table 4.3.8), followed by emerald shiner (10.92) and channel shiner (9.67). Gizzard shad also had the highest *C/f* within the MCBU (15.73) and SCB (22.71) strata..

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

All fixed-site sampling was confined to the TWZ stratum using a combination of night electrofishing and bottom trawling.

### *Night Electrofishing*

Night electrofishing, conducted at one TWZ fixed site in 1999 (Table 4.4.1), yielded gizzard shad (*C/f* = 90.33) in greatest abundance. The next highest mean *C/f* by night electrofishing in TWZ was common carp (28.33) and white bass (18.83).

### *Bottom Trawl*

Shovelnose sturgeon (*C/f* = 2.00) had the highest mean *C/f* by bottom trawling in the TWZ (Table 4.4.2), followed by freshwater drum (1.08) 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 presented may be limited by the size selectiveness of the particular gear. Care should be used when trying to interpret length distributions from samples of fewer than 100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

### *Gizzard Shad*

The length distribution of 5,318 gizzard shad collected by electrofishing during 1999 (Figure 4.2) is dominated by age-0 fish. About 81% of gizzard shad collected were less than 12 cm in total length. The largest gizzard shad collected was about 41 cm long.

### *Common Carp*

The length distribution of 1,296 common carp collected by electrofishing during 1999 (Figure 4.3) indicated a large group of fish between 28 and 68 cm in total length. Few common carp less than 28 cm long were collected. Fish of this size may not be susceptible to our gear or are lost from the population, as they are seldom sampled by LTRMP methods in Pool 26.

### *Smallmouth Buffalo*

The length distribution of 206 smallmouth buffalo collected by electrofishing during 1999 (Figure 4.4) indicated the presence of adult fish mainly between 22 and 44 cm long and another group less than 20 cm long, presumably from a successful year class. The length distribution of 279 smallmouth buffalo collected by small and large hoop netting (Figure 4.5) in 1999 is dominated by smallmouth buffalo greater than 28 cm in total length. Many fish larger than 44 cm were collected by small and large hoop netting but were absent in the electrofishing catch.

### *Channel Catfish*

The length distribution of 301 channel catfish collected by electrofishing during 1999 (Figure 4.6) indicated a group of fish between 0 and 12 cm and another group between 22 and 54 cm long. The length distribution of 397 channel catfish collected by small and large hoop netting during 1999 (Figure 4.7) indicated the presence of many fish between 12 and 26 cm long and a maximum length of 58 cm.

### *White Bass*

The length distribution of 341 white bass collected by electrofishing during 1999 (Figure 4.8) indicated fish of all sizes present between 2 and 40 cm long. More than 36% of white bass collected were greater than 20 cm (~8 inches) in length.

### *Bluegill*

The length distribution of 424 bluegills collected by electrofishing during 1999 (Figure 4.9) indicated fish of all sizes present between 0 and 16 cm long. The length distribution of 113 bluegills collected by fyke netting during 1999 (Figure 4.10) indicated a larger average size: most of these fish ranged between 8 and 16 cm long. The percentage of quality-sized fish (>15 cm or 6 inches long; Anderson 1978) collected by fyke netting was about 8%.

### *Largemouth Bass*

The length distribution of 63 largemouth bass collected by electrofishing during 1999 (Figure 4.11) is widely distributed between 4 and 38 cm long, with no size classes evident. About 13% of largemouth bass collected were greater than 30 cm (~12 inches), which is the minimum legal size for anglers to keep in this reach of the Mississippi River.

### *Black Crappie*

The length distribution of 61 black crappies collected by fyke netting during 1999 (Figure 4.12) indicated that most of the fish ranged between 12 and 18 cm long. About 10% of black crappies collected were greater than 20 cm (~ 8 inches) long.

### *Sauger*

The length distribution of 41 saugers collected by electrofishing during 1999 (Figure 4.13) included fish between 6 and 42 cm long. About 25% of saugers collected were greater than 30 cm (~12 inches) in length.

### *Freshwater Drum*

The length distribution of 397 freshwater drum collected by electrofishing during 1999 (Figure 4.14) is skewed toward small fish, with about 50% of the catch less than 18 cm long. Fish ranged between 2 and 58 cm long.

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 1999. 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 | | 6 | 8 | | 4 | | | | 24 |
| Fyke net | 4 | | 2 | | | 2 | | | | 8 |
| Large hoop net | | 2 | 5 | 7 | | | 2 | | | 16 |
| Small hoop net | | 2 | 5 | 8 | | | 2 | | | 17 |
| Mini fyke net | 4 | | 5 | 2 | 2 | 2 | | | | 15 |
| Night electrofishing | | | | | | | | | 2 | 2 |
| Seine | | | 14 | 8 | | | | | | 22 |
| Trawling | | | | | | | | | 4 | 4 |
| Tandem fyke net | | 2 | | | | | 2 | | | 4 |
| Tandem mini fyke net | | 2 | | | | | 2 | | | 4 |
| SUBTOTAL | 14 | 8 | 37 | 33 | 2 | 8 | 8 | 0 | 6 | 116 |

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 | 4 | 8 | 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 |
| Tandem fyke net | | 2 | | | | | 2 | | | 4 |
| Tandem mini fyke net | | 2 | | | | | 2 | | | 4 |
| SUBTOTAL | 14 | 8 | 34 | 42 | 8 | 8 | 8 | 0 | 6 | 128 |

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 | 7 | 2 | | 2 | | | 18 |
| Small hoop net | | 2 | 5 | 7 | 2 | | 2 | | | 18 |
| Mini fyke net | 4 | | 5 | 2 | 2 | 2 | | | | 15 |
| Night electrofishing | | | | | | | | | 2 | 2 |
| Seine | | | 12 | 16 | | | | | | 28 |
| Trawling | | | | | | | | | 4 | 4 |
| Tandem fyke net | | 2 | | | | | 2 | | | 4 |
| Tandem mini fyke net | | 2 | | | | | 2 | | | 4 |
| SUBTOTAL | 14 | 8 | 35 | 40 | 8 | 8 | 8 | 0 | 6 | 127 |
| | 42 | 24 | 106 | 115 | 18 | 24 | 24 | 0 | 18 | 371 |

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 4.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | Lake sturgeon | Acipenser fulvescens | - | - | - | - | - | - | - | - | - | - | - | 2 | 2 |
| 2 | Shovelnose sturgeon | Scaphirhynchus platorynchus | - | - | - | - | - | - | - | - | - | - | - | 24 | 24 |
| 3 | Spotted gar | Lepisosteus oculatus | 5 | - | 5 | 2 | 3 | - | - | - | - | - | - | - | 15 |
| 4 | Longnose gar | Lepisosteus osseus | 6 | 10 | - | - | 1 | - | - | - | - | - | - | - | 17 |
| 5 | Shortnose gar | Lepisosteus platostomus | 80 | 30 | 55 | 6 | 62 | 3 | 4 | 5 | 9 | - | - | - | 254 |
| 6 | Bowfin | Amia calva | 5 | - | 1 | 2 | 4 | - | - | - | - | - | - | - | 12 |
| 7 | Goldeye | Hiodon alosoides | 1 | 1 | - | - | - | - | - | - | - | - | - | - | 2 |
| 8 | Mooneye | Hiodon tergisus | 6 | - | - | - | 4 | - | 43 | - | - | - | - | - | 53 |
| 9 | American eel | Anguilla rostrata | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| 10 | Skipjack herring | Alosa chrysochloris | 114 | 1 | - | - | 1 | - | 21 | - | 1 | - | - | - | 138 |
| 11 | Gizzard shad | Dorosoma cepedianum | 4776 | 542 | 56 | 75 | 7172 | 190 | 1492 | 3 | 25 | - | - | 2 | 14333 |
| 12 | Threadfin shad | Dorosoma petenense | 7 | - | - | - | 1 | - | 11 | - | - | - | - | - | 19 |
| 13 | Central stoneroller | Campostoma anomalum | 2 | - | - | - | 1 | - | - | - | - | - | - | - | 3 |
| 14 | Grass carp | Ctenopharyngodon idella | 5 | 3 | - | - | - | - | 1 | - | - | - | - | - | 9 |
| 15 | Red shiner | Cyprinella lutrensis | 11 | - | - | - | 48 | - | 27 | - | - | - | - | - | 86 |
| 16 | Spotfin shiner | Cyprinella spiloptera | 47 | 1 | - | - | 136 | 1 | 16 | - | - | - | - | - | 201 |
| 17 | Common carp | Cyprinus carpio | 1126 | 170 | 14 | 8 | 35 | 46 | 4 | 36 | 31 | - | - | - | 1470 |
| 18 | Carp x goldfish hybrid | Cyprinus carpio x auratus | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| 19 | Mississippi silvery minnow | Hybognathus nuchalis | 17 | - | - | - | 72 | - | 24 | - | - | - | - | - | 113 |
| 20 | Silver carp | Hypopthalmichthys molitrix | 2 | 1 | - | - | - | - | - | - | - | - | - | - | 3 |
| 21 | Bighead carp | Hypopthalmichthys nobilis | 2 | - | 4 | 6 | 1 | - | - | 1 | 22 | - | - | - | 36 |
| 22 | Speckled chub | Macrhybopsis aestivalis | - | - | - | - | - | 39 | 1 | - | - | - | - | 9 | 49 |
| 23 | Silver chub | Macrhybopsis storeriana | 16 | 1 | - | - | 8 | 11 | 28 | - | - | - | - | - | 64 |
| 24 | Golden shiner | Notemigonus crysoleucas | 5 | - | - | - | 1 | 3 | - | - | - | - | - | - | 9 |
| 25 | Emerald shiner | Notropis atherinoides | 531 | 16 | - | - | 837 | 143 | 792 | - | - | - | - | - | 2319 |
| 26 | River shiner | Notropis blennius | 32 | - | - | - | 51 | 2 | 74 | - | - | - | - | - | 159 |
| 27 | Bigeye shiner | Notropis boops | 2 | - | - | - | 1 | - | - | - | - | - | - | - | 3 |
| 28 | Bigmouth shiner | Notropis dorsalis | - | - | - | - | - | - | 4 | - | - | - | - | - | 4 |
| 29 | Spottail shiner | Notropis hudsonius | 2 | - | - | - | - | - | 1 | - | - | - | - | - | 3 |
| 30 | Silverband shiner | Notropis shumardi | 10 | - | - | - | 9 | 11 | 20 | - | - | - | - | - | 50 |
| 31 | Sand shiner | Notropis stramineus | 3 | - | - | - | 1 | - | 10 | - | - | - | - | - | 14 |
| 32 | Channel shiner | Notropis wickliffi | 76 | 8 | - | - | 553 | 21 | 643 | - | - | - | - | - | 1301 |
| 33 | Unidentified shiner | Notropis sp. | - | - | - | - | 10 | 9 | 15 | - | - | - | - | - | 34 |
| 34 | Suckermouth minnow | Phenacobius mirabilis | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 35 | Bluntnose minnow | Pimephales notatus | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 36 | Bullhead minnow | Pimephales vigilax | 143 | - | - | - | 98 | 32 | 9 | - | - | - | - | - | 282 |
| 37 | Creek chub | Semotilus atromaculatus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 38 | Unidentified minnow | Unidentified Cyprinidae | - | - | - | - | 16 | - | - | - | - | - | - | - | 16 |
| 39 | River carpsucker | Carpiodes carpio | 114 | 15 | 20 | 10 | 29 | 6 | 95 | - | 8 | - | - | - | 297 |

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 4.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | Quillback | Carpiodes cyprinus | 1 | 2 | - | - | - | - | - | - | - | - | - | - | 3 |
| 41 | Blue sucker | Cycleptus elongatus | - | - | - | - | 1 | - | - | - | 1 | - | - | - | 2 |
| 42 | Smallmouth buffalo | Ictiobus bubalus | 193 | 13 | 5 | 5 | 1 | 2 | 9 | 21 | 258 | - | - | - | 507 |
| 43 | Bigmouth buffalo | Ictiobus cyprinellus | 36 | 1 | 2 | 1 | - | 2 | - | - | 9 | - | - | - | 51 |
| 44 | Black buffalo | Ictiobus niger | 26 | 1 | 1 | - | - | 1 | - | 4 | 15 | - | - | - | 48 |
| 45 | Unidentified buffalo | Ictiobus sp. | 110 | - | - | - | 96 | 2 | 7 | - | - | - | - | - | 215 |
| 46 | Shorthead redhorse | Moxostoma macrolepidotum | 6 | 1 | 5 | - | 1 | - | - | - | - | - | - | - | 13 |
| 47 | Black bullhead | Ameiurus melas | - | - | - | - | - | 9 | - | - | - | - | - | - | 9 |
| 48 | Yellow bullhead | Ameiurus natalis | - | - | 1 | 1 | - | - | - | - | - | - | - | - | 2 |
| 49 | Blue catfish | Ictalurus furcatus | 2 | - | - | - | - | - | - | 10 | 2 | - | - | 5 | 19 |
| 50 | Channel catfish | Ictalurus punctatus | 293 | 8 | 3 | 4 | 36 | 29 | 36 | 383 | 14 | - | - | 12 | 818 |
| 51 | Freckled madtom | Noturus nocturnus | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 52 | Flathead catfish | Pylodictis olivaris | 34 | 4 | 1 | - | 3 | - | - | 4 | 6 | - | - | 1 | 53 |
| 53 | Northern pike | Esox lucius | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 54 | Western mosquitofish | Gambusia affinis | 204 | - | - | - | 97 | 3 | 45 | - | - | - | - | - | 349 |
| 55 | Brook silverside | Labidesthes sicculus | 2 | - | - | - | 2 | 1 | 22 | - | - | - | - | - | 27 |
| 56 | White bass | Morone chrysops | 228 | 113 | 43 | 34 | 342 | 13 | 92 | 1 | 15 | - | - | - | 881 |
| 57 | Yellow bass | Morone mississippiensis | - | 1 | 2 | - | - | - | - | - | - | - | - | - | 3 |
| 58 | Green sunfish | Lepomis cyanellus | 9 | - | - | - | - | - | - | - | - | - | - | - | 9 |
| 59 | Warmouth | Lepomis gulosus | 21 | - | 1 | - | 6 | - | - | - | - | - | - | - | 28 |
| 60 | Orangespotted sunfish | Lepomis humilis | 467 | 1 | 1 | 4 | 70 | 168 | - | - | - | - | - | - | 711 |
| 61 | Bluegill | Lepomis macrochirus | 395 | 29 | 86 | 27 | 42 | 99 | 4 | 1 | - | - | - | - | 683 |
| 62 | Largemouth bass | Micropterus salmoides | 60 | 3 | 1 | - | 16 | - | 5 | - | - | - | - | - | 85 |
| 63 | White crappie | Pomoxis annularis | 19 | 8 | 6 | 6 | 27 | 9 | 1 | 2 | 2 | - | - | - | 80 |
| 64 | Black crappie | Pomoxis nigromaculatus | 20 | 6 | 30 | 31 | 69 | 4 | 6 | - | - | - | - | - | 166 |
| 65 | Mud darter | Etheostoma asprigene | 1 | - | - | - | 1 | - | - | - | - | - | - | - | 2 |
| 66 | Logperch | Percina caprodes | 3 | - | - | - | 6 | - | - | - | - | - | - | - | 9 |
| 67 | River darter | Percina shumardi | 2 | - | - | - | 8 | - | - | - | - | - | - | - | 10 |
| 68 | Sauger | Stizostedion canadense | 30 | 11 | 1 | 3 | 5 | 1 | 2 | 1 | - | - | - | - | 54 |
| 69 | Walleye | Stizostedion vitreum | 1 | 1 | - | - | - | - | - | - | - | - | - | - | 2 |
| 70 | Freshwater drum | Aplodinotus grunniens | 337 | 60 | 34 | 54 | 1028 | 81 | 24 | 10 | 20 | - | - | 13 | 1661 |
| | | | 9651 | 1063 | 379 | 279 | 11013 | 941 | 3589 | 482 | 438 | 0 | 0 | 68 | 27903 |

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 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.03 | 0.11 | 0.17 | 0.04 | 0.00 | 0.00 |
| | (0.03) | (0.08) | (0.11) | (0.04) | (0.00) | (0.00) |
| Longnose gar | 0.13 | 0.00 | 0.00 | 0.13 | 0.00 | 0.17 |
| | (0.07) | (0.00) | (0.00) | (0.09) | (0.00) | (0.12) |
| Shortnose gar | 1.45 | 0.72 | 0.08 | 1.38 | 0.25 | 1.78 |
| | (0.47) | (0.31) | (0.08) | (0.68) | (0.25) | (0.44) |
| Bowfin | 0.04 | 0.22 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.03) | (0.10) | (0.00) | (0.04) | (0.00) | (0.00) |
| Goldeye | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.06) |
| Mooneye | 0.10 | 0.00 | 0.00 | 0.08 | 0.25 | 0.17 |
| | (0.06) | (0.00) | (0.00) | (0.08) | (0.25) | (0.09) |
| Skipjack herring | 2.80 | 0.17 | 0.00 | 3.75 | 0.50 | 1.06 |
| | (0.90) | (0.09) | (0.00) | (1.33) | (0.50) | (0.55) |
| Gizzard shad | 49.94 | 59.89 | 108.25 | 55.67 | 116.00 | 33.28 |
| | (9.31) | (19.56) | (24.46) | (12.58) | (46.08) | (14.12) |
| Threadfin shad | 0.04 | 0.11 | 0.33 | 0.04 | 0.00 | 0.00 |
| | (0.03) | (0.08) | (0.26) | (0.04) | (0.00) | (0.00) |
| Central stoneroller | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.08) |
| Grass carp | 0.02 | 0.00 | 0.17 | 0.00 | 0.50 | 0.06 |
| | (0.02) | (0.00) | (0.11) | (0.00) | (0.29) | (0.06) |
| Red shiner | 0.24 | 0.00 | 0.08 | 0.29 | 0.00 | 0.17 |
| | (0.10) | (0.00) | (0.08) | (0.14) | (0.00) | (0.09) |
| Spotfin shiner | 0.32 | 0.50 | 2.00 | 0.25 | 0.25 | 0.39 |
| | (0.11) | (0.28) | (1.05) | (0.11) | (0.25) | (0.28) |
| Common carp | 18.17 | 11.44 | 2.17 | 15.50 | 14.25 | 25.83 |
| | (2.95) | (3.10) | (0.81) | (3.81) | (6.60) | (5.27) |
| Mississippi silvery minnow | 0.27 | 0.00 | 0.00 | 0.04 | 0.25 | 0.83 |
| | (0.18) | (0.00) | (0.00) | (0.04) | (0.25) | (0.61) |
| Silver carp | 0.00 | 0.06 | 0.00 | 0.00 | 0.25 | 0.00 |
| | (0.00) | (0.06) | (0.00) | (0.00) | (0.25) | (0.00) |
| Bighead carp | 0.03 | 0.06 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.03) | (0.06) | (0.00) | (0.04) | (0.00) | (0.00) |
| Silver chub | 0.18 | 0.00 | 0.67 | 0.17 | 0.00 | 0.22 |
| | (0.07) | (0.00) | (0.38) | (0.08) | (0.00) | (0.17) |
| Golden shiner | 0.01 | 0.22 | 0.08 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.13) | (0.08) | (0.00) | (0.00) | (0.00) |
| Emerald shiner | 6.22 | 2.06 | 18.17 | 6.42 | 3.75 | 5.94 |
| | (3.05) | (0.60) | (12.01) | (4.39) | (2.84) | (3.07) |
| River shiner | 0.37 | 0.06 | 1.08 | 0.25 | 0.00 | 0.67 |
| | (0.15) | (0.06) | (1.08) | (0.14) | (0.00) | (0.41) |
| Bigeye shiner | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 |
| | (0.03) | (0.00) | (0.00) | (0.00) | (0.00) | (0.11) |
| Spottail shiner | 0.02 | 0.00 | 0.08 | 0.00 | 0.00 | 0.06 |
| | (0.02) | (0.00) | (0.08) | (0.00) | (0.00) | (0.06) |
| Silverband shiner | 0.06 | 0.06 | 0.58 | 0.08 | 0.00 | 0.00 |
| | (0.04) | (0.06) | (0.43) | (0.06) | (0.00) | (0.00) |
| Sand shiner | 0.01 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.17) | (0.00) | (0.00) | (0.00) | (0.00) |
| Channel shiner | 0.68 | 0.61 | 3.08 | 0.71 | 0.25 | 0.56 |
| | (0.19) | (0.50) | (2.47) | (0.26) | (0.25) | (0.28) |
| Suckermouth minnow | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.50) | (0.00) |
| Bullhead minnow | 0.41 | 1.06 | 9.25 | 0.33 | 0.25 | 0.22 |
| | (0.11) | (0.38) | (7.28) | (0.12) | (0.25) | (0.13) |
| River carpsucker | 0.58 | 1.41 | 5.75 | 0.50 | 0.00 | 0.50 |
| | (0.18) | (0.39) | (2.45) | (0.26) | (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 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Quillback | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.06) | (0.00) | (0.00) | (0.00) | (0.00) |
| Smallmouth buffalo | 1.66 | 4.33 | 3.33 | 1.33 | 1.75 | 2.00 |
| | (0.30) | (1.14) | (0.90) | (0.38) | (0.75) | (0.54) |
| Bigmouth buffalo | 0.13 | 1.28 | 0.67 | 0.04 | 0.25 | 0.17 |
| | (0.04) | (0.38) | (0.50) | (0.04) | (0.25) | (0.09) |
| Black buffalo | 0.22 | 0.83 | 0.00 | 0.08 | 0.25 | 0.44 |
| | (0.06) | (0.51) | (0.00) | (0.06) | (0.25) | (0.15) |
| Unidentified buffalo | 0.24 | 6.11 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.15) | (3.83) | (0.00) | (0.00) | (0.00) | (0.00) |
| Shorthead redhorse | 0.09 | 0.00 | 0.17 | 0.08 | 0.00 | 0.11 |
| | (0.04) | (0.00) | (0.11) | (0.06) | (0.00) | (0.08) |
| Blue catfish | 0.06 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.06) | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) |
| Channel catfish | 5.48 | 1.44 | 2.08 | 5.79 | 1.25 | 5.44 |
| | (0.82) | (0.36) | (0.62) | (0.96) | (0.63) | (1.82) |
| Freckled madtom | 0.06 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.04) | (0.00) | (0.00) | (0.06) | (0.00) | (0.00) |
| Flathead catfish | 0.47 | 0.11 | 0.33 | 0.63 | 2.50 | 0.17 |
| | (0.14) | (0.08) | (0.26) | (0.20) | (0.65) | (0.12) |
| Northern pike | 0.03 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.04) | (0.00) | (0.00) |
| Western mosquitofish | 0.71 | 10.78 | 0.00 | 0.42 | 0.00 | 0.00 |
| | (0.33) | (4.49) | (0.00) | (0.42) | (0.00) | (0.00) |
| Brook silverside | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) |
| White bass | 3.49 | 1.61 | 3.83 | 3.88 | 2.25 | 2.83 |
| | (0.64) | (0.66) | (0.67) | (0.92) | (1.03) | (0.64) |
| Green sunfish | 0.08 | 0.00 | 0.42 | 0.08 | 0.25 | 0.06 |
| | (0.04) | (0.00) | (0.23) | (0.06) | (0.25) | (0.06) |
| Warmouth | 0.22 | 0.56 | 0.25 | 0.29 | 0.25 | 0.00 |
| | (0.12) | (0.29) | (0.13) | (0.18) | (0.25) | (0.00) |
| Orangespotted sunfish | 0.75 | 13.17 | 18.92 | 0.08 | 0.25 | 0.00 |
| | (0.16) | (2.51) | (12.30) | (0.08) | (0.25) | (0.00) |
| Bluegill | 1.83 | 5.67 | 19.58 | 1.79 | 0.00 | 0.83 |
| | (0.83) | (1.11) | (5.02) | (1.25) | (0.00) | (0.26) |
| Largemouth bass | 0.32 | 0.28 | 3.75 | 0.42 | 0.00 | 0.00 |
| | (0.25) | (0.14) | (0.71) | (0.38) | (0.00) | (0.00) |
| White crappie | 0.07 | 0.94 | 0.00 | 0.00 | 0.00 | 0.11 |
| | (0.03) | (0.36) | (0.00) | (0.00) | (0.00) | (0.08) |
| Black crappie | 0.10 | 0.22 | 1.00 | 0.13 | 0.25 | 0.00 |
| | (0.06) | (0.13) | (0.43) | (0.09) | (0.25) | (0.00) |
| 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 | 0.50 | 0.00 |
| | (0.03) | (0.00) | (0.00) | (0.04) | (0.29) | (0.00) |
| River darter | 0.06 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 |
| | (0.06) | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) |
| Sauger | 0.56 | 0.00 | 0.58 | 0.67 | 0.00 | 0.39 |
| | (0.13) | (0.00) | (0.23) | (0.18) | (0.00) | (0.16) |
| Walleye | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) |
| Freshwater drum | 5.41 | 5.83 | 1.50 | 6.33 | 0.50 | 3.33 |
| | (1.51) | (1.55) | (0.54) | (2.24) | (0.29) | (0.83) |

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 4.3.2. 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | BWCS | IMPS | SCB |
|---|---|---|---|---|---|
| Spotted gar | 0.04 | 0.00 | 0.34 | 0.19 | 0.00 |
| | (0.03) | (0.00) | (0.23) | (0.19) | (0.00) |
| Shortnose gar | 2.59 | 2.86 | 3.05 | 0.60 | 2.57 |
| | (0.63) | () | (0.76) | (0.39) | (0.77) |
| Bowfin | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| Gizzard shad | 0.44 | 0.00 | 0.53 | 9.71 | 0.16 |
| | (0.28) | (0.00) | (0.24) | (9.46) | (0.16) |
| Common carp | 1.68 | 0.00 | 0.18 | 0.21 | 2.04 |
| | (1.35) | (0.00) | (0.18) | (0.21) | (1.67) |
| Goldfish x carp | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| Bighead carp | 0.04 | 0.00 | 0.27 | 0.19 | 0.00 |
| | (0.02) | (0.00) | (0.14) | (0.19) | (0.00) |
| River carpsucker | 0.30 | 0.00 | 1.18 | 1.19 | 0.17 |
| | (0.15) | (0.00) | (0.54) | (0.73) | (0.17) |
| Smallmouth buffalo | 0.09 | 0.95 | 0.37 | 0.00 | 0.00 |
| | (0.02) | () | (0.21) | (0.00) | (0.00) |
| Bigmouth buffalo | 0.02 | 0.00 | 0.09 | 0.19 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.19) | (0.00) |
| Black buffalo | 0.05 | 0.95 | 0.00 | 0.00 | 0.00 |
| | () | () | (0.00) | (0.00) | (0.00) |
| Shorthead redhorse | 0.04 | 0.00 | 0.28 | 0.41 | 0.00 |
| | (0.02) | (0.00) | (0.20) | (0.25) | (0.00) |
| Yellow bullhead | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| Channel catfish | 0.03 | 0.00 | 0.18 | 0.21 | 0.00 |
| | (0.01) | (0.00) | (0.12) | (0.21) | (0.00) |
| Flathead catfish | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| White bass | 1.35 | 3.81 | 1.84 | 2.68 | 1.08 |
| | (0.48) | () | (0.90) | (1.61) | (0.57) |
| Yellow bass | 0.02 | 0.00 | 0.09 | 0.19 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.19) | (0.00) |
| Warmouth | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| Orangespotted sunfish | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| Bluegill | 0.99 | 0.00 | 4.89 | 6.00 | 0.35 |
| | (0.52) | (0.00) | (4.23) | (3.69) | (0.22) |
| Largemouth bass | 0.01 | 0.00 | 0.09 | 0.00 | 0.00 |
| | (0.01) | (0.00) | (0.09) | (0.00) | (0.00) |
| White crappie | 0.19 | 0.00 | 0.45 | 0.00 | 0.17 |
| | (0.15) | (0.00) | (0.45) | (0.00) | (0.17) |
| Black crappie | 0.44 | 0.95 | 1.87 | 1.46 | 0.17 |
| | (0.19) | () | (1.21) | (0.78) | (0.17) |
| Sauger | 0.05 | 0.95 | 0.00 | 0.00 | 0.00 |
| | () | () | (0.00) | (0.00) | (0.00) |
| Freshwater drum | 3.67 | 0.00 | 0.65 | 0.21 | 4.43 |
| | (2.44) | (0.00) | (0.37) | (0.21) | (3.01) |

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 4.3.3. 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Spotted gar | 0.07 | 0.16 | 0.00 |
| | (0.07) | (0.16) | (0.00) |
| Shortnose gar | 0.22 | 0.41 | 0.08 |
| | (0.08) | (0.15) | (0.08) |
| Bowfin | 0.07 | 0.16 | 0.00 |
| | (0.04) | (0.10) | (0.00) |
| Gizzard shad | 3.08 | 3.05 | 3.09 |
| | (1.51) | (1.41) | (2.39) |
| Common carp | 0.32 | 0.40 | 0.26 |
| | (0.16) | (0.31) | (0.18) |
| Bighead carp | 0.20 | 0.49 | 0.00 |
| | (0.10) | (0.25) | (0.00) |
| River carpsucker | 0.39 | 0.58 | 0.25 |
| | (0.19) | (0.39) | (0.17) |
| Smallmouth buffalo | 0.17 | 0.41 | 0.00 |
| | (0.17) | (0.41) | (0.00) |
| Bigmouth buffalo | 0.05 | 0.00 | 0.08 |
| | (0.05) | (0.00) | (0.08) |
| Yellow bullhead | 0.05 | 0.00 | 0.08 |
| | (0.05) | (0.00) | (0.08) |
| Channel catfish | 0.19 | 0.08 | 0.26 |
| | (0.08) | (0.08) | (0.12) |
| White bass | 1.27 | 2.35 | 0.51 |
| | (0.41) | (0.96) | (0.23) |
| Orangespotted sunfish | 0.13 | 0.32 | 0.00 |
| | (0.10) | (0.24) | (0.00) |
| Bluegill | 1.11 | 1.20 | 1.04 |
| | (0.51) | (1.01) | (0.51) |
| White crappie | 0.27 | 0.17 | 0.34 |
| | (0.16) | (0.17) | (0.25) |
| Black crappie | 1.38 | 0.89 | 1.72 |
| | (0.53) | (0.64) | (0.80) |
| Sauger | 0.15 | 0.00 | 0.25 |
| | (0.10) | (0.00) | (0.17) |
| Freshwater drum | 2.55 | 0.74 | 3.82 |
| | (0.97) | (0.47) | (1.62) |

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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.13 | 0.16 | 0.00 | 0.18 | 0.00 | 0.00 |
| | (0.12) | (0.16) | (0.00) | (0.18) | (0.00) | (0.00) |
| Longnose gar | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.07) |
| Shortnose gar | 0.40 | 3.94 | 0.16 | 0.19 | 1.45 | 0.42 |
| | (0.16) | (2.09) | (0.16) | (0.19) | (0.67) | (0.18) |
| Bowfin | 0.03 | 0.17 | 0.17 | 0.00 | 0.00 | 0.07 |
| | (0.02) | (0.17) | (0.17) | (0.00) | (0.00) | (0.07) |
| Mooneye | 0.17 | 0.00 | 0.00 | 0.17 | 0.00 | 0.20 |
| | (0.13) | (0.00) | (0.00) | (0.17) | (0.00) | (0.20) |
| Skipjack herring | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.18) | (0.00) | (0.00) | (0.00) |
| Gizzard shad | 29.27 | 580.62 | 9.18 | 6.03 | 4.46 | 7.33 |
| | (21.44) | (537.69) | (8.18) | (3.90) | (2.06) | (6.14) |
| Threadfin shad | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.07) |
| Central stoneroller | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) |
| Red shiner | 0.72 | 0.00 | 0.33 | 0.19 | 2.90 | 2.09 |
| | (0.39) | (0.00) | (0.21) | (0.19) | (2.90) | (1.31) |
| Spotfin shiner | 2.18 | 1.25 | 1.02 | 1.23 | 8.12 | 4.56 |
| | (0.97) | (0.73) | (1.02) | (0.72) | (4.36) | (2.96) |
| Common carp | 1.38 | 1.83 | 0.17 | 1.87 | 0.00 | 0.20 |
| | (1.25) | (1.04) | (0.17) | (1.87) | (0.00) | (0.20) |
| Mississippi silvery minnow | 5.35 | 0.00 | 0.00 | 7.02 | 0.18 | 2.38 |
| | (4.55) | (0.00) | (0.00) | (6.82) | (0.18) | (1.26) |
| Bighead carp | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) |
| Silver chub | 0.08 | 0.00 | 0.16 | 0.00 | 0.54 | 0.28 |
| | (0.04) | (0.00) | (0.16) | (0.00) | (0.54) | (0.16) |
| Golden shiner | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.17) | (0.00) | (0.00) | (0.00) |
| Emerald shiner | 18.96 | 4.05 | 6.18 | 6.60 | 1.29 | 50.24 |
| | (10.53) | (3.24) | (3.94) | (5.81) | (0.72) | (34.33) |
| River shiner | 1.13 | 0.08 | 0.51 | 0.35 | 0.18 | 3.11 |
| | (0.41) | (0.08) | (0.51) | (0.22) | (0.18) | (1.33) |
| Bigeye 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 | 0.20 | 0.17 | 0.34 | 0.17 | 0.00 | 0.28 |
| | (0.12) | (0.17) | (0.21) | (0.17) | (0.00) | (0.16) |
| Sand 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) |
| Channel shiner | 16.62 | 0.17 | 3.56 | 12.21 | 6.57 | 29.58 |
| | (7.87) | (0.11) | (3.37) | (11.05) | (4.42) | (9.88) |
| Unidentified shiner | 0.03 | 0.84 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.03) | (0.84) | (0.00) | (0.00) | (0.00) | (0.00) |
| Bullhead minnow | 1.01 | 1.19 | 9.72 | 0.74 | 0.76 | 1.33 |
| | (0.51) | (0.68) | (3.78) | (0.74) | (0.57) | (0.45) |
| Creek chub | 0.12 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 |
| | (0.12) | (0.00) | (0.00) | (0.18) | (0.00) | (0.00) |
| Unidentified minnow | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 1.12 |
| | (0.32) | (0.00) | (0.00) | (0.00) | (0.00) | (1.12) |
| River carpsucker | 0.57 | 0.74 | 0.00 | 0.16 | 0.00 | 1.51 |
| | (0.42) | (0.50) | (0.00) | (0.16) | (0.00) | (1.44) |
| Blue sucker | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| | (0.02) | (0.00) | (0.00) | (0.00) | (0.00) | (0.07) |
| Smallmouth buffalo | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.16) | (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
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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|---|---|
| Unidentified buffalo | 0.58 | 7.42 | 0.34 | 0.34 | 0.00 | 0.21 |
| | (0.37) | (7.42) | (0.34) | (0.34) | (0.00) | (0.15) |
| Shorthead redhorse | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.17) | (0.00) | (0.00) | (0.00) |
| Channel catfish | 1.90 | 0.17 | 0.35 | 2.34 | 0.36 | 1.19 |
| | (0.84) | (0.11) | (0.22) | (1.26) | (0.23) | (0.28) |
| Flathead catfish | 0.04 | 0.00 | 0.17 | 0.00 | 0.00 | 0.14 |
| | (0.03) | (0.00) | (0.17) | (0.00) | (0.00) | (0.09) |
| Western mosquitofish | 1.53 | 2.89 | 0.00 | 0.17 | 0.19 | 4.57 |
| | (1.31) | (1.66) | (0.00) | (0.17) | (0.19) | (4.57) |
| Brook silverside | 0.01 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.16) | (0.00) | (0.00) | (0.00) | (0.00) |
| White bass | 10.54 | 16.75 | 2.34 | 13.60 | 1.26 | 2.84 |
| | (7.00) | (16.57) | (1.76) | (10.46) | (0.52) | (1.51) |
| Warmouth | 0.20 | 0.09 | 0.00 | 0.17 | 0.00 | 0.29 |
| | (0.13) | (0.09) | (0.00) | (0.17) | (0.00) | (0.22) |
| Orangespotted sunfish | 0.32 | 2.88 | 4.76 | 0.00 | 0.00 | 0.58 |
| | (0.13) | (0.73) | (2.10) | (0.00) | (0.00) | (0.44) |
| Bluegill | 0.63 | 0.81 | 1.86 | 0.33 | 0.18 | 1.27 |
| | (0.37) | (0.49) | (0.59) | (0.33) | (0.18) | (1.05) |
| Largemouth bass | 0.05 | 1.25 | 0.18 | 0.00 | 0.00 | 0.00 |
| | (0.05) | (1.16) | (0.18) | (0.00) | (0.00) | (0.00) |
| White crappie | 0.42 | 1.96 | 0.17 | 0.51 | 0.00 | 0.00 |
| | (0.16) | (0.91) | (0.17) | (0.23) | (0.00) | (0.00) |
| Black crappie | 1.04 | 3.68 | 2.07 | 1.20 | 0.36 | 0.28 |
| | (0.58) | (3.03) | (0.48) | (0.85) | (0.23) | (0.19) |
| Mud darter | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.09) | (0.00) | (0.00) | (0.00) | (0.00) |
| Logperch | 0.20 | 0.08 | 0.00 | 0.17 | 0.00 | 0.28 |
| | (0.12) | (0.08) | (0.00) | (0.17) | (0.00) | (0.16) |
| River darter | 0.04 | 0.58 | 0.00 | 0.00 | 0.00 | 0.07 |
| | (0.03) | (0.58) | (0.00) | (0.00) | (0.00) | (0.07) |
| Sauger | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| | (0.05) | (0.00) | (0.00) | (0.00) | (0.00) | (0.17) |
| Freshwater drum | 60.10 | 1.26 | 0.34 | 73.38 | 0.54 | 39.37 |
| | (46.45) | (0.75) | (0.21) | (68.11) | (0.37) | (36.30) |

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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.10 | 0.23 | 0.00 |
| | (0.06) | (0.15) | (0.00) |
| Gizzard shad | 5.96 | 13.76 | 0.50 |
| | (4.00) | (9.80) | (0.26) |
| Spotfin shiner | 0.03 | 0.08 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| Common carp | 1.72 | 3.20 | 0.68 |
| | (1.16) | (2.73) | (0.58) |
| Speckled chub | 1.29 | 3.14 | 0.00 |
| | (1.01) | (2.47) | (0.00) |
| Silver chub | 0.37 | 0.79 | 0.08 |
| | (0.18) | (0.43) | (0.08) |
| Golden shiner | 0.10 | 0.23 | 0.00 |
| | (0.09) | (0.23) | (0.00) |
| Emerald shiner | 4.95 | 11.77 | 0.18 |
| | (2.95) | (7.23) | (0.11) |
| River shiner | 0.07 | 0.17 | 0.00 |
| | (0.07) | (0.17) | (0.00) |
| Silverband shiner | 0.42 | 0.67 | 0.25 |
| | (0.22) | (0.41) | (0.25) |
| Channel shiner | 0.73 | 1.66 | 0.08 |
| | (0.33) | (0.79) | (0.08) |
| Unidentified shiner | 0.31 | 0.76 | 0.00 |
| | (0.31) | (0.76) | (0.00) |
| Bullhead minnow | 1.03 | 2.39 | 0.08 |
| | (0.51) | (1.23) | (0.08) |
| River carpsucker | 0.27 | 0.17 | 0.34 |
| | (0.11) | (0.11) | (0.17) |
| Smallmouth buffalo | 0.07 | 0.17 | 0.00 |
| | (0.04) | (0.11) | (0.00) |
| Bigmouth buffalo | 0.08 | 0.08 | 0.09 |
| | (0.06) | (0.08) | (0.09) |
| Black buffalo | 0.03 | 0.08 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| Unidentified buffalo | 0.06 | 0.15 | 0.00 |
| | (0.06) | (0.15) | (0.00) |
| Black bullhead | 0.45 | 0.00 | 0.76 |
| | (0.34) | (0.00) | (0.58) |
| Channel catfish | 1.42 | 0.16 | 2.29 |
| | (0.73) | (0.10) | (1.25) |
| Western mosquitofish | 0.10 | 0.23 | 0.00 |
| | (0.09) | (0.23) | (0.00) |
| Brook silverside | 0.03 | 0.08 | 0.00 |
| | (0.03) | (0.08) | (0.00) |
| White bass | 0.58 | 0.32 | 0.77 |
| | (0.29) | (0.17) | (0.49) |
| Orangespotted sunfish | 5.31 | 12.91 | 0.00 |
| | (3.50) | (8.57) | (0.00) |
| Bluegill | 3.12 | 7.58 | 0.00 |
| | (2.46) | (6.03) | (0.00) |
| White crappie | 0.31 | 0.54 | 0.16 |
| | (0.23) | (0.54) | (0.10) |
| Black crappie | 0.13 | 0.31 | 0.00 |
| | (0.13) | (0.31) | (0.00) |
| Sauger | 0.05 | 0.00 | 0.09 |
| | (0.05) | (0.00) | (0.09) |
| Freshwater drum | 3.93 | 0.59 | 6.26 |
| | (3.02) | (0.28) | (5.15) |

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 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.01 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.21) | (0.00) | (0.00) | (0.00) | (0.00) |
| Gizzard shad | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.18) | (0.00) | (0.00) | (0.00) | (0.00) |
| Common carp | 0.24 | 1.04 | 0.72 | 0.13 | 0.13 | 0.40 |
| | (0.10) | (0.58) | (0.51) | (0.06) | (0.13) | (0.30) |
| Bighead carp | 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 | 0.27 | 0.09 | 0.00 | 0.31 | 0.00 | 0.20 |
| | (0.08) | (0.09) | (0.00) | (0.11) | (0.00) | (0.08) |
| Black buffalo | 0.02 | 0.09 | 0.26 | 0.02 | 0.00 | 0.00 |
| | (0.02) | (0.09) | (0.18) | (0.02) | (0.00) | (0.00) |
| Blue catfish | 0.12 | 0.00 | 0.00 | 0.13 | 0.13 | 0.10 |
| | (0.06) | (0.00) | (0.00) | (0.09) | (0.13) | (0.07) |
| Channel catfish | 4.92 | 0.00 | 1.50 | 5.76 | 0.53 | 3.60 |
| | (1.29) | (0.00) | (0.66) | (1.90) | (0.53) | (0.91) |
| Flathead catfish | 0.05 | 0.00 | 0.00 | 0.04 | 0.00 | 0.07 |
| | (0.02) | (0.00) | (0.00) | (0.03) | (0.00) | (0.05) |
| White bass | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.00) | (0.03) |
| Bluegill | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.09) | (0.00) | (0.00) | (0.00) | (0.00) |
| White crappie | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.18) | (0.00) | (0.00) | (0.00) |
| Sauger | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.09) | (0.00) | (0.00) | (0.00) |
| Freshwater drum | 0.13 | 0.00 | 0.00 | 0.18 | 0.13 | 0.03 |
| | (0.06) | (0.00) | (0.00) | (0.08) | (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 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.61 | 0.18 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.28) | (0.18) | (0.00) | (0.00) | (0.00) |
| Skipjack herring | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.18) | (0.00) | (0.00) | (0.00) |
| Gizzard shad | 0.06 | 1.61 | 0.51 | 0.02 | 0.00 | 0.00 |
| | (0.03) | (1.39) | (0.19) | (0.02) | (0.00) | (0.00) |
| Common carp | 0.37 | 0.00 | 0.81 | 0.33 | 0.00 | 0.43 |
| | (0.11) | (0.00) | (0.70) | (0.12) | (0.00) | (0.22) |
| Bighead carp | 0.04 | 1.40 | 0.62 | 0.00 | 0.00 | 0.00 |
| | (0.01) | (0.65) | (0.22) | (0.00) | (0.00) | (0.00) |
| River carpsucker | 0.05 | 0.17 | 0.27 | 0.02 | 0.00 | 0.07 |
| | (0.03) | (0.11) | (0.27) | (0.02) | (0.00) | (0.07) |
| Blue sucker | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.01) | (0.00) | (0.00) | (0.00) | (0.00) | (0.04) |
| Smallmouth buffalo | 2.40 | 1.25 | 2.05 | 2.52 | 6.51 | 2.22 |
| | (0.46) | (0.95) | (1.29) | (0.64) | (6.17) | (0.65) |
| Bigmouth buffalo | 0.02 | 0.63 | 0.09 | 0.00 | 0.00 | 0.04 |
| | (0.01) | (0.29) | (0.09) | (0.00) | (0.00) | (0.04) |
| Black buffalo | 0.06 | 0.09 | 1.48 | 0.00 | 0.00 | 0.07 |
| | (0.03) | (0.09) | (0.84) | (0.00) | (0.00) | (0.05) |
| Blue catfish | 0.03 | 0.00 | 0.00 | 0.02 | 0.00 | 0.04 |
| | (0.02) | (0.00) | (0.00) | (0.02) | (0.00) | (0.04) |
| Channel catfish | 0.17 | 0.09 | 0.18 | 0.23 | 0.00 | 0.04 |
| | (0.07) | (0.09) | (0.11) | (0.10) | (0.00) | (0.04) |
| Flathead catfish | 0.07 | 0.00 | 0.00 | 0.07 | 0.13 | 0.07 |
| | (0.03) | (0.00) | (0.00) | (0.04) | (0.13) | (0.05) |
| White bass | 0.05 | 0.09 | 0.71 | 0.05 | 0.51 | 0.00 |
| | (0.03) | (0.09) | (0.33) | (0.05) | (0.35) | (0.00) |
| White crappie | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.11) | (0.00) | (0.00) | (0.00) |
| Freshwater drum | 0.29 | 0.00 | 0.00 | 0.37 | 0.00 | 0.14 |
| | (0.08) | (0.00) | (0.00) | (0.11) | (0.00) | (0.11) |

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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.05 | 0.05 | 0.05 |
| | (0.03) | (0.03) | (0.04) |
| Mooneye | 0.57 | 0.60 | 0.50 |
| | (0.23) | (0.31) | (0.23) |
| Skipjack herring | 0.36 | 0.50 | 0.03 |
| | (0.14) | (0.20) | (0.03) |
| Gizzard shad | 17.82 | 15.73 | 22.71 |
| | (4.43) | (5.70) | (6.51) |
| Threadfin shad | 0.14 | 0.15 | 0.13 |
| | (0.08) | (0.10) | (0.09) |
| Grass carp | 0.01 | 0.00 | 0.03 |
| | (0.01) | (0.00) | (0.03) |
| Red shiner | 0.41 | 0.53 | 0.16 |
| | (0.31) | (0.43) | (0.13) |
| Spotfin shiner | 0.18 | 0.15 | 0.26 |
| | (0.10) | (0.13) | (0.12) |
| Common carp | 0.04 | 0.03 | 0.08 |
| | (0.02) | (0.03) | (0.06) |
| Mississippi silvery minnow | 0.40 | 0.55 | 0.05 |
| | (0.35) | (0.50) | (0.04) |
| Speckled chub | 0.02 | 0.03 | 0.00 |
| | (0.02) | (0.03) | (0.00) |
| Silver chub | 0.29 | 0.18 | 0.55 |
| | (0.11) | (0.13) | (0.24) |
| Emerald shiner | 10.92 | 12.15 | 8.05 |
| | (2.84) | (3.82) | (3.23) |
| River shiner | 0.92 | 0.88 | 1.03 |
| | (0.40) | (0.53) | (0.51) |
| Bigmouth shiner | 0.07 | 0.10 | 0.00 |
| | (0.05) | (0.08) | (0.00) |
| Spottail shiner | 0.01 | 0.00 | 0.03 |
| | (0.01) | (0.00) | (0.03) |
| Silverband shiner | 0.21 | 0.13 | 0.39 |
| | (0.08) | (0.07) | (0.22) |
| Sand shiner | 0.10 | 0.05 | 0.21 |
| | (0.07) | (0.05) | (0.19) |
| Channel shiner | 9.67 | 11.98 | 4.32 |
| | (7.76) | (11.04) | (2.75) |
| Unidentified shiner | 0.26 | 0.38 | 0.00 |
| | (0.21) | (0.31) | (0.00) |
| Bluntnose minnow | 0.02 | 0.03 | 0.00 |
| | (0.02) | (0.03) | (0.00) |
| Bullhead minnow | 0.15 | 0.20 | 0.03 |
| | (0.06) | (0.08) | (0.03) |
| River carpsucker | 1.53 | 2.03 | 0.37 |
| | (1.27) | (1.82) | (0.18) |
| Smallmouth buffalo | 0.10 | 0.08 | 0.16 |
| | (0.06) | (0.08) | (0.08) |
| Unidentified buffalo | 0.12 | 0.18 | 0.00 |
| | (0.11) | (0.15) | (0.00) |
| Channel catfish | 0.54 | 0.68 | 0.24 |
| | (0.29) | (0.42) | (0.13) |
| Western mosquitofish | 0.65 | 0.78 | 0.37 |
| | (0.25) | (0.36) | (0.13) |
| Brook silverside | 0.38 | 0.53 | 0.03 |
| | (0.21) | (0.30) | (0.03) |
| White bass | 1.30 | 1.50 | 0.84 |
| | (0.56) | (0.79) | (0.33) |

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 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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|
| Bluegill | 0.05 | 0.05 | 0.05 |
| | (0.04) | (0.05) | (0.04) |
| Largemouth bass | 0.09 | 0.13 | 0.00 |
| | (0.09) | (0.13) | (0.00) |
| White crappie | 0.02 | 0.03 | 0.00 |
| | (0.02) | (0.03) | (0.00) |
| Black crappie | 0.09 | 0.10 | 0.05 |
| | (0.07) | (0.10) | (0.04) |
| Sauger | 0.02 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.04) |
| Freshwater drum | 0.31 | 0.33 | 0.29 |
| | (0.10) | (0.13) | (0.12) |

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 1999. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

| Common name | TWZ |
|---|---|
| Longnose gar | 1.67 (1.28) |
| Shortnose gar | 5.00 (1.59) |
| Goldeye | 0.17 (0.17) |
| American eel | 0.17 (0.17) |
| Skipjack herring | 0.17 (0.17) |
| Gizzard shad | 90.33 (24.86) |
| Grass carp | 0.50 (0.34) |
| Spotfin shiner | 0.17 (0.17) |
| Common carp | 28.33 (5.10) |
| Silver carp | 0.17 (0.17) |
| Silver chub | 0.17 (0.17) |
| Emerald shiner | 2.67 (0.80) |
| Channel shiner | 1.33 (0.49) |
| River carpsucker | 2.50 (1.09) |
| Quillback | 0.33 (0.21) |
| Smallmouth buffalo | 2.17 (0.95) |
| Bigmouth buffalo | 0.17 (0.17) |
| Black buffalo | 0.17 (0.17) |
| Shorthead redhorse | 0.17 (0.17) |
| Channel catfish | 1.33 (0.33) |
| Flathead catfish | 0.67 (0.49) |
| White bass | 18.83 (6.61) |
| Yellow bass | 0.17 (0.17) |
| Orangespotted sunfish | 0.17 (0.17) |
| Bluegill | 4.83 (1.58) |
| Largemouth bass | 0.50 (0.22) |
| White crappie | 1.33 (0.61) |
| Black crappie | 1.00 (0.37) |
| Sauger | 1.83 (0.75) |
| Walleye | 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 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 1999. See text for definitions of catch-per-unit-effort and standard error. Table page: 2

| Common name | TWZ |
|---|---|
| | (0.17) |
| Freshwater drum | 10.00 |
| | (2.53) |

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 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Lake sturgeon | 0.17 (0.11) |
| Shovelnose sturgeon | 2.00 (0.59) |
| Gizzard shad | 0.17 (0.11) |
| Speckled chub | 0.75 (0.30) |
| Blue catfish | 0.42 (0.26) |
| Channel catfish | 1.00 (0.58) |
| Flathead catfish | 0.08 (0.08) |
| Freshwater drum | 1.08 (0.53) |

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

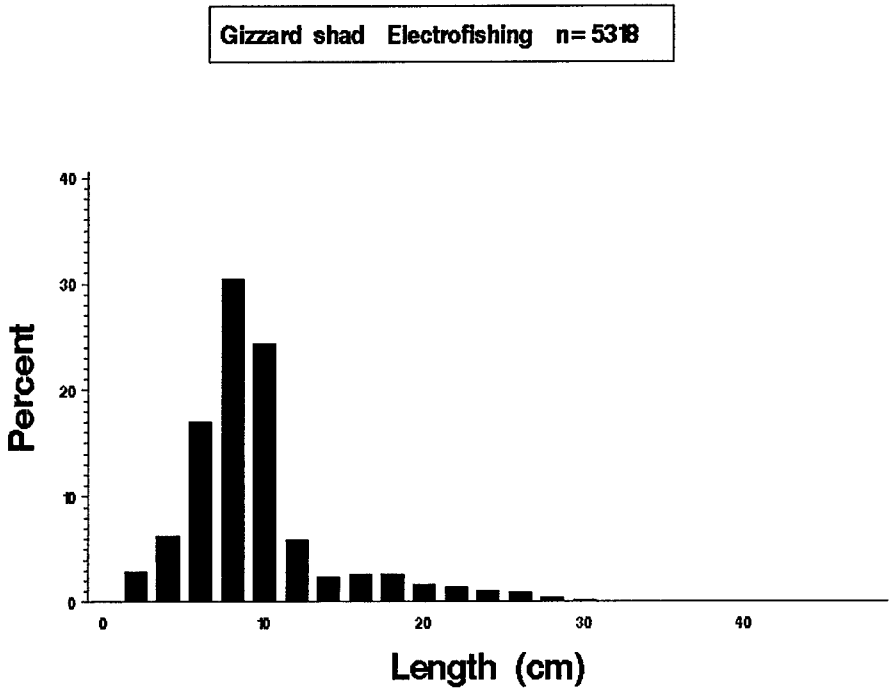


**Figure 4.2.** Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

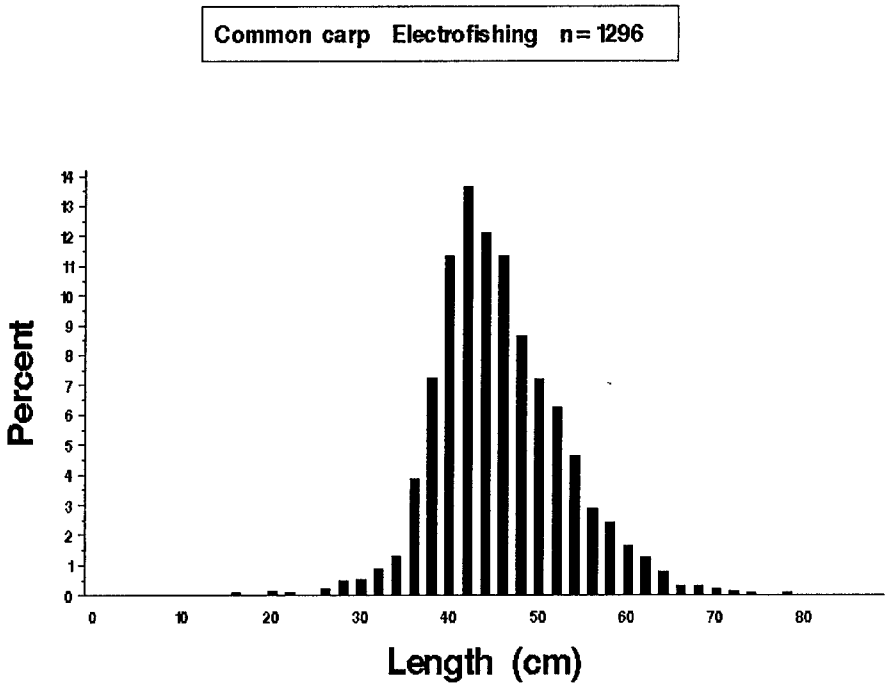


**Figure 4.3.** Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

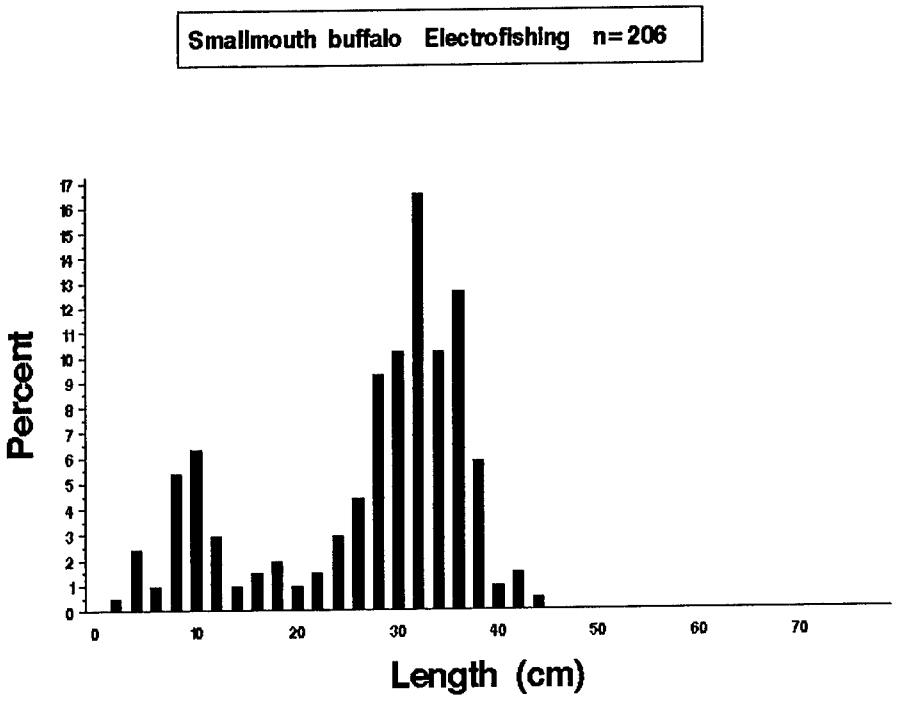


**Figure 4.4.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

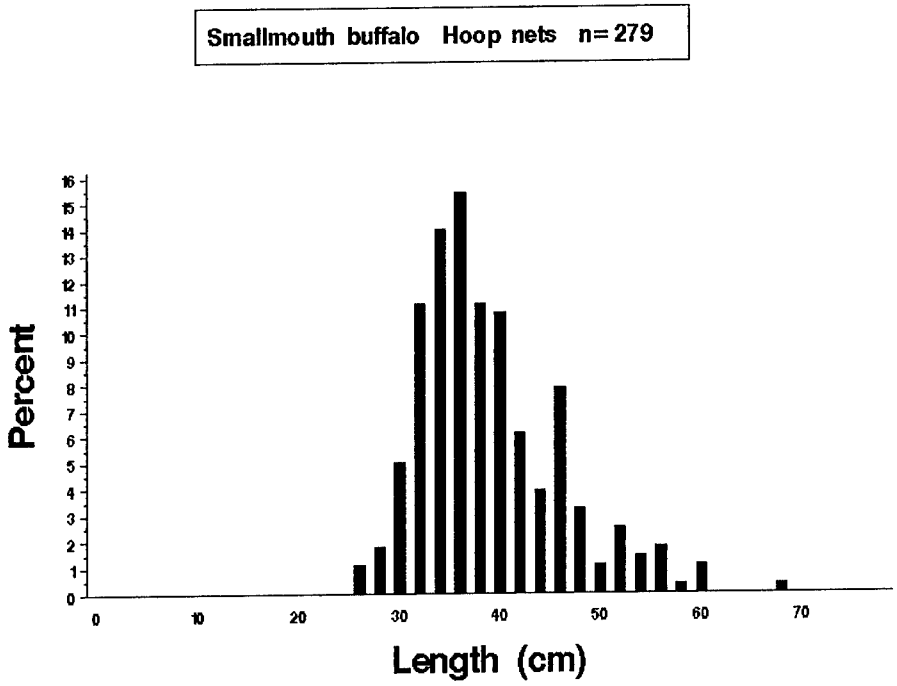


**Figure 4.5.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in Upper Mississippi River Pool 26 during 1999.

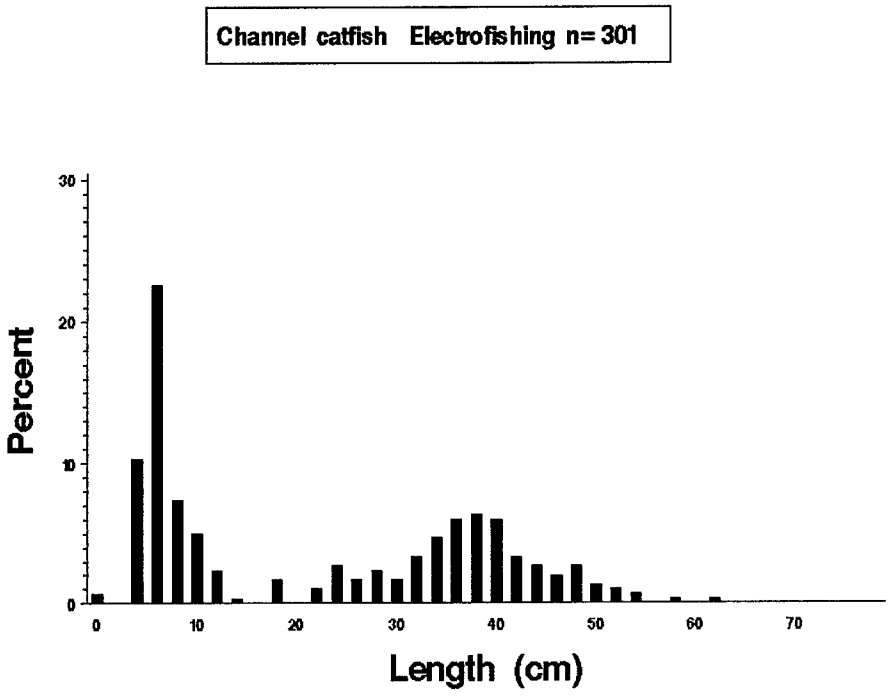


**Figure 4.6.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

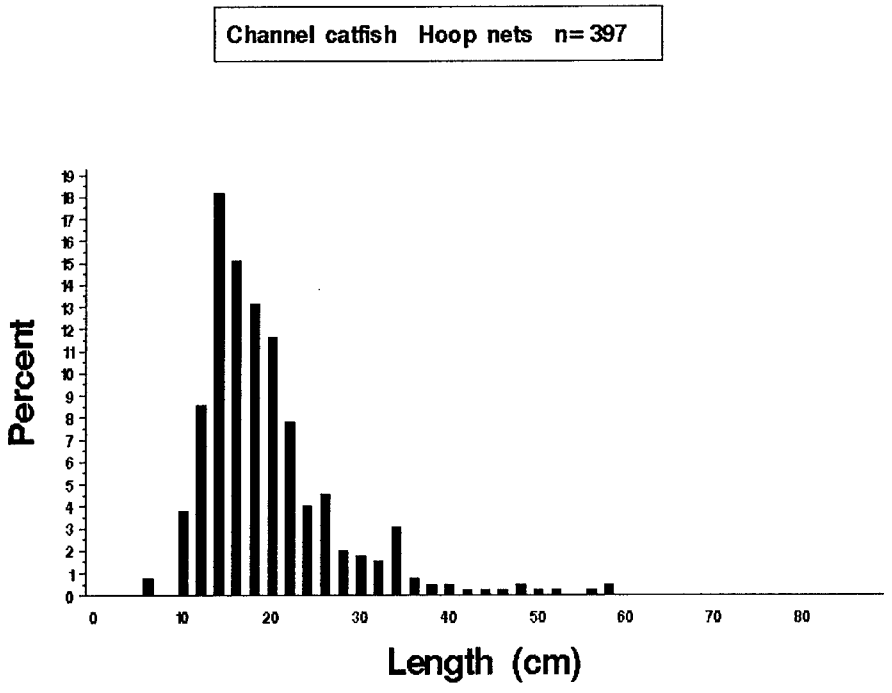


**Figure 4.7.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in Upper Mississippi River Pool 26 during 1999.

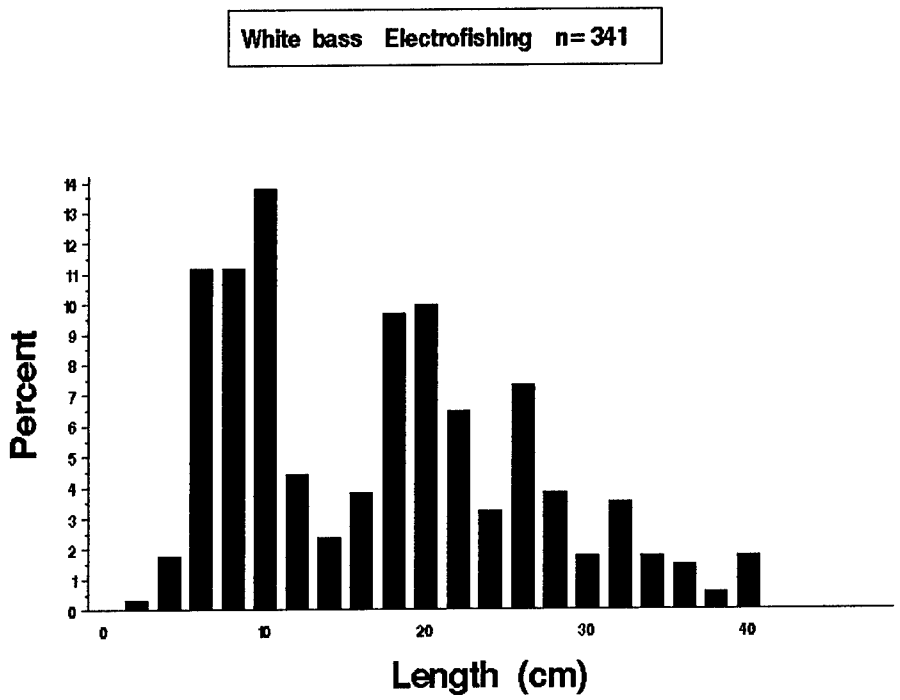


**Figure 4.8.** Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

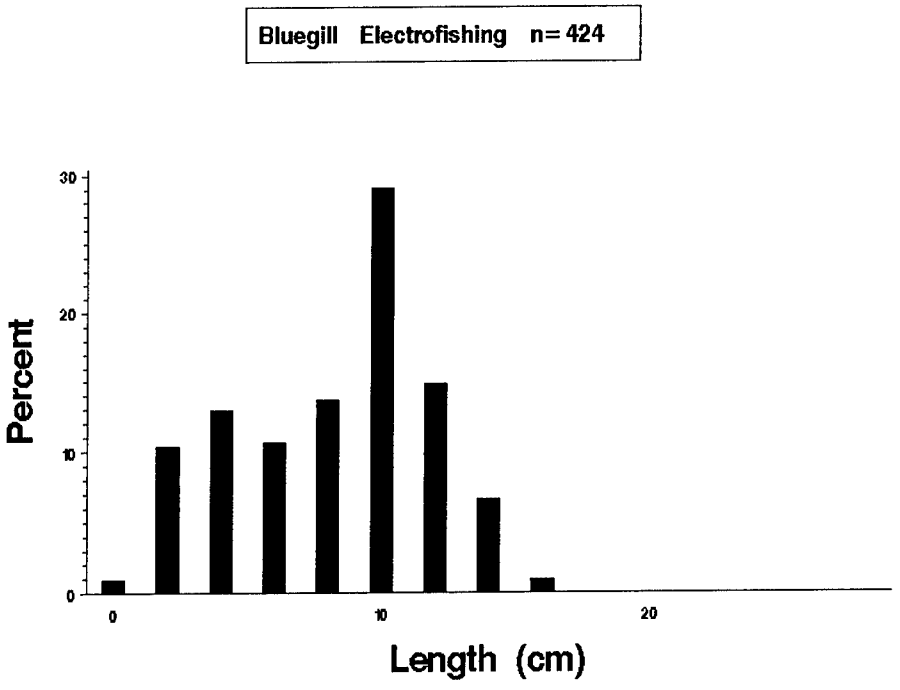


**Figure 4.9.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

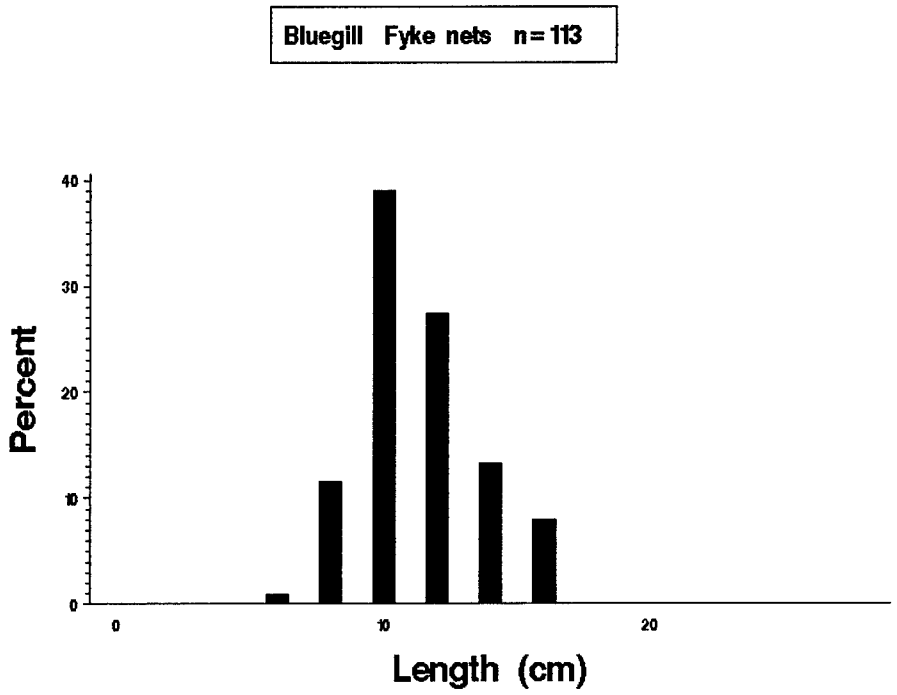


**Figure 4.10.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in Upper Mississippi River Pool 26 during 1999.

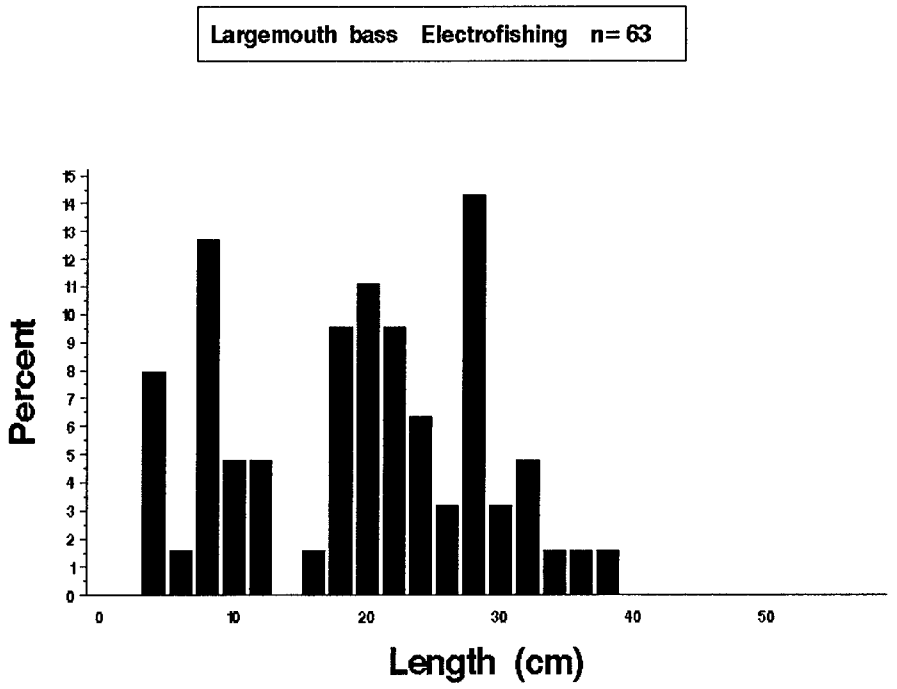


**Figure 4.11.** Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

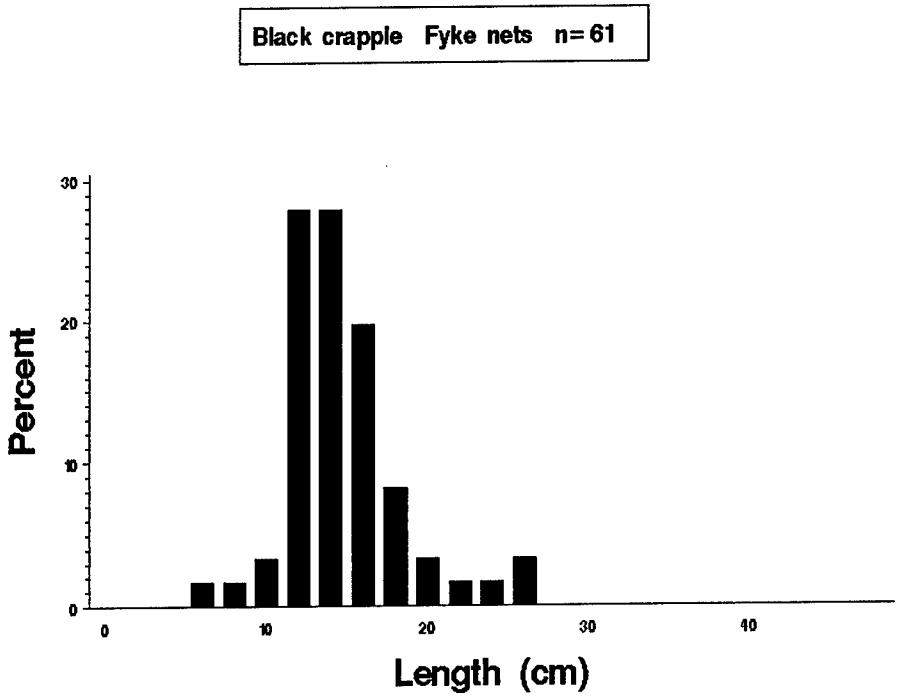


**Figure 4.12.** Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Upper Mississippi River Pool 26 during 1999.

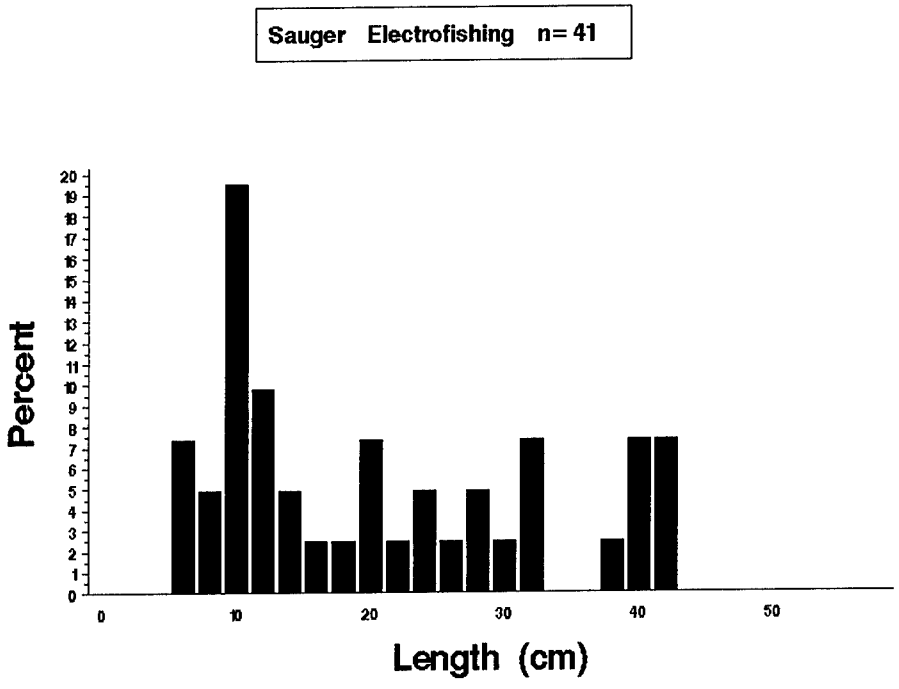


**Figure 4.13.** Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

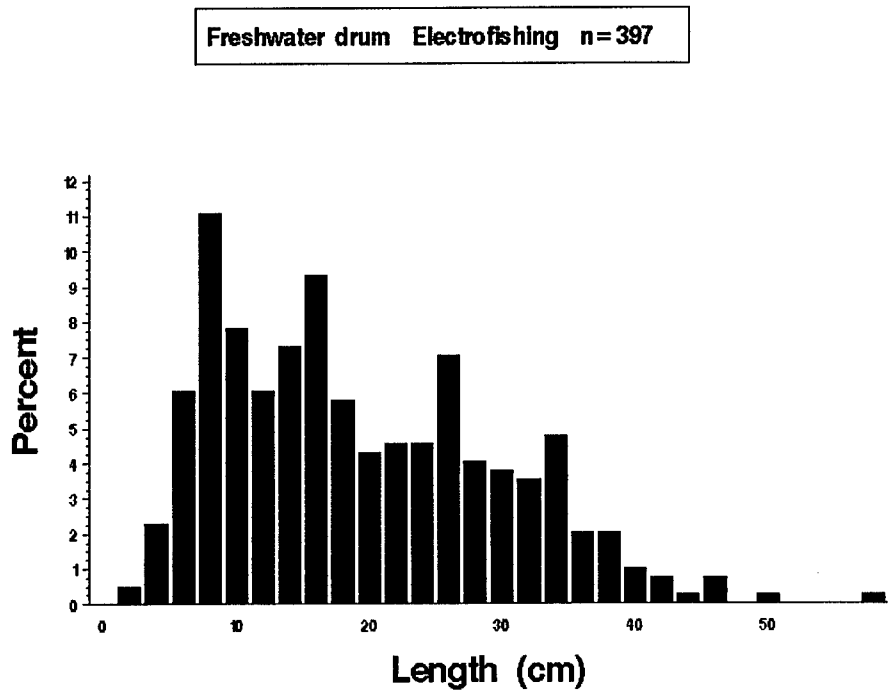


**Figure 4.14.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Upper Mississippi River Pool 26 during 1999.

# Chapter 5. Mississippi River Open Reach

by

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## Hydrograph

Mississippi River Open Reach 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 1999, water stages were higher than normal in spring through early summer and lower than normal through the rest of the year (Figure 5.1). Fluctuations in water stage were typically 2–4 feet/week. The lowest stage occurred on December 25 at 7.2 feet, and the highest stage occurred on May 10 at 37.8 feet. Water stages during LTRMP sampling in 1999 could be characterized as high and relatively stable. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

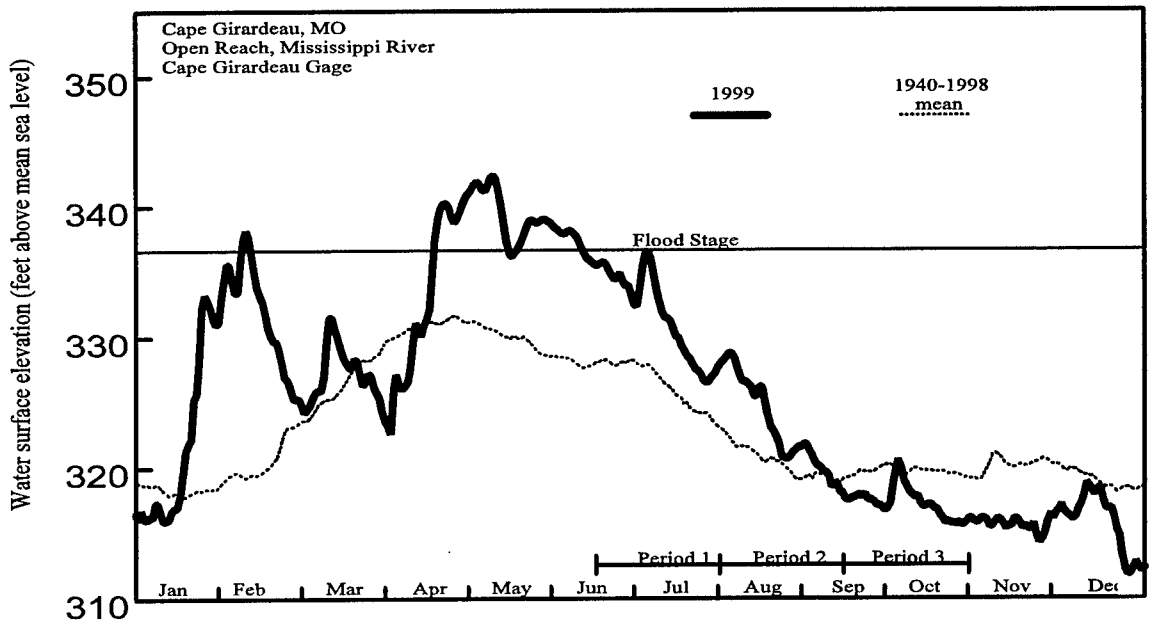


**Figure 5.1.** Daily water surface elevation from Cape Girardeau Gage for the Mississippi River Open Reach during 1999 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

## Summary of Sampling Effort

We made 280 fish collections in the open river reach during 1999 using seven gear types (Table 5.1). Gear allocations among strata varied for all three sampling periods because of high and low water extremes. Of

the total number of collections, 234 were from randomly selected sites in the SCB, MCBU, and MCBW strata. Thirty-one collections were made at fixed TRI sites and 15 were from fixed MCBU sites. The SCB, followed by the MCBU and MCBW, received the most sampling effort.

## Total Catch by Gear

A total of 18,268 fish were collected representing 71 species (Table 5.2). This total does not include 85 fish identified only to genus or unidentified. The five most numerically abundant species collected were gizzard shad (6,987), freshwater drum (2,814), channel shiner (2,654), common carp (860), and channel catfish (792). Total species collected by gear type were as follows: day electrofishing(60), fyke netting (15), mini fyke netting (53), seining (25), small hoop netting (11), large hoop netting (15), and gill netting (14). Historically, 129 fish species have been collected from the open river (Pitlo et al. 1995). Open River field station biologists have collected 100 species from 1991 to 1999. In 1999, 71 species were collected, adding trout-perch and bleeding shiner as new species. Previous records of trout-perch are 30–50 years old. The bleeding shiner is a tributary stray species. Eight Missouri-listed species were collected: paddlefish, mooneye, Mississippi silvery minnow, plains minnow, silver chub, blue sucker, trout-perch, and river darter.

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

### *Day Electrofishing*

Reachwide mean catch-per-unit-effort *(C/f)* by day electrofishing was highest for gizzard shad (42.89), goldeye (14.02), and freshwater drum (3.40; Table 5.3.1). By stratum, gizzard shad had the highest *C/f* in the MCBU (30.00), MCBW (37.00), and SCB (138.18).

### *Fyke Net*

Reachwide mean *C/f* by fyke netting was highest for shortnose gar (1.59), freshwater drum (0.70), and gizzard shad (0.59; Table 5.3.2). By stratum, shortnose gar had the highest *C/f* in the SCB (1.59).

### *Mini Fyke Net*

Reachwide mean *C/f* by mini fyke netting was highest for freshwater drum (61.24), channel shiner (27.11), and gizzard shad (9.42; Table 5.3.3). By stratum, freshwater drum had the highest *C/f* in the MCBU (62.41) and MCBW (14.69), and channel shiner had the highest *C/f* in the SCB (86.12).

### *Small Hoop Net*

Reachwide mean *C/f* by small hoop netting was highest for common carp (1.31), blue catfish (0.48), and freshwater drum (0.18; Table 5.3.4). By stratum, common carp had the highest *C/f* in the MCBU (1.38) and MCBW (0.63), and channel catfish had the highest *C/f* in the SCB (2.13).

### *Large Hoop Net*

Reachwide mean *C/f* by small hoop netting was highest for smallmouth buffalo (2.16), common carp (2.05), and channel catfish (1.45; Table 5.3.5). By stratum, smallmouth buffalo had the highest *C/f* in the MCBU (2.16), common carp had the highest *C/f* in the MCBW (1.60), and smallmouth buffalo had the highest *C/f* in the SCB (2.29).

### *Seine*

Reachwide mean *C/f* by seine was highest for gizzard shad (20.55), channel shiner (1.23), and channel catfish (0.84; Table 5.3.6). By stratum, gizzard shad had the highest *C/f* in the MCBU (23.08), and channel shiner had the highest *C/f* in the SCB (4.15).

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

All fixed-site sampling was confined to the MCBU and TRI strata using a combination of day electrofishing, fyke netting, mini fyke netting, small and large hoop netting, and gill netting.

### *Day Electrofishing*

At the MCBU fixed site, *C/f* by day electrofishing was highest for gizzard shad (55.53), goldeye (54.00), and freshwater drum (1.67; Table 5.4.1). At the TRI fixed sites, *C/f* was highest for gizzard shad (529.75), brook silverside (27.50), and spotted bass (20.50).

### *Fyke Net*

At the MCBU fixed site, *C/f* by fyke netting was highest for gizzard shad (1.98), freshwater drum (1.49), and river carpsucker (1.26; Table 5.4.2). At the TRI fixed sites, *C/f* was highest for freshwater drum (2.29), shortnose gar (2.28), and black crappie (0.96).

### *Mini Fyke Net*

At the MCBU fixed site, *C/f* by mini fyke netting was highest for freshwater drum (43.73), channel shiner (40.54), and white bass (12.61; Table 5.4.3). At the TRI fixed sites, *C/f* was highest for bluegill (9.82), channel shiner (8.67), and white crappie (4.09).

### *Small Hoop Net*

At the MCBU fixed site, *C/f* by small hoop netting was highest for channel catfish (4.78), common carp (1.01), and blue catfish (0.37; Table 5.4.4). At the TRI fixed sites, *C/f* was highest for common carp (1.77), channel catfish (0.88), and river carpsucker (0.59).

### *Large Hoop Net*

At the MCBU fixed site, *C/f* by large hoop netting was highest for smallmouth buffalo (1.36), channel catfish (0.54), and flathead catfish (0.52; Table 5.4.5). At the TRI fixed sites, *C/f* was highest for common carp (4.12), smallmouth buffalo (0.71), and river carpsucker (0.36).

### *Gill Net*

At the TRI fixed sites, *C/f* by gill netting was highest for common carp (7.43), river carpsucker (3.00), and white bass (2.62; Table 5.4.6).

## Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 5.2 to 5.12. 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 of fewer than 100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

### *Gizzard Shad*

The length distribution of 5,686 gizzard shad collected by electrofishing during 1999 (Figure 5.2) was composed largely of 7–12-cm-long fish and had a mode of 8 cm. The largest gizzard shad collected was about 36 cm long.

### *Common Carp*

The length distribution of 214 common carp collected by electrofishing during 1999 (Figure 5.3) showed a large group of fish 38–60 cm in total length.

### *Smallmouth Buffalo*

The length distribution of 43 smallmouth buffalo collected by electrofishing during 1999 (Figure 5.4) indicated fish was mainly between 28 and 42 cm long, with a mode of 30 cm. The length distribution of 188 smallmouth buffalo collected by small and large hoop netting (Figure 5.5) was composed of 10–72-cm-long fish. Most smallmouth buffalo were 32–51 cm long and had a mode of 42 cm.

### *Channel Catfish*

The length distribution of 152 channel catfish collected by electrofishing during 1999 (Figure 5.6) was composed of fish 2–58 cm in total length. The greatest percentage of channel catfish was 2–6 cm long. The length distribution of 253 channel catfish collected by small and large hoop netting during 1999 (Figure 5.7) indicated most fish were 14–26 cm in total length. About 40% of channel catfish collected by hoop netting were greater than ~38 cm (15 inches) in length.

### *White Bass*

The length distribution of 61 white bass collected by electrofishing during 1999 (Figure 5.8) was composed of 2–46-cm-long fish and had a mode of 6 cm.

### *Bluegill*

The length distribution of 89 bluegill collected by electrofishing during 1999 (Figure 5.9) was composed of 1–16-cm-long fish and had a mode of 4 cm.

### *Largemouth Bass*

The length distribution of 49 largemouth bass collected by electrofishing during 1999 (Figure 5.10) was composed of 4–34-cm-long fish and had a mode of 8 cm.

## *Freshwater Drum*

The length distribution of 211 freshwater drum collected by electrofishing during 1999 (Figure 5.11) was composed of 2–58-cm-long fish and had a mode at 6 cm. The length distribution of 24 freshwater drum collected by fyke netting during 1999 (Figure 5.12) was composed of 12–32-cm-long fish, with a mode of 28 cm.

Table 5.1. Allocation of fish sampling effort among strata by the Long Term Resource Monitoring Program in the Mississippi River Open Reach during 1999. 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 | | | | 2 | | 15 |
| Fyke net | | | 1 | 1 | | | | 2 | | 4 |
| Gill net | | | | | | | | 2 | | 2 |
| Large hoop net | | | 8 | 4 | 4 | | | 2 | | 18 |
| Small hoop net | | | 8 | 6 | 4 | | | 2 | | 20 |
| Mini fyke net | | | 8 | 5 | 4 | | | 2 | | 19 |
| Seine | | | 12 | 8 | | | | | | 20 |
| SUBTOTAL | 0 | 0 | 45 | 29 | 12 | 0 | 0 | 12 | 0 | 98 |

Sampling period=2: August 1 - September 14

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | | | 8 | 5 | 4 | | | 1 | | 18 |
| Fyke net | | | 3 | 1 | | | | 2 | | 6 |
| Gill net | | | | | | | | 1 | | 1 |
| Large hoop net | | | 8 | 5 | 6 | | | 2 | | 21 |
| Small hoop net | | | 9 | 5 | 6 | | | 2 | | 22 |
| Mini fyke net | | | 8 | 5 | 7 | | | 2 | | 22 |
| Seine | | | 8 | 4 | | | | | | 12 |
| SUBTOTAL | 0 | 0 | 44 | 25 | 23 | 0 | 0 | 10 | 0 | 102 |

Sampling period=3: September 15 - October 31

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | | | 6 | 5 | 4 | | | 1 | | 16 |
| Fyke net | | | 4 | 1 | | | | 2 | | 7 |
| Large hoop net | | | 8 | 5 | 4 | | | 2 | | 19 |
| Small hoop net | | | 8 | 5 | 4 | | | 2 | | 19 |
| Mini fyke net | | | 8 | 5 | 4 | | | 2 | | 19 |
| SUBTOTAL | 0 | 0 | 34 | 21 | 16 | 0 | 0 | 9 | 0 | 80 |
| | 0 | 0 | 123 | 75 | 51 | 0 | 0 | 31 | 0 | 280 |

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 5.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 in the Mississippi River Open Reach. 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 | 4 | - | - | - | - | - | - | - | - | - | - | - | 4 |
| 2 | Shovelnose sturgeon | Scaphirhynchus platorynchus | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 3 |
| 3 | Paddlefish | Polyodon spathula | - | - | - | - | - | - | - | - | - | 7 | - | - | 7 |
| 4 | Spotted gar | Lepisosteus oculatus | 4 | - | - | - | - | - | - | - | - | - | - | - | 4 |
| 5 | Longnose gar | Lepisosteus osseus | 7 | - | 1 | - | 14 | - | - | - | 2 | - | - | - | 24 |
| 6 | Shortnose gar | Lepisosteus platostomus | 65 | - | 25 | - | 19 | - | 3 | 3 | 2 | 1 | - | - | 118 |
| 7 | Bowfin | Amia calva | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 8 | Goldeye | Hiodon alosoides | 663 | - | - | - | 90 | - | 7 | - | 1 | 1 | - | - | 762 |
| 9 | Mooneye | Hiodon tergisus | 45 | - | - | - | 6 | - | 7 | - | - | - | - | - | 58 |
| 10 | American eel | Anguilla rostrata | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 11 | Skipjack herring | Alosa chrysochloris | 43 | - | - | - | 7 | - | 10 | - | - | - | - | - | 60 |
| 12 | Gizzard shad | Dorosoma cepedianum | 5981 | - | 10 | - | 677 | - | 316 | 1 | 1 | 1 | - | - | 6987 |
| 13 | Threadfin shad | Dorosoma petenense | 7 | - | - | - | 3 | - | 1 | - | - | - | - | - | 11 |
| 14 | Central stoneroller | Campostoma anomalum | - | - | - | - | 4 | - | - | - | - | - | - | - | 4 |
| 15 | Grass carp | Ctenopharyngodon idella | 1 | - | - | - | - | - | 2 | - | - | - | - | - | 3 |
| 16 | Red shiner | Cyprinella lutrensis | 257 | - | - | - | 316 | - | 19 | - | - | - | - | - | 592 |
| 17 | Blacktail shiner | Cyprinella venusta | - | - | - | - | 10 | - | - | - | - | - | - | - | 10 |
| 18 | Common carp | Cyprinus carpio | 214 | - | 2 | - | 263 | - | - | 120 | 241 | 20 | - | - | 860 |
| 19 | Mississippi silvery minnow | Hybognathus nuchalis | 20 | - | - | - | 6 | - | 2 | - | - | - | - | - | 28 |
| 20 | Plains minnow | Hybognathus placitus | - | - | - | - | - | - | 1 | - | - | - | - | - | 1 |
| 21 | Bighead carp | Hypopthalmichthys nobilis | - | - | - | - | 2 | - | - | - | 2 | 3 | - | - | 7 |
| 22 | Speckled chub | Macrhybopsis aestivalis | 2 | - | - | - | 12 | - | 2 | - | - | - | - | - | 16 |
| 23 | Silver chub | Macrhybopsis storeriana | 7 | - | - | - | 5 | - | 1 | - | - | - | - | - | 13 |
| 24 | Emerald shiner | Notropis atherinoides | 134 | - | - | - | 92 | - | 18 | - | - | - | - | - | 244 |
| 25 | River shiner | Notropis blennius | 4 | - | - | - | 14 | - | 15 | - | - | - | - | - | 33 |
| 26 | Spottail shiner | Notropis hudsonius | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 27 | Silverband shiner | Notropis shumardi | 38 | - | - | - | 301 | - | 14 | - | - | - | - | - | 353 |
| 28 | Sand shiner | Notropis stramineus | 1 | - | - | - | 1 | - | - | - | - | - | - | - | 2 |
| 29 | Channel shiner | Notropis wickliffi | 114 | - | - | - | 2447 | - | 93 | - | - | - | - | - | 2654 |
| 30 | Unidentified shiner | Notropis sp. | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 31 | Pugnose minnow | Opsopoeodus emiliae | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 3 |
| 32 | Bluntnose minnow | Pimephales notatus | 1 | - | - | - | 6 | - | - | - | - | - | - | - | 7 |
| 33 | Bullhead minnow | Pimephales vigilax | 4 | - | - | - | 24 | - | - | - | - | - | - | - | 28 |
| 34 | Creek chub | Semotilus atromaculatus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 35 | Unidentified minnow | Unidentified Cyprinidae | - | - | - | - | 9 | - | - | - | - | - | - | - | 9 |
| 36 | River carpsucker | Carpiodes carpio | 18 | - | 8 | - | 17 | - | 18 | 7 | 20 | 8 | - | - | 96 |
| 37 | Blue sucker | Cycleptus elongatus | 18 | - | - | - | 8 | - | - | - | - | - | - | - | 26 |
| 38 | Smallmouth buffalo | Ictiobus bubalus | 43 | - | - | - | - | - | - | 8 | 180 | 4 | - | - | 235 |
| 39 | Bigmouth buffalo | Ictiobus cyprinellus | 13 | - | - | - | - | - | - | - | 7 | 1 | - | - | 21 |

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 collected by the Long Term Resource Program during 1999 in the Mississippi River Open Reach. 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 | Black buffalo | Ictiobus niger | 9 | - | - | - | - | - | - | 11 | 32 | - | - | - | 52 |
| 41 | Unidentified buffalo | Ictiobus sp. | 4 | - | - | - | 75 | - | - | - | - | - | - | - | 79 |
| 42 | Shorthead redhorse | Moxostoma macrolepidotum | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 43 | Blue catfish | Ictalurus furcatus | 7 | - | - | - | 3 | - | 5 | 18 | 11 | - | - | - | 44 |
| 44 | Channel catfish | Ictalurus punctatus | 152 | - | 3 | - | 365 | - | 17 | 161 | 92 | 2 | - | - | 792 |
| 45 | Stonecat | Noturus flavus | 2 | - | 1 | - | 1 | - | - | - | - | - | - | - | 4 |
| 46 | Freckled madtom | Noturus nocturnus | 9 | - | - | - | 6 | - | - | - | - | - | - | - | 15 |
| 47 | Flathead catfish | Pylodictis olivaris | 55 | - | 3 | - | 4 | - | - | 9 | 17 | 1 | - | - | 89 |
| 48 | Trout perch | Percopsis omiscomaycus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 49 | Blackstripe topminnow | Fundulus notatus | 19 | - | - | - | 4 | - | - | - | - | - | - | - | 23 |
| 50 | Western mosquitofish | Gambusia affinis | 25 | - | - | - | 9 | - | - | - | - | - | - | - | 34 |
| 51 | Brook silverside | Labidesthes sicculus | 124 | - | - | - | 1 | - | - | - | - | - | - | - | 125 |
| 52 | White bass | Morone chrysops | 61 | - | 10 | - | 228 | - | 4 | 2 | 3 | 7 | - | - | 315 |
| 53 | Yellow bass | Morone mississippiensis | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| 54 | Striped bass | Morone saxatilis | - | - | - | - | 4 | - | - | - | - | - | - | - | 4 |
| 55 | Green sunfish | Lepomis cyanellus | 6 | - | - | - | 7 | - | - | - | - | - | - | - | 13 |
| 56 | Warmouth | Lepomis gulosus | 30 | - | - | - | 8 | - | - | - | - | - | - | - | 38 |
| 57 | Orangespotted sunfish | Lepomis humilis | 26 | - | - | - | 34 | - | - | - | - | - | - | - | 60 |
| 58 | Bluegill | Lepomis macrochirus | 89 | - | 1 | - | 133 | - | 1 | - | - | - | - | - | 224 |
| 59 | Longear sunfish | Lepomis megalotis | 4 | - | - | - | 2 | - | - | - | - | - | - | - | 6 |
| 60 | Smallmouth bass | Micropterus dolomieu | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 61 | Spotted bass | Micropterus punctulatus | 83 | - | - | - | 1 | - | - | - | - | 4 | - | - | 88 |
| 62 | Largemouth bass | Micropterus salmoides | 49 | - | - | - | - | - | - | - | - | - | - | - | 49 |
| 63 | White crappie | Pomoxis annularis | 25 | - | 2 | - | 74 | - | 1 | - | - | - | - | - | 102 |
| 64 | Black crappie | Pomoxis nigromaculatus | 3 | - | 6 | - | 15 | - | - | - | - | - | - | - | 24 |
| 65 | Mud darter | Etheostoma asprigene | 1 | - | - | - | 1 | - | - | - | - | - | - | - | 2 |
| 66 | Bluntnose darter | Etheostoma chlorosomum | 2 | - | - | - | 3 | - | - | - | - | - | - | - | 5 |
| 67 | Orangethroat darter | Etheostoma spectabile | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 68 | Logperch | Percina caprodes | 5 | - | - | - | 3 | - | - | - | - | - | - | - | 8 |
| 69 | Dusky darter | Percina sciera | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 70 | River darter | Percina shumardi | 1 | - | - | - | 5 | - | 1 | - | - | - | - | - | 7 |
| 71 | Sauger | Stizostedion canadense | 21 | - | 1 | - | 9 | - | 1 | - | - | - | - | - | 32 |
| 72 | Freshwater drum | Aplodinotus grunniens | 211 | - | 24 | - | 2486 | - | 2 | 12 | 76 | 3 | - | - | 2814 |
| 73 | Larval fish | Unidentified | - | - | - | - | 1 | - | 1 | - | - | - | - | - | 2 |
| 74 | Unidentified | Unidentified | - | - | - | - | 3 | - | 1 | - | - | - | - | - | 4 |
| 75 | Bleeding shiner | Luxilus zonatus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| | | | 8744 | 0 | 98 | 0 | 7846 | 0 | 563 | 352 | 687 | 63 | 0 | 0 | 18353 |

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 day electrofishing in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.01 | 0.00 | 0.13 | 0.05 |
| | (0.01) | (0.00) | (0.13) | (0.05) |
| Longnose gar | 0.02 | 0.00 | 0.13 | 0.14 |
| | (0.01) | (0.00) | (0.13) | (0.07) |
| Shortnose gar | 0.94 | 0.83 | 1.13 | 1.73 |
| | (0.24) | (0.27) | (0.55) | (0.41) |
| Goldeye | 14.02 | 14.08 | 1.25 | 14.59 |
| | (4.16) | (4.74) | (0.49) | (4.38) |
| Mooneye | 1.52 | 1.58 | 0.00 | 1.18 |
| | (0.88) | (1.01) | (0.00) | (0.55) |
| American eel | 0.01 | 0.00 | 0.00 | 0.09 |
| | (0.01) | (0.00) | (0.00) | (0.06) |
| Skipjack herring | 1.19 | 1.25 | 1.00 | 0.77 |
| | (0.81) | (0.92) | (0.42) | (0.48) |
| Gizzard shad | 42.89 | 30.00 | 37.00 | 138.18 |
| | (15.73) | (17.17) | (7.67) | (41.18) |
| Threadfin shad | 0.10 | 0.08 | 0.13 | 0.18 |
| | (0.07) | (0.08) | (0.13) | (0.11) |
| Grass carp | 0.01 | 0.00 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.00) | (0.05) |
| Red shiner | 2.30 | 1.25 | 2.38 | 10.00 |
| | (0.61) | (0.46) | (0.63) | (3.87) |
| Common carp | 2.83 | 2.58 | 6.25 | 4.36 |
| | (0.87) | (0.99) | (2.20) | (1.02) |
| Mississippi silvery minnow | 0.70 | 0.75 | 0.13 | 0.41 |
| | (0.65) | (0.75) | (0.13) | (0.33) |
| Speckled chub | 0.01 | 0.00 | 0.00 | 0.09 |
| | (0.01) | (0.00) | (0.00) | (0.06) |
| Silver chub | 0.17 | 0.17 | 0.00 | 0.18 |
| | (0.15) | (0.17) | (0.00) | (0.11) |
| Emerald shiner | 2.23 | 1.92 | 1.00 | 4.64 |
| | (0.86) | (0.83) | (0.42) | (4.02) |
| River shiner | 0.16 | 0.17 | 0.00 | 0.09 |
| | (0.10) | (0.11) | (0.00) | (0.06) |
| Spottail shiner | 0.00 | 0.00 | 0.13 | 0.00 |
| | (0.00) | (0.00) | (0.13) | (0.00) |
| Silverband shiner | 0.26 | 0.08 | 0.13 | 1.59 |
| | (0.13) | (0.08) | (0.13) | (0.93) |
| Sand shiner | 0.01 | 0.00 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.00) | (0.05) |
| Channel shiner | 0.80 | 0.42 | 3.75 | 3.41 |
| | (0.30) | (0.29) | (3.06) | (1.40) |
| Bullhead minnow | 0.16 | 0.17 | 0.00 | 0.09 |
| | (0.10) | (0.11) | (0.00) | (0.06) |
| River carpsucker | 0.50 | 0.50 | 0.00 | 0.55 |
| | (0.25) | (0.29) | (0.00) | (0.21) |
| Blue sucker | 0.27 | 0.25 | 0.75 | 0.41 |
| | (0.16) | (0.18) | (0.41) | (0.36) |
| Smallmouth buffalo | 0.64 | 0.58 | 0.38 | 1.09 |
| | (0.24) | (0.26) | (0.18) | (0.61) |
| Bigmouth buffalo | 0.13 | 0.08 | 0.13 | 0.45 |
| | (0.08) | (0.08) | (0.13) | (0.19) |
| Black buffalo | 0.24 | 0.25 | 0.00 | 0.23 |
| | (0.16) | (0.18) | (0.00) | (0.11) |
| Unidentified buffalo | 0.02 | 0.00 | 0.00 | 0.18 |
| | (0.02) | (0.00) | (0.00) | (0.18) |
| Shorthead redhorse | 0.08 | 0.08 | 0.00 | 0.05 |
| | (0.07) | (0.08) | (0.00) | (0.05) |

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 day electrofishing in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Blue catfish | 0.01 (0.01) | 0.00 (0.00) | 0.75 (0.31) | 0.05 (0.05) |
| Channel catfish | 2.05 (0.46) | 1.83 (0.51) | 6.25 (2.16) | 3.32 (1.06) |
| Stonecat | 0.01 (0.01) | 0.00 (0.00) | 0.13 (0.13) | 0.05 (0.05) |
| Freckled madtom | 0.16 (0.10) | 0.17 (0.11) | 0.75 (0.31) | 0.05 (0.05) |
| Flathead catfish | 0.64 (0.31) | 0.58 (0.36) | 3.50 (1.05) | 0.82 (0.20) |
| Blackstripe topminnow | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.09 (0.09) |
| Western mosquitofish | 0.13 (0.12) | 0.00 (0.00) | 0.00 (0.00) | 1.14 (1.00) |
| Brook silverside | 0.81 (0.56) | 0.92 (0.65) | 0.13 (0.13) | 0.09 (0.09) |
| White bass | 0.73 (0.29) | 0.67 (0.33) | 1.00 (0.38) | 1.18 (0.35) |
| Green sunfish | 0.02 (0.01) | 0.00 (0.00) | 0.13 (0.13) | 0.14 (0.07) |
| Warmouth | 0.00 (0.00) | 0.00 (0.00) | 0.13 (0.13) | 0.00 (0.00) |
| Orangespotted sunfish | 0.03 (0.02) | 0.00 (0.00) | 0.25 (0.16) | 0.23 (0.15) |
| Bluegill | 0.13 (0.07) | 0.08 (0.08) | 0.50 (0.27) | 0.41 (0.14) |
| Smallmouth bass | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.05 (0.05) |
| Spotted bass | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.05 (0.05) |
| Largemouth bass | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.09 (0.06) |
| White crappie | 0.02 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.14 (0.10) |
| Black crappie | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.05 (0.05) |
| Orangethroat darter | 0.01 (0.01) | 0.00 (0.00) | 0.13 (0.13) | 0.05 (0.05) |
| Logperch | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.09 (0.09) |
| River darter | 0.01 (0.01) | 0.00 (0.00) | 0.00 (0.00) | 0.05 (0.05) |
| Sauger | 0.63 (0.43) | 0.67 (0.50) | 0.13 (0.13) | 0.36 (0.19) |
| Freshwater drum | 3.40 (1.19) | 3.17 (1.35) | 6.63 (2.66) | 4.82 (1.48) |

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Table 5.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | SCB |
|---|---|---|
| Shortnose gar | 1.59 | 1.59 |
| | (1.12) | (1.12) |
| Gizzard shad | 0.59 | 0.59 |
| | (0.44) | (0.45) |
| Channel catfish | 0.14 | 0.14 |
| | (0.14) | (0.14) |
| Stonecat | 0.15 | 0.15 |
| | (0.15) | (0.15) |
| Flathead catfish | 0.30 | 0.30 |
| | (0.30) | (0.30) |
| White bass | 0.26 | 0.26 |
| | (0.17) | (0.17) |
| Bluegill | 0.13 | 0.13 |
| | (0.13) | (0.13) |
| Sauger | 0.13 | 0.13 |
| | (0.13) | (0.13) |
| Freshwater drum | 0.70 | 0.70 |
| | (0.41) | (0.41) |

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TWZ - Tailwater

Table 5.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Shovelnose sturgeon | 0.08 | 0.08 | 0.00 | 0.04 |
| | (0.07) | (0.08) | (0.00) | (0.04) |
| Longnose gar | 0.37 | 0.42 | 0.27 | 0.04 |
| | (0.20) | (0.23) | (0.21) | (0.04) |
| Shortnose gar | 0.12 | 0.08 | 0.47 | 0.38 |
| | (0.08) | (0.08) | (0.17) | (0.19) |
| Goldeye | 1.68 | 1.72 | 0.00 | 1.52 |
| | (0.94) | (1.07) | (0.00) | (0.89) |
| Mooneye | 0.29 | 0.33 | 0.00 | 0.00 |
| | (0.22) | (0.26) | (0.00) | (0.00) |
| Skipjack herring | 0.29 | 0.33 | 0.07 | 0.00 |
| | (0.22) | (0.26) | (0.07) | (0.00) |
| Gizzard shad | 9.42 | 8.20 | 6.75 | 18.59 |
| | (4.41) | (4.68) | (2.40) | (14.40) |
| Threadfin shad | 0.01 | 0.00 | 0.07 | 0.04 |
| | (0.00) | (0.00) | (0.07) | (0.04) |
| Central stoneroller | 0.09 | 0.08 | 0.00 | 0.12 |
| | (0.07) | (0.08) | (0.00) | (0.09) |
| Red shiner | 2.68 | 1.71 | 4.89 | 9.67 |
| | (0.97) | (0.72) | (2.85) | (6.26) |
| Blacktail shiner | 0.63 | 0.73 | 0.07 | 0.00 |
| | (0.44) | (0.51) | (0.07) | (0.00) |
| Common carp | 2.83 | 1.98 | 0.14 | 9.30 |
| | (1.28) | (1.00) | (0.09) | (7.95) |
| Mississippi silvery minnow | 0.01 | 0.00 | 0.20 | 0.09 |
| | (0.01) | (0.00) | (0.15) | (0.06) |
| Bighead carp | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.00) | (0.00) | (0.00) | (0.04) |
| Speckled chub | 0.20 | 0.18 | 0.07 | 0.33 |
| | (0.16) | (0.18) | (0.07) | (0.33) |
| Emerald shiner | 2.94 | 3.24 | 1.30 | 0.84 |
| | (2.61) | (2.99) | (0.52) | (0.45) |
| River shiner | 0.38 | 0.40 | 0.00 | 0.26 |
| | (0.20) | (0.22) | (0.00) | (0.14) |
| Silverband shiner | 6.30 | 6.02 | 1.86 | 8.71 |
| | (5.25) | (5.93) | (1.30) | (7.56) |
| Sand shiner | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.00) | (0.00) | (0.00) | (0.04) |
| Channel shiner | 27.11 | 19.25 | 11.64 | 86.12 |
| | (13.48) | (11.26) | (4.39) | (78.50) |
| Pugnose minnow | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.00) | (0.00) | (0.00) | (0.04) |
| Bluntnose minnow | 0.03 | 0.00 | 0.00 | 0.23 |
| | (0.03) | (0.00) | (0.00) | (0.23) |
| Bullhead minnow | 0.32 | 0.32 | 0.57 | 0.33 |
| | (0.16) | (0.18) | (0.27) | (0.13) |
| Creek chub | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.00) | (0.00) | (0.00) | (0.04) |
| Unidentified minnow | 0.14 | 0.17 | 0.00 | 0.00 |
| | (0.14) | (0.17) | (0.00) | (0.00) |
| River carpsucker | 0.41 | 0.46 | 0.41 | 0.00 |
| | (0.40) | (0.46) | (0.24) | (0.00) |
| Blue sucker | 0.09 | 0.08 | 0.00 | 0.17 |
| | (0.07) | (0.08) | (0.00) | (0.13) |
| Unidentified buffalo | 1.12 | 1.03 | 0.21 | 1.84 |
| | (0.54) | (0.61) | (0.15) | (0.80) |
| Blue catfish | 0.08 | 0.08 | 0.00 | 0.08 |
| | (0.07) | (0.08) | (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 5.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Channel catfish | 4.11 | 3.85 | 10.02 | 5.52 |
| | (1.25) | (1.42) | (3.09) | (1.42) |
| Stonecat | 0.00 | 0.00 | 0.07 | 0.00 |
| | (0.00) | (0.00) | (0.07) | (0.00) |
| Freckled madtom | 0.16 | 0.17 | 0.07 | 0.13 |
| | (0.10) | (0.11) | (0.07) | (0.09) |
| Flathead catfish | 0.08 | 0.09 | 0.20 | 0.00 |
| | (0.08) | (0.09) | (0.11) | (0.00) |
| Blackstripe topminnow | 0.02 | 0.00 | 0.00 | 0.19 |
| | (0.02) | (0.00) | (0.00) | (0.19) |
| Western mosquitofish | 0.16 | 0.15 | 0.15 | 0.20 |
| | (0.14) | (0.15) | (0.10) | (0.11) |
| Brook silverside | 0.00 | 0.00 | 0.07 | 0.00 |
| | (0.00) | (0.00) | (0.07) | (0.00) |
| White bass | 4.15 | 4.15 | 1.22 | 4.37 |
| | (2.46) | (2.81) | (0.59) | (2.17) |
| White bass x striped bass | 0.07 | 0.08 | 0.14 | 0.05 |
| | (0.07) | (0.08) | (0.10) | (0.05) |
| Green sunfish | 0.01 | 0.00 | 0.13 | 0.08 |
| | (0.01) | (0.00) | (0.09) | (0.06) |
| Warmouth | 0.08 | 0.09 | 0.21 | 0.00 |
| | (0.08) | (0.09) | (0.15) | (0.00) |
| Orangespotted sunfish | 0.02 | 0.00 | 0.95 | 0.08 |
| | (0.01) | (0.00) | (0.48) | (0.08) |
| Bluegill | 0.68 | 0.59 | 2.46 | 1.19 |
| | (0.27) | (0.30) | (1.15) | (0.53) |
| Spotted bass | 0.00 | 0.00 | 0.07 | 0.00 |
| | (0.00) | (0.00) | (0.07) | (0.00) |
| White crappie | 0.47 | 0.43 | 1.44 | 0.65 |
| | (0.31) | (0.35) | (0.82) | (0.15) |
| Black crappie | 0.16 | 0.17 | 0.07 | 0.12 |
| | (0.10) | (0.11) | (0.07) | (0.07) |
| Mud darter | 0.07 | 0.09 | 0.00 | 0.00 |
| | (0.07) | (0.09) | (0.00) | (0.00) |
| Bluntnose darter | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.00) | (0.00) | (0.00) | (0.04) |
| Logperch | 0.08 | 0.08 | 0.07 | 0.04 |
| | (0.07) | (0.08) | (0.07) | (0.04) |
| River darter | 0.15 | 0.17 | 0.21 | 0.00 |
| | (0.10) | (0.11) | (0.11) | (0.00) |
| Sauger | 0.02 | 0.00 | 0.07 | 0.16 |
| | (0.01) | (0.00) | (0.07) | (0.10) |
| Freshwater drum | 61.24 | 62.41 | 14.69 | 56.42 |
| | (35.52) | (40.52) | (5.11) | (32.97) |
| Unidentified | 0.01 | 0.00 | 0.00 | 0.13 |
| | (0.01) | (0.00) | (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 5.3.4. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Shortnose gar | 0.04 | 0.04 | 0.00 | 0.04 |
| | (0.03) | (0.04) | (0.00) | (0.03) |
| Gizzard shad | 0.04 | 0.04 | 0.00 | 0.00 |
| | (0.04) | (0.04) | (0.00) | (0.00) |
| Common carp | 1.31 | 1.38 | 0.63 | 0.84 |
| | (0.25) | (0.29) | (0.20) | (0.24) |
| Smallmouth buffalo | 0.05 | 0.04 | 0.00 | 0.14 |
| | (0.04) | (0.04) | (0.00) | (0.14) |
| Black buffalo | 0.17 | 0.19 | 0.00 | 0.06 |
| | (0.09) | (0.10) | (0.00) | (0.03) |
| Blue catfish | 0.48 | 0.55 | 0.04 | 0.02 |
| | (0.20) | (0.23) | (0.04) | (0.02) |
| Channel catfish | 0.83 | 0.67 | 0.11 | 2.13 |
| | (0.34) | (0.38) | (0.08) | (0.74) |
| Flathead catfish | 0.04 | 0.04 | 0.14 | 0.08 |
| | (0.03) | (0.04) | (0.11) | (0.04) |
| White bass | 0.07 | 0.08 | 0.00 | 0.00 |
| | (0.05) | (0.05) | (0.00) | (0.00) |
| Freshwater drum | 0.18 | 0.19 | 0.00 | 0.06 |
| | (0.11) | (0.12) | (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 5.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Longnose gar | 0.08 | 0.09 | 0.00 | 0.00 |
| | (0.05) | (0.06) | (0.00) | (0.00) |
| Shortnose gar | 0.00 | 0.00 | 0.00 | 0.02 |
| | (0.00) | (0.00) | (0.00) | (0.02) |
| Goldeye | 0.00 | 0.00 | 0.00 | 0.02 |
| | (0.00) | (0.00) | (0.00) | (0.02) |
| Gizzard shad | 0.00 | 0.00 | 0.00 | 0.02 |
| | (0.00) | (0.00) | (0.00) | (0.02) |
| Common carp | 2.05 | 2.04 | 1.60 | 2.20 |
| | (0.51) | (0.58) | (0.83) | (0.55) |
| Bighead carp | 0.08 | 0.09 | 0.00 | 0.00 |
| | (0.05) | (0.06) | (0.00) | (0.00) |
| River carpsucker | 0.20 | 0.19 | 0.04 | 0.23 |
| | (0.17) | (0.19) | (0.04) | (0.15) |
| Smallmouth buffalo | 2.16 | 2.16 | 0.30 | 2.29 |
| | (0.61) | (0.69) | (0.19) | (0.59) |
| Bigmouth buffalo | 0.02 | 0.00 | 0.00 | 0.15 |
| | (0.01) | (0.00) | (0.00) | (0.07) |
| Black buffalo | 0.34 | 0.33 | 0.00 | 0.47 |
| | (0.15) | (0.17) | (0.00) | (0.14) |
| Blue catfish | 0.10 | 0.09 | 0.07 | 0.15 |
| | (0.06) | (0.06) | (0.05) | (0.11) |
| Channel catfish | 1.45 | 1.53 | 0.30 | 0.95 |
| | (0.51) | (0.58) | (0.21) | (0.35) |
| Flathead catfish | 0.15 | 0.14 | 0.00 | 0.23 |
| | (0.06) | (0.07) | (0.00) | (0.09) |
| White bass | 0.12 | 0.14 | 0.00 | 0.00 |
| | (0.09) | (0.10) | (0.00) | (0.00) |
| Freshwater drum | 0.71 | 0.64 | 0.00 | 1.27 |
| | (0.33) | (0.37) | (0.00) | (0.54) |

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 seining in the Mississippi River Open Reach using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.09 | 0.08 | 0.10 |
| | (0.07) | (0.08) | (0.07) |
| Goldeye | 0.51 | 0.58 | 0.00 |
| | (0.30) | (0.34) | (0.00) |
| Mooneye | 0.31 | 0.33 | 0.15 |
| | (0.13) | (0.14) | (0.08) |
| Skipjack herring | 0.73 | 0.83 | 0.00 |
| | (0.36) | (0.41) | (0.00) |
| Gizzard shad | 20.55 | 23.08 | 1.95 |
| | (8.07) | (9.17) | (0.83) |
| Threadfin shad | 0.07 | 0.08 | 0.00 |
| | (0.07) | (0.08) | (0.00) |
| Grass carp | 0.01 | 0.00 | 0.10 |
| | (0.01) | (0.00) | (0.10) |
| Red shiner | 0.18 | 0.08 | 0.90 |
| | (0.08) | (0.08) | (0.31) |
| Mississippi silvery minnow | 0.01 | 0.00 | 0.10 |
| | (0.01) | (0.00) | (0.07) |
| Plains minnow | 0.01 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.05) |
| Speckled chub | 0.08 | 0.08 | 0.05 |
| | (0.07) | (0.08) | (0.05) |
| Silver chub | 0.07 | 0.08 | 0.00 |
| | (0.07) | (0.08) | (0.00) |
| Emerald shiner | 0.78 | 0.83 | 0.40 |
| | (0.52) | (0.59) | (0.13) |
| River shiner | 0.36 | 0.33 | 0.55 |
| | (0.20) | (0.22) | (0.26) |
| Silverband shiner | 0.29 | 0.25 | 0.55 |
| | (0.16) | (0.18) | (0.39) |
| Channel shiner | 1.23 | 0.83 | 4.15 |
| | (0.40) | (0.41) | (1.45) |
| River carpsucker | 0.31 | 0.25 | 0.75 |
| | (0.12) | (0.13) | (0.39) |
| Blue catfish | 0.37 | 0.42 | 0.00 |
| | (0.30) | (0.34) | (0.00) |
| Channel catfish | 0.84 | 0.92 | 0.30 |
| | (0.50) | (0.57) | (0.18) |
| White bass | 0.29 | 0.33 | 0.00 |
| | (0.20) | (0.22) | (0.00) |
| Bluegill | 0.07 | 0.08 | 0.00 |
| | (0.07) | (0.08) | (0.00) |
| White crappie | 0.07 | 0.08 | 0.00 |
| | (0.07) | (0.08) | (0.00) |
| River darter | 0.01 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.05) |
| Sauger | 0.01 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.05) |
| Freshwater drum | 0.15 | 0.17 | 0.00 |
| | (0.10) | (0.11) | (0.00) |
| Larval fish | 0.01 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.05) |
| Unidentified | 0.01 | 0.00 | 0.05 |
| | (0.01) | (0.00) | (0.05) |

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 5.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | MCBU | TRI |
|---|---|---|
| Chestnut lamprey | 0.33 | 0.25 |
| | (0.33) | (0.25) |
| Shovelnose sturgeon | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Spotted gar | 0.00 | 1.00 |
| | (0.00) | (0.41) |
| Longnose gar | 0.00 | 0.75 |
| | (0.00) | (0.75) |
| Shortnose gar | 0.67 | 1.50 |
| | (0.33) | (0.96) |
| Bowfin | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Goldeye | 54.00 | 0.25 |
| | (52.50) | (0.25) |
| Skipjack herring | 0.00 | 0.75 |
| | (0.00) | (0.75) |
| Gizzard shad | 55.33 | 529.75 |
| | (46.91) | (158.99) |
| Threadfin shad | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Red shiner | 0.67 | 0.25 |
| | (0.67) | (0.25) |
| Common carp | 1.33 | 8.25 |
| | (1.33) | (4.13) |
| Mississippi silvery minnow | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Silver chub | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Emerald shiner | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Silverband shiner | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Channel shiner | 0.33 | 0.75 |
| | (0.33) | (0.75) |
| Pugnose minnow | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Bluntnose minnow | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Smallmouth buffalo | 0.00 | 2.25 |
| | (0.00) | (0.63) |
| Bigmouth buffalo | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Black buffalo | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Channel catfish | 1.00 | 1.00 |
| | (0.58) | (0.71) |
| Flathead catfish | 0.00 | 0.50 |
| | (0.00) | (0.29) |
| Blackstripe topminnow | 0.00 | 4.25 |
| | (0.00) | (2.53) |
| Brook silverside | 0.00 | 27.50 |
| | (0.00) | (16.57) |
| White bass | 0.67 | 4.25 |
| | (0.33) | (1.38) |
| Green sunfish | 0.00 | 0.50 |
| | (0.00) | (0.29) |
| Warmouth | 0.00 | 7.25 |
| | (0.00) | (3.68) |
| Orangespotted sunfish | 0.00 | 4.75 |

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 5.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBU | TRI |
|---|---|---|
| | (0.00) | (1.89) |
| Bluegill | 0.00 | 18.75 |
| | (0.00) | (7.42) |
| Longear sunfish | 0.00 | 1.00 |
| | (0.00) | (0.41) |
| Spotted bass | 0.00 | 20.50 |
| | (0.00) | (13.96) |
| Largemouth bass | 0.00 | 11.75 |
| | (0.00) | (3.28) |
| White crappie | 0.00 | 5.50 |
| | (0.00) | (2.22) |
| Black crappie | 0.00 | 0.50 |
| | (0.00) | (0.29) |
| Mud darter | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Bluntnose darter | 0.00 | 0.50 |
| | (0.00) | (0.29) |
| Logperch | 0.00 | 0.75 |
| | (0.00) | (0.48) |
| Dusky darter | 0.00 | 0.50 |
| | (0.00) | (0.29) |
| Sauger | 1.00 | 0.25 |
| | (1.00) | (0.25) |
| Freshwater drum | 1.67 | 2.25 |
| | (0.88) | (1.31) |

Strata:
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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 5.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBU | TRI |
|---|---|---|
| Longnose gar | 0.00 | 0.16 |
| | (0.00) | (0.16) |
| Shortnose gar | 0.00 | 2.28 |
| | (0.00) | (1.52) |
| Gizzard shad | 1.98 | 0.00 |
| | (1.98) | (0.00) |
| Common carp | 0.30 | 0.16 |
| | (0.30) | (0.16) |
| River carpsucker | 1.26 | 0.65 |
| | (0.63) | (0.32) |
| Channel catfish | 0.30 | 0.17 |
| | (0.30) | (0.17) |
| Flathead catfish | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| White bass | 0.99 | 0.81 |
| | (0.99) | (0.81) |
| Yellow bass | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| White crappie | 0.00 | 0.32 |
| | (0.00) | (0.21) |
| Black crappie | 0.00 | 0.96 |
| | (0.00) | (0.59) |
| Freshwater drum | 1.49 | 2.29 |
| | (1.49) | (1.27) |

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 5.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBU | TRI |
|---|---|---|
| Longnose gar | 1.22 | 0.00 |
| | (1.22) | (0.00) |
| Shortnose gar | 0.33 | 0.18 |
| | (0.33) | (0.18) |
| Goldeye | 10.09 | 0.00 |
| | (10.09) | (0.00) |
| Mooneye | 0.61 | 0.00 |
| | (0.61) | (0.00) |
| Skipjack herring | 0.61 | 0.00 |
| | (0.61) | (0.00) |
| Gizzard shad | 4.94 | 2.28 |
| | (3.51) | (1.69) |
| Threadfin shad | 0.00 | 0.16 |
| | (0.00) | (0.16) |
| Red shiner | 0.31 | 0.00 |
| | (0.31) | (0.00) |
| Common carp | 3.11 | 0.00 |
| | (2.19) | (0.00) |
| Mississippi silvery minnow | 0.31 | 0.00 |
| | (0.31) | (0.00) |
| Bighead carp | 0.31 | 0.00 |
| | (0.31) | (0.00) |
| Speckled chub | 0.00 | 0.16 |
| | (0.00) | (0.16) |
| Silver chub | 1.65 | 0.00 |
| | (1.65) | (0.00) |
| Emerald shiner | 3.23 | 0.00 |
| | (2.01) | (0.00) |
| River shiner | 0.94 | 0.00 |
| | (0.53) | (0.00) |
| Silverband shiner | 2.14 | 0.00 |
| | (1.70) | (0.00) |
| Channel shiner | 40.54 | 8.67 |
| | (16.81) | (7.30) |
| Unidentified shiner | 0.00 | 0.16 |
| | (0.00) | (0.16) |
| Pugnose minnow | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| Bullhead minnow | 1.25 | 0.00 |
| | (0.80) | (0.00) |
| Unidentified minnow | 2.14 | 0.00 |
| | (2.14) | (0.00) |
| River carpsucker | 1.22 | 0.16 |
| | (1.22) | (0.16) |
| Blue sucker | 0.92 | 0.00 |
| | (0.92) | (0.00) |
| Unidentified buffalo | 4.66 | 0.00 |
| | (1.00) | (0.00) |
| Channel catfish | 12.07 | 0.15 |
| | (9.26) | (0.15) |
| Trout perch | 0.31 | 0.00 |
| | (0.31) | (0.00) |
| White bass | 12.61 | 2.38 |
| | (10.21) | (1.45) |
| Green sunfish | 0.00 | 0.53 |
| | (0.00) | (0.53) |
| Warmouth | 0.99 | 0.15 |
| | (0.99) | (0.15) |
| Orangespotted sunfish | 0.31 | 2.98 |

Strata: BWCS - Backwater, contiguous, shoreline
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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 mini fyke netting in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | MCBU | TRI |
|---|---|---|
| | (0.31) | (2.98) |
| Bluegill | 1.22 | 9.82 |
| | (0.81) | (6.21) |
| Longear sunfish | 0.00 | 0.35 |
| | (0.00) | (0.35) |
| White crappie | 3.13 | 4.09 |
| | (0.28) | (2.24) |
| Black crappie | 0.00 | 1.57 |
| | (0.00) | (0.89) |
| Bluntnose darter | 0.00 | 0.31 |
| | (0.00) | (0.31) |
| Sauger | 0.31 | 0.49 |
| | (0.31) | (0.22) |
| Freshwater drum | 43.73 | 0.85 |
| | (43.27) | (0.31) |
| Larval fish | 0.31 | 0.00 |
| | (0.31) | (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 5.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | MCBU | TRI |
|---|---|---|
| Common carp | 1.01 | 1.77 |
| | (1.01) | (1.10) |
| River carpsucker | 0.00 | 0.59 |
| | (0.00) | (0.59) |
| Black buffalo | 0.00 | 0.26 |
| | (0.00) | (0.17) |
| Blue catfish | 0.37 | 0.00 |
| | (0.37) | (0.00) |
| Channel catfish | 4.78 | 0.88 |
| | (4.28) | (0.43) |
| Freshwater drum | 0.00 | 0.34 |
| | (0.00) | (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 5.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. Table page: 1

| Common name | MCBU | TRI |
|---|---|---|
| Shortnose gar | 0.00 | 0.09 |
| | (0.00) | (0.09) |
| Common carp | 0.18 | 4.12 |
| | (0.18) | (2.88) |
| River carpsucker | 0.00 | 0.36 |
| | (0.00) | (0.27) |
| Smallmouth buffalo | 1.36 | 0.71 |
| | (1.09) | (0.53) |
| Black buffalo | 0.17 | 0.17 |
| | (0.17) | (0.11) |
| Channel catfish | 0.54 | 0.25 |
| | (0.32) | (0.25) |
| Flathead catfish | 0.52 | 0.00 |
| | (0.29) | (0.00) |
| Freshwater drum | 0.17 | 0.08 |
| | (0.17) | (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 5.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by gill netting in the Mississippi River Open Reach using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TRI |
|---|---|
| Paddlefish | 2.61 (2.09) |
| Shortnose gar | 0.37 (0.37) |
| Goldeye | 0.37 (0.37) |
| Gizzard shad | 0.37 (0.37) |
| Common carp | 7.43 (5.32) |
| Bighead carp | 1.05 (0.58) |
| River carpsucker | 3.00 (3.00) |
| Smallmouth buffalo | 1.50 (1.50) |
| Bigmouth buffalo | 0.37 (0.37) |
| Channel catfish | 0.75 (0.75) |
| Flathead catfish | 0.37 (0.37) |
| White bass | 2.62 (2.62) |
| Spotted bass | 1.50 (1.50) |
| Freshwater drum | 1.12 (1.12) |

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

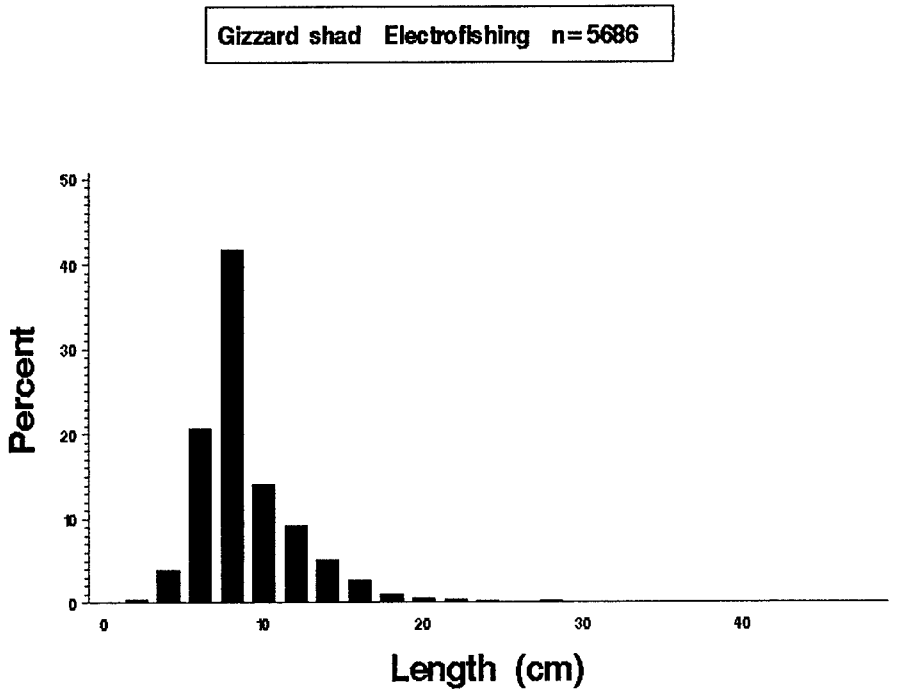


**Figure 5.2.** Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

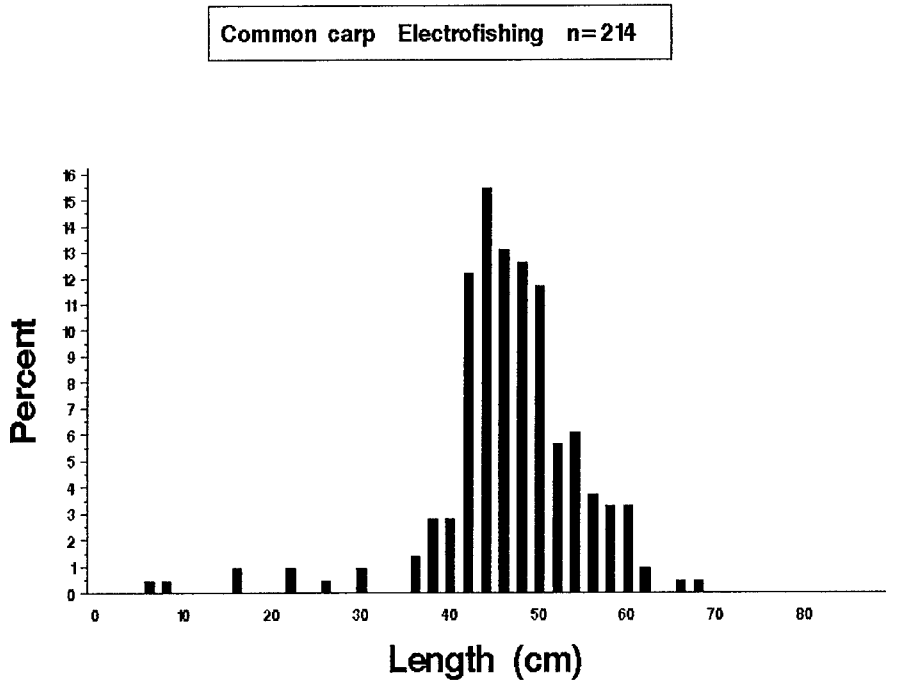


**Figure 5.3.** Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

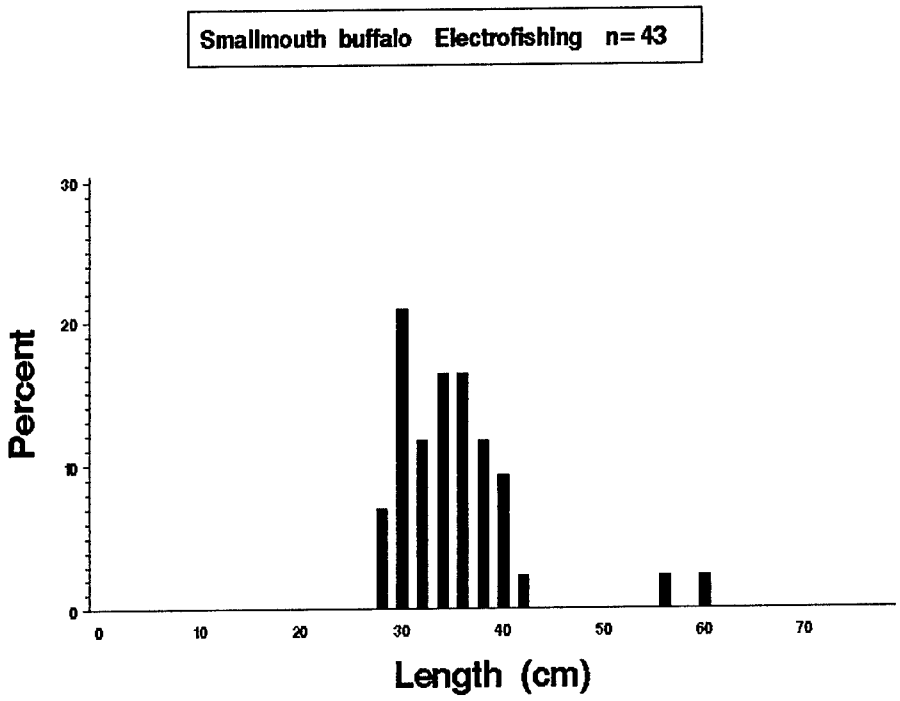


**Figure 5.4.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

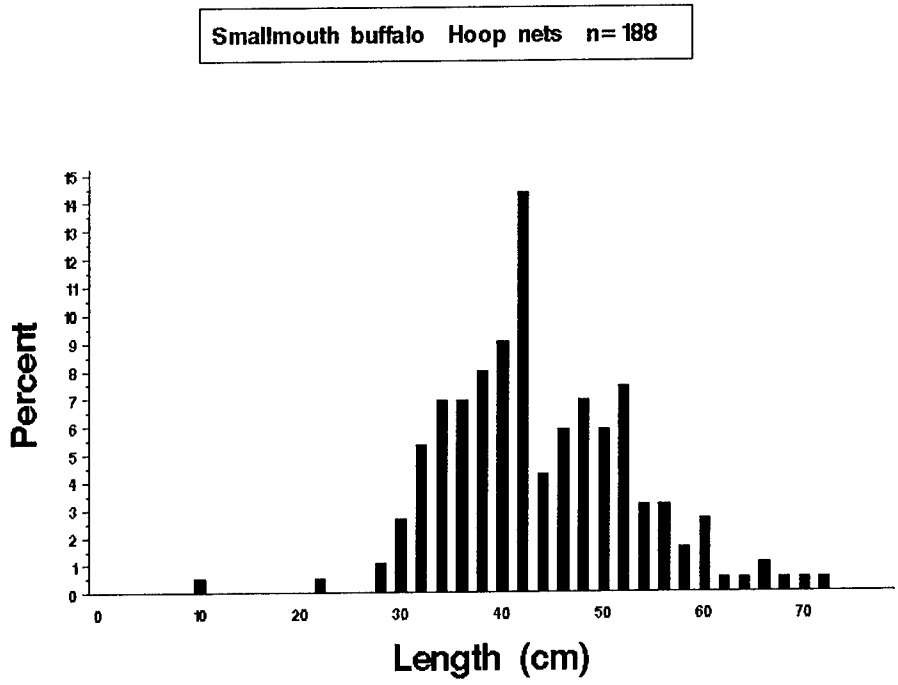


**Figure 5.5.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in the Upper Mississippi River Open Reach during 1999.

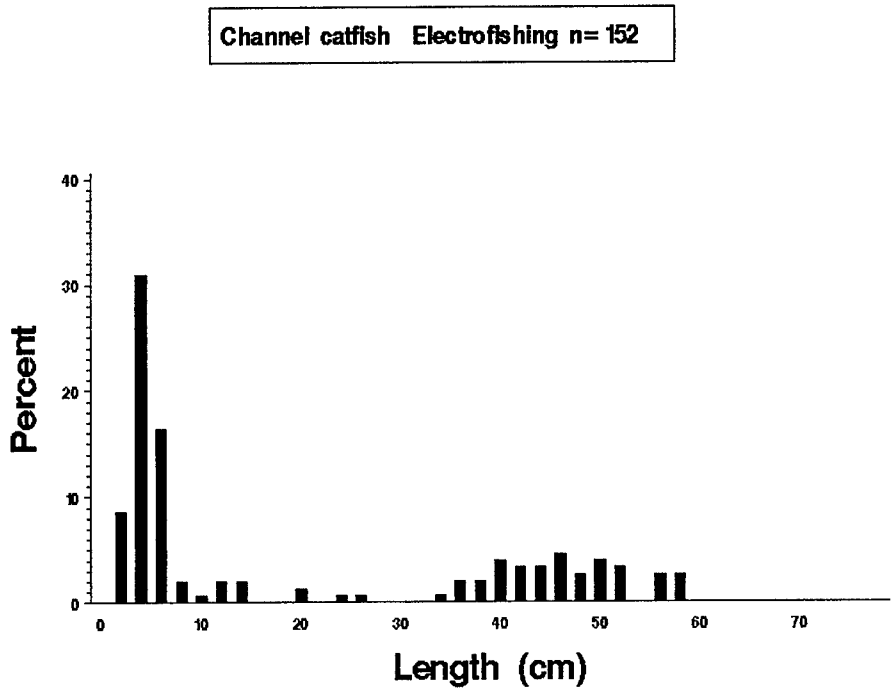


**Figure 5.6.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

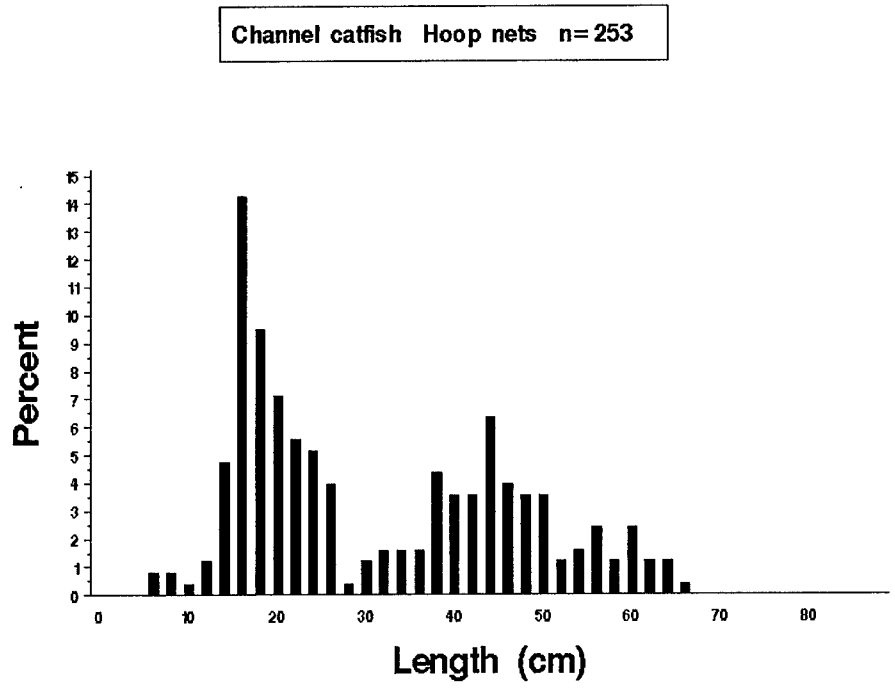


**Figure 5.7.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in the Upper Mississippi River Open Reach during 1999.

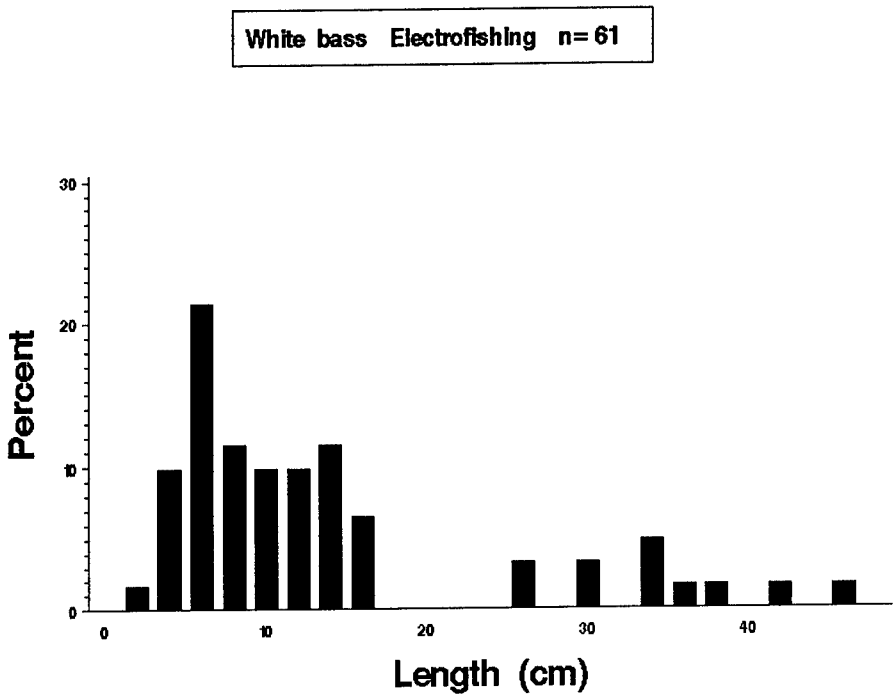


**Figure 5.8.** Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

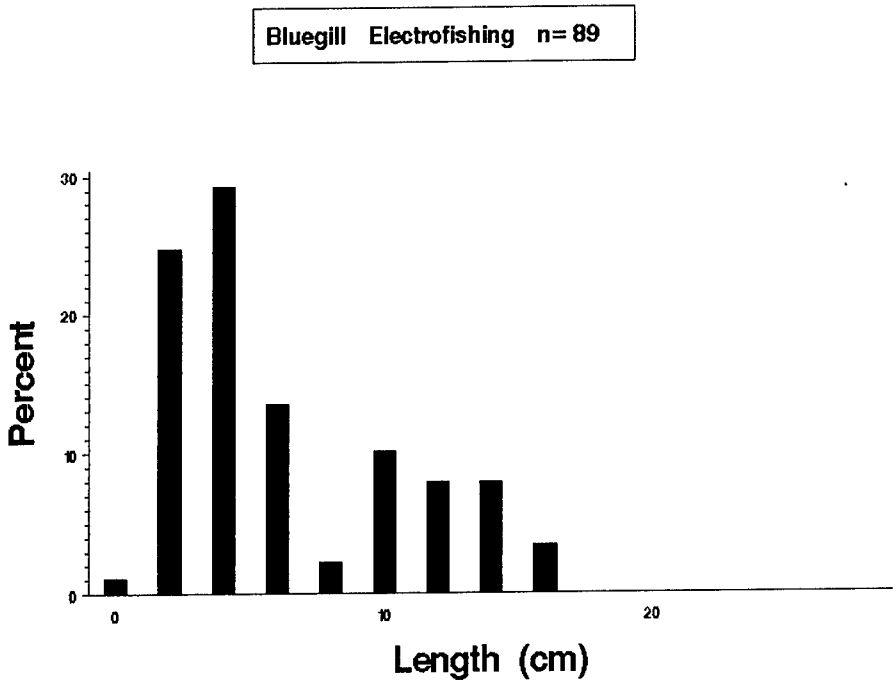


**Figure 5.9.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

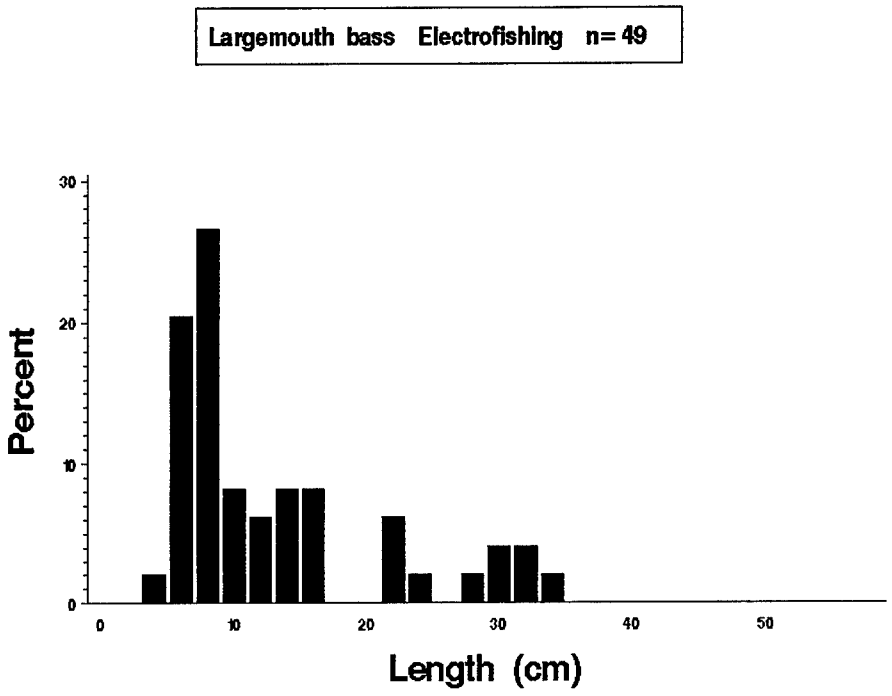


**Figure 5.10.** Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus* salmoides) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

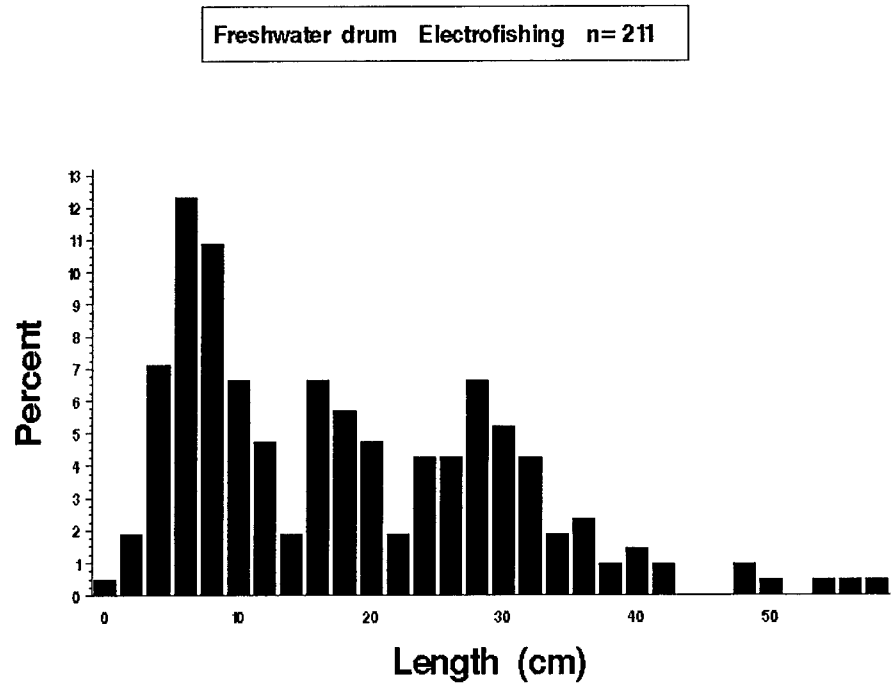


**Figure 5.11.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in the Upper Mississippi River Open Reach during 1999.

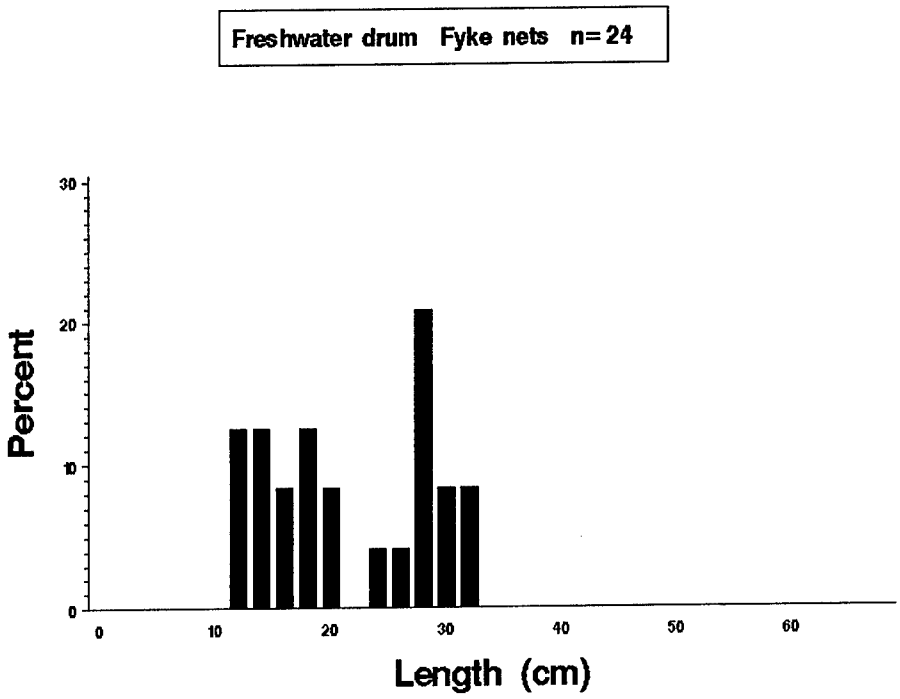


**Figure 5.12.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in the Upper Mississippi River Open Reach during 1999.

# Chapter 6. La Grange Pool, Illinois River

by

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## Hydrograph

Water levels were at flood stage from late January to early March and again in April (Figure 6.1). Starting in early July (middle of period 1), water levels fell below flood stage and remained low and relatively stable for the remainder of the year. High water levels early in period 1 allowed easy access into backwaters, but during periods 2 and 3 access was limited, with the river levels well below the mean. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

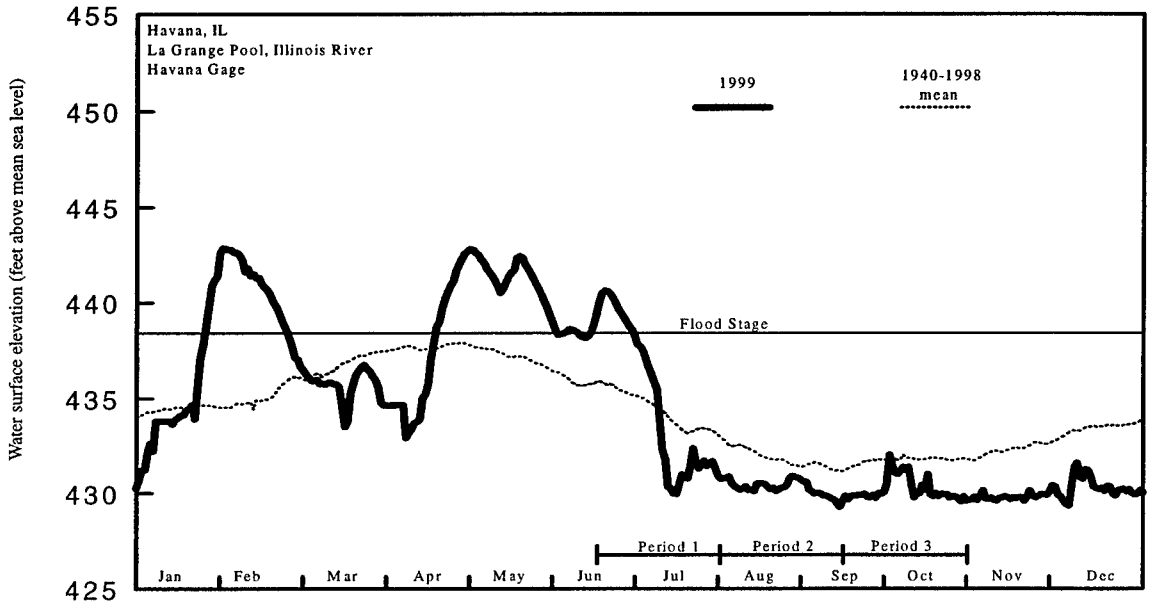


**Figure 6.1.** Daily water surface elevation from Havana Gage for La Grange Pool, Illinois River, during 1999 and mean elevation since 1940. Discharge data were obtained from the U.S. Army Corps of Engineers in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).

## Summary of Sampling Effort

We made 543 fish collections in La Grange Pool during 1999 using 10 gear types (Table 6.1). Gear allocations among strata varied among all three sampling periods because of low water levels (period 2) and the loss of the electrofishing boat (engine repair; period 3). Of the total number of collections, 412 were from randomly selected sites in the BWCS, BWCO, SCB, and MCBU strata. Ninety-three collections were made at fixed TWZ sites, and 39 were from one SCB site. Two TWZ sites were sampled—La Grange Lock and Dam and Peoria Lock and Dam; data from both TWZ sites were combined. The SCB, followed by the MCBU and backwaters, received the most sampling effort.

## Total Catch

We collected a total of 64,946 fish representing 65 species and 5 hybrids in 1999 (Table 6.2). This total does not include 384 fish <30 mm long identified only to family or genus. The five most abundant species

numerically were the gizzard shad (19,849), emerald shiner (10,254), bluegill (9,839), freshwater drum (5,819), and white bass (3,097). Total species collected, excluding hybrids, by gear type were as follows: day and night electrofishing combined (54), fyke netting (40), tandem fyke netting (29), mini fyke netting (51), tandem mini fyke netting (23), seining (38), small hoop netting (12), large hoop netting (13), and bottom trawling (7). Fish distribution records for the Illinois River (Smith 1979) document 115 fish species from La Grange Pool. Our species total before the 1999 season was 83; no new species were added to this total during 1999.

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

### *Day Electrofishing*

Poolwide mean catch-per-unit-effort (*C/f*) by day electrofishing was highest for gizzard shad (102.15), bluegill (8.25), and common carp (6.20; Table 6.3.1). By stratum, gizzard shad had the highest *C/f* in the BWCS (80.26), MCBU (111.96), and SCB (82.22).

### *Fyke Net*

Poolwide mean *C/f* by fyke netting (Table 6.3.2), based solely on BWCS collections, was highest for black crappie (43.92), bluegill (42.93), and white bass (8.60).

### *Tandem Fyke Net*

Poolwide mean *C/f* by tandem fyke netting (Table 6.3.3), based solely on BWCO collections, was highest for gizzard shad (20.90), black crappie (9.84), and bluegill (8.58).

### *Mini Fyke Net*

Poolwide mean *C/f* by mini fyke netting (Table 6.3.4) was highest for gizzard shad (101.94), bluegill (91.04), and emerald shiner (36.51). By stratum, bluegill had the highest *C/f* in the BWCS (32.04) and SCB (105.37), and gizzard shad had the highest *C/f* in the MCBU (135.47).

### *Tandem Mini Fyke Net*

Poolwide mean *C/f* by tandem mini fyke netting (Table 6.3.5), based solely on BWCO collections, was highest for gizzard shad (20.75), freshwater drum (7.77), and white bass (3.76).

### *Small Hoop Net*

Poolwide mean *C/f* by small hoop netting (Table 6.3.6) was highest for channel catfish (4.51), common carp (3.92), and smallmouth buffalo (0.52). By stratum, channel catfish had the highest *C/f* in the MCBU (4.11) and SCB (10.50).

### *Large Hoop Net*

Poolwide mean *C/f* by large hoop netting (Table 6.3.7) was highest for common carp (5.61), smallmouth buffalo (3.42), and freshwater drum (0.70). By stratum, common carp had the highest *C/f* in the MCBU (5.53) and SCB (6.91).

### *Seine*

Poolwide mean *C/f* by seining (Table 6.3.8) was highest for emerald shiner (17.64), threadfin shad (14.40), and gizzard shad (10.61). By stratum, gizzard shad had the highest *C/f* in the BWCS (5.71) and emerald shiner had the highest *C/f* in the MCBU (23.92) and SCB (7.63).

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

All fixed-site sampling was confined to SCB and TWZ strata using a combination of day and night electrofishing, fyke netting, mini fyke netting, small and large hoop netting, seining, and bottom trawling.

### *Day Electrofishing*

At the SCB fixed sites, *C/f* by day electrofishing was highest for gizzard shad (62.60), bigmouth buffalo (12.40), and common carp (10.00; Table 6.4.1). At the TWZ sites, *C/f* was highest for gizzard shad (59.67), white bass (32.83), and bluegill (25.92).

### *Night Electrofishing*

At the SCB fixed sites, *C/f* by night electrofishing was highest for gizzard shad (23.75), bluegill (12.25), and common carp (10.50; Table 6.4.2). At the TWZ sites, *C/f* was highest for gizzard shad (88.33), white bass (53.67), and smallmouth buffalo (19.44).

### *Fyke Net*

At the TWZ fixed sites, *C/f* by fyke netting was highest for white bass (23.75), bluegill (13.04), and gizzard shad (12.47; Table 6.4.3).

### *Mini Fyke Net*

At the SCB fixed sites, *C/f* by mini fyke netting was highest for emerald shiner (1019.11), freshwater drum (659.18), and gizzard shad (97.08; Table 6.4.4). At the TWZ sites, *C/f* was highest for emerald shiner (14.91), white bass (10.07), and gizzard shad (6.64).

### *Small Hoop Net*

At the SCB fixed sites, *C/f* by small hoop netting was highest for common carp (2.08), freshwater drum (0.08), and flathead catfish (0.08; Table 6.4.5). At the TWZ sites, *C/f* was highest for common carp (3.02), smallmouth buffalo (0.42), and freshwater drum (0.17).

### *Large Hoop Net*

At the SCB fixed sites, *C/f* by large hoop netting was highest for common carp (2.57), smallmouth buffalo (0.50), and freshwater drum (0.25; Table 6.4.6). At the TWZ sites, *C/f* was highest for common carp (6.86), smallmouth buffalo (4.70), and freshwater drum (3.14).

### *Seine*

At the SCB fixed sites, *C/f* by seining was highest for gizzard shad (10.17), emerald shiner (9.67), and threadfin shad (2.50; Table 6.4.7).

### *Bottom Trawl*

At the TWZ fixed sites, *C/f* by bottom trawling was highest for channel catfish (3.17), freshwater drum (1.54), and walleye (1.54; Table 6.4.8).

## Length Distributions of Selected Species

Length distributions are presented for selected species in Figures 6.2 to 6.16. 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 of fewer than 100 (Anderson and Neumann 1996); they are presented in this report because of local interest in the species by river managers.

### *Gizzard Shad*

The length distribution of 11,624 gizzard shad collected by electrofishing during 1999 (Figure 6.2) was dominated by age-0 fish. About 80% of gizzard shad collected were less than 12 cm in total length.

### *Common Carp*

The length distribution of 1,321 common carp collected by electrofishing during 1999 (Figure 6.3) showed a large group of fish between 30 and 50 cm in total length. Few 15- to 35-cm-long common carp were collected, which may indicate fish of this size may not be susceptible to our gear or are lost from the population.

### *Smallmouth Buffalo*

The length distribution of 1,025 smallmouth buffalo collected by electrofishing during 1999 (Figure 6.4) indicated the presence of fish mainly between 20 and 38 cm long. The length distribution of 444 smallmouth buffalo collected by small and large hoop netting (Figure 6.5) in 1999 indicated the presence of fish mainly between 28 and 44 cm long.

### *Channel Catfish*

The length distribution of 277 channel catfish collected by electrofishing showed a range of fish between 2 and 68 cm long and indicated the presence of age 0+ fish (2 to 10 cm long; Figure 6.6). The length distribution of 636 channel catfish collected by small and large hoop netting during 1999 (Figure 6.7) showed a range of fish between 14 and 68 cm long. Hoop netting do not indicate the presence of age 0+ channel catfish, which is a bias because of the size of the mesh used.

### *Northern Pike*

Only one 58-cm-long northern pike was collected by fyke netting in 1999. Because of the small sample sizes, length distribution was not constructed for this report.

### White Bass

The length distribution of 1,517 white bass collected by electrofishing during 1999 (Figure 6.8) showed fish between 2 and 38 cm long. More than 76% of white bass collected were greater than 20 cm (8 inches) in length.

### Bluegill

The length distribution of 1,755 bluegills collected by electrofishing during 1999 (Figure 6.9) indicated that 71% of fish were between 10 and 14 cm long, just under the quality-size criterion (>15 cm or 6 inches long; Anderson 1978). About 25% of the fish collected were less than 8 cm long. The length distribution of 1,784 bluegills collected by fyke netting during 1999 (Figure 6.10) also showed a large grouping of fish (77%) between 10 and 14 cm long but lacked fish between 0 and 4 cm long.

### Largemouth Bass

The length distribution of 1,010 largemouth bass collected by electrofishing during 1999 (Figure 6.11) was widely distributed between 4 and 54 cm long. Fish collected between 4 and 10 cm long indicated young-of-the-year largemouth bass. A large grouping of fish was centered around 20 cm, possibly the 1998 cohort. Only about 9% of largemouth bass collected were longer than 35 cm (~14 inches).

### White Crappie

The length distribution of 338 white crappies collected by fyke netting during 1999 (Figure 6.12) showed 95% of fish were between 12 and 30 cm, but few juveniles were collected. About 56% of white crappies collected were greater than 20 cm (8 inches) in total length.

### Black Crappie

The length distribution of 1,812 black crappies collected by fyke netting during 1999 (Figure 6.13) showed that 67% of the fish ranged between 14 and 18 cm long. About 10% of black crappies collected were greater than 20 cm (8 inches) in total length.

### Sauger

The length distribution of 126 saugers collected by electrofishing during 1999 (Figure 6.14) was dominated by a large group of fish about 6–16 cm long. About 17% of saugers collected were greater than 30 cm (12 inches) in length.

### Walleye

Five walleyes ranging between 38 and 42 cm long were collected by electrofishing. Because of the small sample sizes, length distribution was not constructed for this report.

### Freshwater Drum

The length distribution of 536 freshwater drum collected by electrofishing (Figure 6.15) was widely distributed between 2 and 46 cm long. Groupings of fish between 2 and 10 cm long are possibly young-of-

year fish. The length distribution of 293 freshwater drum collected by fyke netting during 1999 (Figure 6.16) was also widely distributed (8 to 52 cm long) but lacked fish between 2 and 8 cm long.

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 1999. 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 | 13 | | 14 | 13 | | | | | 4 | 44 |
| 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 | 41 | 12 | 52 | 49 | 0 | 0 | 0 | 0 | 32 | 186 |

Sampling period=2: August 1 - September 14

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | 10 | | 14 | 11 | | | | | 4 | 39 |
| 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 | 47 | 0 | 0 | 0 | 0 | 32 | 181 |

Sampling period=3: September 15 - October 31

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | 11 | | 13 | 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 | | 7 | 8 | | | | | 4 | 29 |
| Night electrofishing | | | | | | | | | 1 | 1 |
| Seine | 8 | | 12 | 12 | | | | | | 32 |
| Trawling | | | | | | | | | 8 | 8 |
| Tandem fyke net | | 6 | | | | | | | | 6 |
| Tandem mini fyke net | | 6 | | | | | | | | 6 |
| SUBTOTAL | 39 | 12 | 48 | 48 | 0 | 0 | 0 | 0 | 29 | 176 |
| | 118 | 36 | 152 | 144 | 0 | 0 | 0 | 0 | 93 | 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
SCB - Side channel border
TRI - Tributary mouth
TWZ - Tailwater

Table 6.2. Total catches, by gear type, of fishes collected by the Long Term Resource Program during 1999 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 | Spotted gar | Lepisosteus oculatus | 1 | - | 15 | 1 | 3 | - | - | - | - | - | - | - | 20 |
| 2 | Longnose gar | Lepisosteus osseus | 8 | 3 | 15 | 1 | 6 | - | 1 | - | - | - | - | - | 34 |
| 3 | Shortnose gar | Lepisosteus platostomus | 33 | 15 | 193 | 33 | 46 | 3 | 2 | - | - | - | - | - | 325 |
| 4 | Bowfin | Amia calva | 3 | - | 17 | - | - | - | - | - | - | - | - | - | 20 |
| 5 | Goldeye | Hiodon alosoides | 4 | 4 | 1 | - | - | - | - | - | - | - | - | - | 9 |
| 6 | Skipjack herring | Alosa chrysochloris | 147 | 11 | 2 | - | 15 | 21 | 20 | - | - | - | - | - | 216 |
| 7 | Gizzard shad | Dorosoma cepedianum | 10734 | 890 | 351 | 747 | 5509 | 768 | 836 | 2 | 12 | - | - | - | 19849 |
| 8 | Threadfin shad | Dorosoma petenense | 371 | 11 | 49 | 129 | 109 | 111 | 984 | - | - | - | - | 1 | 1765 |
| 9 | Central stoneroller | Campostoma anomalum | - | - | - | - | 7 | - | - | - | - | - | - | - | 7 |
| 10 | Unidentified herring | Clupeidae sp. | - | - | - | - | - | 8 | - | - | - | - | - | - | 8 |
| 11 | Goldfish | Carassius auratus | 19 | 4 | 2 | - | 1 | - | - | - | - | - | - | - | 26 |
| 12 | Grass carp | Ctenopharyngodon idella | 42 | 3 | 6 | - | 1 | - | - | 2 | 1 | - | - | - | 55 |
| 13 | Red shiner | Cyprinella lutrensis | 14 | - | - | - | 11 | - | 4 | - | - | - | - | - | 29 |
| 14 | Common carp | Cyprinus carpio | 1207 | 114 | 117 | 26 | 36 | 3 | 2 | 380 | 709 | - | - | 2 | 2596 |
| 15 | Carp x goldfish hybrid | Cyprinus carpio x auratus | 9 | - | 7 | - | - | - | - | - | 2 | - | - | - | 18 |
| 16 | Bighead carp | Hypopthalmichthys nobilis | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 |
| 17 | Silver chub | Macrhybopsis storeriana | 9 | - | - | - | 9 | - | 18 | - | - | - | - | - | 36 |
| 18 | Golden shiner | Notemigonus crysoleucas | 8 | 1 | 6 | 2 | 66 | - | 27 | - | - | - | - | - | 110 |
| 19 | Emerald shiner | Notropis atherinoides | 480 | 5 | - | - | 8530 | 20 | 1219 | - | - | - | - | - | 10254 |
| 20 | River shiner | Notropis blennius | - | - | - | - | 5 | - | 3 | - | - | - | - | - | 8 |
| 21 | Spottail shiner | Notropis hudsonius | 2 | - | - | - | 4 | - | 6 | - | - | - | - | - | 12 |
| 22 | Silverband shiner | Notropis shumardi | 12 | 9 | - | - | 74 | 4 | 14 | - | - | - | - | - | 113 |
| 23 | Sand shiner | Notropis stramineus | - | - | - | - | - | - | 6 | - | - | - | - | - | 6 |
| 24 | Bluntnose minnow | Pimephales notatus | 1 | - | - | - | 5 | - | - | - | - | - | - | - | 6 |
| 25 | Bullhead minnow | Pimephales vigilax | 70 | 1 | - | - | 75 | 8 | 102 | - | - | - | - | - | 256 |
| 26 | River carpsucker | Carpiodes carpio | 66 | 10 | 102 | 21 | 4 | - | 5 | - | 22 | - | - | - | 230 |
| 27 | Quillback | Carpiodes cyprinus | 1 | - | 6 | 4 | - | - | 1 | - | - | - | - | - | 12 |
| 28 | Highfin carpsucker | Carpiodes velifer | 2 | - | 2 | - | - | - | - | - | - | - | - | - | 4 |
| 29 | Smallmouth buffalo | Ictiobus bubalus | 822 | 203 | 227 | 10 | 4 | 1 | 28 | 48 | 396 | - | - | - | 1739 |
| 30 | Bigmouth buffalo | Ictiobus cyprinellus | 496 | 56 | 21 | 6 | 1 | - | 2 | - | - | - | - | - | 582 |
| 31 | Black buffalo | Ictiobus niger | 43 | 2 | 3 | 8 | 1 | - | - | - | 3 | - | - | - | 60 |
| 32 | Unidentified buffalo | Ictiobus sp. | 19 | 1 | - | - | 344 | 3 | 8 | - | - | - | - | - | 375 |
| 33 | Silver redhorse | Moxostoma anisurum | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 34 | Golden redhorse | Moxostoma erythrurum | 8 | - | 7 | - | - | - | - | - | - | - | - | - | 15 |
| 35 | Shorthead redhorse | Moxostoma macrolepidotum | 35 | 2 | 32 | 1 | - | - | 2 | 1 | 1 | - | - | - | 74 |
| 36 | Black bullhead | Ameiurus melas | - | - | 4 | 3 | 27 | 1 | - | - | - | - | - | - | 35 |
| 37 | Yellow bullhead | Ameiurus natalis | 13 | - | 77 | 9 | 10 | 1 | - | 1 | - | - | - | - | 111 |
| 38 | Brown bullhead | Ameiurus nebulosus | 5 | - | 20 | 57 | 18 | 3 | - | 1 | 1 | - | - | - | 105 |
| 39 | Channel catfish | Ictalurus punctatus | 274 | 3 | 5 | - | 58 | 4 | 15 | 590 | 46 | - | - | 76 | 1071 |

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 collected by the Long Term Resource Program during 1999 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 | Unidentified catfish | Ictalurus sp. | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 41 | Tadpole madtom | Noturus gyrinus | - | 1 | - | - | 22 | - | 1 | - | - | - | - | - | 24 |
| 42 | Flathead catfish | Pylodictis olivaris | 46 | 13 | 5 | 1 | 2 | - | 1 | 6 | 14 | - | - | - | 88 |
| 43 | Grass pickerel | Esox americanus vermiculatus | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 44 | Northern pike | Esox lucius | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| 45 | Pirate perch | Aphredoderus sayanus | 2 | - | - | - | 55 | - | - | - | - | - | - | - | 57 |
| 46 | Blackstripe topminnow | Fundulus notatus | 11 | - | - | - | 13 | - | 19 | - | - | - | - | - | 43 |
| 47 | Western mosquitofish | Gambusia affinis | 21 | - | - | - | 73 | 1 | 109 | - | - | - | - | - | 204 |
| 48 | Brook silverside | Labidesthes sicculus | 40 | 3 | - | - | 21 | - | 63 | - | - | - | - | - | 127 |
| 49 | White perch | Morone americana | 2 | 2 | 39 | 11 | - | - | - | - | - | - | - | - | 54 |
| 50 | White bass | Morone chrysops | 1017 | 500 | 678 | 67 | 630 | 142 | 46 | - | 16 | - | - | 1 | 3097 |
| 51 | Yellow bass | Morone mississippiensis | 27 | 7 | 42 | 30 | 7 | 1 | 1 | - | - | - | - | - | 115 |
| 52 | Striped bass | Morone saxatilis | 2 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 53 | Striped x white bass | M. saxatilis x chrysops | 1 | - | 1 | - | 1 | - | - | - | - | - | - | - | 3 |
| 54 | Green sunfish | Lepomis cyanellus | 32 | 2 | 2 | - | 3 | - | - | - | - | - | - | - | 39 |
| 55 | Warmouth | Lepomis gulosus | 44 | 2 | 48 | 19 | 21 | 1 | - | - | - | - | - | - | 135 |
| 56 | Orangespotted sunfish | Lepomis humilis | 19 | - | 7 | - | 29 | - | 17 | - | - | - | - | - | 72 |
| 57 | Bluegill | Lepomis macrochirus | 1576 | 179 | 1477 | 307 | 5994 | 75 | 229 | 2 | - | - | - | - | 9839 |
| 58 | Longear sunfish | Lepomis megalotis | 6 | - | - | - | - | - | - | - | - | - | - | - | 6 |
| 59 | Redear sunfish | Lepomis microlophus | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 |
| 60 | Green x warmouth sunfish | L. cyanellus x gulosus | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 |
| 61 | Green x bluegill sunfish | L. cyanellus x macrochirus | 10 | 3 | 3 | 1 | 2 | - | - | - | - | - | - | - | 19 |
| 62 | Bluegill x warmouth | L. macrochirus x gulosus | - | - | 1 | - | 1 | - | - | - | - | - | - | - | 2 |
| 63 | Smallmouth bass | Micropterus dolomieu | 2 | - | - | - | - | - | 1 | - | - | - | - | - | 3 |
| 64 | Largemouth bass | Micropterus salmoides | 917 | 93 | 79 | 16 | 133 | 1 | 56 | - | - | - | - | - | 1295 |
| 65 | White crappie | Pomoxis annularis | 147 | 31 | 249 | 89 | 241 | 6 | 23 | 1 | 1 | - | - | - | 788 |
| 66 | Black crappie | Pomoxis nigromaculatus | 306 | 18 | 1457 | 355 | 348 | 14 | 23 | - | - | - | - | - | 2521 |
| 67 | Mud darter | Etheostoma asprigene | 4 | - | - | - | 84 | - | - | - | - | - | - | - | 88 |
| 68 | Johnny darter | Etheostoma nigrum | - | - | - | - | 5 | - | 1 | - | - | - | - | - | 6 |
| 69 | Logperch | Percina caprodes | 8 | - | - | - | 81 | - | - | - | - | - | - | - | 89 |
| 70 | Blackside darter | Percina maculata | - | - | - | - | 3 | - | - | - | - | - | - | - | 3 |
| 71 | Slenderhead darter | Percina phoxocephala | - | - | - | - | 2 | - | 1 | - | - | - | - | - | 3 |
| 72 | Sauger | Stizostedion canadense | 106 | 20 | 17 | 3 | 41 | 2 | 4 | - | - | - | - | 1 | 194 |
| 73 | Walleye | Stizostedion vitreum | 3 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 12 |
| 74 | Freshwater drum | Aplodinotus grunniens | 464 | 72 | 238 | 55 | 4471 | 286 | 51 | 21 | 124 | - | - | 37 | 5819 |
| | | | 19772 | 2296 | 5635 | 2015 | 27265 | 1488 | 3951 | 1055 | 1348 | 0 | 0 | 121 | 64946 |

Gears:
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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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) |
| Longnose gar | 0.02 | 0.03 | 0.00 | 0.19 |
| | (0.01) | (0.03) | (0.00) | (0.10) |
| Shortnose gar | 0.20 | 0.12 | 0.22 | 0.25 |
| | (0.06) | (0.06) | (0.09) | (0.10) |
| Bowfin | 0.01 | 0.03 | 0.00 | 0.03 |
| | (0.01) | (0.03) | (0.00) | (0.03) |
| Goldeye | 0.02 | 0.00 | 0.03 | 0.00 |
| | (0.02) | (0.00) | (0.03) | (0.00) |
| Skipjack herring | 1.27 | 0.26 | 1.64 | 1.33 |
| | (0.37) | (0.11) | (0.53) | (0.99) |
| Gizzard shad | 102.15 | 80.26 | 111.56 | 82.22 |
| | (20.43) | (25.00) | (27.86) | (21.13) |
| Threadfin shad | 4.21 | 0.74 | 5.67 | 1.69 |
| | (1.76) | (0.38) | (2.53) | (0.61) |
| Goldfish | 0.05 | 0.03 | 0.06 | 0.00 |
| | (0.03) | (0.03) | (0.04) | (0.00) |
| Grass carp | 0.21 | 0.35 | 0.14 | 0.50 |
| | (0.05) | (0.12) | (0.06) | (0.15) |
| Red shiner | 0.07 | 0.18 | 0.03 | 0.14 |
| | (0.03) | (0.09) | (0.03) | (0.07) |
| Common carp | 6.20 | 14.68 | 2.61 | 13.08 |
| | (0.67) | (1.96) | (0.61) | (2.31) |
| Goldfish x carp | 0.01 | 0.03 | 0.00 | 0.08 |
| | (0.01) | (0.03) | (0.00) | (0.05) |
| Silver chub | 0.04 | 0.03 | 0.03 | 0.19 |
| | (0.02) | (0.03) | (0.03) | (0.14) |
| Golden shiner | 0.06 | 0.15 | 0.03 | 0.06 |
| | (0.04) | (0.12) | (0.03) | (0.06) |
| Emerald shiner | 6.09 | 0.53 | 8.39 | 2.33 |
| | (4.41) | (0.17) | (6.33) | (0.59) |
| Spottail shiner | 0.02 | 0.00 | 0.03 | 0.03 |
| | (0.02) | (0.00) | (0.03) | (0.03) |
| Silverband shiner | 0.11 | 0.06 | 0.14 | 0.03 |
| | (0.08) | (0.04) | (0.11) | (0.03) |
| Bullhead minnow | 0.48 | 1.76 | 0.03 | 0.22 |
| | (0.30) | (1.17) | (0.03) | (0.09) |
| River carpsucker | 0.40 | 1.24 | 0.08 | 0.50 |
| | (0.09) | (0.29) | (0.06) | (0.17) |
| Quillback | 0.02 | 0.00 | 0.03 | 0.00 |
| | (0.02) | (0.00) | (0.03) | (0.00) |
| Highfin carpsucker | 0.02 | 0.06 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.00) | (0.00) |
| Smallmouth buffalo | 4.41 | 10.38 | 2.08 | 6.11 |
| | (0.49) | (1.41) | (0.46) | (1.41) |
| Bigmouth buffalo | 2.41 | 5.82 | 1.00 | 4.58 |
| | (0.46) | (1.37) | (0.41) | (1.37) |
| Black buffalo | 0.26 | 0.65 | 0.11 | 0.36 |
| | (0.06) | (0.16) | (0.05) | (0.14) |
| Unidentified buffalo | 0.05 | 0.15 | 0.00 | 0.33 |
| | (0.02) | (0.06) | (0.00) | (0.20) |
| Golden redhorse | 0.07 | 0.06 | 0.08 | 0.03 |
| | (0.06) | (0.04) | (0.08) | (0.03) |
| Shorthead redhorse | 0.07 | 0.03 | 0.06 | 0.44 |
| | (0.04) | (0.03) | (0.06) | (0.14) |
| Yellow bullhead | 0.09 | 0.35 | 0.00 | 0.00 |
| | (0.05) | (0.19) | (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
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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 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Brown bullhead | 0.05 | 0.12 | 0.03 | 0.00 |
| | (0.03) | (0.07) | (0.03) | (0.00) |
| Channel catfish | 1.78 | 4.38 | 0.78 | 2.42 |
| | (0.30) | (1.03) | (0.21) | (0.66) |
| Flathead catfish | 0.21 | 0.26 | 0.17 | 0.61 |
| | (0.05) | (0.11) | (0.06) | (0.20) |
| Pirate perch | 0.02 | 0.06 | 0.00 | 0.00 |
| | (0.02) | (0.06) | (0.00) | (0.00) |
| Blackstripe topminnow | 0.08 | 0.32 | 0.00 | 0.00 |
| | (0.04) | (0.17) | (0.00) | (0.00) |
| Western mosquitofish | 0.10 | 0.18 | 0.06 | 0.33 |
| | (0.04) | (0.12) | (0.04) | (0.21) |
| Brook silverside | 0.29 | 1.06 | 0.03 | 0.03 |
| | (0.15) | (0.56) | (0.03) | (0.03) |
| White perch | 0.02 | 0.00 | 0.03 | 0.03 |
| | (0.02) | (0.00) | (0.03) | (0.03) |
| White bass | 5.00 | 7.65 | 4.00 | 5.31 |
| | (0.92) | (2.22) | (1.04) | (1.26) |
| Yellow bass | 0.14 | 0.32 | 0.08 | 0.00 |
| | (0.04) | (0.11) | (0.05) | (0.00) |
| Green sunfish | 0.25 | 0.74 | 0.08 | 0.00 |
| | (0.07) | (0.20) | (0.06) | (0.00) |
| Warmouth | 0.32 | 1.06 | 0.06 | 0.17 |
| | (0.09) | (0.32) | (0.04) | (0.08) |
| Orangespotted sunfish | 0.14 | 0.56 | 0.00 | 0.00 |
| | (0.06) | (0.24) | (0.00) | (0.00) |
| Bluegill | 8.25 | 29.32 | 0.64 | 5.44 |
| | (1.13) | (4.37) | (0.22) | (1.84) |
| Longear sunfish | 0.05 | 0.18 | 0.00 | 0.00 |
| | (0.03) | (0.11) | (0.00) | (0.00) |
| Green sunfish x warmouth | 0.00 | 0.00 | 0.00 | 0.03 |
| | (0.00) | (0.00) | (0.00) | (0.03) |
| Green sunfish x bluegill | 0.05 | 0.18 | 0.00 | 0.03 |
| | (0.02) | (0.07) | (0.00) | (0.03) |
| Largemouth bass | 5.56 | 16.97 | 1.50 | 3.17 |
| | (1.02) | (3.75) | (0.50) | (0.93) |
| White crappie | 0.68 | 2.59 | 0.00 | 0.36 |
| | (0.16) | (0.62) | (0.00) | (0.17) |
| Black crappie | 1.72 | 6.09 | 0.11 | 1.61 |
| | (0.32) | (1.21) | (0.07) | (0.72) |
| Mud darter | 0.02 | 0.06 | 0.00 | 0.06 |
| | (0.02) | (0.06) | (0.00) | (0.04) |
| Logperch | 0.02 | 0.00 | 0.03 | 0.03 |
| | (0.02) | (0.00) | (0.03) | (0.03) |
| Sauger | 0.51 | 0.62 | 0.44 | 0.92 |
| | (0.11) | (0.16) | (0.15) | (0.23) |
| Walleye | 0.01 | 0.03 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) |
| Freshwater drum | 3.05 | 7.62 | 1.31 | 3.81 |
| | (0.57) | (1.96) | (0.39) | (0.76) |

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

Table 6.3.2. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.48 (0.31) | 0.48 (0.31) |
| Longnose gar | 0.34 (0.16) | 0.34 (0.16) |
| Shortnose gar | 5.88 (2.19) | 5.88 (2.20) |
| Bowfin | 0.54 (0.17) | 0.54 (0.18) |
| Gizzard shad | 6.77 (1.92) | 6.77 (1.93) |
| Threadfin shad | 0.89 (0.33) | 0.89 (0.33) |
| Goldfish | 0.07 (0.05) | 0.07 (0.05) |
| Grass carp | 0.19 (0.13) | 0.19 (0.13) |
| Common carp | 2.53 (0.64) | 2.53 (0.64) |
| Goldfish x carp | 0.20 (0.11) | 0.20 (0.11) |
| Golden shiner | 0.18 (0.10) | 0.18 (0.10) |
| River carpsucker | 2.79 (0.65) | 2.79 (0.66) |
| Quillback | 0.17 (0.09) | 0.17 (0.09) |
| Highfin carpsucker | 0.04 (0.04) | 0.04 (0.04) |
| Smallmouth buffalo | 5.57 (1.84) | 5.57 (1.85) |
| Bigmouth buffalo | 0.52 (0.19) | 0.52 (0.19) |
| Black buffalo | 0.07 (0.05) | 0.07 (0.05) |
| Shorthead redhorse | 0.54 (0.24) | 0.54 (0.24) |
| Black bullhead | 0.03 (0.03) | 0.03 (0.03) |
| Yellow bullhead | 2.58 (1.64) | 2.58 (1.65) |
| Brown bullhead | 0.66 (0.32) | 0.66 (0.32) |
| Channel catfish | 0.03 (0.03) | 0.03 (0.03) |
| White perch | 0.33 (0.21) | 0.33 (0.21) |
| White bass | 8.60 (2.32) | 8.60 (2.32) |
| Yellow bass | 0.58 (0.26) | 0.58 (0.26) |
| Green sunfish | 0.07 (0.05) | 0.07 (0.05) |
| Warmouth | 1.64 (0.85) | 1.64 (0.86) |
| Orangespotted sunfish | 0.24 (0.24) | 0.24 (0.24) |
| Bluegill | 42.93 (13.80) | 42.93 (13.86) |

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| Common name | ALL | BWCS |
|---|---|---|
| Redear sunfish | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Green sunfish x bluegill | 0.10 | 0.10 |
| | (0.06) | (0.06) |
| Bluegill x warmouth | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Largemouth bass | 2.54 | 2.54 |
| | (0.91) | (0.91) |
| White crappie | 5.38 | 5.38 |
| | (1.39) | (1.40) |
| Black crappie | 43.92 | 43.92 |
| | (12.35) | (12.41) |
| Sauger | 0.07 | 0.07 |
| | (0.05) | (0.05) |
| Freshwater drum | 4.96 | 4.96 |
| | (2.19) | (2.20) |

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 6.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|
| Spotted gar | 0.03 (0.03) | 0.03 (0.03) |
| Longnose gar | 0.03 (0.03) | 0.03 (0.03) |
| Shortnose gar | 0.93 (0.39) | 0.93 (0.39) |
| Gizzard shad | 20.90 (6.20) | 20.90 (6.21) |
| Threadfin shad | 3.58 (1.25) | 3.58 (1.25) |
| Common carp | 0.74 (0.23) | 0.74 (0.23) |
| Bighead carp | 0.03 (0.03) | 0.03 (0.03) |
| Golden shiner | 0.05 (0.05) | 0.05 (0.05) |
| River carpsucker | 0.59 (0.20) | 0.59 (0.20) |
| Quillback | 0.12 (0.07) | 0.12 (0.07) |
| Smallmouth buffalo | 0.27 (0.12) | 0.27 (0.12) |
| Bigmouth buffalo | 0.16 (0.07) | 0.16 (0.07) |
| Black buffalo | 0.22 (0.14) | 0.22 (0.14) |
| Shorthead redhorse | 0.03 (0.03) | 0.03 (0.03) |
| Black bullhead | 0.08 (0.05) | 0.08 (0.05) |
| Yellow bullhead | 0.26 (0.16) | 0.26 (0.16) |
| Brown bullhead | 1.62 (0.79) | 1.62 (0.79) |
| Flathead catfish | 0.03 (0.03) | 0.03 (0.03) |
| White perch | 0.31 (0.19) | 0.31 (0.19) |
| White bass | 1.88 (0.34) | 1.88 (0.34) |
| Yellow bass | 0.86 (0.24) | 0.86 (0.24) |
| Warmouth | 0.54 (0.33) | 0.54 (0.33) |
| Bluegill | 8.58 (3.72) | 8.58 (3.72) |
| Green sunfish x bluegill | 0.03 (0.03) | 0.03 (0.03) |
| Largemouth bass | 0.46 (0.19) | 0.46 (0.19) |
| White crappie | 2.53 (0.75) | 2.53 (0.75) |
| Black crappie | 9.84 (4.38) | 9.84 (4.38) |
| Sauger | 0.08 (0.04) | 0.08 (0.04) |
| Walleye | 0.06 (0.04) | 0.06 (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 6.3.3. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|
| Freshwater drum | 1.52 (0.35) | 1.52 (0.35) |

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 mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.03 | 0.00 | 0.04 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Longnose gar | 0.05 | 0.09 | 0.04 | 0.06 |
| | (0.03) | (0.05) | (0.04) | (0.06) |
| Shortnose gar | 0.57 | 0.58 | 0.57 | 0.61 |
| | (0.29) | (0.20) | (0.42) | (0.41) |
| Skipjack herring | 0.07 | 0.10 | 0.04 | 0.35 |
| | (0.04) | (0.10) | (0.04) | (0.24) |
| Gizzard shad | 101.94 | 20.66 | 135.47 | 49.13 |
| | (66.18) | (6.07) | (95.08) | (15.54) |
| Threadfin shad | 0.47 | 1.53 | 0.04 | 1.09 |
| | (0.22) | (0.84) | (0.04) | (0.52) |
| Central stoneroller | 0.16 | 0.00 | 0.21 | 0.13 |
| | (0.15) | (0.00) | (0.21) | (0.13) |
| Grass carp | 0.03 | 0.00 | 0.04 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Red shiner | 0.09 | 0.10 | 0.09 | 0.18 |
| | (0.06) | (0.08) | (0.09) | (0.10) |
| Common carp | 0.65 | 0.10 | 0.87 | 0.29 |
| | (0.32) | (0.07) | (0.45) | (0.14) |
| Silver chub | 0.17 | 0.00 | 0.25 | 0.00 |
| | (0.10) | (0.00) | (0.15) | (0.00) |
| Golden shiner | 0.57 | 0.39 | 0.52 | 2.25 |
| | (0.25) | (0.24) | (0.33) | (1.36) |
| Emerald shiner | 36.51 | 2.77 | 48.81 | 39.38 |
| | (24.97) | (1.52) | (35.84) | (27.37) |
| River shiner | 0.03 | 0.00 | 0.04 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Spottail shiner | 0.01 | 0.03 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) |
| Silverband shiner | 1.08 | 0.07 | 1.48 | 0.58 |
| | (0.37) | (0.07) | (0.53) | (0.25) |
| Bluntnose minnow | 0.02 | 0.03 | 0.00 | 0.25 |
| | (0.01) | (0.03) | (0.00) | (0.25) |
| Bullhead minnow | 0.67 | 1.26 | 0.40 | 1.37 |
| | (0.26) | (0.87) | (0.17) | (0.84) |
| River carpsucker | 0.07 | 0.03 | 0.08 | 0.00 |
| | (0.06) | (0.03) | (0.08) | (0.00) |
| Smallmouth buffalo | 0.03 | 0.10 | 0.00 | 0.06 |
| | (0.02) | (0.08) | (0.00) | (0.06) |
| Bigmouth buffalo | 0.01 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) |
| Black buffalo | 0.01 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) |
| Unidentified buffalo | 9.29 | 0.16 | 13.21 | 0.93 |
| | (7.50) | (0.09) | (10.79) | (0.54) |
| Silver redhorse | 0.01 | 0.03 | 0.00 | 0.00 |
| | (0.01) | (0.03) | (0.00) | (0.00) |
| Black bullhead | 0.22 | 0.10 | 0.24 | 0.51 |
| | (0.09) | (0.05) | (0.12) | (0.24) |
| Yellow bullhead | 0.06 | 0.19 | 0.00 | 0.13 |
| | (0.03) | (0.12) | (0.00) | (0.13) |
| Brown bullhead | 0.15 | 0.57 | 0.00 | 0.00 |
| | (0.07) | (0.27) | (0.00) | (0.00) |
| Channel catfish | 0.57 | 0.47 | 0.56 | 1.21 |
| | (0.18) | (0.19) | (0.25) | (0.47) |
| Unidentified catfish | 0.00 | 0.00 | 0.00 | 0.06 |
| | (0.00) | (0.00) | (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 mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Tadpole madtom | 0.17 | 0.67 | 0.00 | 0.00 |
| | (0.10) | (0.40) | (0.00) | (0.00) |
| Flathead catfish | 0.01 | 0.03 | 0.00 | 0.06 |
| | (0.01) | (0.03) | (0.00) | (0.06) |
| Grass pickerel | 0.00 | 0.00 | 0.00 | 0.05 |
| | (0.00) | (0.00) | (0.00) | (0.05) |
| Pirate perch | 0.43 | 1.65 | 0.00 | 0.06 |
| | (0.39) | (1.52) | (0.00) | (0.06) |
| Blackstripe topminnow | 0.13 | 0.17 | 0.11 | 0.17 |
| | (0.09) | (0.17) | (0.11) | (0.12) |
| Western mosquitofish | 1.35 | 0.34 | 1.79 | 0.50 |
| | (0.71) | (0.16) | (1.02) | (0.44) |
| Brook silverside | 0.41 | 0.00 | 0.58 | 0.11 |
| | (0.19) | (0.00) | (0.28) | (0.11) |
| White bass | 11.36 | 1.02 | 15.76 | 2.62 |
| | (4.89) | (0.25) | (7.03) | (0.59) |
| Yellow bass | 0.11 | 0.10 | 0.12 | 0.00 |
| | (0.05) | (0.07) | (0.07) | (0.00) |
| Striped x white bass | 0.03 | 0.00 | 0.04 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Green sunfish | 0.03 | 0.00 | 0.04 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Warmouth | 0.11 | 0.26 | 0.04 | 0.23 |
| | (0.04) | (0.08) | (0.04) | (0.23) |
| Orangespotted sunfish | 0.21 | 0.81 | 0.00 | 0.12 |
| | (0.11) | (0.44) | (0.00) | (0.08) |
| Bluegill | 91.04 | 32.04 | 111.94 | 105.37 |
| | (59.90) | (13.71) | (85.82) | (69.80) |
| Green sunfish x bluegill | 0.03 | 0.00 | 0.04 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Bluegill x warmouth | 0.00 | 0.00 | 0.00 | 0.06 |
| | (0.00) | (0.00) | (0.00) | (0.06) |
| Largemouth bass | 1.40 | 0.23 | 1.65 | 4.24 |
| | (0.73) | (0.09) | (1.03) | (2.31) |
| White crappie | 2.80 | 3.79 | 2.52 | 1.60 |
| | (1.10) | (3.26) | (1.03) | (0.80) |
| Black crappie | 5.02 | 4.28 | 5.43 | 3.03 |
| | (3.26) | (3.07) | (4.55) | (1.49) |
| Mud darter | 0.90 | 1.48 | 0.73 | 0.19 |
| | (0.55) | (1.01) | (0.69) | (0.19) |
| Johnny darter | 0.05 | 0.10 | 0.04 | 0.06 |
| | (0.04) | (0.10) | (0.04) | (0.06) |
| Logperch | 0.28 | 0.29 | 0.24 | 0.80 |
| | (0.10) | (0.18) | (0.12) | (0.54) |
| Blackside darter | 0.02 | 0.06 | 0.00 | 0.06 |
| | (0.02) | (0.06) | (0.00) | (0.06) |
| Slenderhead darter | 0.00 | 0.00 | 0.00 | 0.06 |
| | (0.00) | (0.00) | (0.00) | (0.06) |
| Sauger | 0.54 | 0.00 | 0.77 | 0.06 |
| | (0.19) | (0.00) | (0.27) | (0.06) |
| Freshwater drum | 10.12 | 11.09 | 10.10 | 4.93 |
| | (4.17) | (4.81) | (5.72) | (1.76) |

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 6.3.5. Mean catch-per-unit-effort and (standard error) for fishes collected by tandem mini fyke netting in the La Grange Pool of the Illinois River using stratified random sampling dur 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.09 | 0.09 |
| | (0.05) | (0.05) |
| Skipjack herring | 0.54 | 0.54 |
| | (0.46) | (0.46) |
| Gizzard shad | 20.75 | 20.75 |
| | (8.58) | (8.59) |
| Threadfin shad | 3.07 | 3.07 |
| | (1.07) | (1.07) |
| Common carp | 0.09 | 0.09 |
| | (0.05) | (0.05) |
| Emerald shiner | 0.57 | 0.57 |
| | (0.24) | (0.24) |
| Silverband shiner | 0.11 | 0.11 |
| | (0.08) | (0.08) |
| Bullhead minnow | 0.23 | 0.23 |
| | (0.23) | (0.23) |
| Smallmouth buffalo | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Unidentified buffalo | 0.09 | 0.09 |
| | (0.06) | (0.06) |
| Black bullhead | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Yellow bullhead | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Brown bullhead | 0.08 | 0.08 |
| | (0.05) | (0.05) |
| Channel catfish | 0.11 | 0.11 |
| | (0.05) | (0.05) |
| Western mosquitofish | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| White bass | 3.76 | 3.76 |
| | (2.18) | (2.18) |
| Yellow bass | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Warmouth | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| Bluegill | 2.10 | 2.10 |
| | (0.89) | (0.90) |
| Largemouth bass | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| White crappie | 0.16 | 0.16 |
| | (0.06) | (0.06) |
| Black crappie | 0.39 | 0.39 |
| | (0.11) | (0.11) |
| Sauger | 0.05 | 0.05 |
| | (0.05) | (0.05) |
| Freshwater drum | 7.77 | 7.77 |
| | (4.32) | (4.32) |

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 6.3.6. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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) |
| Grass carp | 0.04 | 0.04 | 0.00 |
| | (0.03) | (0.03) | (0.00) |
| Common carp | 3.92 | 4.01 | 2.50 |
| | (0.98) | (1.04) | (0.72) |
| Smallmouth buffalo | 0.52 | 0.53 | 0.32 |
| | (0.33) | (0.36) | (0.17) |
| Shorthead redhorse | 0.00 | 0.00 | 0.03 |
| | (0.00) | (0.00) | (0.03) |
| Yellow bullhead | 0.02 | 0.02 | 0.00 |
| | (0.02) | (0.02) | (0.00) |
| Channel catfish | 4.51 | 4.11 | 10.50 |
| | (1.74) | (1.82) | (5.46) |
| Flathead catfish | 0.08 | 0.08 | 0.03 |
| | (0.04) | (0.04) | (0.03) |
| Bluegill | 0.04 | 0.04 | 0.00 |
| | (0.04) | (0.04) | (0.00) |
| White crappie | 0.02 | 0.02 | 0.00 |
| | (0.02) | (0.02) | (0.00) |
| Freshwater drum | 0.24 | 0.25 | 0.11 |
| | (0.14) | (0.15) | (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 6.3.7. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 | 0.11 | 0.10 | 0.17 |
| | (0.06) | (0.06) | (0.07) |
| Common carp | 5.61 | 5.53 | 6.91 |
| | (1.43) | (1.52) | (2.19) |
| River carpsucker | 0.10 | 0.10 | 0.03 |
| | (0.10) | (0.10) | (0.03) |
| Smallmouth buffalo | 3.42 | 3.44 | 3.11 |
| | (0.79) | (0.84) | (1.40) |
| Black buffalo | 0.00 | 0.00 | 0.03 |
| | (0.00) | (0.00) | (0.03) |
| Brown bullhead | 0.02 | 0.02 | 0.00 |
| | (0.02) | (0.02) | (0.00) |
| Channel catfish | 0.38 | 0.37 | 0.55 |
| | (0.11) | (0.12) | (0.30) |
| Flathead catfish | 0.10 | 0.10 | 0.06 |
| | (0.06) | (0.06) | (0.04) |
| White bass | 0.14 | 0.13 | 0.27 |
| | (0.07) | (0.08) | (0.20) |
| White crappie | 0.02 | 0.02 | 0.00 |
| | (0.02) | (0.02) | (0.00) |
| Freshwater drum | 0.70 | 0.72 | 0.30 |
| | (0.24) | (0.26) | (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 6.3.8. Mean catch-per-unit-effort and (standard error) for fishes collected by seining in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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) |
| Skipjack herring | 0.31 | 0.00 | 0.44 | 0.04 |
| | (0.18) | (0.00) | (0.27) | (0.04) |
| Gizzard shad | 10.61 | 5.71 | 12.81 | 4.83 |
| | (2.81) | (2.99) | (3.88) | (1.60) |
| Threadfin shad | 14.40 | 4.38 | 18.56 | 7.54 |
| | (6.82) | (2.51) | (9.76) | (3.01) |
| Red shiner | 0.05 | 0.13 | 0.03 | 0.00 |
| | (0.03) | (0.07) | (0.03) | (0.00) |
| Common carp | 0.04 | 0.00 | 0.06 | 0.00 |
| | (0.03) | (0.00) | (0.04) | (0.00) |
| Silver chub | 0.21 | 0.00 | 0.28 | 0.29 |
| | (0.13) | (0.00) | (0.19) | (0.16) |
| Golden shiner | 0.27 | 1.04 | 0.00 | 0.08 |
| | (0.18) | (0.69) | (0.00) | (0.06) |
| Emerald shiner | 17.64 | 2.46 | 23.92 | 7.63 |
| | (6.07) | (0.79) | (8.72) | (2.83) |
| River shiner | 0.06 | 0.00 | 0.08 | 0.00 |
| | (0.04) | (0.00) | (0.06) | (0.00) |
| Spottail shiner | 0.08 | 0.17 | 0.06 | 0.00 |
| | (0.04) | (0.13) | (0.04) | (0.00) |
| Silverband shiner | 0.11 | 0.00 | 0.14 | 0.21 |
| | (0.08) | (0.00) | (0.11) | (0.15) |
| Sand shiner | 0.10 | 0.00 | 0.14 | 0.04 |
| | (0.06) | (0.00) | (0.08) | (0.04) |
| Bullhead minnow | 0.82 | 2.50 | 0.19 | 0.79 |
| | (0.32) | (1.18) | (0.14) | (0.29) |
| River carpsucker | 0.05 | 0.13 | 0.03 | 0.00 |
| | (0.03) | (0.09) | (0.03) | (0.00) |
| Quillback | 0.02 | 0.00 | 0.03 | 0.00 |
| | (0.02) | (0.00) | (0.03) | (0.00) |
| Smallmouth buffalo | 0.23 | 0.88 | 0.00 | 0.13 |
| | (0.13) | (0.49) | (0.00) | (0.07) |
| Bigmouth buffalo | 0.02 | 0.08 | 0.00 | 0.00 |
| | (0.01) | (0.06) | (0.00) | (0.00) |
| Unidentified buffalo | 0.10 | 0.17 | 0.08 | 0.00 |
| | (0.06) | (0.10) | (0.08) | (0.00) |
| Shorthead redhorse | 0.03 | 0.04 | 0.03 | 0.00 |
| | (0.02) | (0.04) | (0.03) | (0.00) |
| Channel catfish | 0.24 | 0.00 | 0.33 | 0.08 |
| | (0.15) | (0.00) | (0.22) | (0.06) |
| Tadpole madtom | 0.01 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) |
| Flathead catfish | 0.02 | 0.00 | 0.03 | 0.00 |
| | (0.02) | (0.00) | (0.03) | (0.00) |
| Blackstripe topminnow | 0.13 | 0.21 | 0.08 | 0.42 |
| | (0.05) | (0.12) | (0.06) | (0.31) |
| Western mosquitofish | 0.74 | 1.00 | 0.58 | 1.67 |
| | (0.21) | (0.49) | (0.24) | (0.45) |
| Brook silverside | 0.64 | 2.21 | 0.08 | 0.21 |
| | (0.32) | (1.24) | (0.06) | (0.12) |
| White bass | 0.44 | 0.00 | 0.61 | 0.42 |
| | (0.14) | (0.00) | (0.20) | (0.20) |
| Orangespotted sunfish | 0.18 | 0.71 | 0.00 | 0.00 |
| | (0.11) | (0.44) | (0.00) | (0.00) |
| Bluegill | 2.16 | 5.04 | 1.11 | 1.96 |
| | (0.43) | (1.10) | (0.46) | (0.81) |

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 seining in the La Grange Pool of the Illinois River using stratified random sampling during 1999. The statistics under ALL pertain to unbiased means over all strata sampled by 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 |
|---|---|---|---|---|
| Smallmouth bass | 0.00 | 0.00 | 0.00 | 0.04 |
| | (0.00) | (0.00) | (0.00) | (0.04) |
| Largemouth bass | 0.57 | 1.71 | 0.17 | 0.29 |
| | (0.17) | (0.60) | (0.09) | (0.15) |
| White crappie | 0.26 | 0.79 | 0.08 | 0.00 |
| | (0.09) | (0.32) | (0.06) | (0.00) |
| Black crappie | 0.23 | 0.79 | 0.03 | 0.08 |
| | (0.06) | (0.24) | (0.03) | (0.06) |
| Johnny darter | 0.01 | 0.04 | 0.00 | 0.00 |
| | (0.01) | (0.04) | (0.00) | (0.00) |
| Slenderhead darter | 0.02 | 0.00 | 0.03 | 0.00 |
| | (0.02) | (0.00) | (0.03) | (0.00) |
| Sauger | 0.06 | 0.00 | 0.08 | 0.00 |
| | (0.03) | (0.00) | (0.05) | (0.00) |
| Freshwater drum | 0.73 | 0.04 | 1.00 | 0.46 |
| | (0.55) | (0.04) | (0.79) | (0.21) |

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 day electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | SCB | TWZ |
|---|---|---|
| Shortnose gar | 0.00 | 1.00 |
| | (0.00) | (0.44) |
| Bowfin | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Goldeye | 0.00 | 0.25 |
| | (0.00) | (0.13) |
| Skipjack herring | 0.60 | 2.33 |
| | (0.40) | (0.87) |
| Gizzard shad | 62.60 | 59.67 |
| | (23.55) | (21.08) |
| Threadfin shad | 0.80 | 6.42 |
| | (0.49) | (2.59) |
| Goldfish | 0.00 | 1.33 |
| | (0.00) | (0.45) |
| Grass carp | 1.20 | 0.08 |
| | (0.97) | (0.08) |
| Red shiner | 0.40 | 0.00 |
| | (0.24) | (0.00) |
| Common carp | 10.00 | 7.75 |
| | (2.77) | (2.56) |
| Goldfish x carp | 0.00 | 0.42 |
| | (0.00) | (0.29) |
| Emerald shiner | 0.60 | 6.08 |
| | (0.24) | (5.72) |
| Silverband shiner | 0.40 | 0.17 |
| | (0.40) | (0.11) |
| Bluntnose minnow | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Bullhead minnow | 0.20 | 0.00 |
| | (0.20) | (0.00) |
| River carpsucker | 0.20 | 0.17 |
| | (0.20) | (0.11) |
| Smallmouth buffalo | 4.40 | 12.67 |
| | (2.04) | (5.34) |
| Bigmouth buffalo | 12.40 | 2.92 |
| | (7.94) | (0.99) |
| Black buffalo | 0.40 | 0.17 |
| | (0.24) | (0.11) |
| Unidentified buffalo | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| Golden redhorse | 0.00 | 0.17 |
| | (0.00) | (0.11) |
| Shorthead redhorse | 0.80 | 1.00 |
| | (0.58) | (0.58) |
| Yellow bullhead | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Channel catfish | 0.60 | 0.58 |
| | (0.40) | (0.29) |
| Flathead catfish | 0.60 | 0.50 |
| | (0.24) | (0.26) |
| Western mosquitofish | 0.20 | 0.00 |
| | (0.20) | (0.00) |
| Brook silverside | 0.20 | 0.08 |
| | (0.20) | (0.08) |
| White bass | 5.60 | 32.83 |
| | (0.68) | (7.87) |
| Yellow bass | 0.60 | 0.83 |
| | (0.60) | (0.32) |
| Striped bass | 0.00 | 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 6.4.1. Mean catch-per-unit-effort and (standard error) for fishes collected by day electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | SCB | TWZ |
|---|---|---|
| | (0.00) | (0.11) |
| White bass x striped bass | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Green sunfish | 0.00 | 0.33 |
| | (0.00) | (0.19) |
| Bluegill | 9.80 | 25.92 |
| | (4.78) | (5.59) |
| Green sunfish x bluegill | 0.00 | 0.25 |
| | (0.00) | (0.13) |
| Smallmouth bass | 0.00 | 0.17 |
| | (0.00) | (0.11) |
| Largemouth bass | 5.00 | 12.25 |
| | (1.52) | (2.03) |
| White crappie | 0.20 | 3.75 |
| | (0.20) | (1.75) |
| Black crappie | 0.60 | 2.83 |
| | (0.60) | (0.66) |
| Logperch | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| Sauger | 0.20 | 2.92 |
| | (0.20) | (1.16) |
| Walleye | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| Freshwater drum | 2.20 | 0.83 |
| | (1.50) | (0.32) |

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 6.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | SCB | TWZ |
|---|---|---|
| Longnose gar | 0.50 | 0.11 |
| | (0.29) | (0.11) |
| Shortnose gar | 1.25 | 1.11 |
| | (0.95) | (0.87) |
| Goldeye | 0.00 | 0.44 |
| | (0.00) | (0.34) |
| Skipjack herring | 0.25 | 1.11 |
| | (0.25) | (0.70) |
| Gizzard shad | 23.75 | 88.33 |
| | (10.38) | (23.00) |
| Threadfin shad | 0.25 | 1.11 |
| | (0.25) | (0.51) |
| Goldfish | 0.00 | 0.44 |
| | (0.00) | (0.34) |
| Grass carp | 0.50 | 0.11 |
| | (0.50) | (0.11) |
| Common carp | 10.50 | 8.00 |
| | (3.18) | (3.55) |
| Golden shiner | 0.00 | 0.11 |
| | (0.00) | (0.11) |
| Emerald shiner | 0.50 | 0.33 |
| | (0.29) | (0.17) |
| Silverband shiner | 0.00 | 1.00 |
| | (0.00) | (1.00) |
| Bullhead minnow | 0.00 | 0.11 |
| | (0.00) | (0.11) |
| River carpsucker | 2.00 | 0.22 |
| | (0.71) | (0.15) |
| Smallmouth buffalo | 7.00 | 19.44 |
| | (2.08) | (8.34) |
| Bigmouth buffalo | 7.00 | 3.11 |
| | (1.35) | (1.49) |
| Black buffalo | 0.25 | 0.11 |
| | (0.25) | (0.11) |
| Unidentified buffalo | 0.00 | 0.11 |
| | (0.00) | (0.11) |
| Shorthead redhorse | 0.00 | 0.22 |
| | (0.00) | (0.15) |
| Channel catfish | 0.00 | 0.33 |
| | (0.00) | (0.33) |
| Tadpole madtom | 0.00 | 0.11 |
| | (0.00) | (0.11) |
| Flathead catfish | 0.75 | 1.11 |
| | (0.48) | (0.26) |
| Brook silverside | 0.25 | 0.22 |
| | (0.25) | (0.15) |
| White perch | 0.00 | 0.22 |
| | (0.00) | (0.22) |
| White bass | 4.25 | 53.67 |
| | (1.49) | (17.61) |
| Yellow bass | 0.00 | 0.78 |
| | (0.00) | (0.28) |
| Green sunfish | 0.00 | 0.22 |
| | (0.00) | (0.15) |
| Warmouth | 0.00 | 0.22 |
| | (0.00) | (0.15) |
| Bluegill | 12.25 | 14.44 |
| | (3.82) | (3.71) |
| Green sunfish x bluegill | 0.00 | 0.33 |

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 6.4.2. Mean catch-per-unit-effort and (standard error) for fishes collected by night electrofishing in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | SCB | TWZ |
|---|---|---|
| | (0.00) | (0.17) |
| Largemouth bass | 4.00 | 8.56 |
| | (2.48) | (5.39) |
| White crappie | 0.75 | 3.11 |
| | (0.48) | (1.83) |
| Black crappie | 2.00 | 1.11 |
| | (0.41) | (0.65) |
| Sauger | 0.00 | 2.22 |
| | (0.00) | (1.28) |
| Walleye | 0.00 | 0.22 |
| | (0.00) | (0.22) |
| Freshwater drum | 8.50 | 4.22 |
| | (2.78) | (1.62) |

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 6.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Longnose gar | 0.33 |
| | (0.14) |
| Shortnose gar | 1.17 |
| | (0.36) |
| Bowfin | 0.09 |
| | (0.09) |
| Goldeye | 0.08 |
| | (0.08) |
| Skipjack herring | 0.16 |
| | (0.11) |
| Gizzard shad | 12.47 |
| | (7.06) |
| Threadfin shad | 1.81 |
| | (1.06) |
| Common carp | 3.50 |
| | (1.93) |
| Goldfish x carp | 0.09 |
| | (0.09) |
| River carpsucker | 1.61 |
| | (0.79) |
| Quillback | 0.09 |
| | (0.09) |
| Highfin carpsucker | 0.09 |
| | (0.09) |
| Smallmouth buffalo | 6.18 |
| | (2.65) |
| Bigmouth buffalo | 0.51 |
| | (0.43) |
| Black buffalo | 0.08 |
| | (0.08) |
| Golden redhorse | 0.58 |
| | (0.33) |
| Shorthead redhorse | 1.36 |
| | (0.63) |
| Black bullhead | 0.24 |
| | (0.17) |
| Yellow bullhead | 0.08 |
| | (0.08) |
| Channel catfish | 0.33 |
| | (0.19) |
| Flathead catfish | 0.43 |
| | (0.30) |
| Northern pike | 0.08 |
| | (0.08) |
| White perch | 2.41 |
| | (1.20) |
| White bass | 33.12 |
| | (20.18) |
| Yellow bass | 2.10 |
| | (0.89) |
| Striped x white bass | 0.09 |
| | (0.09) |
| Bluegill | 13.04 |
| | (4.64) |
| Redear sunfish | 0.08 |
| | (0.08) |
| Largemouth bass | 0.17 |
| | (0.12) |
| White crappie | 7.61 |

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 6.4.3. Mean catch-per-unit-effort and (standard error) for fishes collected by fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| | (3.28) |
| Black crappie | 9.78 |
| | (4.63) |
| Sauger | 1.30 |
| | (0.86) |
| Walleye | 0.17 |
| | (0.12) |
| Freshwater drum | 7.70 |
| | (3.44) |

Strata:
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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 6.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | SCB | TWZ |
|---|---|---|
| Spotted gar | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| Longnose gar | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| Shortnose gar | 0.00 | 0.17 |
| | (0.00) | (0.12) |
| Skipjack herring | 0.69 | 0.09 |
| | (0.69) | (0.09) |
| Gizzard shad | 97.08 | 6.64 |
| | (53.55) | (2.90) |
| Threadfin shad | 6.70 | 0.25 |
| | (4.66) | (0.18) |
| Goldfish | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Red shiner | 0.50 | 0.00 |
| | (0.34) | (0.00) |
| Common carp | 0.69 | 0.25 |
| | (0.69) | (0.18) |
| Silver chub | 0.49 | 0.00 |
| | (0.34) | (0.00) |
| Golden shiner | 0.16 | 0.00 |
| | (0.16) | (0.00) |
| Emerald shiner | 1019.11 | 14.91 |
| | (999.65) | (13.64) |
| River shiner | 0.67 | 0.00 |
| | (0.67) | (0.00) |
| Spottail shiner | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| Silverband shiner | 1.70 | 1.26 |
| | (0.82) | (0.85) |
| Bullhead minnow | 0.34 | 0.17 |
| | (0.34) | (0.17) |
| River carpsucker | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Unidentified buffalo | 0.00 | 1.18 |
| | (0.00) | (1.18) |
| Black bullhead | 0.35 | 0.56 |
| | (0.35) | (0.38) |
| Yellow bullhead | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| Brown bullhead | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Channel catfish | 0.51 | 0.49 |
| | (0.35) | (0.22) |
| Tadpole madtom | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| Pirate perch | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| Blackstripe topminnow | 0.33 | 0.00 |
| | (0.33) | (0.00) |
| Western mosquitofish | 1.15 | 0.08 |
| | (0.53) | (0.08) |
| Brook silverside | 0.64 | 0.00 |
| | (0.48) | (0.00) |
| White bass | 3.50 | 10.07 |
| | (1.77) | (8.84) |
| Yellow bass | 0.16 | 0.00 |
| | (0.16) | (0.00) |
| Green sunfish | 0.00 | 0.16 |

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 6.4.4. Mean catch-per-unit-effort and (standard error) for fishes collected by mini fyke netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | SCB | TWZ |
|---|---|---|
| | (0.00) | (0.11) |
| Warmouth | 0.00 | 0.67 |
| | (0.00) | (0.29) |
| Orangespotted sunfish | 0.00 | 0.17 |
| | (0.00) | (0.11) |
| Bluegill | 21.86 | 4.94 |
| | (18.38) | (1.43) |
| Green sunfish x bluegill | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Largemouth bass | 0.65 | 0.49 |
| | (0.48) | (0.19) |
| White crappie | 1.68 | 1.84 |
| | (0.93) | (1.49) |
| Black crappie | 0.65 | 0.94 |
| | (0.32) | (0.51) |
| Mud darter | 0.00 | 1.28 |
| | (0.00) | (1.04) |
| Logperch | 0.33 | 4.21 |
| | (0.21) | (3.85) |
| Slenderhead darter | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| Sauger | 0.00 | 1.76 |
| | (0.00) | (1.26) |
| Freshwater drum | 659.18 | 0.26 |
| | (656.08) | (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 6.4.5. Mean catch-per-unit-effort and (standard error) for fishes collected by small hoop netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error. 

| Common name | SCB | TWZ |
|---|---|---|
| Gizzard shad | 0.00 | 0.04 |
| | (0.00) | (0.04) |
| Common carp | 2.08 | 3.02 |
| | (1.36) | (1.14) |
| Smallmouth buffalo | 0.00 | 0.42 |
| | (0.00) | (0.38) |
| Brown bullhead | 0.00 | 0.04 |
| | (0.00) | (0.04) |
| Channel catfish | 0.17 | 0.04 |
| | (0.17) | (0.04) |
| Flathead catfish | 0.08 | 0.00 |
| | (0.08) | (0.00) |
| Freshwater drum | 0.08 | 0.17 |
| | (0.08) | (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 6.4.6. Mean catch-per-unit-effort and (standard error) for fishes collected by large hoop netting in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | SCB | TWZ |
|---|---|---|
| Gizzard shad | 0.00 (0.00) | 0.04 (0.04) |
| Grass carp | 0.00 (0.00) | 0.04 (0.04) |
| Common carp | 2.57 (1.36) | 6.86 (3.48) |
| Goldfish x carp | 0.00 (0.00) | 0.08 (0.06) |
| River carpsucker | 0.00 (0.00) | 0.66 (0.58) |
| Smallmouth buffalo | 0.50 (0.31) | 4.70 (1.69) |
| Black buffalo | 0.00 (0.00) | 0.08 (0.06) |
| Shorthead redhorse | 0.00 (0.00) | 0.04 (0.04) |
| Channel catfish | 0.00 (0.00) | 0.33 (0.11) |
| Flathead catfish | 0.17 (0.17) | 0.21 (0.14) |
| Freshwater drum | 0.25 (0.17) | 3.14 (1.34) |

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 seining in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | SCB |
|---|---|
| Shortnose gar | 0.17 |
| | (0.17) |
| Skipjack herring | 0.25 |
| | (0.18) |
| Gizzard shad | 10.17 |
| | (4.39) |
| Threadfin shad | 2.50 |
| | (1.62) |
| Silver chub | 0.08 |
| | (0.08) |
| Emerald shiner | 9.67 |
| | (2.59) |
| Silverband shiner | 0.33 |
| | (0.33) |
| Bullhead minnow | 1.33 |
| | (0.92) |
| River carpsucker | 0.08 |
| | (0.08) |
| Smallmouth buffalo | 0.33 |
| | (0.19) |
| Unidentified buffalo | 0.08 |
| | (0.08) |
| Channel catfish | 0.08 |
| | (0.08) |
| Blackstripe topminnow | 0.08 |
| | (0.08) |
| Western mosquitofish | 2.00 |
| | (0.73) |
| Brook silverside | 0.17 |
| | (0.11) |
| White bass | 1.17 |
| | (0.67) |
| Yellow bass | 0.08 |
| | (0.08) |
| Bluegill | 1.75 |
| | (1.09) |
| Largemouth bass | 0.17 |
| | (0.17) |
| White crappie | 0.08 |
| | (0.08) |
| Black crappie | 0.08 |
| | (0.08) |
| Sauger | 0.08 |
| | (0.08) |
| Freshwater drum | 0.25 |
| | (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 6.4.8. Mean catch-per-unit-effort and (standard error) for fishes collected by bottom trawling in the La Grange Pool of the Illinois River using fixed-site sampling during 1999. See text for definitions of catch-per-unit-effort and standard error.



| Common name | TWZ |
|---|---|
| Threadfin shad | 0.04 (0.04) |
| Common carp | 0.08 (0.06) |
| Channel catfish | 3.17 (2.13) |
| White bass | 0.04 (0.04) |
| Sauger | 0.04 (0.04) |
| Walleye | 0.13 (0.13) |
| Freshwater drum | 1.54 (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
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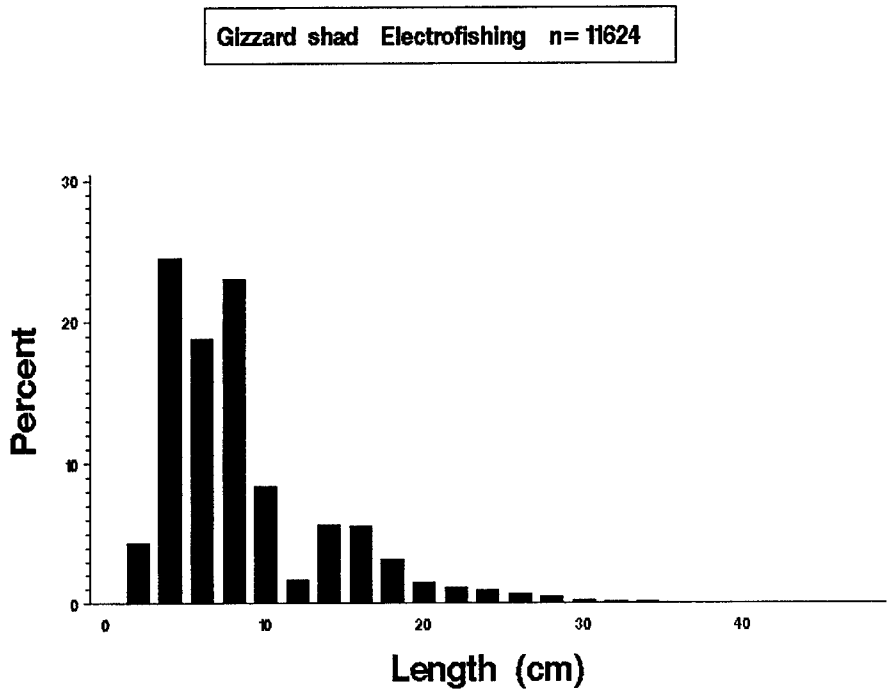


**Figure 6.2.** Length distributions (*length*) as a percentage of catch (*percent*) for gizzard shad (*Dorosoma cepedianum*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

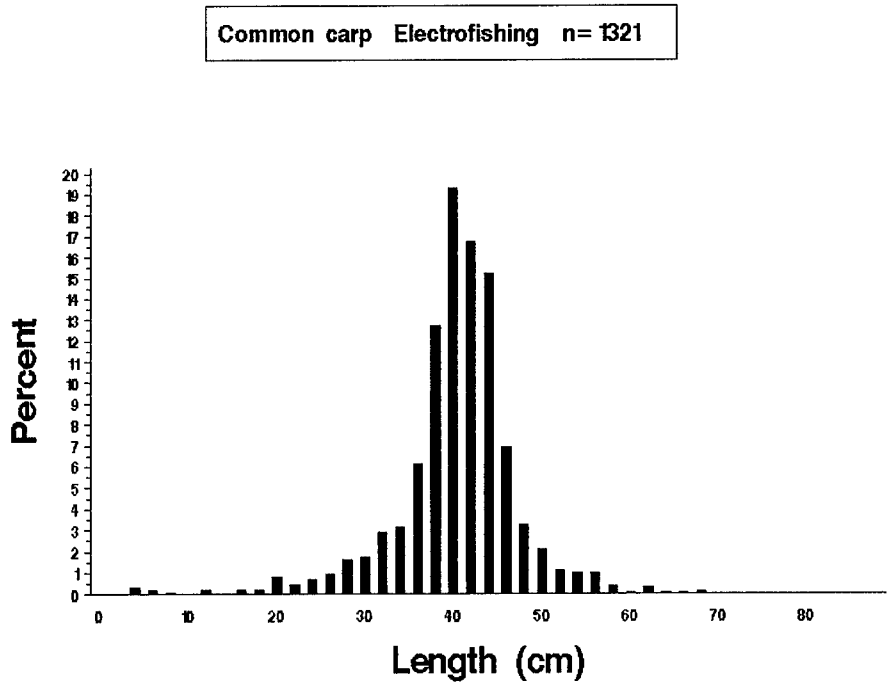


**Figure 6.3.** Length distributions (*length*) as a percentage of catch (*percent*) for common carp (*Cyprinus carpio*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

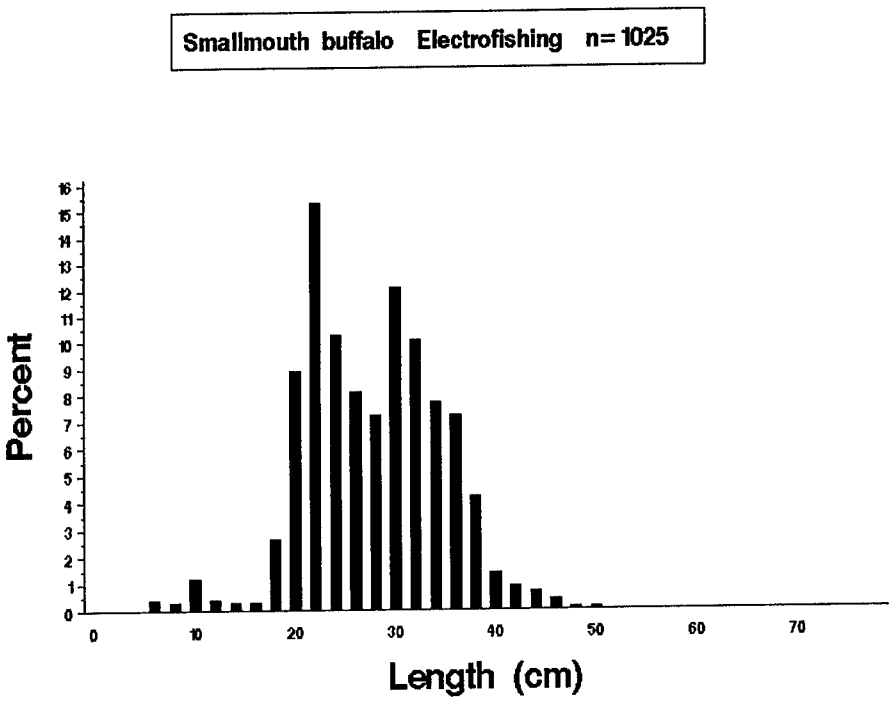


**Figure 6.4.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

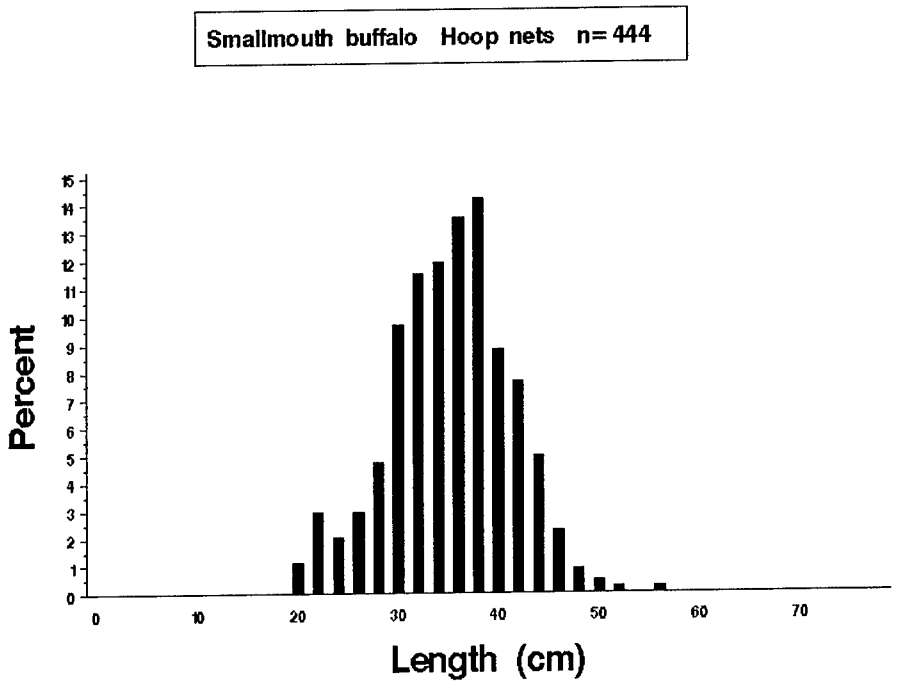


**Figure 6.5.** Length distributions (*length*) as a percentage of catch (*percent*) for smallmouth buffalo (*Ictiobus bubalus*) collected by small and large hoop netting in the Illinois River, La Grange Pool during 1999.

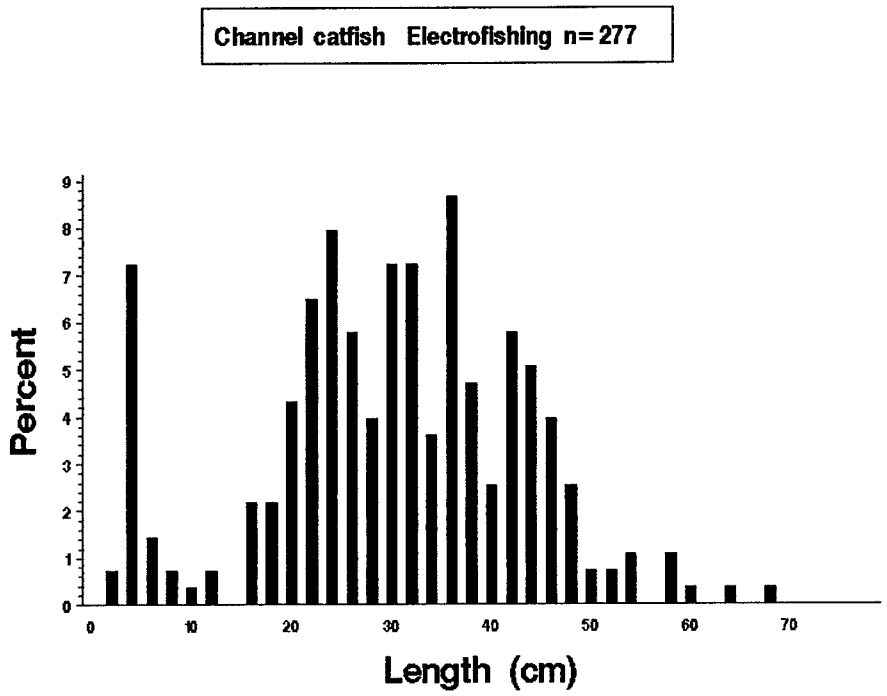


**Figure 6.6.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

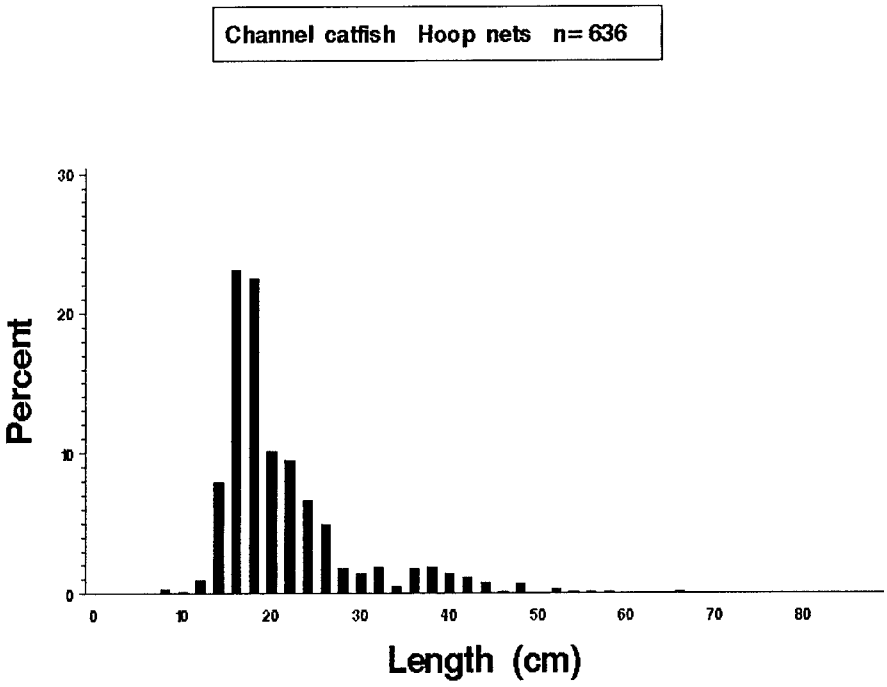


**Figure 6.7.** Length distributions (*length*) as a percentage of catch (*percent*) for channel catfish (*Ictalurus punctatus*) collected by small and large hoop netting in the Illinois River, La Grange Pool during 1999.

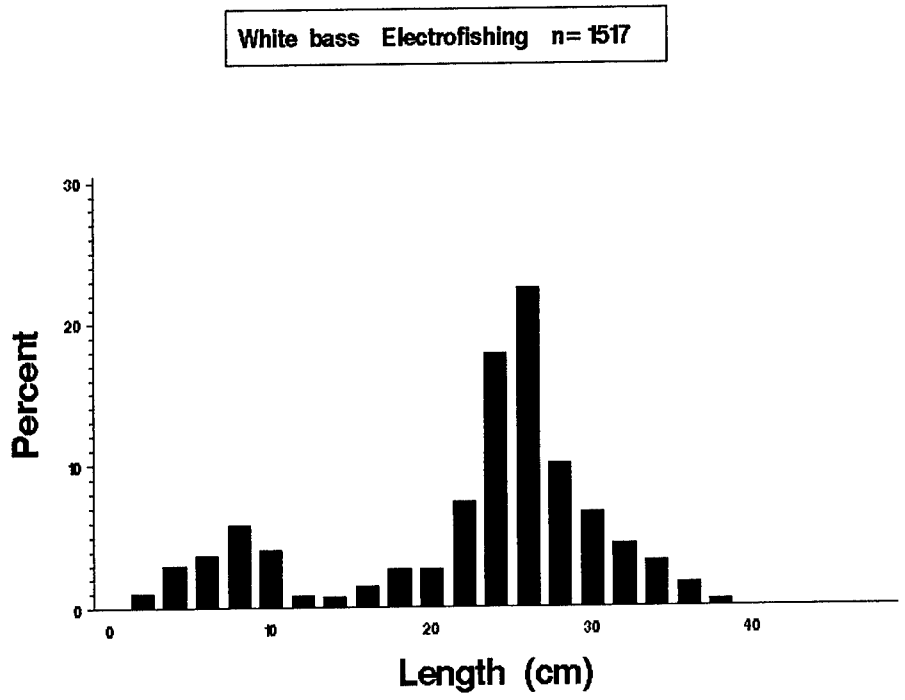


**Figure 6.8.** Length distributions (*length*) as a percentage of catch (*percent*) for white bass (*Morone chryops*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

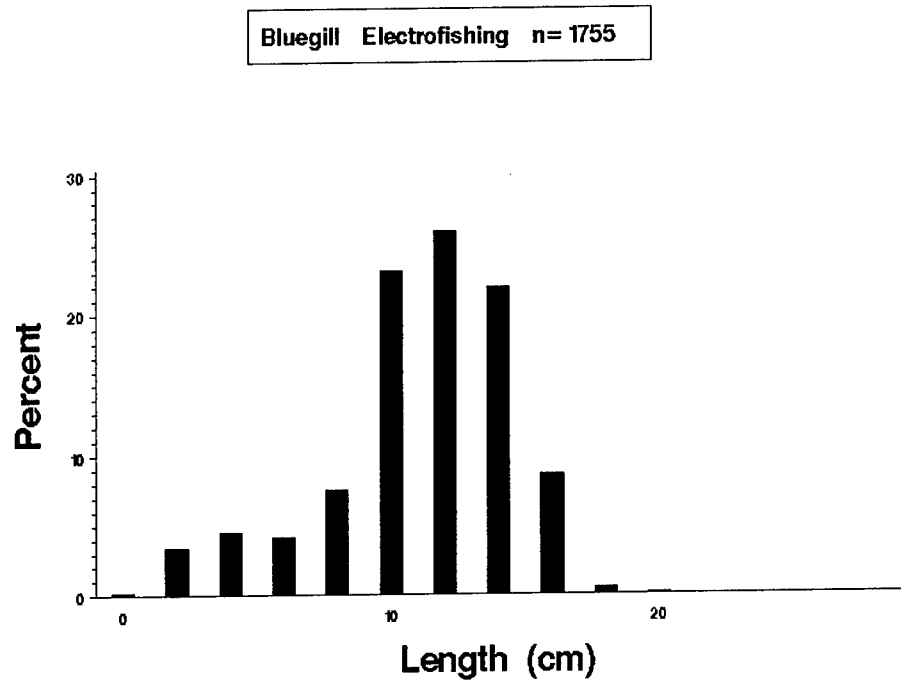


**Figure 6.9.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

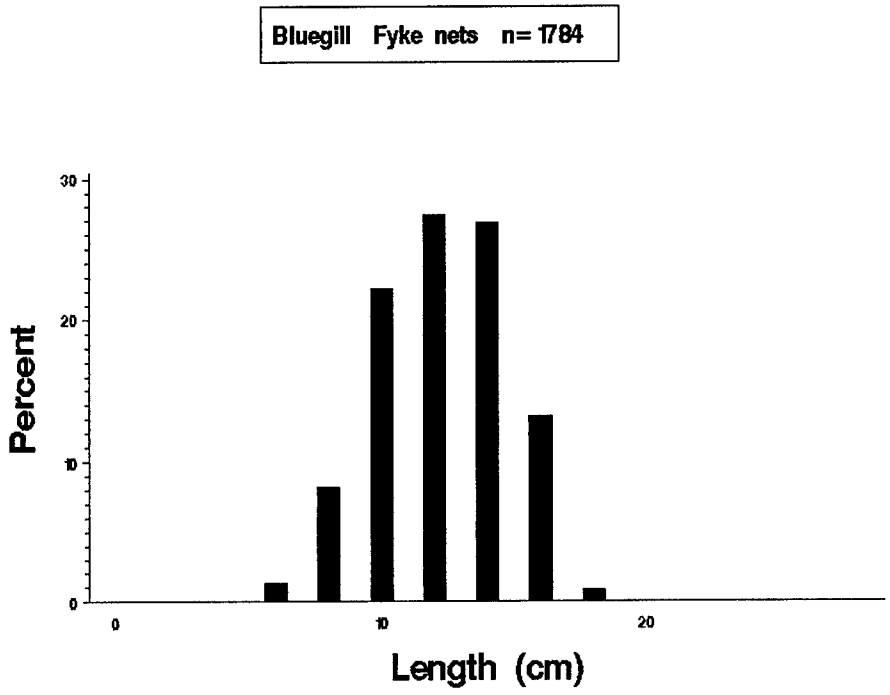


**Figure 6.10.** Length distributions (*length*) as a percentage of catch (*percent*) for bluegill (*Lepomis macrochirus*) collected by fyke netting in the Illinois River, La Grange Pool during 1999.

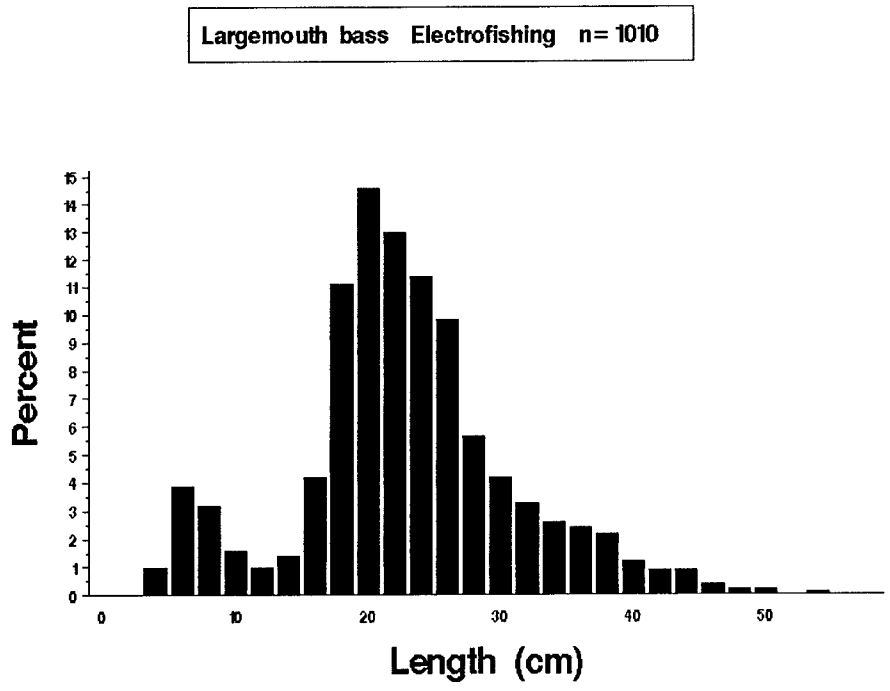


**Figure 6.11.** Length distributions (*length*) as a percentage of catch (*percent*) for largemouth bass (*Micropterus salmoides*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

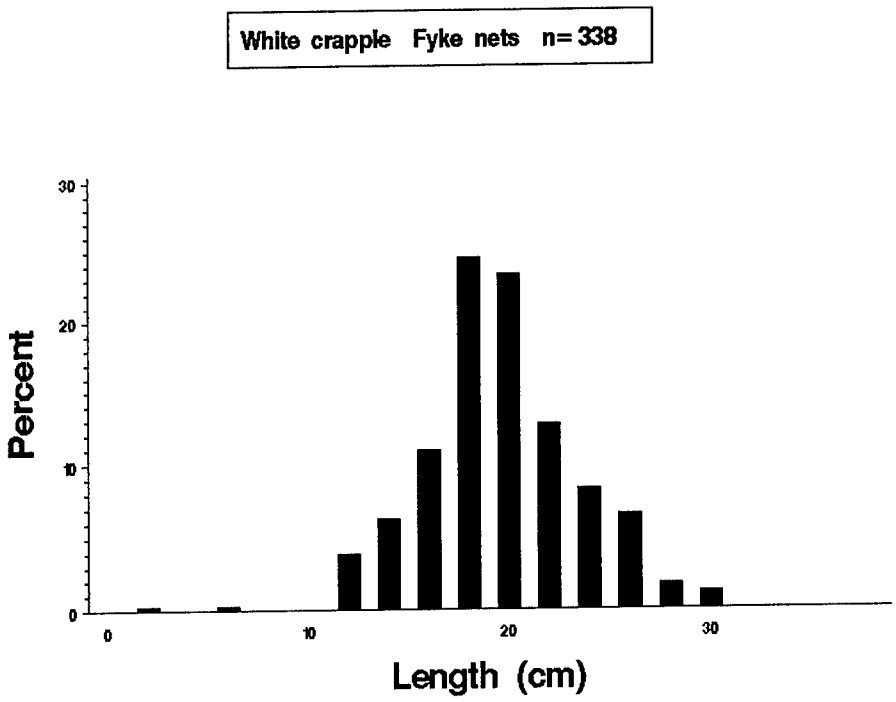


**Figure 6.12.** Length distributions (*length*) as a percentage of catch (*percent*) for white crappie (*Pomoxis annularus*) collected by fyke netting in the Illinois River, La Grange Pool during 1999.

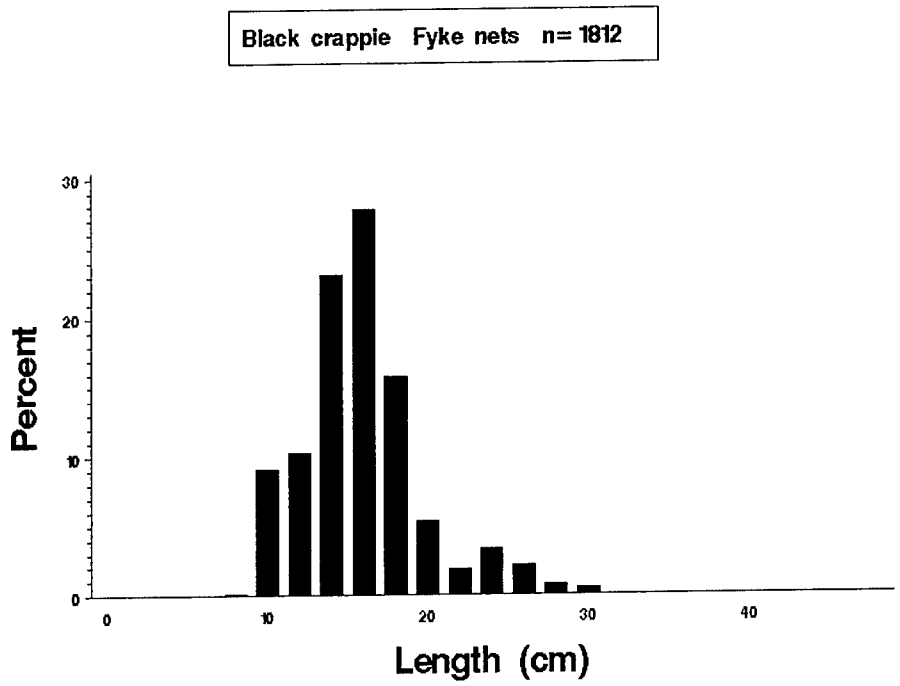


**Figure 6.13.** Length distributions (*length*) as a percentage of catch (*percent*) for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in the Illinois River, La Grange Pool during 1999.

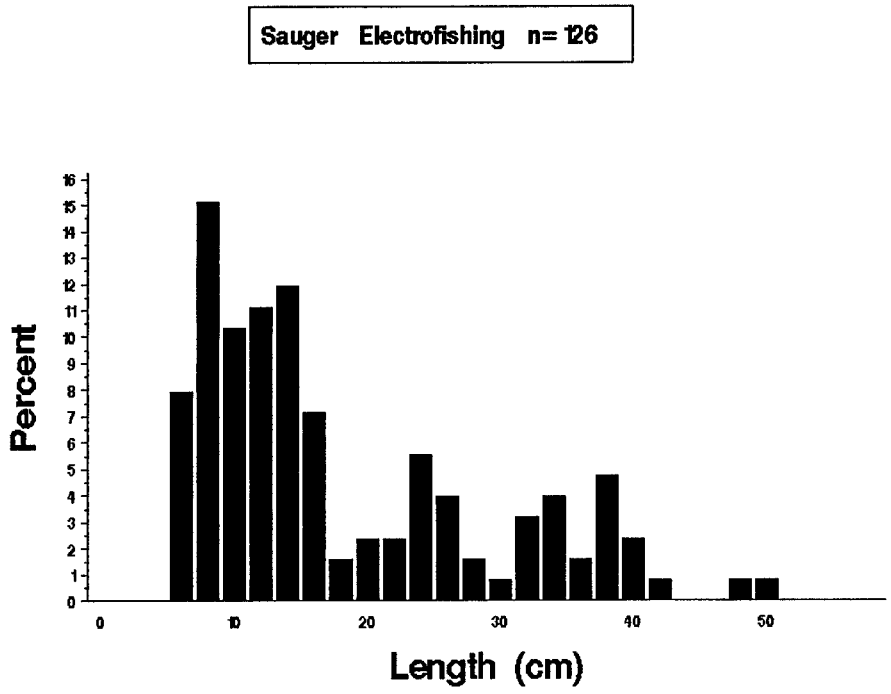


**Figure 6.14.** Length distributions (*length*) as a percentage of catch (*percent*) for sauger (*Stizostedion canadense*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

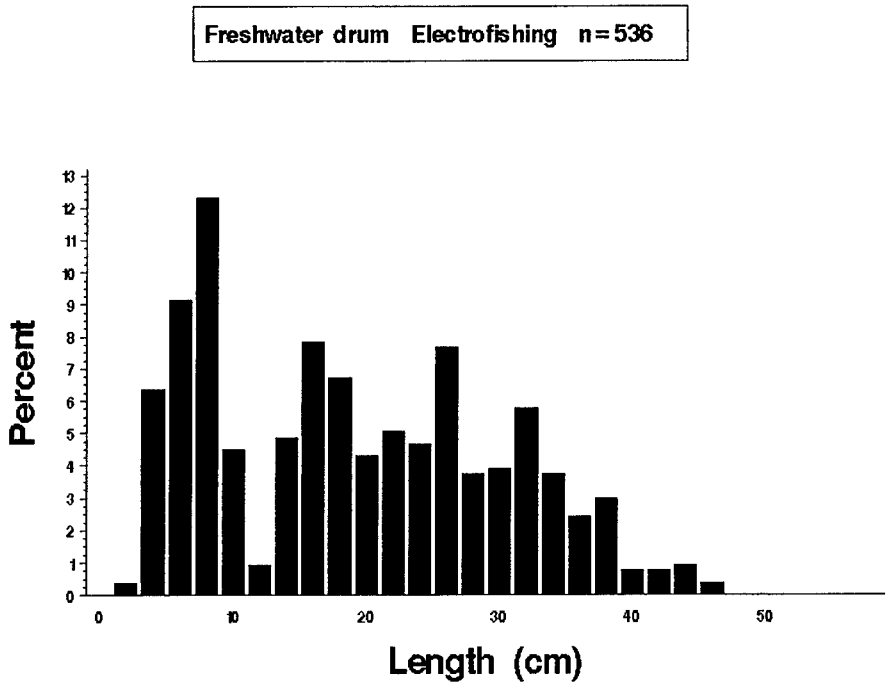


**Figure 6.15.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in the Illinois River, La Grange Pool during 1999.

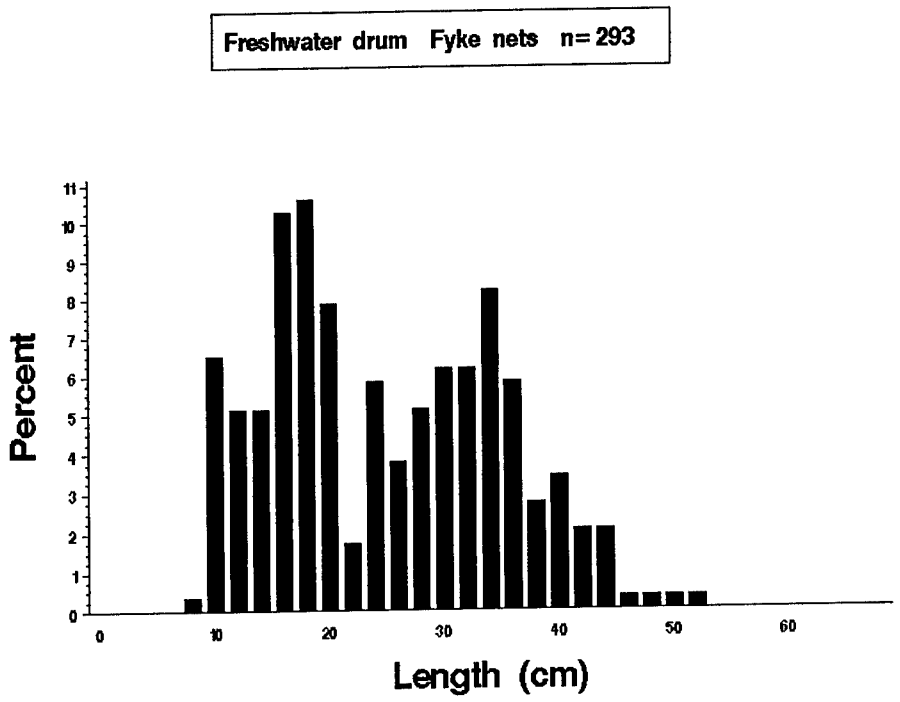


**Figure 6.16.** Length distributions (*length*) as a percentage of catch (*percent*) for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in the Illinois River, La Grange Pool during 1999.

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13. ABSTRACT (Maximum 200 words)

The Long Term Resource Monitoring Program (LTRMP) completed 2,692 collections of fishes from stratified random and permanently fixed sampling locations in six study reaches of the Upper Mississippi River System during 1999. Collection methods included day and night electrofishing, hoop netting, fyke netting (two net sizes), gill netting, seining, anchored trammel netting, and bottom trawling in selected 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.

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