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# 2003 Annual Status Report: A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

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fish_2003.pdf (5,448 KB)




Pool 4 | Pool 8 | Pool 13
La Grange | Pool 26 | Open River

# 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 containing a synthesis of data from fish

populations and communities in the Upper Mississippi River System. This report satisfies, 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.

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# Abstract

The Long Term Resource Monitoring Program (LTRMP) completed collections of fish from stratified random sampling and permanently fixed-site sampling in six study areas of the Upper Mississippi River System. Collection methods included day electrofishing, hoop netting, fyke netting (two net sizes), and bottom trawling in selected aquatic area classes. The six LTRMP study areas are Pools 4 (excluding Lake Pepin), 8, 13, and 26 of the Upper Mississippi River, an Open River (unimpounded) reach of the Mississippi River near Cape Girardeau, Missouri, and La Grange Pool of the Illinois River.

For each of the six LTRMP study areas, this report contains summaries by year 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. In 2003, sampling was reduced to only day electrofishing for the three northern study reaches because of budget reductions. Funding from the National Great Rivers Research and Education Center, the Illinois Department of Natural Resources, and the Missouri Deptartment of Conservation allowed for complete LTRMP fish monitoring in Pool 26, Open River, and La Grange Pool (all gears, all sampling periods).

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

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# Introduction

This report summarizes 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.

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## Study areas for Long Term Resource Monitoring fish sampling


- Pool 4
- Pool 8
- Pool 13
- Pool 26
- Open River Reach
- La Grange Pool


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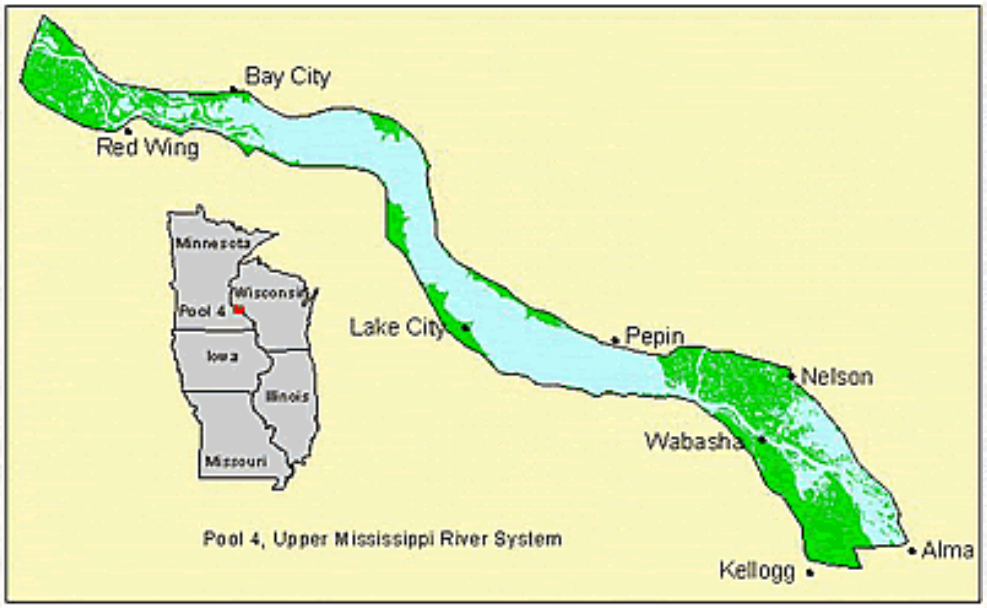
**Navigation Pool 4** is 73.3 km (44 river miles) long and includes 14,700 ha (36,300 acres) of aquatic habitat. It is located between Lock and Dam 3 (above Red Wing, Minnesota) and Lock and Dam 4 (Alma, Wisconsin). Major tributaries include the Cannon and Vermillion Rivers on the Minnesota side and the much larger Chippewa River on the Wisconsin side. Lake Pepin, a riverine lake created by the Chippewa River delta, is located in the middle of Pool 4. The location of Lake Pepin divides the rest of the pool into upper Pool 4 and lower Pool 4. The smaller backwaters of upper Pool 4 have been degraded by sedimentation, whereas the larger backwaters of lower Pool 4 are much better habitat for vegetation.



**Navigation Pool 8** is 38.8 km (23.3 river miles) long and is bounded by Lock and Dam 7 (Dresbach, Minnesota) to the north and Lock and Dam 8 (Genoa, Wisconsin) to the south. It encompasses 9,000 ha (22,100 acres) of aquatic habitat. Major tributaries include the Black, Root, and La Crosse Rivers. The upper section of Pool 8 has high bank islands adjacent to the main channel, deep secondary channels, and backwater sloughs. The middle section contains low islands, braided channels, and small backwater sloughs. The lower section is a large open expanse of water.


**Navigation Pool 13** is 52.1 km (34.2 river miles) in length and is bounded by Lock and Dam 12 (Bellevue, Iowa) to the north and Lock and Dam 13 (Fulton, Illinois) to the south. It encompasses 11,400 ha (28,100 acres) of aquatic habitat. Similar to pools upstream, Pool 13 contains many high bank islands adjacent to the main channel in the upper section, braided backwater channels and sloughs in the middle section, and a large open lake-like area in the lower section of the pool. Major tributaries include the Apple and Plum Rivers on the Illinois side and Maquoketa and Elk Rivers on the Iowa side.

**Navigation Pool 26** study area includes water bodies along the Upper Mississippi River from Lock and Dam 25 (Winfield, Missouri) to Lock and Dam 26 (Alton, Illinois) and the lower Illinois River from its confluence with the Mississippi River north to Illinois River mile 12. This reach of the two rivers is bordered by high bluffs on the Illinois side and low elevation floodplain on the Missouri side. The reach encompasses 9,500 ha (23,700 acres) of aquatic habitat. Presently, most of the backwaters of the lower Illinois River are isolated from the river by low levees so as to decrease sedimentation and allow management for waterfowl. Likewise, many of the secondary channels of the Mississippi River are isolated from the river on the upstream side to create backwaters and to reduce sedimentation.

The **Open River Reach** is 84 km (52 river miles) long. The study reach has approximately 7,241 ha (17,893 acres) of aquatic habitat in the form of open water, sand and mud flats, and swamps and marsh. The floodplain is extensively disconnected from the mainstem river by levees. Many of the islands are now joined to the mainland and most side channels contain closing structures and become disconnected from the mainstem at moderately low flows. This river reach is characterized by turbid water, high water velocities, and sand substrate; thus, the aquatic communities are dominated by more obligate riverine species than the pooled portion of the Upper Mississippi River. Major tributaries to the Open River Reach are the Little River Diversion Channel in Missouri and the Big Muddy Rivers and Cache River Diversion Channel in Illinois.


**La Grange Pool** on the Illinois River is about 130 km (80 river miles) long and encompasses 10,750 ha (26,500 acres) of aquatic habitat. It is bounded by Peoria Lock and Dam to the north and La Grange Lock and Dam to the south. This reach has the highest proportion of backwaters, except for Pool 4, but these backwaters are highly degraded by excessive sedimentation over the last 150 years. Many backwaters are isolated by low levees to enhance waterfowl habitat management. Major tributaries include the Sangmon, Mackinaw, and LaMoine Rivers.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# Methods

## *Sampling Methods*

The Long Term Resource Monitoring Program's (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 1. As water levels are often suspected of affecting fish populations and community stratum, hydrographs are provided for each study area and each year sampled.

We summarize the annual increment of fish data obtained by the LTRMP from stratified random and fixed-site sampling by year. 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 a 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.

From 1990 to 2001, the LTRMP used day and night electrofishing, fyke nets, mini fyke nets, small and large hoop nets, seines, gill nets, anchored trammel nets, and bottom trawls to sample fish in various strata. After an evaluation of the fish sampling gear deployment scheme (Ickes and Burkhardt 2002), the LTRMP eliminated the use of night electrofishing, seining in all strata, and offshore netting in impounded and backwater strata. The following is a summary of the sampling gears according to Gutreuter et al. (1995):

## *Electrofishing*

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

### *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.

### *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-lb] test) transparent nylon monofilament. The 25.4-cm mesh is woven from No. 12 (13.61-kg [30-lb] 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.

### *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-site sampling locations 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

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

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

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

where

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

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

In this report, *C/f* statistics are reported separately for the limited, fixed-site sampling and the primary stratified random sampling. Equation (1) is used to estimate means of data obtained from fixed-site sampling to maintain computational consistency. The pooled means from fixed-site sampling are not guaranteed unbiased because there is no assurance that the fixed sites were unbiased within the stratum. Equation (1) is also used to obtain estimates of overall mean *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 (fyke and tandem fyke netting), black crappie (fyke and tandem fyke netting), sauger (electrofishing), walleye (electrofishing), and freshwater drum (electrofishing; fyke and tandem fyke netting). Night electrofishing was eliminated in 2002 and, therefore, total catch may be lower for length distributions in years after 2001. The length data are illustrated in the form of histograms. 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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**Table 1.** List of fishes collected by the Long Term Resource Monitoring Program (1993–2003), 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 | | *Ichthyomyzon unicuspis* |
| Least brook lamprey | | *Lampetra aepyptera* |
| American brook lamprey | | *Lampetra appendix* |
| | **Acipenseridae** | |
| Lake sturgeon | | *Acipenser fulvescens* |
| Shovelnose sturgeon | | *Scaphirhynchus platorynchus* |
| Shovelnose sturgeon × pallid sturgeon hybrid | | *Scaphirhynchus platorynchus* × *S. albus* |
| | **Polyodontidae** | |
| Paddlefish | | *Polyodon spathula* |
| | **Lepisosteidae** | |
| Spotted gar | | *Lepisosteus oculatus* |
| Longnose gar | | *Lepisosteus osseus* |
| Longnose gar x spotted gar hybrid | | *Lepisosteus osseus x L. oculatus* |
| Shortnose gar | | *Lepisosteus platostomus* |
| | **Amiidae** | |
| Bowfin | | *Amia calva* |
| | **Hiodontidae** | |
| Goldeye | | *Hiodon alosoides* |
| Mooneye | | *Hiodon tergisus* |
| | **Anguillidae** | |
| American eel | | *Anguilla rostrata* |

| | **Clupeidae** | |
|---|---|---|
| Skipjack herring | | *Alosa chrysochloris* |
| Gizzard shad | | *Dorosoma cepedianum* |
| Threadfin shad | | *Dorosoma petenense* |
| | **Cyprinidae** | |
| Central stoneroller | | *Campostoma anomalum* |
| Goldfish | | *Carassius auratus* |
| Grass carp | | *Ctenopharyngodon idella* |
| Red shiner | | *Cyprinella lutrensis* |
| Spotfin shiner | | *Cyprinella spiloptera* |
| Blacktail shiner | | *Cyprinella venusta* |
| Common carp | | *Cyprinus carpio* |
| Common carp × goldfish hybrid | | *Cyprinus carpio* × *Carassius auratus* |
| Brassy minnow | | *Hybognathus hankinsoni* |
| Mississippi silvery minnow | | *Hybognathus nuchalis* |
| Plains minnow | | *Hybognathus placitus* |
| Silver carp | | *Hypopthalmichthys molitrix* |
| Bighead carp | | *Hypopthalmichthys nobilis* |
| Striped shiner | | *Luxilus chrysocephalus* |
| Bleeding shiner | | *Luxilus zonatus* |
| Speckled chub | | *Macrhybopsis aestivalis* |
| Sturgeon chub | | *Macrhybopsis gelida* |
| Sicklefin chub | | *Macrhybopsis meeki* |
| Silver chub | | *Macrhybopsis storeriana* |
| Hornyhead chub | | *Nocomis biguttatus* |
| River chub | | *Nocomis micropogon* |
| Golden shiner | | *Notemigonus crysoleucas* |
| Bigeye chub | | *Notropis amblops* |
| Pallid shiner | | *Notropis amnis* |
| Emerald shiner | | *Notropis atherinoides* |
| River shiner | | *Notropis blennius* |
| Bigeye shiner | | *Notropis boops* |
| Ghost shiner | | *Notropis buchanani* |
| Bigmouth shiner | | *Notropis dorsalis* |
| Spottail shiner | | *Notropis hudsonius* |
| Silverband shiner | | *Notropis shumardi* |

| | | |
|---|---|---|
| Sand shiner | | *Notropis stramineus* |
| Weed shiner | | *Notropis texanus* |
| Mimic shiner | | *Notropis volucellus* |
| Channel shiner | | *Notropis wickliffi* |
| Pugnose minnow | | *Opsopoeodus emiliae* |
| Suckermouth minnow | | *Phenacobius mirabilis* |
| Southern redbelly dace | | *Phenacobius erythrogaster* |
| Bluntnose minnow | | *Pimephales notatus* |
| Fathead minnow | | *Pimephales promelas* |
| Bullhead minnow | | *Pimephales vigilax* |
| Blacknose dace | | *Rhinichthys atratulus* |
| Rudd | | *Scardinius erythrophthalmus* |
| Creek chub | | *Semotilus atromaculatus* |
| | **Catostomidae** | |
| River carpsucker | | *Carpiodes carpio* |
| Quillback | | *Carpiodes cyprinus* |
| Highfin carpsucker | | *Carpiodes velifer* |
| White sucker | | *Carpiodes commersoni* |
| Blue sucker | | *Cycleptus elongatus* |
| Northern hog sucker | | *Hypentelium nigricans* |
| Smallmouth buffalo | | *Ictiobus bubalus* |
| Bigmouth buffalo | | *Ictiobus cyprinellus* |
| Black buffalo | | *Ictiobus niger* |
| Spotted sucker | | *Minytrema melanops* |
| Silver redhorse | | *Moxostoma anisurum* |
| River redhorse | | *Moxostoma carinatum* |
| Golden redhorse | | *Moxostoma erythrurum* |
| Shorthead redhorse | | *Moxostoma macrolepidotum* |
| | **Ictaluridae** | |
| Black bullhead | | *Ameiurus melas* |
| Yellow bullhead | | *Ameiurus natalis* |
| Brown bullhead | | *Ameiurus nebulosus* |
| Blue catfish | | *Ictalurus furcatus* |
| Channel catfish | | *Ictalurus punctatus* |
| Stonecat | | *Noturus flavus* |
| Tadpole madtom | | *Noturus gyrinus* |

| | | |
|---|---|---|
| Freckled madtom | | *Noturus nocturnus* |
| Flathead catfish | | *Pylodictis olivaris* |
| | **Esocidae** | |
| Grass pickerel | | *Esox americanus vermiculatus* |
| Northern pike | | *Esox lucius* |
| Muskellunge | | *Esox masquinongy* |
| Tiger muskellunge | | *Esox masquinongy* × *E. lucius* |
| | **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* |
| | **Gadidae** | |
| Burbot | | *Lota lota* |
| | **Cyprinodontidae** | |
| Starhead topminnow | | *Fundulus dispar* |
| Blackstripe topminnow | | *Fundulus notatus* |
| Blackspotted topminnow | | *Fundulus olivaceus* |
| | **Poeciliidae** | |
| Western mosquitofish | | *Gambusia affinis* |
| | **Atherinidae** | |
| Brook silverside | | *Labidesthes sicculus* |
| Inland silverside | | *Menidia beryllina* |
| | **Gasterosteidae** | |
| Brook stickleback | | *Culaea inconstans* |
| | **Percichthyidae** | |
| White perch | | *Morone americana* |
| White perch x yellow bass hybrid | | *Morone americana x M. mississippiensis* |
| White bass | | *Morone chrysops* |
| White bass x striped bass hybrid | | *Morone chryops x M. saxatilis* |

| | | |
|---|---|---|
| Yellow bass | | *Morone mississippiensis* |
| Striped bass | | *Morone saxatilis* |
| | **Centrarchidae** | |
| Rock bass | | *Ambloplites rupestris* |
| Flier | | *Centrarchus macropterus* |
| Green sunfish | | *Lepomis cyanellus* |
| Pumpkinseed | | *Lepomis gibbosus* |
| Warmouth | | *Lepomis gulosus* |
| Orangespotted sunfish | | *Lepomis humilis* |
| Bluegill | | *Lepomis macrochirus* |
| Longear sunfish | | *Lepomis megalotis* |
| Redear sunfish | | *Lepomis microlophus* |
| Redspotted sunfish | | *Lepomis miniatus* |
| Green sunfish × pumpkinseed hybrid | | *Lepomis cyanellus* × *L. gibbosus* |
| Green sunfish × warmouth hybrid | | *Lepomis cyanellus* × *L. gulosus* |
| Green sunfish × orangespotted sunfish hybrid | | *Lepomis cyanellus* × *L. humilis* |
| Green sunfish × bluegill hybrid | | *Lepomis cyanellus* × *L. macrochirus* |
| Pumpkinseed × warmouth hybrid | | *Lepomis gibbosus* × *L. gulosus* |
| Pumpkinseed × orangespotted sunfish hybrid | | *Lepomis gibbosus* × *L. humilis* |
| Pumpkinseed × bluegill hybrid | | *Lepomis gibbosus* × *L. macrochirus* |
| Bluegill × warmouth | | *Lepomis macrochirus* × *L. gulosus* |
| Bluegill × orangespotted sunfish hybrid | | *Lepomis macrochirus* × *L. humilis* |
| Bluegill × longear sunfish hybrid | | *Lepomis macrochirus* × *L. megalotis* |
| Bluegill × redear sunfish hybrid | | *Lepomis macrochirus* × *L. microlophus* |
| Smallmouth bass | | *Micropterus dolomieu* |
| Spotted bass | | *Micropterus punctulatus* |
| Largemouth bass | | *Micropterus salmoides* |
| White crappie | | *Pomoxis annularis* |
| Black crappie | | *Pomoxis nigromaculatus* |
| Black crappie x white crappie hybrid | | *Pomoxis annularis x P. nigromaculatus* |
| | **Percidae** | |
| Crystal darter | | *Crystallaria asprella* |
| Western sand darter | | *Ammocrypta clara* |

| | | |
|---|---|---|
| Mud darter | | *Etheostoma asprigene* |
| Greenside darter | | *Etheostoma blennioides* |
| Bluntnose darter | | *Etheostoma chlorosomum* |
| Iowa darter | | *Etheostoma exile* |
| Fantail darter | | *Etheostoma flabellare* |
| Slough darter | | *Etheostoma gracile* |
| Johnny darter | | *Etheostoma nigrum* |
| Orangethroat darter | | *Etheostoma spectabile* |
| Banded darter | | *Etheostoma zonale* |
| Yellow perch | | *Perca flavescens* |
| Logperch | | *Percina caprodes* |
| Blackside darter | | *Percina maculata* |
| Slenderhead darter | | *Percina phoxocephala* |
| Dusky darter | | *Percina sciera* |
| River darter | | *Percina shumardi* |
| Sauger | | *Stizostedion canadense* |
| Walleye | | *Stizostedion vitreum* |
| Sauger × walleye hybrid | | *Stizostedion canadense* × *S. vitreum* |
| | **Sciaenidae** | |
| Freshwater drum | | *Aplodinotus grunniens* |
| | **Mugilidae** | |
| Striped mullet | | *Mugil cephalus* |

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Content manager: Jennie Sauer

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# LTRMP Fish Component Program Sampling History

The table below outlines major changes in the sampling scheme for the Long Term Resource Monitoring Program's (LTRMP) fish component from its initiation in 1989 to the present. As a responsible monitoring program charged with providing scientifically defensible data to UMRS natural resource managers and scientists, some of the changes presented below represent modifications that enhance the program's ability to provide useful, timely, relevant, and defensible information. In these instances, detailed and extensive study has occurred, program partnership consensus was sought, and changes are fully documented. However, sometimes, various short-term modifications were implemented to achieve annual budget compliance in years of fiscal attrition. Some degree of study was always conducted to minimize impacts that these largely unpredictable, budgetary driven changes necessitated. However, these changes are not well documented, except in annual work planning documents.

| Sampling year | Change | Source | Narrative |
|---|---|---|---|
| 1989 | Initiate monitoring | Lubinski, K. S., and J. L. Rasmussen. 1988. Procedures Manual of the Long Term Resource Monitoring Program for the Upper Mississippi River System. U.S. Fish and Wildlife Service, Environmental Management Technical Center, Onalaska, Wisconsin. EMTC 88-03. 216 pp. (NTIS # PB94-145885)<br><br>Rasmussen, J. L., and J. H. Wlosinski. 1988 Operating Plan of the Long Term Resource Monitoring Program for the Upper | The Long Term Resource Monitoring Program (LTRMP) fish component monitoring is initiated under a fixed-site design in six study reaches (Pools 4, 8, 13, 26, and Open River and La Grange Pool). The primary purpose was community monitoring, necessitating the need for multiple gears. The years 1989 to 1993 can be considered pilot years in the program, used to evaluate the sampling design itself, as well as the methods |

| | | | |
|---|---|---|---|
| | | Mississippi River System. U. S. Fish and Wildlife Service, Environmental Management Technical Center, Onalaska, Wisconsin, January 1988. EMTC 88-01. 55 pp. (NTIS # PB88 169669/AS) | and protocols. |
| 1993 | Switch to stratified random sampling | Gutreuter, S. 1993. A statistical review of sampling of fishes in the Long Term Resource Monitoring Program. National Biological Survey, Environmental Management Technical Center, Onalaska, Wisconsin, December 1993. EMTC 93-T004. 15 pp. (NTIS # PB94-150828) | The LTRMP fish component sampling design was radically altered in 1993. Formerly, sampling was conducted under a fixed-site design with site-specific inferences. In 1993, a stratified random sampling design was implemented, ensuring unbiased estimates of species abundance at designed spatial scales (e.g., sampling strata—loosely aquatic area types—and study reaches: Pools 4, 8, 13, 26 and Open River and La Grange Pool) . |
| 2002 | Implement sampling efficiencies | Ickes, B. S., and R. W. Burkhardt. 2002. Evaluation and proposed refinement of the sampling design for the Long Term Resource Monitoring Program's fish component. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin, October 2002. LTRMP 2002-T001. 17 pp. + Appendixes A-E. CD-ROM included. (NTIS #PB2003-500042) | Environmental monitoring programs are frequently designed to track changes in key physical, chemical, and biological features of an ecosystem. As such, these programs provide critical information for detecting changes in system state, investigating ecological relations, and making resource management decisions. However, monitoring programs require significant investments of time, |

| | | | |
|---|---|---|---|
| | | | money, and human resources to implement and maintain. Periodic evaluations are necessary to assess whether the sampling design adequately addresses program goals and objectives, and whether adequate and useful information can continue to be provided for changing management and science needs. We evaluated the LTRMP sampling design for fish by analyzing data from stratified random samples collected from 1993 to 1999 in six trend analysis areas. Specifically, we investigated whether the sampling design could provide similar information with fewer sampling gears. Our goals were to identify and quantify information provided by each gear used to monitor fish in the LTRMP, develop alternative sampling design scenarios based on our analyses and expert opinion, and engage program partners in a discussion on the relative value of each gear within the present sampling design. We forwarded a proposal to systemically eliminate 4 of the 10 sampling gears presently used to |

| | | | |
|---|---|---|---|
| | | | monitor the status and trends in fish resources within the LTRMP. The four gears that were dropped uniformly across the program were night electrofishing, seining, tandem fyke nets, and tandem mini fyke nets. Dropping these gears also removed backwater contiguous offshore and impounded offshore sampling strata from the design. |
| 2003 | Budgetarily driven reduction in sampling In Pools 4 (Minnesota), 8 (Wisconsin), and 13 (Iowa), sampling was only performed during the third sampling period (September 15-October 31) using only day electrofishing. A full annual compliment of sampling effort was expended in Pool 26 (Illinois), Open River (Missouri), and La Grange Pool (Illinois). Full annual compliment occurred because the States of Illinois and Missouri paid for the effort. | Some information provided in the annual Scope of Work agreement.<br><br>Available online at http://www.umesc.usgs.gov/ltrmp.html#documents | Budget-driven rescission. Selection of day electrofishing in period 3 was predicated on studies that have demonstrated day electrofishing to be the best overall gear for community profiling and single species detection and enumeration. Choice of period 3 was largely predicated on logistics. |

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# Pool 4, Upper Mississippi River
# 2003 Fish Collection Summary

This report is a bullet summary of the Long Term Resource Monitoring Program's (LTRMP)fish collection efforts conducted by the Lake City Field Station on Pool 4, Upper Mississippi River during 2003. Information on changes in fish catch over all years can be obtained from the Graphical Fish Database Browser.

- 28 fish collections were conducted using day electrofishing (Table 2.1).
- Water levels were below the long-term mean from mid-January to late April (Figure 1.1). From April to May, water levels fluctuated above and below the long-term mean. Water levels rose significantly above the long-term mean for period 1. During periods 2 and 3, water levels remained below the long-term average.
- Of the 28 fish collections, 26 were from randomly selected sites, and 2 were from fixed sites. The reduction in fish collections and gear types from the previous year were because of the elimination of sampling during periods 1 and 2, and the reduction of sampling during period 3 to only day electrofishing.
- Side channel borders, backwaters, and main channel borders received equivalent sampling effort (Table 2.1).
- 2,470 fish, representing 48 species and 3 hybrids, were collected (Table 3.1).
- Historical fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 4. To date, the Lake City Field Station has collected a total of 89 species and 5 hybrids.
- During the 2003 fish sampling season, the three species with the highest total catch were as follows: 729 gizzard shad, 312 largemouth bass, and 300 emerald shiners.
- Mean catch-per-unit-effort and standard effort for fish collected by day

electrofishing using stratified random (Table 4.1) and fixed-site sampling (Table 14.1) for each stratum are shown.

- Length distributions for selected species of fish are shown in Figures 1 to 17.

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**Table 2.1** Allocation of fish sampling effort among strata in Pool 4 of the Upper Mississippi River during 2003. Table entries are numbers of successfully completed standardized monitoring collections.

**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 |

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

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**Figure 1.1** Daily water surface elevation from Lock and Dam 3 for Pool 4, Upper Mississippi River, during 2003 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).

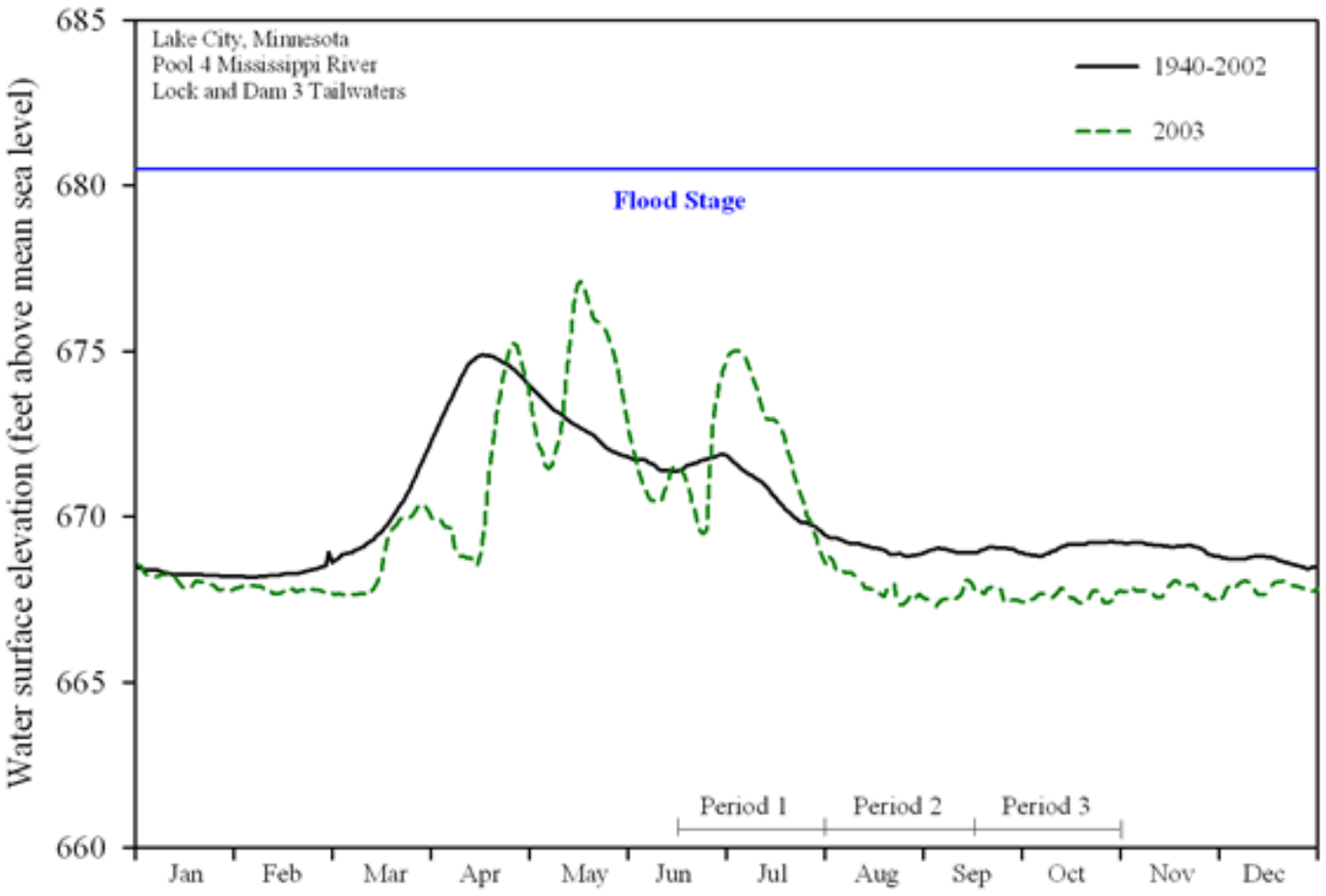

**Table 3.1** Total catches, by gear type, of fish collected in Pool 4 of the Upper Mississippi River during 2003. See Table 2.1 for the list of sampling gears actually deployed in this study reach.

| Species | Common name | Scientific name | D | F | M | HS | HL | T | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Chestnut lamprey | *Ichthyomyzon castaneus* | 1 | - | - | - | - | - | 1 |
| 2 | Silver lamprey | *I. unicuspis* | 1 | - | - | - | - | - | 1 |
| 3 | Least brook lamprey | *Lampetra aepyptera* | 1 | - | - | - | - | - | 1 |
| 4 | Longnose gar | *Lepisosteus osseus* | 1 | - | - | - | - | - | 1 |
| 5 | Bowfin | *Amia calva* | 9 | - | - | - | - | - | 9 |
| 6 | Mooneye | *Hiodon tergisus* | 2 | - | - | - | - | - | 2 |
| 7 | Gizzard shad | *Dorosoma cepedianum* | 729 | - | - | - | - | - | 729 |
| 8 | Spotfin shiner | *Cyprinella spiloptera* | 20 | - | - | - | - | - | 20 |
| 9 | Common carp | *Cyprinus carpio* | 124 | - | - | - | - | - | 124 |
| 10 | Emerald shiner | *Notropis atherinoides* | 300 | - | - | - | - | - | 300 |
| 11 | River shiner | *N. blennius* | 4 | - | - | - | - | - | 4 |
| 12 | Spottail shiner | *N. hudsonius* | 12 | - | - | - | - | - | 12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | Sand shiner | *N. stramineus* | 2 | - | - | - | - | - | 2 |
| 14 | Mimic shiner | *N. volucellus* | 2 | - | - | - | - | - | 2 |
| 15 | Pugnose minnow | *Opsopoeodus emiliae* | 11 | - | - | - | - | - | 11 |
| 16 | Bluntnose minnow | *Pimephales notatus* | 2 | - | - | - | - | - | 2 |
| 17 | Bullhead minnow | *P. vigilax* | 4 | - | - | - | - | - | 4 |
| 18 | River carpsucker | *Carpiodes carpio* | 4 | - | - | - | - | - | 4 |
| 19 | Quillback | *C. cyprinus* | 7 | - | - | - | - | - | 7 |
| 20 | White sucker | *Catostomus commersoni* | 5 | - | - | - | - | - | 5 |
| 21 | Smallmouth buffalo | *Ictiobus bubalus* | 8 | - | - | - | - | - | 8 |
| 22 | Bigmouth buffalo | *I. cyprinellus* | 2 | - | - | - | - | - | 2 |
| 23 | Spotted sucker | *Minytrema melanops* | 47 | - | - | - | - | - | 47 |
| 24 | Silver redhorse | *Moxostoma anisurum* | 49 | - | - | - | - | - | 49 |
| 25 | River redhorse | *M. carinatum* | 16 | - | - | - | - | - | 16 |
| 26 | Golden redhorse | *M. erythrurum* | 18 | - | - | - | - | - | 18 |
| 27 | Shorthead redhorse | *M. macrolepidotum* | 93 | - | - | - | - | - | 93 |
| 28 | Unidentified sucker | Unidentified *Catostomidae* | 10 | - | - | - | - | - | 10 |
| 29 | Yellow bullhead | *Ameiurus natalis* | 1 | - | - | - | - | - | 1 |
| 30 | Channel catfish | *Ictalurus punctatus* | 5 | - | - | - | - | - | 5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 31 | Northern pike | *Esox lucius* | 12 | - | - | - | - | - | 12 |
| 32 | Brook silverside | *Labidesthes sicculus* | 6 | - | - | - | - | - | 6 |
| 33 | White bass | *Morone chrysops* | 23 | - | - | - | - | - | 23 |
| 34 | Rock bass | *Ambloplites rupestris* | 17 | - | - | - | - | - | 17 |
| 35 | Green sunfish | *Lepomis cyanellus* | 5 | - | - | - | - | - | 5 |
| 36 | Pumpkinseed | *L. gibbosus* | 3 | - | - | - | - | - | 3 |
| 37 | Bluegill | *L. macrochirus* | 239 | - | - | - | - | - | 239 |
| 38 | Green x pumpkinseed sunfish | *L. cyanellus x gibbosus* | 1 | - | - | - | - | - | 1 |
| 39 | Green x bluegill sunfish | *L. cyanellus x macrochirus* | 2 | - | - | - | - | - | 2 |
| 40 | Pumpkinseed x bluegill | *L. gibbosus x macrochirus* | 3 | - | - | - | - | - | 3 |
| 41 | Smallmouth bass | *Micropterus dolomieu* | 111 | - | - | - | - | - | 111 |
| 42 | Largemouth bass | *M. salmoides* | 312 | - | - | - | - | - | 312 |
| 43 | White crappie | *Pomoxis annularis* | 1 | - | - | - | - | - | 1 |
| 44 | Black crappie | *P. nigromaculatus* | 44 | - | - | - | - | - | 44 |
| 45 | Johnny darter | *Etheostoma nigrum* | 1 | - | - | - | - | - | 1 |
| 46 | Yellow perch | *Perca flavescens* | 75 | - | - | - | - | - | 75 |
| 47 | Logperch | *Percina caprodes* | 72 | - | - | - | - | - | 72 |
| 48 | Slenderhead darter | *P. phoxocephala* | 2 | - | - | - | - | - | 2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 49 | River darter | *P. shumardi* | 2 | - | - | - | - | - | 2 |
| 50 | Sauger | *Stizostedion canadense* | 8 | - | - | - | - | - | 8 |
| 51 | Walleye | *S. vitreum* | 24 | - | - | - | - | - | 24 |
| 52 | Freshwater drum | *Aplodinotus grunniens* | 17 | - | - | - | - | - | 17 |
| | | | **2470** | **0** | **0** | **0** | **0** | **0** | **2470** |

**Sampling gears:**
**D - Day electrofishing**
**F - Fyke netting**
**M - Mini fyke netting**
**HS - Small hoop netting**
**HL - Large hoop netting**
**T- Trawling**

*Last updated on May 6, 2004*
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# Pool 4 Tables

| Table* | Stratified Random Sampling |
|---|---|
| 4.1 | Mean catch-per-unit-effort for fish collected by day electrofishing |
| | **Fixed-Site Sampling** |
| 14.1 | Mean catch-per-unit-effort for fish collected by day electrofishing |
| *Table numbers are not always in sequence because some gears were not fished in some study areas. Table numbers for each gear type are consistent among study areas. | |

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**Table 4.1** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Pool 4 of the Upper Mississippi River using stratified random sampling during 2003. 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 Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | MCBU | MCBW | SCB |
|---|---|---|---|---|---|
| **Chestnut lamprey** | 0.03 | | 0.13 | | |
| | (0.03) | | (0.13) | | |
| **Silver lamprey** | 0.04 | | | | 0.13 |
| | (0.04) | | | | (0.13) |
| **Least brook lamprey** | 0.05 | 0.13 | | | |
| | (0.05) | (0.13) | | | |
| **Longnose gar** | 0.05 | 0.13 | | | |
| | (0.05) | (0.13) | | | |
| **Bowfin** | 0.39 | 0.50 | 0.38 | | 0.25 |
| | (0.16) | (0.27) | (0.38) | | (0.16) |
| **Mooneye** | 0.08 | | | | 0.25 |

| | | | | | |
|---|---|---|---|---|---|
| | (0.05) | | | | (0.16) |
| **Gizzard shad** | 19.88 | 0.75 | 52.00 | 10.50 | 20.50 |
| | (10.34) | (0.75) | (37.72) | (10.50) | (13.50) |
| **Spotfin shiner** | 0.75 | 0.25 | 0.50 | | 1.63 |
| | (0.25) | (0.25) | (0.38) | | (0.65) |
| **Common carp** | 4.80 | 4.88 | 3.00 | 1.00 | 6.13 |
| | (1.83) | (3.12) | (1.09) | (1.00) | (3.81) |
| **Emerald shiner** | 6.81 | 0.13 | 24.50 | | 2.00 |
| | (5.75) | (0.13) | (22.97) | | (1.86) |
| **River shiner** | 0.15 | | 0.13 | | 0.38 |
| | (0.12) | | (0.13) | | (0.38) |
| **Spottail shiner** | 0.48 | | | | 1.50 |
| | (0.44) | | | | (1.36) |
| **Sand shiner** | 0.06 | | 0.25 | | |
| | (0.06) | | (0.25) | | |
| **Mimic shiner** | 0.03 | | 0.13 | | |
| | (0.03) | | (0.13) | | |
| **Pugnose minnow** | 0.52 | 0.75 | | | 0.63 |
| | (0.36) | (0.75) | | | (0.50) |
| **Bluntnose minnow** | 0.09 | 0.13 | | | 0.13 |
| | (0.07) | (0.13) | | | (0.13) |

| | | | | | |
|---|---|---|---|---|---|
| **Bullhead minnow** | 0.08 | | | | 0.25 |
| | (0.05) | | | | (0.16) |
| **River carpsucker** | 0.11 | | 0.13 | 0.50 | 0.25 |
| | (0.09) | | (0.13) | (0.50) | (0.25) |
| **Quillback** | 0.18 | | 0.25 | 0.50 | 0.38 |
| | (0.10) | | (0.25) | (0.50) | (0.26) |
| **White sucker** | 0.24 | 0.38 | | | 0.25 |
| | (0.14) | (0.26) | | | (0.25) |
| **Smallmouth buffalo** | 0.31 | | 0.13 | | 0.88 |
| | (0.28) | | (0.13) | | (0.88) |
| **Bigmouth buffalo** | 0.11 | 0.25 | | | |
| | (0.07) | (0.16) | | | |
| **Spotted sucker** | 2.24 | 3.38 | | | 2.50 |
| | (0.98) | (1.69) | | | (2.08) |
| **Silver redhorse** | 1.00 | 0.25 | 1.38 | 11.00 | 1.63 |
| | (0.22) | (0.16) | (0.38) | (6.00) | (0.60) |
| **River redhorse** | 0.09 | | 0.13 | 7.00 | 0.13 |
| | (0.05) | | (0.13) | (7.00) | (0.13) |
| **Golden redhorse** | 0.62 | 0.63 | 0.25 | 2.00 | 0.88 |

| | | | | | |
|---|---|---|---|---|---|
| | (0.25) | (0.50) | (0.16) | (1.00) | (0.40) |
| **Shorthead redhorse** | 2.26 | 1.13 | 2.75 | 16.50 | 3.25 |
| | (0.64) | (0.67) | (1.01) | (0.50) | (1.61) |
| **Unidentified sucker** | 0.27 | | 0.75 | 0.50 | 0.25 |
| | (0.14) | | (0.53) | (0.50) | (0.16) |
| **Yellow bullhead** | 0.04 | | | | 0.13 |
| | (0.04) | | | | (0.13) |
| **Channel catfish** | 0.21 | 0.13 | | | 0.50 |
| | (0.17) | (0.13) | | | (0.50) |
| **Northern pike** | 0.49 | 0.38 | 0.38 | | 0.75 |
| | (0.16) | (0.26) | (0.18) | | (0.31) |
| **Brook silverside** | 0.27 | 0.63 | | | |
| | (0.18) | (0.42) | | | |
| **White bass** | 0.63 | 0.13 | 0.38 | | 1.50 |
| | (0.40) | (0.13) | (0.26) | | (1.24) |
| **Rock bass** | 0.80 | 1.25 | 0.25 | | 0.63 |
| | (0.45) | (1.00) | (0.25) | | (0.38) |
| **Green sunfish** | 0.27 | 0.63 | | | |
| | (0.27) | (0.63) | | | |
| **Pumpkinseed** | 0.15 | 0.25 | | | 0.13 |
| | (0.08) | (0.16) | | | (0.13) |

| | | | | | |
|---|---|---|---|---|---|
| **Bluegill** | 10.21 | 16.50 | 1.75 | | 8.50 |
| | (3.45) | (7.73) | (1.24) | | (2.95) |
| **Green x pumpkinseed sunfish** | 0.05 | 0.13 | | | |
| | (0.05) | (0.13) | | | |
| **Pumpkinseed x bluegill** | 0.16 | 0.38 | | | |
| | (0.11) | (0.26) | | | |
| **Smallmouth bass** | 3.03 | 1.50 | 7.25 | 7.00 | 1.75 |
| | (0.59) | (1.10) | (1.10) | (6.00) | (0.70) |
| **Largemouth bass** | 11.51 | 14.50 | 8.63 | | 9.88 |
| | (2.62) | (5.15) | (3.44) | | (3.54) |
| **White crappie** | 0.04 | | | | 0.13 |
| | (0.04) | | | | (0.13) |
| **Black crappie** | 1.91 | 1.88 | 0.75 | | 2.88 |
| | (0.56) | (0.69) | (0.49) | | (1.43) |
| **Johnny darter** | 0.03 | | 0.13 | | |
| | (0.03) | | (0.13) | | |
| **Yellow perch** | 3.17 | 2.75 | 1.25 | | 5.25 |
| | (0.81) | (0.70) | (1.00) | | (2.22) |
| **Logperch** | 1.45 | | 5.63 | 1.00 | 0.13 |
| | (0.99) | | (3.96) | (1.00) | (0.13) |

| | | | | | |
|---|---|---|---|---|---|
| **Slenderhead darter** | 0.03 | | 0.13 | | |
| | (0.03) | | (0.13) | | |
| **Sauger** | 0.22 | | 0.25 | | 0.50 |
| | (0.14) | | (0.25) | | (0.38) |
| **Walleye** | 0.75 | 1.00 | 0.13 | 3.00 | 0.88 |
| | (0.45) | (1.00) | (0.13) | (2.00) | (0.40) |
| **Freshwater drum** | 0.61 | 0.50 | 0.63 | 1.00 | 0.75 |
| | (0.17) | (0.27) | (0.26) | (1.00) | (0.31) |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 14.1** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Pool 4 of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | MCBW |
|---|---|
| **Gizzard shad** | 61.00 |
| | (7.00) |
| **Spotfin shiner** | 0.50 |
| | (0.50) |
| **Common carp** | 5.00 |
| | (2.00) |
| **Emerald shiner** | 43.50 |
| | (4.50) |
| **Mimic shiner** | 0.50 |
| | (0.50) |
| **Bullhead minnow** | 1.00 |
| | (1.00) |
| **Quillback** | 0.50 |
| | (0.50) |

| | |
|---|---|
| **Silver redhorse** | 0.50 |
| | (0.50) |
| **Shorthead redhorse** | 1.50 |
| | (1.50) |
| **Unidentified sucker** | 0.50 |
| | (0.50) |
| **Brook silverside** | 0.50 |
| | (0.50) |
| **White bass** | 3.50 |
| | (0.50) |
| **Bluegill** | 12.50 |
| | (11.50) |
| **Green x bluegill sunfish** | 1.00 |
| | (1.00) |
| **Smallmouth bass** | 6.50 |
| | (5.50) |
| **Largemouth bass** | 24.00 |
| | (5.00) |
| **Yellow perch** | 0.50 |
| | (0.50) |
| **Logperch** | 12.00 |
| | (6.00) |
| **Slenderhead darter** | 0.50 |

| | |
|---|---|
| | (0.50) |
| **River darter** | 1.00 |
| | (1.00) |
| **Sauger** | 1.00 |
| | (1.00) |
| **Walleye** | 1.00 |
| | (1.00) |

**Sampling stratum:**
**MCBW - Main channel border, wing dam**

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# Length Distributions for all Study Reaches

Length distributions as a percentage of catch for selected species of interest collected by the Long Term Resource Monitoring Program. Fish species are listed in phylogenetical order following Robins et al. (1991) nomenclature. 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 because of local interest, while others were omitted (reach dependent). Scientific names for the species listed can be found in Table 1.

| Figure | Species | Method |
|---|---|---|
| 1 | Gizzard shad | Electrofishing |
| 2 | Common carp | Electrofishing |
| 3 | Smallmouth buffalo | Electrofishing |
| 4 | Smallmouth buffalo | Hoop netting |
| 5 | Channel catfish | Electrofishing |
| 6 | Channel catfish | Hoop netting |
| 7 | Northern pike | Electrofishing |
| 8 | White bass | Electrofishing |
| 9 | Bluegill | Electrofishing |
| 10 | Bluegill | Fyke netting |
| 11 | Largemouth bass | Electrofishing |
| 12 | White crappie | Fyke netting |
| 13 | Black crappie | Fyke netting |
| 14 | Sauger | Electrofishing |
| 15 | Walleye | Electrofishing |
| 16 | Freshwater drum | Electrofishing |
| 17 | Freshwater drum | Fyke netting |

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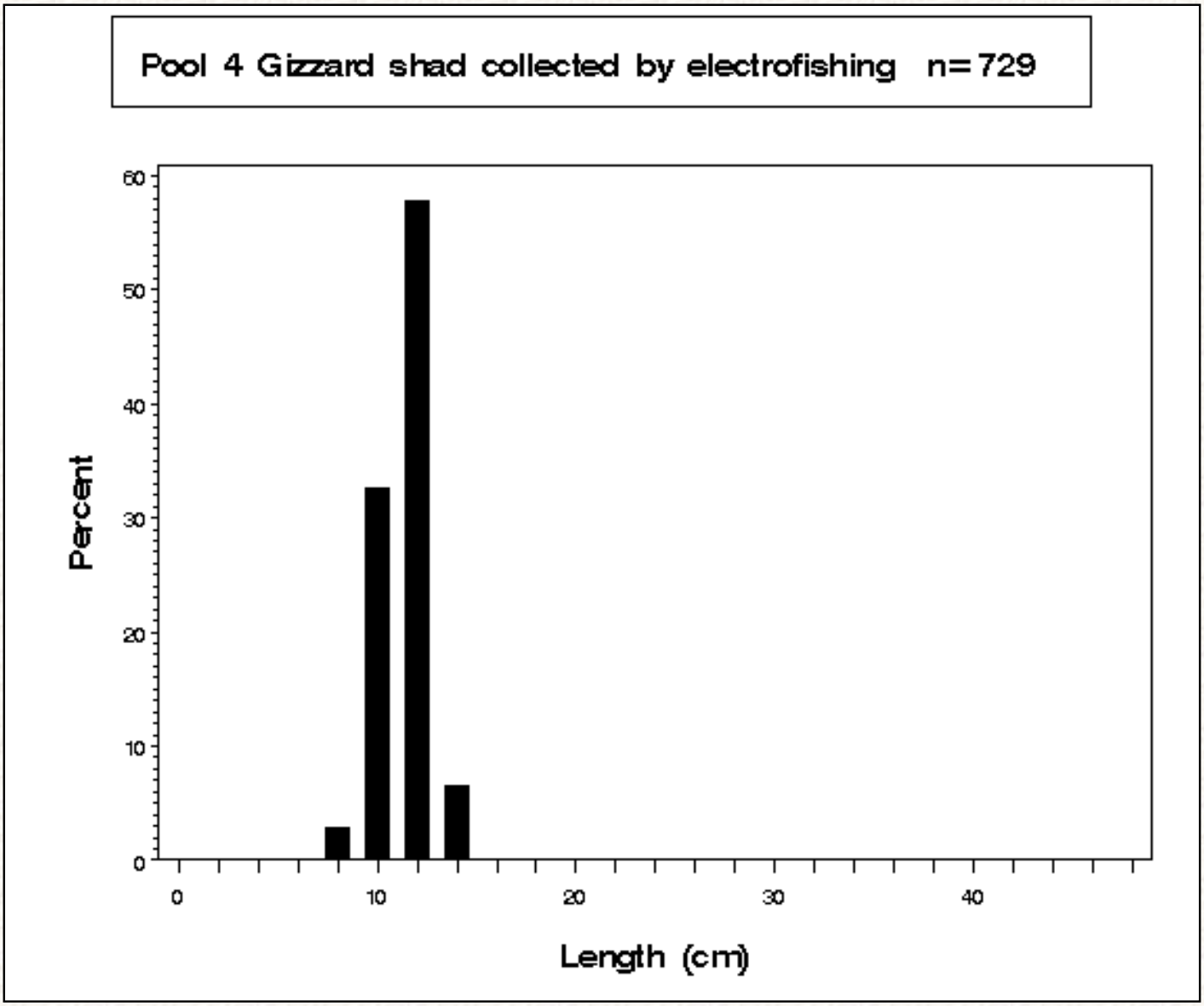
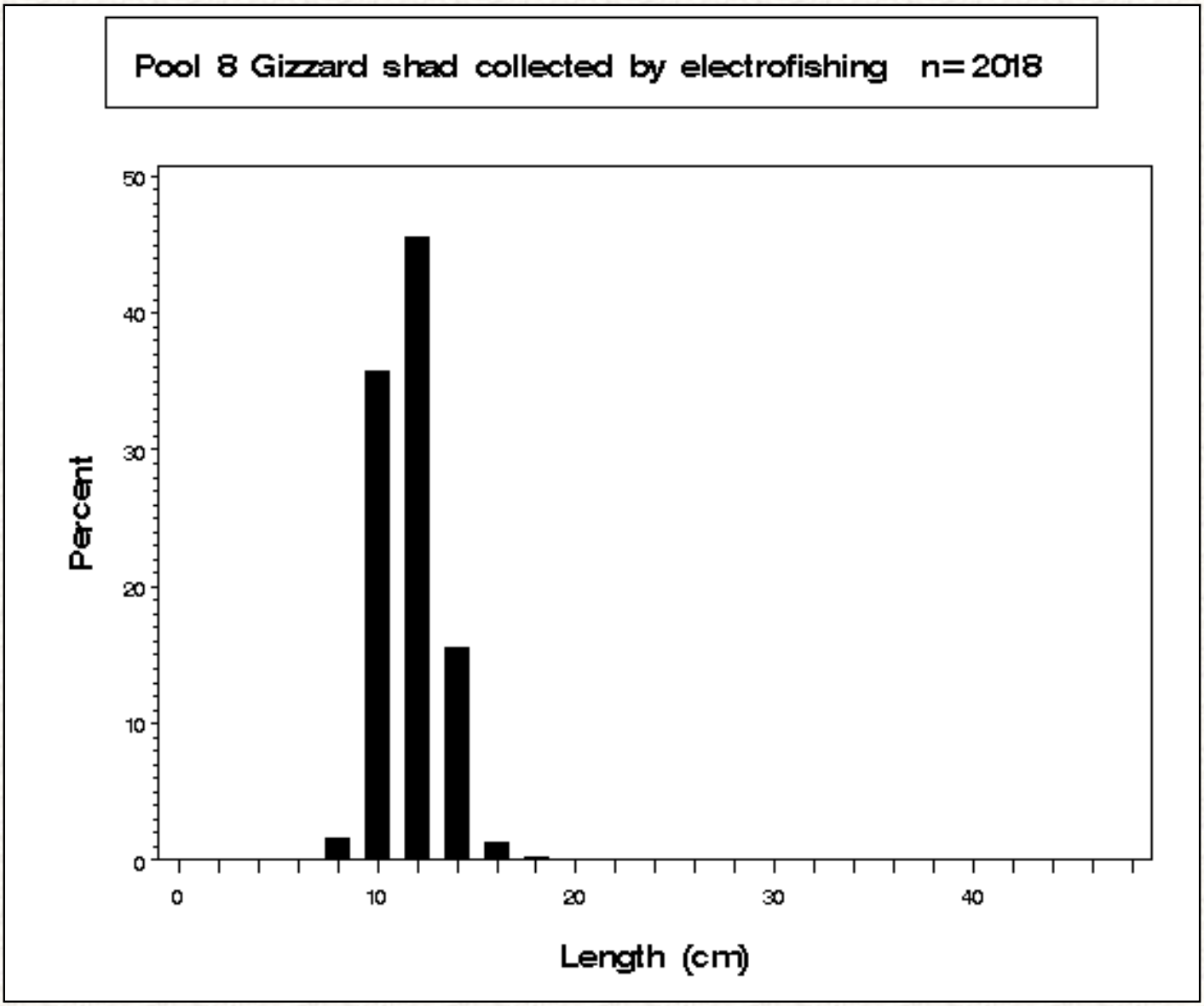
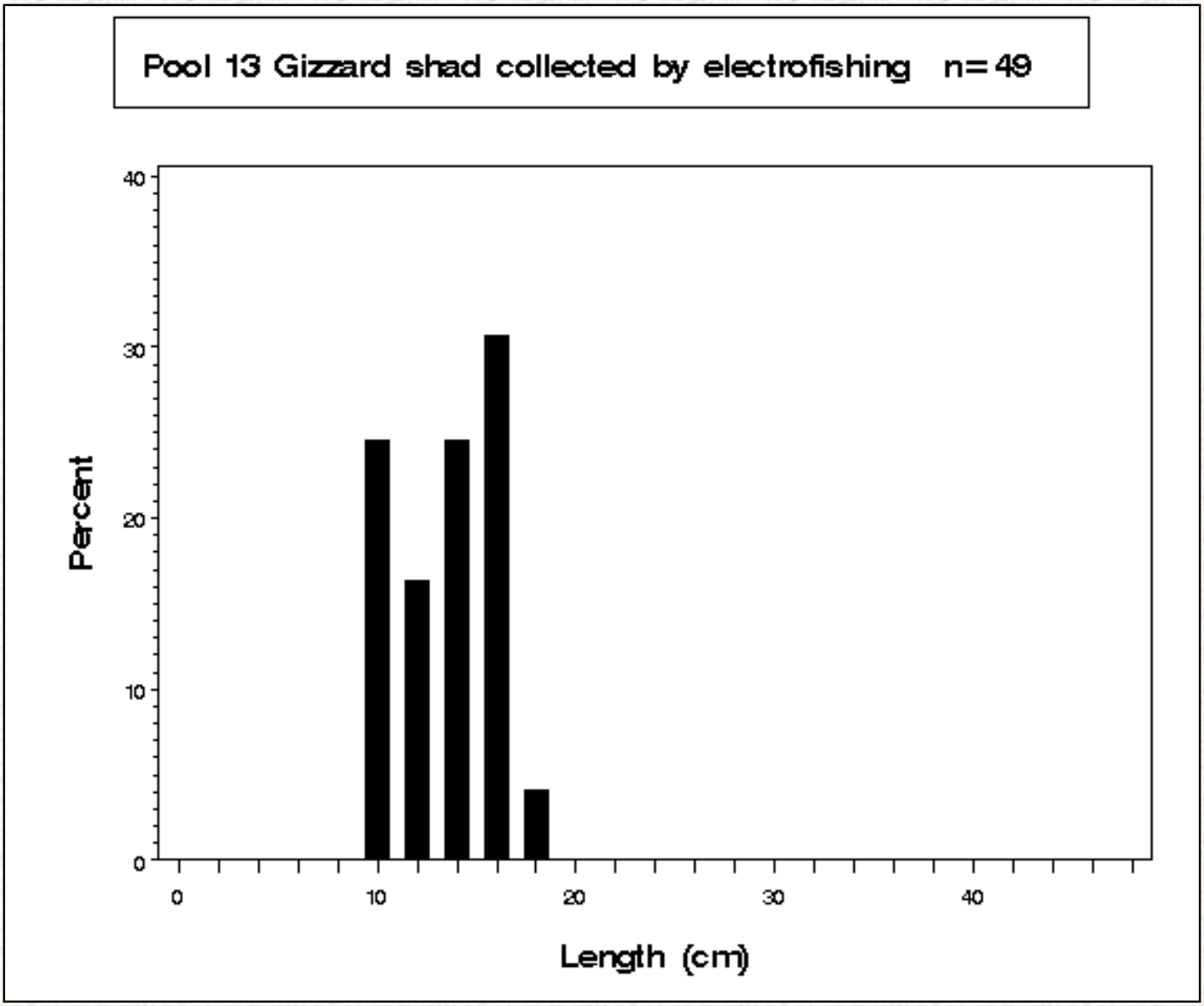
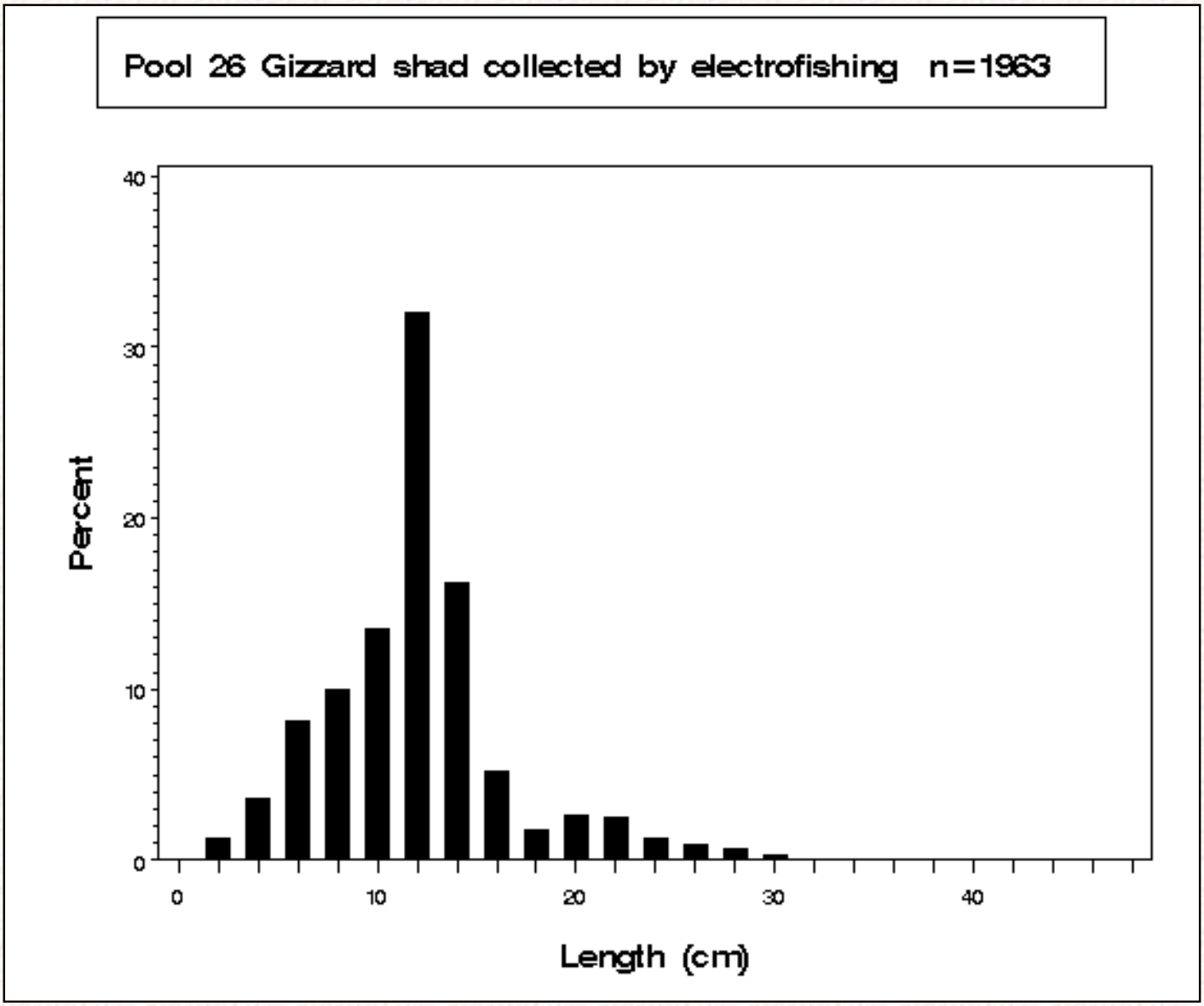
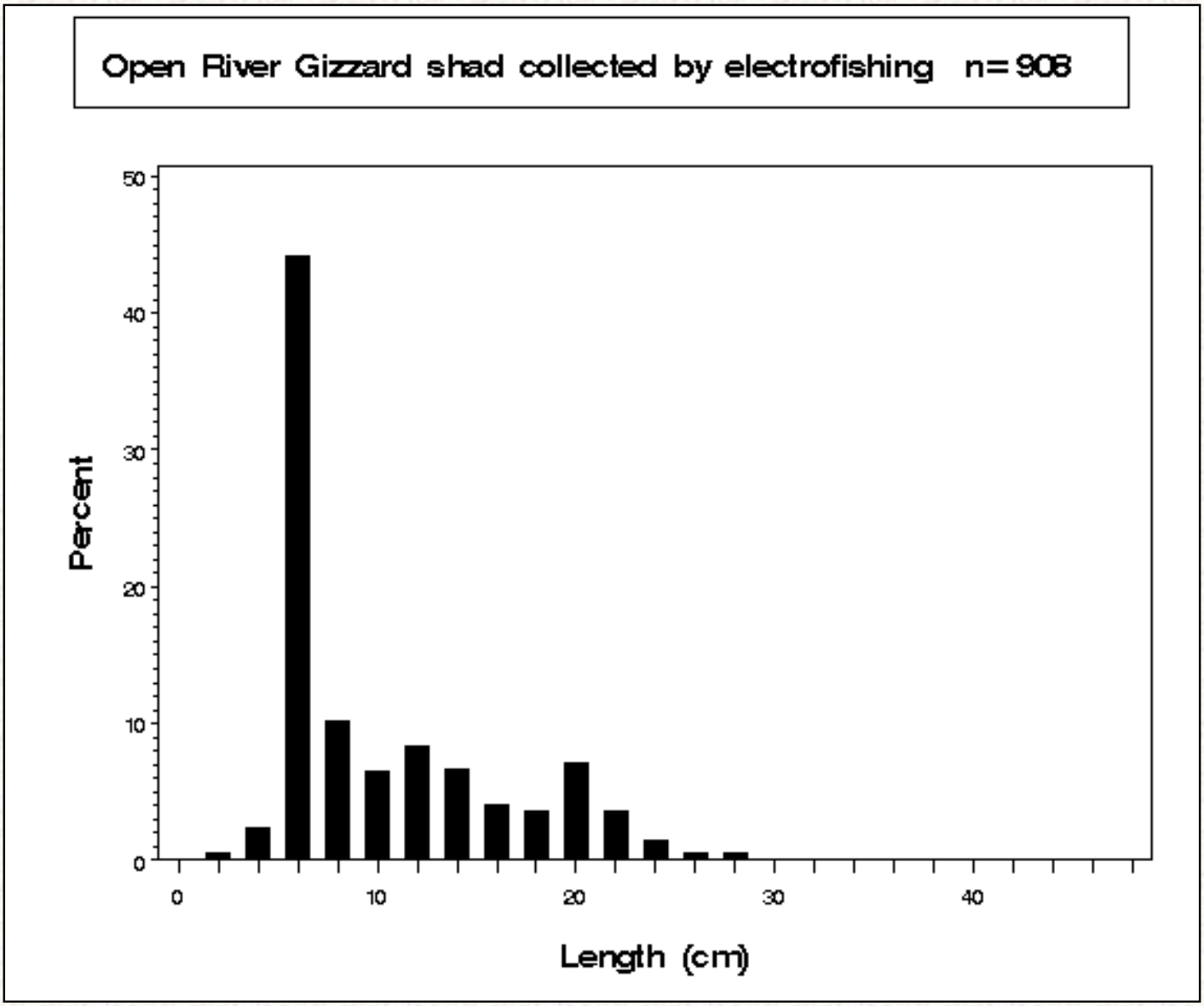
**Figure 1.** Length distributions as a percentage of catch for gizzard shad (*Dorosoma cepedianum)* collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Gizzard shad collected by electrofishing n=2018
Percent
0
10
20
30
40
50
0
10
20
30
40
Length (cm)


Pool 13 Gizzard shad collected by electrofishing n=49
Percent
0
10
20
30
40
Length (cm)
0
10
20
30
40


Pool 26 Gizzard shad collected by electrofishing n=1963
Percent
0
10
20
30
40
Length (cm)
0
10
20
30
40


Open River Gizzard shad collected by electrofishing n=908
Percent
0
10
20
30
40
50
0
10
20
30
40
Length (cm)

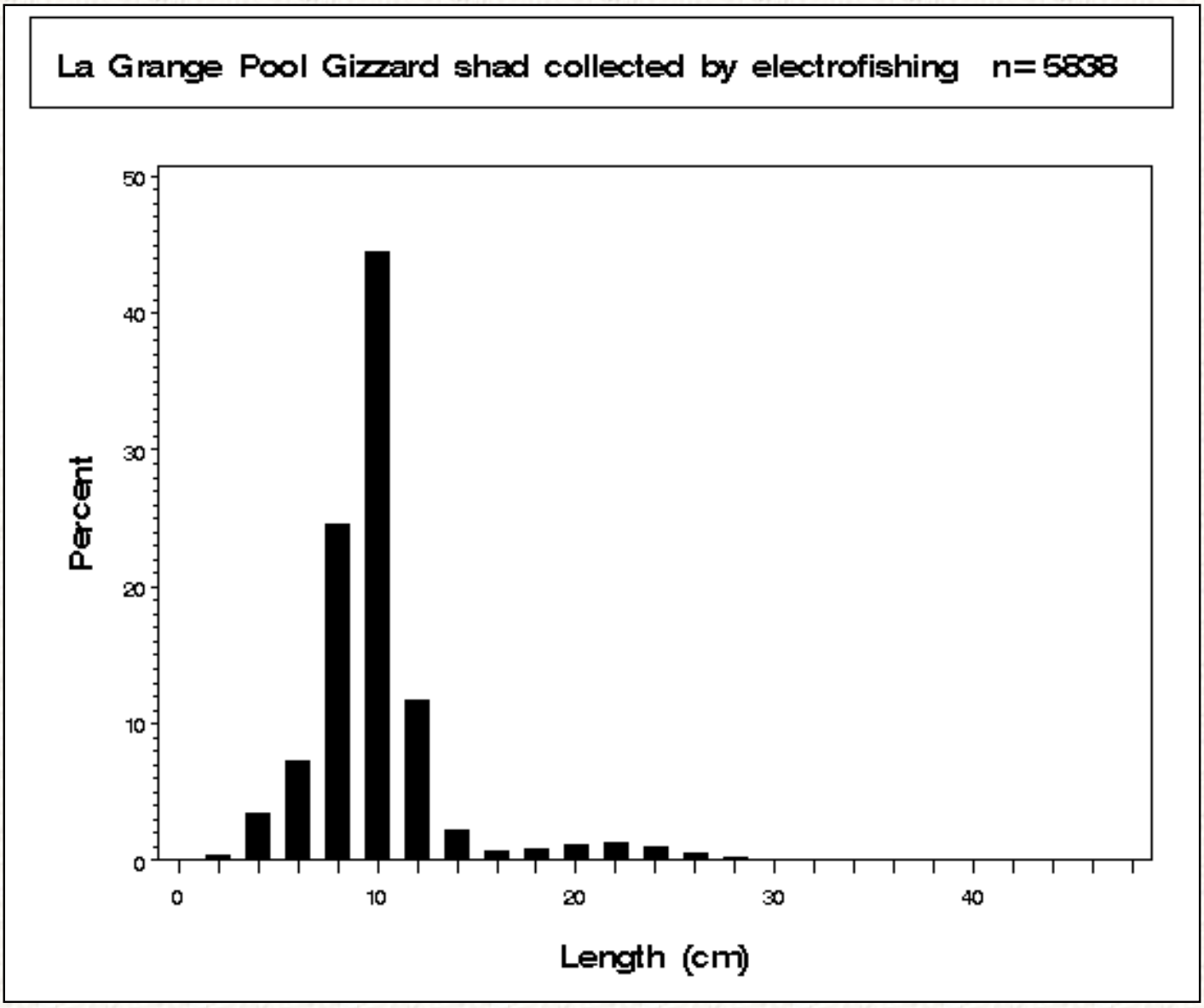



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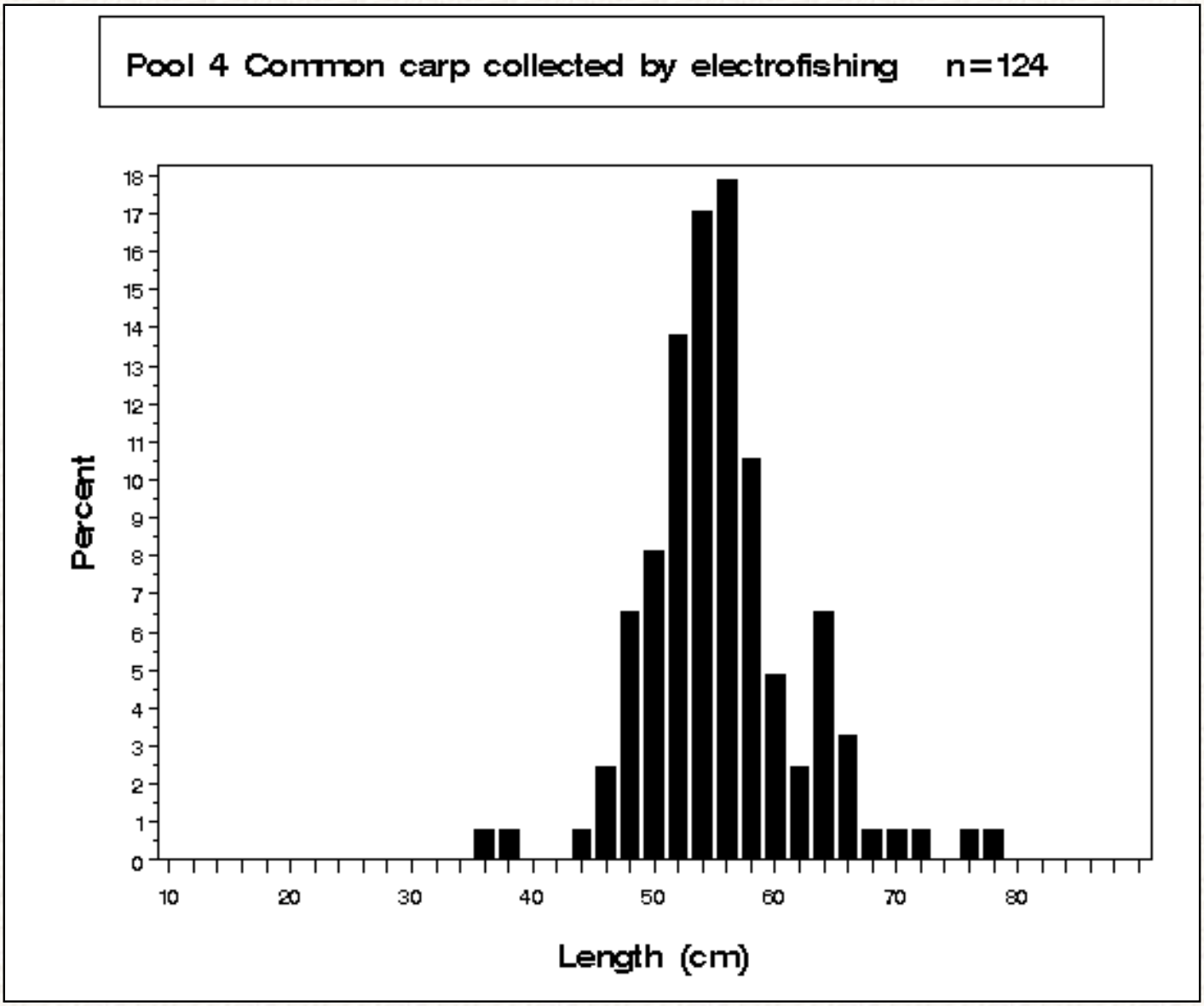
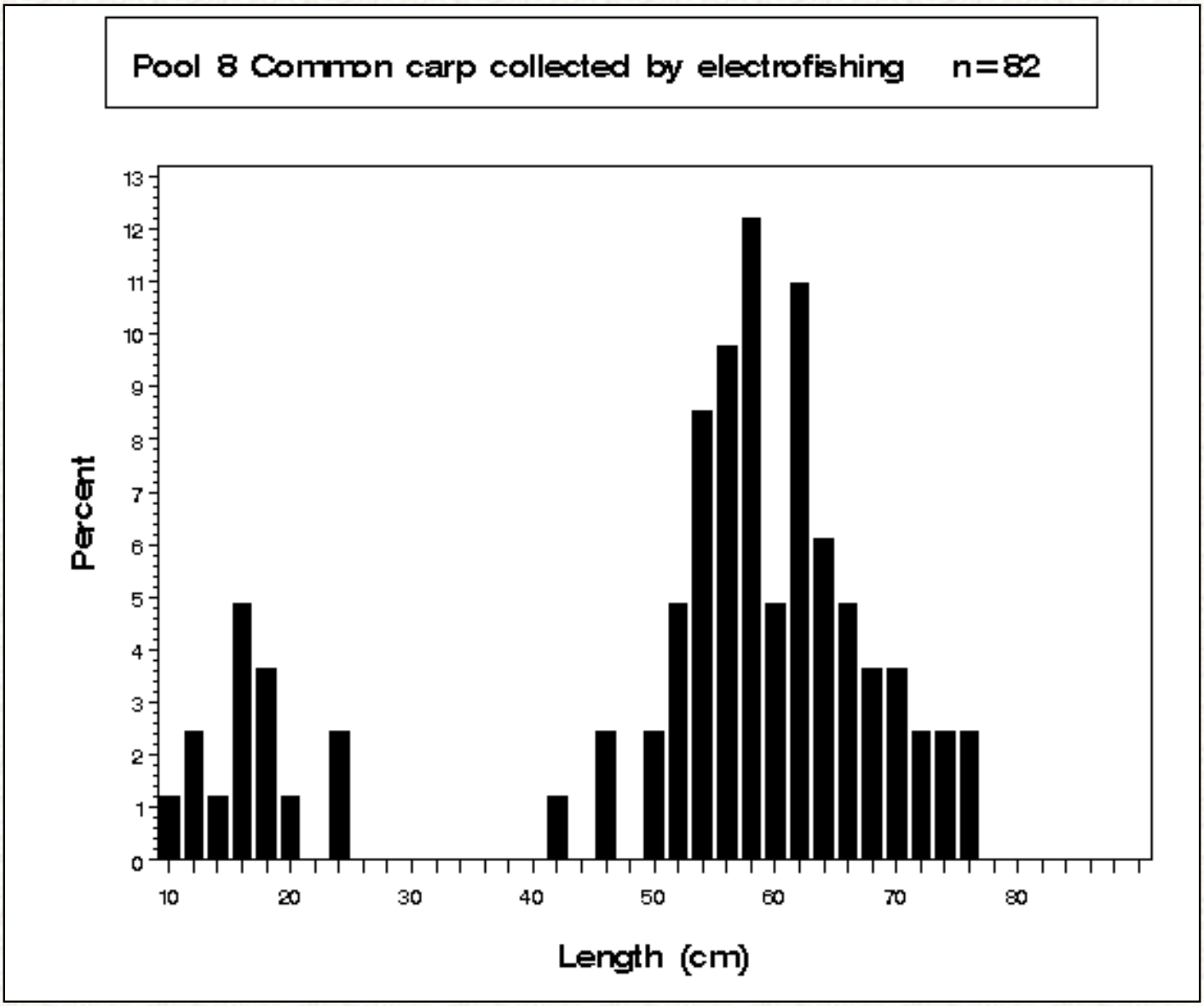
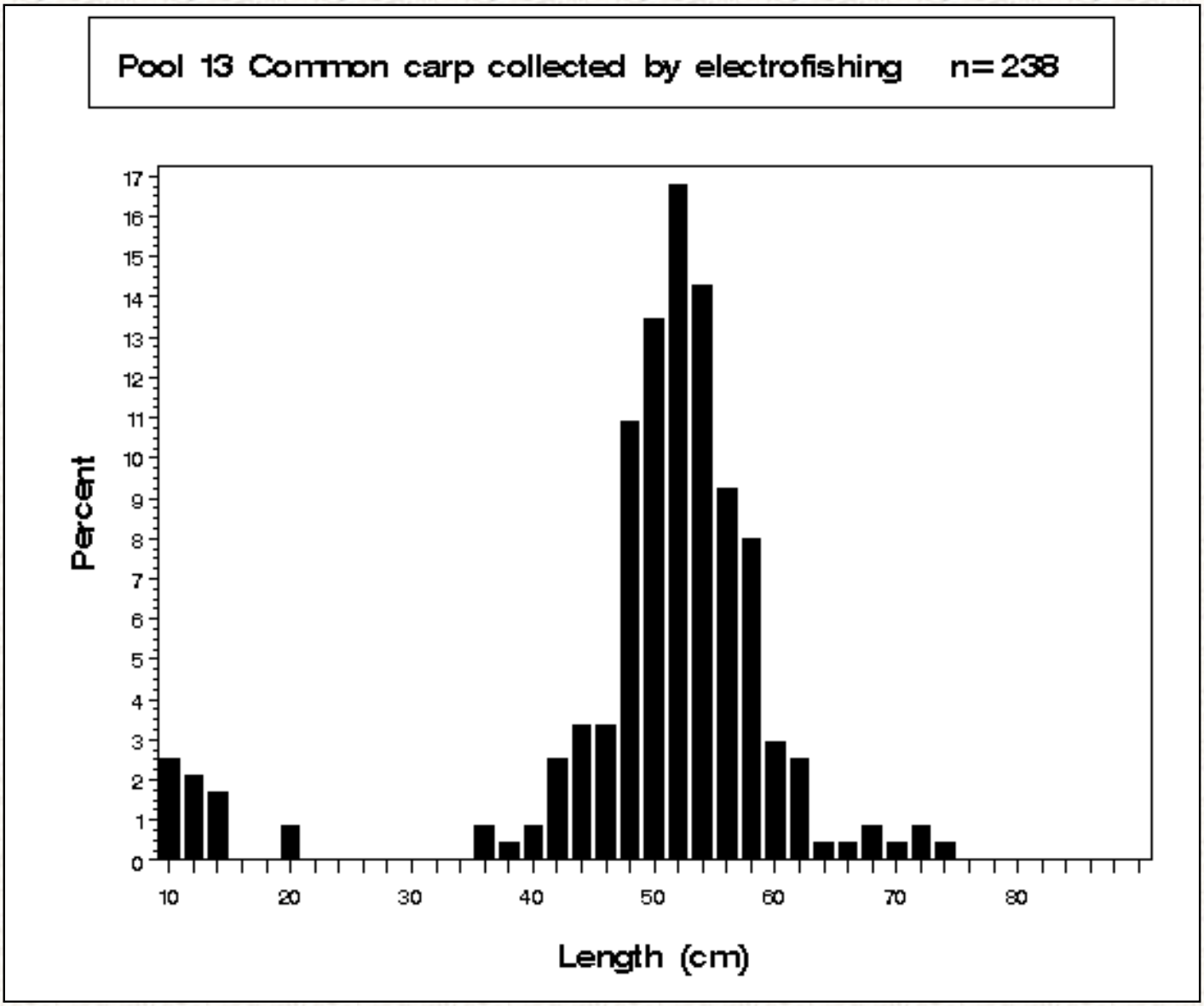
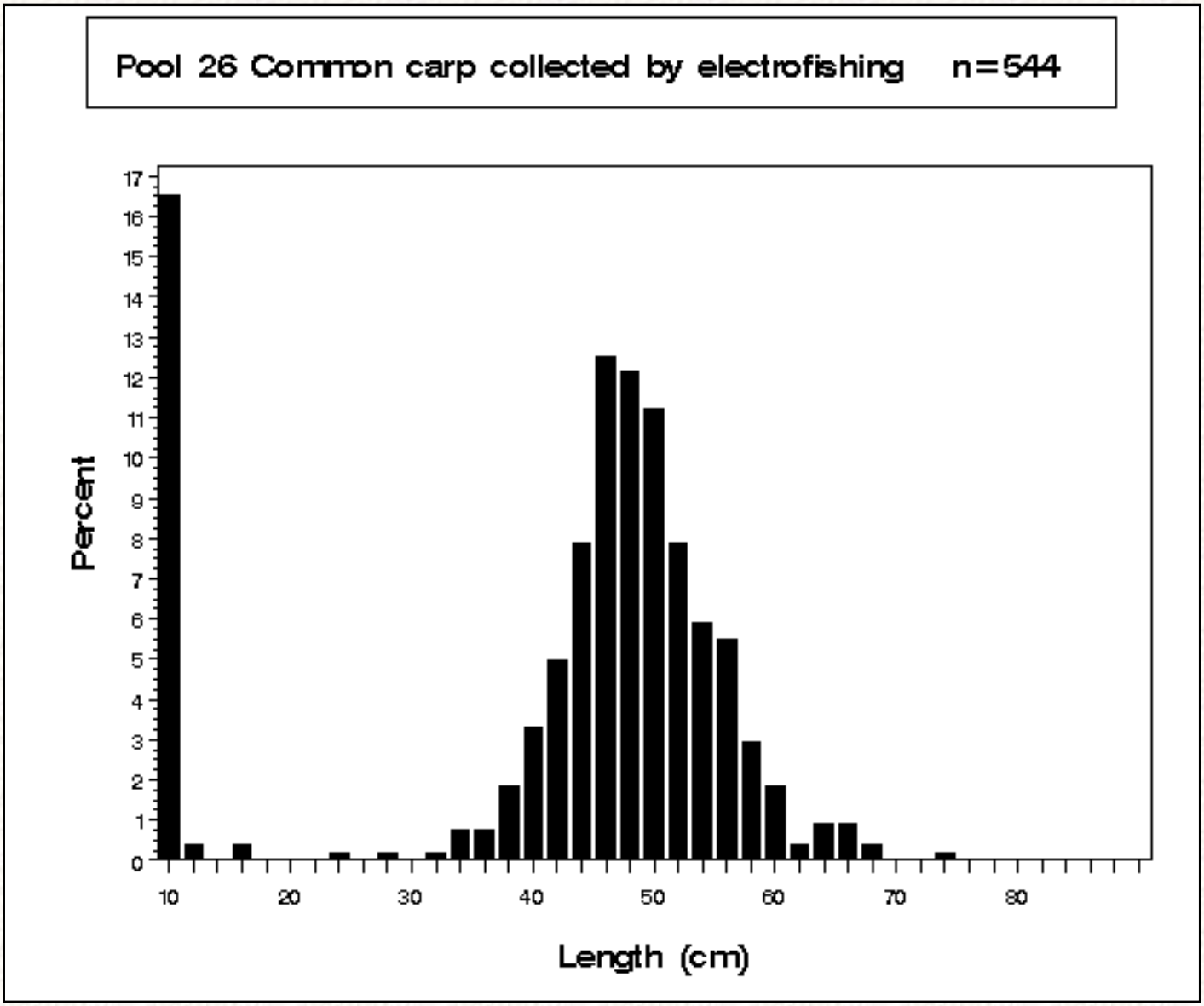
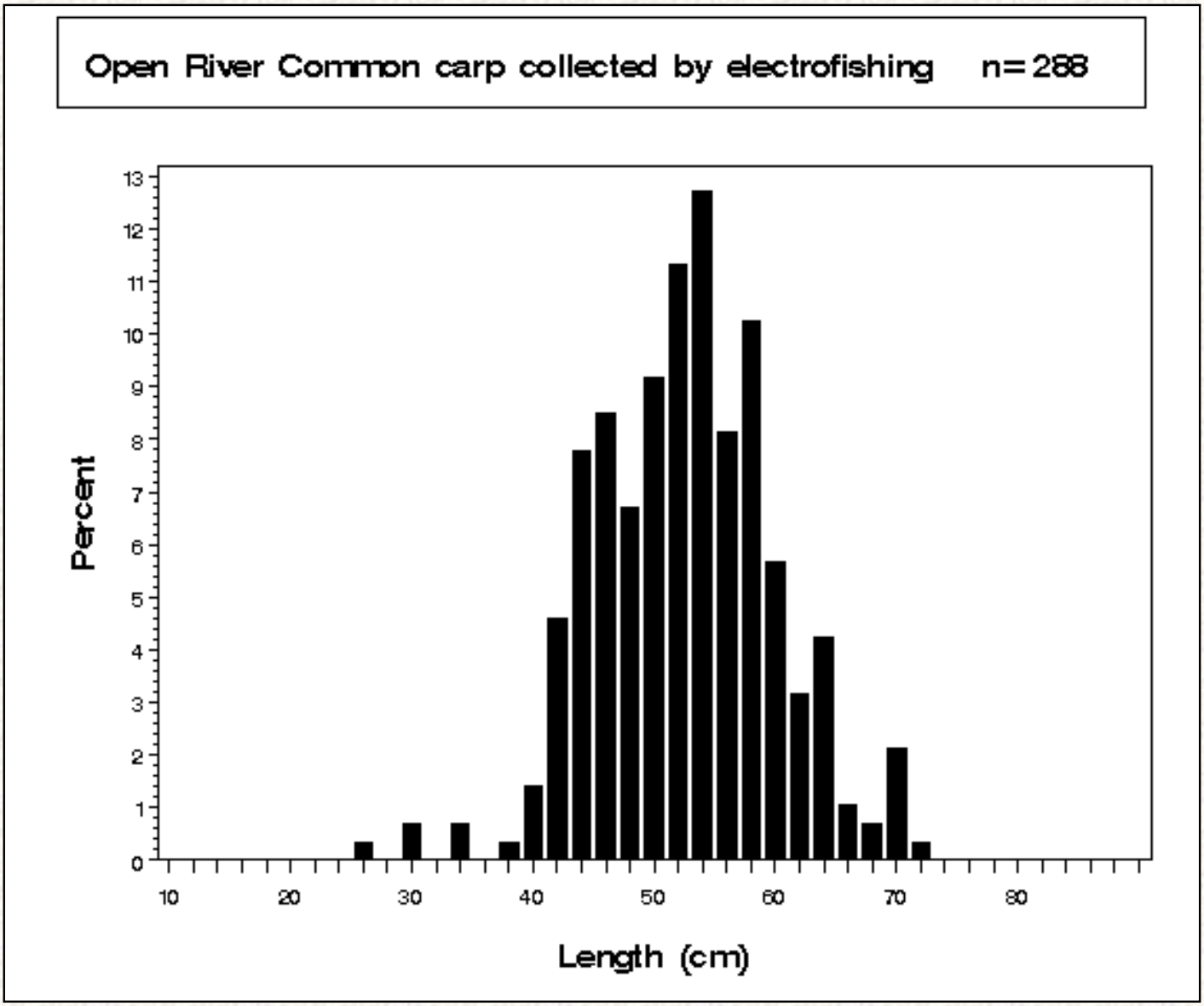
**Figure 2.** Length distributions as a percentage of catch for common carp (*Cyprinus carpio)* collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Common carp collected by electrofishing n=82
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
10
20
30
40
50
60
70
80
Length (cm)


Pool 13 Common carp collected by electrofishing n=238
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
10
20
30
40
50
60
70
80
Length (cm)


Pool 26 Common carp collected by electrofishing n=544
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
10
20
30
40
50
60
70
80
Length (cm)


Open River Common carp collected by electrofishing n=288
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
10
20
30
40
50
60
70
80
Length (cm)

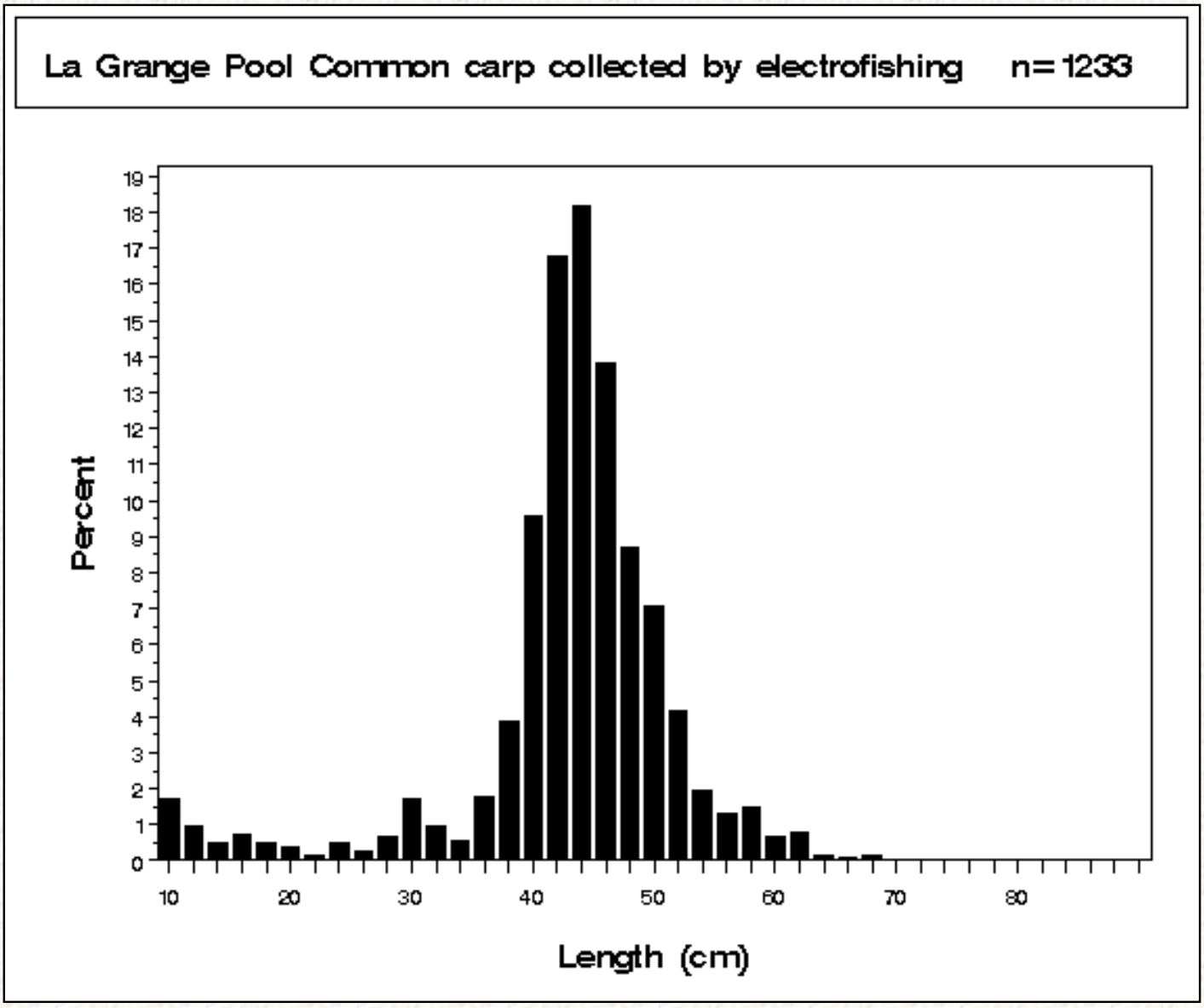



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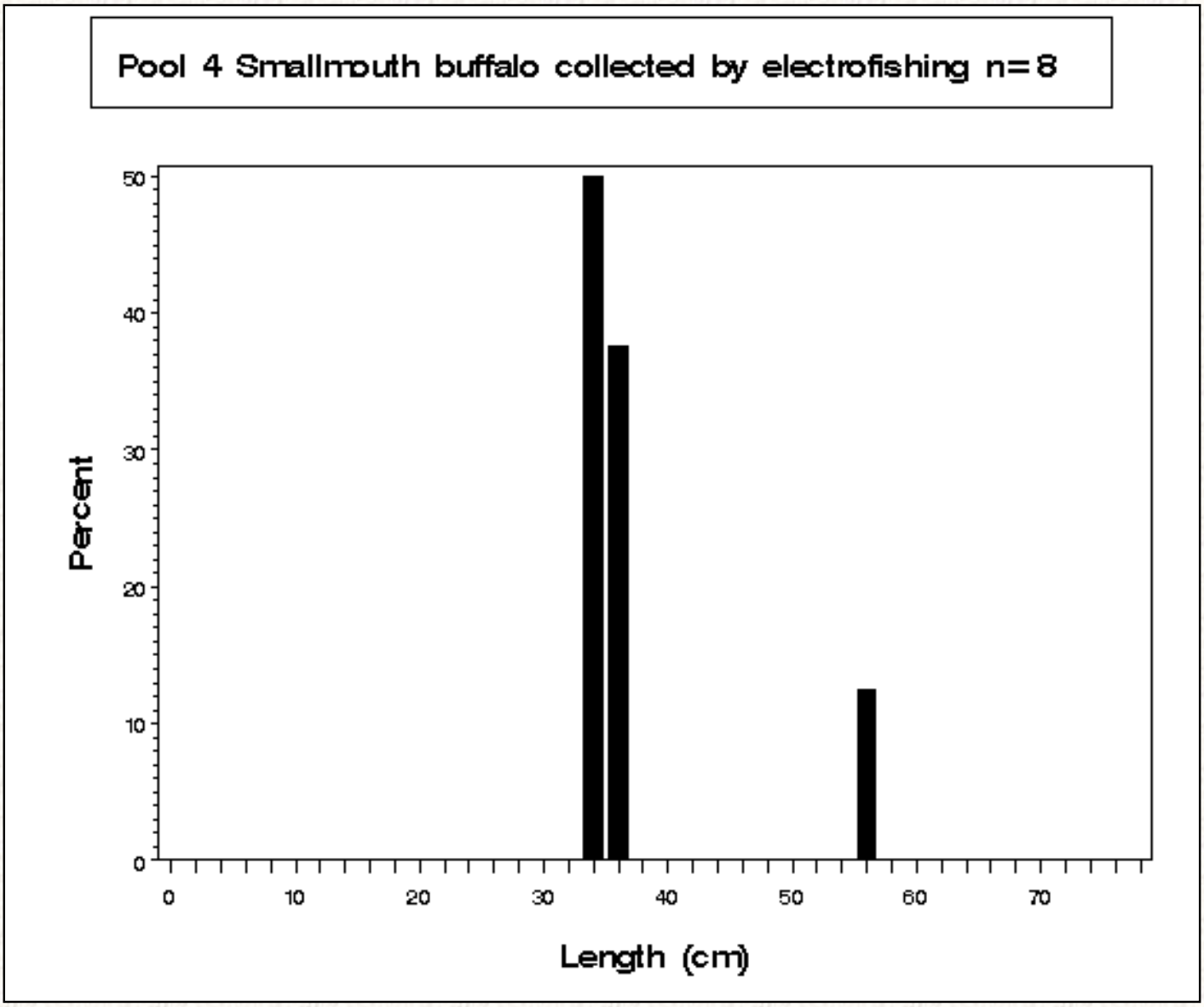
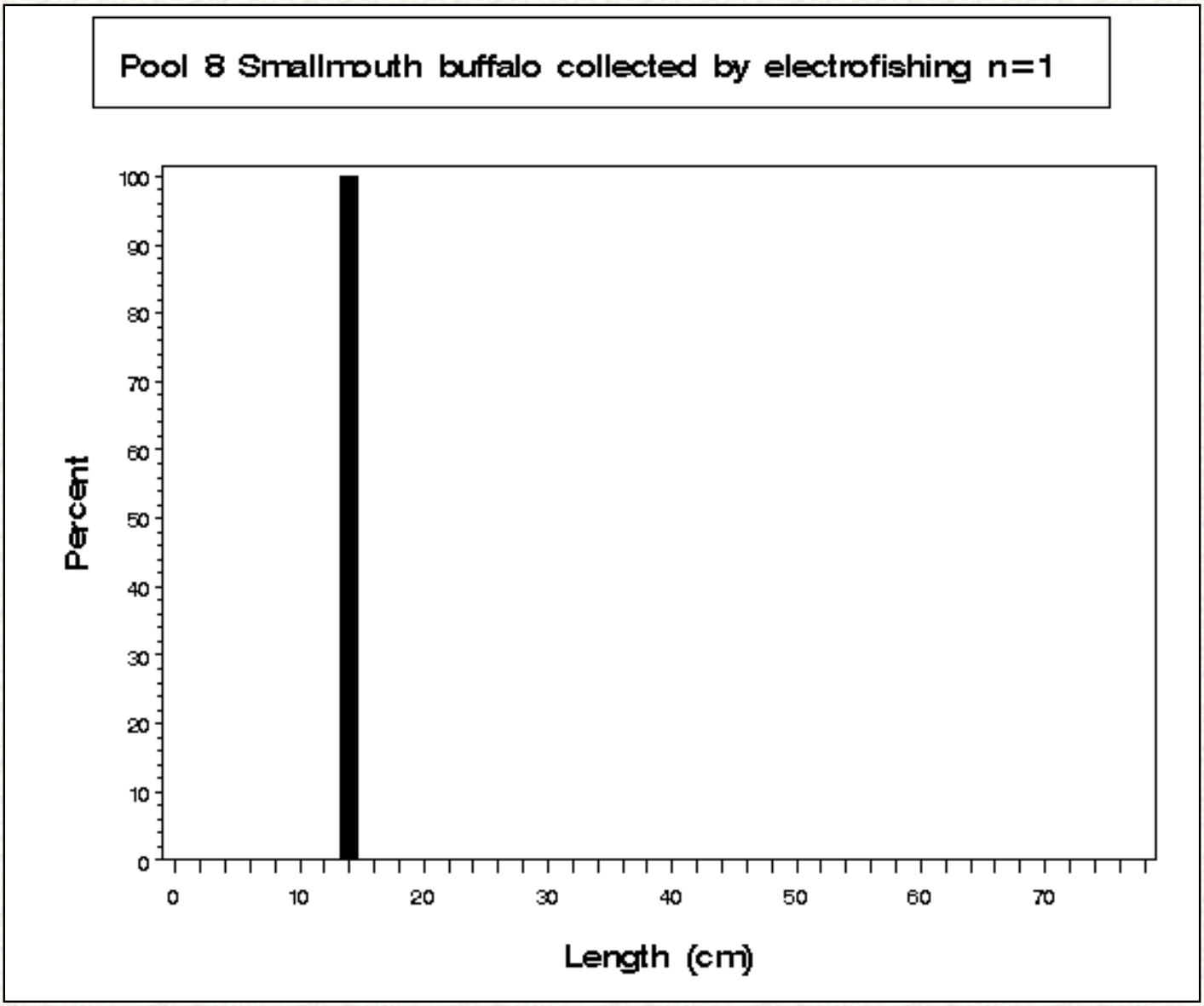
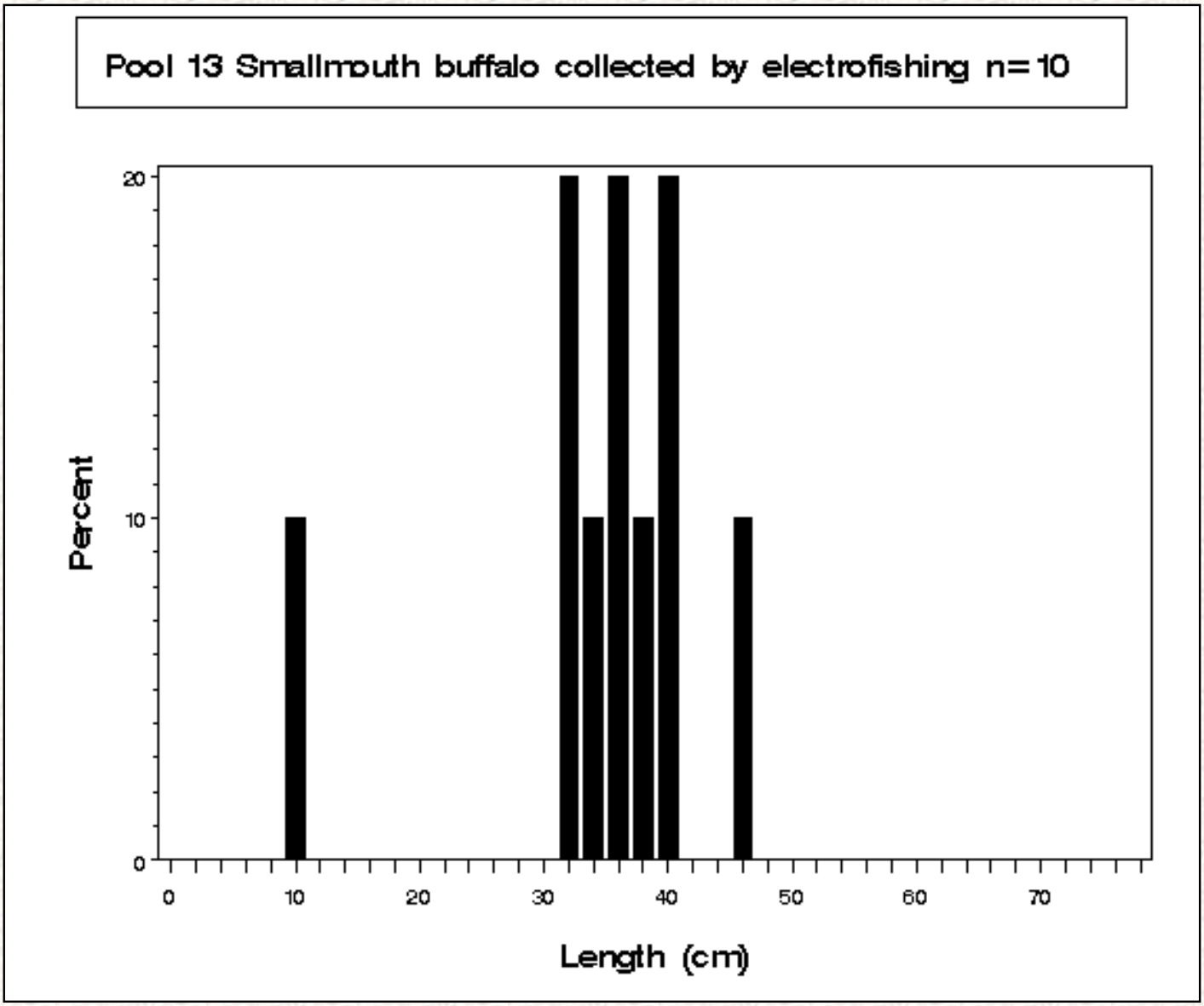
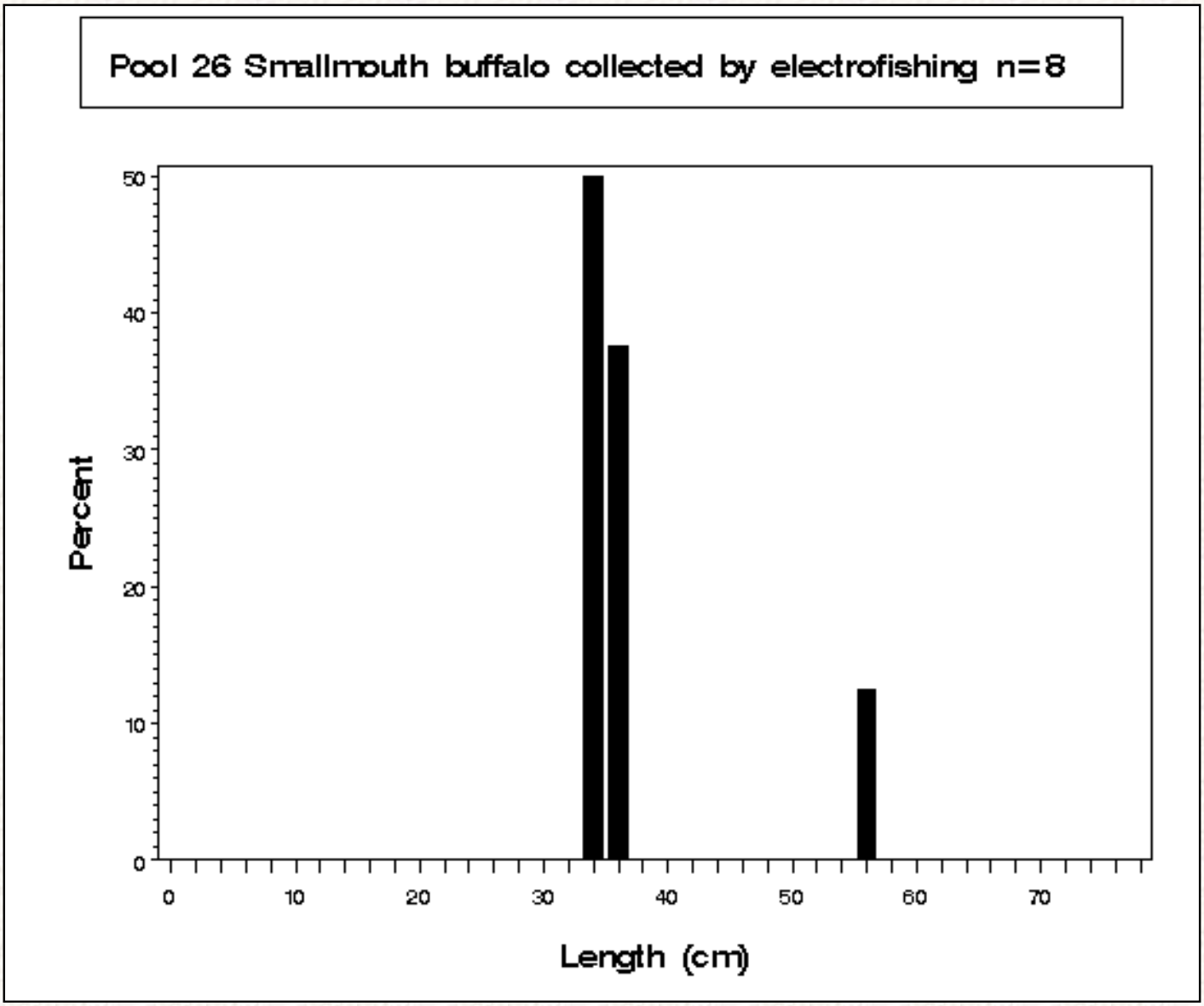
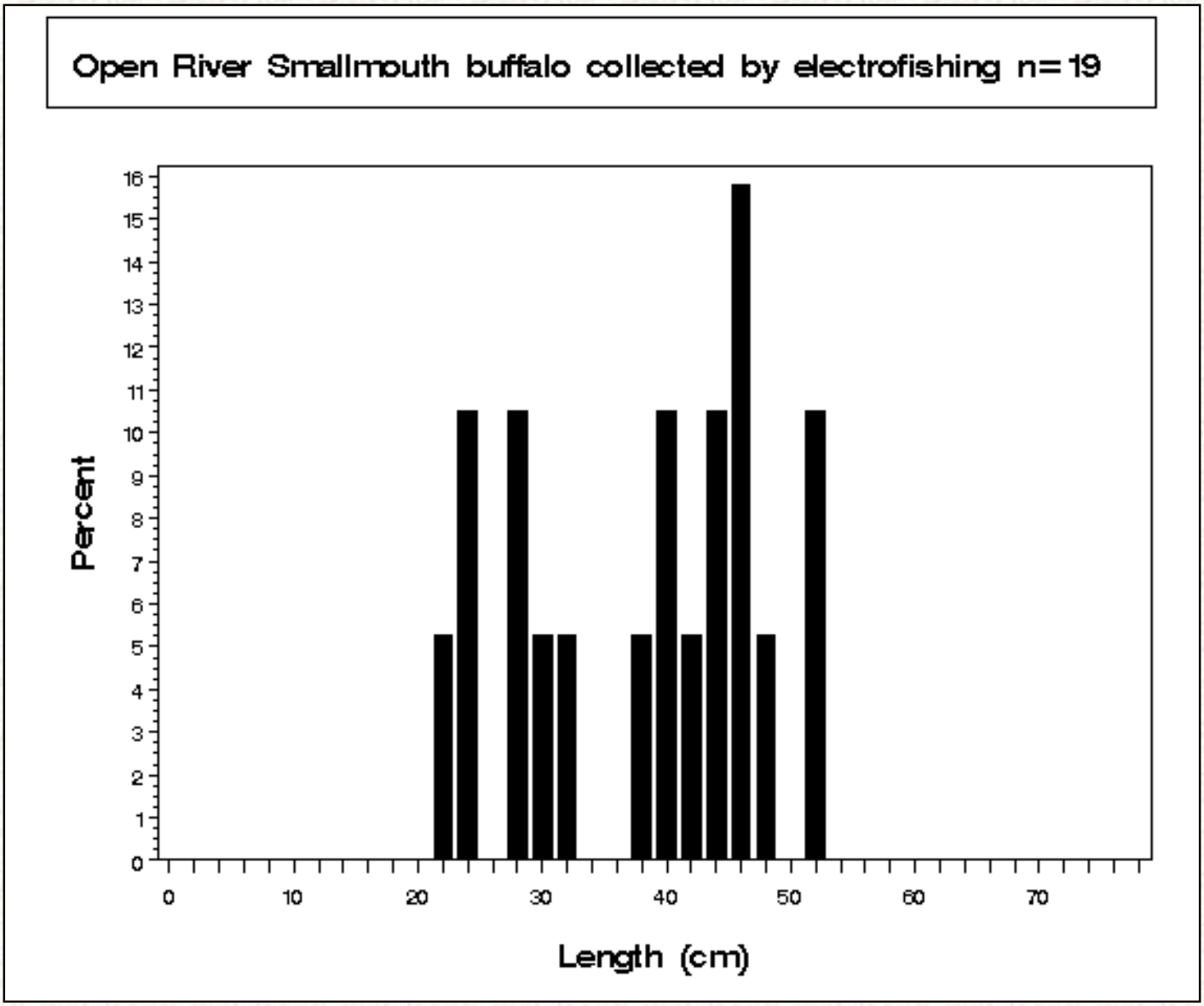
**Figure 3.** Length distributions as a percentage of catch for smallmouth buffalo (*Ictiobus bubalus)* collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Smallmouth buffalo collected by electrofishing n=1
Percent
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
Length (cm)


Pool 13 Smallmouth buffalo collected by electrofishing n=10
Percent
20
10
0
0
10
20
30
40
50
60
70
Length (cm)


Pool 26 Smallmouth buffalo collected by electrofishing n=8
Percent
0
10
20
30
40
50
0
10
20
30
40
50
60
70
Length (cm)


Open River Smallmouth buffalo collected by electrofishing n=19
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0
10
20
30
40
50
60
70
Length (cm)

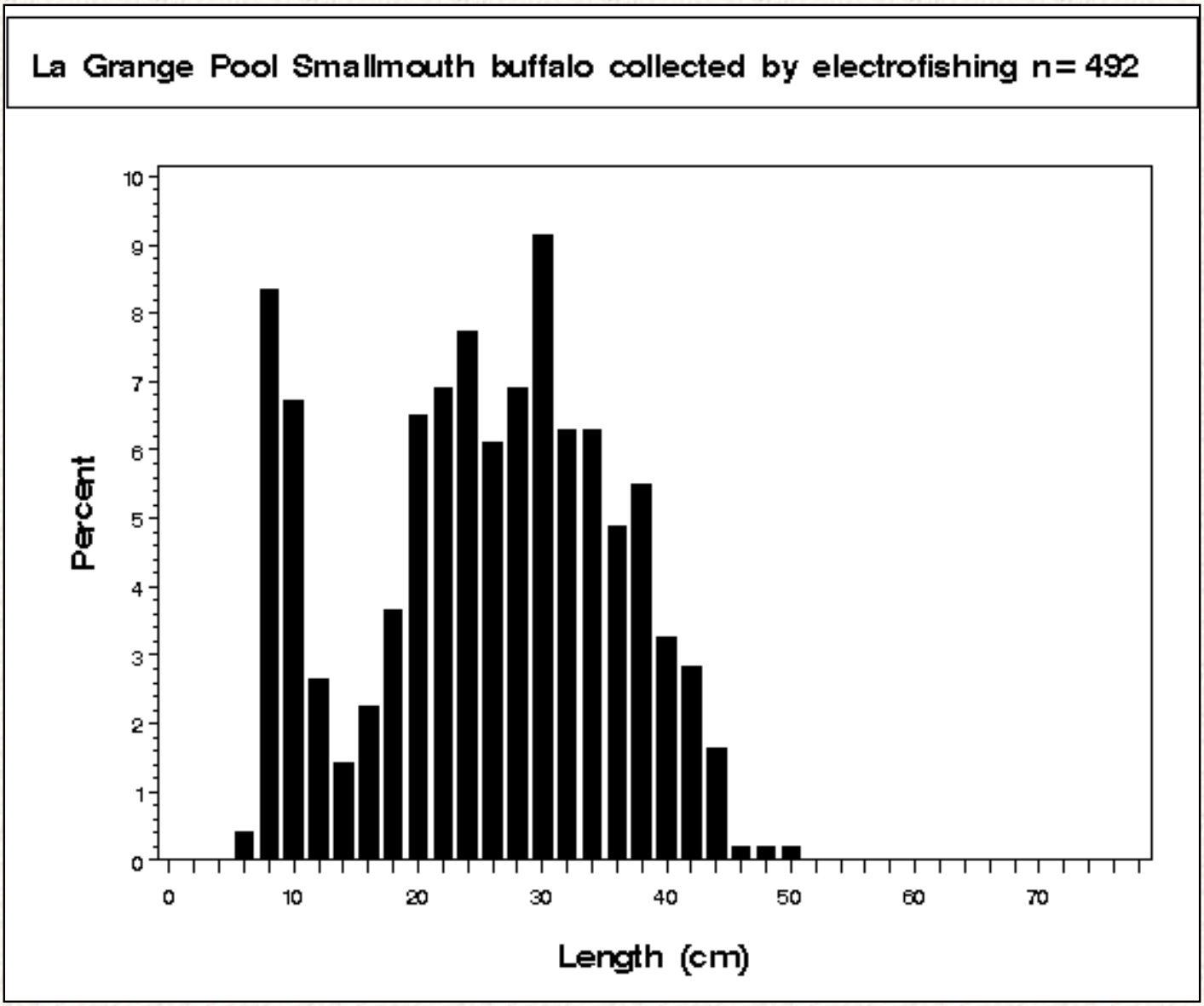



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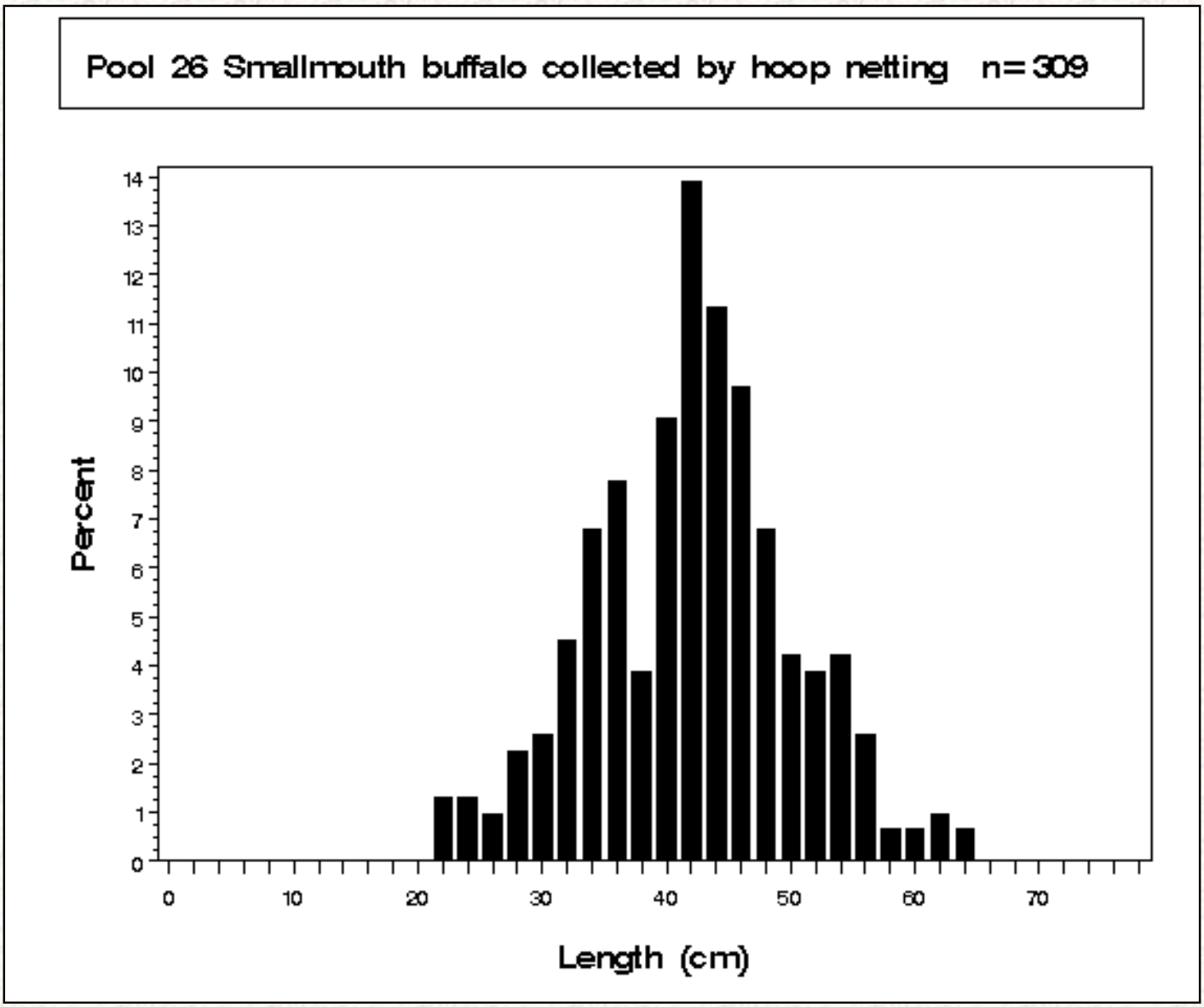
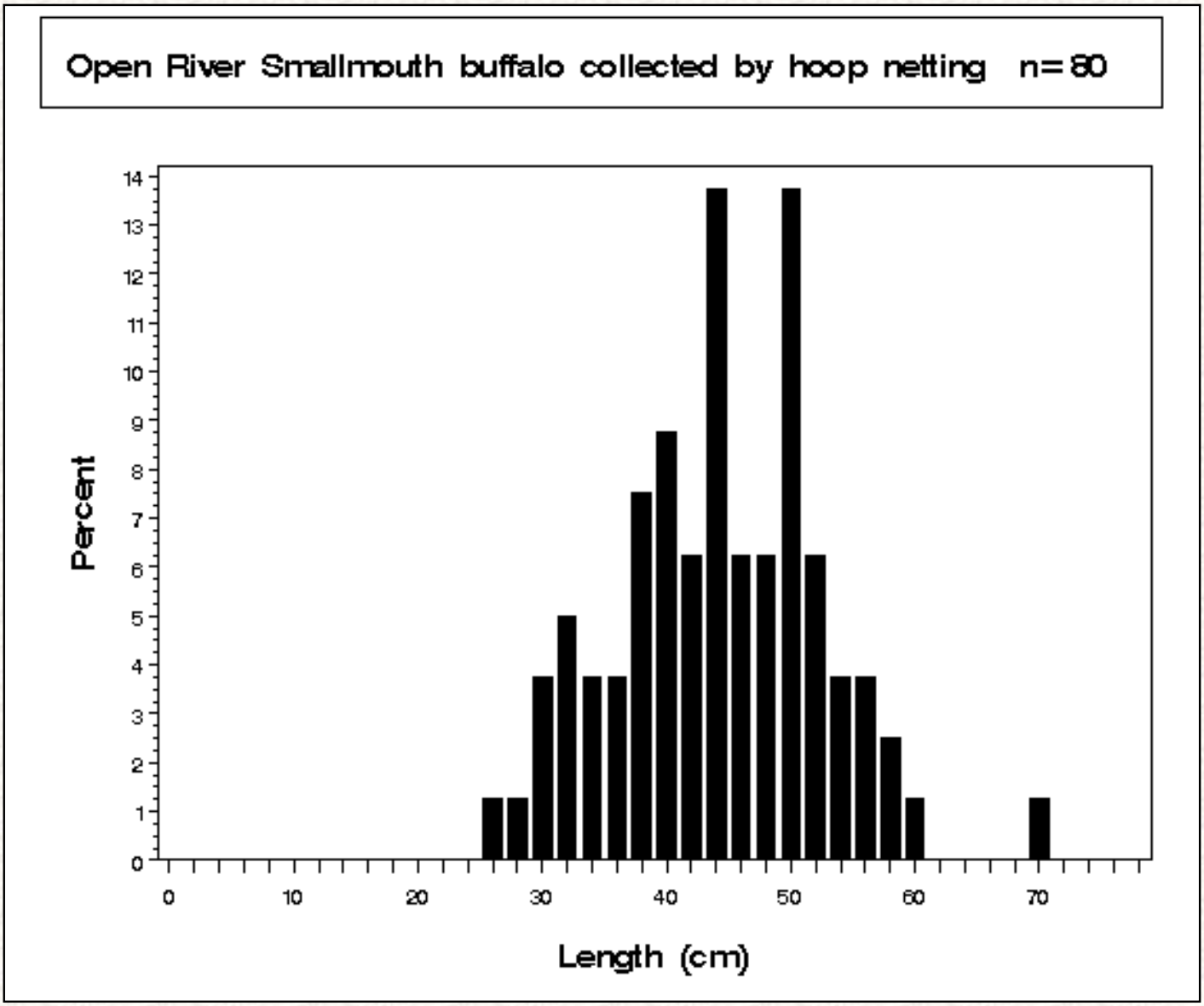
**Figure 4.** Length distributions as a percentage of catch for smallmouth buffalo (*Ictiobus bubalus)* collected by hoop netting in Pool 26 and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No hoop netting was conducted in Pools 4, 8, or 13 in 2003.




Open River Smallmouth buffalo collected by hoop netting n=80
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
0
10
20
30
40
50
60
70
Length (cm)

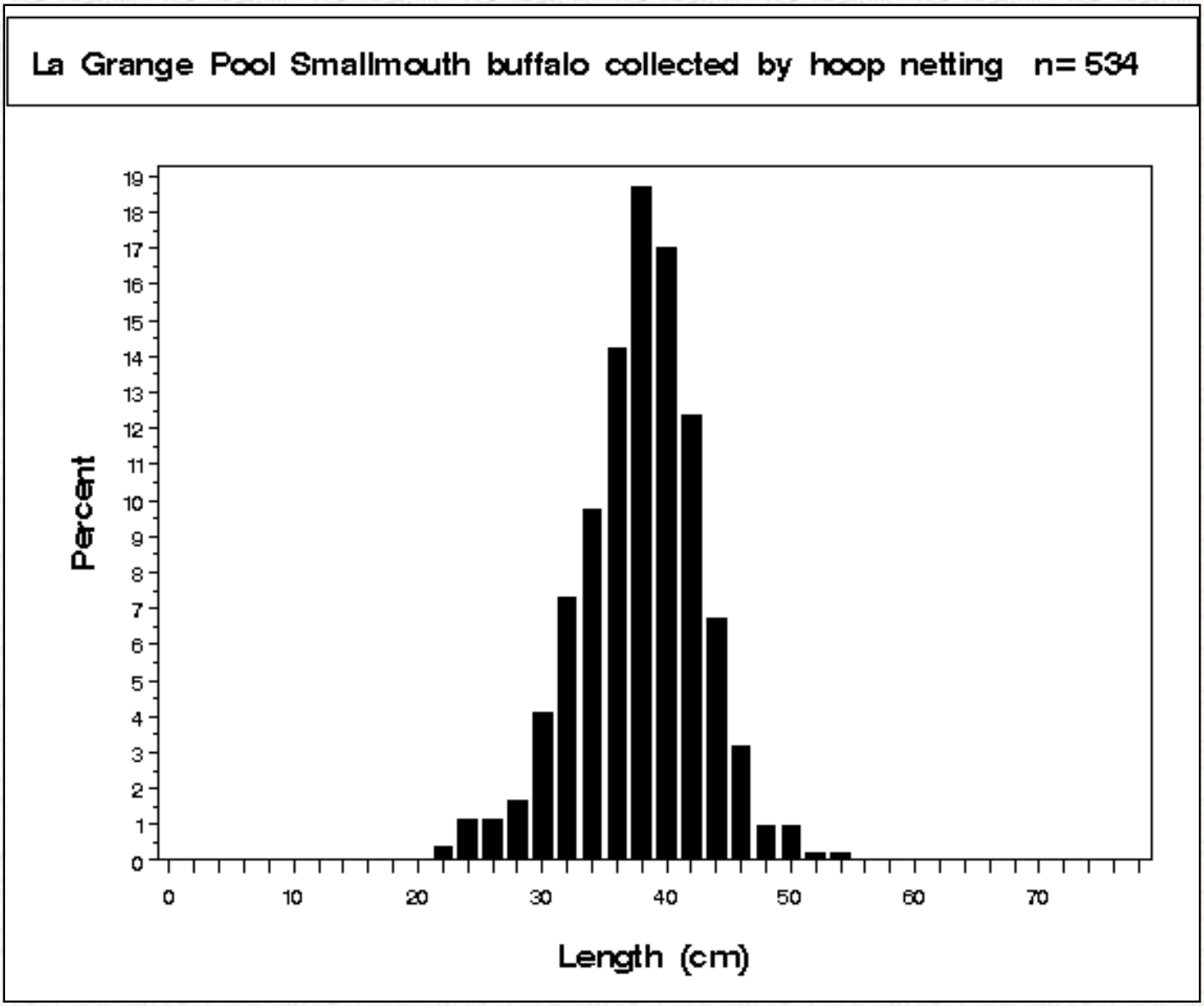



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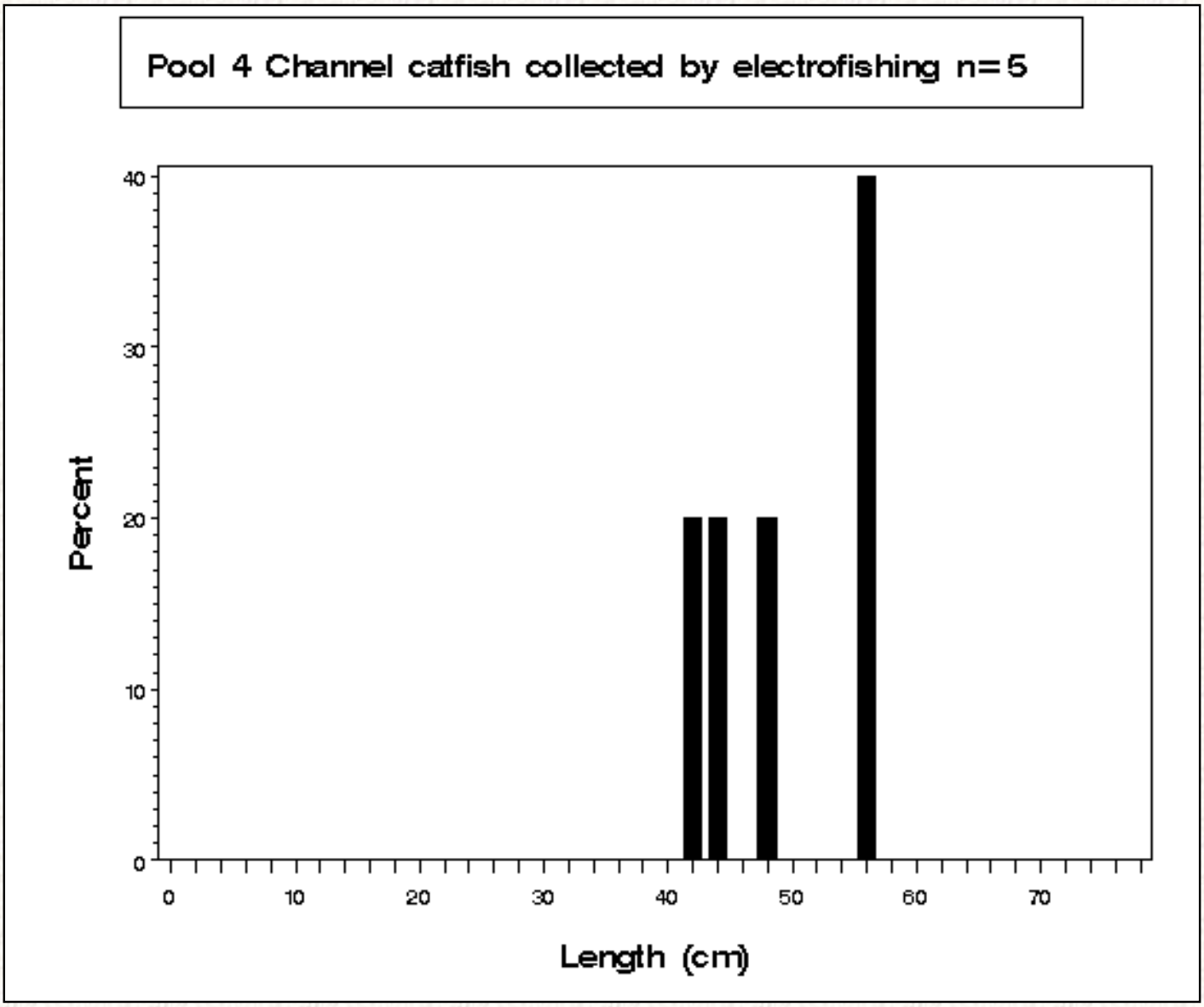
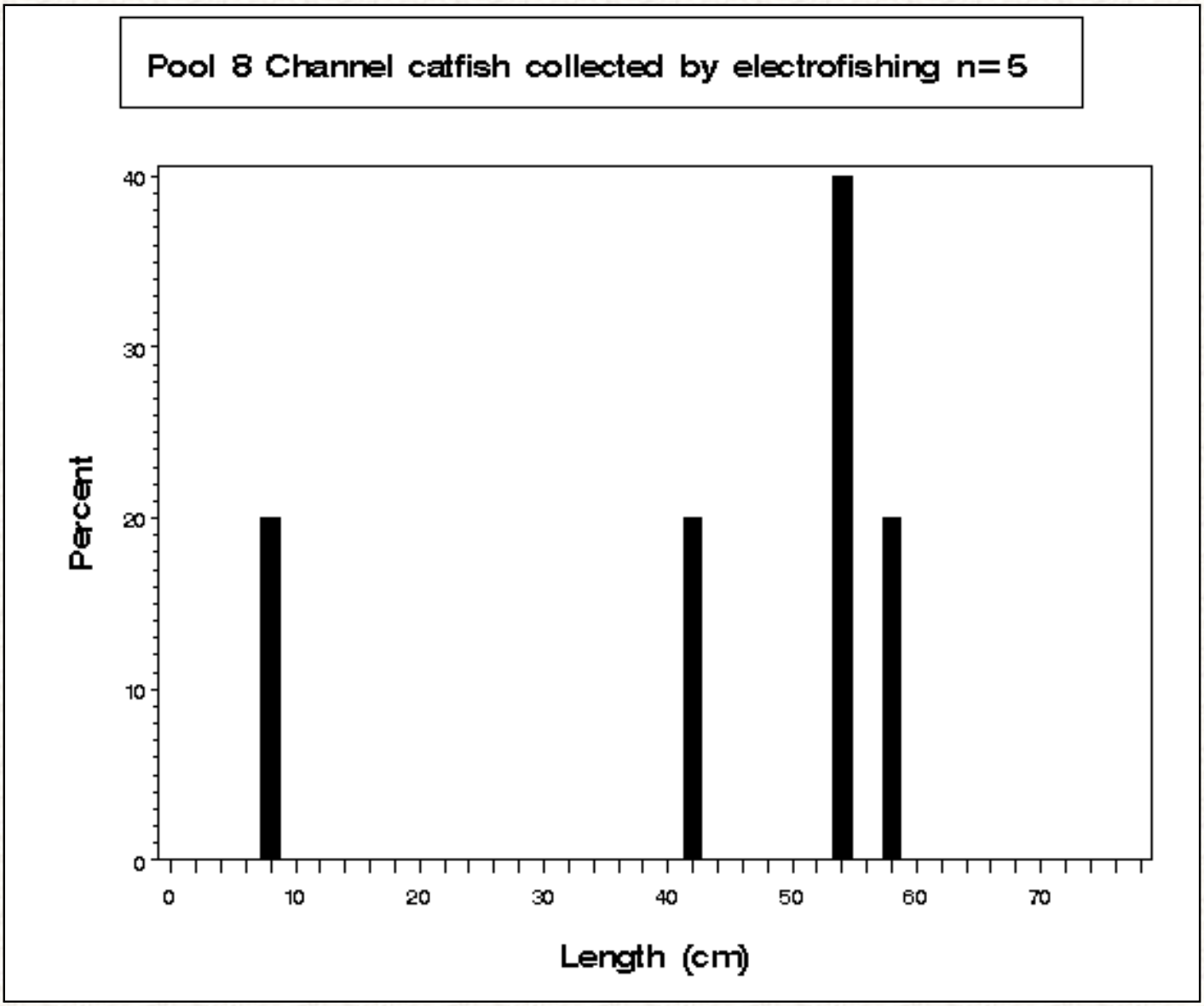
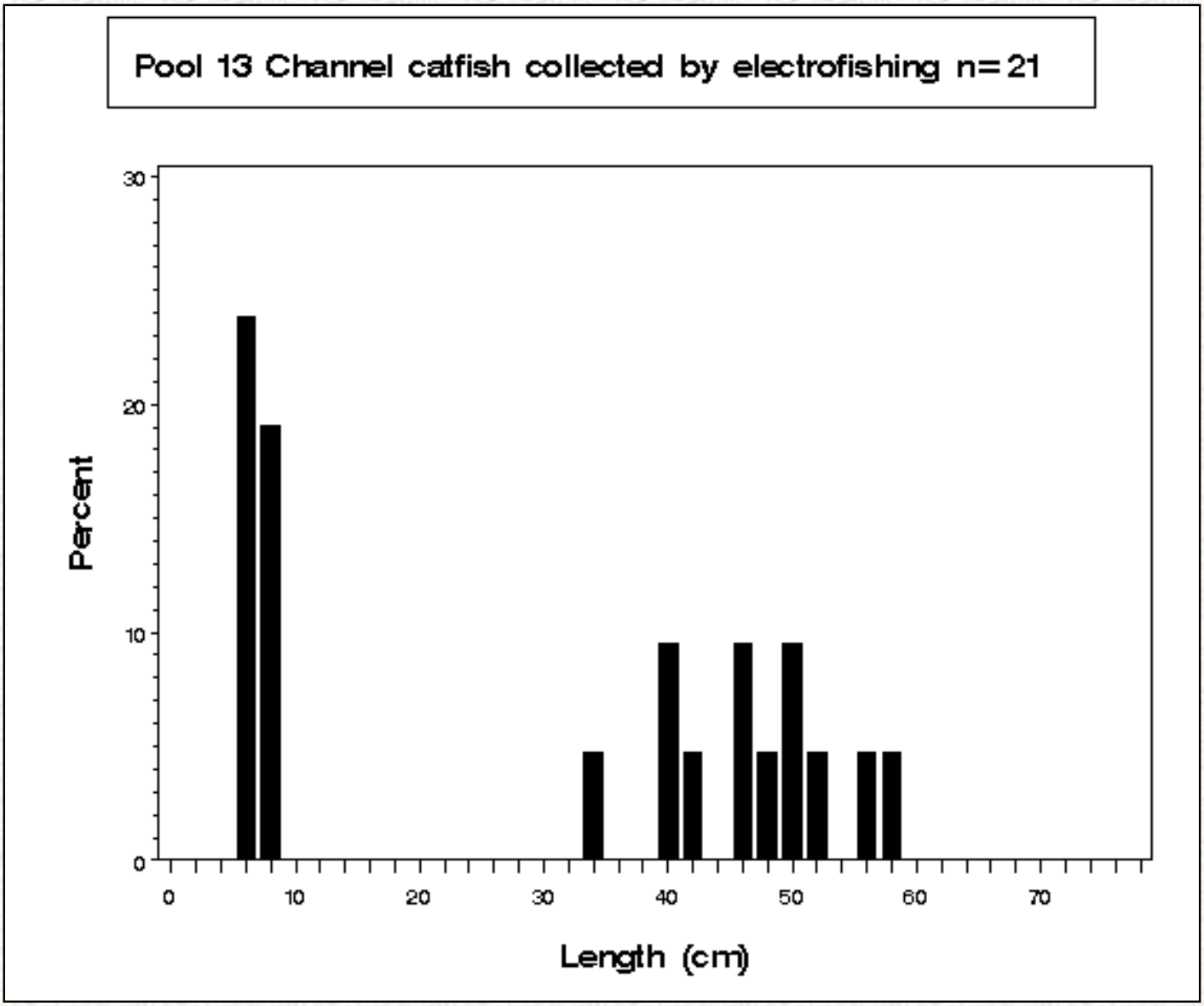
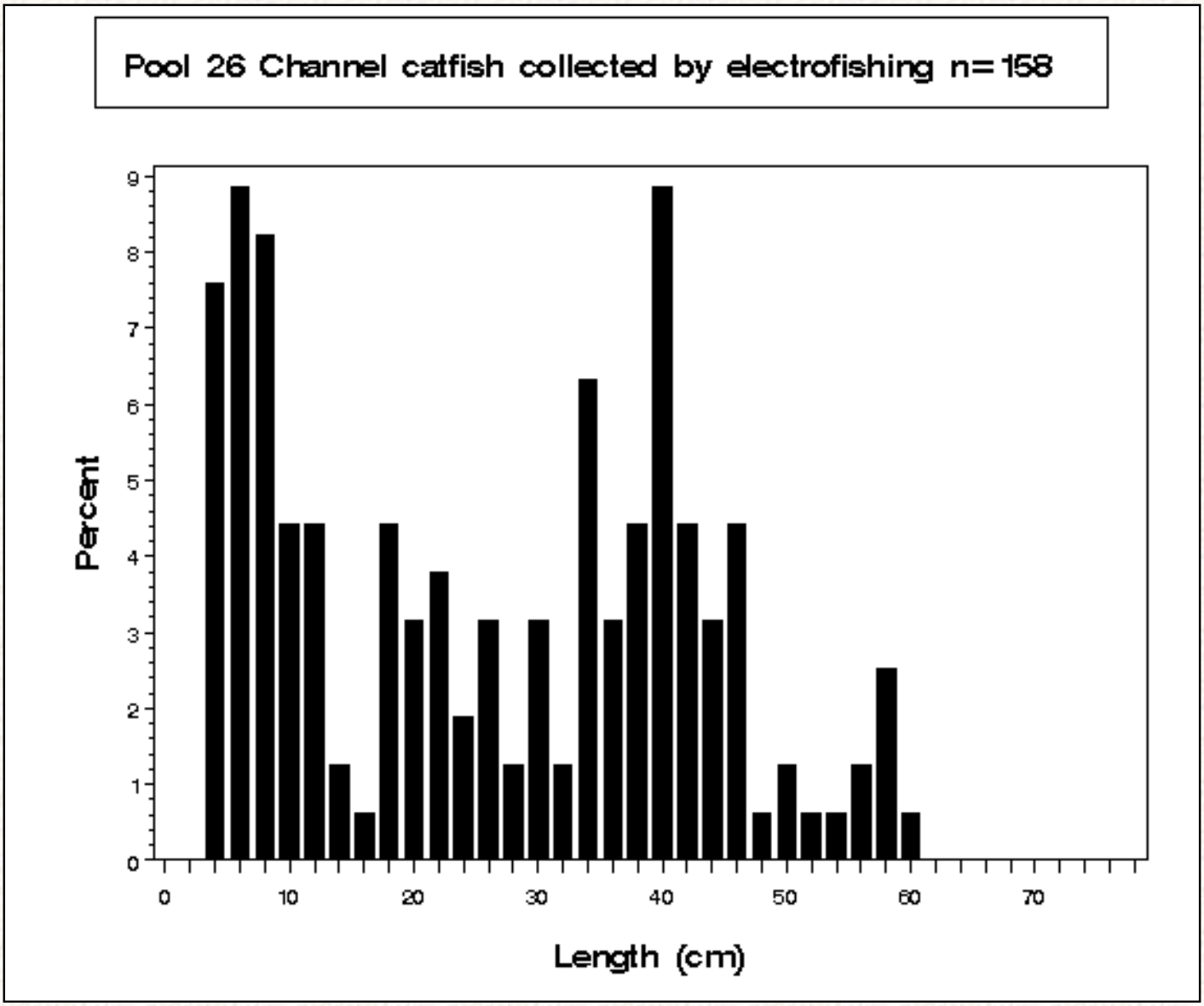
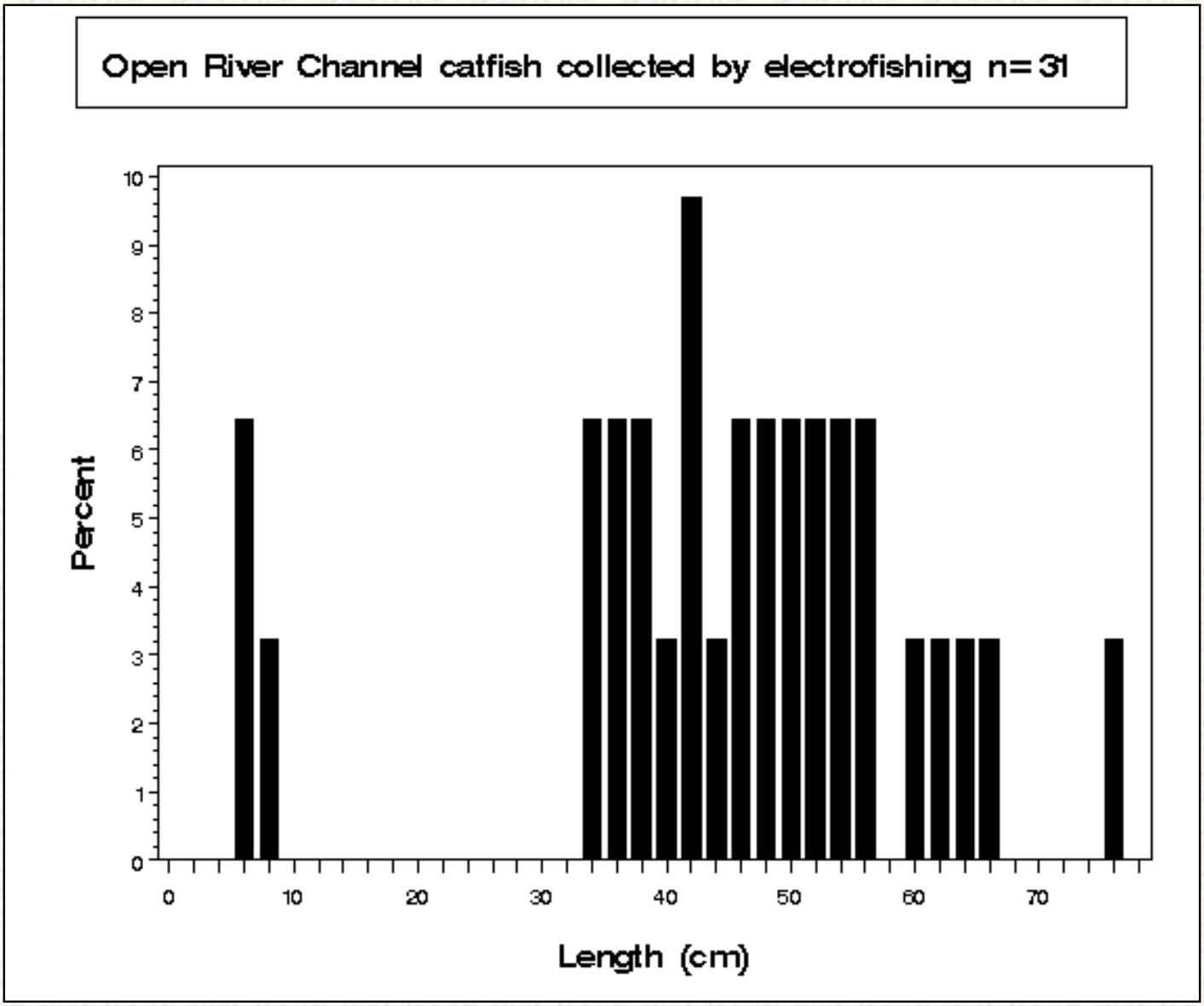
**Figure 5.** Length distributions as a percentage of catch for channel catfish (*Ictalurus punctatus)* collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Channel catfish collected by electrofishing n=5
Percent
0
10
20
30
40
0
10
20
30
40
50
60
70
Length (cm)


Pool 13 Channel catfish collected by electrofishing n=21
Percent
0
10
20
30
0
10
20
30
40
50
60
70
Length (cm)


Pool 26 Channel catfish collected by electrofishing n=158
Percent
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
Length (cm)


Open River Channel catfish collected by electrofishing n=31
Percent
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
Length (cm)

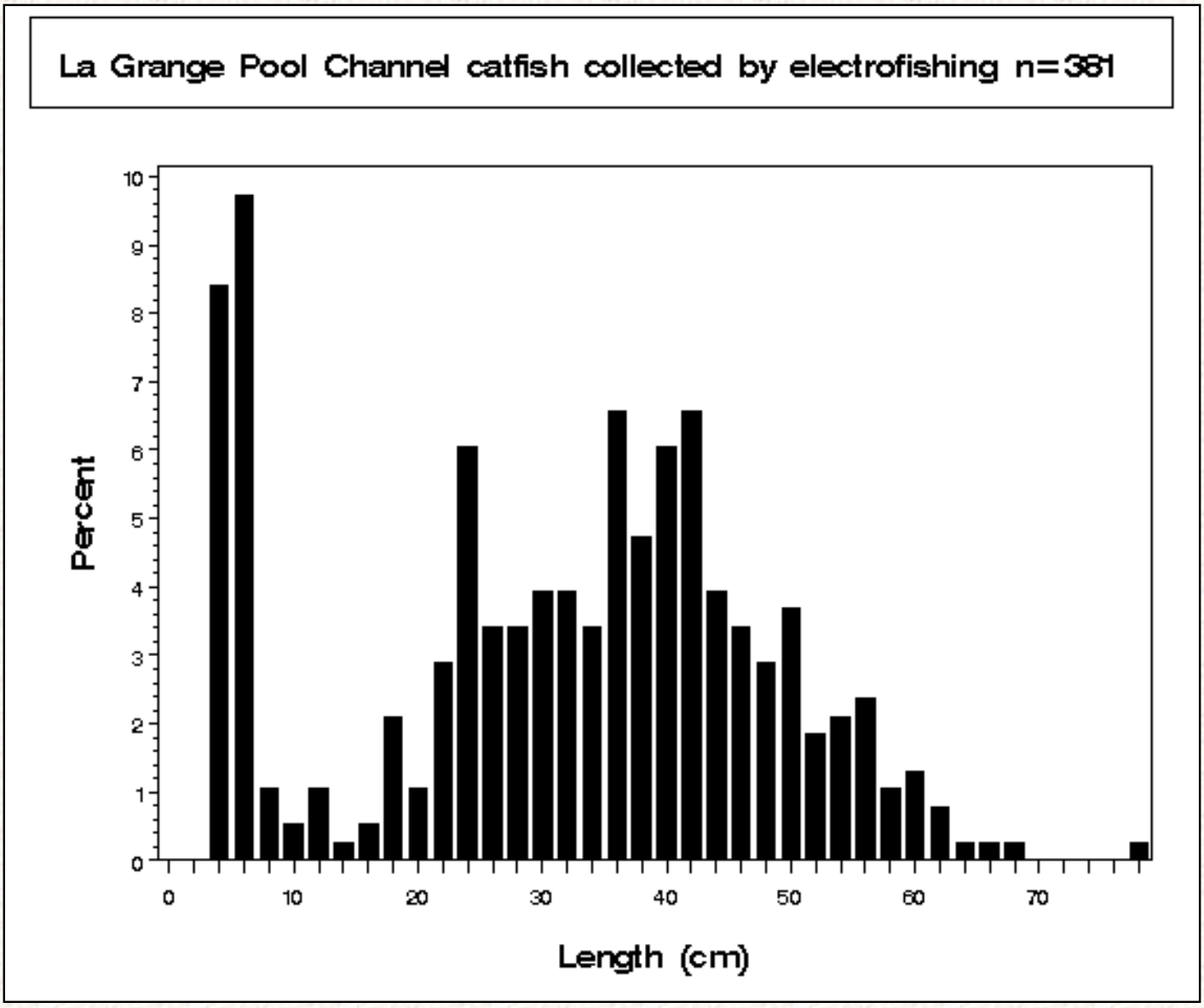



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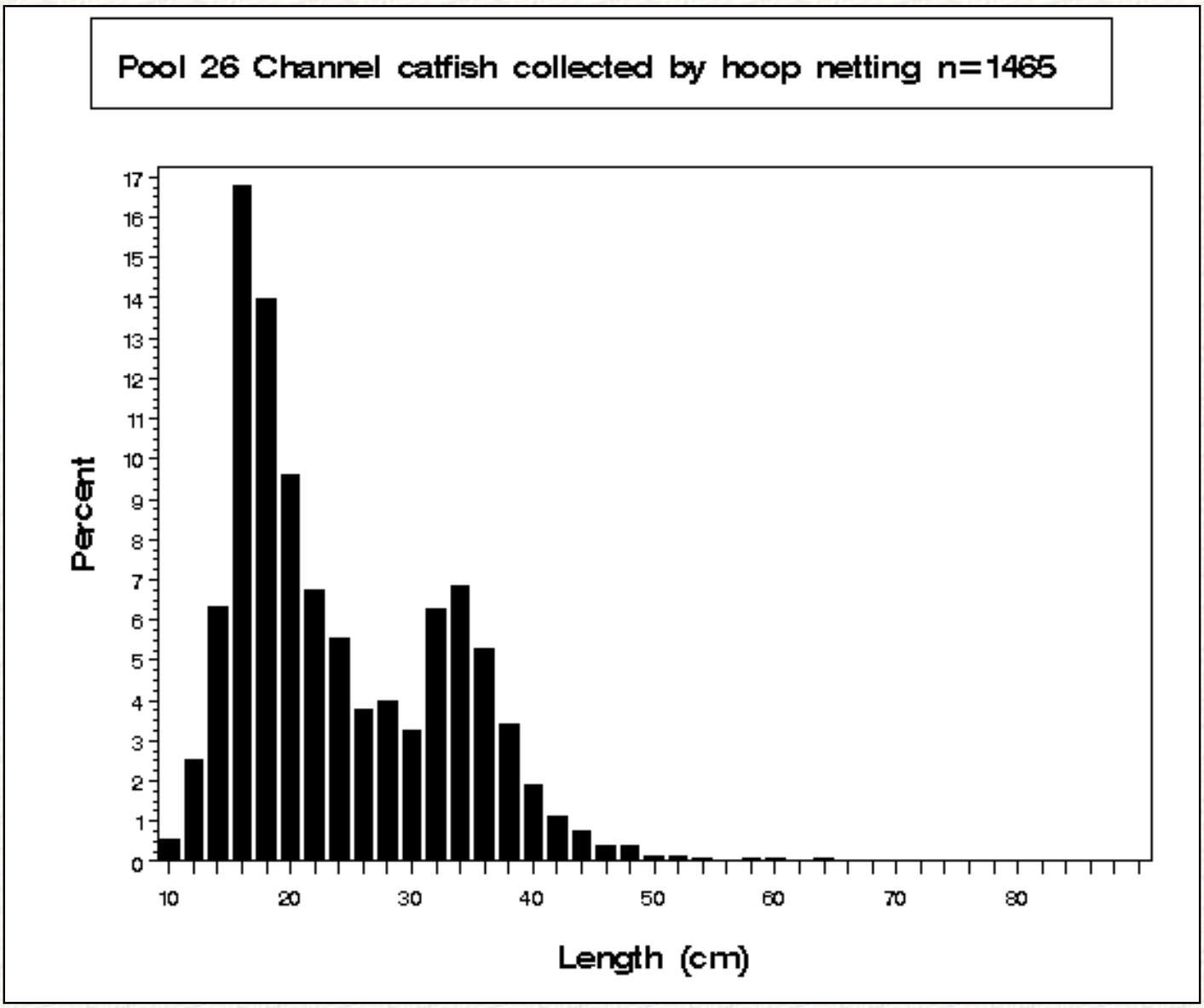
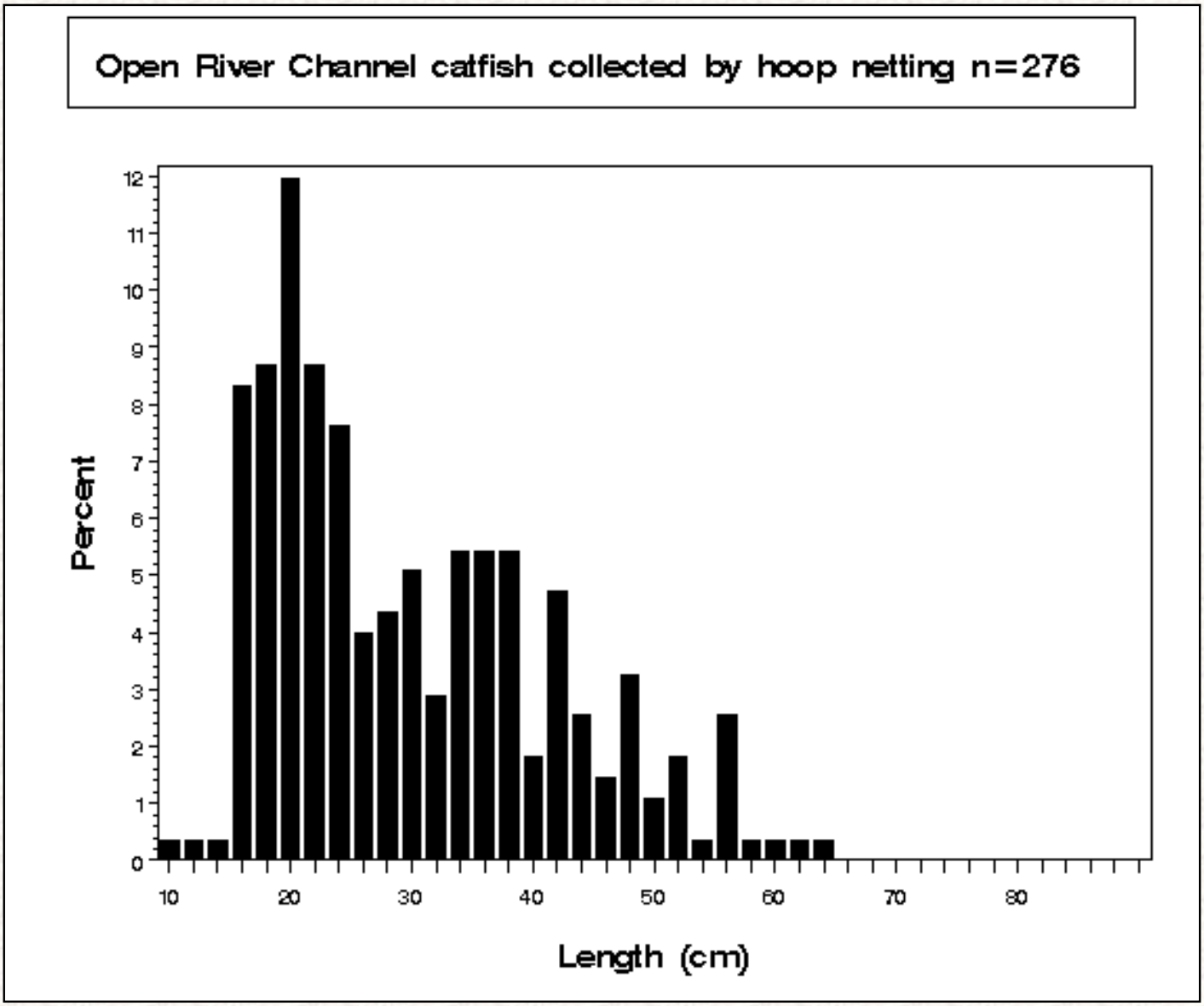
**Figure 6.** Length distributions as a percentage of catch for channel catfish (*Ictalurus punctatus)* collected by hoop netting in Pool 26 and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No hoop netting was conducted in Pools 4, 8, or 13 in 2003.




Open River Channel catfish collected by hoop netting n=276
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
10
20
30
40
50
60
70
80
Length (cm)

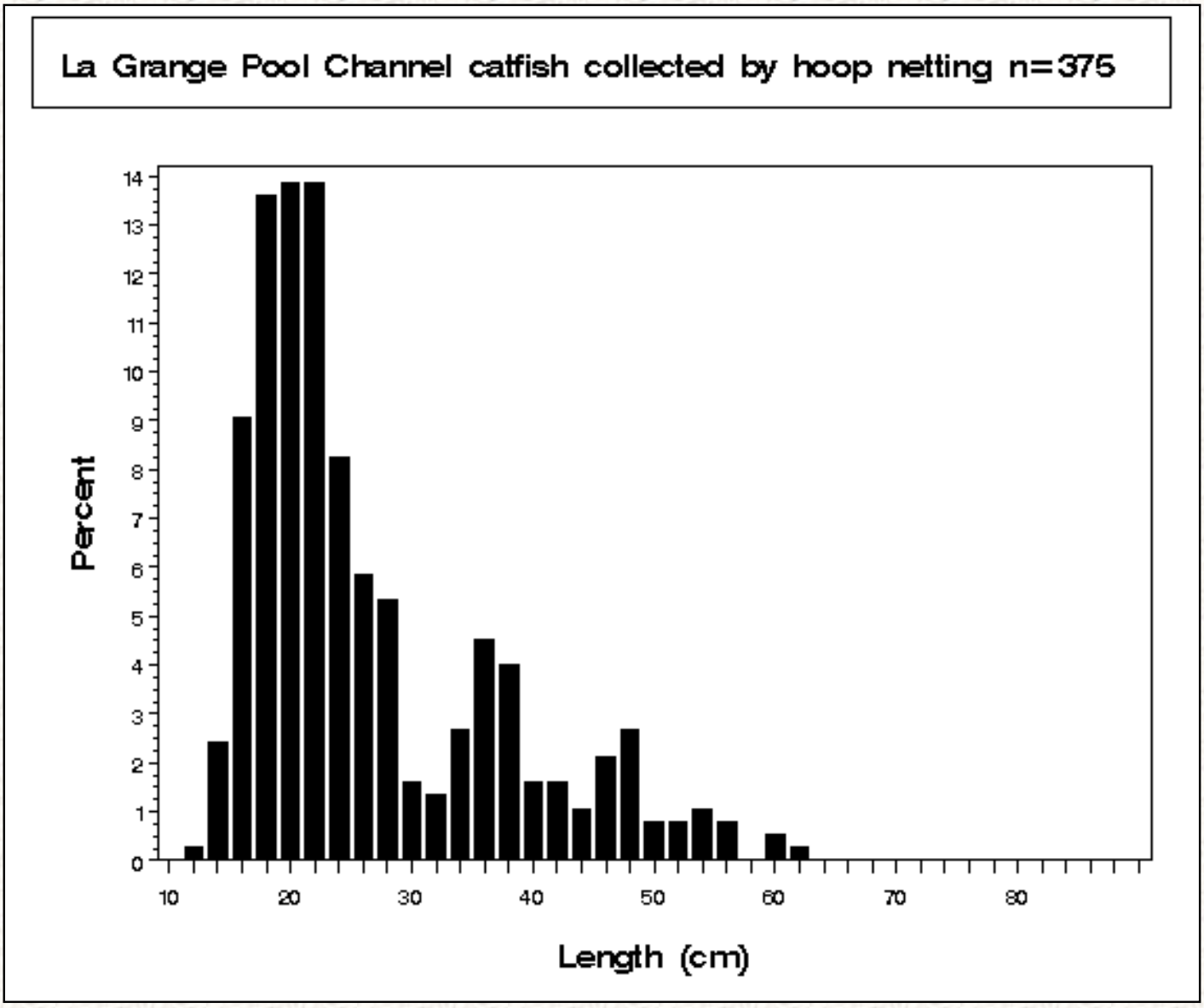



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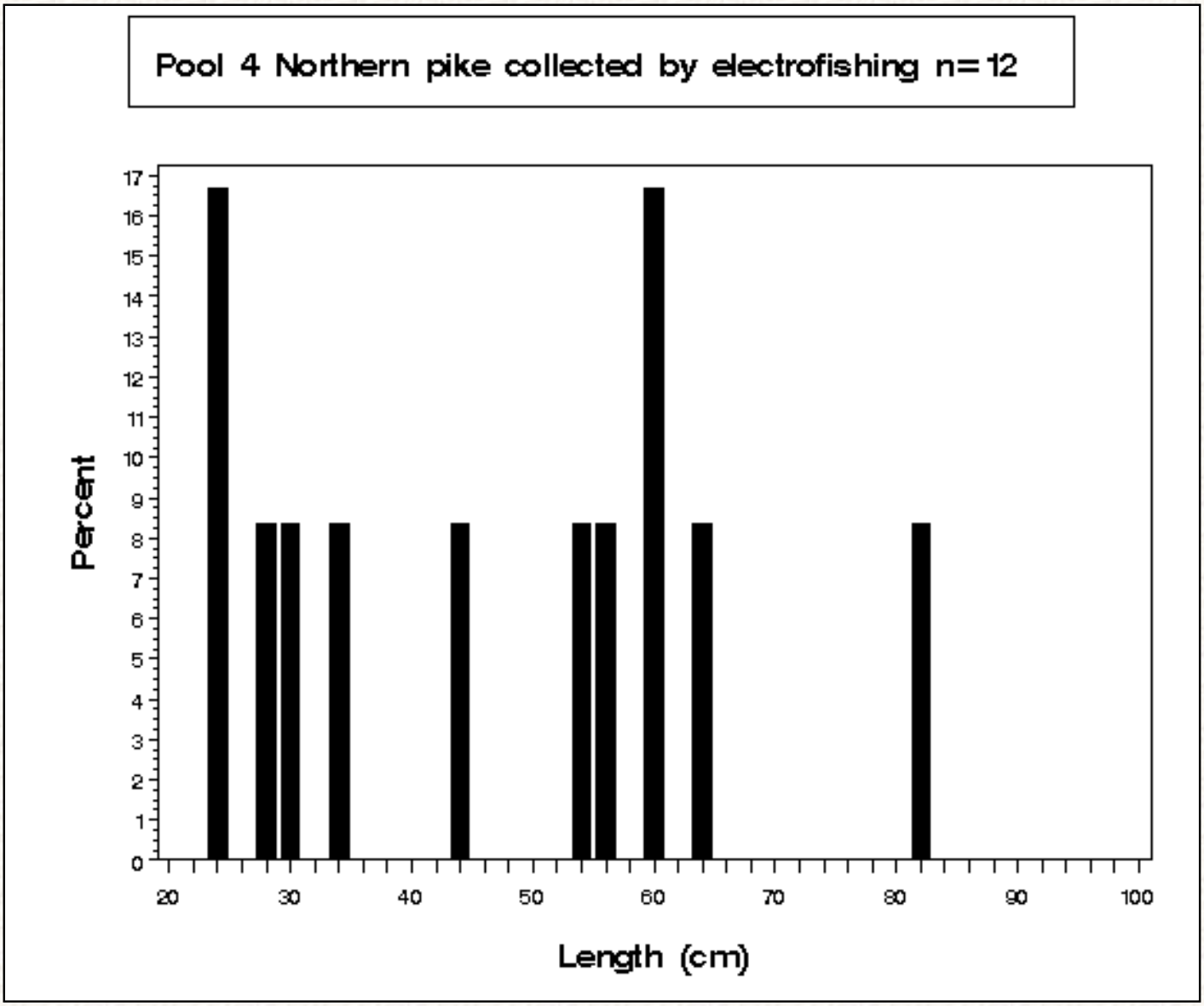
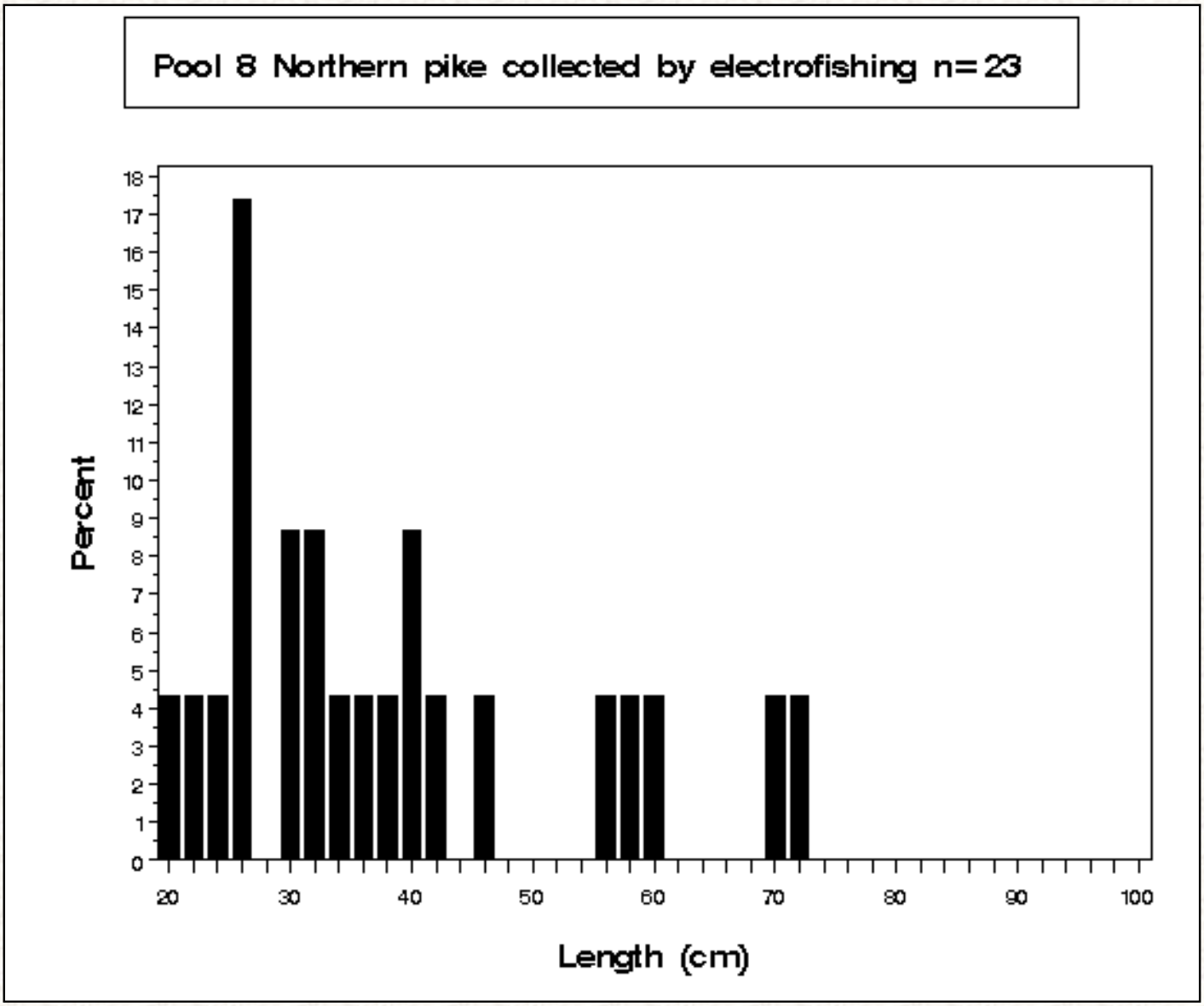
**Figure 7.** Length distributions as a percentage of catch for northern pike (*Esox lucius)* collected by electrofishing in Pools 4, 8, and 13 of the Upper Mississippi River during 2003. No northern pike were collected in Pool 26, Open River, and La Grange Pool in 2003.




Pool 8 Northern pike collected by electrofishing n=23
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
20
30
40
50
60
70
80
90
100
Length (cm)

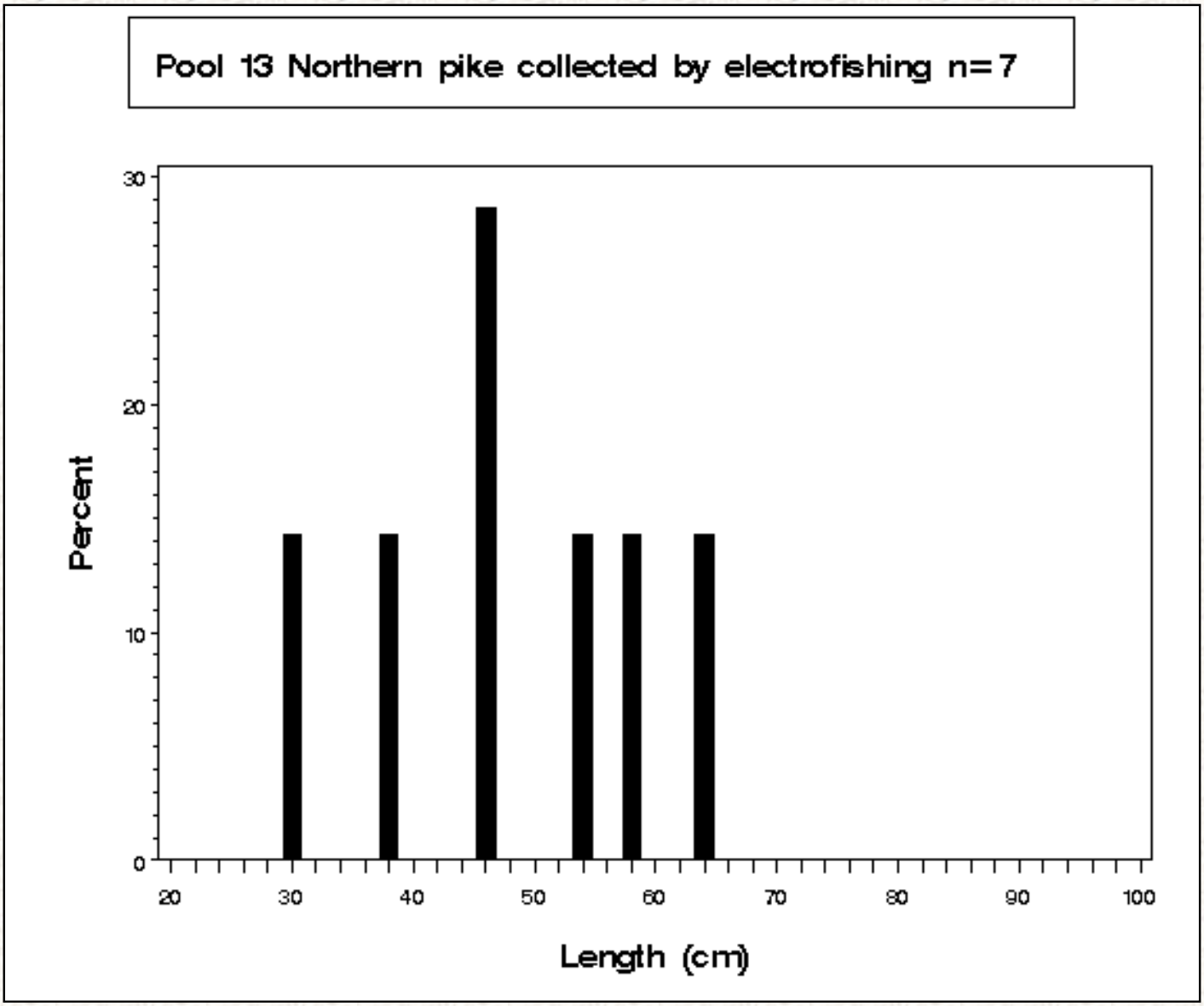



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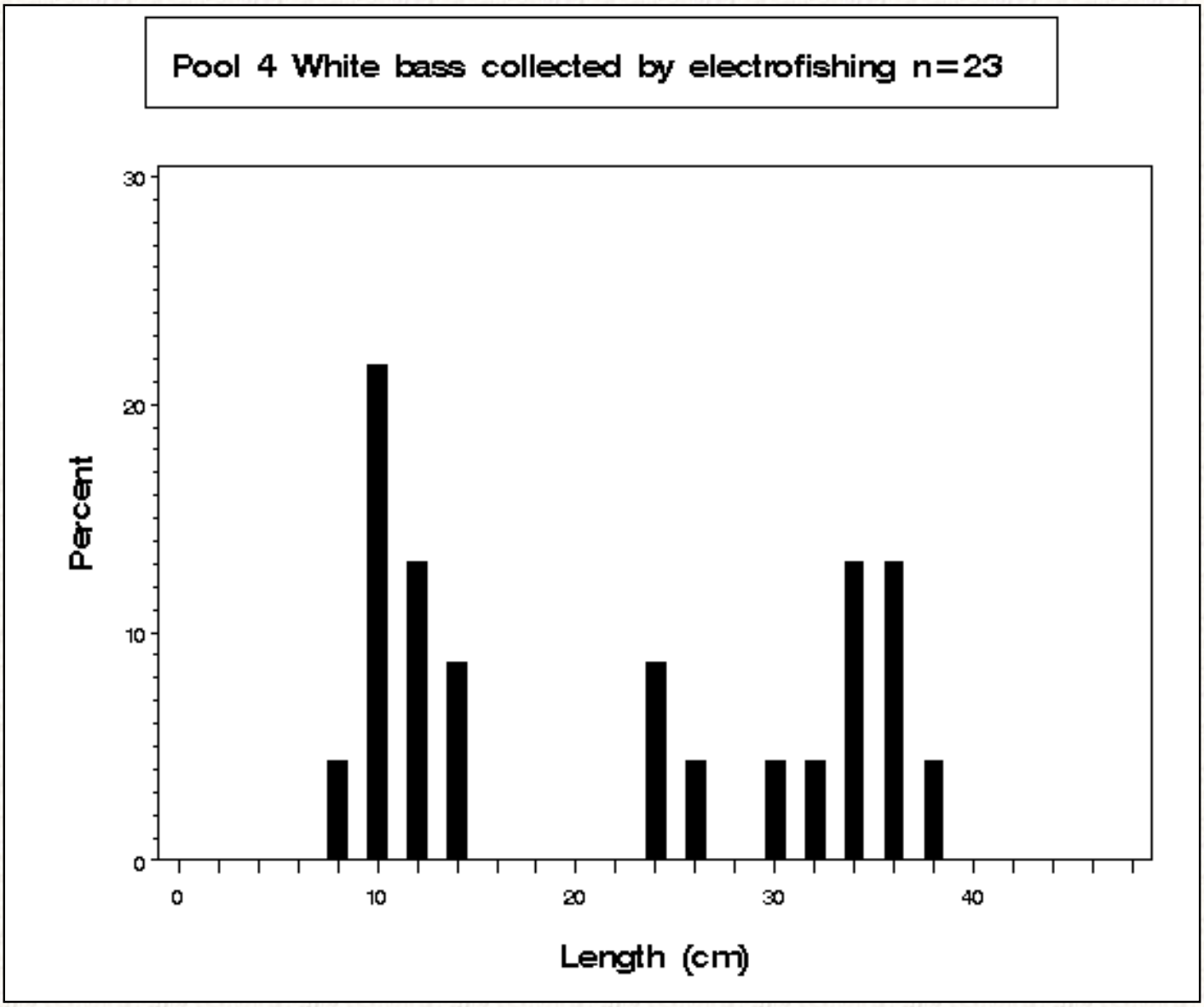
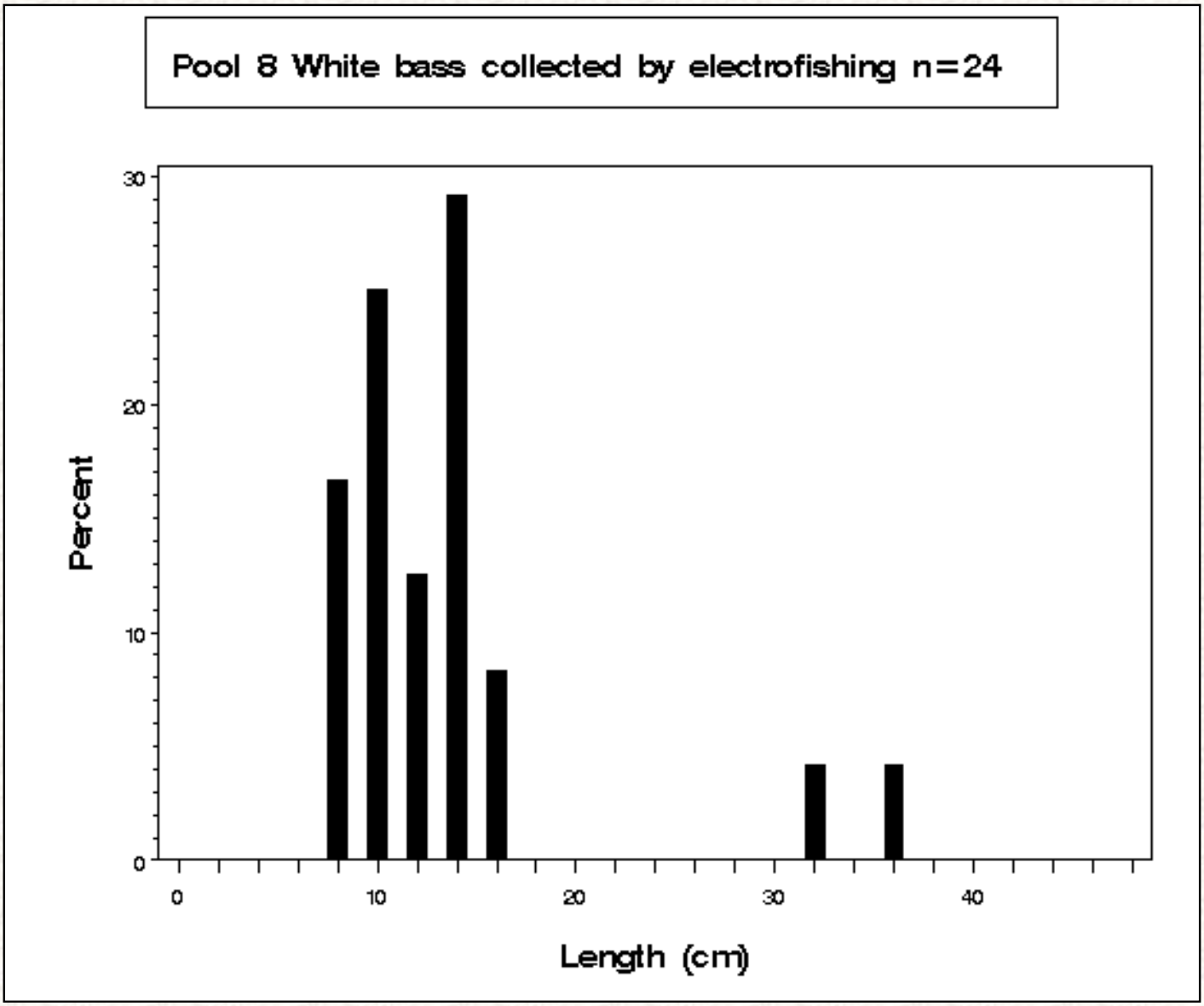
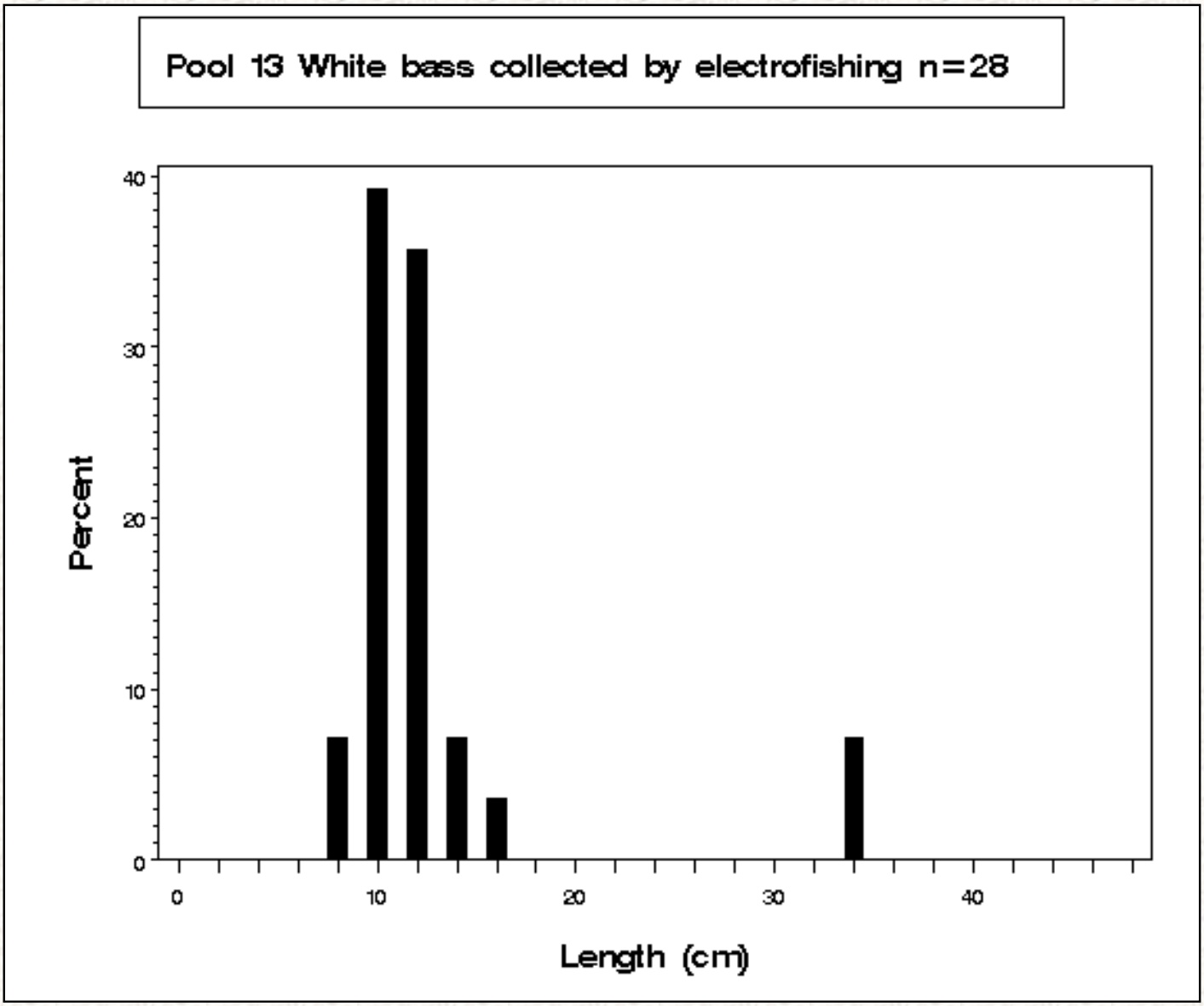
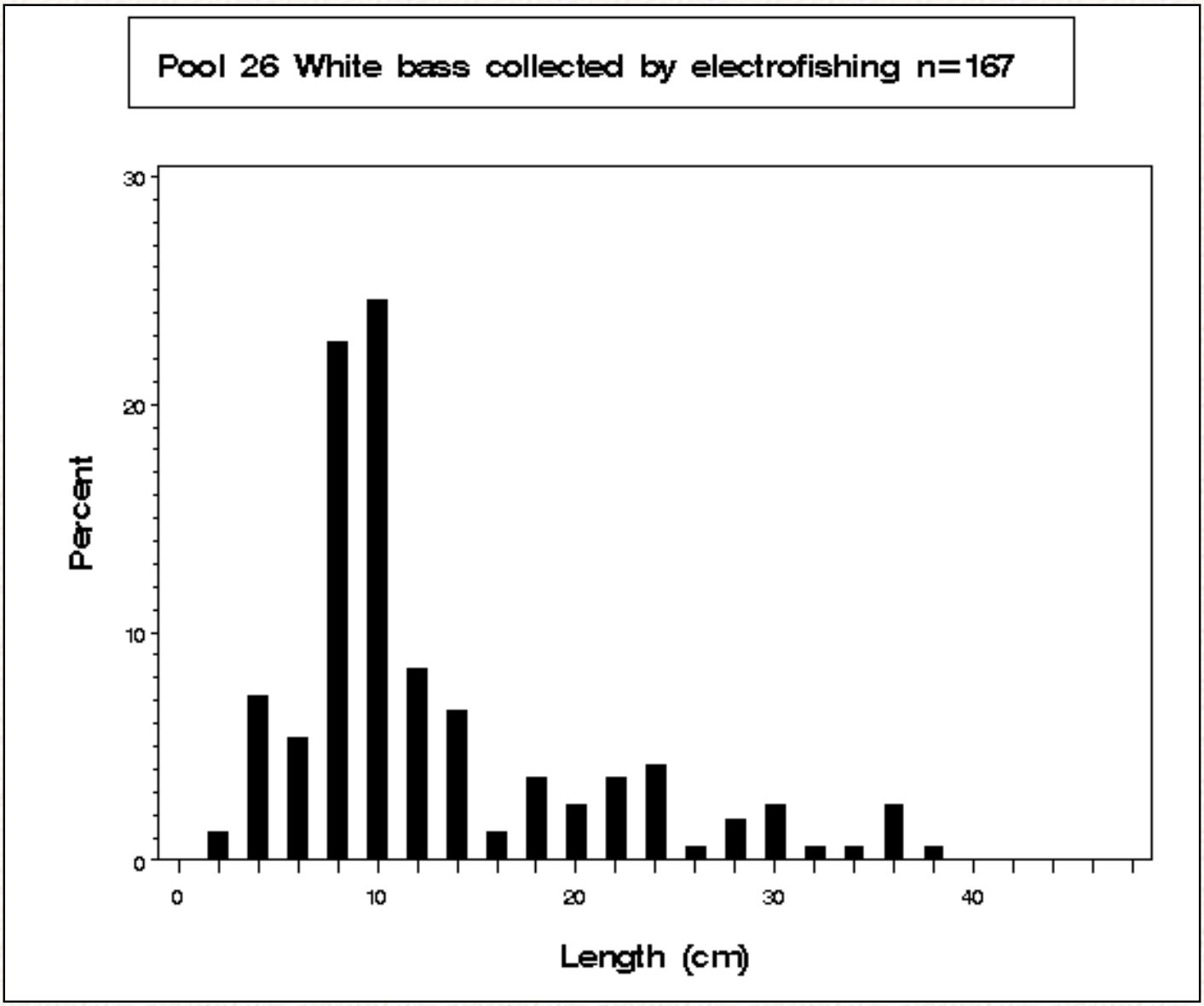
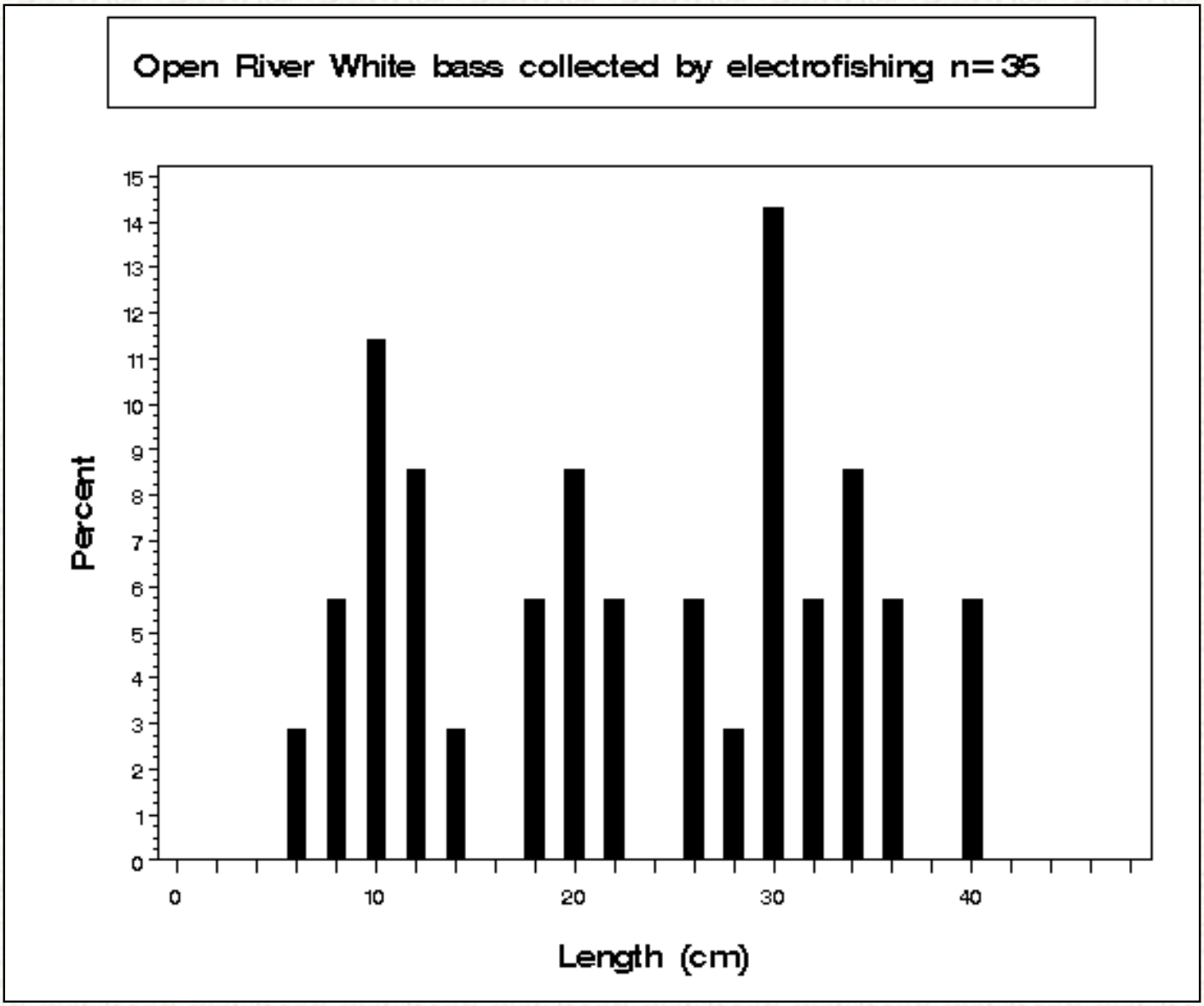
**Figure 8.** Length distributions as a percentage of catch for white bass (*Morone chrysops)* collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 White bass collected by electrofishing n=24
Percent
0
10
20
30
0
10
20
30
40
Length (cm)


Pool 13 White bass collected by electrofishing n=28
Percent
0
10
20
30
40
0
10
20
30
40
Length (cm)


Pool 26 White bass collected by electrofishing n=167
Percent
0
10
20
30
0
10
20
30
40
Length (cm)


Open River White bass collected by electrofishing n=35
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
10
20
30
40
Length (cm)

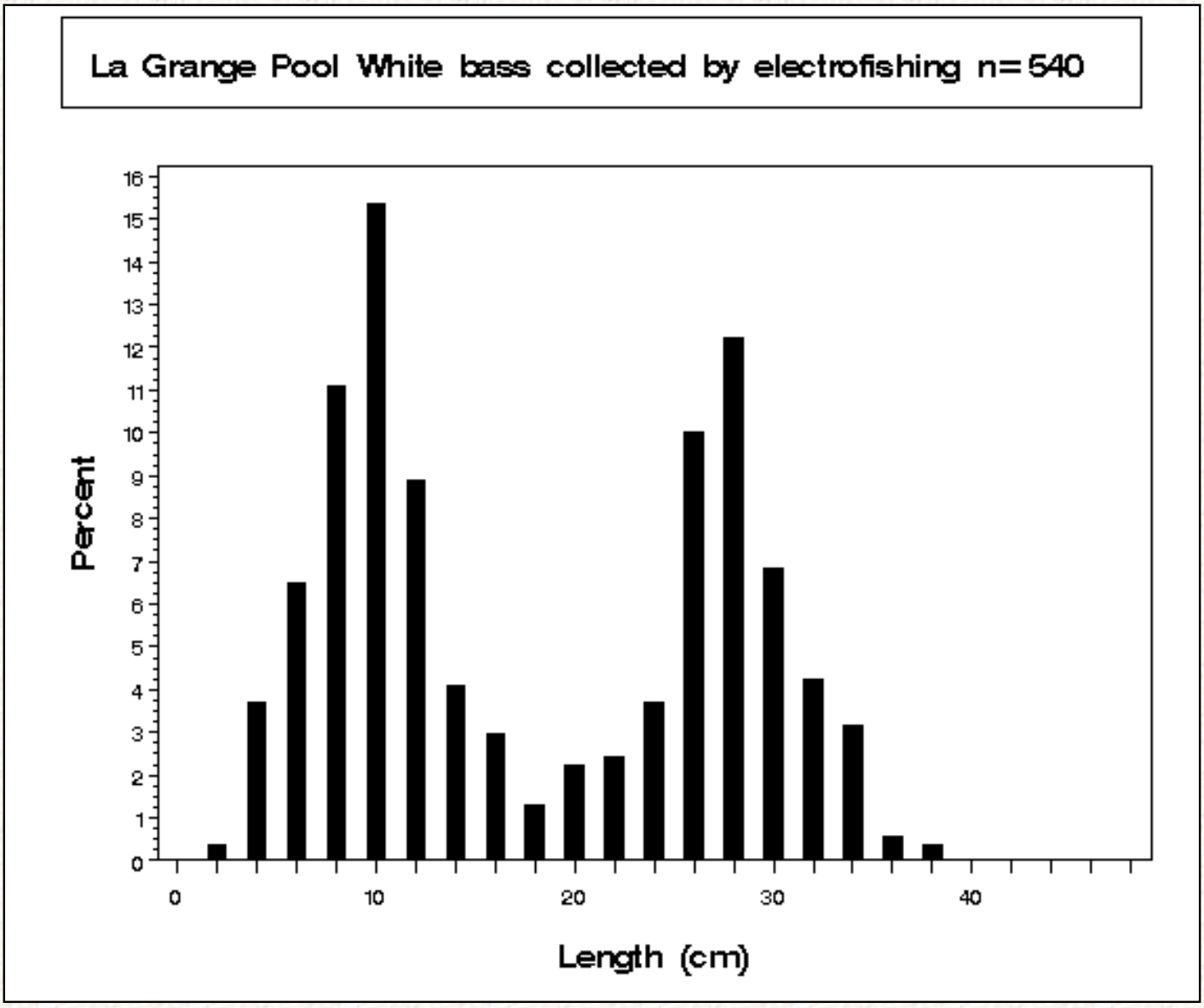



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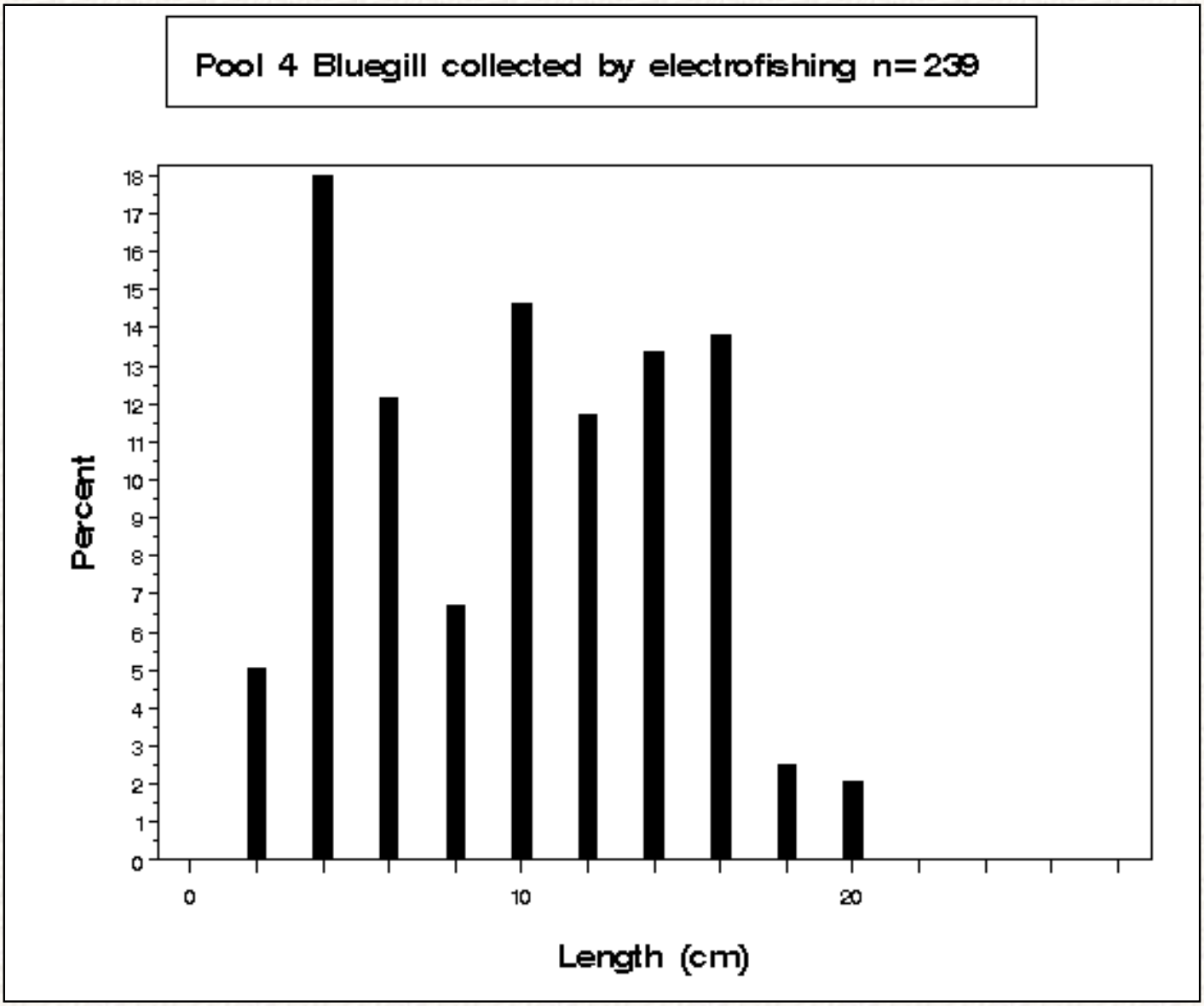
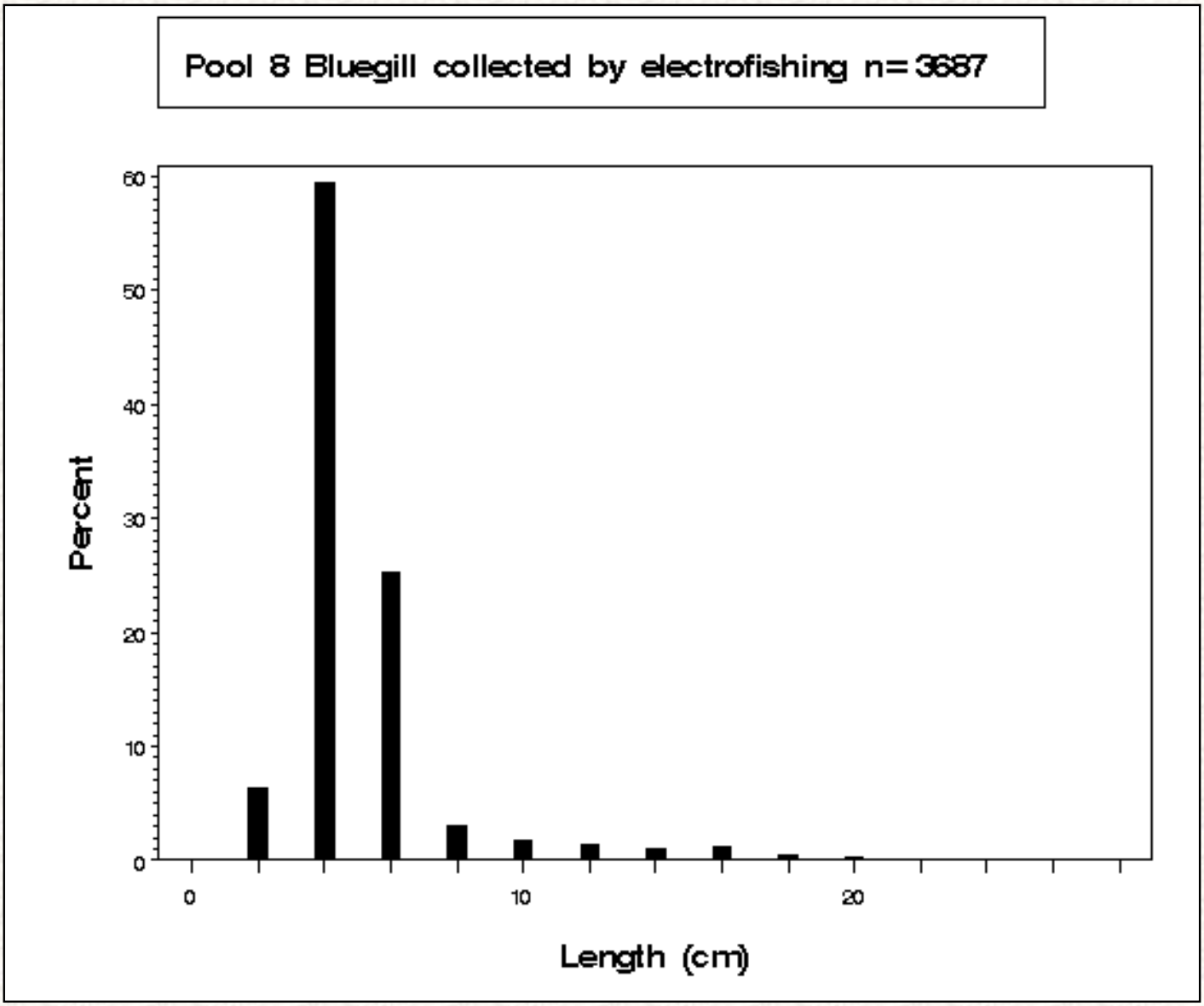
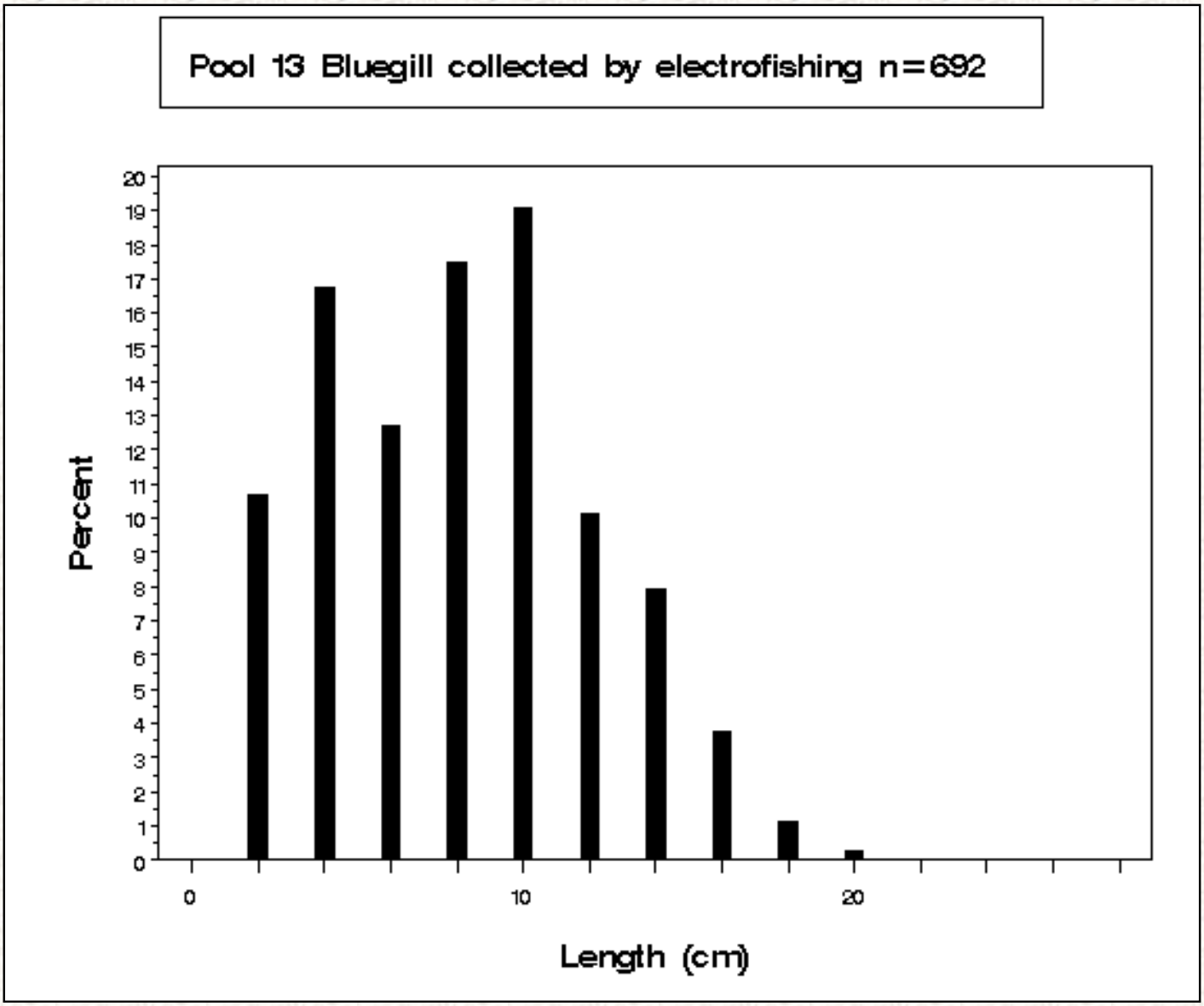
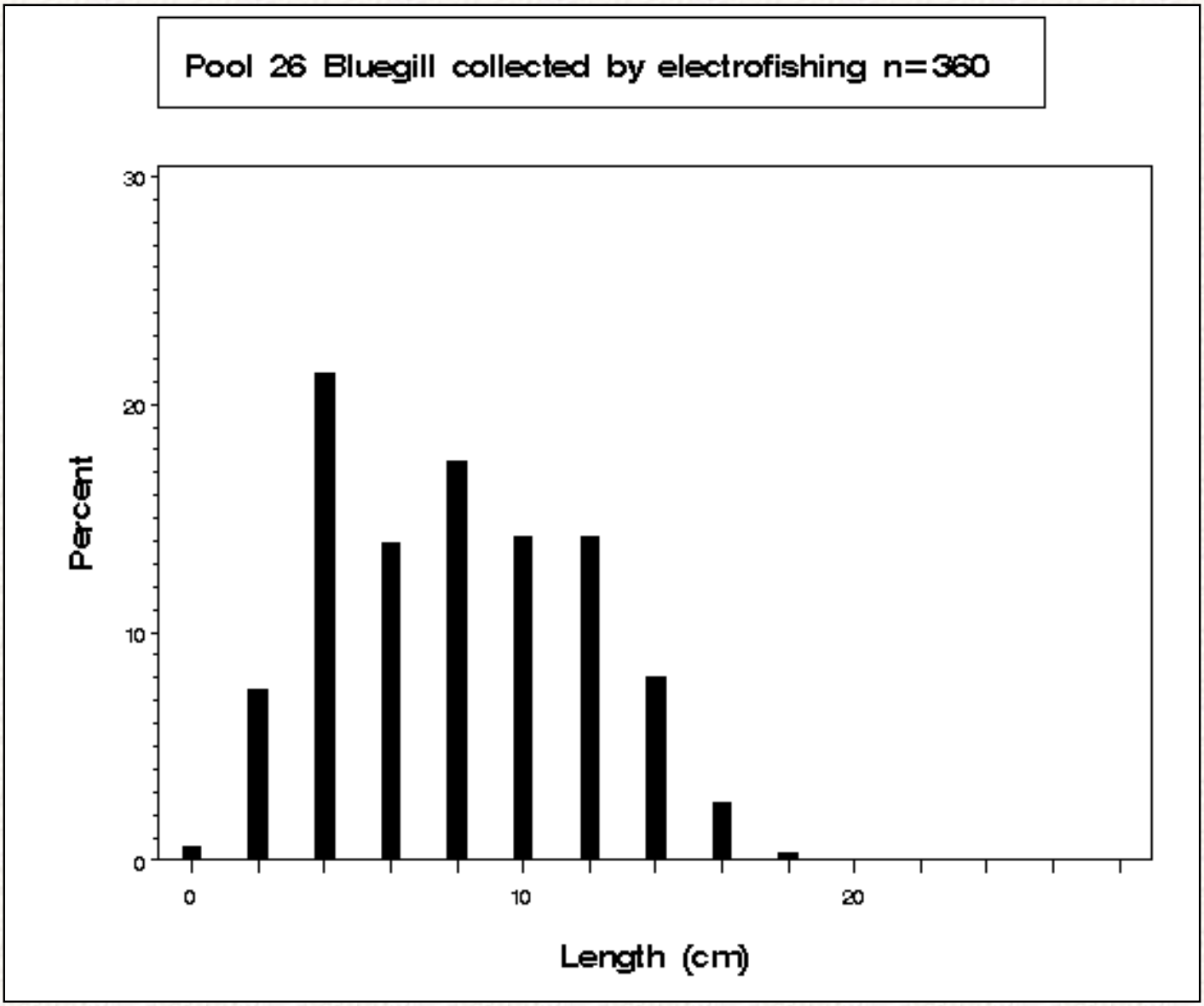
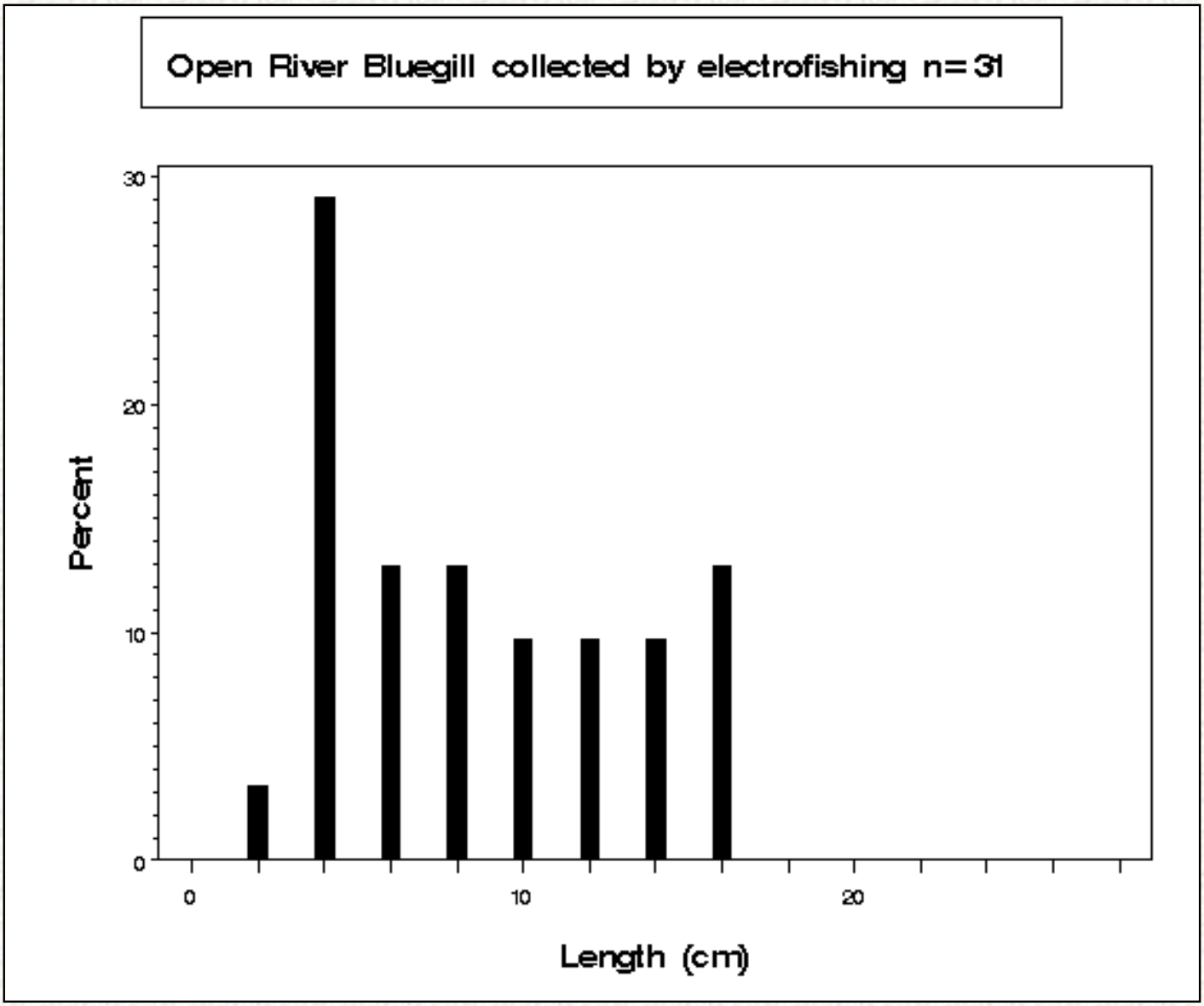
**Figure 9.** Length distributions as a percentage of catch for bluegill (*Lepomis macrochirus*) collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Bluegill collected by electrofishing n=3687
Percent
60
50
40
30
20
10
0
0
10
20
Length (cm)


Pool 13 Bluegill collected by electrofishing n=692
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
0
10
20
Length (cm)


Pool 26 Bluegill collected by electrofishing n=360
Percent
30
20
10
0
0
10
20
Length (cm)


Open River Bluegill collected by electrofishing n=31
Percent
30
20
10
0
0
10
20
Length (cm)

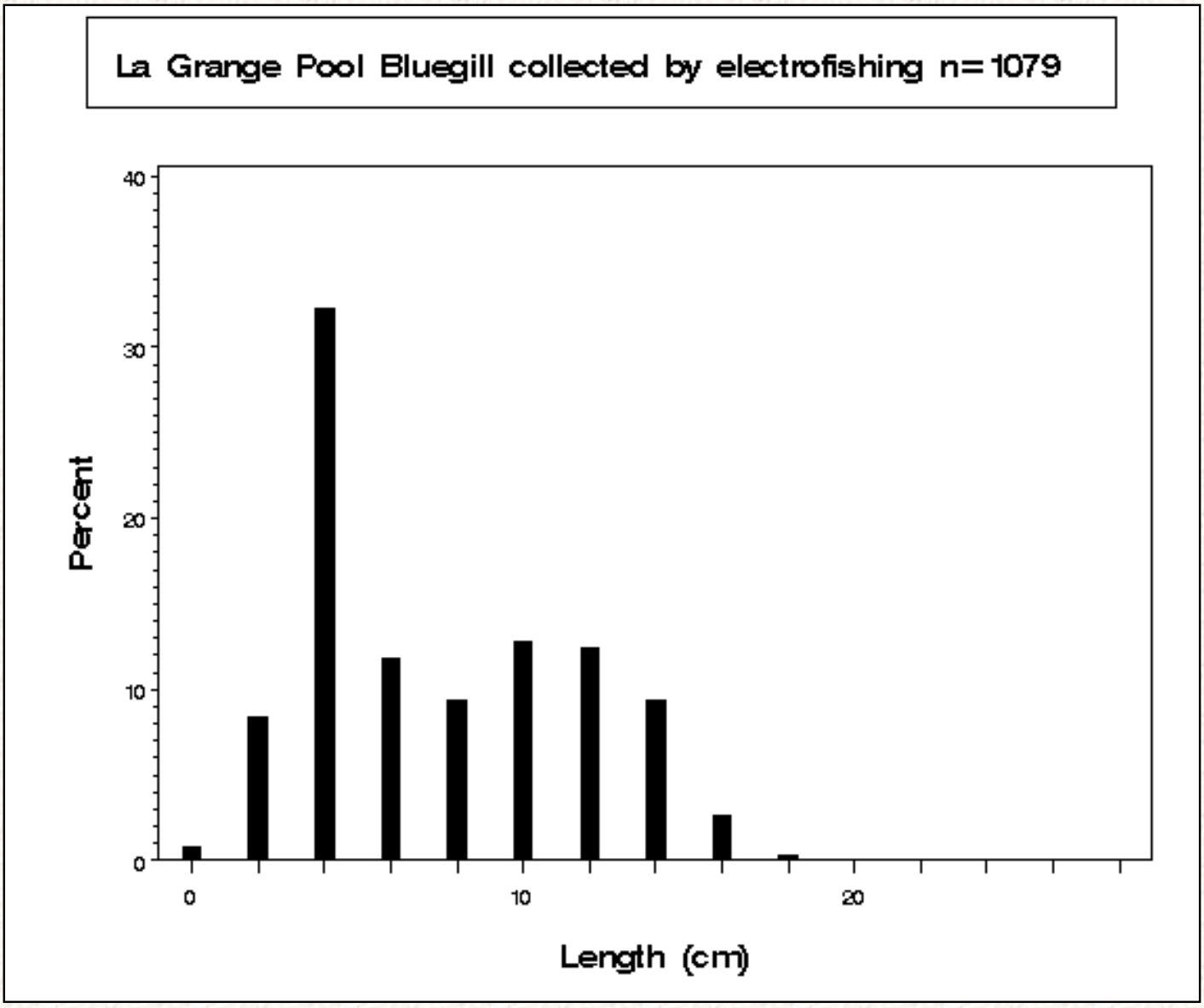



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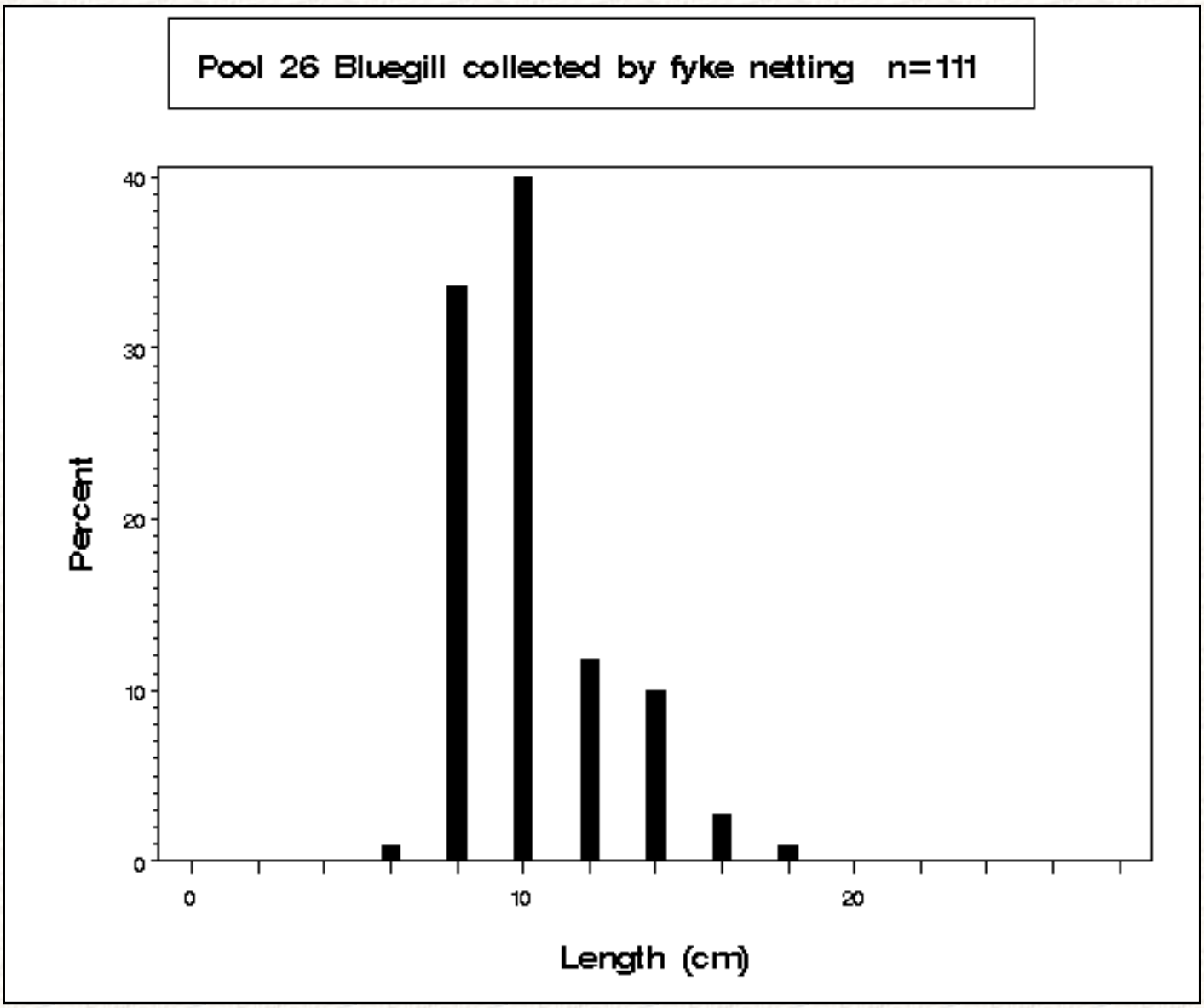
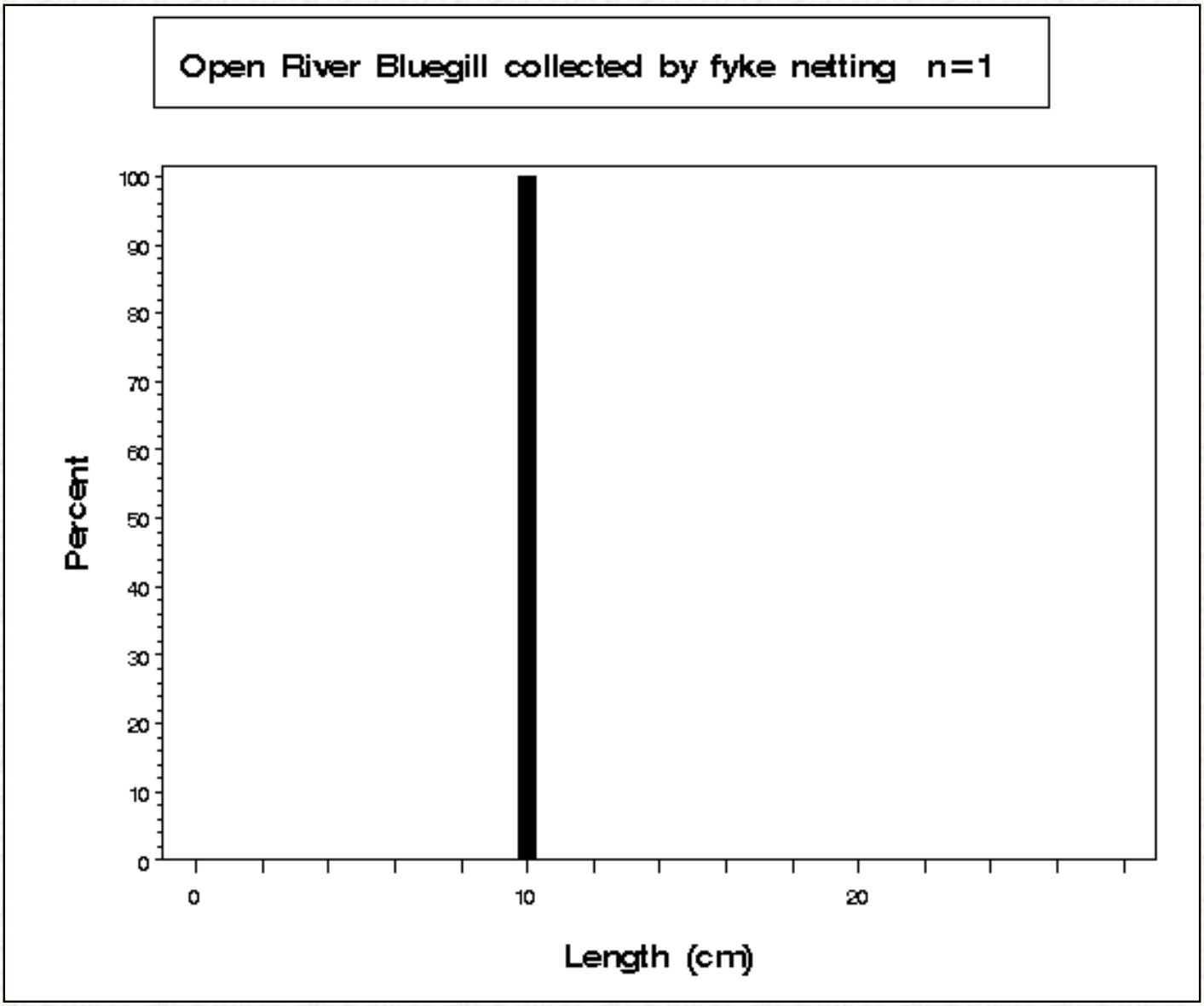
**Figure 10.** Length distributions as a percentage of catch for bluegill (*Lepomis macrochirus*) collected by fyke netting in Pool 26 and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No fyke netting was conducted in Pools 4, 8, or 13 in 2003.




Open River Bluegill collected by fyke netting n=1
Percent
100
90
80
70
60
50
40
30
20
10
0
0
10
20
Length (cm)

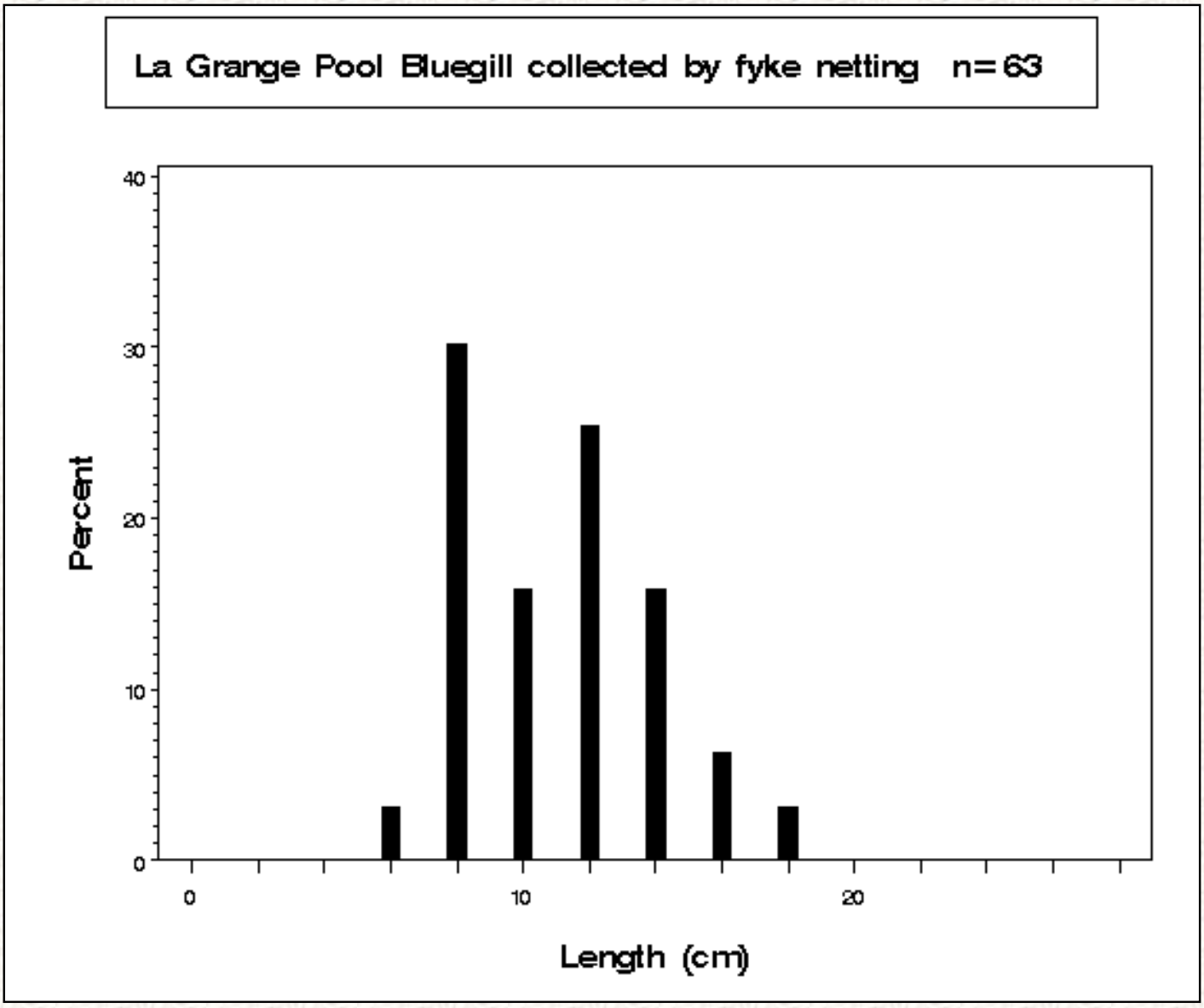



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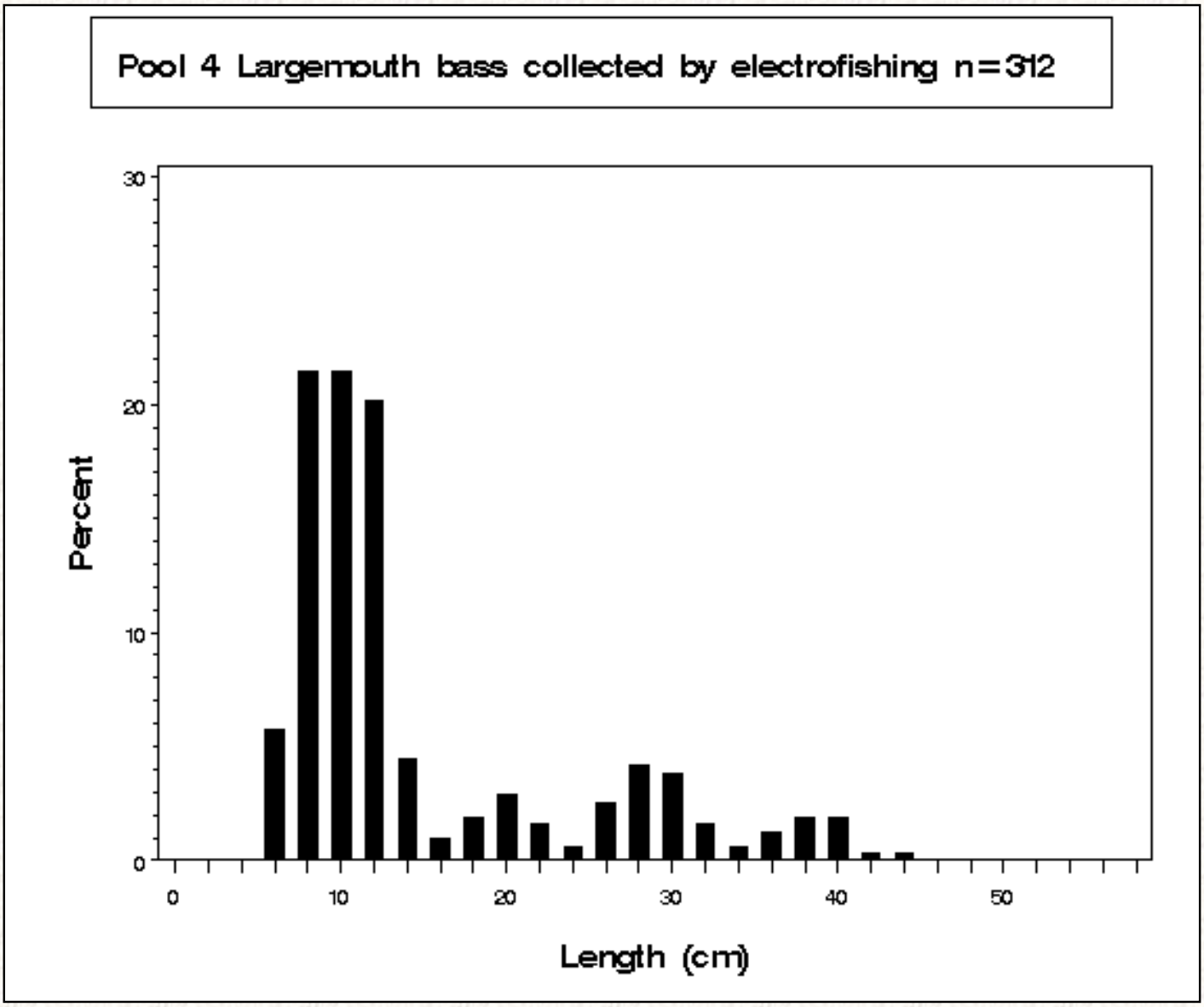
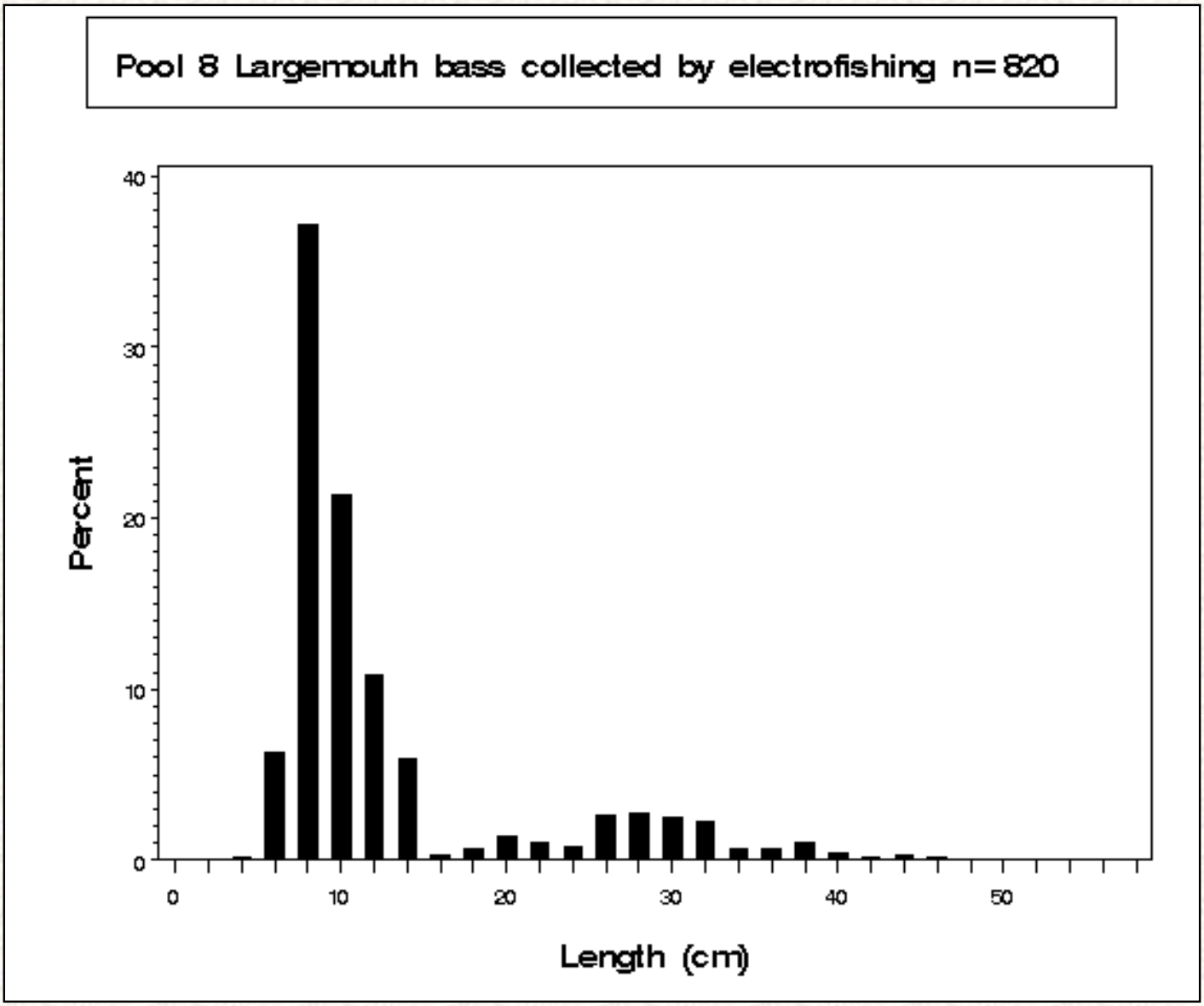
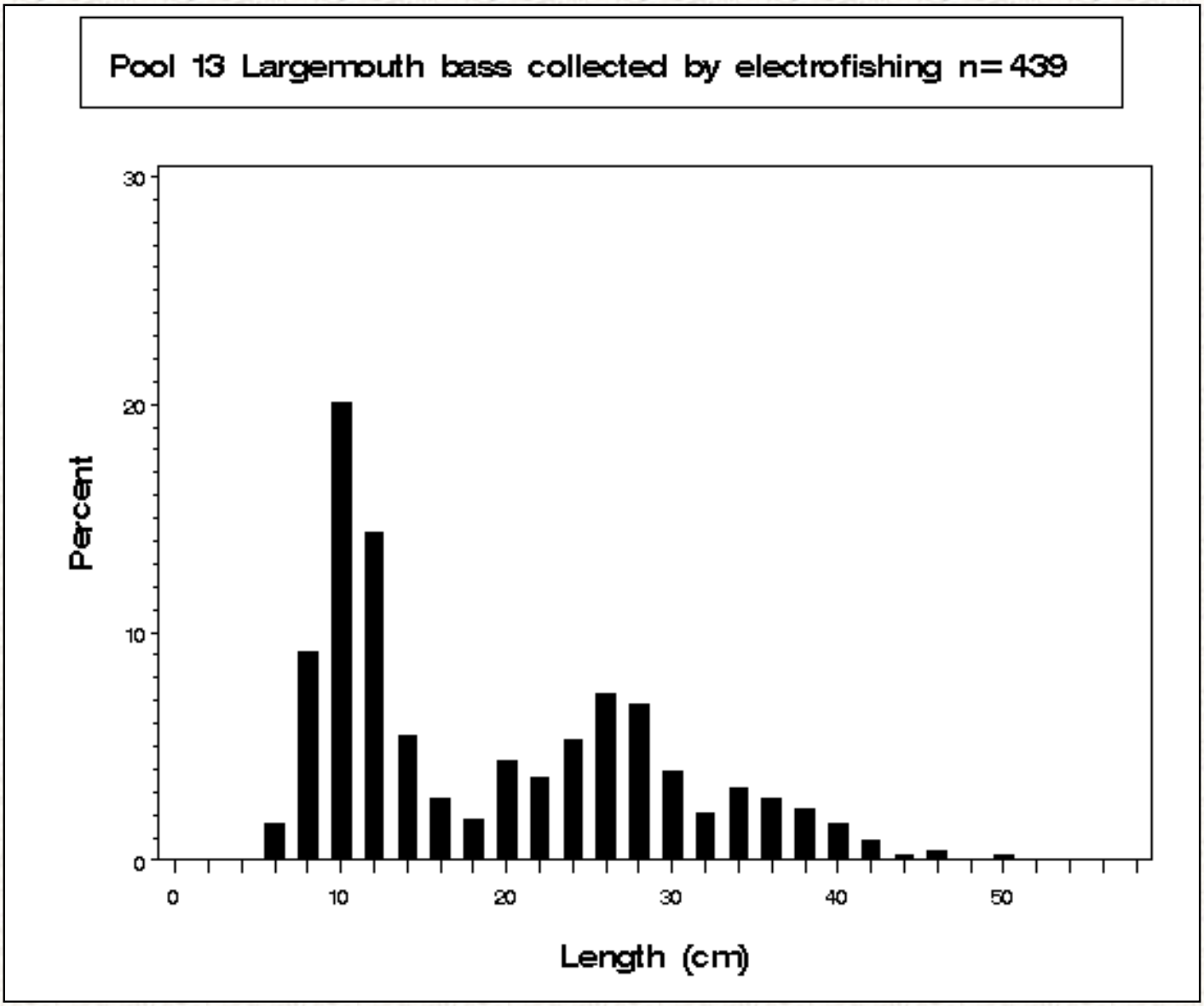
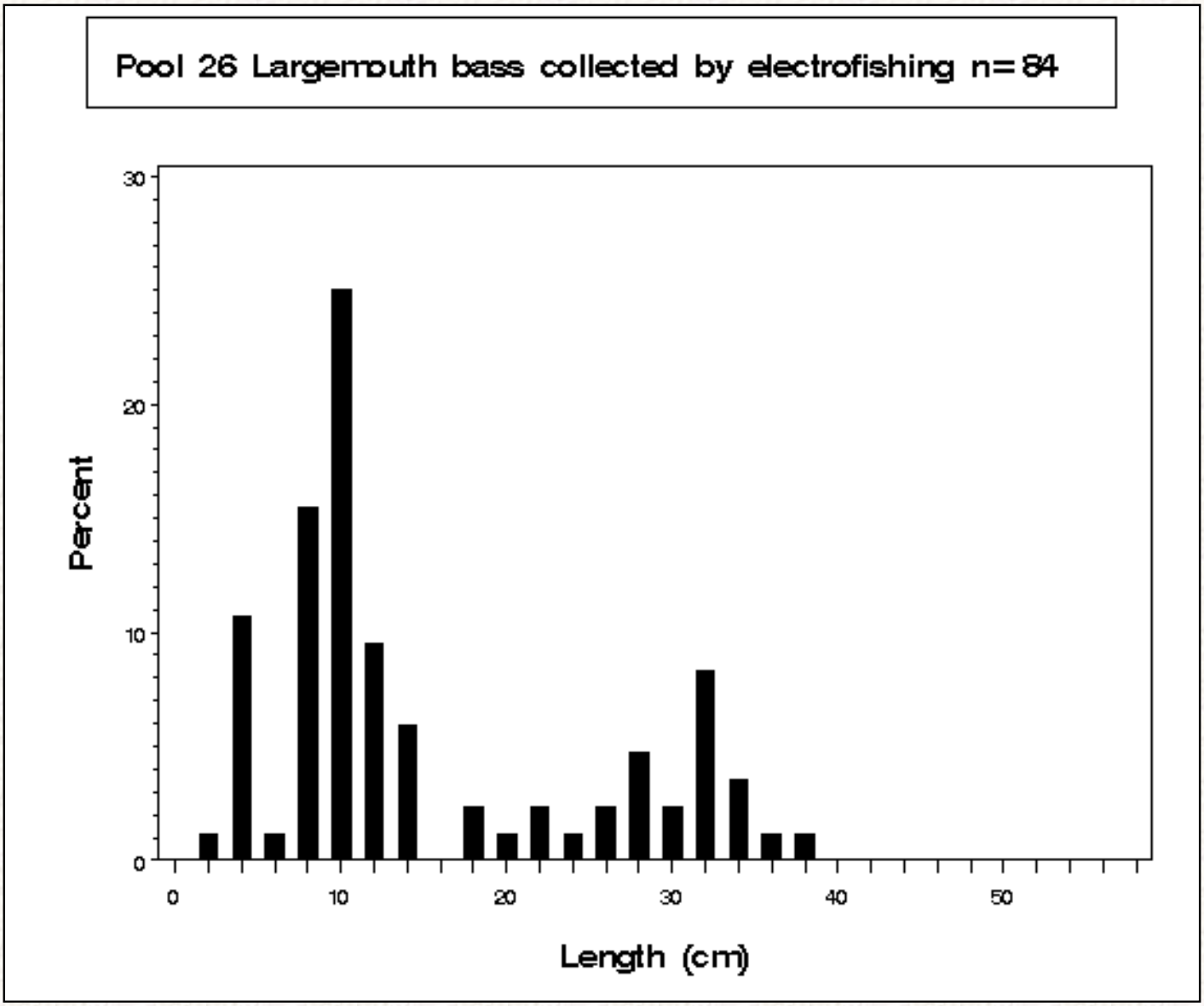
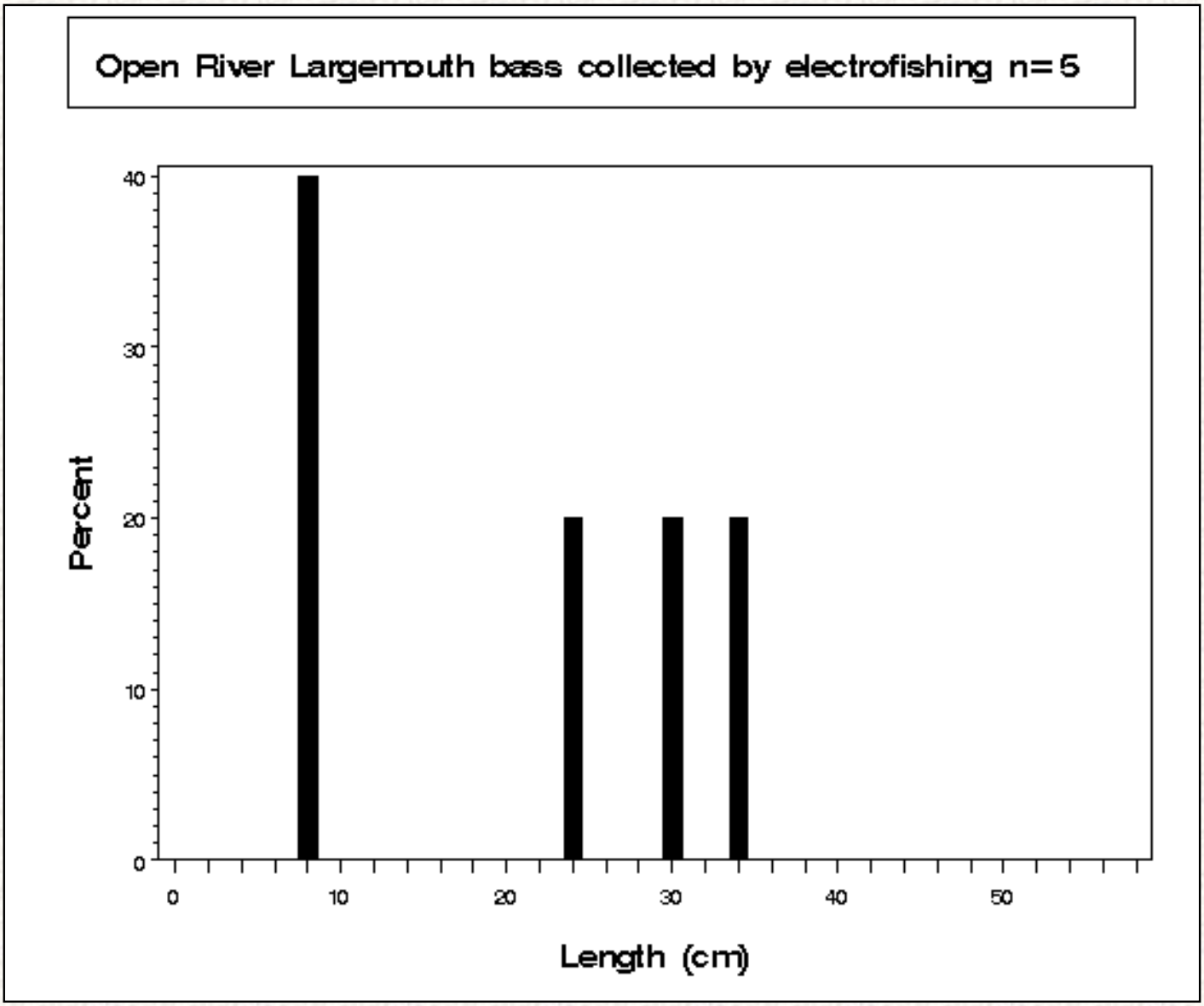
**Figure 11.** Length distributions as a percentage of catch for largemouth bass (*Micropterus salmoides)* collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Largemouth bass collected by electrofishing n=820
Percent
0
10
20
30
40
0
10
20
30
40
50
Length (cm)


Pool 13 Largemouth bass collected by electrofishing n=439
Percent
30
20
10
0
0
10
20
30
40
50
Length (cm)


Pool 26 Largemouth bass collected by electrofishing n=84
Percent
0
10
20
30
0
10
20
30
40
50
Length (cm)


Open River Largemouth bass collected by electrofishing n=5
Percent
0
10
20
30
40
0
10
20
30
40
50
Length (cm)

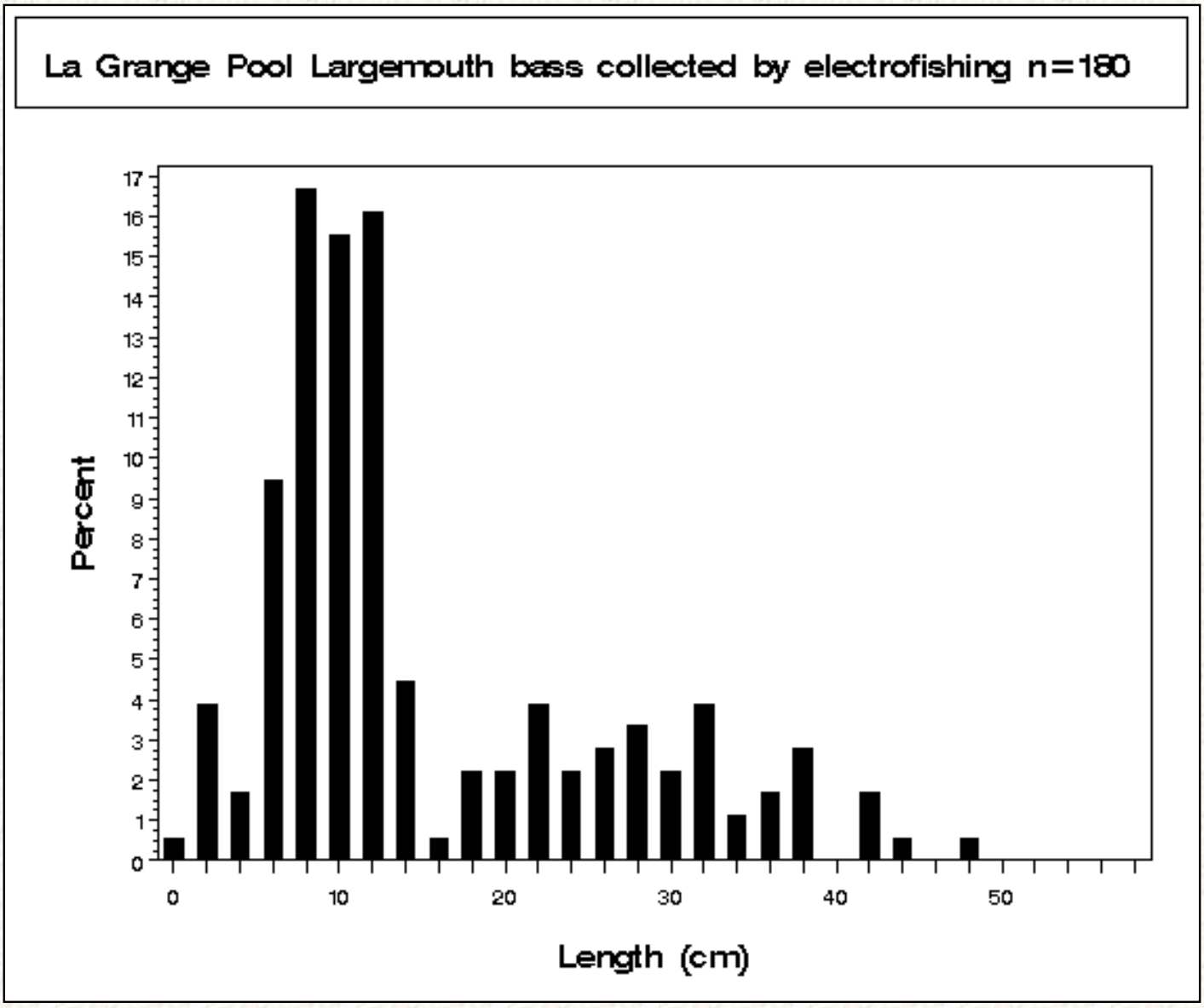



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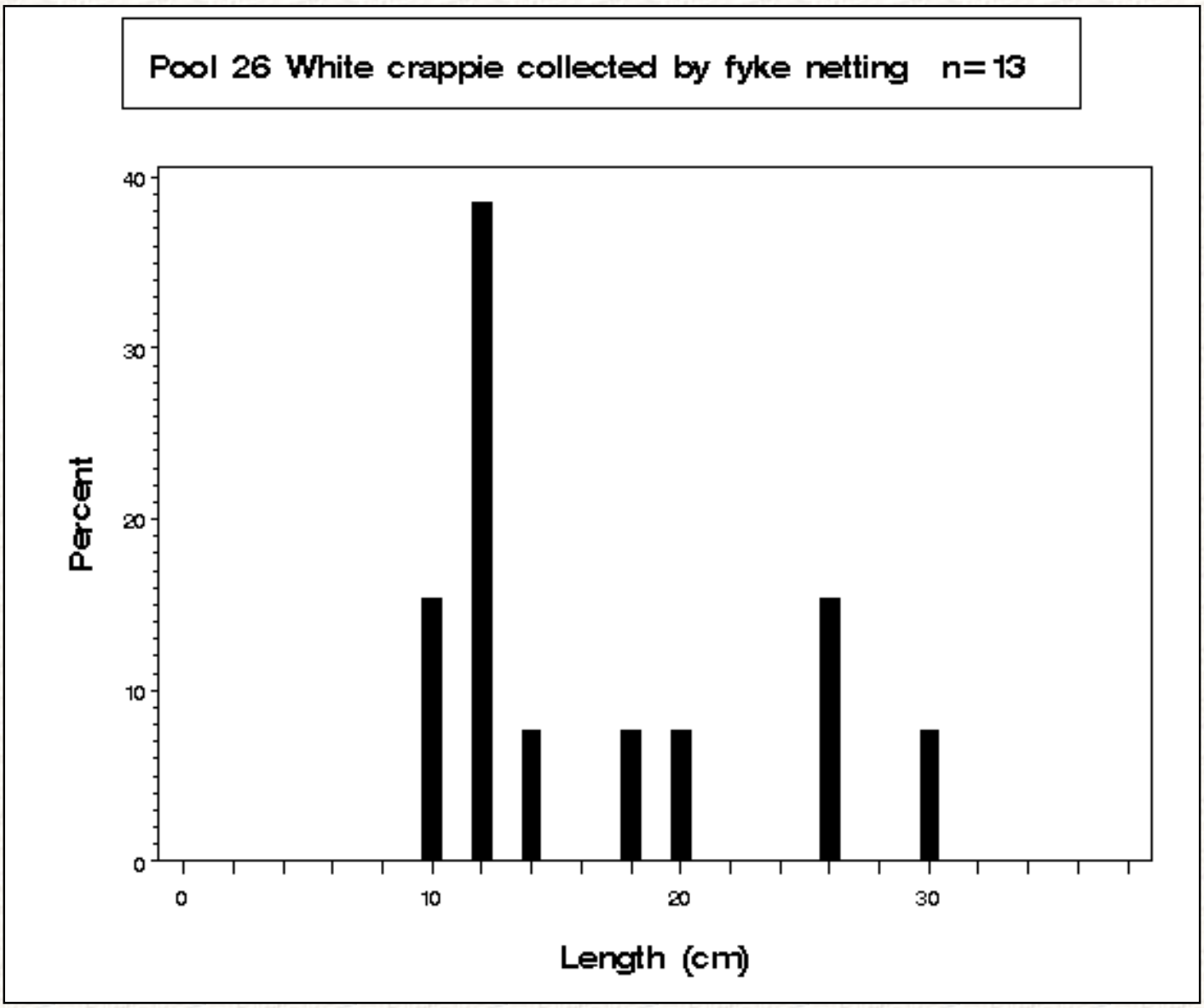
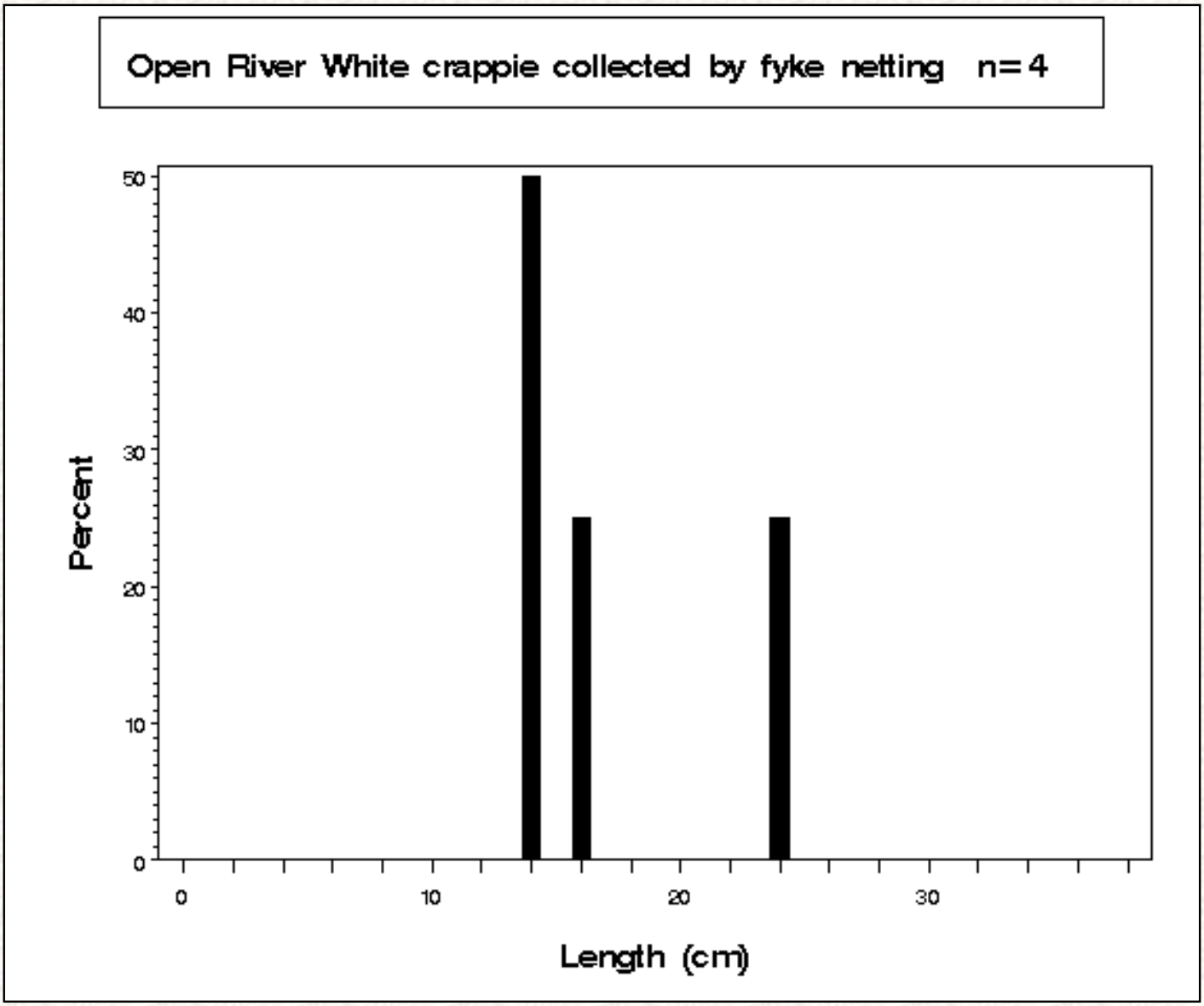
**Figure 12.** Length distributions as a percentage of catch for white crappie (*Pomoxis annularius)* collected by fyke netting in Pool 26 and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No fyke netting was conducted in Pools 4, 8, or 13 in 2003.




Open River White crappie collected by fyke netting n=4
Percent
50
40
30
20
10
0
0
10
20
30
Length (cm)

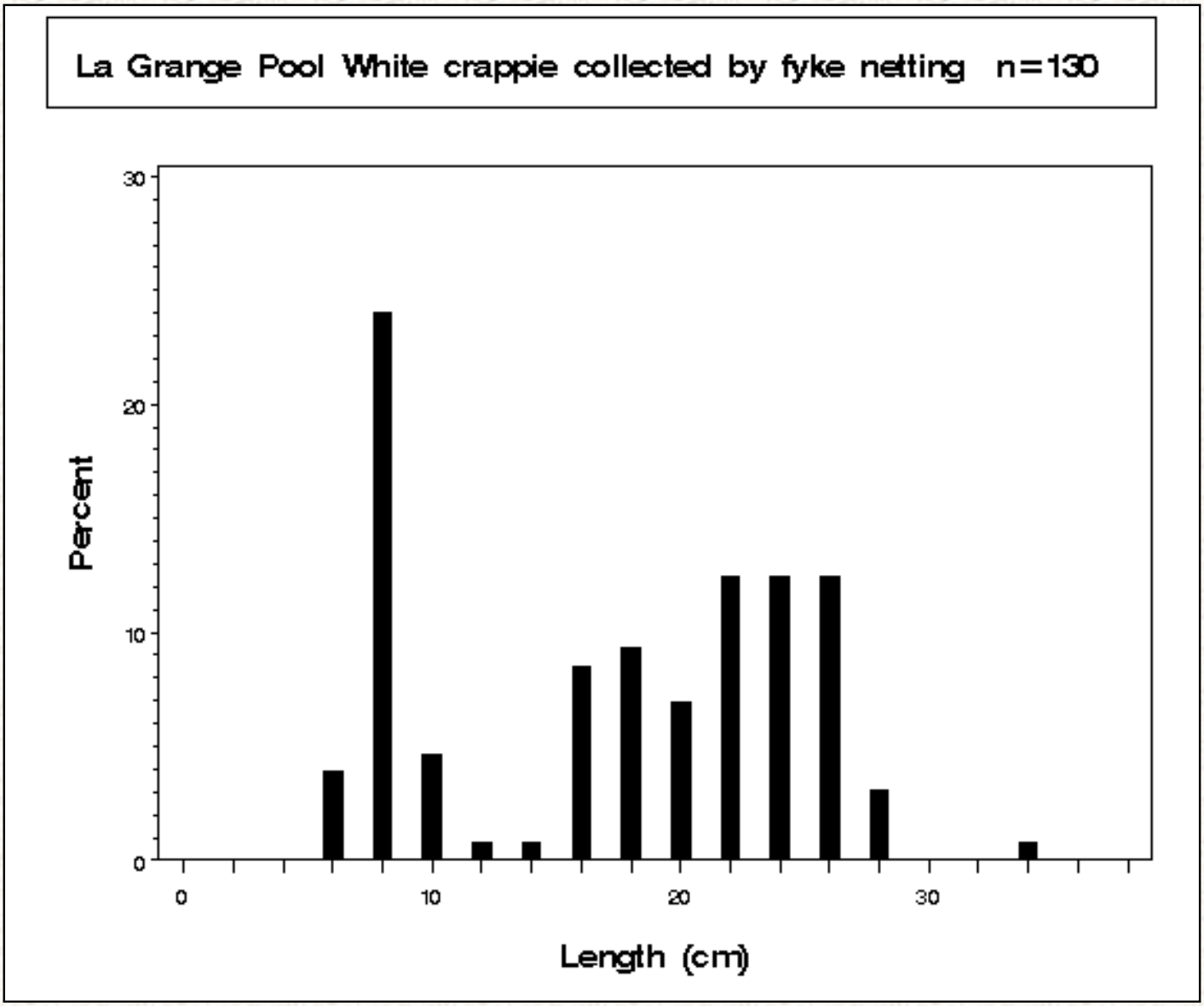



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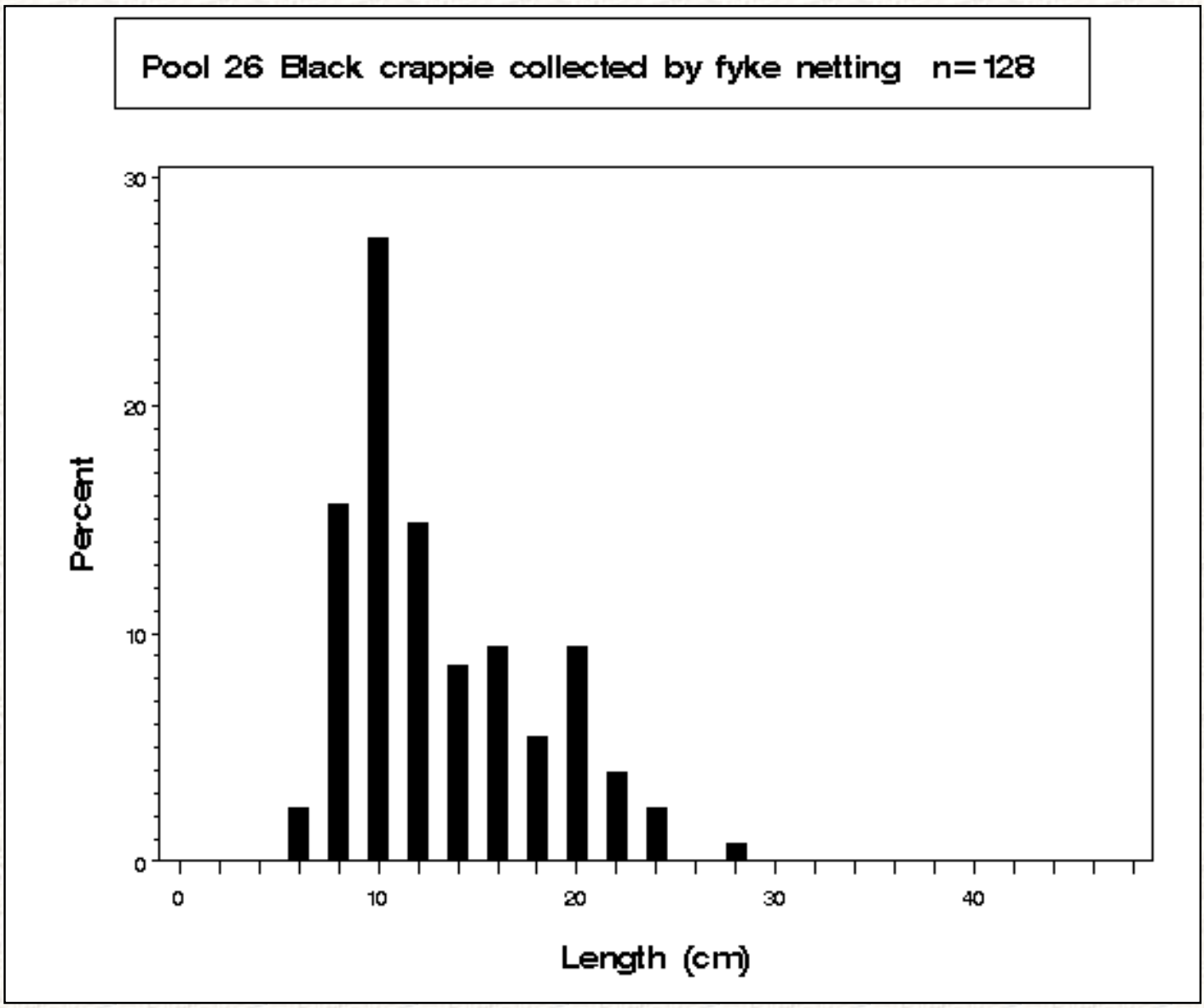
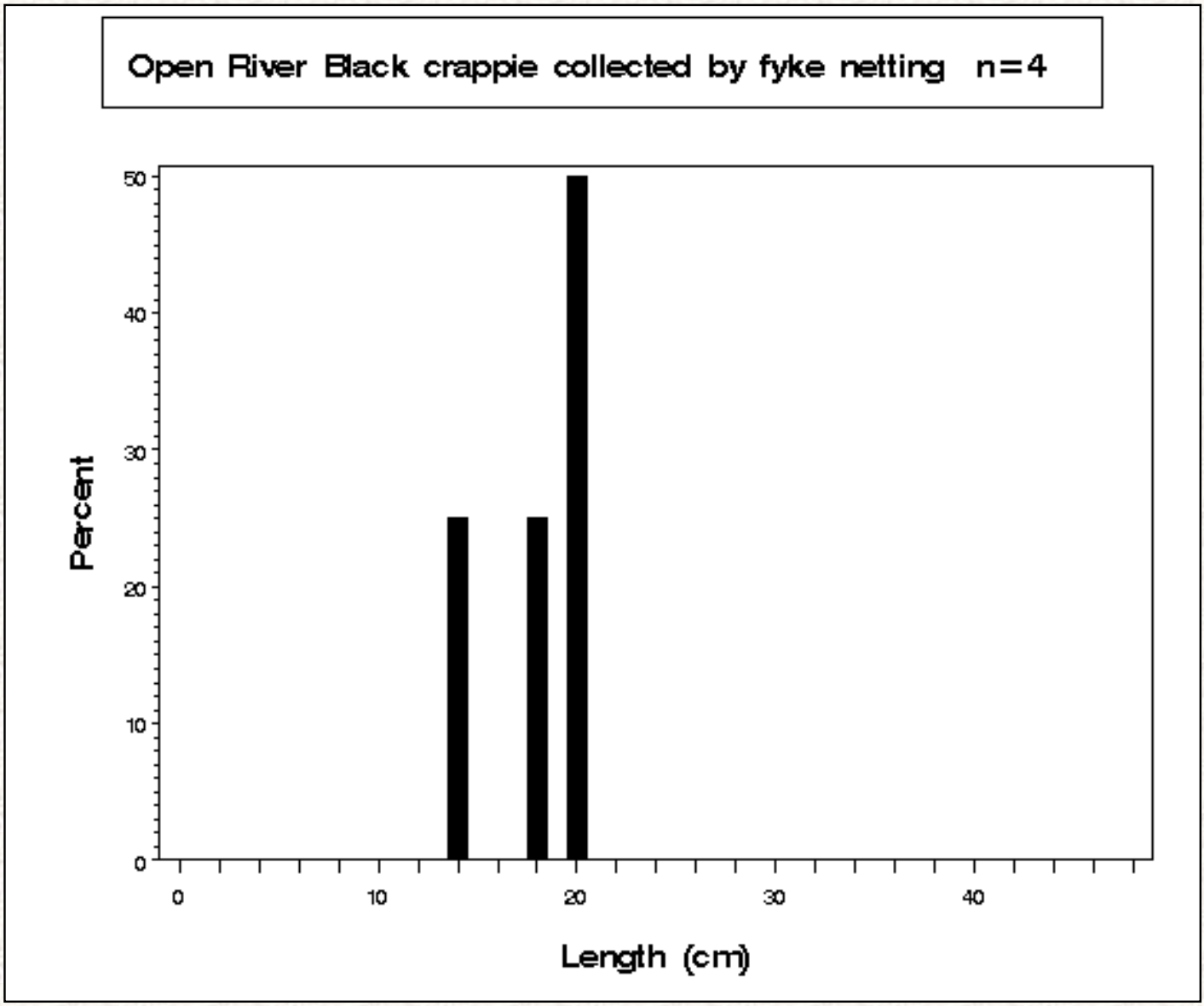
**Figure 13.** Length distributions as a percentage of catch for black crappie (*Pomoxis nigromaculatus*) collected by fyke netting in Pool 26 and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No fyke netting was conducted in Pools 4, 8, or 13 in 2003.




Open River Black crappie collected by fyke netting n=4
Percent
0
10
20
30
40
50
0
10
20
30
40
Length (cm)

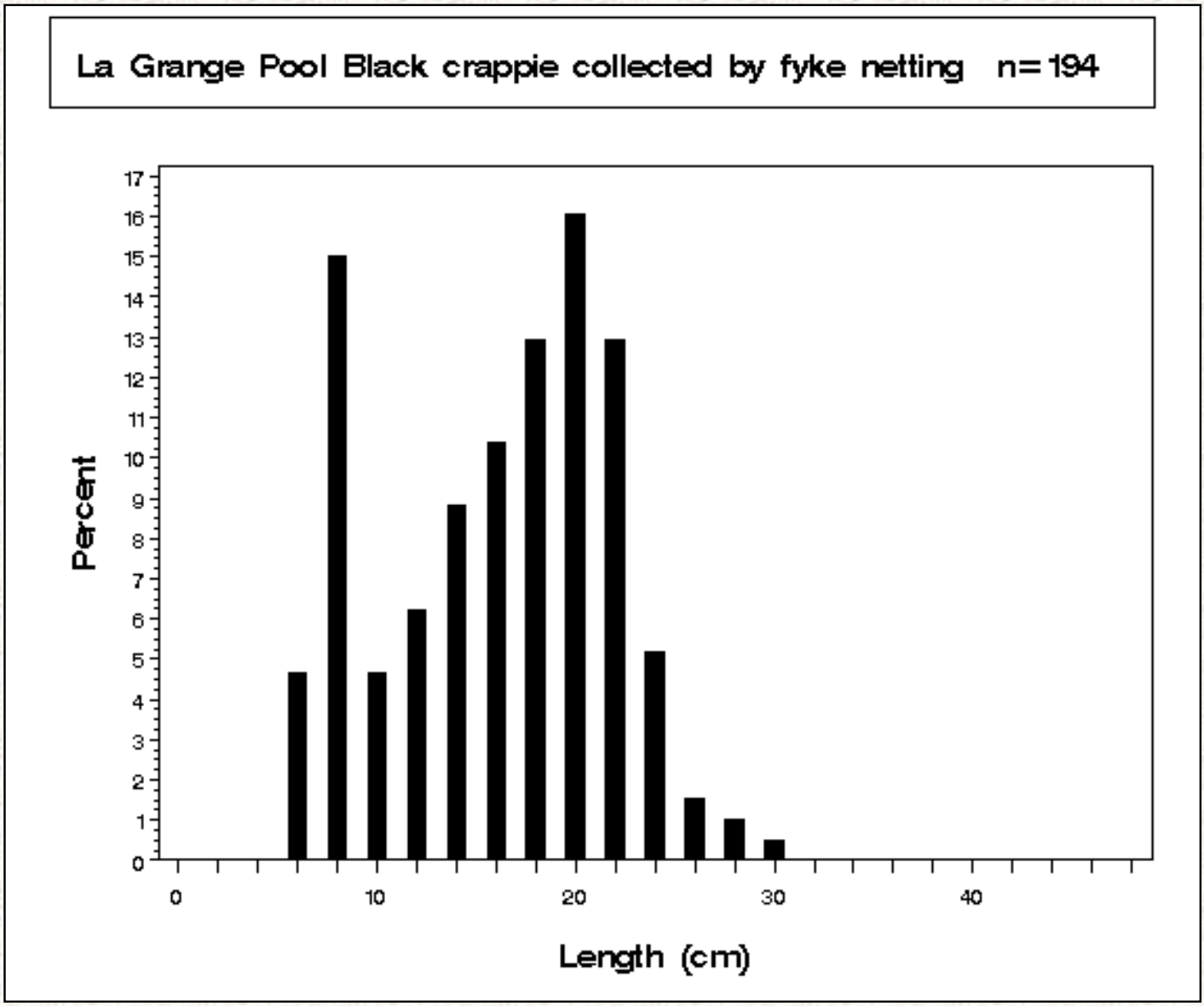



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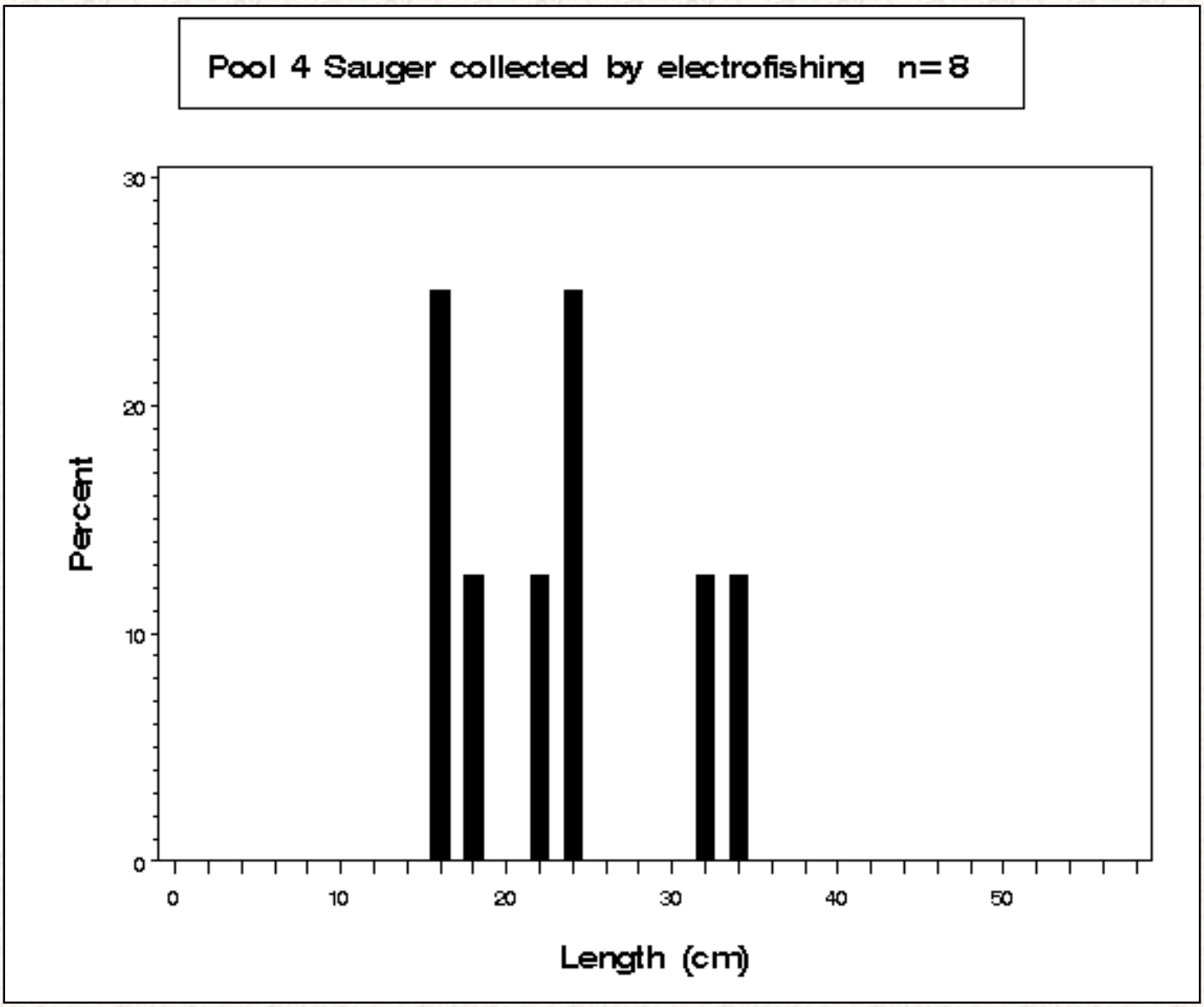
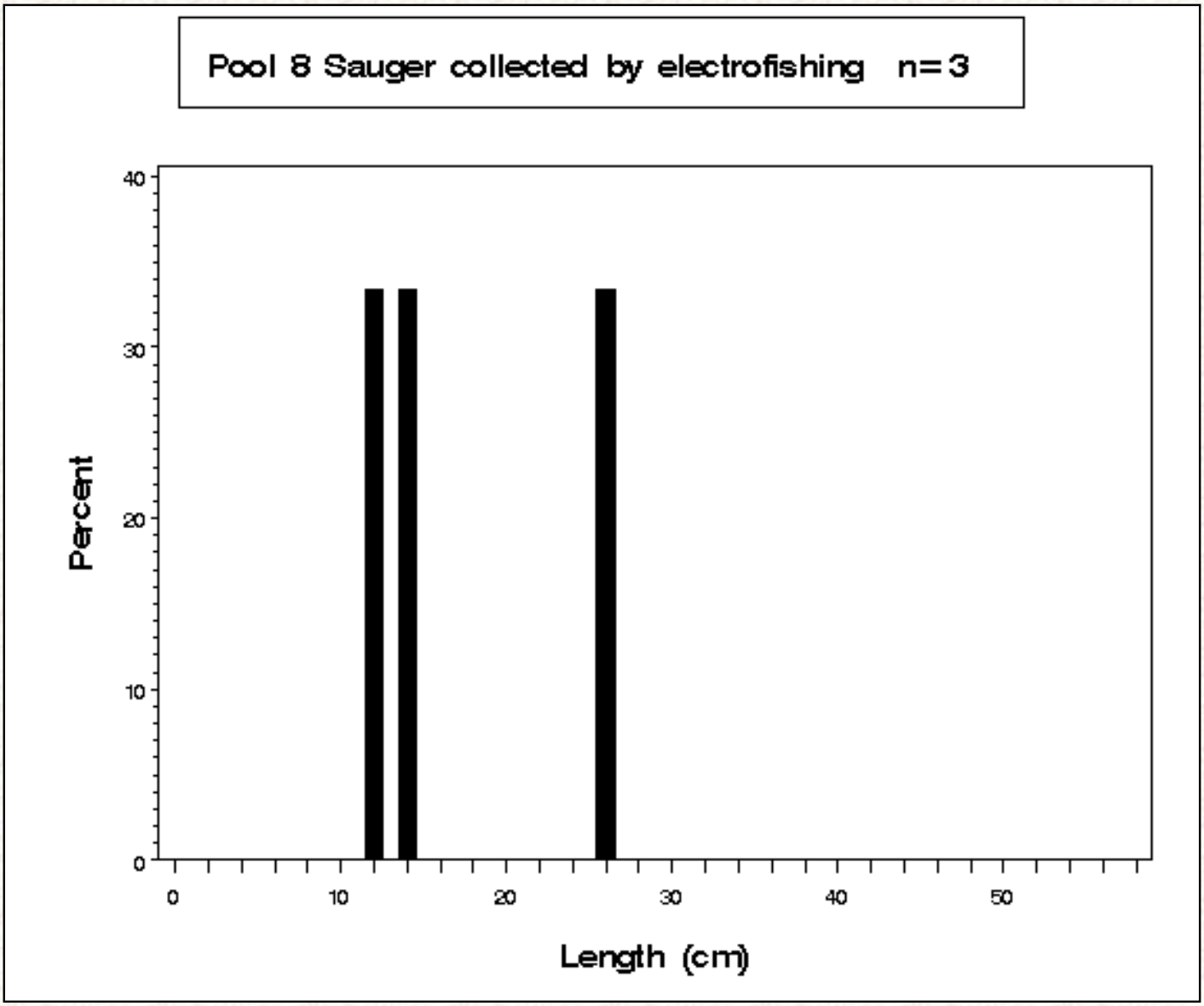
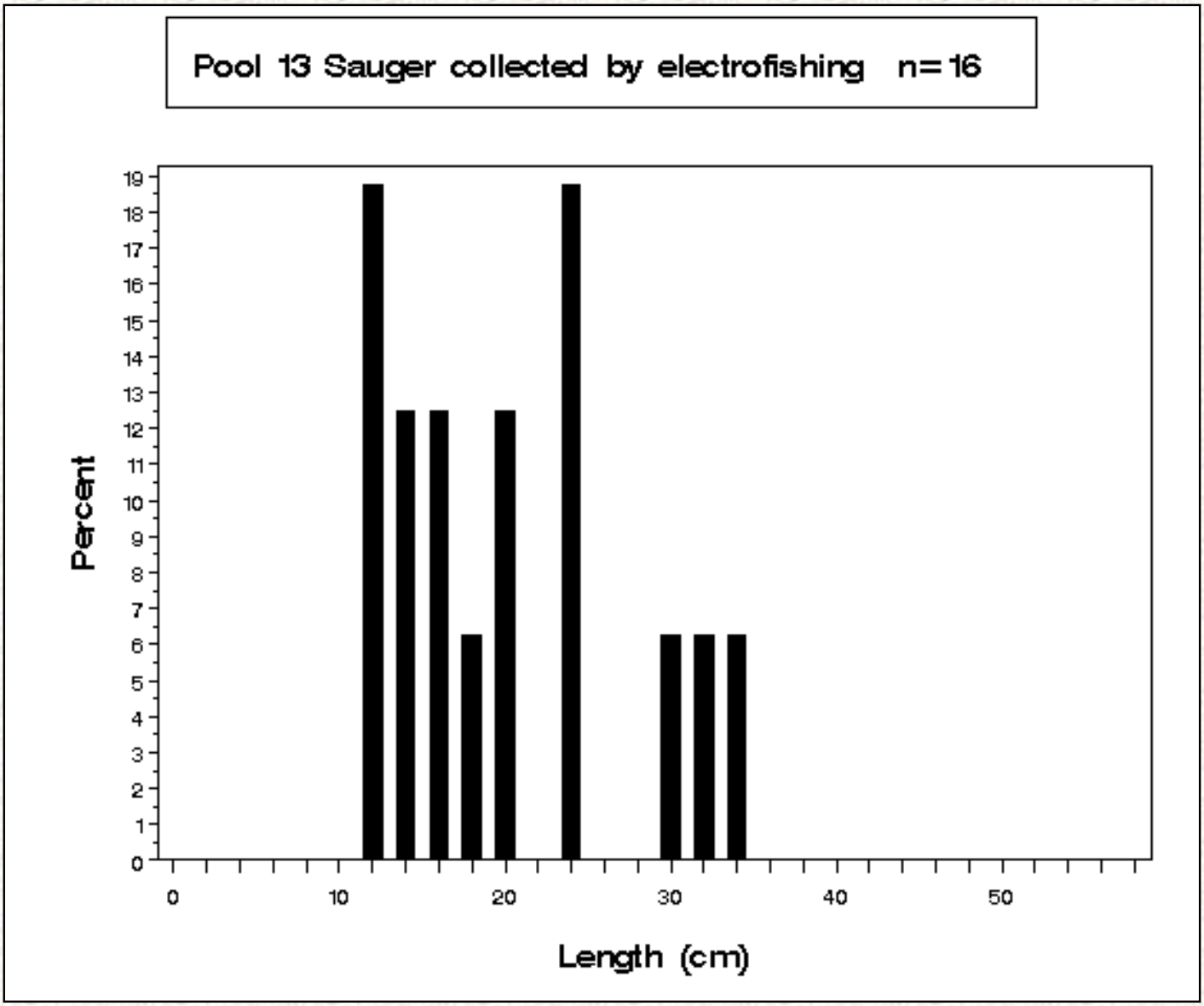
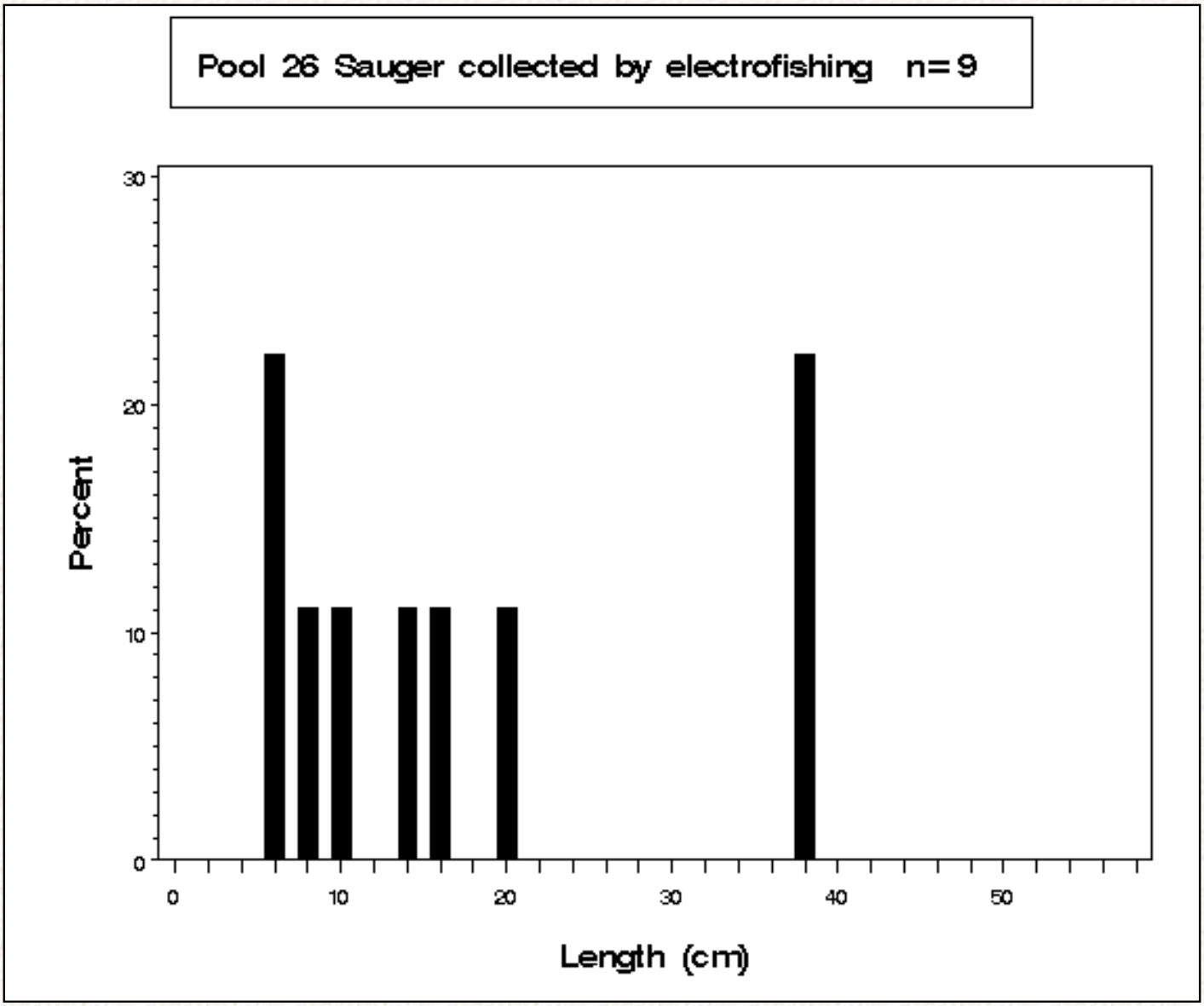
**Figure 14.** Length distributions as a percentage of catch for sauger (*Stizostedion canadense)* collected by electrofishing in Pools 4, 8, 13, and 26 of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No sauger were collected with this gear in the Open River study area in 2003.




Pool 8 Sauger collected by electrofishing n=3
Percent
0
10
20
30
40
0
10
20
30
40
50
Length (cm)


Pool 13 Sauger collected by electrofishing n=16
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
0
10
20
30
40
50
Length (cm)


Pool 26 Sauger collected by electrofishing n=9
Percent
30
20
10
0
0
10
20
30
40
50
Length (cm)

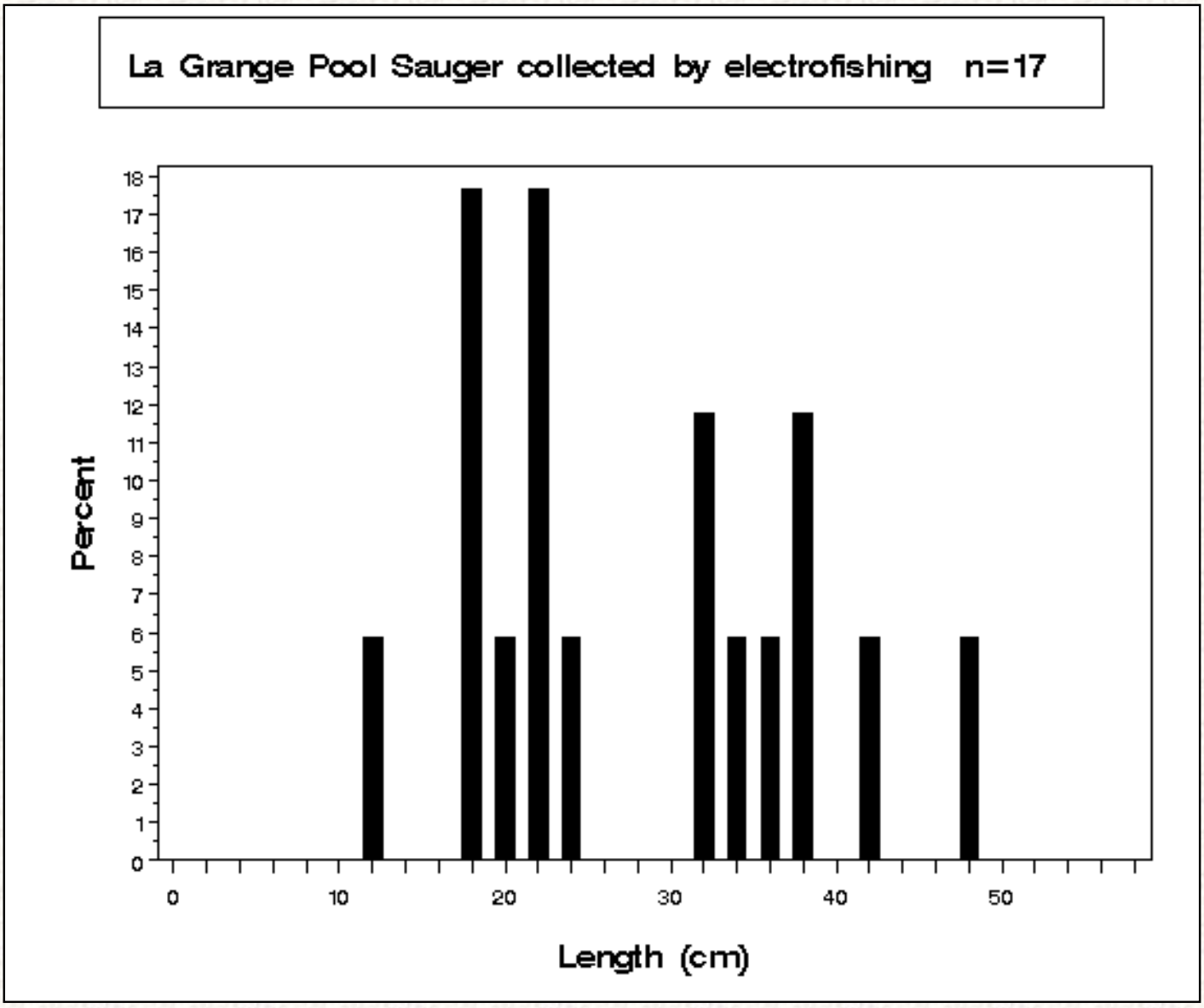



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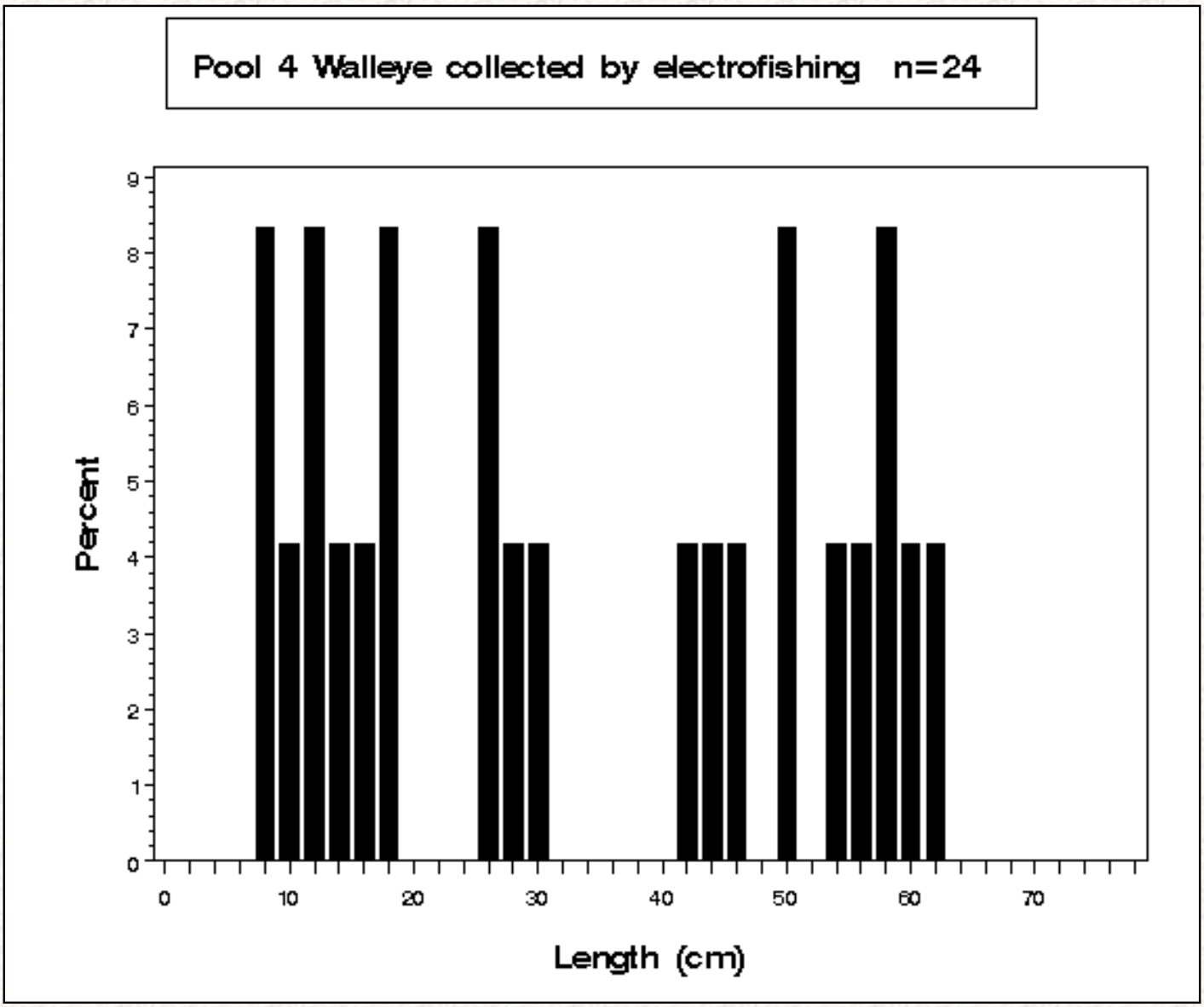
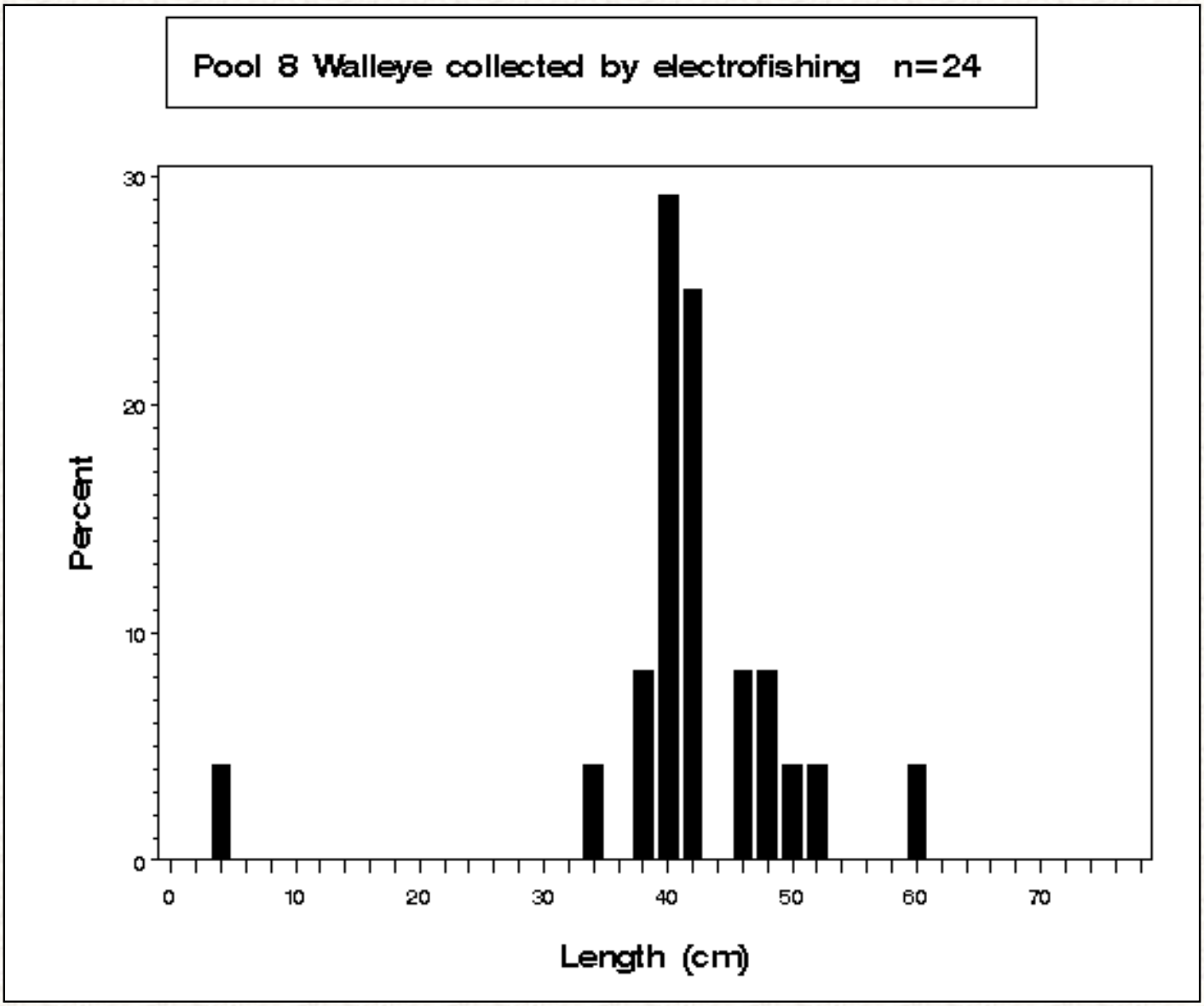
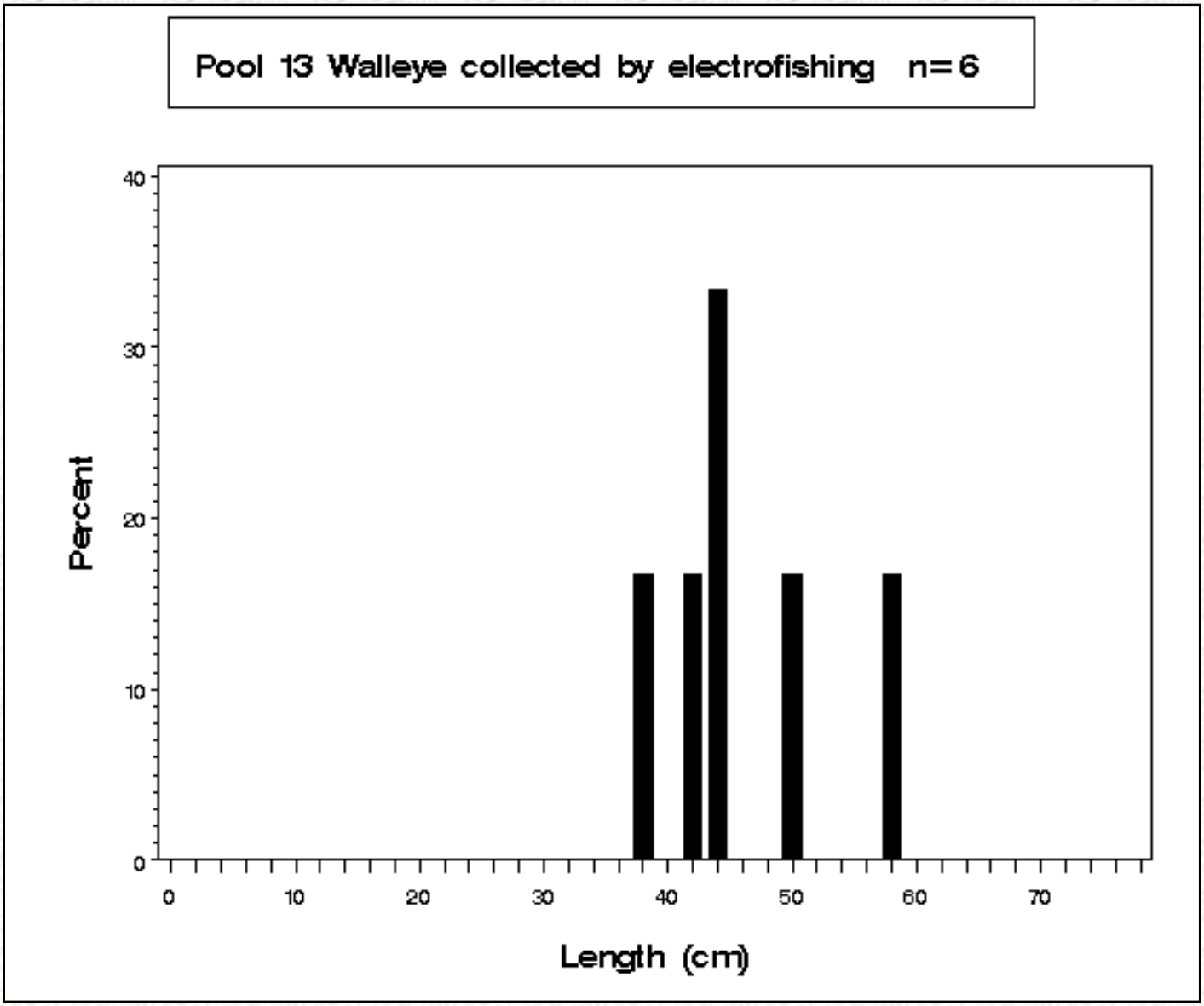
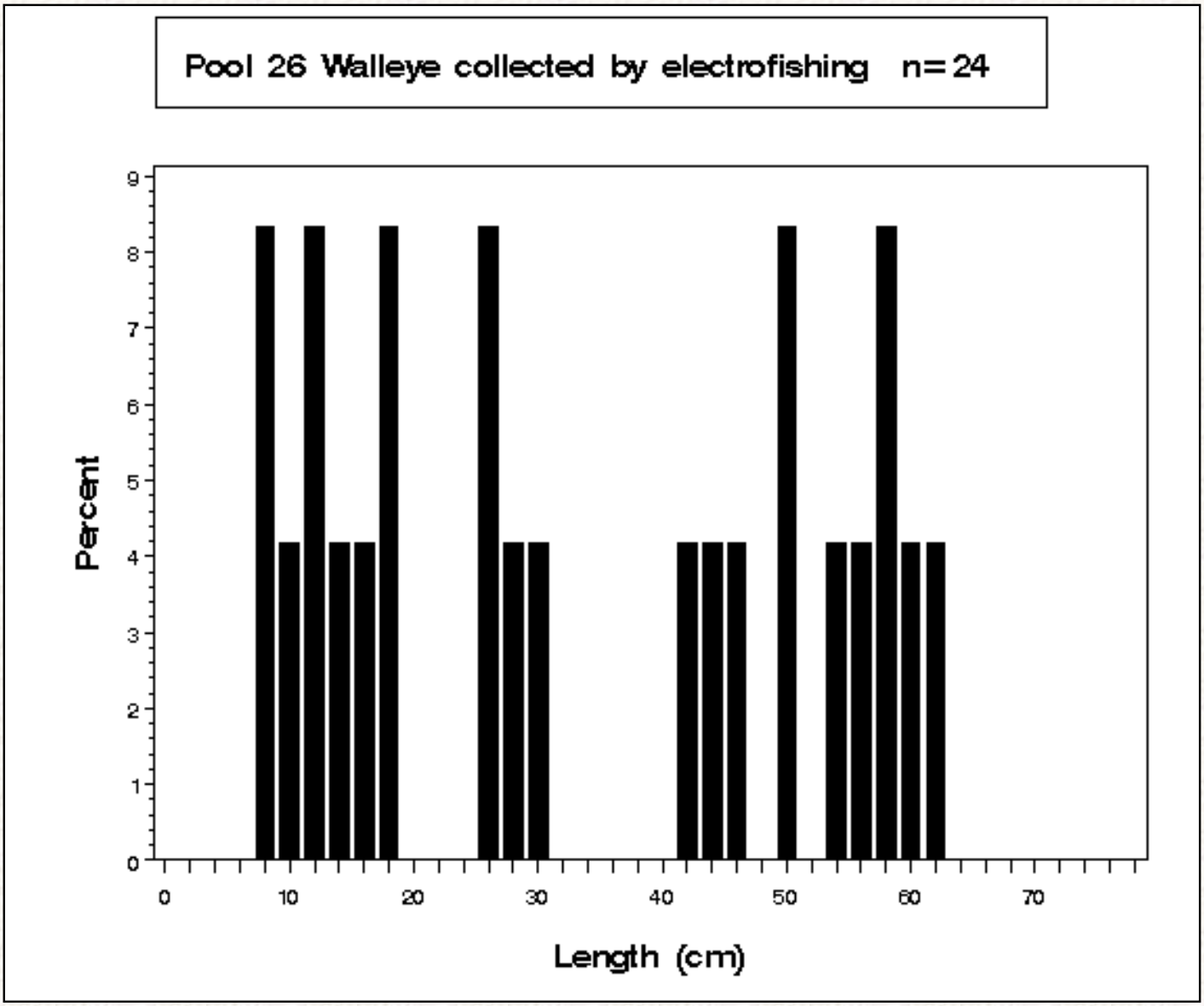
**Figure 15.** Length distributions as a percentage of catch for walleye (*Stizostedion vitreum)* collected by electrofishing in Pools 4, 8, and 13 of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No walleye were collected with this gear in the Open River study area in 2003.




Pool 8 Walleye collected by electrofishing n=24
Percent
0
10
20
30
0
10
20
30
40
50
60
70
Length (cm)


Pool 13 Walleye collected by electrofishing n=6
Percent
0
10
20
30
40
0
10
20
30
40
50
60
70
Length (cm)


Pool 26 Walleye collected by electrofishing n=24
Percent
0
1
2
3
4
5
6
7
8
9
0
10
20
30
40
50
60
70
Length (cm)

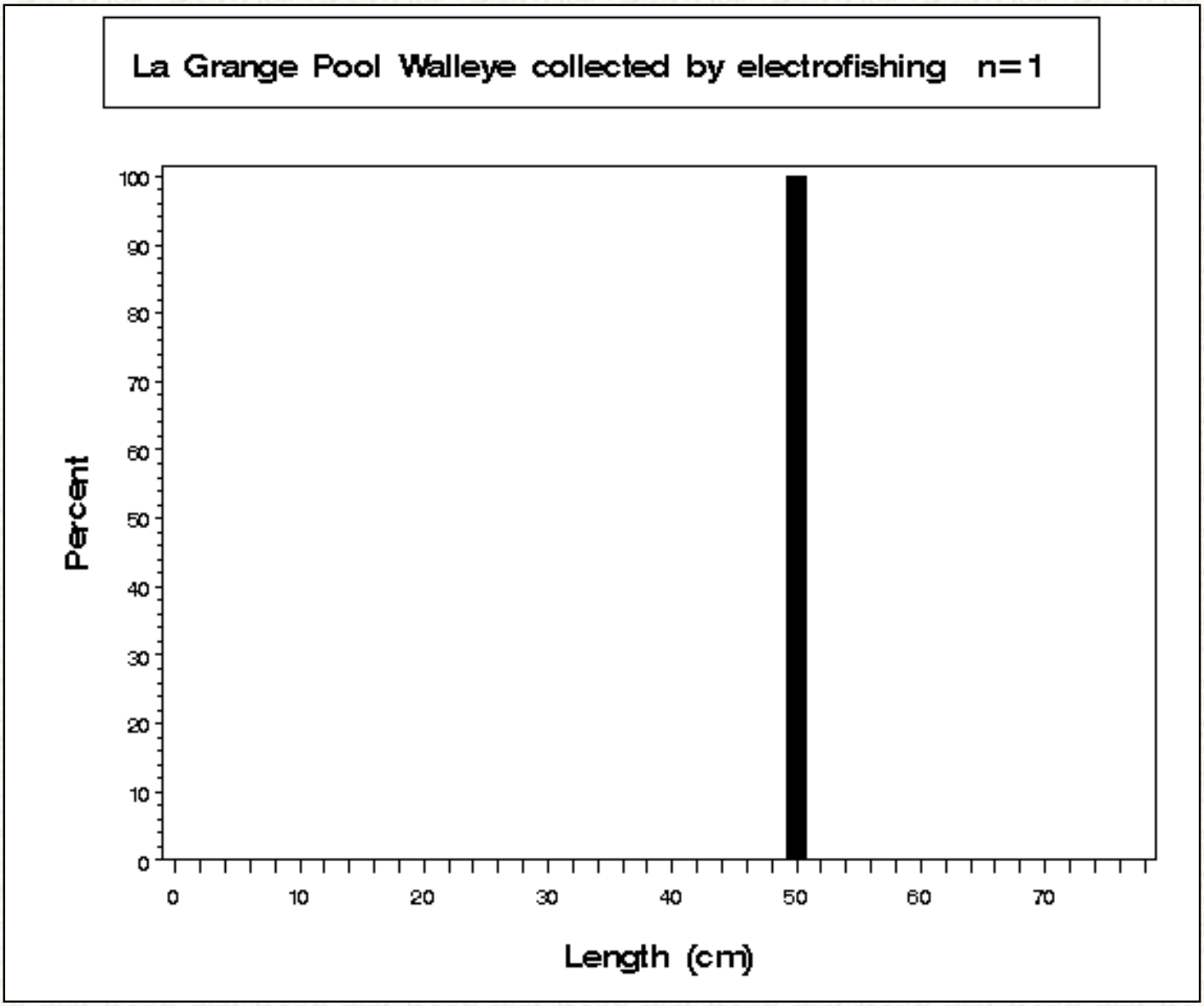



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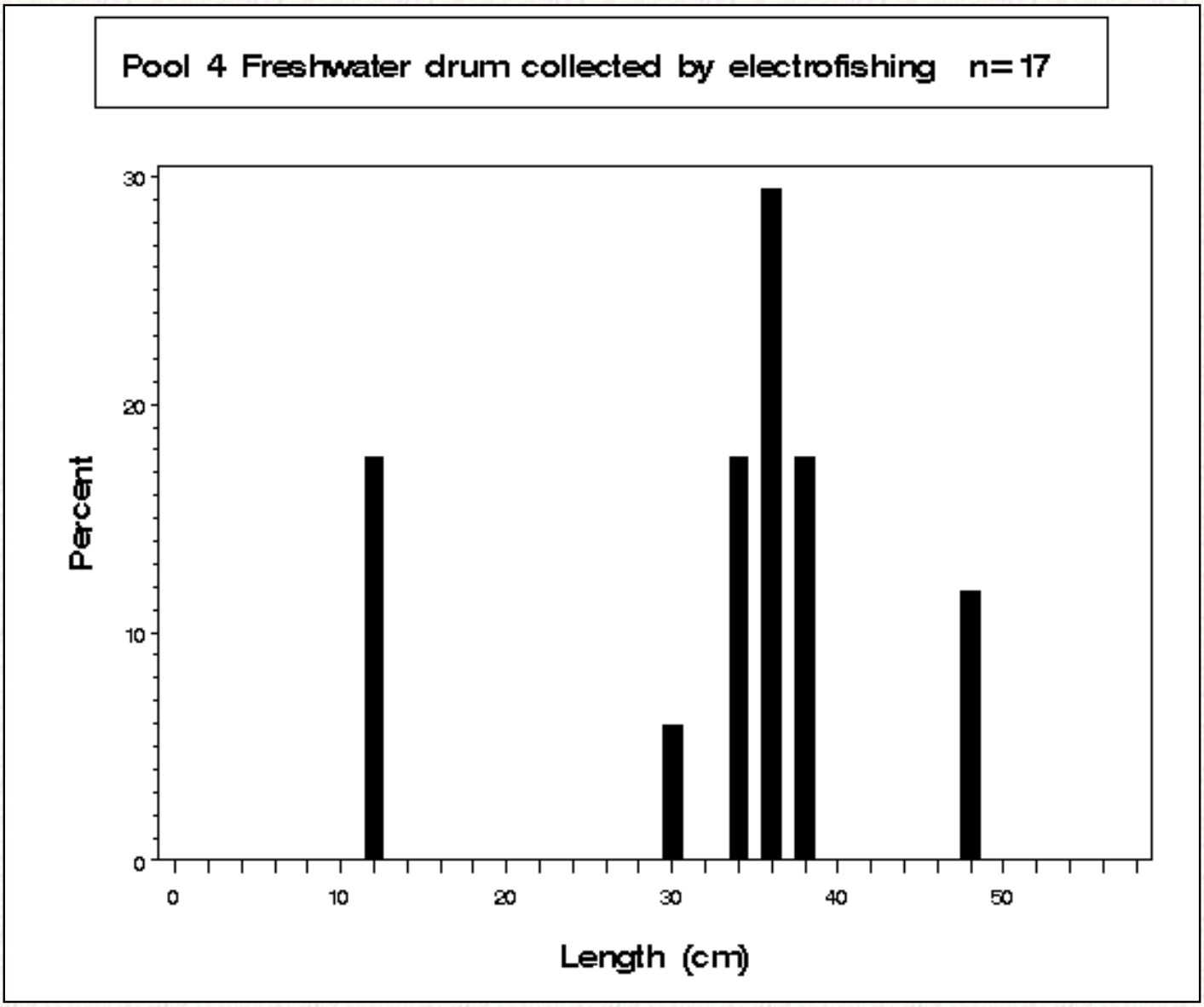
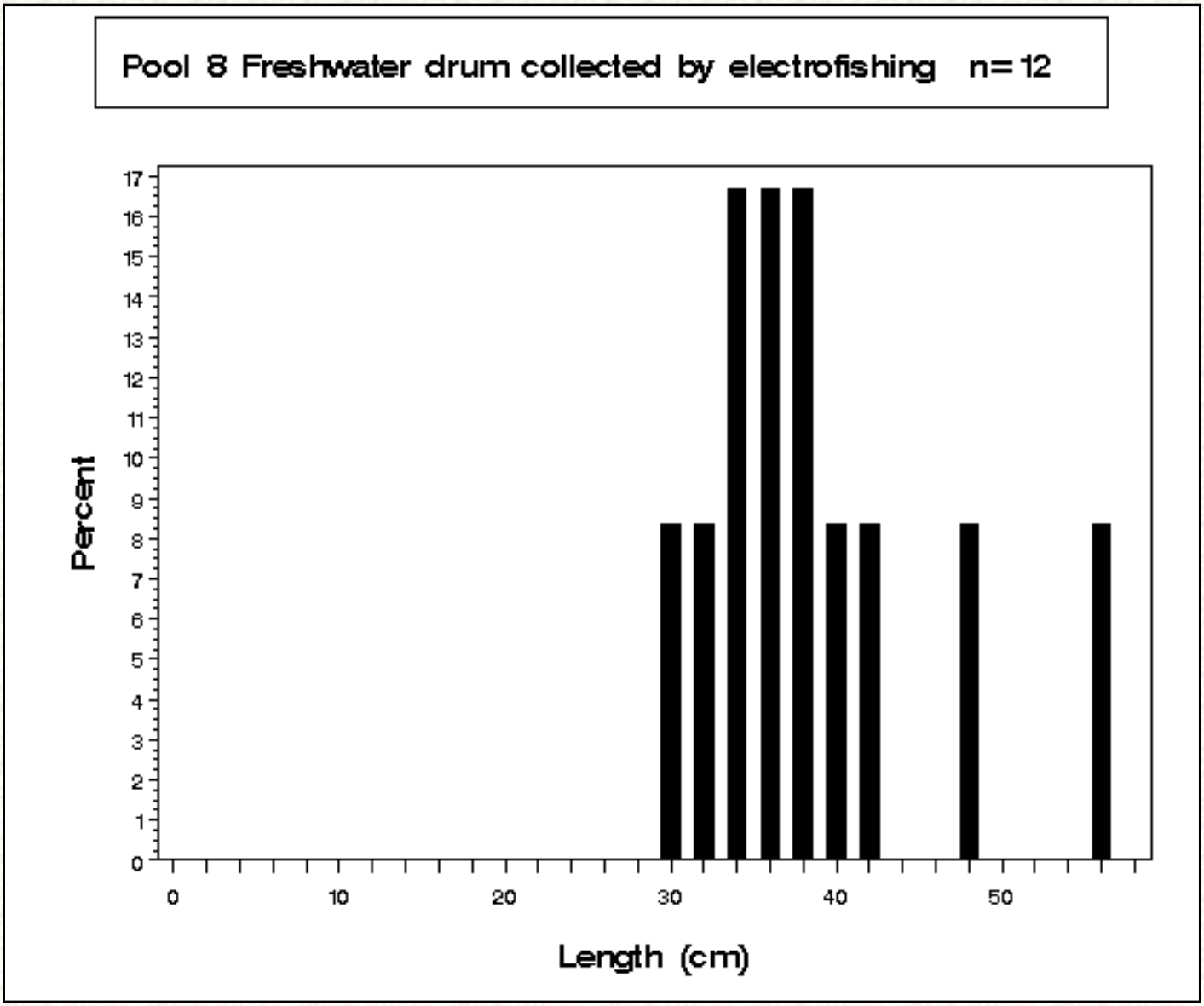
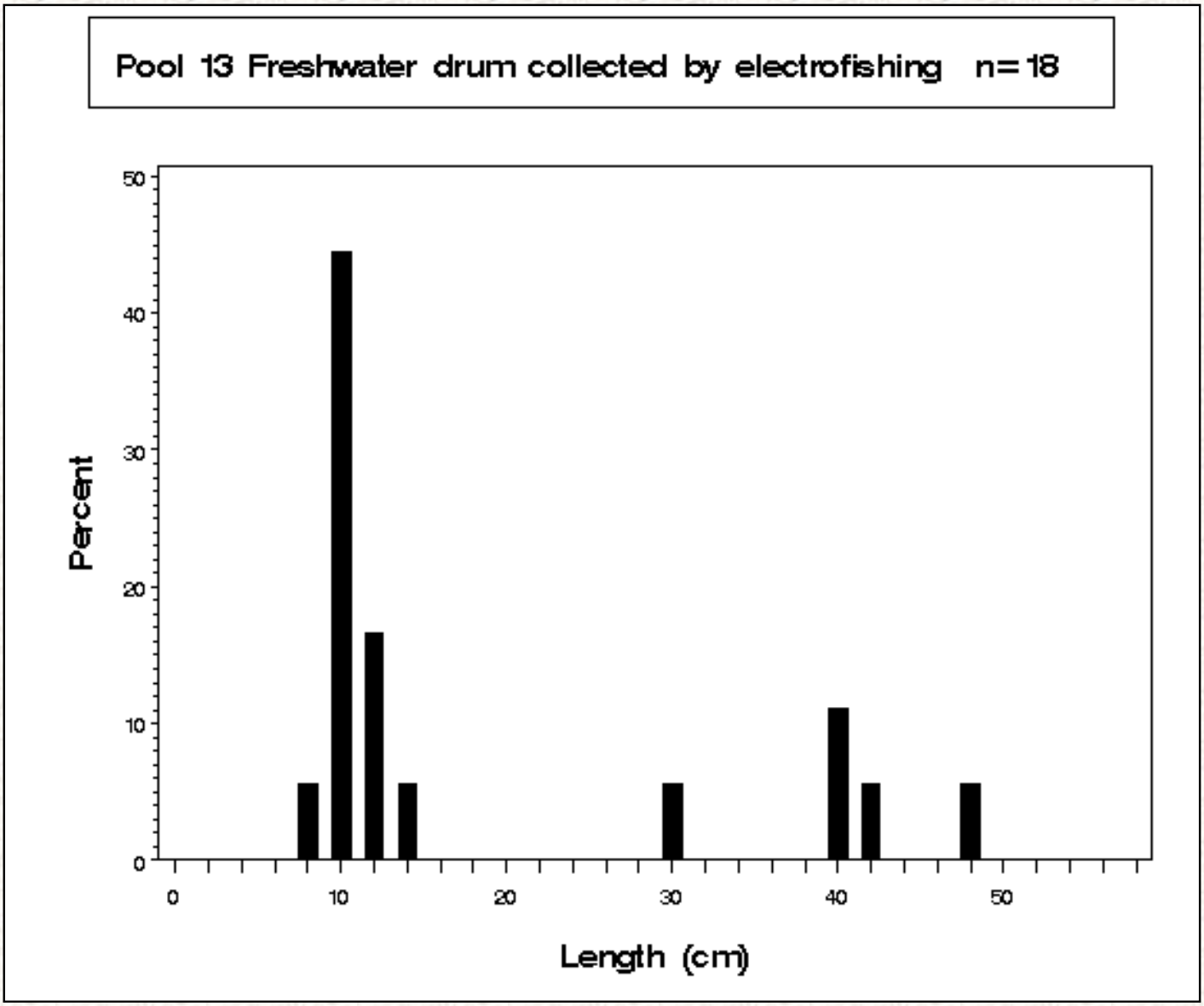
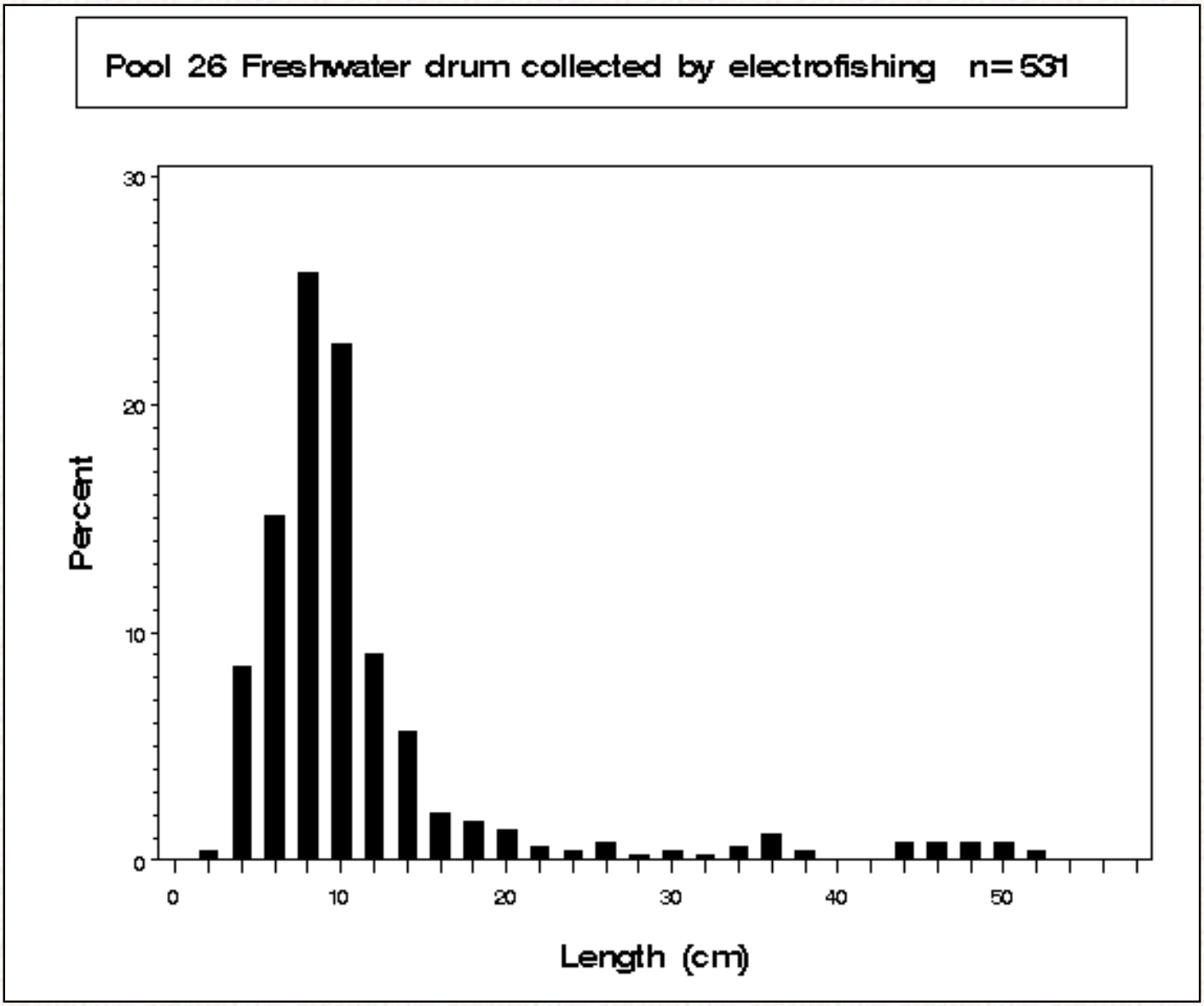
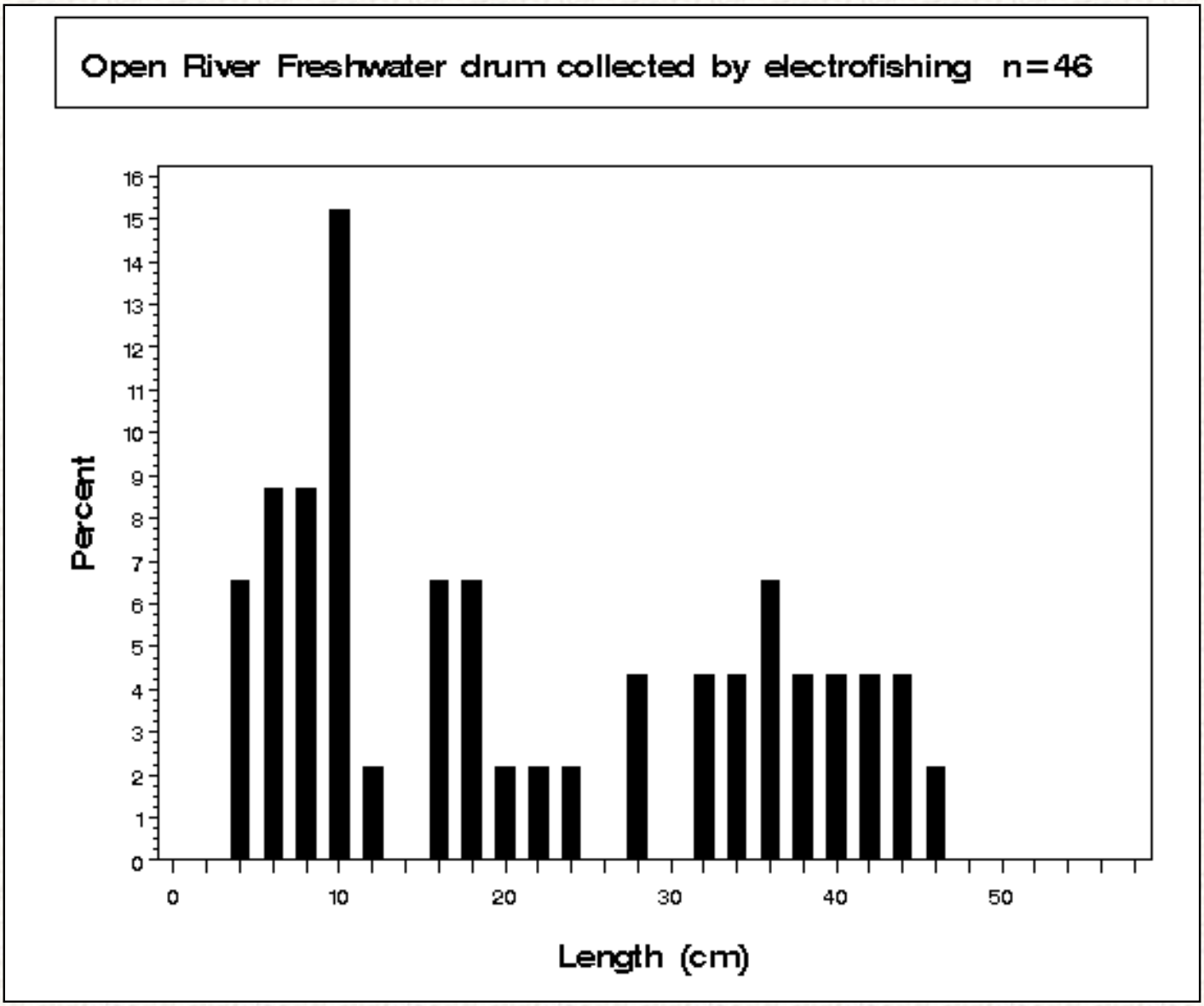
**Figure 16.** Length distributions as a percentage of catch for freshwater drum (*Aplodinotus grunniens*) collected by electrofishing in Pools 4, 8, 13, 26, and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003.




Pool 8 Freshwater drum collected by electrofishing n=12
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
0
10
20
30
40
50
Length (cm)


Pool 13 Freshwater drum collected by electrofishing n=18
Percent
0
10
20
30
40
50
Length (cm)


Pool 26 Freshwater drum collected by electrofishing n=531
Percent
30
20
10
0
0
10
20
30
40
50
Length (cm)


Open River Freshwater drum collected by electrofishing n=46
Percent
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0
10
20
30
40
50
Length (cm)

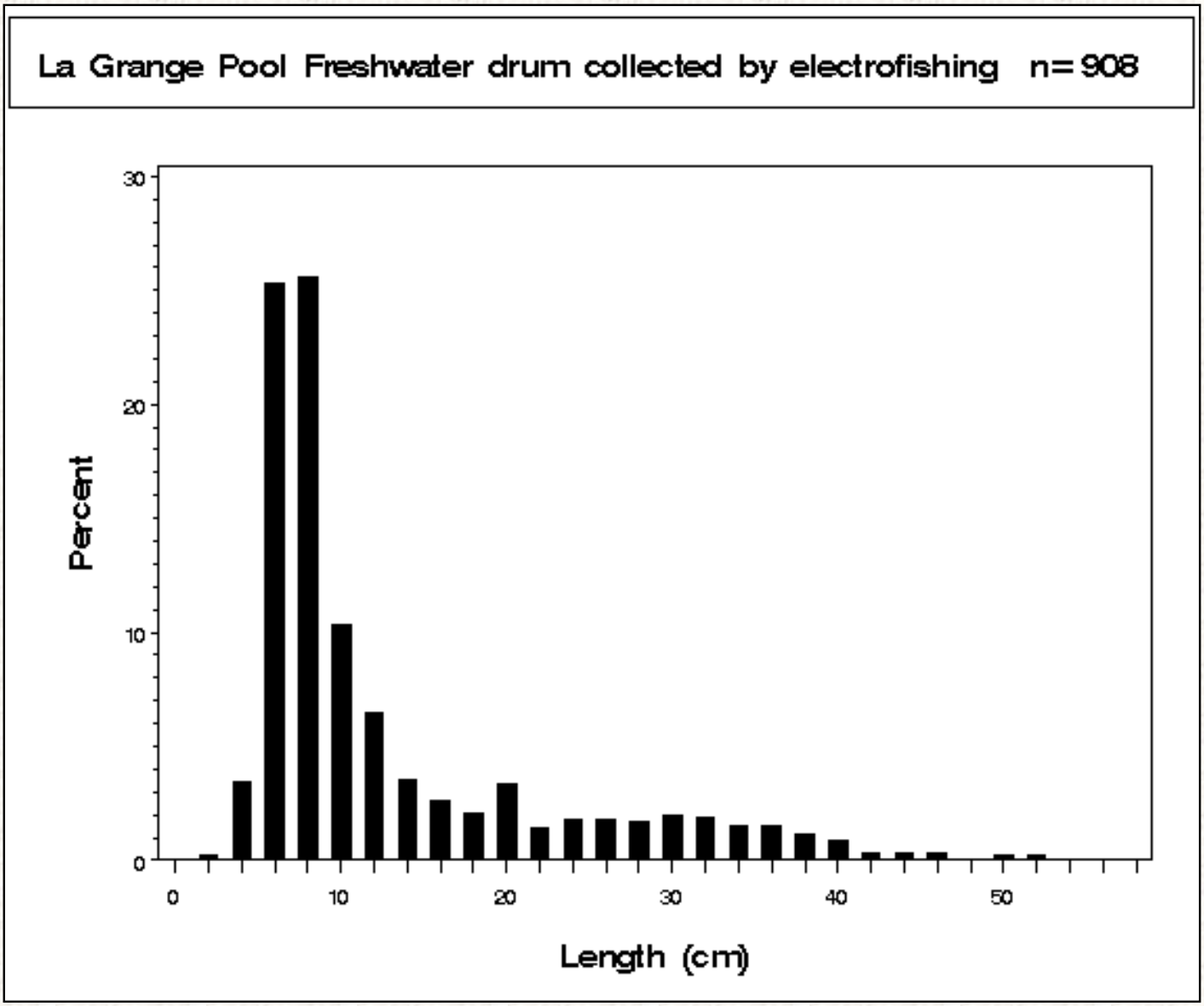



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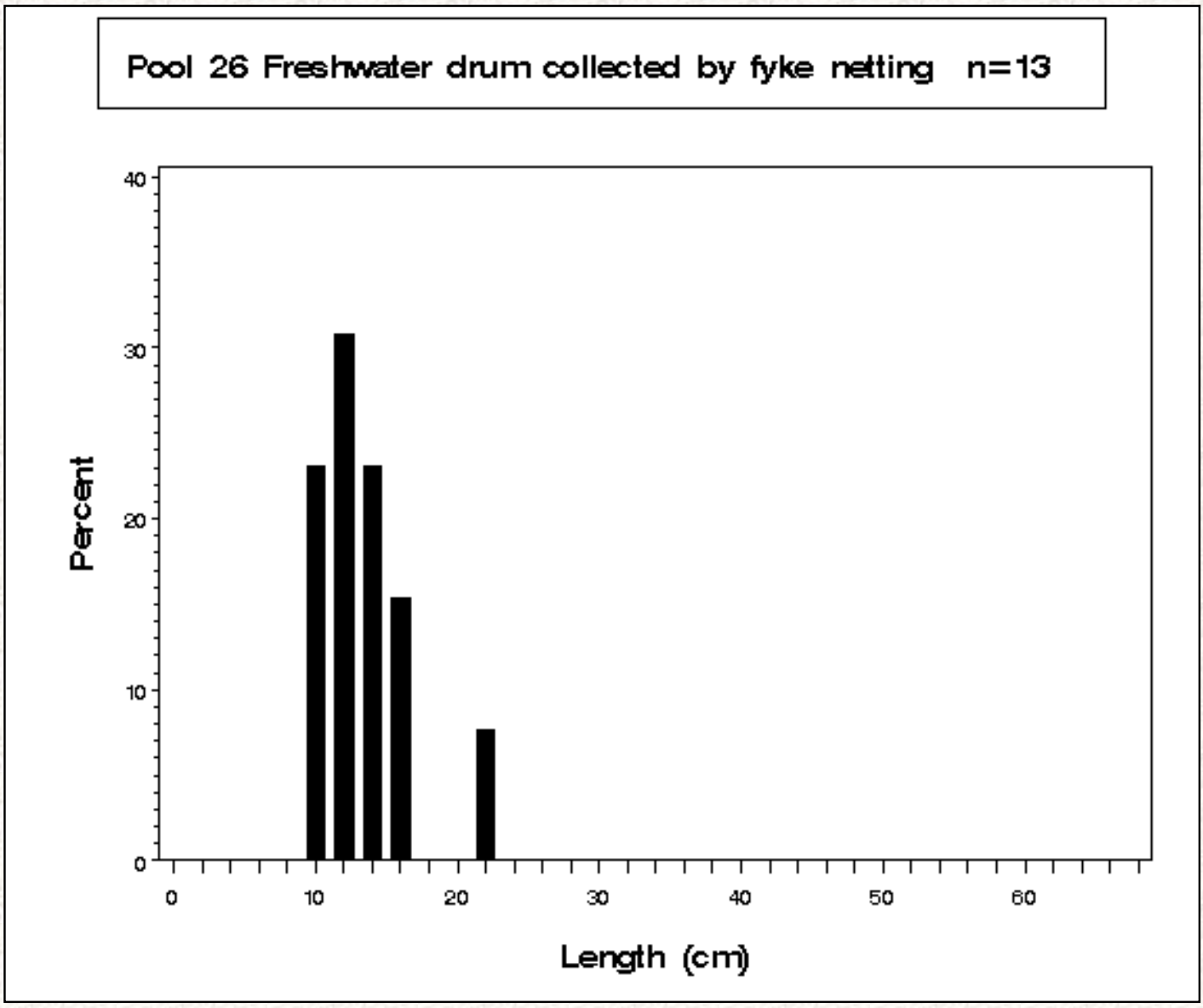
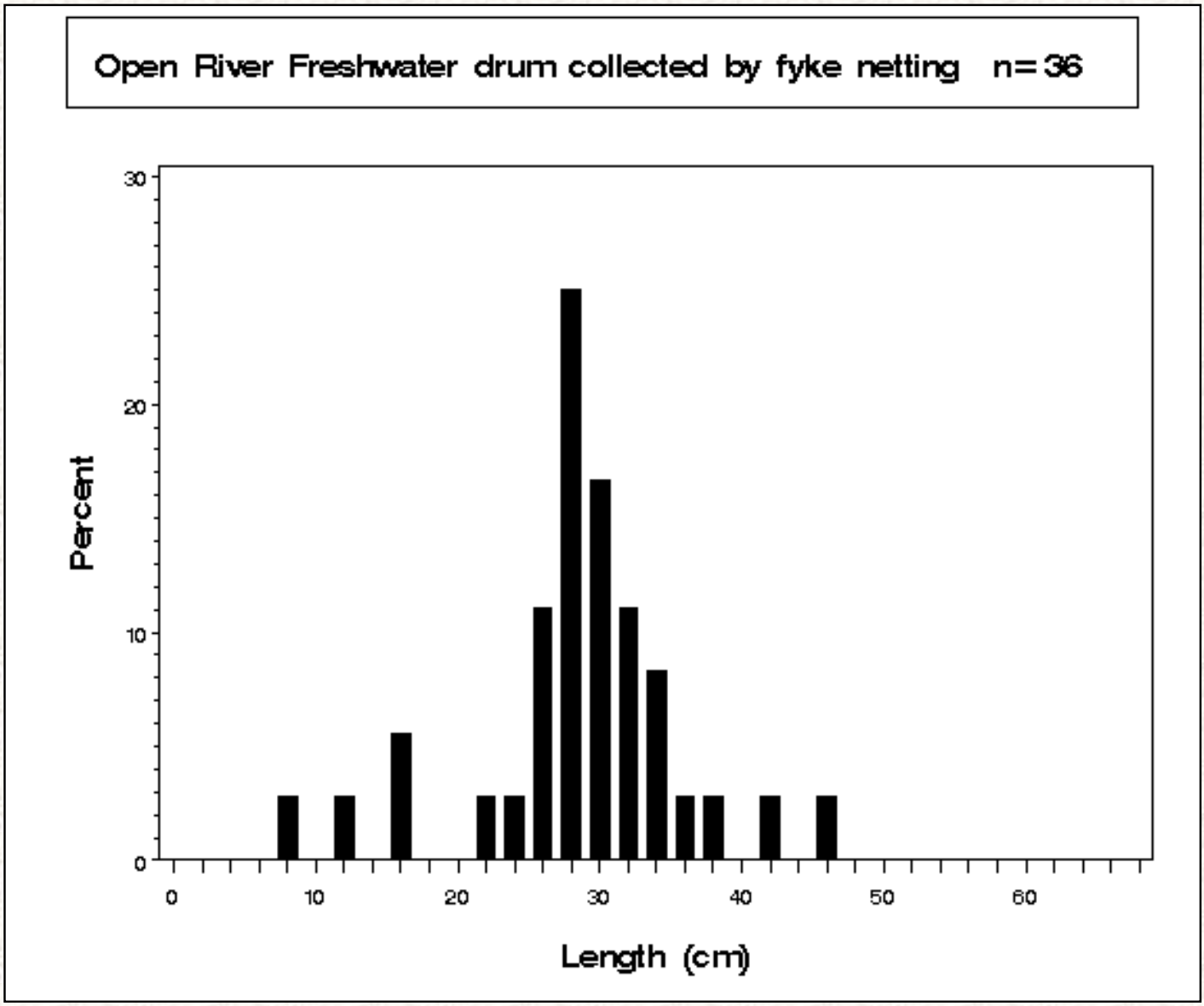
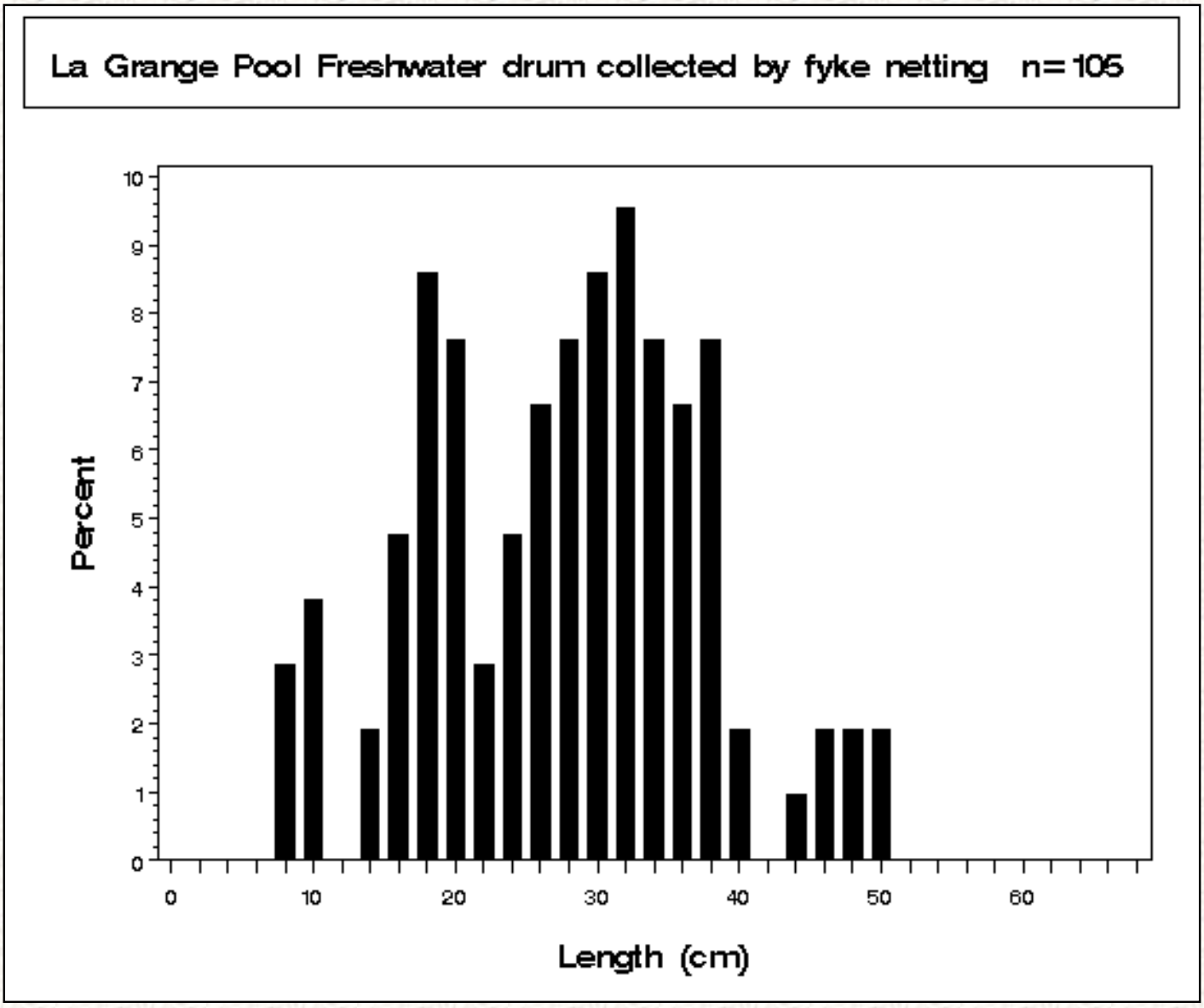
**Figure 17.** Length distributions as a percentage of catch for freshwater drum (*Aplodinotus grunniens*) collected by fyke netting in Pool 26 and Open River of the Upper Mississippi River and La Grange Pool of the Illinois River during 2003. No fyke netting was conducted in Pools 4, 8, or 13 in 2003.




Open River Freshwater drum collected by fyke netting n=36
Percent
0
10
20
30
0
10
20
30
40
50
60
Length (cm)

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# Pool 8, Upper Mississippi River
# 2003 Fish Collection Summary

This report is a summary of the Long Term Resource Monitoring Program's (LTRMP) fish collection efforts conducted by the Onalaska Field Station on Pool 8, Upper Mississippi River during 2003. Information on changes in fish catch over all years can be obtained from the Graphical Fish Database Browser.

- 28 fish collections were conducted using day electrofishing (Table 2.2).
- A 90% reduction in total effort (from 2002 levels) was implemented. The reduction included eliminating all sampling in periods 1 and 2, and deployment of only day electrofishing in period 3 (Table 2.2).
- Water levels rose above the long-term average during period 1, but were below the long-term average for periods 2 and 3. Water levels did not adversely affect sampling activities in period 3 (Table 2.2; Figure 1.2).
- All 28 fish collections were from randomly selected sites.
- Backwater and side channel border strata received the most sampling effort (Table 2.2).
- 11,877 fish were collected representing 46 species and 1 hybrid (Table 3.2). Six unidentified sunfish were also included in the total catch.
- Historical fish distribution records for the Upper Mississippi River (Pitlo et al. 1995) document 99 fish species from Pool 8.
- The LTRMP species total for Pool 8 before the 2003 season was 90; no new species were added to this total since 1997.

- 4 river redhorse, listed as threatened in Wisconsin, were collected (Table 3.2).
- Mean catch-per-unit-effort and standard effort for fish collected by day electrofishing using stratified random sampling (Table 4.2) for each stratum are shown.
- Length distributions for selected species of fish are shown in Figures 1 to 17.

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*Last updated on September 27, 2004*
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**Table 2.2** Allocation of fish sampling effort among strata in Pool 8 of the Upper Mississippi River during 2003. Table entries are numbers of successfully completed standardized monitoring collections.

**Sampling period = 3: September 15–October 31**

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | 8 | | 8 | 4 | 4 | 4 | | | | 28 |

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

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*Last updated on May 5, 2004*

**Figure 1.2** Daily water surface elevation from Lock and Dam 7 for Pool 8, Upper Mississippi River, during 2003 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).

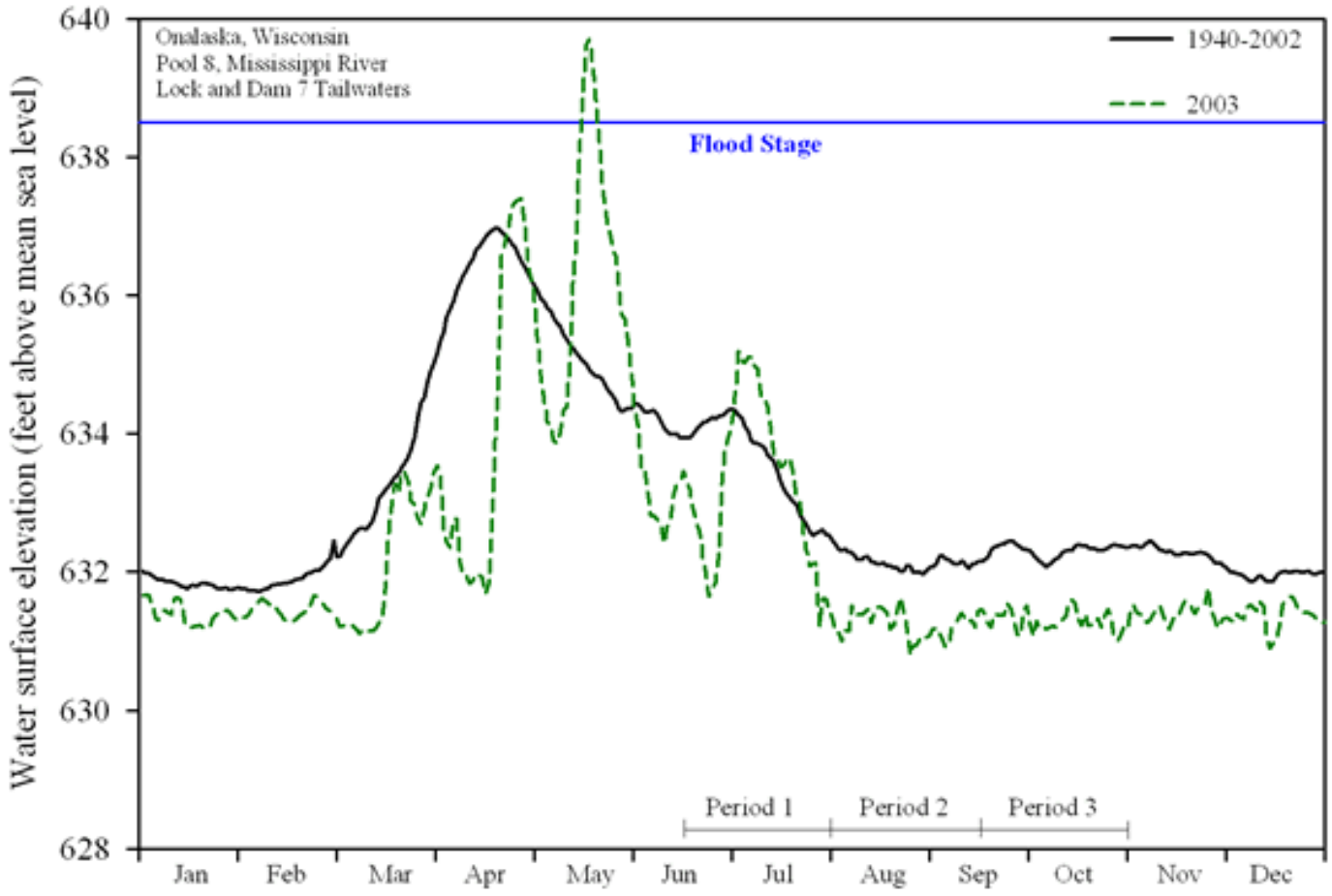

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**Table 3.2** Total catches, by gear type, of fish collected in Pool 8 of the Upper Mississippi River during 2003. See Table 2.2 for the list of sampling gears actually deployed in this study reach.

| Species | Common name | Scientific name | D | F | M | HS | HL | T | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Chestnut lamprey | *Ichthyomyzon castaneus* | 5 | - | - | - | - | - | 5 |
| 2 | American brook lamprey | *Lampetra appendix* | 1 | - | - | - | - | - | 1 |
| 3 | Longnose gar | *Lepisosteus osseus* | 1 | - | - | - | - | - | 1 |
| 4 | Bowfin | *Amia calva* | 6 | - | - | - | - | - | 6 |
| 5 | Gizzard shad | *Dorosoma cepedianum* | 2018 | - | - | - | - | - | 2018 |
| 6 | Spotfin shiner | *Cyprinella spiloptera* | 780 | - | - | - | - | - | 780 |
| 7 | Common carp | *Cyprinus carpio* | 82 | - | - | - | - | - | 82 |
| 8 | Golden shiner | *Notemigonus crysoleucas* | 121 | - | - | - | - | - | 121 |
| 9 | Emerald shiner | *Notropis atherinoides* | 1291 | - | - | - | - | - | 1291 |
| 10 | River shiner | *N. blennius* | 72 | - | - | - | - | - | 72 |
| 11 | Spottail shiner | *N. hudsonius* | 53 | - | - | - | - | - | 53 |
| 12 | Weed shiner | *N. texanus* | 106 | - | - | - | - | - | 106 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | Mimic shiner | *N. volucellus* | 816 | - | - | - | - | - | 816 |
| 14 | Pugnose minnow | *Opsopoeodus emiliae* | 172 | - | - | - | - | - | 172 |
| 15 | Bullhead minnow | *Pimephales vigilax* | 814 | - | - | - | - | - | 814 |
| 16 | Quillback | *Carpiodes cyprinus* | 2 | - | - | - | - | - | 2 |
| 17 | Highfin carpsucker | *C. velifer* | 1 | - | - | - | - | - | 1 |
| 18 | Smallmouth buffalo | *Ictiobus bubalus* | 1 | - | - | - | - | - | 1 |
| 19 | Spotted sucker | *Minytrema melanops* | 68 | - | - | - | - | - | 68 |
| 20 | Silver redhorse | *Moxostoma anisurum* | 41 | - | - | - | - | - | 41 |
| 21 | River redhorse | *M. carinatum* | 4 | - | - | - | - | - | 4 |
| 22 | Golden redhorse | *M. erythrurum* | 24 | - | - | - | - | - | 24 |
| 23 | Shorthead redhorse | *M. macrolepidotum* | 165 | - | - | - | - | - | 165 |
| 24 | Yellow bullhead | *Ameiurus natalis* | 1 | - | - | - | - | - | 1 |
| 25 | Channel catfish | *Ictalurus punctatus* | 5 | - | - | - | - | - | 5 |
| 26 | Tadpole madtom | *Noturus gyrinus* | 1 | - | - | - | - | - | 1 |
| 27 | Northern pike | *Esox lucius* | 23 | - | - | - | - | - | 23 |
| 28 | Brook silverside | *Labidesthes sicculus* | 101 | - | - | - | - | - | 101 |
| 29 | White bass | *Morone chrysops* | 24 | - | - | - | - | - | 24 |
| 30 | Rock bass | *Ambloplites rupestris* | 41 | - | - | - | - | - | 41 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 31 | Green sunfish | *Lepomis cyanellus* | 5 | - | - | - | - | - | 5 |
| 32 | Pumpkinseed | *L. gibbosus* | 26 | - | - | - | - | - | 26 |
| 33 | Orangespotted sunfish | *L. humilis* | 1 | - | - | - | - | - | 1 |
| 34 | Bluegill | *L. macrochirus* | 3687 | - | - | - | - | - | 3687 |
| 35 | Green x pumpkinseed sunfish | *L. cyanellus x gibbosus* | 3 | - | - | - | - | - | 3 |
| 36 | Smallmouth bass | *Micropterus dolomieu* | 185 | - | - | - | - | - | 185 |
| 37 | Largemouth bass | *M. salmoides* | 820 | - | - | - | - | - | 820 |
| 38 | Black crappie | *Pomoxis nigromaculatus* | 84 | - | - | - | - | - | 84 |
| 39 | Unidentified sunfish | Unidentified *Centrarchidae* | 6 | - | - | - | - | - | 6 |
| 40 | Western sand darter | *Ammocrypta clara* | 2 | - | - | - | - | - | 2 |
| 41 | Mud darter | *Etheostoma asprigene* | 2 | - | - | - | - | - | 2 |
| 42 | Johnny darter | *Etheostoma nigrum* | 17 | - | - | - | - | - | 17 |
| 43 | Banded darter | *E. zonale* | 1 | - | - | - | - | - | 1 |
| 44 | Yellow perch | *Perca flavescens* | 144 | - | - | - | - | - | 144 |
| 45 | Logperch | *Percina caprodes* | 15 | - | - | - | - | - | 15 |
| 46 | Sauger | *Stizostedion canadense* | 3 | - | - | - | - | - | 3 |
| 47 | Walleye | *S. vitreum* | 24 | - | - | - | - | - | 24 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 48 | Freshwater drum | *Aplodinotus grunniens* | 12 | - | - | - | - | - | 12 |
| | | | **11877** | **0** | **0** | **0** | **0** | **0** | **11877** |

**Sampling gears:**
**D - Day electrofishing**
**F - Fyke netting**
**M - Mini fyke netting**
**HS - Small hoop netting**
**HL - Large hoop netting**
**T- Trawling**

*Last updated on May 7, 2004*
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# Pool 8 Table

| Table | Stratified Random Sampling |
|---|---|
| 4.2 | Mean catch-per-unit-effort for fish collected by day electrofishing |

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*Last updated on September 29, 2004*

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**Table 4.2** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Pool 8 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.2). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | IMPS | MCBU | MCBW | SCB |
|---|---|---|---|---|---|---|
| **Chestnut lamprey** | 0.14 | | | | 0.47 | 0.38 |
| | (0.14) | | | | (0.47) | (0.38) |
| **American brook lamprey** | 0.06 | | | 0.25 | | |
| | (0.06) | | | (0.25) | | |
| **Longnose gar** | 0.01 | | 0.25 | | | |
| | (0.01) | | (0.25) | | | |
| **Bowfin** | 0.26 | 0.75 | | | | |
| | (0.18) | (0.53) | | | | |
| **Gizzard shad** | 80.01 | 50.75 | 7.75 | 91.25 | 58.22 | 109.13 |
| | (31.79) | (37.71) | (3.86) | (75.40) | (33.95) | (61.93) |
| **Spotfin shiner** | 33.59 | 10.63 | 43.75 | 87.50 | 1.33 | 20.50 |
| | (14.09) | (5.70) | (40.15) | (59.44) | (1.33) | (6.44) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Common carp** | 2.76 | 1.00 | 6.50 | 0.25 | 0.93 | 5.38 |
| | (1.12) | (0.50) | (4.29) | (0.25) | (0.93) | (2.88) |
| **Golden shiner** | 5.49 | 5.25 | 0.25 | | | 9.75 |
| | (3.80) | (3.76) | (0.25) | | | (9.47) |
| **Emerald shiner** | 57.38 | 42.50 | 4.50 | 113.00 | 23.71 | 44.25 |
| | (16.64) | (25.21) | (2.36) | (49.73) | (18.45) | (22.73) |
| **River shiner** | 3.93 | 0.38 | | 13.50 | | 1.88 |
| | (1.31) | (0.38) | | (5.30) | | (1.26) |
| **Spottail shiner** | 2.22 | 3.00 | 0.75 | 1.75 | 0.60 | 2.00 |
| | (0.75) | (1.79) | (0.48) | (1.18) | (0.21) | (0.89) |
| **Weed shiner** | 4.36 | 11.75 | 1.50 | | | 0.75 |
| | (1.58) | (4.62) | (0.96) | | | (0.49) |
| **Mimic shiner** | 41.77 | 10.75 | | 114.50 | 4.25 | 31.38 |
| | (13.70) | (4.94) | | (53.62) | (3.90) | (15.45) |
| **Pugnose minnow** | 7.08 | 16.00 | 3.25 | 0.25 | | 3.75 |
| | (1.75) | (4.38) | (1.80) | (0.25) | | (2.43) |
| **Bullhead minnow** | 35.91 | 36.00 | 22.50 | 54.00 | 1.11 | 26.88 |
| | (9.03) | (14.10) | (14.73) | (25.02) | (1.11) | (13.28) |
| **Quillback** | 0.00 | | | | 0.18 | |
| | (0.00) | | | | (0.18) | |
| **Highfin carpsucker** | 0.05 | | | | | 0.13 |
| | (0.05) | | | | | (0.13) |
| **Smallmouth buffalo** | 0.01 | | 0.25 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.01) | | (0.25) | | | |
| **Spotted sucker** | 2.86 | 6.63 | 0.75 | | | 1.50 |
| | (1.06) | (3.01) | (0.48) | | | (0.76) |
| **Silver redhorse** | 1.07 | 0.38 | 0.50 | 0.25 | 2.31 | 2.25 |
| | (0.40) | (0.18) | (0.29) | (0.25) | (0.72) | (1.03) |
| **River redhorse** | 0.00 | | | | 0.75 | |
| | (0.00) | | | | (0.64) | |
| **Golden redhorse** | 0.86 | | | 0.25 | 0.54 | 2.13 |
| | (0.23) | | | (0.25) | (0.54) | (0.58) |
| **Shorthead redhorse** | 4.34 | 5.75 | 2.25 | 1.75 | 10.93 | 4.88 |
| | (1.25) | (3.29) | (1.31) | (1.44) | (5.24) | (1.19) |
| **Yellow bullhead** | 0.04 | 0.13 | | | | |
| | (0.04) | (0.13) | | | | |
| **Channel catfish** | 0.23 | 0.38 | | 0.25 | | 0.13 |
| | (0.15) | (0.38) | | (0.25) | | (0.13) |
| **Tadpole madtom** | 0.04 | 0.13 | | | | |
| | (0.04) | (0.13) | | | | |
| **Northern pike** | 0.95 | 2.50 | | | 0.22 | 0.25 |
| | (0.41) | (1.20) | | | (0.22) | (0.16) |
| **Brook silverside** | 3.48 | 3.88 | 7.75 | 0.75 | 0.44 | 4.25 |
| | (1.03) | (1.67) | (4.01) | (0.48) | (0.44) | (2.19) |
| **White bass** | 0.89 | 0.13 | | 1.00 | 1.08 | 1.63 |
| | (0.45) | (0.13) | | (0.71) | (0.56) | (1.10) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Rock bass** | 1.49 | 1.50 | 2.50 | | 0.22 | 2.25 |
| | (0.37) | (0.73) | (0.96) | | (0.22) | (0.70) |
| **Green sunfish** | 0.18 | 0.25 | | | 0.23 | 0.25 |
| | (0.08) | (0.16) | | | (0.23) | (0.16) |
| **Pumpkinseed** | 0.93 | 2.25 | 1.50 | | | 0.25 |
| | (0.59) | (1.72) | (0.96) | | | (0.16) |
| **Orangespotted sunfish** | 0.04 | 0.13 | | | | |
| | (0.04) | (0.13) | | | | |
| **Bluegill** | 121.54 | 257.13 | 308.75 | 1.75 | 0.22 | 48.38 |
| | (23.70) | (62.88) | (176.69) | (0.75) | (0.22) | (14.09) |
| **Green x pumpkinseed sunfish** | 0.13 | 0.38 | | | | |
| | (0.13) | (0.38) | | | | |
| **Smallmouth bass** | 3.82 | 0.25 | 3.75 | 4.00 | 12.20 | 6.88 |
| | (0.87) | (0.16) | (2.39) | (1.29) | (5.36) | (2.13) |
| **Largemouth bass** | 33.79 | 62.88 | 18.25 | 3.25 | 0.88 | 28.38 |
| | (7.07) | (18.69) | (13.48) | (1.38) | (0.88) | (7.94) |
| **Black crappie** | 3.59 | 6.63 | 0.75 | 0.50 | 0.09 | 3.13 |
| | (0.96) | (1.13) | (0.48) | (0.50) | (0.09) | (2.32) |
| **Unidentified sunfish** | 0.26 | 0.75 | | | | |
| | (0.11) | (0.31) | | | | |
| **Western sand darter** | 0.11 | | | 0.50 | | |
| | (0.11) | | | (0.50) | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Mud darter** | 0.09 | | | | | 0.25 |
| | (0.06) | | | | | (0.16) |
| **Johnny darter** | 0.76 | 0.88 | 0.25 | 0.50 | | 0.88 |
| | (0.21) | (0.30) | (0.25) | (0.50) | | (0.40) |
| **Banded darter** | 0.00 | | | | 0.22 | |
| | (0.00) | | | | (0.22) | |
| **Yellow perch** | 5.97 | 17.13 | 1.00 | | 0.09 | 0.25 |
| | (2.91) | (8.57) | (0.41) | | (0.09) | (0.16) |
| **Logperch** | 0.11 | 0.13 | 1.25 | | 2.08 | |
| | (0.08) | (0.13) | (1.25) | | (1.55) | |
| **Sauger** | 0.10 | | | 0.25 | 0.09 | 0.13 |
| | (0.07) | | | (0.25) | (0.09) | (0.13) |
| **Walleye** | 0.58 | | | 0.25 | 1.49 | 1.38 |
| | (0.31) | | | (0.25) | (0.69) | (0.80) |
| **Freshwater drum** | 0.19 | 0.13 | | | 1.08 | 0.38 |
| | (0.11) | (0.13) | | | (0.86) | (0.26) |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**IMPS - Impounded, shoreline**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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# Pool 13, Upper Mississippi River
# 2003 Fish Collection Summary

This report is a bullet summary of the Long Term Resource Monitoring Program's (LTRMP) fish collection efforts conducted by the Bellevue Field Station on Pool 13, Upper Mississippi River during 2003. Information on changes in fish catch over all years can be obtained from the Graphical Fish Database Browser.

- 21 fish collections were conducted using day electrofishing in period 3 only (Table 2.3).
- Water levels did not affect sample allocations (Table 2.3; Figure 1.3).
- All 21 fish collections were from randomly selected sites.
- Day electrofishing collections were conducted in backwater; main channel border, unstructured, and side channel border strata (Table 2.3).
- 2,563 fish were collected representing 45 species (Table 3.3).
- The LTRMP species total for Pool 13 from 1993 to 2002 was 83; no new species were collected in the 2003 season (Table 3.3).
- No species were collected that are Iowa-listed endangered or threatened species (Table 3.3).
- No species were collected that are an Iowa-listed species of special concern (Table 3.3).
- Other species that were collected and are noted as uncommon, rare, or probably strays from tributaries (Pitlo et al. 1995) in Pool 13 were black buffalo, green sunfish, quillback, silver redhorse, and smallmouth bass (Table 3.3).

- Mean catch-per-unit-effort and standard effort for fish collected by day electrofishing using stratified random sampling (Table 4.3) for each stratum are shown.
- Length distributions for selected species of fish are shown in Figures 1 to 17.

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Content manager: Jennie Sauer

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**Table 2.3** Allocation of fish sampling effort among strata in Pool 13 of the Upper Mississippi River during 2003. Table entries are numbers of successfully completed standardized monitoring collections.

**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 |

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

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**Figure 1.3** Daily water surface elevation from Lock and Dam 12 for Pool 13, Upper Mississippi River, during 2003 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).

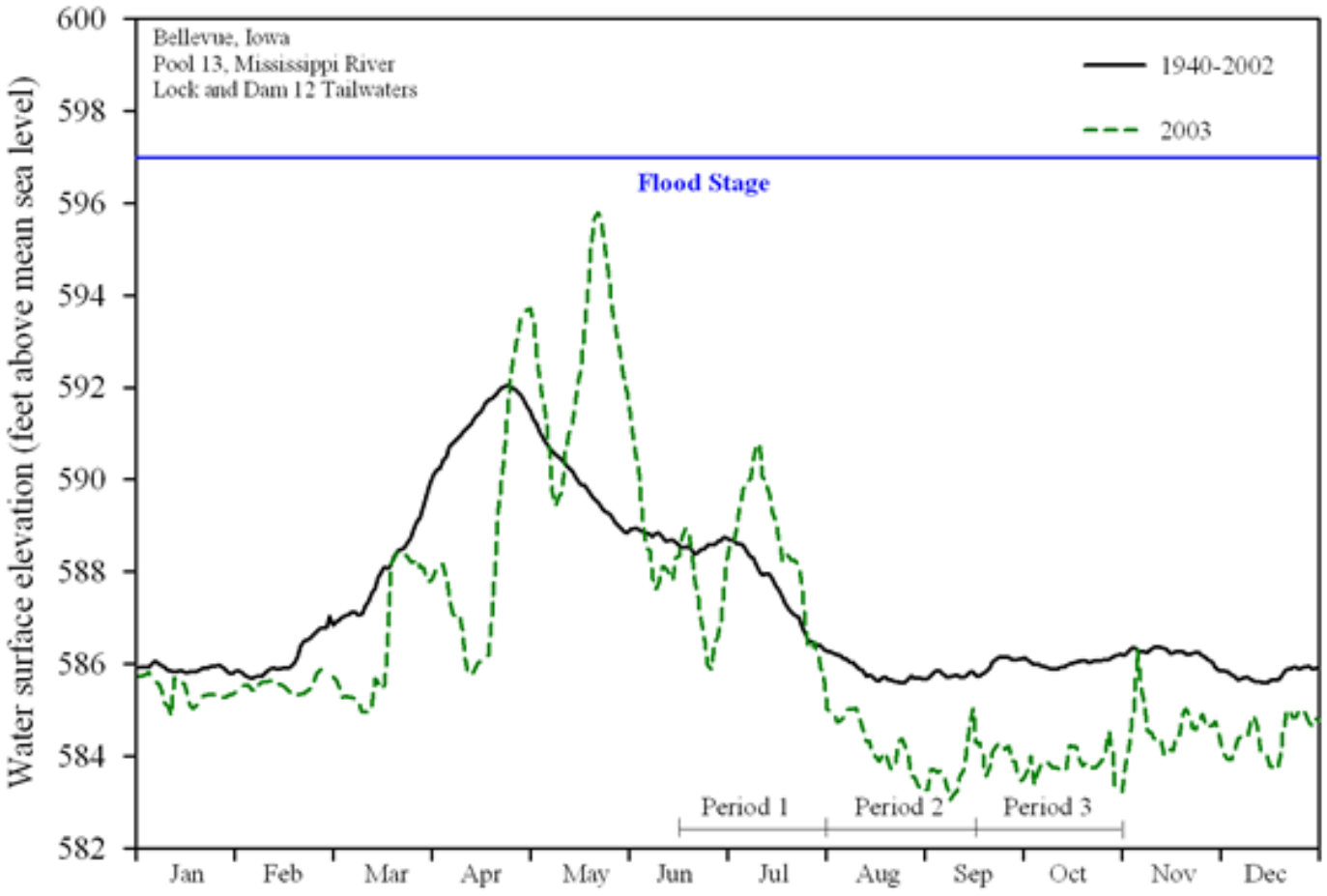

**Table 3.3** Total catches, by gear type, of fish collected in Pool 13 of the Upper Mississippi River during 2003. See Table 2.3 for the list of sampling gears actually deployed in this study reach.

| Species | Common name | Scientific name | D | F | M | HS | HL | T | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Silver lamprey | *Ichthyomyzon unicuspis* | 2 | - | - | - | - | - | 2 |
| 2 | Longnose gar | *Lepisosteus osseus* | 2 | - | - | - | - | - | 2 |
| 3 | Shortnose gar | *L. platostomus* | 9 | - | - | - | - | - | 9 |
| 4 | Bowfin | *Amia calva* | 6 | - | - | - | - | - | 6 |
| 5 | Gizzard shad | *Dorosoma cepedianum* | 49 | - | - | - | - | - | 49 |
| 6 | Spotfin shiner | *Cyprinella spiloptera* | 43 | - | - | - | - | - | 43 |
| 7 | Common carp | *Cyprinus carpio* | 238 | - | - | - | - | - | 238 |
| 8 | Silver chub | *Macrhybopsis storeriana* | 9 | - | - | - | - | - | 9 |
| 9 | Golden shiner | *Notemigonus crysoleucas* | 10 | - | - | - | - | - | 10 |
| 10 | Emerald shiner | *Notropis atherinoides* | 476 | - | - | - | - | - | 476 |
| 11 | River shiner | *N. blennius* | 71 | - | - | - | - | - | 71 |
| 12 | Spottail shiner | *N. hudsonius* | 8 | - | - | - | - | - | 8 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | Mimic shiner | *N. volucellus* | 58 | - | - | - | - | - | 58 |
| 14 | Bullhead minnow | *Pimephales vigilax* | 46 | - | - | - | - | - | 46 |
| 15 | River carpsucker | *Carpiodes carpio* | 2 | - | - | - | - | - | 2 |
| 16 | Quillback | *C. cyprinus* | 1 | - | - | - | - | - | 1 |
| 17 | Smallmouth buffalo | *Ictiobus bubalus* | 10 | - | - | - | - | - | 10 |
| 18 | Bigmouth buffalo | *I. cyprinellus* | 15 | - | - | - | - | - | 15 |
| 19 | Black buffalo | *I. niger* | 4 | - | - | - | - | - | 4 |
| 20 | Spotted sucker | *Minytrema melanops* | 16 | - | - | - | - | - | 16 |
| 21 | Silver redhorse | *Moxostoma anisurum* | 1 | - | - | - | - | - | 1 |
| 22 | Golden redhorse | *M. erythrurum* | 6 | - | - | - | - | - | 6 |
| 23 | Shorthead redhorse | *M. macrolepidotum* | 22 | - | - | - | - | - | 22 |
| 24 | Channel catfish | *Ictalurus punctatus* | 21 | - | - | - | - | - | 21 |
| 25 | Flathead catfish | *Pylodictis olivaris* | 2 | - | - | - | - | - | 2 |
| 26 | Northern pike | *Esox lucius* | 7 | - | - | - | - | - | 7 |
| 27 | Brook silverside | *Labidesthes sicculus* | 2 | - | - | - | - | - | 2 |
| 28 | White bass | *Morone chrysops* | 28 | - | - | - | - | - | 28 |
| 29 | Yellow bass | *M. mississippiensis* | 5 | - | - | - | - | - | 5 |
| 30 | Rock bass | *Ambloplites rupestris* | 1 | - | - | - | - | - | 1 |
| 31 | Green sunfish | *Lepomis cyanellus* | 1 | - | - | - | - | - | 1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32 | Pumpkinseed | *L. gibbosus* | 45 | - | - | - | - | - | 45 |
| 33 | Warmouth | *L. gulosus* | 7 | - | - | - | - | - | 7 |
| 34 | Orangespotted sunfish | *L. humilis* | 66 | - | - | - | - | - | 66 |
| 35 | Bluegill | *L. macrochirus* | 692 | - | - | - | - | - | 692 |
| 36 | Smallmouth bass | *Micropterus dolomieu* | 18 | - | - | - | - | - | 18 |
| 37 | Largemouth bass | *M. salmoides* | 439 | - | - | - | - | - | 439 |
| 38 | White crappie | *Pomoxis annularis* | 15 | - | - | - | - | - | 15 |
| 39 | Black crappie | *P. nigromaculatus* | 38 | - | - | - | - | - | 38 |
| 40 | Yellow perch | *Perca flavescens* | 30 | - | - | - | - | - | 30 |
| 41 | Logperch | *Percina caprodes* | 1 | - | - | - | - | - | 1 |
| 42 | River darter | *P. shumardi* | 1 | - | - | - | - | - | 1 |
| 43 | Sauger | *Stizostedion canadense* | 16 | - | - | - | - | - | 16 |
| 44 | Walleye | *S. vitreum* | 6 | - | - | - | - | - | 6 |
| 45 | Freshwater drum | *Aplodinotus grunniens* | 18 | - | - | - | - | - | 18 |
| | | | **2563** | **0** | **0** | **0** | **0** | **0** | **2563** |

**Sampling gears:**
**D - Day electrofishing**
**F - Fyke netting**
**M - Mini fyke netting**
**HS - Small hoop netting**
**HL - Large hoop netting**
**T- Trawling**

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# Pool 13 Table

| Table | Stratified Random Sampling |
|---|---|
| 4.3 | Mean catch-per-unit-effort for fish collected by day electrofishing |

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**Table 4.3.** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Pool 13 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.3). See Methods for definitions of catch-per-unit-effort and standard error.

| Common name | ALL | BWCS | IMPS | MCBU | MCBW | SCB |
|---|---|---|---|---|---|---|
| **Silver lamprey** | 0.17 | 0.13 | | | | 0.50 |
| | (0.13) | (0.13) | | | | (0.50) |
| **Longnose gar** | 0.17 | 0.13 | | | | 0.50 |
| | (0.13) | (0.13) | | | | (0.50) |
| **Shortnose gar** | 0.52 | | | | 1.67 | 2.00 |
| | (0.51) | | | | (1.67) | (2.00) |
| **Bowfin** | 0.18 | 0.50 | 0.25 | | 0.33 | |
| | (0.09) | (0.27) | (0.25) | | (0.33) | |
| **Gizzard shad** | 2.41 | 5.25 | | 0.75 | 0.33 | 1.50 |
| | (1.19) | (3.44) | | (0.75) | (0.33) | (0.50) |
| **Spotfin shiner** | 4.15 | 1.25 | 0.25 | 2.50 | | 11.00 |
| | (2.90) | (1.11) | (0.25) | (1.89) | | (11.00) |
| **Common carp** | 17.25 | 13.63 | 5.50 | 6.00 | 0.67 | 40.50 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (4.47) | (6.55) | (1.85) | (3.49) | (0.67) | (14.50) |
| **Silver chub** | 0.51 | 0.13 | | 1.25 | 1.00 | |
| | (0.24) | (0.13) | | (0.63) | (0.58) | |
| **Golden shiner** | 0.42 | 1.25 | | | | |
| | (0.21) | (0.62) | | | | |
| **Emerald shiner** | 42.60 | 2.63 | 1.75 | 99.00 | 4.67 | 19.00 |
| | (14.67) | (0.94) | (1.03) | (37.49) | (4.18) | (18.00) |
| **River shiner** | 5.86 | 1.75 | | 13.50 | 0.33 | 1.00 |
| | (3.21) | (1.28) | | (8.54) | (0.33) | (1.00) |
| **Spottail shiner** | 0.36 | 0.13 | 1.00 | 0.75 | | |
| | (0.19) | (0.13) | (1.00) | (0.48) | | |
| **Mimic shiner** | 4.07 | 2.00 | | 5.00 | 3.33 | 6.00 |
| | (1.85) | (1.24) | | (2.61) | (3.33) | (6.00) |
| **Bullhead minnow** | 2.33 | 4.50 | 0.50 | 1.50 | | 1.00 |
| | (0.97) | (2.60) | (0.29) | (1.19) | | (0.00) |
| **River carpsucker** | 0.17 | 0.13 | | | | 0.50 |
| | (0.13) | (0.13) | | | | (0.50) |
| **Quillback** | 0.00 | | | | 0.33 | |
| | (0.00) | | | | (0.33) | |
| **Smallmouth buffalo** | 1.03 | 0.25 | | 0.50 | | 3.00 |
| | (0.77) | (0.25) | | (0.29) | | (3.00) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Bigmouth buffalo** | 1.44 | 0.63 | | 0.25 | | 4.50 |
| | (1.16) | (0.50) | | (0.25) | | (4.50) |
| **Black buffalo** | 0.42 | 0.13 | | | | 1.50 |
| | (0.38) | (0.13) | | | | (1.50) |
| **Spotted sucker** | 0.60 | 1.75 | 0.50 | | | |
| | (0.30) | (0.90) | (0.29) | | | |
| **Silver redhorse** | 0.00 | | | | 0.33 | |
| | (0.00) | | | | (0.33) | |
| **Golden redhorse** | 0.42 | 0.50 | | | | 1.00 |
| | (0.30) | (0.50) | | | | (1.00) |
| **Shorthead redhorse** | 0.47 | 0.50 | 2.00 | 0.25 | 2.67 | 0.50 |
| | (0.21) | (0.38) | (1.22) | (0.25) | (1.45) | (0.50) |
| **Channel catfish** | 0.88 | 0.38 | 0.50 | 1.25 | 3.00 | 1.00 |
| | (0.44) | (0.26) | (0.50) | (0.95) | (1.73) | (1.00) |
| **Flathead catfish** | 0.04 | 0.13 | | | 0.33 | |
| | (0.04) | (0.13) | | | (0.33) | |
| **Northern pike** | 0.26 | 0.75 | 0.25 | | | |
| | (0.16) | (0.49) | (0.25) | | | |
| **Brook silverside** | 0.13 | 0.13 | | 0.25 | | |
| | (0.10) | (0.13) | | (0.25) | | |
| **White bass** | 1.73 | 0.88 | 1.00 | 3.75 | 0.67 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.43) | (0.61) | (0.71) | (1.03) | (0.67) | |
| **Yellow bass** | 0.21 | 0.63 | | | | |
| | (0.21) | (0.63) | | | | |
| **Rock bass** | 0.04 | 0.13 | | | | |
| | (0.04) | (0.13) | | | | |
| **Green sunfish** | 0.04 | 0.13 | | | | |
| | (0.04) | (0.13) | | | | |
| **Pumpkinseed** | 1.58 | 4.50 | 2.25 | | | |
| | (0.62) | (1.86) | (0.75) | | | |
| **Warmouth** | 0.26 | 0.75 | 0.25 | | | |
| | (0.14) | (0.41) | (0.25) | | | |
| **Orangespotted sunfish** | 3.56 | 6.50 | 0.25 | 1.00 | 0.33 | 4.00 |
| | (1.38) | (3.78) | (0.25) | (0.71) | (0.33) | (2.00) |
| **Bluegill** | 30.59 | 80.00 | 3.00 | 3.75 | 2.00 | 9.50 |
| | (10.87) | (32.41) | (1.22) | (3.42) | (1.53) | (0.50) |
| **Smallmouth bass** | 0.59 | | 0.25 | 1.50 | 3.67 | |
| | (0.24) | | (0.25) | (0.65) | (1.67) | |
| **Largemouth bass** | 19.59 | 40.50 | 12.00 | 10.75 | 3.67 | 6.50 |
| | (6.85) | (18.83) | (7.31) | (5.91) | (1.86) | (6.50) |
| **White crappie** | 0.63 | 1.88 | | | | |
| | (0.28) | (0.83) | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Black crappie** | 3.03 | 2.63 | | | | 8.50 |
| | (1.95) | (1.28) | | | | (7.50) |
| **Yellow perch** | 1.22 | 3.63 | 0.25 | | | |
| | (0.90) | (2.69) | (0.25) | | | |
| **Logperch** | 0.00 | | | | 0.33 | |
| | (0.00) | | | | (0.33) | |
| **River darter** | 0.00 | | | | 0.33 | |
| | (0.00) | | | | (0.33) | |
| **Sauger** | 0.66 | 1.00 | | 0.50 | 1.67 | 0.50 |
| | (0.37) | (1.00) | | (0.29) | (0.67) | (0.50) |
| **Walleye** | 0.38 | 0.38 | | | 0.33 | 1.00 |
| | (0.27) | (0.26) | | | (0.33) | (1.00) |
| **Freshwater drum** | 1.39 | 0.50 | | 2.25 | 0.67 | 1.50 |
| | (0.66) | (0.27) | | (1.44) | (0.33) | (1.50) |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**IMPS - Impounded, shoreline**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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# Pool 26, Upper Mississippi River
# 2003 Fish Collection Summary

This report is a bullet summary of the Long Term Resource Monitoring Program's (LTRMP) fish collection efforts conducted by the Great Rivers Field Station on Pool 26, Upper Mississippi River during 2003. Information on changes in fish catch over all years can be obtained from the Graphical Fish Database Browser.

- Additional funding from the National Great Rivers Research and Education Center allowed for complete LTRMP fish monitoring in Pool 26 (all gears, all sampling periods).
- 273 fish collections were conducted using six gear types (Table 2.4).
- Water levels did not affect sample allocations; however, one large hoop net was damaged in period 2 (apparently run over by a boat) and both the large and small hoop nets for that site were reset. One trawling run was missed in period 3 because the trawl became irretrievably snagged (Table 2.4; Figure 1.4).
- Of the 273 fish collections, 262 were from randomly selected sites. Eleven collections were made at a fixed site.
- Main channel border, unstructured; side channel border; and contiguous backwater, shoreline strata received the most sampling effort (Table 2.4).
- 18,371 fish were collected representing 61 species and 3 hybrids (Table 3.4). This total includes 101 unidentified suckers (Catostomidae) >90 mm long, 62 unidentified sunfishes (Centrarchidae) >30 mm long, 836 unidentified herrings (Clupeidae) >30 mm long, 42 unidentified minnows (Cyprinidae) >30 mm long, and 5 unidentified young-of-the-year fish >10 mm long.
- The LTRMP species total for Pool 26 before the 2003 season was 90; no new

species were collected in the 2003 season (Table 3.4).

- One Illinois-listed, endangered lake sturgeon was collected (Table 3.4).
- No species were collected that are Illinois-listed threatened species (Table 3.4).
- Other species collected and are noted as uncommon, rare, or probably strays from tributaries (Pitlo et al. 1995) in Pool 26 were suckermouth minnow, fathead minnow, golden redhorse, wiper (striped bass x white bass hybrid), logperch, and smallmouth bass. Mississippi silvery minnow and grass carp were listed as rare and uncommon, respectively by Pitlo et al. (1995), but LTRMP collections in Pool 26 since 1995 suggest that they may no longer be uncommon (Table 3.4).
- Mean catch-per-unit-effort and standard effort for fish collected by gears using stratified random (Tables 4.4–11.4) and fixed-site sampling (Table 21.4) for each stratum are shown.
- Length distributions for selected species of fish are shown in Figures 1 to 17.

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**Table 2.4** Allocation of fish sampling effort among strata in Pool 26 of the Upper Mississippi River during 2003. 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 | | | 8 | 2 | 4 | | | | 26 |
| **Fyke net** | 4 | | | | | 4 | | | | 8 |
| **Large hoop net** | | | 7 | 10 | 2 | | | | | 19 |
| **Small hoop net** | | | 7 | 11 | 2 | | | | | 20 |
| **Mini fyke net** | 4 | | 5 | 2 | 2 | 2 | | | | 15 |
| **Trawling** | | | | | | | | | 4 | 4 |
| **Subtotal** | **14** | **0** | **25** | **31** | **8** | **10** | **0** | **0** | **4** | **92** |

## 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 | | | | | 4 | | | | 8 |
| **Large hoop net** | | | 7 | 10 | 2 | | | | | 19 |
| **Small hoop net** | | | 7 | 10 | 2 | | | | | 19 |
| **Mini fyke net** | 4 | | 5 | 2 | 2 | 2 | | | | 15 |
| **Trawling** | | | | | | | | | 4 | 4 |
| **Subtotal** | **14** | **0** | **25** | **30** | **8** | **10** | **0** | **0** | **4** | **91** |

## 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 | | | | | 4 | | | | 8 |
| **Large hoop net** | | | 7 | 10 | 2 | | | | | 19 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Small hoop net** | | | 7 | 10 | 2 | | | | | 19 |
| **Mini fyke net** | 4 | | 5 | 2 | 2 | 2 | | | | 15 |
| **Trawling** | | | | | | | | | 4 | 4 |
| **Subtotal** | **14** | **0** | **25** | **31** | **8** | **10** | **0** | **0** | **4** | **91** |
| **Total** | **42** | **0** | **75** | **92** | **24** | **30** | **0** | **0** | **12** | **272** |

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

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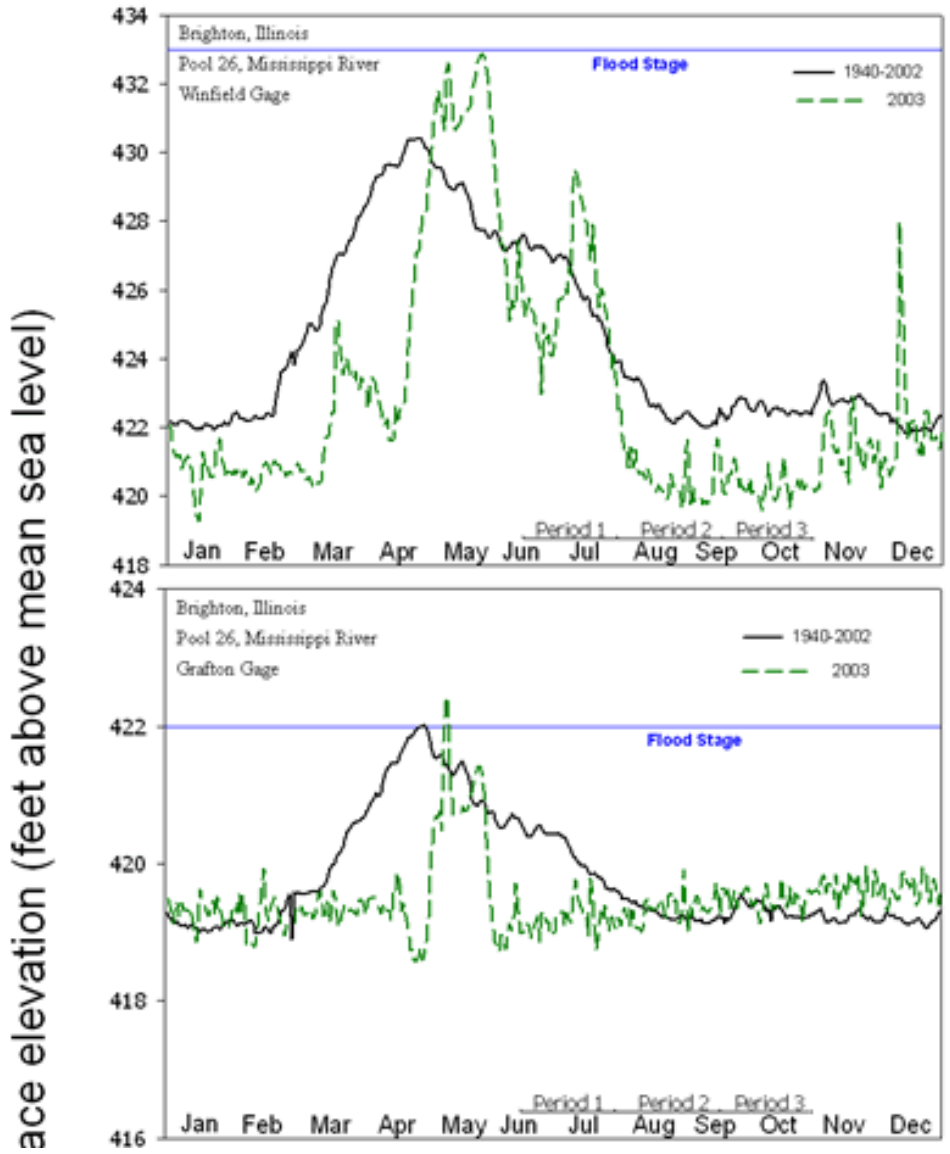
**Figure 1.4** Daily water surface elevation from Winfield, Grafton, and Alton Gages for Pool 26, Upper Mississippi River, during 2003 and mean elevation since 1940. The U.S. Army Corps of Engineers discharge data were obtained in accordance with Upper Midwest Environmental Sciences Center established procedures (Wlosinski et al. 1995).



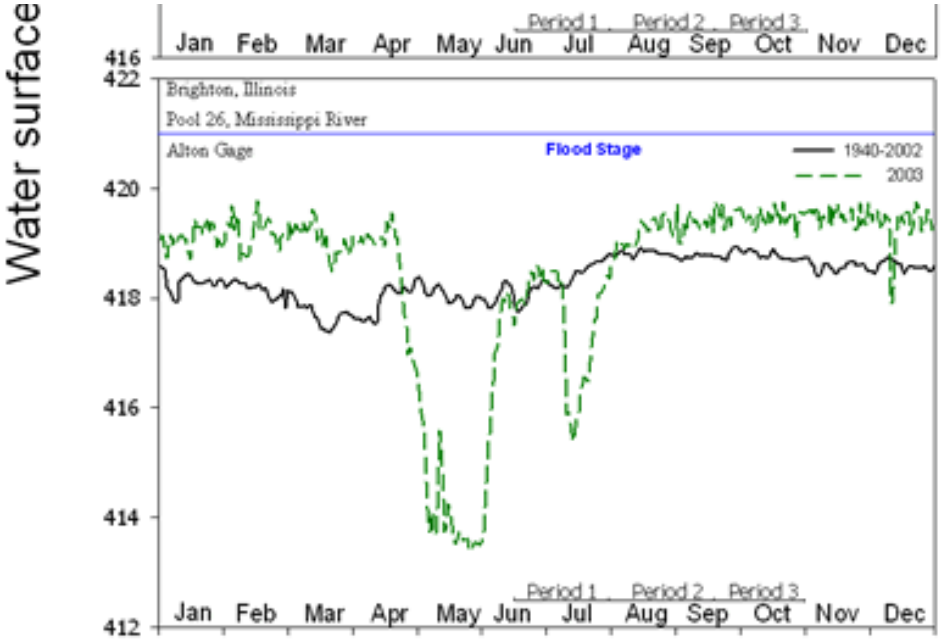



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**Table 3.4** Total catches, by gear type, of fish collected in Pool 26 of the Upper Mississippi River during 2003. See Table 2.4 for the list of sampling gears actually deployed in this study reach.

| Species | Common name | Scientific name | D | F | M | HS | HL | T | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Lake sturgeon | *Acipenser fulvescens* | - | - | - | - | - | 1 | 1 |
| 2 | Shovelnose sturgeon | *Scaphirhynchus platorynchus* | - | - | - | - | - | 12 | 12 |
| 3 | Paddlefish | *Polyodon pathula* | - | - | - | - | - | 2 | 2 |
| 4 | Spotted gar | *Lepisosteus oculatus* | 1 | 1 | 1 | - | - | - | 3 |
| 5 | Shortnose gar | *L. platostomus* | 71 | 92 | 27 | - | 3 | - | 193 |
| 6 | Bowfin | *Amia calva* | 1 | 3 | 2 | - | - | - | 6 |
| 7 | Goldeye | *Hiodon alosoides* | 3 | - | - | - | - | - | 3 |
| 8 | Mooneye | *H. tergisus* | 3 | - | - | - | 3 | - | 6 |
| 9 | Skipjack herring | *Alosa chrysochloris* | 21 | 2 | 6 | - | - | - | 29 |
| 10 | Gizzard shad | *Dorosoma cepedianum* | 1963 | 4 | 227 | - | 5 | - | 2199 |
| 11 | Threadfin shad | *D. petenense* | 26 | - | 15 | - | - | - | 41 |
| 12 | Goldfish | *Carassius auratus* | - | 1 | 1 | - | - | - | 2 |
| 13 | Grass carp | *Ctenopharyngodon idella* | 12 | 1 | 28 | - | - | - | 41 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 14 | Red shiner | *Cyprinella lutrensis* | 3 | - | - | - | - | - | 3 |
| 15 | Spotfin shiner | *C. spiloptera* | 128 | - | 806 | - | - | - | 934 |
| 16 | Common carp | *Cyprinus carpio* | 544 | 5 | 546 | 47 | 81 | 2 | 1225 |
| 17 | Mississippi silvery minnow | *Hybognathus nuchalis* | - | - | 34 | - | - | - | 34 |
| 18 | Silver carp | *Hypopthalmichthys molitrix* | 10 | 1 | 3 | - | - | - | 14 |
| 19 | Bighead carp | *H. nobilis* | 4 | 6 | 81 | - | 6 | - | 97 |
| 20 | Speckled chub | *Macrhybopsis aestivalis* | - | - | - | - | - | 21 | 21 |
| 21 | Silver chub | *M. storeriana* | 6 | - | - | - | - | - | 6 |
| 22 | Golden shiner | *Notemigonus crysoleucas* | - | - | 5 | - | - | - | 5 |
| 23 | Emerald shiner | *Notropis atherinoides* | 896 | - | 1101 | - | - | - | 1997 |
| 24 | River shiner | *N. blennius* | 32 | - | 329 | - | - | - | 361 |
| 25 | Spottail shiner | *N. hudsonius* | 2 | - | - | - | - | - | 2 |
| 26 | Silverband shiner | *N. shumardi* | 10 | - | 56 | - | 1 | - | 67 |
| 27 | Sand shiner | *N. stramineus* | 4 | - | 34 | - | - | - | 38 |
| 28 | Channel shiner | *N. wickliffi* | 81 | - | 3170 | - | - | - | 3251 |
| 29 | Suckermouth minnow | *Phenacobius mirabilis* | 1 | - | - | - | - | - | 1 |
| 30 | Bluntnose minnow | *Pimephales notatus* | 1 | - | 13 | - | - | - | 14 |
| 31 | Fathead minnow | *P. promelas* | 2 | - | - | - | - | - | 2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32 | Bullhead minnow | *P. vigilax* | 530 | - | 164 | - | - | - | 694 |
| 33 | Unidentified minnow | Unidentified *Cyprinidae* | 2 | - | 40 | - | - | - | 42 |
| 34 | River carpsucker | *Carpiodes carpio* | 74 | 9 | 10 | - | 1 | - | 94 |
| 35 | Smallmouth buffalo | *Ictiobus bubalus* | 142 | 3 | 3 | 8 | 301 | - | 457 |
| 36 | Bigmouth buffalo | *I. cyprinellus* | 25 | 5 | - | - | 1 | - | 31 |
| 37 | Black buffalo | *I. niger* | 8 | - | - | 1 | 8 | - | 17 |
| 38 | Golden redhorse | *Moxostoma erythrurum* | 1 | - | - | - | - | - | 1 |
| 39 | Shorthead redhorse | *M. macrolepidotum* | 15 | 3 | 1 | - | 1 | - | 20 |
| 40 | Unidentified sucker | Unidentified *Catostomidae* | 15 | - | 86 | - | - | - | 101 |
| 41 | Black bullhead | *Ameiurus melas* | - | 1 | 1 | - | - | - | 2 |
| 42 | Blue catfish | *Ictalurus furcatus* | 2 | - | - | 417 | 88 | 65 | 572 |
| 43 | Channel catfish | *I. punctatus* | 158 | 6 | 36 | 1244 | 221 | 61 | 1726 |
| 44 | Flathead catfish | *Pylodictis olivaris* | 45 | - | 4 | 18 | 13 | 6 | 86 |
| 45 | Blackstripe topminnow | *Fundulus notatus* | 1 | - | - | - | - | - | 1 |
| 46 | Western mosquitofish | *Gambusia affinis* | 12 | - | 133 | - | - | - | 145 |
| 47 | Brook silverside | *Labidesthes sicculus* | 5 | - | - | - | - | - | 5 |
| 48 | White bass | *Morone chrysops* | 167 | 102 | 85 | 9 | 19 | - | 382 |
| 49 | Yellow bass | *M. mississippiensis* | 10 | 1 | - | - | - | - | 11 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 50 | Striped x white bass | *M. saxatilis x chrysops* | 1 | - | - | - | - | - | 1 |
| 51 | Green sunfish | *Lepomis cyanellus* | 161 | 1 | 3 | - | - | - | 165 |
| 52 | Warmouth | *L. gulosus* | 11 | 1 | 1 | - | - | - | 13 |
| 53 | Orangespotted sunfish | *L. humilis* | 313 | 2 | 100 | - | - | - | 415 |
| 54 | Bluegill | *L. macrochirus* | 360 | 111 | 44 | 2 | - | - | 517 |
| 55 | Green x bluegill sunfish | *L. cyanellus x macrochirus* | 12 | 1 | - | - | - | - | 13 |
| 56 | Bluegill x longear sunfish | *L. macrochirus x megalotis* | 1 | - | - | - | - | - | 1 |
| 57 | Smallmouth bass | *Micropterus dolomieu* | 4 | - | - | - | - | - | 4 |
| 58 | Largemouth bass | *M. salmoides* | 84 | 3 | 9 | - | - | - | 96 |
| 59 | White crappie | *Pomoxis annularis* | 10 | 13 | 36 | - | - | - | 59 |
| 60 | Black crappie | *P. nigromaculatus* | 9 | 128 | 38 | - | - | - | 175 |
| 61 | Unidentified sunfish | Unidentified *Centrarchidae* | 12 | - | 50 | - | - | - | 62 |
| 62 | Mud darter | *Etheostoma asprigene* | 1 | - | - | - | - | - | 1 |
| 63 | Logperch | *Percina caprodes* | 1 | - | 1 | - | - | - | 2 |
| 64 | Slenderhead darter | *P. phoxocephala* | 4 | - | - | - | - | - | 4 |
| 65 | Sauger | *Stizostedion canadense* | 9 | - | 1 | - | - | - | 10 |
| 66 | Walleye | *S. vitreum* | 3 | - | - | - | - | - | 3 |
| 67 | Freshwater drum | *Aplodinotus grunniens* | 531 | 13 | 264 | 41 | 61 | 82 | 992 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 68 | Age-0 fish | Unidentified | - | - | 4 | - | - | 1 | 5 |
| | | | **6564** | **519** | **7599** | **1787** | **813** | **253** | **17535** |

**Sampling gears:**
**D - Day electrofishing**
**F - Fyke netting**
**M - Mini fyke netting**
**HS - Small hoop netting**
**HL - Large hoop netting**
**T - Trawling**

*Last updated on October 13, 2004*
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# Pool 26 Tables

| Table* | Stratified Random Sampling |
|---|---|
| 4.4 | Mean catch-per-unit-effort for fish collected by day electrofishing |
| 6.4 | Mean catch-per-unit-effort for fish collected by fyke netting |
| 8.4 | Mean catch-per-unit-effort for fish collected by mini fyke netting |
| 10.4 | Mean catch-per-unit-effort for fish collected by small hoop netting |
| 11.4 | Mean catch-per-unit-effort for fish collected by large hoop netting |
| | **Fixed-site Sampling** |
| 21.4 | Mean catch-per-unit-effort for fish collected by bottom trawling |

*Table numbers are not always in sequence because some gears were not fished in some study areas. Table numbers for each gear type are consistent among study areas.

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Content manager: Jennie Sauer

*Last updated on September 28, 2004*

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**Table 4.4** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Pool 26 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.4). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | IMPS | MCBU | MCBW | SCB |
|---|---|---|---|---|---|---|
| **Spotted gar** | 0.00 | 0.06 | | | | |
| | (0.00) | (0.06) | | | | |
| **Shortnose gar** | 0.91 | 1.44 | 0.25 | 0.96 | 1.00 | 0.75 |
| | (0.28) | (0.68) | (0.13) | (0.41) | (1.00) | (0.23) |
| **Bowfin** | 0.02 | | | | | 0.08 |
| | (0.02) | | | | | (0.08) |
| **Goldeye** | 0.07 | | | 0.08 | | 0.06 |
| | (0.04) | | | (0.06) | | (0.06) |
| **Mooneye** | 0.08 | | | 0.13 | | |
| | (0.06) | | | (0.09) | | |
| **Skipjack herring** | 0.20 | 0.17 | 0.17 | 0.17 | 1.17 | 0.28 |
| | (0.09) | (0.09) | (0.17) | (0.08) | (0.48) | (0.28) |
| **Gizzard shad** | 28.10 | 16.22 | 19.83 | 27.63 | 36.67 | 31.10 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (5.16) | (5.71) | (3.95) | (7.09) | (16.73) | (7.32) |
| **Threadfin shad** | 0.11 | 0.06 | 1.67 | 0.04 | | 0.22 |
| | (0.06) | (0.06) | (1.02) | (0.04) | | (0.17) |
| **Grass carp** | 0.11 | 0.28 | 0.25 | 0.13 | | 0.06 |
| | (0.06) | (0.11) | (0.18) | (0.09) | | (0.06) |
| **Red shiner** | 0.00 | | 0.17 | | 0.17 | |
| | (0.00) | | (0.11) | | (0.17) | |
| **Spotfin shiner** | 0.50 | 1.11 | 5.25 | 0.38 | 4.50 | 0.55 |
| | (0.11) | (0.41) | (3.87) | (0.13) | (1.89) | (0.20) |
| **Common carp** | 7.56 | 5.06 | 6.42 | 7.17 | 8.50 | 8.86 |
| | (1.38) | (1.22) | (3.45) | (1.79) | (2.39) | (2.49) |
| **Silver carp** | 0.01 | 0.33 | 0.17 | | 0.33 | |
| | (0.01) | (0.16) | (0.17) | | (0.33) | |
| **Bighead carp** | 0.05 | 0.11 | | 0.04 | | 0.06 |
| | (0.03) | (0.11) | | (0.04) | | (0.06) |
| **Silver chub** | 0.03 | | 0.42 | 0.04 | | |
| | (0.03) | | (0.23) | (0.04) | | |
| **Emerald shiner** | 9.28 | 8.00 | 16.33 | 7.04 | 22.83 | 14.44 |
| | (2.60) | (2.37) | (9.98) | (2.74) | (9.16) | (6.48) |
| **River shiner** | 0.29 | 0.17 | 1.33 | 0.29 | 0.17 | 0.28 |
| | (0.15) | (0.12) | (0.89) | (0.21) | (0.17) | (0.16) |
| **Spottail shiner** | 0.00 | | 0.17 | | | |
| | (0.00) | | (0.11) | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Silverband shiner** | 0.01 | 0.28 | 0.42 | | | |
| | (0.01) | (0.19) | (0.29) | | | |
| **Sand shiner** | 0.03 | 0.17 | | 0.04 | | |
| | (0.03) | (0.17) | | (0.04) | | |
| **Channel shiner** | 0.83 | 0.61 | 0.58 | 0.42 | 3.33 | 1.83 |
| | (0.38) | (0.36) | (0.50) | (0.22) | (1.67) | (1.22) |
| **Suckermouth minnow** | 0.00 | | 0.08 | | | |
| | (0.00) | | (0.08) | | | |
| **Bluntnose minnow** | 0.00 | | 0.08 | | | |
| | (0.00) | | (0.08) | | | |
| **Fathead minnow** | 0.00 | | 0.17 | | | |
| | (0.00) | | (0.11) | | | |
| **Bullhead minnow** | 0.87 | 3.72 | 36.25 | 0.25 | 1.33 | 0.78 |
| | (0.24) | (1.64) | (21.59) | (0.11) | (0.61) | (0.41) |
| **Unidentified minnow** | 0.06 | | | 0.08 | | |
| | (0.06) | | | (0.08) | | |
| **River carpsucker** | 0.64 | 0.17 | 3.08 | 0.46 | 0.67 | 1.06 |
| | (0.22) | (0.12) | (0.99) | (0.29) | (0.49) | (0.34) |
| **Smallmouth buffalo** | 1.55 | 1.06 | 4.92 | 1.79 | 0.67 | 0.94 |
| | (0.26) | (0.32) | (1.61) | (0.38) | (0.42) | (0.25) |
| **Bigmouth buffalo** | 0.27 | 0.50 | 0.42 | 0.29 | 0.17 | 0.17 |
| | (0.08) | (0.17) | (0.29) | (0.11) | (0.17) | (0.12) |
| **Black buffalo** | 0.11 | 0.06 | | 0.04 | 0.17 | 0.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.06) | (0.06) | | (0.04) | (0.17) | (0.18) |
| **Golden redhorse** | 0.00 | | | | 0.17 | |
| | (0.00) | | | | (0.17) | |
| **Shorthead redhorse** | 0.18 | 0.11 | 0.33 | 0.17 | 0.17 | 0.22 |
| | (0.09) | (0.11) | (0.14) | (0.13) | (0.17) | (0.10) |
| **Unidentified sucker** | 0.03 | 0.78 | 0.08 | | | |
| | (0.02) | (0.42) | (0.08) | | | |
| **Blue catfish** | 0.06 | | | 0.08 | | |
| | (0.06) | | | (0.08) | | |
| **Channel catfish** | 2.39 | 0.89 | 1.42 | 2.38 | 3.33 | 2.67 |
| | (0.72) | (0.20) | (0.50) | (1.01) | (2.58) | (0.93) |
| **Flathead catfish** | 0.69 | | 0.42 | 0.58 | 1.17 | 1.06 |
| | (0.19) | | (0.34) | (0.24) | (0.60) | (0.38) |
| **Blackstripe topminnow** | 0.00 | 0.06 | | | | |
| | (0.00) | (0.06) | | | | |
| **Western mosquitofish** | 0.03 | 0.61 | 0.08 | | | |
| | (0.01) | (0.31) | (0.08) | | | |
| **Brook silverside** | 0.05 | 0.11 | | | | 0.17 |
| | (0.03) | (0.08) | | | | (0.12) |
| **White bass** | 2.22 | 2.22 | 3.25 | 2.79 | 1.00 | 0.86 |
| | (0.44) | (0.39) | (1.18) | (0.66) | (0.63) | (0.19) |
| **Yellow bass** | 0.12 | | 0.50 | 0.17 | | |
| | (0.09) | | (0.36) | (0.13) | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Striped x white bass** | 0.02 | | | | | 0.06 |
| | (0.02) | | | | | (0.06) |
| **Green sunfish** | 1.13 | 1.83 | 5.50 | 0.92 | 2.67 | 1.39 |
| | (0.28) | (0.68) | (2.73) | (0.32) | (1.26) | (0.64) |
| **Warmouth** | 0.02 | 0.39 | 0.33 | | | |
| | (0.02) | (0.39) | (0.26) | | | |
| **Orangespotted sunfish** | 0.59 | 13.28 | 5.50 | | 1.17 | 0.06 |
| | (0.15) | (3.75) | (2.40) | | (1.17) | (0.06) |
| **Bluegill** | 2.40 | 5.11 | 11.75 | 1.25 | 3.83 | 4.38 |
| | (0.63) | (2.79) | (3.33) | (0.40) | (2.09) | (1.96) |
| **Green x bluegill sunfish** | 0.01 | 0.06 | 0.92 | | | |
| | (0.01) | (0.06) | (0.62) | | | |
| **Bluegill x longear sunfish** | 0.00 | | 0.08 | | | |
| | (0.00) | | (0.08) | | | |
| **Smallmouth bass** | 0.03 | | 0.17 | 0.04 | 0.17 | |
| | (0.03) | | (0.11) | (0.04) | (0.17) | |
| **Largemouth bass** | 0.64 | 0.61 | 3.17 | 0.46 | 1.00 | 1.00 |
| | (0.19) | (0.34) | (0.72) | (0.17) | (0.52) | (0.51) |
| **White crappie** | 0.09 | 0.39 | | 0.08 | | 0.08 |
| | (0.05) | (0.23) | | (0.06) | | (0.08) |
| **Black crappie** | 0.06 | 0.11 | 0.42 | 0.08 | | |
| | (0.06) | (0.08) | (0.19) | (0.08) | | |
| **Unidentified sunfish** | 0.05 | 0.61 | | 0.04 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.04) | (0.56) | | (0.04) | | |
| **Mud darter** | 0.03 | | | 0.04 | | |
| | (0.03) | | | (0.04) | | |
| **Logperch** | 0.03 | | | 0.04 | | |
| | (0.03) | | | (0.04) | | |
| **Slenderhead darter** | 0.09 | 0.06 | | 0.13 | | |
| | (0.08) | (0.06) | | (0.13) | | |
| **Sauger** | 0.07 | 0.06 | 0.33 | | | 0.22 |
| | (0.04) | (0.06) | (0.19) | | | (0.13) |
| **Walleye** | 0.00 | | 0.25 | | | |
| | (0.00) | | (0.13) | | | |
| **Freshwater drum** | 4.98 | 13.67 | 8.50 | 5.33 | 1.00 | 2.83 |
| | (1.49) | (3.28) | (2.87) | (2.22) | (0.45) | (0.54) |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**IMPS - Impounded, shoreline**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 6.4** Mean catch-per-unit-effort and (standard error) for fish collected by fyke netting in Pool 26 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.4). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | IMPS |
|---|---|---|---|
| **Spotted gar** | 0.07 | 0.08 | |
| | (0.07) | (0.08) | |
| **Shortnose gar** | 4.72 | 5.23 | 2.51 |
| | (0.95) | (1.16) | (0.72) |
| **Bowfin** | 0.15 | 0.17 | 0.09 |
| | (0.09) | (0.11) | (0.09) |
| **Skipjack herring** | 0.08 | 0.08 | 0.09 |
| | (0.06) | (0.08) | (0.09) |
| **Gizzard shad** | 0.21 | 0.25 | 0.08 |
| | (0.10) | (0.13) | (0.08) |
| **Goldfish** | 0.02 | | 0.09 |
| | (0.02) | | (0.09) |
| **Grass carp** | 0.07 | 0.09 | |

| | | | |
|---|---|---|---|
| | (0.07) | (0.09) | |
| **Common carp** | 0.28 | 0.33 | 0.08 |
| | (0.18) | (0.22) | (0.08) |
| **Silver carp** | 0.07 | 0.08 | |
| | (0.07) | (0.08) | |
| **Bighead carp** | 0.41 | 0.50 | |
| | (0.27) | (0.34) | |
| **River carpsucker** | 0.40 | 0.41 | 0.34 |
| | (0.27) | (0.34) | (0.14) |
| **Smallmouth buffalo** | 0.20 | 0.25 | |
| | (0.20) | (0.25) | |
| **Bigmouth buffalo** | 0.29 | 0.34 | 0.08 |
| | (0.15) | (0.19) | (0.08) |
| **Shorthead redhorse** | 0.10 | 0.08 | 0.17 |
| | (0.07) | (0.08) | (0.11) |
| **Black bullhead** | 0.02 | | 0.09 |
| | (0.02) | | (0.09) |
| **Channel catfish** | 0.41 | 0.50 | |
| | (0.16) | (0.20) | |
| **White bass** | 5.14 | 5.71 | 2.70 |
| | (2.11) | (2.62) | (0.64) |
| **Yellow bass** | 0.07 | 0.09 | |
| | (0.07) | (0.09) | |

| | | | |
|---|---|---|---|
| **Green sunfish** | 0.02 | | 0.09 |
| | (0.02) | | (0.09) |
| **Warmouth** | 0.02 | | 0.09 |
| | (0.02) | | (0.09) |
| **Orangespotted sunfish** | 0.09 | 0.09 | 0.09 |
| | (0.07) | (0.09) | (0.09) |
| **Bluegill** | 2.89 | 1.76 | 7.81 |
| | (0.97) | (0.57) | (4.74) |
| **Green x bluegill sunfish** | 0.02 | | 0.09 |
| | (0.02) | | (0.09) |
| **Largemouth bass** | 0.10 | 0.08 | 0.17 |
| | (0.07) | (0.08) | (0.12) |
| **White crappie** | 0.75 | 0.89 | 0.18 |
| | (0.26) | (0.32) | (0.18) |
| **Black crappie** | 3.15 | 1.75 | 9.26 |
| | (0.80) | (0.48) | (3.85) |
| **Freshwater drum** | 0.56 | 0.57 | 0.50 |
| | (0.34) | (0.42) | (0.26) |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**IMPS - Impounded, shoreline**

**Table 8.4** Mean catch-per-unit-effort and (standard error) for fish collected by mini fyke netting in Pool 26 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.4). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | IMPS | MCBU | MCBW | SCB |
|---|---|---|---|---|---|---|
| **Spotted gar** | 0.00 | 0.08 | | | | |
| | (0.00) | (0.08) | | | | |
| **Shortnose gar** | 0.39 | 1.79 | | 0.36 | | 0.29 |
| | (0.24) | (0.47) | | (0.36) | | (0.13) |
| **Bowfin** | 0.01 | 0.17 | | | | |
| | (0.01) | (0.17) | | | | |
| **Skipjack herring** | 0.03 | | 0.88 | | | 0.07 |
| | (0.02) | | (0.88) | | | (0.07) |
| **Gizzard shad** | 21.16 | 3.53 | | 31.28 | | 0.75 |
| | (19.87) | (2.19) | | (29.88) | | (0.47) |
| **Threadfin shad** | 0.04 | | 2.43 | | | 0.07 |
| | (0.02) | | (1.29) | | | (0.07) |
| **Goldfish** | 0.00 | 0.09 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.00) | (0.09) | | | | |
| **Grass carp** | 0.23 | 1.57 | | | | 0.58 |
| | (0.12) | (1.48) | | | | (0.36) |
| **Spotfin shiner** | 73.00 | 5.99 | 4.77 | 108.63 | 0.32 | 1.67 |
| | (71.05) | (5.33) | (2.26) | (106.86) | (0.32) | (0.68) |
| **Common carp** | 4.12 | 1.91 | 85.44 | 4.60 | 0.16 | 0.71 |
| | (2.69) | (1.29) | (85.44) | (3.87) | (0.16) | (0.44) |
| **Mississippi silvery minnow** | 3.73 | | | 5.61 | | |
| | (3.73) | | | (5.61) | | |
| **Silver carp** | 0.01 | 0.25 | | | | |
| | (0.01) | (0.25) | | | | |
| **Bighead carp** | 1.64 | 5.71 | | 2.13 | | |
| | (1.17) | (4.84) | | (1.74) | | |
| **Golden shiner** | 0.03 | 0.26 | 0.18 | | | 0.06 |
| | (0.02) | (0.19) | (0.18) | | | (0.06) |
| **Emerald shiner** | 52.25 | 21.29 | 2.35 | 69.52 | 17.93 | 18.01 |
| | (38.76) | (16.80) | (1.23) | (58.12) | (17.74) | (10.38) |
| **River shiner** | 33.94 | | | 50.79 | | 0.57 |
| | (33.77) | | | (50.79) | | (0.46) |
| **Silverband shiner** | 0.28 | 3.79 | 1.23 | | | 0.40 |
| | (0.12) | (1.80) | (1.23) | | | (0.33) |
| **Sand shiner** | 3.59 | | | 5.40 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (3.59) | | | (5.40) | | |
| **Channel shiner** | 323.24 | | | 484.79 | 12.50 | 2.94 |
| | (310.02) | | | (466.29) | (12.31) | (1.78) |
| **Bluntnose minnow** | 0.82 | 0.09 | 0.17 | 1.11 | | 0.27 |
| | (0.74) | (0.09) | (0.17) | (1.11) | | (0.15) |
| **Bullhead minnow** | 10.41 | 1.45 | 5.42 | 15.16 | 1.28 | 0.78 |
| | (8.18) | (0.96) | (2.03) | (12.30) | (1.28) | (0.30) |
| **Unidentified minnow** | 3.43 | | | 4.81 | | 0.81 |
| | (3.21) | | | (4.81) | | (0.81) |
| **River carpsucker** | 0.16 | 0.67 | | 0.18 | | 0.06 |
| | (0.12) | (0.59) | | (0.18) | | (0.06) |
| **Smallmouth buffalo** | 0.01 | 0.25 | | | | |
| | (0.01) | (0.25) | | | | |
| **Shorthead redhorse** | 0.00 | 0.08 | | | | |
| | (0.00) | (0.08) | | | | |
| **Unidentified sucker** | 0.76 | 4.69 | | | 0.49 | 1.99 |
| | (0.55) | (3.27) | | | (0.49) | (1.86) |
| **Black bullhead** | 0.02 | | | | | 0.07 |
| | (0.02) | | | | | (0.07) |
| **Channel catfish** | 0.68 | | 0.33 | 0.65 | 2.72 | 0.86 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | (0.24) | | (0.33) | (0.32) | (2.72) | (0.41) |
| **Flathead catfish** | 0.36 | | | 0.54 | 0.16 | |
| | (0.36) | | | (0.54) | (0.16) | |
| **Western mosquitofish** | 1.73 | 8.74 | 0.70 | 1.62 | 0.16 | 1.04 |
| | (0.65) | (3.00) | (0.70) | (0.89) | (0.16) | (0.81) |
| **White bass** | 2.94 | 4.29 | | 3.89 | 0.82 | 0.63 |
| | (2.08) | (2.32) | | (3.12) | (0.82) | (0.22) |
| **Green sunfish** | 0.01 | 0.08 | 0.34 | | | |
| | (0.00) | (0.08) | (0.34) | | | |
| **Warmouth** | 0.00 | | | | 0.16 | |
| | (0.00) | | | | (0.16) | |
| **Orangespotted sunfish** | 0.84 | 6.01 | 0.88 | 0.66 | 2.24 | 0.54 |
| | (0.25) | (2.15) | (0.69) | (0.33) | (2.24) | (0.30) |
| **Bluegill** | 1.30 | 0.76 | 1.38 | 1.69 | 1.59 | 0.46 |
| | (0.59) | (0.43) | (0.84) | (0.89) | (0.88) | (0.21) |
| **Largemouth bass** | 0.08 | 0.52 | | | | 0.21 |
| | (0.05) | (0.43) | | | | (0.15) |
| **White crappie** | 1.37 | 1.92 | | 1.92 | 0.16 | 0.06 |
| | (0.78) | (1.74) | | (1.16) | (0.16) | (0.06) |
| **Black crappie** | 0.27 | 2.79 | 0.48 | 0.17 | | 0.14 |
| | (0.14) | (1.87) | (0.32) | (0.17) | | (0.10) |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Unidentified sunfish** | 3.20 | 0.89 | 1.14 | 4.65 | 0.16 | 0.21 |
| | (2.68) | (0.56) | (0.97) | (4.04) | (0.16) | (0.11) |
| **Logperch** | 0.00 | 0.08 | | | | |
| | (0.00) | (0.08) | | | | |
| **Sauger** | 0.12 | | | 0.18 | | |
| | (0.12) | | | (0.18) | | |
| **Freshwater drum** | 21.44 | 5.75 | 2.25 | 31.72 | 0.64 | 0.34 |
| | (21.09) | (5.29) | (2.06) | (31.72) | (0.47) | (0.13) |
| **Age-0 fish** | 0.00 | | 0.33 | | 0.33 | |
| | (0.00) | | (0.33) | | (0.33) | |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**IMPS - Impounded, shoreline**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 10.4** Mean catch-per-unit-effort and (standard error) for fish collected by small hoop netting in Pool 26 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.4). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | MCBW | SCB |
|---|---|---|---|---|
| **Common carp** | 0.24 | 0.16 | 1.63 | 0.43 |
| | (0.10) | (0.09) | (1.44) | (0.27) |
| **Smallmouth buffalo** | 0.08 | 0.10 | | 0.05 |
| | (0.04) | (0.05) | | (0.03) |
| **Black buffalo** | 0.01 | 0.02 | | |
| | (0.01) | (0.02) | | |
| **Blue catfish** | 4.22 | 4.89 | 0.25 | 2.68 |
| | (1.98) | (2.69) | (0.17) | (2.16) |
| **Channel catfish** | 10.39 | 10.32 | 13.28 | 10.55 |
| | (3.35) | (4.17) | (9.87) | (5.56) |
| **Flathead catfish** | 0.16 | 0.17 | 0.08 | 0.14 |
| | (0.06) | (0.07) | (0.08) | (0.06) |
| **White bass** | 0.10 | 0.15 | | |

| | | | | |
|---|---|---|---|---|
| | (0.07) | (0.10) | | |
| **Bluegill** | 0.01 | | | 0.05 |
| | (0.01) | | | (0.03) |
| **Freshwater drum** | 0.20 | 0.18 | 1.56 | 0.26 |
| | (0.09) | (0.12) | (1.26) | (0.14) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 11.4** Mean catch-per-unit-effort and (standard error) for fish collected by large hoop netting in Pool 26 of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.4). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | MCBW | SCB |
|---|---|---|---|---|
| **Shortnose gar** | 0.03 | 0.02 | | 0.05 |
| | (0.02) | (0.02) | | (0.05) |
| **Mooneye** | 0.02 | | | 0.07 |
| | (0.02) | | | (0.07) |
| **Gizzard shad** | 0.06 | 0.09 | | |
| | (0.05) | (0.07) | | |
| **Common carp** | 0.77 | 0.76 | 0.34 | 0.79 |
| | (0.20) | (0.25) | (0.17) | (0.33) |
| **Bighead carp** | 0.07 | 0.10 | | |
| | (0.04) | (0.06) | | |
| **Silverband shiner** | 0.01 | 0.02 | | |
| | (0.01) | (0.02) | | |
| **River carpsucker** | 0.01 | | | 0.02 |

| | | | | |
|---|---|---|---|---|
| | (0.01) | | | (0.02) |
| **Smallmouth buffalo** | 3.18 | 3.96 | 1.34 | 1.37 |
| | (0.63) | (0.88) | (0.70) | (0.45) |
| **Bigmouth buffalo** | 0.01 | 0.02 | | |
| | (0.01) | (0.02) | | |
| **Black buffalo** | 0.08 | 0.12 | 0.09 | |
| | (0.06) | (0.08) | (0.09) | |
| **Shorthead redhorse** | 0.01 | | | 0.02 |
| | (0.01) | | | (0.02) |
| **Blue catfish** | 0.90 | 0.81 | 0.17 | 1.13 |
| | (0.40) | (0.42) | (0.17) | (0.91) |
| **Channel catfish** | 2.87 | 3.72 | 0.41 | 0.91 |
| | (1.66) | (2.37) | (0.23) | (0.36) |
| **Flathead catfish** | 0.10 | 0.11 | 0.25 | 0.10 |
| | (0.04) | (0.05) | (0.25) | (0.06) |
| **White bass** | 0.19 | 0.22 | 0.08 | 0.12 |
| | (0.10) | (0.14) | (0.08) | (0.06) |
| **Freshwater drum** | 0.49 | 0.62 | 1.76 | 0.19 |
| | (0.24) | (0.34) | (0.92) | (0.06) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

**Table 21.4** Mean catch-per-unit-effort and (standard error) for fish collected by bottom trawling in Pool 26 of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | TWZ |
|---|---|
| **Lake sturgeon** | 0.33 |
| | (0.33) |
| **Shovelnose sturgeon** | 4.00 |
| | (2.65) |
| **Paddlefish** | 0.67 |
| | (0.67) |
| **Common carp** | 0.67 |
| | (0.67) |
| **Speckled chub** | 7.00 |
| | (7.00) |
| **Blue catfish** | 21.67 |
| | (8.29) |
| **Channel catfish** | 20.33 |
| | (14.84) |

| | |
|---|---|
| **Flathead catfish** | 2.00 |
| | (1.15) |
| **Freshwater drum** | 27.33 |
| | (18.48) |
| **Age-0 fish** | 0.33 |
| | (0.33) |

**Sampling stratum:**
**TWZ - Tailwater**

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# Open River, Upper Mississippi River
# 2003 Fish Collection Summary

This report is a bullet summary of the Long Term Resource Monitoring Program's (LTRMP) fish collection efforts conducted by the Open River Field Station on the Open River, Upper Mississippi River, during 2003. Information on changes in fish catch over all years can be obtained from the Graphical Fish Database Browser.

- Additional funding from the Missouri Department of Conservation allowed for complete LTRMP fish monitoring in the Open River (all gears, all sampling periods).
- 167 fish collections were conducted using five gear types (Table 2.5).
- Sample allocations were affected by water levels in periods 2 and 3 as side channel sites and one tributary fixed site were inaccessible. No electrofishing was completed during period 1 because of shocking control box failure (Table 2.5; Figure 1.5).
- Of the 167 fish collections, 139 were from randomly selected sites. Fourteen collections were from tributary fixed sites and 14 were from main channel border, unstructured fixed sites.
- Side channel border, main channel border-unstructured, and main channel border, wing dam strata received the most sampling effort. The tributary stratum received the least amount of sampling effort (Table 2.5).
- 4,947 fish were collected representing 50 species and 1 hybrid (Table 3.5). This total excludes 6 unidentifiable larval fish, 1 unidentifiable Scaphirhynchus, 6 unidentifiable Macrhybopsis, 1 unidentifiable Cyprinid, and 8 unidentifiable Catostomids.
- Historically, 129 fish species have been collected from the Open River (Pitlo et al. 1995).

- The LTRMP species total for Open River before the 2003 season was 105. No new species were collected during 2003.
- Missouri-listed species of special concern collected included Mississippi silvery minnow (2), pugnose minnow (13), blue sucker (5), and mooneye (2; Table 3.5).
- Three species of Asian carp were collected and included grass carp (5), bighead carp (14), and silver carp (5). The exotic fish species were accidentally released into the Mississippi River System.
- Mean catch-per-unit-effort and standard effort for fish collected by gears using stratified random (Tables 4.5–11.5) and fixed-site sampling (Tables 14.5–19.5) for each stratum are shown.
- Length distributions for selected species of fish are shown in Figures 1 to 17.

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**Table 2.5** Allocation of fish sampling effort among strata in the Open River of the Upper Mississippi River during 2003. 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 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** | **28** | **16** | **12** | **0** | **0** | **8** | **0** | **64** |

## Sampling period = 2: August 1–September 14

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | | | 3 | 5 | 4 | | | 1 | | 13 |
| Fyke net | | | 4 | 1 | | | | | | 5 |
| Large hoop net | | | 5 | 5 | 3 | | | | | 13 |
| Small hoop net | | | 4 | 5 | 3 | | | | | 12 |
| Mini fyke net | | | 4 | 5 | 4 | | | | | 13 |
| **Subtotal** | **0** | **0** | **20** | **21** | **14** | **0** | **0** | **1** | **0** | **56** |

## Sampling period = 3: September 15–October 31

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | | | 4 | 5 | 4 | | | 1 | | 14 |
| Fyke net | | | | 1 | | | | 1 | | 2 |
| Large hoop net | | | | 5 | 4 | | | 1 | | 10 |
| Small hoop net | | | | 5 | 4 | | | 1 | | 10 |
| Mini fyke net | | | 2 | 4 | 4 | | | 1 | | 11 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Subtotal** | **0** | **0** | **6** | **20** | **16** | **0** | **0** | **5** | **0** | **47** |
| **Total** | **0** | **0** | **54** | **57** | **42** | **0** | **0** | **14** | **0** | **167** |

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

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**Figure 1.5** Daily water surface elevation from Cape Girardeau Gage for the Mississippi River, Open River, during 2003 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).

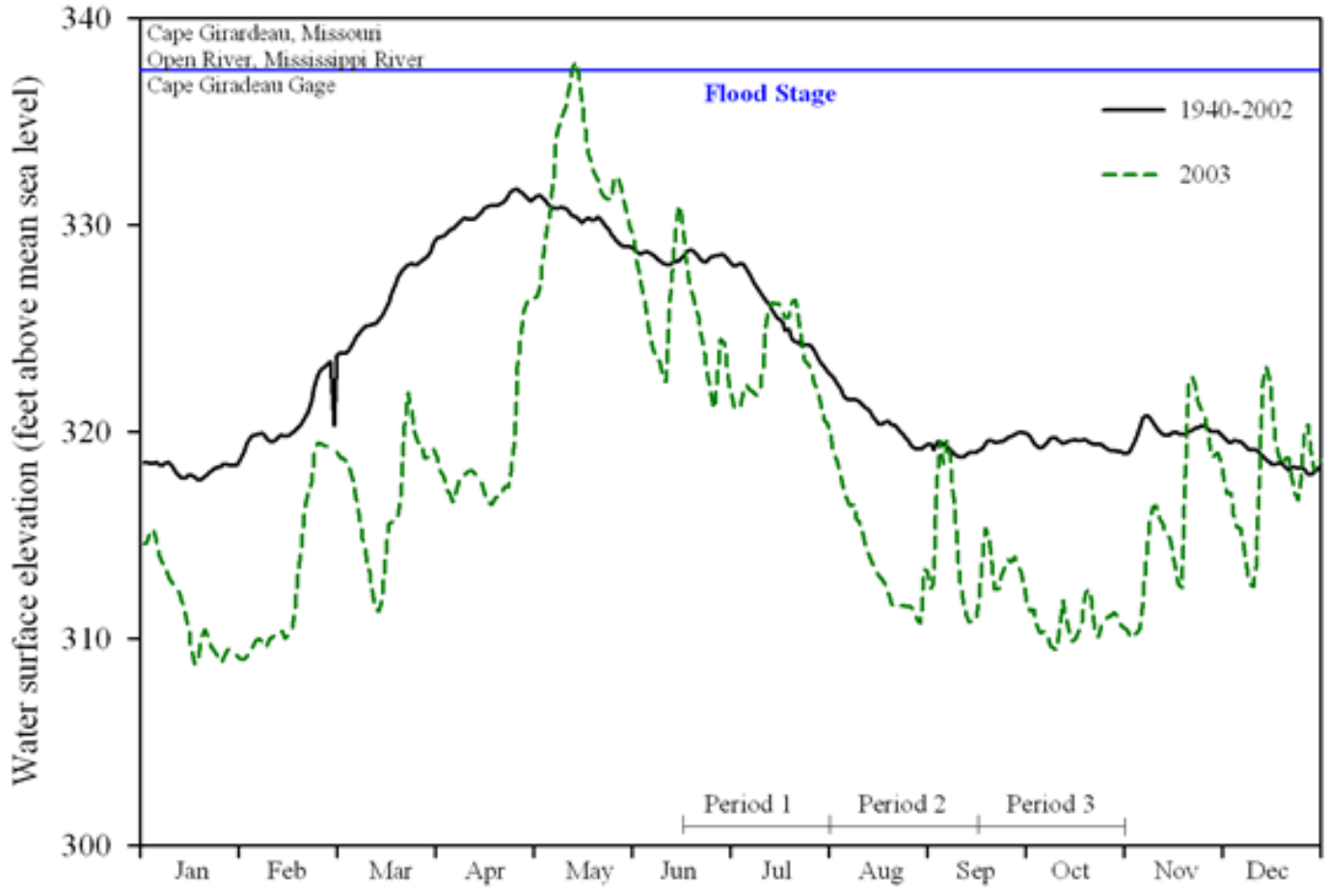

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**Table 3.5** Total catches, by gear type, of fish collected in the Open River of the Upper Mississippi River during 2003. See Table 2.5 for the list of sampling gears actually deployed in this study reach.

| Species | Common name | Scientific name | D | F | M | HS | HL | T | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Chestnut lamprey | *Ichthyomyzon castaneus* | 6 | - | - | - | - | - | 6 |
| 2 | Unidentified sturgeon | *Scaphirhynchus* sp. | - | - | 1 | - | - | - | 1 |
| 3 | Longnose gar | *Lepisosteus osseus* | - | - | 1 | - | - | - | 1 |
| 4 | Shortnose gar | *L. platostomus* | 63 | 33 | 9 | 3 | 1 | - | 109 |
| 5 | Bowfin | *Amia calva* | 1 | - | - | - | - | - | 1 |
| 6 | Goldeye | *Hiodon alosoides* | 10 | - | - | - | - | - | 10 |
| 7 | Mooneye | *H. tergisus* | 2 | - | - | - | - | - | 2 |
| 8 | Skipjack herring | *Alosa chrysochloris* | 9 | - | 8 | - | - | - | 17 |
| 9 | Gizzard shad | *Dorosoma cepedianum* | 908 | 29 | 293 | - | - | - | 1230 |
| 10 | Threadfin shad | *D. petenense* | 1 | - | - | - | - | - | 1 |
| 11 | Grass carp | *Ctenopharyngodon idella* | 3 | - | - | - | 2 | - | 5 |
| 12 | Red shiner | *Cyprinella lutrensis* | 2 | - | 42 | - | - | - | 44 |
| 13 | Spotfin shiner | *C. spiloptera* | - | - | 1 | - | - | - | 1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 14 | Blacktail shiner | *C. venusta* | - | - | 12 | - | - | - | 12 |
| 15 | Common carp | *Cyprinus carpio* | 288 | 1 | 5 | 96 | 218 | - | 608 |
| 16 | Mississippi silvery minnow | *Hybognathus nuchalis* | - | - | 2 | - | - | - | 2 |
| 17 | Silver carp | *Hypopthalmichthys molitrix* | 3 | - | 2 | - | - | - | 5 |
| 18 | Bighead carp | *H. nobilis* | - | - | 13 | - | 1 | - | 14 |
| 19 | Speckled chub | *Macrhybopsis aestivalis* | - | - | 5 | - | - | - | 5 |
| 20 | Sturgeon chub | *M. gelida* | - | - | 1 | - | - | - | 1 |
| 21 | Unidentified chub | *Macrhybopsis* sp. | - | - | 6 | - | - | - | 6 |
| 22 | River chub | *Nocomis micropogon* | - | 1 | - | - | - | - | 1 |
| 23 | Emerald shiner | *N. atherinoides* | 50 | - | 66 | - | - | - | 116 |
| 24 | River shiner | *N. blennius* | 25 | - | 26 | - | - | - | 51 |
| 25 | Spottail shiner | *N. hudsonius* | - | - | 2 | - | - | - | 2 |
| 26 | Silverband shiner | *N. shumardi* | 1 | - | 3 | - | - | - | 4 |
| 27 | Channel shiner | *N. wickliffi* | 10 | - | 39 | - | - | - | 49 |
| 28 | Pugnose minnow | *Opsopoeodus emiliae* | 12 | - | 1 | - | - | - | 13 |
| 29 | Bluntnose minnow | *Pimephales notatus* | 1 | - | - | - | - | - | 1 |
| 30 | Bullhead minnow | *P. vigilax* | 1 | - | - | - | - | - | 1 |
| 31 | Unidentified minnow | Unidentified *Cyprinidae* | - | - | 1 | - | - | - | 1 |
| 32 | River carpsucker | *Carpiodes carpio* | 30 | 15 | 16 | - | 29 | - | 90 |
| 33 | Blue sucker | *Cycleptus elongatus* | 5 | - | - | - | - | - | 5 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 34 | Smallmouth buffalo | *Ictiobus bubalus* | 19 | 1 | - | 4 | 76 | - | 100 |
| 35 | Bigmouth buffalo | *I. cyprinellus* | 25 | - | - | - | 3 | - | 28 |
| 36 | Black buffalo | *I. niger* | 22 | - | - | 8 | 24 | - | 54 |
| 37 | River redhorse | *Moxostoma carinatum* | - | 1 | - | - | - | - | 1 |
| 38 | Shorthead redhorse | *M. macrolepidotum* | 2 | - | - | - | - | - | 2 |
| 39 | Unidentified sucker | Unidentified *Catostomidae* | - | - | 8 | - | - | - | 8 |
| 40 | Blue catfish | *Ictalurus furcatus* | 6 | - | 1 | 8 | 4 | - | 19 |
| 41 | Channel catfish | *I. punctatus* | 31 | 2 | 36 | 209 | 67 | - | 345 |
| 42 | Freckled madtom | *Noturus nocturnus* | 3 | - | 1 | - | - | - | 4 |
| 43 | Flathead catfish | *Pylodictis olivaris* | 31 | 1 | 2 | 7 | 8 | - | 49 |
| 44 | Western mosquitofish | *Gambusia affinis* | - | - | 3 | - | - | - | 3 |
| 45 | Brook silverside | *Labidesthes sicculus* | - | - | 1 | - | - | - | 1 |
| 46 | White bass | *Morone chrysops* | 35 | 2 | 34 | 2 | 3 | - | 76 |
| 47 | Striped x white bass | *M. saxatilis x chrysops* | 1 | - | - | - | - | - | 1 |
| 48 | Green sunfish | *Lepomis cyanellus* | 7 | - | 1 | - | - | - | 8 |
| 49 | Warmouth | *L. gulosus* | 2 | - | - | - | - | - | 2 |
| 50 | Orangespotted sunfish | *L. humilis* | 6 | 1 | 4 | - | - | - | 11 |
| 51 | Bluegill | *L. macrochirus* | 31 | 1 | 51 | - | - | - | 83 |
| 52 | Longear sunfish | *L. megalotis* | 2 | - | 1 | - | - | - | 3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 53 | Spotted bass | *Micropterus punctulatus* | 6 | - | 4 | - | - | - | 10 |
| 54 | Largemouth bass | *M. salmoides* | 5 | - | 1 | - | - | - | 6 |
| 55 | White crappie | *Pomoxis annularis* | 2 | 4 | 32 | - | - | - | 38 |
| 56 | Black crappie | *P. nigromaculatus* | 2 | 4 | 8 | 1 | 1 | - | 16 |
| 57 | Logperch | *Percina caprodes* | 1 | - | 2 | - | - | - | 3 |
| 58 | Sauger | *Stizostedion canadense* | - | 1 | - | - | 1 | - | 2 |
| 59 | Freshwater drum | *Aplodinotus grunniens* | 46 | 36 | 1552 | 7 | 12 | - | 1653 |
| 60 | Unidentified | Unidentified | - | - | 6 | - | - | - | 6 |
| | | | **1716** | **133** | **2303** | **345** | **450** | **0** | **4947** |

**Sampling gears:**
**D - Day electrofishing**
**F - Fyke netting**
**M - Mini fyke netting**
**HS - Small hoop netting**
**HL - Large hoop netting**

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# Open River Tables

| Table* | Stratified Random Sampling |
|---|---|
| 4.5 | Mean catch-per-unit-effort for fish collected by day electrofishing |
| 6.5 | Mean catch-per-unit-effort for fish collected by fyke netting |
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*Table numbers are not always in sequence because some gears were not fished in some study areas. Table numbers for each gear type are consistent among study areas.

Content manager: Jennie Sauer

*Last updated on September 27, 2004*

**Table 4.5** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Open River of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.5). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | MCBW | SCB |
|---|---|---|---|---|
| **Chestnut lamprey** | 0.15 | 0.13 | 0.25 | 0.29 |
| | (0.11) | (0.13) | (0.25) | (0.18) |
| **Shortnose gar** | 2.24 | 2.25 | 2.31 | 2.14 |
| | (0.72) | (0.82) | (0.99) | (0.86) |
| **Bowfin** | 0.00 | | 0.13 | |
| | (0.00) | | (0.13) | |
| **Goldeye** | 0.87 | 1.00 | | |
| | (0.44) | (0.50) | | |
| **Mooneye** | 0.22 | 0.25 | | |
| | (0.14) | (0.16) | | |
| **Skipjack herring** | 0.55 | 0.63 | 0.25 | |
| | (0.33) | (0.38) | (0.16) | |
| **Gizzard shad** | 16.19 | 13.25 | 60.81 | 34.14 |

| | | | | |
|---|---|---|---|---|
| | (6.09) | (6.54) | (42.41) | (17.86) |
| **Threadfin shad** | 0.00 | | 0.13 | |
| | (0.00) | | (0.13) | |
| **Grass carp** | 0.00 | | 0.25 | |
| | (0.00) | | (0.16) | |
| **Red shiner** | 0.03 | | | 0.29 |
| | (0.03) | | | (0.29) |
| **Common carp** | 6.81 | 6.13 | 8.75 | 11.71 |
| | (1.77) | (1.89) | (2.99) | (5.33) |
| **Silver carp** | 0.04 | | 0.13 | 0.29 |
| | (0.02) | | (0.13) | (0.18) |
| **Emerald shiner** | 0.59 | 0.25 | 3.44 | 2.86 |
| | (0.27) | (0.16) | (2.20) | (1.96) |
| **River shiner** | 0.11 | 0.13 | | |
| | (0.11) | (0.13) | | |
| **Silverband shiner** | 0.11 | 0.13 | | |
| | (0.11) | (0.13) | | |
| **Channel shiner** | 0.17 | | | 1.43 |
| | (0.11) | | | (0.92) |
| **Pugnose minnow** | 1.31 | 1.50 | | |
| | (1.31) | (1.50) | | |
| **Bullhead minnow** | 0.02 | | | 0.14 |
| | (0.02) | | | (0.14) |

| | | | | |
|---|---|---|---|---|
| **River carpsucker** | 0.66 | 0.50 | 0.63 | 1.86 |
| | (0.26) | (0.27) | (0.42) | (1.06) |
| **Blue sucker** | 0.01 | | 0.56 | |
| | (0.00) | | (0.29) | |
| **Smallmouth buffalo** | 0.60 | 0.63 | 0.63 | 0.43 |
| | (0.28) | (0.32) | (0.32) | (0.20) |
| **Bigmouth buffalo** | 0.71 | 0.50 | 0.13 | 2.29 |
| | (0.26) | (0.27) | (0.13) | (0.92) |
| **Black buffalo** | 0.99 | 1.00 | 0.25 | 1.00 |
| | (0.37) | (0.42) | (0.16) | (0.49) |
| **Shorthead redhorse** | 0.11 | 0.13 | | |
| | (0.11) | (0.13) | | |
| **Blue catfish** | 0.24 | 0.25 | 0.38 | 0.14 |
| | (0.22) | (0.25) | (0.26) | (0.14) |
| **Channel catfish** | 0.63 | 0.50 | 1.13 | 1.57 |
| | (0.24) | (0.27) | (0.44) | (0.37) |
| **Freckled madtom** | 0.04 | | 0.13 | 0.29 |
| | (0.03) | | (0.13) | (0.29) |
| **Flathead catfish** | 1.73 | 1.88 | 1.13 | 0.71 |
| | (1.28) | (1.47) | (0.55) | (0.57) |
| **White bass** | 1.23 | 1.13 | 1.50 | 2.00 |
| | (0.37) | (0.40) | (0.42) | (1.00) |
| **Striped x white bass** | 0.02 | | | 0.14 |

| | | | | |
|---|---|---|---|---|
| | (0.02) | | | (0.14) |
| **Green sunfish** | 0.09 | | 0.25 | 0.71 |
| | (0.08) | | (0.16) | (0.71) |
| **Warmouth** | 0.03 | | | 0.29 |
| | (0.02) | | | (0.18) |
| **Orangespotted sunfish** | 0.05 | | 0.38 | 0.43 |
| | (0.05) | | (0.18) | (0.43) |
| **Bluegill** | 0.43 | | 0.38 | 3.57 |
| | (0.23) | | (0.18) | (1.91) |
| **Longear sunfish** | 0.03 | | | 0.29 |
| | (0.02) | | | (0.18) |
| **Spotted bass** | 0.01 | | 0.63 | |
| | (0.00) | | (0.38) | |
| **Largemouth bass** | 0.03 | | | 0.29 |
| | (0.03) | | | (0.29) |
| **White crappie** | 0.03 | | | 0.29 |
| | (0.02) | | | (0.18) |
| **Black crappie** | 0.03 | | | 0.29 |
| | (0.02) | | | (0.18) |
| **Logperch** | 0.00 | | 0.13 | |
| | (0.00) | | (0.13) | |
| **Freshwater drum** | 2.30 | 2.50 | 1.93 | 0.86 |
| | (0.86) | (0.98) | (0.58) | (0.55) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 6.5** Mean catch-per-unit-effort and (standard error) for fish collected by fyke netting in Open River of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.5). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | SCB |
|---|---|---|
| **Shortnose gar** | 3.48 | 3.48 |
| | (1.68) | (1.68) |
| **Gizzard shad** | 1.63 | 1.63 |
| | (1.03) | (1.03) |
| **Common carp** | 0.13 | 0.13 |
| | (0.12) | (0.13) |
| **River carpsucker** | 1.28 | 1.28 |
| | (0.62) | (0.62) |
| **Channel catfish** | 0.13 | 0.13 |
| | (0.13) | (0.13) |
| **Flathead catfish** | 0.12 | 0.12 |
| | (0.12) | (0.12) |
| **White bass** | 0.12 | 0.12 |

| | | |
|---|---|---|
| | (0.12) | (0.12) |
| **Orangespotted sunfish** | 0.14 | 0.14 |
| | (0.14) | (0.14) |
| **Bluegill** | 0.13 | 0.13 |
| | (0.13) | (0.13) |
| **White crappie** | 0.50 | 0.50 |
| | (0.38) | (0.38) |
| **Black crappie** | 0.39 | 0.39 |
| | (0.27) | (0.27) |
| **Sauger** | 0.14 | 0.14 |
| | (0.14) | (0.14) |
| **Freshwater drum** | 3.59 | 3.59 |
| | (3.00) | (3.01) |

**Sampling stratum:**
**SCB - Side channel border**

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**Table 8.5** Mean catch-per-unit-effort and (standard error) for fish collected by mini fyke netting in Open River of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.5). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | MCBW | SCB |
|---|---|---|---|---|
| **Longnose gar** | 0.00 | | 0.09 | |
| | (0.00) | | (0.09) | |
| **Shortnose gar** | 0.25 | 0.25 | 0.17 | 0.27 |
| | (0.22) | (0.25) | (0.17) | (0.12) |
| **Skipjack herring** | 0.26 | 0.25 | | 0.33 |
| | (0.22) | (0.25) | | (0.27) |
| **Gizzard shad** | 5.78 | 4.72 | 1.89 | 13.91 |
| | (4.23) | (4.53) | (1.63) | (12.90) |
| **Red shiner** | 2.30 | 2.56 | 0.35 | 0.60 |
| | (1.71) | (1.96) | (0.19) | (0.54) |
| **Spotfin shiner** | 0.08 | 0.09 | | |
| | (0.08) | (0.09) | | |
| **Blacktail shiner** | 0.73 | 0.83 | 0.17 | |

| | | | | |
|---|---|---|---|---|
| | (0.65) | (0.74) | (0.17) | |
| **Common carp** | 0.09 | 0.09 | 0.25 | 0.07 |
| | (0.08) | (0.09) | (0.25) | (0.07) |
| **Mississippi silvery minnow** | 0.01 | | | 0.07 |
| | (0.01) | | | (0.07) |
| **Silver carp** | 0.07 | 0.08 | 0.08 | |
| | (0.07) | (0.08) | (0.08) | |
| **Bighead carp** | 0.35 | 0.33 | | 0.53 |
| | (0.29) | (0.33) | | (0.37) |
| **Speckled chub** | 0.18 | 0.20 | 0.17 | 0.07 |
| | (0.17) | (0.20) | (0.12) | (0.07) |
| **Sturgeon chub** | 0.01 | | | 0.08 |
| | (0.01) | | | (0.08) |
| **Unidentified chub** | 0.43 | 0.50 | | |
| | (0.43) | (0.50) | | |
| **Emerald shiner** | 0.79 | 0.54 | 2.29 | 2.50 |
| | (0.34) | (0.31) | (1.51) | (1.75) |
| **River shiner** | 1.10 | 1.25 | 0.94 | |
| | (0.73) | (0.84) | (0.48) | |
| **Spottail shiner** | 0.02 | | | 0.14 |
| | (0.02) | | | (0.14) |
| **Silverband shiner** | 0.01 | | 0.17 | 0.08 |

| | | | | |
|---|---|---|---|---|
| | (0.01) | | (0.17) | (0.08) |
| **Channel shiner** | 0.33 | 0.34 | 1.29 | 0.20 |
| | (0.22) | (0.26) | (0.83) | (0.11) |
| **Unidentified minnow** | 0.08 | 0.09 | | |
| | (0.08) | (0.09) | | |
| **River carpsucker** | 0.13 | | | 1.10 |
| | (0.12) | | | (1.02) |
| **Unidentified sucker** | 0.12 | 0.09 | 0.09 | 0.35 |
| | (0.09) | (0.09) | (0.09) | (0.35) |
| **Blue catfish** | 0.00 | | 0.09 | |
| | (0.00) | | (0.09) | |
| **Channel catfish** | 1.69 | 1.83 | 0.34 | 0.80 |
| | (1.19) | (1.36) | (0.19) | (0.51) |
| **Freckled madtom** | 0.01 | | | 0.07 |
| | (0.01) | | | (0.07) |
| **Flathead catfish** | 0.01 | | 0.09 | 0.07 |
| | (0.01) | | (0.09) | (0.07) |
| **Western mosquitofish** | 0.09 | 0.08 | | 0.15 |
| | (0.07) | (0.08) | | (0.15) |
| **Brook silverside** | 0.08 | 0.09 | | |
| | (0.08) | (0.09) | | |
| **White bass** | 0.24 | 0.18 | | 0.71 |
| | (0.12) | (0.12) | | (0.37) |

| | | | | |
|---|---|---|---|---|
| **Green sunfish** | 0.01 | | | 0.07 |
| | (0.01) | | | (0.07) |
| **Orangespotted sunfish** | 0.16 | 0.17 | | 0.15 |
| | (0.10) | (0.11) | | (0.15) |
| **Bluegill** | 0.22 | 0.08 | | 1.24 |
| | (0.09) | (0.08) | | (0.48) |
| **Longear sunfish** | 0.01 | | | 0.07 |
| | (0.01) | | | (0.07) |
| **Spotted bass** | 0.02 | | | 0.15 |
| | (0.02) | | | (0.15) |
| **Largemouth bass** | 0.01 | | | 0.08 |
| | (0.01) | | | (0.08) |
| **White crappie** | 0.27 | 0.25 | 0.17 | 0.42 |
| | (0.22) | (0.25) | (0.17) | (0.19) |
| **Black crappie** | 0.02 | | | 0.13 |
| | (0.01) | | | (0.09) |
| **Logperch** | 0.01 | | 0.08 | 0.08 |
| | (0.01) | | (0.08) | (0.08) |
| **Freshwater drum** | 20.29 | 11.73 | 15.04 | 83.72 |
| | (12.09) | (9.52) | (7.45) | (74.49) |
| **Unidentified** | 0.02 | | | 0.13 |
| | (0.02) | | | (0.13) |

## Sampling strata:

**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 10.5** Mean catch-per-unit-effort and (standard error) for fish collected by small hoop netting in Open River of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.5). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | MCBW | SCB |
|---|---|---|---|---|
| **Shortnose gar** | 0.02 | | | 0.13 |
| | (0.01) | | | (0.07) |
| **Common carp** | 1.78 | 1.90 | 0.96 | 1.00 |
| | (0.60) | (0.69) | (0.31) | (0.35) |
| **Smallmouth buffalo** | 0.04 | 0.04 | 0.05 | 0.04 |
| | (0.04) | (0.04) | (0.05) | (0.04) |
| **Black buffalo** | 0.02 | | 0.15 | 0.17 |
| | (0.02) | | (0.11) | (0.17) |
| **Blue catfish** | 0.04 | 0.04 | 0.28 | 0.04 |
| | (0.04) | (0.04) | (0.28) | (0.04) |
| **Channel catfish** | 2.38 | 2.11 | 1.33 | 4.42 |
| | (1.04) | (1.13) | (0.89) | (2.89) |
| **Flathead catfish** | 0.13 | 0.13 | 0.05 | 0.13 |

| | | | | |
|---|---|---|---|---|
| | (0.06) | (0.07) | (0.05) | (0.09) |
| **White bass** | 0.01 | | 0.05 | 0.04 |
| | (0.01) | | (0.05) | (0.04) |
| **Black crappie** | 0.00 | | 0.05 | |
| | (0.00) | | (0.05) | |
| **Freshwater drum** | 0.16 | 0.18 | 0.10 | 0.04 |
| | (0.12) | (0.14) | (0.06) | (0.04) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

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**Table 11.5** Mean catch-per-unit-effort and (standard error) for fish collected by large hoop netting in Open River of the Upper Mississippi River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.5). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | MCBW | SCB |
|---|---|---|---|---|
| **Shortnose gar** | 0.00 | | | 0.04 |
| | (0.00) | | | (0.04) |
| **Grass carp** | 0.08 | 0.09 | | |
| | (0.08) | (0.09) | | |
| **Common carp** | 2.72 | 2.75 | 2.10 | 2.59 |
| | (0.93) | (1.04) | (1.51) | (1.46) |
| **Bighead carp** | 0.00 | | | 0.04 |
| | (0.00) | | | (0.04) |
| **River carpsucker** | 0.09 | | | 0.77 |
| | (0.05) | | | (0.40) |
| **Smallmouth buffalo** | 1.31 | 1.44 | 0.10 | 0.45 |
| | (0.42) | (0.48) | (0.10) | (0.20) |

| | | | | |
|---|---|---|---|---|
| **Bigmouth buffalo** | 0.01 | | | 0.08 |
| | (0.01) | | | (0.05) |
| **Black buffalo** | 0.26 | 0.22 | | 0.60 |
| | (0.10) | (0.10) | | (0.37) |
| **Blue catfish** | 0.08 | 0.08 | | 0.04 |
| | (0.07) | (0.08) | | (0.04) |
| **Channel catfish** | 0.60 | 0.53 | 0.10 | 1.22 |
| | (0.24) | (0.24) | (0.10) | (0.89) |
| **Flathead catfish** | 0.06 | 0.04 | 0.05 | 0.16 |
| | (0.04) | (0.04) | (0.05) | (0.11) |
| **White bass** | 0.08 | 0.08 | | 0.04 |
| | (0.07) | (0.08) | | (0.04) |
| **Black crappie** | 0.00 | | | 0.04 |
| | (0.00) | | | (0.04) |
| **Sauger** | 0.04 | 0.04 | | |
| | (0.04) | (0.04) | | |
| **Freshwater drum** | 0.26 | 0.27 | 0.05 | 0.20 |
| | (0.12) | (0.14) | (0.05) | (0.14) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**MCBW - Main channel border, wing dam**
**SCB - Side channel border**

**Table 14.5** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in Open River of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | MCBU | TRI |
|---|---|---|
| **Chestnut lamprey** | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| **Shortnose gar** | 2.50 | 3.50 |
| | (2.50) | (1.50) |
| **Goldeye** | 1.00 | 0.00 |
| | (0.00) | (0.00) |
| **Skipjack herring** | 1.00 | 0.00 |
| | (1.00) | (0.00) |
| **Gizzard shad** | 36.00 | 4.00 |
| | (10.00) | (3.00) |
| **Grass carp** | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| **Common carp** | 0.00 | 43.50 |
| | (0.00) | (30.50) |

| | | |
|---|---|---|
| **Emerald shiner** | 0.50 | 0.00 |
| | (0.50) | (0.00) |
| **River shiner** | 12.00 | 0.00 |
| | (12.00) | (0.00) |
| **Bluntnose minnow** | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| **River carpsucker** | 0.50 | 3.50 |
| | (0.50) | (2.50) |
| **Blue sucker** | 0.50 | 0.00 |
| | (0.50) | (0.00) |
| **Smallmouth buffalo** | 0.00 | 3.00 |
| | (0.00) | (0.00) |
| **Bigmouth buffalo** | 0.00 | 2.00 |
| | (0.00) | (1.00) |
| **Black buffalo** | 1.00 | 1.50 |
| | (0.00) | (0.50) |
| **Shorthead redhorse** | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| **Channel catfish** | 1.00 | 2.50 |
| | (1.00) | (2.50) |
| **Flathead catfish** | 0.00 | 1.00 |
| | (0.00) | (0.00) |
| **Bluegill** | 0.00 | 1.50 |

| | | |
|---|---|---|
| | (0.00) | (0.50) |
| **Spotted bass** | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| **Largemouth bass** | 0.00 | 1.50 |
| | (0.00) | (1.50) |
| **Freshwater drum** | 2.00 | 1.00 |
| | (1.00) | (1.00) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**TRI - Tributary mouth**

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**Table 16.5** Mean catch-per-unit-effort and (standard error) for fish collected by fyke netting in Open River of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | MCBU | TRI |
|---|---|---|
| **Shortnose gar** | 2.02 | 0.00 |
| | (0.52) | (0.00) |
| **Gizzard shad** | 5.12 | 0.00 |
| | (4.59) | (0.00) |
| **River chub** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **River carpsucker** | 1.27 | 0.33 |
| | (1.27) | (0.33) |
| **Smallmouth buffalo** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **River redhorse** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **Channel catfish** | 0.32 | 0.00 |
| | (0.32) | (0.00) |

| | | |
|---|---|---|
| **White bass** | 0.00 | 0.31 |
| | (0.00) | (0.31) |
| **Black crappie** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **Freshwater drum** | 1.27 | 0.66 |
| | (1.27) | (0.66) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**TRI - Tributary mouth**

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**Table 17.5** Mean catch-per-unit-effort and (standard error) for fish collected by mini fyke netting in Open River of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | MCBU | TRI |
|---|---|---|
| **Unidentified sturgeon** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **Gizzard shad** | 0.32 | 0.95 |
| | (0.32) | (0.95) |
| **Red shiner** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **Mississippi silvery minnow** | 0.00 | 0.32 |
| | (0.00) | (0.32) |
| **Bighead carp** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **River shiner** | 0.32 | 0.00 |
| | (0.32) | (0.00) |
| **Channel shiner** | 1.62 | 3.81 |
| | (1.14) | (3.81) |

| | | |
|---|---|---|
| **Pugnose minnow** | 0.00 | 0.32 |
| | (0.00) | (0.32) |
| **Unidentified sucker** | 0.00 | 0.32 |
| | (0.00) | (0.32) |
| **Channel catfish** | 0.35 | 0.00 |
| | (0.35) | (0.00) |
| **White bass** | 0.63 | 6.35 |
| | (0.63) | (6.35) |
| **Bluegill** | 0.32 | 10.16 |
| | (0.32) | (10.16) |
| **Spotted bass** | 0.00 | 0.63 |
| | (0.00) | (0.63) |
| **White crappie** | 0.00 | 6.67 |
| | (0.00) | (6.67) |
| **Black crappie** | 0.00 | 1.90 |
| | (0.00) | (1.90) |
| **Freshwater drum** | 4.54 | 7.67 |
| | (3.10) | (5.40) |
| **Unidentified** | 1.27 | 0.00 |
| | (1.27) | (0.00) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**TRI - Tributary mouth**

**Table 18.5** Mean catch-per-unit-effort and (standard error) for fish collected by small hoop netting in Open River of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | MCBU | TRI |
|---|---|---|
| **Common carp** | 0.00 | 1.55 |
| | (0.00) | (1.08) |
| **Smallmouth buffalo** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Black buffalo** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Channel catfish** | 0.50 | 4.23 |
| | (0.50) | (3.98) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**TRI - Tributary mouth**

**Table 19.5** Mean catch-per-unit-effort and (standard error) for fish collected by large hoop netting in Open River of the Upper Mississippi River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | MCBU | TRI |
|---|---|---|
| **Common carp** | 0.34 | 7.67 |
| | (0.34) | (4.40) |
| **River carpsucker** | 0.00 | 1.52 |
| | (0.00) | (1.52) |
| **Smallmouth buffalo** | 0.00 | 4.91 |
| | (0.00) | (4.91) |
| **Bigmouth buffalo** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Black buffalo** | 0.00 | 0.51 |
| | (0.00) | (0.29) |
| **Blue catfish** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Channel catfish** | 0.00 | 3.89 |
| | (0.00) | (3.89) |

| | | |
|---|---|---|
| **Flathead catfish** | 0.17 | 0.17 |
| | (0.17) | (0.17) |

**Sampling stratum:**
**MCBU - Main channel border, unstructured**
**TRI - Tributary mouth**

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# La Grange Pool, Illinois River
# 2003 Fish Collection Summary

This report is a bullet summary of the Long Term Resource Monitoring Program's (LTRMP) fish collection efforts conducted by the Havana Field Station on La Grange Pool, Illinois River, during 2003. Information on changes in fish catch over all years can be obtained from the Graphical Fish Database Browser.

- The Illinois Department of Natural Resources provided funding for all LTRMP fisheries sampling completed in 2003 (all gears, all sampling periods).
- 354 fish collections were conducted using six gear types (Table 2.6).
- Water levels did not affect sample allocations. All gear allocations were completed for all three sampling periods (Table 2.6; Figure 1.6).
- Peoria Lock and Dam was the only tailwater site sampled in 2003 (Table 2.6). From 1995 until 2002, La Grange Lock and Dam tailwater site was sampled and data from both tailwater sites were combined for analysis.
- Side channel border received the most sampling effort (Table 2.6).
- 34,607 fish were collected representing 64 species and 4 hybrids (Table 3.6).
- Historical fish distribution records for La Grange Pool of the Illinois River (Smith 1979) document 115 fish species from La Grange Pool.
- The LTRMP species total for La Grange Pool collected by LTRMP through 2002 is 85 species and 9 hybrids (Table 3.6).
- 8 non-native species (and 3 non-native hybrids) have been collected by LTRMP monitoring of La Grange Pool; all of these were collected in 2003.

- No federal or state threatened or endangered species have been collected by LTRMP monitoring of La Grange Pool.
- Mean catch-per-unit-effort and standard effort for fish collected by gears using stratified random (Tables 4.6–11.6) and fixed-site sampling (Tables 14.6–21.6) for each stratum are shown.
- Length distributions for selected species of fish are shown in Figures 1 to 17.

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**Table 2.6** Allocation of fish sampling effort among strata in La Grange Pool of the Illinois River during 2003. Table entries are numbers of successfully completed standardized monitoring collections.

## Sampling period = 1: June 15–July 31

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | 12 | | 14 | 12 | | | | | 2 | 40 |
| Fyke net | 10 | | | | | | | | 2 | 12 |
| Large hoop net | | | 8 | 8 | | | | | 2 | 18 |
| Small hoop net | | | 8 | 8 | | | | | 2 | 18 |
| Mini fyke net | 10 | | 8 | 8 | | | | | 2 | 28 |
| Trawling | | | | | | | | | 8 | 8 |
| **Subtotal** | **32** | **0** | **38** | **36** | **0** | **0** | **0** | **0** | **18** | **124** |

## Sampling period = 2: August 1–September 14

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | 12 | | 14 | 12 | | | | | 2 | 40 |
| Fyke net | 10 | | | | | | | | 2 | 12 |
| Large hoop net | | | 8 | 8 | | | | | 2 | 18 |
| Small hoop net | | | 8 | 8 | | | | | 2 | 18 |
| Mini fyke net | 10 | | 8 | 8 | | | | | 2 | 28 |
| Trawling | | | | | | | | | 8 | 8 |
| **Subtotal** | **32** | **0** | **38** | **36** | **0** | **0** | **0** | **0** | **18** | **124** |

## Sampling period = 3: September 15–October 31

| Sampling gear | BWCS | BWCO | SCB | MCBU | MCBW | IMPS | IMPO | TRI | TWZ | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Day electrofishing | 13 | | 14 | 12 | | | | | 2 | 41 |
| Fyke net | 10 | | | | | | | | 2 | 12 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Large hoop net** | | | 8 | 8 | | | | | 2 | 18 |
| **Small hoop net** | | | 8 | 8 | | | | | 2 | 18 |
| **Mini fyke net** | 10 | | 8 | 8 | | | | | 2 | 28 |
| **Trawling** | | | | | | | | | 8 | 8 |
| **Subtotal** | **33** | **0** | **38** | **36** | **0** | **0** | **0** | **0** | **18** | **125** |
| **Total** | **97** | **0** | **114** | **108** | **0** | **0** | **0** | **0** | **54** | **373** |

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

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**Figure 1.6** Daily water surface elevation from Havana Gage for La Grange Pool, Illinois River, during 2003 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).

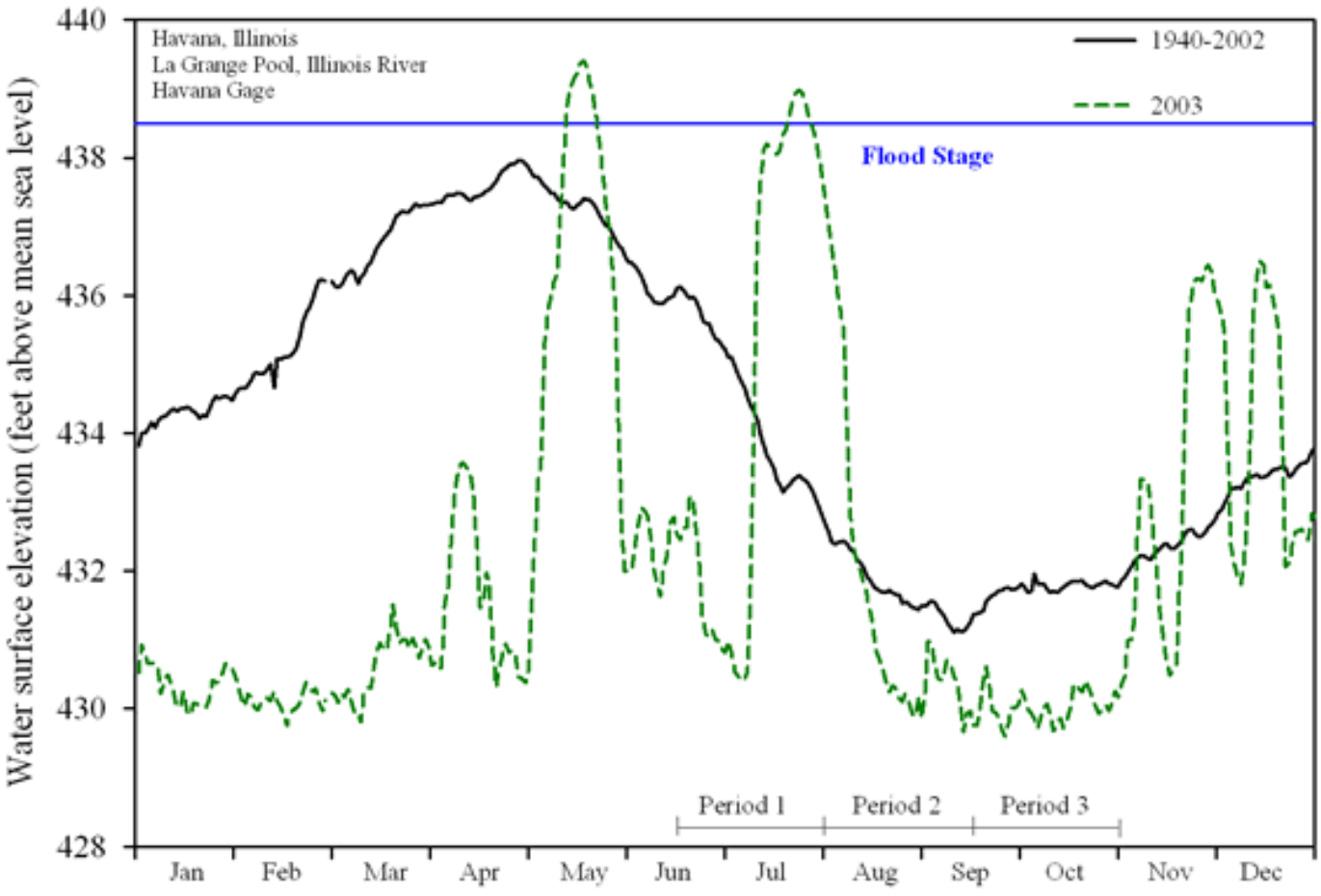

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**Table 3.6** Total catches, by gear type, of fish collected in La Grange Pool of the Illinois River during 2003. See Table 2.6 for the list of sampling gears actually deployed in this study reach.

| Species | Common name | Scientific name | D | F | M | HS | HL | T | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Spotted gar | *Lepisosteus oculatus* | 6 | 1 | 7 | - | - | - | 14 |
| 2 | Longnose gar | *L. osseus* | 12 | - | 1 | - | - | - | 13 |
| 3 | Shortnose gar | *L. platostomus* | 55 | 39 | 51 | - | 3 | - | 148 |
| 4 | Bowfin | *Amia calva* | 18 | 16 | - | - | - | - | 34 |
| 5 | Goldeye | *Hiodon alosoides* | 1 | - | - | - | - | - | 1 |
| 6 | Skipjack herring | *Alosa chrysochloris* | 106 | 4 | 3 | - | - | - | 113 |
| 7 | Gizzard shad | *Dorosoma cepedianum* | 5838 | 186 | 3978 | 1 | 16 | 1 | 10020 |
| 8 | Threadfin shad | *D. petenense* | 207 | 9 | 142 | - | - | - | 358 |
| 9 | Central stoneroller | *Campostoma anomalum* | - | - | 15 | - | - | - | 15 |
| 10 | Goldfish | *Carassius auratus* | 24 | - | 1 | - | - | - | 25 |
| 11 | Grass carp | *Ctenopharyngodon idella* | 76 | 2 | 205 | - | 5 | - | 288 |
| 12 | Red shiner | *Cyprinella lutrensis* | 36 | - | 56 | - | - | - | 92 |
| 13 | Common carp | *Cyprinus carpio* | 1233 | 46 | 60 | 199 | 464 | - | 2002 |
| 14 | Carp x goldfish hybrid | *C. carpio x auratus* | 1 | - | - | - | - | - | 1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 15 | Silver carp | *Hypopthalmichthys molitrix* | 162 | 1 | 242 | - | - | 1 | 406 |
| 16 | Bighead carp | *H. nobilis* | 9 | 9 | 287 | - | 11 | - | 316 |
| 17 | Silver chub | *Macrhybopsis storeriana* | 5 | - | 5 | - | - | - | 10 |
| 18 | Golden shiner | *Notemigonus crysoleucas* | 50 | - | 128 | - | - | - | 178 |
| 19 | Emerald shiner | *Notropis atherinoides* | 872 | - | 9006 | - | - | - | 9878 |
| 20 | River shiner | *N. blennius* | 5 | - | 17 | - | - | - | 22 |
| 21 | Spottail shiner | *N. hudsonius* | 5 | - | 13 | - | - | - | 18 |
| 22 | Silverband shiner | *N. shumardi* | 12 | - | 80 | - | - | - | 92 |
| 23 | Sand shiner | *N. stramineus* | - | - | 5 | - | - | - | 5 |
| 24 | Suckermouth minnow | *Phenacobius mirabilis* | - | - | 1 | - | - | - | 1 |
| 25 | Bluntnose minnow | *Pimephales notatus* | - | - | 7 | - | - | - | 7 |
| 26 | Fathead minnow | *P. promelas* | - | - | 3 | - | - | - | 3 |
| 27 | Bullhead minnow | *P. vigilax* | 68 | - | 48 | - | - | - | 116 |
| 28 | Creek chub | *Semotilus atromaculatus* | 1 | - | 3 | - | - | - | 4 |
| 29 | River carpsucker | *Carpiodes carpio* | 91 | 48 | - | - | 7 | - | 146 |
| 30 | Quillback | *C. cyprinus* | 3 | 2 | - | - | - | - | 5 |
| 31 | Highfin carpsucker | *C. velifer* | - | 1 | - | - | - | - | 1 |
| 32 | Smallmouth buffalo | *Ictiobus bubalus* | 492 | 38 | 6 | 24 | 510 | 1 | 1071 |
| 33 | Bigmouth buffalo | *I. cyprinellus* | 460 | 4 | 1 | - | - | 1 | 466 |
| 34 | Black buffalo | *I. niger* | 48 | 1 | - | - | 3 | - | 52 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 35 | Golden redhorse | *Moxostoma erythrurum* | 1 | - | 1 | - | - | - | 2 |
| 36 | Shorthead redhorse | *M. macrolepidotum* | 27 | 24 | - | - | - | - | 51 |
| 37 | Unidentified sucker | Unidentified *Catostomidae* | 121 | - | 384 | - | - | - | 505 |
| 38 | Black bullhead | *Ameiurus melas* | 3 | 9 | 13 | 6 | - | - | 31 |
| 39 | Yellow bullhead | *A. natalis* | 11 | 1 | 2 | - | - | - | 14 |
| 40 | Brown bullhead | *A. nebulosus* | 5 | 5 | 1 | 1 | 1 | - | 13 |
| 41 | Channel catfish | *Ictalurus punctatus* | 381 | 18 | 249 | 317 | 58 | 17 | 1040 |
| 42 | Tadpole madtom | *Noturus gyrinus* | - | - | 1 | - | - | - | 1 |
| 43 | Flathead catfish | *Pylodictis olivaris* | 57 | 1 | 1 | 4 | 14 | - | 77 |
| 44 | Pirate perch | *Aphredoderus sayanus* | 2 | - | - | - | - | - | 2 |
| 45 | Blackstripe topminnow | *Fundulus notatus* | 3 | - | 2 | - | - | - | 5 |
| 46 | Western mosquitofish | *Gambusia affinis* | 61 | - | 92 | - | - | - | 153 |
| 47 | Brook silverside | *Labidesthes sicculus* | 13 | - | 3 | - | - | - | 16 |
| 48 | White perch | *Morone americana* | 4 | 7 | 1 | - | - | - | 12 |
| 49 | White bass | *M. chrysops* | 540 | 548 | 334 | 1 | 31 | - | 1454 |
| 50 | Yellow bass | *M. mississippiensis* | 54 | 23 | 3 | - | - | - | 80 |
| 51 | Striped bass | *M. saxatilis* | 1 | - | - | - | - | - | 1 |
| 52 | Striped x white bass | *M. saxatilis x chrysops* | - | 1 | - | - | - | - | 1 |
| 53 | Green sunfish | *Lepomis cyanellus* | 25 | - | 3 | - | - | - | 28 |
| 54 | Warmouth | *L. gulosus* | 8 | - | 4 | - | - | - | 12 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 55 | Orangespotted sunfish | *L. humilis* | 85 | 1 | 60 | - | - | - | 146 |
| 56 | Bluegill | *L. macrochirus* | 1079 | 63 | 594 | - | - | - | 1736 |
| 57 | Redear sunfish | *L. microlophus* | 6 | - | - | - | - | - | 6 |
| 58 | Green x bluegill sunfish | *L. cyanellus x macrochirus* | 5 | - | 4 | - | - | - | 9 |
| 59 | Smallmouth bass | *Micropterus dolomieu* | 6 | 1 | 1 | - | - | - | 8 |
| 60 | Largemouth bass | *M. salmoides* | 180 | 3 | 14 | - | - | - | 197 |
| 61 | White crappie | *Pomoxis annularis* | 189 | 130 | 996 | - | 4 | - | 1319 |
| 62 | Black crappie | *P. nigromaculatus* | 88 | 194 | 150 | - | 1 | - | 433 |
| 63 | Mud darter | *Etheostoma asprigene* | - | - | 1 | - | - | - | 1 |
| 64 | Johnny darter | *E. nigrum* | 2 | - | 1 | - | - | - | 3 |
| 65 | Logperch | *Percina caprodes* | 3 | - | 3 | - | - | - | 6 |
| 66 | Sauger | *Stizostedion canadense* | 17 | - | 1 | - | 4 | - | 22 |
| 67 | Walleye | *S. vitreum* | 1 | - | - | - | 1 | - | 2 |
| 68 | Freshwater drum | *Aplodinotus grunniens* | 908 | 105 | 433 | 13 | 36 | 19 | 1514 |
| | | | **13782** | **1541** | **17723** | **566** | **1169** | **40** | **34821** |

**Sampling gears:**
**D - Day electrofishing**
**F - Fyke netting**
**M - Mini fyke netting**
**HS - Small hoop netting**
**HL - Large hoop netting**

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# La Grange Pool Tables

| Table* | Stratified Random Sampling |
|---|---|
| 4.6 | Mean catch-per-unit-effort for fish collected by day electrofishing |
| 6.6 | Mean catch-per-unit-effort for fish collected by fyke netting |
| 8.6 | Mean catch-per-unit-effort for fish collected by mini fyke netting |
| 10.6 | Mean catch-per-unit-effort for fish collected by small hoop netting |
| 11.6 | Mean catch-per-unit-effort for fish collected by large hoop netting |
| | **Fixed-site Sampling** |
| 14.6 | Mean catch-per-unit-effort for fish collected by day electrofishing |
| 16.6 | Mean catch-per-unit-effort for fish collected by fyke netting |
| 17.6 | Mean catch-per-unit-effort for fish collected by mini fyke netting |
| 18.6 | Mean catch-per-unit-effort for fish collected by small hoop netting |
| 19.6 | Mean catch-per-unit-effort for fish collected by large hoop netting |
| 21.6 | Mean catch-per-unit-effort for fish collected by bottom trawling |

*Table numbers are not always in sequence because some gears were not fished in some study areas. Table numbers for each gear type are consistent among study areas.

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**Table 4.6** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in La Grange Pool of the Illinois River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.6). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | MCBU | SCB |
|---|---|---|---|---|
| **Spotted gar** | 0.04 | 0.14 | | 0.03 |
| | (0.02) | (0.09) | | (0.03) |
| **Longnose gar** | 0.12 | | 0.17 | 0.03 |
| | (0.06) | | (0.08) | (0.03) |
| **Shortnose gar** | 0.31 | 0.76 | 0.14 | 0.44 |
| | (0.09) | (0.29) | (0.06) | (0.21) |
| **Bowfin** | 0.12 | 0.46 | | 0.03 |
| | (0.04) | (0.16) | | (0.03) |
| **Goldeye** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **Skipjack herring** | 0.93 | 0.08 | 1.25 | 0.75 |
| | (0.21) | (0.05) | (0.30) | (0.18) |
| **Gizzard shad** | 48.99 | 37.35 | 52.86 | 55.61 |

| | | | | |
|---|---|---|---|---|
| | (9.06) | (11.44) | (12.32) | (9.86) |
| **Threadfin shad** | 1.39 | 1.70 | 1.22 | 2.11 |
| | (0.25) | (0.55) | (0.30) | (0.49) |
| **Goldfish** | 0.20 | 0.16 | 0.22 | 0.17 |
| | (0.10) | (0.06) | (0.14) | (0.07) |
| **Grass carp** | 0.31 | 0.70 | 0.11 | 1.06 |
| | (0.08) | (0.29) | (0.05) | (0.39) |
| **Red shiner** | 0.13 | 0.32 | 0.06 | 0.28 |
| | (0.04) | (0.10) | (0.04) | (0.14) |
| **Common carp** | 7.31 | 14.32 | 4.42 | 11.95 |
| | (0.95) | (1.95) | (1.14) | (2.46) |
| **Carp x goldfish hybrid** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **Silver carp** | 1.11 | 2.81 | 0.50 | 0.77 |
| | (0.38) | (1.40) | (0.19) | (0.21) |
| **Bighead carp** | 0.03 | 0.11 | | 0.14 |
| | (0.01) | (0.05) | | (0.11) |
| **Silver chub** | 0.06 | | 0.08 | 0.03 |
| | (0.06) | | (0.08) | (0.03) |
| **Golden shiner** | 0.36 | 1.24 | 0.06 | 0.03 |
| | (0.22) | (0.85) | (0.04) | (0.03) |
| **Emerald shiner** | 6.89 | 2.38 | 8.58 | 6.47 |
| | (1.27) | (1.62) | (1.72) | (2.13) |

| | | | | |
|---|---|---|---|---|
| **River shiner** | 0.02 | | 0.03 | 0.11 |
| | (0.02) | | (0.03) | (0.09) |
| **Spottail shiner** | 0.06 | 0.08 | 0.06 | |
| | (0.03) | (0.06) | (0.04) | |
| **Silverband shiner** | 0.20 | 0.03 | 0.28 | 0.03 |
| | (0.16) | (0.03) | (0.22) | (0.03) |
| **Bullhead minnow** | 0.48 | 1.54 | 0.11 | 0.19 |
| | (0.20) | (0.74) | (0.07) | (0.07) |
| **Creek chub** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **River carpsucker** | 0.66 | 1.16 | 0.50 | 0.36 |
| | (0.13) | (0.30) | (0.15) | (0.14) |
| **Quillback** | 0.03 | 0.05 | 0.03 | |
| | (0.02) | (0.05) | (0.03) | |
| **Smallmouth buffalo** | 2.70 | 5.54 | 1.58 | 3.69 |
| | (0.50) | (0.90) | (0.64) | (0.89) |
| **Bigmouth buffalo** | 2.37 | 8.00 | 0.28 | 2.42 |
| | (0.59) | (2.24) | (0.16) | (0.88) |
| **Black buffalo** | 0.16 | 0.51 | | 0.64 |
| | (0.07) | (0.26) | | (0.21) |
| **Golden redhorse** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **Shorthead redhorse** | 0.24 | 0.46 | 0.17 | 0.06 |

| | | | | |
|---|---|---|---|---|
| | (0.08) | (0.16) | (0.09) | (0.04) |
| **Unidentified sucker** | 0.86 | 3.00 | 0.11 | 0.17 |
| | (0.46) | (1.77) | (0.05) | (0.09) |
| **Black bullhead** | 0.02 | 0.05 | | 0.03 |
| | (0.01) | (0.04) | | (0.03) |
| **Yellow bullhead** | 0.07 | 0.27 | | 0.03 |
| | (0.03) | (0.13) | | (0.03) |
| **Brown bullhead** | 0.03 | 0.11 | | 0.03 |
| | (0.02) | (0.06) | | (0.03) |
| **Channel catfish** | 3.55 | 4.27 | 3.39 | 2.00 |
| | (0.42) | (0.71) | (0.55) | (0.40) |
| **Flathead catfish** | 0.39 | 0.38 | 0.39 | 0.39 |
| | (0.11) | (0.13) | (0.15) | (0.12) |
| **Pirate perch** | 0.01 | 0.05 | | |
| | (0.01) | (0.04) | | |
| **Blackstripe topminnow** | 0.03 | 0.05 | 0.03 | |
| | (0.02) | (0.04) | (0.03) | |
| **Western mosquitofish** | 0.33 | 0.81 | 0.14 | 0.53 |
| | (0.17) | (0.62) | (0.09) | (0.32) |
| **Brook silverside** | 0.09 | 0.27 | 0.03 | 0.03 |
| | (0.04) | (0.15) | (0.03) | (0.03) |
| **White perch** | 0.03 | 0.03 | 0.03 | |
| | (0.02) | (0.03) | (0.03) | |

| | | | | |
|---|---|---|---|---|
| **White bass** | 2.35 | 2.24 | 2.36 | 2.80 |
| | (0.36) | (0.59) | (0.47) | (0.39) |
| **Yellow bass** | 0.23 | 0.65 | 0.08 | 0.08 |
| | (0.08) | (0.29) | (0.05) | (0.05) |
| **Green sunfish** | 0.15 | 0.59 | | 0.03 |
| | (0.06) | (0.22) | | (0.03) |
| **Warmouth** | 0.04 | 0.16 | | 0.03 |
| | (0.02) | (0.08) | | (0.03) |
| **Orangespotted sunfish** | 0.57 | 2.03 | 0.06 | 0.19 |
| | (0.14) | (0.54) | (0.06) | (0.08) |
| **Bluegill** | 6.42 | 21.65 | 1.11 | 1.42 |
| | (1.23) | (4.54) | (0.58) | (0.38) |
| **Redear sunfish** | 0.05 | 0.11 | 0.03 | |
| | (0.03) | (0.08) | (0.03) | |
| **Green x bluegill sunfish** | 0.01 | | | 0.11 |
| | (0.00) | | | (0.05) |
| **Smallmouth bass** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **Largemouth bass** | 1.24 | 4.35 | 0.17 | 0.14 |
| | (0.37) | (1.43) | (0.09) | (0.07) |
| **White crappie** | 0.73 | 2.51 | 0.08 | 0.56 |
| | (0.14) | (0.52) | (0.06) | (0.14) |
| **Black crappie** | 0.44 | 1.59 | 0.03 | 0.22 |

| | | | | |
|---|---|---|---|---|
| | (0.10) | (0.37) | (0.03) | (0.08) |
| **Johnny darter** | 0.01 | 0.05 | | |
| | (0.01) | (0.04) | | |
| **Logperch** | 0.02 | 0.08 | | |
| | (0.02) | (0.08) | | |
| **Sauger** | 0.14 | 0.05 | 0.17 | 0.14 |
| | (0.06) | (0.04) | (0.08) | (0.07) |
| **Freshwater drum** | 8.25 | 14.35 | 6.31 | 3.50 |
| | (1.24) | (3.22) | (1.32) | (0.77) |

**Sampling strata:**
**BWCS - Backwater, contiguous, shoreline**
**MCBU - Main channel border, unstructured**
**SCB - Side channel border**

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**Table 6.6** Mean catch-per-unit-effort and (standard error) for fish collected by fyke netting in La Grange Pool of the Illinois River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.6). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS |
|---|---|---|
| **Spotted gar** | 0.04 | 0.04 |
| | (0.04) | (0.04) |
| **Shortnose gar** | 0.82 | 0.82 |
| | (0.26) | (0.26) |
| **Bowfin** | 0.48 | 0.48 |
| | (0.29) | (0.29) |
| **Gizzard shad** | 2.76 | 2.76 |
| | (1.37) | (1.37) |
| **Threadfin shad** | 0.11 | 0.11 |
| | (0.11) | (0.11) |
| **Grass carp** | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| **Common carp** | 1.43 | 1.43 |

| | | |
|---|---|---|
| | (0.33) | (0.33) |
| **Silver carp** | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| **Bighead carp** | 0.14 | 0.14 |
| | (0.08) | (0.08) |
| **River carpsucker** | 1.53 | 1.53 |
| | (0.43) | (0.43) |
| **Quillback** | 0.07 | 0.07 |
| | (0.07) | (0.07) |
| **Highfin carpsucker** | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| **Smallmouth buffalo** | 1.25 | 1.25 |
| | (0.39) | (0.39) |
| **Bigmouth buffalo** | 0.13 | 0.13 |
| | (0.09) | (0.09) |
| **Black buffalo** | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| **Shorthead redhorse** | 0.54 | 0.54 |
| | (0.18) | (0.18) |
| **Black bullhead** | 0.31 | 0.31 |
| | (0.18) | (0.18) |
| **Yellow bullhead** | 0.03 | 0.03 |
| | (0.03) | (0.03) |

| | | |
|---|---|---|
| **Brown bullhead** | 0.18 | 0.18 |
| | (0.13) | (0.13) |
| **Channel catfish** | 0.45 | 0.45 |
| | (0.18) | (0.18) |
| **Flathead catfish** | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| **White perch** | 0.16 | 0.16 |
| | (0.09) | (0.09) |
| **White bass** | 13.29 | 13.29 |
| | (8.92) | (8.96) |
| **Yellow bass** | 0.70 | 0.70 |
| | (0.29) | (0.29) |
| **Orangespotted sunfish** | 0.03 | 0.03 |
| | (0.03) | (0.03) |
| **Bluegill** | 1.37 | 1.37 |
| | (0.34) | (0.35) |
| **Largemouth bass** | 0.10 | 0.10 |
| | (0.06) | (0.06) |
| **White crappie** | 3.30 | 3.30 |
| | (0.95) | (0.95) |
| **Black crappie** | 4.89 | 4.89 |
| | (1.35) | (1.36) |
| **Freshwater drum** | 2.17 | 2.17 |

| | | |
|---|---|---|
| | (0.60) | (0.60) |

**Sampling stratum:**
**BWCS - Backwater, contiguous, shoreline**

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**Table 8.6** Mean catch-per-unit-effort and (standard error) for fish collected by mini fyke netting in La Grange Pool of the Illinois River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.6). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | BWCS | MCBU | SCB |
|---|---|---|---|---|
| **Spotted gar** | 0.05 | 0.20 | | |
| | (0.03) | (0.11) | | |
| **Shortnose gar** | 0.42 | 0.74 | 0.33 | |
| | (0.13) | (0.41) | (0.11) | |
| **Skipjack herring** | 0.03 | | 0.04 | |
| | (0.03) | | (0.04) | |
| **Gizzard shad** | 37.72 | 1.73 | 45.73 | 118.95 |
| | (13.23) | (0.59) | (17.58) | (112.21) |
| **Threadfin shad** | 1.07 | 0.59 | 1.27 | 0.84 |
| | (0.34) | (0.22) | (0.48) | (0.47) |
| **Central stoneroller** | 0.44 | | 0.63 | |
| | (0.26) | | (0.37) | |
| **Goldfish** | 0.01 | 0.04 | | |

| | | | | |
|---|---|---|---|---|
| | (0.01) | (0.04) | | |
| **Grass carp** | 1.58 | 4.67 | 0.51 | 0.35 |
| | (1.15) | (4.34) | (0.38) | (0.35) |
| **Red shiner** | 0.95 | 0.07 | 1.33 | 0.22 |
| | (0.49) | (0.05) | (0.70) | (0.17) |
| **Common carp** | 0.69 | 1.30 | 0.50 | 0.28 |
| | (0.24) | (0.78) | (0.19) | (0.14) |
| **Silver carp** | 0.80 | 2.82 | 0.09 | 0.34 |
| | (0.52) | (2.03) | (0.06) | (0.24) |
| **Bighead carp** | 3.11 | 9.59 | 0.91 | |
| | (2.15) | (8.02) | (0.91) | |
| **Silver chub** | 0.08 | 0.10 | 0.08 | |
| | (0.05) | (0.10) | (0.05) | |
| **Golden shiner** | 3.01 | 0.54 | 4.12 | 0.11 |
| | (1.49) | (0.37) | (2.14) | (0.08) |
| **Emerald shiner** | 118.75 | 1.41 | 169.55 | 5.74 |
| | (73.53) | (0.57) | (105.68) | (3.68) |
| **River shiner** | 0.49 | | 0.70 | |
| | (0.35) | | (0.50) | |
| **Spottail shiner** | 0.24 | 0.03 | 0.33 | |
| | (0.13) | (0.03) | (0.18) | |
| **Silverband shiner** | 1.72 | 0.04 | 2.43 | 0.22 |
| | (0.80) | (0.04) | (1.15) | (0.22) |

| | | | | |
|---|---|---|---|---|
| **Sand shiner** | 0.06 | | 0.08 | |
| | (0.04) | | (0.06) | |
| **Bluntnose minnow** | 0.18 | 0.03 | 0.24 | |
| | (0.07) | (0.03) | (0.10) | |
| **Fathead minnow** | 0.09 | | 0.12 | |
| | (0.09) | | (0.12) | |
| **Bullhead minnow** | 0.49 | 0.55 | 0.49 | 0.17 |
| | (0.17) | (0.19) | (0.24) | (0.09) |
| **Creek chub** | 0.05 | 0.07 | 0.04 | |
| | (0.03) | (0.05) | (0.04) | |
| **Smallmouth buffalo** | 0.08 | | 0.12 | |
| | (0.06) | | (0.09) | |
| **Golden redhorse** | 0.03 | | 0.04 | |
| | (0.03) | | (0.04) | |
| **Unidentified sucker** | 4.52 | 2.03 | 5.61 | 1.84 |
| | (2.06) | (1.25) | (2.93) | (0.94) |
| **Black bullhead** | 0.17 | 0.17 | 0.17 | 0.23 |
| | (0.07) | (0.09) | (0.10) | (0.18) |
| **Yellow bullhead** | 0.02 | 0.07 | | |
| | (0.01) | (0.05) | | |
| **Brown bullhead** | 0.03 | | 0.04 | |
| | (0.03) | | (0.04) | |

| | | | | |
|---|---|---|---|---|
| **Channel catfish** | 4.56 | 0.46 | 6.22 | 2.36 |
| | (1.28) | (0.14) | (1.84) | (0.76) |
| **Tadpole madtom** | 0.00 | | | 0.06 |
| | (0.00) | | | (0.06) |
| **Flathead catfish** | 0.00 | | | 0.05 |
| | (0.00) | | | (0.05) |
| **Blackstripe topminnow** | 0.03 | | 0.04 | |
| | (0.03) | | (0.04) | |
| **Western mosquitofish** | 1.37 | 1.84 | 1.28 | |
| | (0.54) | (1.27) | (0.61) | |
| **Brook silverside** | 0.05 | | 0.08 | |
| | (0.04) | | (0.05) | |
| **White bass** | 5.70 | 0.31 | 7.85 | 3.26 |
| | (1.58) | (0.17) | (2.27) | (1.08) |
| **Yellow bass** | 0.03 | | 0.04 | 0.05 |
| | (0.03) | | (0.04) | (0.05) |
| **Green sunfish** | 0.04 | 0.04 | 0.04 | |
| | (0.03) | (0.04) | (0.04) | |
| **Warmouth** | 0.03 | 0.10 | | 0.06 |
| | (0.02) | (0.07) | | (0.06) |
| **Orangespotted sunfish** | 0.67 | 1.53 | 0.39 | 0.11 |

| | | | | |
|---|---|---|---|---|
| | (0.29) | (0.96) | (0.22) | (0.07) |
| **Bluegill** | 5.65 | 10.03 | 3.72 | 10.36 |
| | (1.58) | (3.83) | (1.69) | (8.09) |
| **Green x bluegill sunfish** | 0.05 | | 0.08 | |
| | (0.05) | | (0.08) | |
| **Smallmouth bass** | 0.03 | | 0.04 | |
| | (0.03) | | (0.04) | |
| **Largemouth bass** | 0.28 | 0.18 | 0.34 | |
| | (0.11) | (0.13) | (0.15) | |
| **White crappie** | 15.23 | 3.62 | 19.40 | 17.27 |
| | (8.40) | (0.99) | (12.06) | (8.17) |
| **Black crappie** | 1.19 | 1.25 | 1.10 | 2.21 |
| | (0.31) | (0.35) | (0.42) | (0.96) |
| **Mud darter** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **Johnny darter** | 0.01 | 0.03 | | |
| | (0.01) | (0.03) | | |
| **Logperch** | 0.06 | | 0.09 | |
| | (0.06) | | (0.09) | |
| **Sauger** | 0.03 | | 0.04 | |
| | (0.03) | | (0.04) | |
| **Freshwater drum** | 7.20 | 4.79 | 8.33 | 3.54 |

| | | | | |
|---|---|---|---|---|
| | (1.74) | (3.48) | (2.15) | (1.74) |

**Sampling stratum:**
**BWCS - Backwater, contiguous, shoreline**
**MCBU - Main channel border, unstructured**
**SCB - Side channel border**

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**Table 10.6** Mean catch-per-unit-effort and (standard error) for fish collected by small hoop netting in La Grange Pool of the Illinois River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.6). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | SCB |
|---|---|---|---|
| **Gizzard shad** | 0.02 | 0.02 | |
| | (0.02) | (0.02) | |
| **Common carp** | 1.95 | 2.06 | 0.28 |
| | (0.52) | (0.56) | (0.12) |
| **Smallmouth buffalo** | 0.22 | 0.23 | |
| | (0.10) | (0.10) | |
| **Channel catfish** | 5.10 | 5.34 | 1.51 |
| | (1.89) | (2.01) | (1.28) |
| **Flathead catfish** | 0.06 | 0.06 | |
| | (0.03) | (0.03) | |
| **White bass** | 0.00 | | 0.03 |
| | (0.00) | | (0.03) |
| **Freshwater drum** | 0.03 | 0.02 | 0.22 |

| | | | |
|---|---|---|---|
| | (0.02) | (0.02) | (0.12) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**SCB - Side channel border**

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**Table 11.6** Mean catch-per-unit-effort and (standard error) for fish collected by large hoop netting in La Grange Pool of the Illinois River using stratified random sampling during 2003. The statistics under ALL pertain to unbiased means over all strata sampled by this gear (as indicated by nonmissing entries below and by Table 2.6). See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | ALL | MCBU | SCB |
|---|---|---|---|
| **Shortnose gar** | 0.04 | 0.04 | 0.03 |
| | (0.04) | (0.04) | (0.03) |
| **Gizzard shad** | 0.06 | 0.06 | 0.08 |
| | (0.03) | (0.03) | (0.08) |
| **Grass carp** | 0.06 | 0.06 | 0.06 |
| | (0.04) | (0.05) | (0.04) |
| **Common carp** | 2.81 | 2.65 | 5.35 |
| | (0.82) | (0.87) | (1.55) |
| **Bighead carp** | 0.11 | 0.10 | 0.17 |
| | (0.05) | (0.05) | (0.08) |
| **River carpsucker** | 0.06 | 0.06 | 0.03 |
| | (0.04) | (0.05) | (0.03) |
| **Smallmouth buffalo** | 4.39 | 4.42 | 3.93 |

| | | | |
|---|---|---|---|
| | (0.98) | (1.04) | (1.63) |
| **Black buffalo** | 0.02 | 0.02 | 0.03 |
| | (0.02) | (0.02) | (0.03) |
| **Brown bullhead** | 0.02 | 0.02 | |
| | (0.02) | (0.02) | |
| **Channel catfish** | 0.71 | 0.73 | 0.49 |
| | (0.20) | (0.22) | (0.22) |
| **Flathead catfish** | 0.10 | 0.10 | 0.06 |
| | (0.05) | (0.05) | (0.04) |
| **White bass** | 0.03 | 0.02 | 0.12 |
| | (0.02) | (0.02) | (0.09) |
| **Sauger** | 0.00 | | 0.03 |
| | (0.00) | | (0.03) |
| **Freshwater drum** | 0.42 | 0.44 | 0.06 |
| | (0.23) | (0.25) | (0.04) |

**Sampling strata:**
**MCBU - Main channel border, unstructured**
**SCB - Side channel border**

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**Table 14.6** Mean catch-per-unit-effort and (standard error) for fish collected by day electrofishing in La Grange Pool of the Illinois River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | SCB | TWZ |
|---|---|---|
| **Longnose gar** | 0.67 | 0.17 |
| | (0.33) | (0.17) |
| **Shortnose gar** | 0.33 | 0.67 |
| | (0.33) | (0.49) |
| **Skipjack herring** | 2.67 | 2.50 |
| | (1.50) | (1.34) |
| **Gizzard shad** | 40.17 | 50.50 |
| | (10.23) | (20.07) |
| **Threadfin shad** | 1.00 | 3.00 |
| | (0.52) | (1.55) |
| **Goldfish** | 0.00 | 0.67 |
| | (0.00) | (0.42) |
| **Grass carp** | 0.67 | 0.67 |
| | (0.33) | (0.42) |

| | | |
|---|---|---|
| **Red shiner** | 2.00 | 0.00 |
| | (1.03) | (0.00) |
| **Common carp** | 9.33 | 9.50 |
| | (2.25) | (2.16) |
| **Silver carp** | 1.50 | 0.50 |
| | (0.56) | (0.22) |
| **Silver chub** | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| **Golden shiner** | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| **Emerald shiner** | 16.33 | 24.00 |
| | (10.71) | (19.93) |
| **River carpsucker** | 0.83 | 2.00 |
| | (0.54) | (0.52) |
| **Smallmouth buffalo** | 3.17 | 13.00 |
| | (1.30) | (4.66) |
| **Bigmouth buffalo** | 8.00 | 3.17 |
| | (3.21) | (1.33) |
| **Black buffalo** | 0.67 | 0.33 |
| | (0.33) | (0.21) |
| **Shorthead redhorse** | 0.00 | 0.33 |
| | (0.00) | (0.33) |
| **Channel catfish** | 1.17 | 3.67 |

| | | |
|---|---|---|
| | (0.31) | (1.61) |
| **Flathead catfish** | 1.00 | 1.50 |
| | (0.45) | (0.62) |
| **Western mosquitofish** | 1.17 | 0.00 |
| | (0.54) | (0.00) |
| **Brook silverside** | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| **White perch** | 0.00 | 0.33 |
| | (0.00) | (0.21) |
| **White bass** | 3.33 | 41.83 |
| | (0.95) | (9.05) |
| **Yellow bass** | 0.00 | 4.00 |
| | (0.00) | (1.71) |
| **Striped bass** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Green sunfish** | 0.00 | 0.33 |
| | (0.00) | (0.33) |
| **Warmouth** | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| **Orangespotted sunfish** | 0.17 | 0.00 |
| | (0.17) | (0.00) |
| **Bluegill** | 4.67 | 26.50 |

| | | |
|---|---|---|
| | (1.78) | (9.54) |
| **Redear sunfish** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Green x bluegill sunfish** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Smallmouth bass** | 0.00 | 0.83 |
| | (0.00) | (0.31) |
| **Largemouth bass** | 0.33 | 1.00 |
| | (0.21) | (0.45) |
| **White crappie** | 2.33 | 9.83 |
| | (0.92) | (2.41) |
| **Black crappie** | 1.33 | 2.00 |
| | (0.61) | (0.77) |
| **Sauger** | 0.00 | 0.67 |
| | (0.00) | (0.42) |
| **Walleye** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Freshwater drum** | 2.00 | 2.00 |
| | (0.73) | (0.45) |

**Sampling strata:**
**SCB - Side channel border**
**TWZ - Tailwater**

**Table 16.6** Mean catch-per-unit-effort and (standard error) for fish collected by fyke netting in La Grange Pool of the Illinois River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | TWZ |
|---|---|
| **Shortnose gar** | 2.57 |
| | (1.26) |
| **Bowfin** | 0.35 |
| | (0.22) |
| **Skipjack herring** | 0.68 |
| | (0.34) |
| **Gizzard shad** | 16.52 |
| | (8.42) |
| **Threadfin shad** | 1.03 |
| | (0.85) |
| **Grass carp** | 0.18 |
| | (0.18) |
| **Common carp** | 0.70 |
| | (0.53) |

| | |
|---|---|
| **Bighead carp** | 0.86 |
| | (0.86) |
| **River carpsucker** | 0.52 |
| | (0.52) |
| **Smallmouth buffalo** | 0.18 |
| | (0.18) |
| **Shorthead redhorse** | 1.37 |
| | (0.78) |
| **Channel catfish** | 0.86 |
| | (0.56) |
| **White perch** | 0.33 |
| | (0.21) |
| **White bass** | 23.27 |
| | (8.99) |
| **Yellow bass** | 0.35 |
| | (0.22) |
| **Striped x white bass** | 0.17 |
| | (0.17) |
| **Bluegill** | 3.94 |
| | (1.58) |
| **Smallmouth bass** | 0.17 |
| | (0.17) |
| **White crappie** | 5.23 |

| | |
|---|---|
| | (1.99) |
| **Black crappie** | 8.54 |
| | (4.90) |
| **Freshwater drum** | 6.99 |
| | (4.28) |

**Sampling stratum:**
**TWZ - Tailwater**

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**Table 17.6** Mean catch-per-unit-effort and (standard error) for fish collected by mini fyke netting in La Grange Pool of the Illinois River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | SCB | TWZ |
|---|---|---|
| **Spotted gar** | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| **Longnose gar** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **Shortnose gar** | 0.20 | 3.38 |
| | (0.20) | (2.27) |
| **Skipjack herring** | 0.00 | 0.33 |
| | (0.00) | (0.33) |
| **Gizzard shad** | 124.18 | 26.86 |
| | (86.07) | (20.09) |
| **Threadfin shad** | 15.72 | 0.31 |
| | (14.51) | (0.31) |
| **Grass carp** | 11.37 | 0.00 |
| | (11.37) | (0.00) |

| | | |
|---|---|---|
| **Red shiner** | 2.17 | 0.17 |
| | (1.68) | (0.17) |
| **Common carp** | 0.84 | 0.55 |
| | (0.84) | (0.55) |
| **Silver carp** | 32.21 | 0.00 |
| | (32.21) | (0.00) |
| **Bighead carp** | 0.42 | 0.00 |
| | (0.42) | (0.00) |
| **Golden shiner** | 1.47 | 0.00 |
| | (1.23) | (0.00) |
| **Emerald shiner** | 34.52 | 739.85 |
| | (18.68) | (691.36) |
| **Spottail shiner** | 0.00 | 0.70 |
| | (0.00) | (0.36) |
| **Silverband shiner** | 0.00 | 2.66 |
| | (0.00) | (2.45) |
| **Sand shiner** | 0.39 | 0.18 |
| | (0.39) | (0.18) |
| **Suckermouth minnow** | 0.20 | 0.00 |
| | (0.20) | (0.00) |
| **Bullhead minnow** | 0.20 | 2.17 |
| | (0.20) | (1.76) |
| **Smallmouth buffalo** | 0.63 | 0.00 |

| | | |
|---|---|---|
| | (0.63) | (0.00) |
| **Bigmouth buffalo** | 0.21 | 0.00 |
| | (0.21) | (0.00) |
| **Unidentified sucker** | 27.05 | 4.66 |
| | (22.36) | (4.23) |
| **Channel catfish** | 4.06 | 0.87 |
| | (1.74) | (0.49) |
| **Blackstripe topminnow** | 0.20 | 0.00 |
| | (0.20) | (0.00) |
| **Western mosquitofish** | 0.81 | 0.00 |
| | (0.59) | (0.00) |
| **Brook silverside** | 0.21 | 0.00 |
| | (0.21) | (0.00) |
| **White perch** | 0.00 | 0.17 |
| | (0.00) | (0.17) |
| **White bass** | 5.67 | 7.26 |
| | (2.31) | (3.28) |
| **Yellow bass** | 0.00 | 0.15 |
| | (0.00) | (0.15) |
| **Green sunfish** | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| **Orangespotted sunfish** | 0.79 | 0.00 |
| | (0.57) | (0.00) |

| | | |
|---|---|---|
| **Bluegill** | 3.12 | 2.69 |
| | (2.41) | (1.08) |
| **Green x bluegill sunfish** | 0.00 | 0.37 |
| | (0.00) | (0.37) |
| **Largemouth bass** | 0.20 | 0.00 |
| | (0.20) | (0.00) |
| **White crappie** | 23.06 | 1.99 |
| | (18.54) | (0.55) |
| **Black crappie** | 9.04 | 0.84 |
| | (8.79) | (0.65) |
| **Logperch** | 0.00 | 0.18 |
| | (0.00) | (0.18) |
| **Freshwater drum** | 2.67 | 2.73 |
| | (1.29) | (0.86) |

**Sampling strata:**
**SCB - Side channel border**
**TWZ - Tailwater**

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**Table 18.6** Mean catch-per-unit-effort and (standard error) for fish collected by small hoop netting in La Grange Pool of the Illinois River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | SCB | TWZ |
|---|---|---|
| **Common carp** | 0.44 | 7.21 |
| | (0.35) | (2.77) |
| **Smallmouth buffalo** | 0.00 | 1.09 |
| | (0.00) | (0.65) |
| **Black bullhead** | 0.00 | 0.50 |
| | (0.00) | (0.50) |
| **Brown bullhead** | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| **Channel catfish** | 0.00 | 1.00 |
| | (0.00) | (0.90) |
| **Flathead catfish** | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| **Freshwater drum** | 0.00 | 0.33 |
| | (0.00) | (0.16) |

**Sampling strata:**
**SCB - Side channel border**
**TWZ - Tailwater**

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**Table 19.6** Mean catch-per-unit-effort and (standard error) for fish collected by large hoop netting in La Grange Pool of the Illinois River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | SCB | TWZ |
|---|---|---|
| **Gizzard shad** | 0.00 | 0.82 |
| | (0.00) | (0.58) |
| **Common carp** | 2.34 | 9.95 |
| | (0.59) | (5.22) |
| **River carpsucker** | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| **Smallmouth buffalo** | 2.57 | 10.87 |
| | (1.09) | (7.55) |
| **Black buffalo** | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| **Channel catfish** | 0.09 | 0.41 |
| | (0.09) | (0.27) |
| **Flathead catfish** | 0.17 | 0.42 |
| | (0.11) | (0.21) |

| | | |
|---|---|---|
| **White bass** | 0.00 | 2.12 |
| | (0.00) | (2.12) |
| **White crappie** | 0.00 | 0.33 |
| | (0.00) | (0.33) |
| **Black crappie** | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| **Sauger** | 0.00 | 0.25 |
| | (0.00) | (0.25) |
| **Walleye** | 0.00 | 0.08 |
| | (0.00) | (0.08) |
| **Freshwater drum** | 0.17 | 0.92 |
| | (0.11) | (0.33) |

**Sampling strata:**
**SCB - Side channel border**
**TWZ - Tailwater**

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**Table 21.6** Mean catch-per-unit-effort and (standard error) for fish collected by bottom trawling in La Grange Pool of the Illinois River using fixed-site sampling during 2003. See Methods for definitions of catch-per-unit-effort and standard error. Scientific names for the species listed can be found in Table 1.

| Common name | TWZ |
|---|---|
| **Gizzard shad** | 0.17 |
| | (0.17) |
| **Silver carp** | 0.17 |
| | (0.17) |
| **Smallmouth buffalo** | 0.17 |
| | (0.17) |
| **Bigmouth buffalo** | 0.17 |
| | (0.17) |
| **Channel catfish** | 2.83 |
| | (1.35) |
| **Freshwater drum** | 3.17 |
| | (2.41) |

**Sampling stratum:**
**SCB - Side channel border**

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