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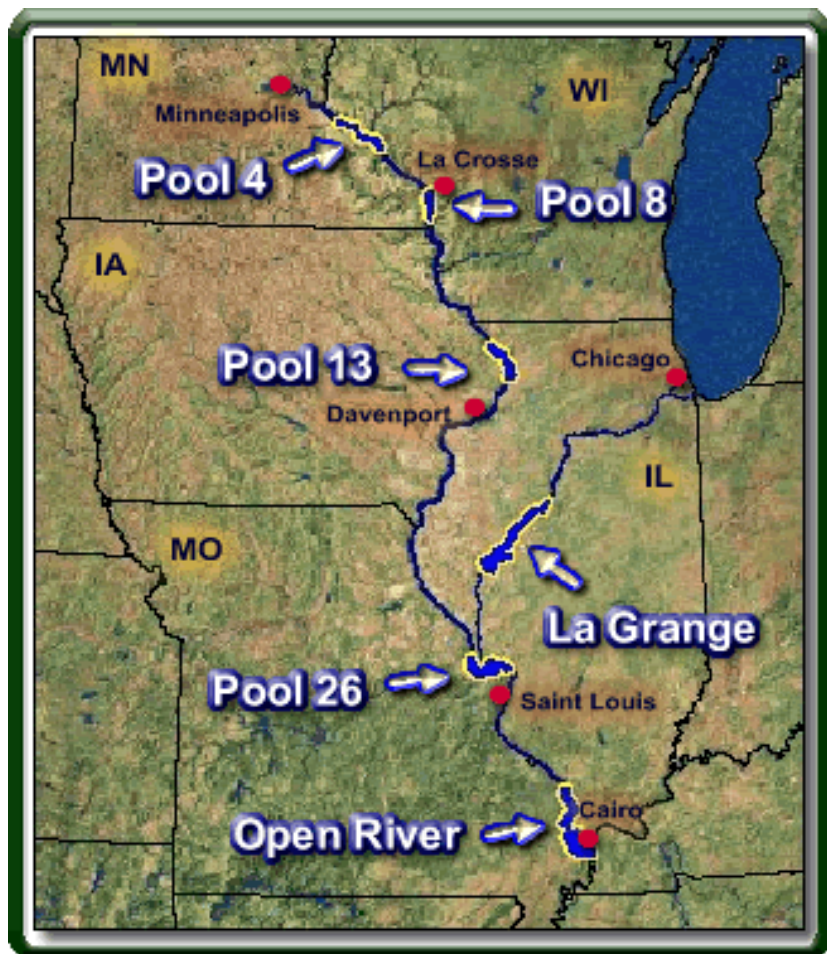
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2005 Annual Status Report: A Summary of Fish Data in Six Reaches of the Upper Mississippi River System

Andy Bartels, Melvin C. Bowler, Steve DeLain, Eric J. Gittinger, David P. Herzog, Kevin S. Irons, Kevin Mauel, Timothy M. O'Hara, Eric Ratcliff, and Joseph Ridings

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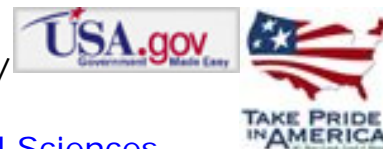
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Pool 13, Upper Mississippi River 2005 Fish Collection Summary

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 2005. Information on changes in fish catch over all years can be obtained from the [Graphical Fish Database Browser](#).

- 200 fish collections were conducted using six gear types ([Table 2.3](#)), with 172 from randomly selected sites and 28 from fixed sites.
- Backwater; main channel border, unstructured; and side channel border strata received the most sampling effort ([Table 2.3](#)).
- In 2005, water levels were lower than normal during much of the field season, but were considerably higher than normal during early October. Water levels did not affect sample allocations ([Table 2.3](#); [Figure 1.3](#)).
- 14,188 fish were collected representing 54 species ([Table 3.3](#)).
- The LTRMP species total for Pool 13 before the 2005 season was 85; no new species were collected in the 2005 season ([Table 3.3](#)).

- Seven weed shiners were collected that are listed as endangered in Iowa. Also, fifty-three pugnose minnows 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, fathead minnow, green sunfish, quillback, silver lamprey, and smallmouth bass ([Table 3.3](#)).
 - Mean catch-per-unit-effort and standard error for stratified random sampling and fixed-site sampling for each stratum are shown in [Pool 13 tables](#). Length distributions for selected species of fish are shown in [Figures 1 to 17](#).
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Pool 26, Upper Mississippi River 2005 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 2005. Information on changes in fish catch over all years can be obtained from the [Graphical Fish Database Browser](#).

- 182 fish collections were conducted using six gear types ([Table 2.4](#)), with 174 from randomly selected sites and 8 from a fixed site.
- Backwater; main channel border, unstructured; and side channel border strata received the most sampling effort ([Table 2.4](#)).
- In 2005, water levels did not greatly deviate from normal during most of the field season, and therefore did not affect sample allocations ([Table 2.4](#); [Figure 1.4](#)).
- 15,891 fish were collected representing 54 species and 2 hybrids ([Table 3.4](#)). This total includes 17 unidentified suckers (Catostomidae) less than 90 mm long, 189 unidentified sunfishes (Centrarchidae) less than 30 mm long, and 176 unidentified minnows (Cyprinidae) less than 20 mm long.

- The LTRMP species total for Pool 26 before the 2005 season was 90; no new species were collected in the 2005 season ([Table 3.4](#)).
- No Illinois-listed threatened or endangered species were collected ([Table 3.4](#)).
- Other species that were collected and are noted as uncommon, rare, or probably strays from tributaries (Pitlo et al. 1995) in Pool 26 were blue sucker, golden redhorse, grass carp, logperch, hybrid striped bass, and smallmouth bass ([Table 3.4](#)).
- One white perch was collected in 2005. This is the second specimen of this invasive species collected by the LTRMP in Pool 26.
- Mean catch-per-unit-effort and standard error for stratified random and fixed-site sampling for each stratum are shown in [Pool 26 tables](#). Length distributions for selected species of fish are shown in [Figures 1 to 17](#).

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Open River, Upper Mississippi River 2005 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 2005. Information on changes in fish catch over all years can be obtained from the [Graphical Fish Database Browser](#).

- 136 fish collections were conducted using five gear types ([Table 2.5](#)). Of the 136 collections, 111 were from randomly selected sites. Fifteen collections were from tributary fixed sites and 10 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. Tributary strata received the least amount of sampling effort ([Table 2.5](#)).
- In 2005, water levels were lower than normal during April and early May (typically the peak flood period), but considerably higher than normal during late May and June. Sample allocations were affected by water level in the summer and fall periods as side channel sites and one tributary fixed site were inaccessible ([Table 2.5](#); [Figure 1.5](#)).

- 4,948 fish were collected representing 45 species ([Table 3.5](#)).
- Historically, 129 fish species have been collected from the Open River (Pitlo et al. 1995).
- The LTRMP species total for Open River before the 2005 season was 106. No new species were collected during 2005.
- Species collected that are Missouri-listed species of special concern included Mississippi silvery minnow (1), river darter (1), blue sucker (5), and mooneye (2) ([Table 3.5](#)).
- Two species of Asian carp were collected and included grass carp (2) and silver carp (12). These are two species of Asian carp that were accidentally released into the Mississippi River system.
- Mean catch-per-unit-effort and standard error for stratified random and fixed-site sampling for each stratum are shown in the [Open River tables](#). Length distributions for selected species of fish are shown in [Figures 1 to 17](#).

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La Grange Pool, Illinois River 2005 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 2005. Information on changes in fish catch over all years can be obtained from the [Graphical Fish Database Browser](#).

- 240 fish collections were conducted using six gear types ([Table 2.6](#)).
- Side channel border received the most sampling effort ([Table 2.6](#)).
- In 2005, water levels were lower than normal during April and early May (typically the peak flood period), but considerably higher than normal during late May and June. Water levels did not affect sample allocations. All gear allocations were completed for all sampling periods ([Table 2.6](#); [Figure 1.6](#)).
- 18,327 fish were collected representing 57 species and 4 hybrids ([Table 3.6](#)).
- The first collection of lake sturgeon, spotfin shiner, and green sunfish x redear sunfish hybrid from La Grange Pool occurred in 2005.
- 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 is 89 species and 9 hybrids ([Table 3.6](#)).
- Six nonnative species (and 2 nonnative hybrids) we collected in 2005.
- No Federal or state threatened or endangered species have been collected by LTRMP monitoring in La Grange Pool.
- Mean catch-per-unit-effort and standard error for stratified random and fixed-site sampling for each stratum are shown in [La Grange Pool tables](#). Length distributions for selected species of fish are shown in [Figures 1 to 17](#).

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Acknowledgments

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References

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447–482 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques. 2nd edition. American Fisheries Society, Bethesda, Maryland.

Burkhardt, R. W., and S. Gutreuter. 1995. Improving electrofishing catch consistency by standardizing power.

North American Journal of Fisheries Management 15:375–381.

Cahn, A. R. 1929. The effect of carp on a small lake: The carp as a dominant. Ecology 10:271–274.

Cochran, W. G. 1977. Sampling techniques. 3rd edition. John Wiley & Sons, New York. 480 pp.

Fremling, C. R., J. L. Rasmussen, R. E. Sparks, S. P. Cobb, C. F. Bryan, and T. O. Clafin. 1989.

Mississippi River fisheries: A case history. Pages 309–351 *in* D. P. Dodge, editor. Proceedings of the International Large River Symposium, Department of Fisheries and Oceans, Ottawa, Ontario, Canada. Canadian Special Publication of Fisheries and Aquatic Sciences 106.

[Gutreuter, S., R. Burkhardt, and K. Lubinski.](#) 1995. Long Term Resource Monitoring Program Procedures:

Fish monitoring. National Biological Service, Environmental Management Technical Center, Onalaska, Wisconsin, July 1995. LTRMP 95-P002-1. 42 pp. + Appendixes A–J

[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.

Lastrup, M. S., and C. D. Lowenberg. 1994. Development of a systemic land cover/land use database

for the Upper Mississippi River System derived from Landsat Thematic Mapper satellite data. National Biological Survey, Environmental Management Technical Center, Onalaska, Wisconsin, May 1994. LTRMP 94-T001. 103 pp.

Macrae, D. A. 1979. The impact of carp on the summer production of aquatic vegetation as indicated

by an enclosure experiment and food habits study. M.S. Thesis, Trent University, Peterborough, Ontario, Canada. 110 pp.

Northcote, T. G. 1988. Fish in the structure and function of freshwater ecosystems: A "top-down" view.

Canadian Journal of Fisheries and Aquatic Sciences 45:361-379.

Pitlo J., A. Van Vooren, and J. Rasmussen. 1995. Distribution and relative abundance of

Upper Mississippi River Conservation Committee, Rock Island, Illinois. 20 pp.

Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish Upper Mississippi River fishes.

populations. Bulletin 191. Fisheries Research Board of Canada, Ottawa, Ontario. 382 pp.

Robins, C. R., R. M. Bailey, C. E. Bond, J. R. Brooker, E. A. Lachner, R. N. Lea, and W. B. Scott. 1991.

Common and scientific names of fishes from the United States and Canada. 5th edition. Special Publication 20. American Fisheries Society, Bethesda, Maryland. 183 pp.

Smith, P. W. 1979. The fishes of Illinois. University of Illinois Press, Urbana. 314 pp.

Sparks, R. E., P. B. Bayley, S. L. Kohler, and L. L. Osborne. 1990. Disturbance and recovery of large floodplain rivers.

Environmental Management 14:699–709.

Upper Mississippi River Conservation Committee. 1989. Upper Mississippi River commercial fisheries statistics for 1987.

Pages 145–151 *in* Proceedings of the forty-fifth annual meeting of the Upper Mississippi River Conservation Committee. Upper Mississippi River Conservation Committee, Rock Island, Illinois.

U.S. Fish and Wildlife Service. 1993. Operating Plan for the Upper Mississippi River System Long Term Resource Monitoring Program.

Environmental Management Technical Center, Onalaska, Wisconsin, Revised September 1993. EMTC 91-P002R. 179 pp. (NTIS #PB94-160199)

Welcomme, R. L., R. A. Ryder, and J. A. Sedell. 1989. Dynamics of fish assemblages in river systems—A synthesis.

Pages 577–599 *in* D. P. Dodge, editor. Proceedings of the International Large River Symposium, Department of Fisheries and Oceans, Ottawa, Ontario, Canada. Canadian Special Publication of Fisheries and Aquatic Sciences 106.

[Wilcox, D. B.](#) 1993. An aquatic habitat classification system for the Upper Mississippi

U.S. Fish and Wildlife Service, Environmental Management Technical Center, Onalaska, Wisconsin, May 1993. EMTC 93-T003. 9 pp. + Appendix A (NTIS # PB93-208981)

[Wlosinski, J. H., D. E. Hansen, and S. R. Hagedorn](#). 1995. Long Term Resource River System.

Monitoring Program Procedures: Water surface elevation and discharge. National Biological Service, Environmental Management Technical Center, Onalaska, Wisconsin, August 1995. LTRMP 95-P002-4. 9 pp. + Appendixes A–O

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Preface

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

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

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

This document is an annual status report 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 (small and large), 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](#) and [Open River](#) (an unimpounded reach near Cape Girardeau, Missouri) of the Upper Mississippi River, 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.

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](#)

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.

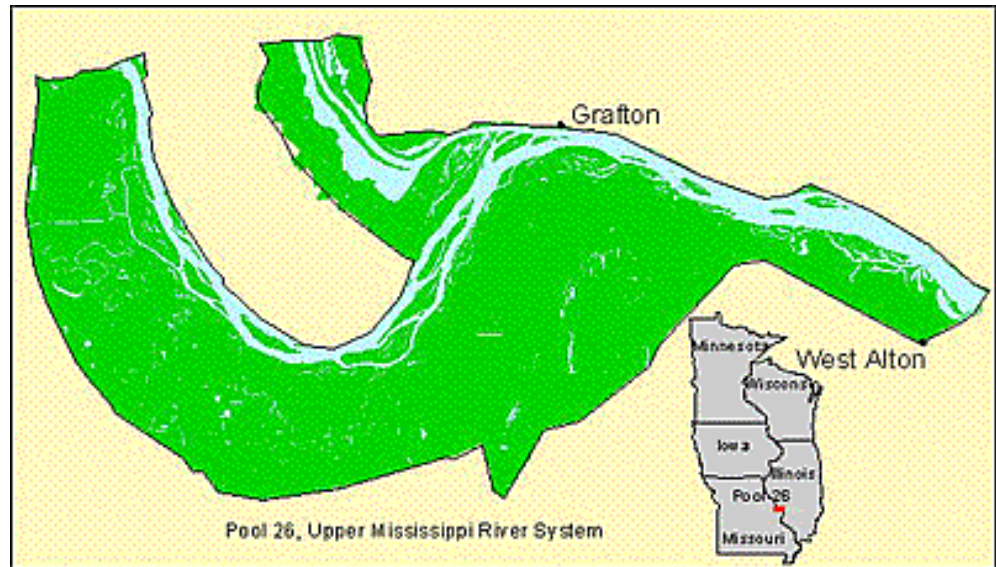
Navigation Pool 8 is 38.8 km (23.3 river miles) long and is bounded by Lock and Dam 7 (Dresbach, Minnesota) to the north and Lock and Dam 8 (Genoa, Wisconsin) to the south. It encompasses 9,000 ha (22,100 acres) of aquatic habitat. Major tributaries include the Black, Root, and La Crosse Rivers. The 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, a few of the secondary channels of the Mississippi River are isolated from the river on the upstream side to create backwaters and to reduce sedimentation.

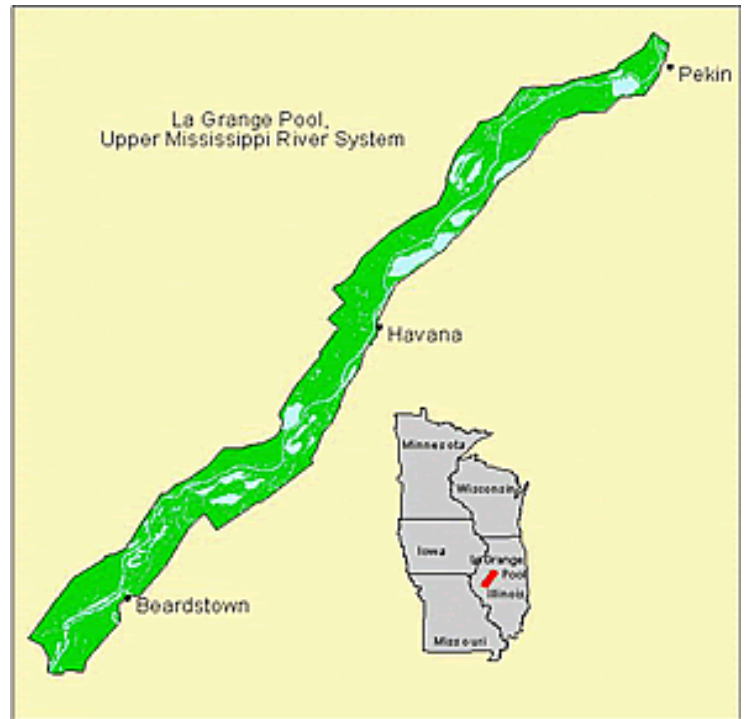


The **Open River Reach** is 84 km (52 river miles) long. The study reach has approximately 7,241 ha (17,893 acres) of aquatic habitat in the form of open water, sand and mud flats, and swamps and marsh. The floodplain is extensively disconnected from the mainstem river by levees. Many of the islands 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-m² 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.

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. Major changes for the sampling design are summarized in the [LTRMP Fish Component Sampling History](#) section. 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-m² 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

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

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

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

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-m² 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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LTRMP Fish Component 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
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1989	Initiate monitoring	<p>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)</p> <p>Rasmussen, J. L., and J. H. Wlosinski. 1988 Operating Plan 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, January 1988. EMTC 88-01. 55 pp. (NTIS # PB88 169669/AS)</p>	<p>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 and protocols.</p>
1993	Switch to stratified random sampling	<p>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)</p>	<p>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.</p>

2002	Implement sampling efficiencies	<p>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)</p>	<p>Periodic evaluations of environmental monitoring 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.</p>
2003	<p>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</p>	<p>Some information provided in the FY03 Scope of Work agreement.</p>	<p>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.</p>

	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.		
2004	Sampling occurred in all six reaches with six gears. Sampling effort was allocated independently and equally across three sampling periods.	See FY04 Scope of Work agreement .	
2005	Sampling occurred in all six reaches with six gears. Sampling effort was allocated independently and equally across two sampling periods.	See FY05 Scope of Work agreement .	

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Pool 4, Upper Mississippi River 2005 Fish Collection Summary

This report is a bullet summary of the [Long Term Resource Monitoring Program's](#) fish collection efforts conducted by the [Lake City Field Station](#) on [Pool 4](#), Upper Mississippi River during 2005. Information on changes in fish catch over all years can be obtained from the [Graphical Fish Database Browser](#).

- 158 fish collections were conducted using six gear types ([Table 2.1](#)), with 136 from randomly selected sites and 22 from fixed sites.
- Side channel borders, backwaters, and main channel borders received the most sampling effort ([Table 2.1](#)).
- Gear allocations among strata were the same for both sampling periods except for a variation between strata for mini fyke net during period two.
- In 2005, water levels were higher than normal during mid-May through late June (typically when flood waters recede). Water levels from early July through mid-September were significantly lower than normal, but considerably higher than normal during late September through early November. Sampling was delayed during this high water period. Sampling resumed after water levels receded

([Figure 1.1](#)).

- 11,648 fish representing 60 species and 2 hybrids were collected ([Table 3.1](#)). Historical fish distribution for the Upper Mississippi River (Pitlo et al. 1995) documents 99 fish species from Pool 4. To date the Lake City Field Station has collected a total of 89 species and 5 hybrids.
- The three fish species with the highest total catch were 5,007 emerald shiners, 2,014 bluegill, and 721 gizzard shad ([Table 3.1](#)).
- Thirty-seven pugnose minnows, seven shovelnose sturgeon, two lake sturgeon, and one blue sucker—all Minnesota species of special concern—were collected ([Table 3.1](#)).
- Mean catch-per-unit-effort and standard error for fish collected by the LTRMP using stratified random and fixed-site sampling for each stratum are shown in [Pool 4 tables](#). Length distributions for selected species of fish are shown in [Figures 1 to 17](#).

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Pool 8, Upper Mississippi River 2005 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 2005. Information on changes in fish catch over all years can be obtained from the [Graphical Fish Database Browser](#).

- 180 fish collections were conducted using 6 gear types ([Table 2.2](#)). Of the 180 collections, 160 were from randomly selected sites. Twenty collections were made at fixed TWZ sites.
- Water levels did not affect sample allocations. A high-water event during period three may have altered catches somewhat, but sampling continued routinely. For most of the sampling season, water levels resembled those depicted by the historical hydrograph. ([Figure 1.2](#)).
- Backwater, main channel border-unstructured, and side channel border strata strata received the most sampling effort ([Table 2.2](#)).
- 14,879 fish were collected representing 60 species and 2 hybrids (Table 3). This total includes 149 unidentified sunfishes (Centrarchidae) less than 30 mm long

([Table 3.2](#)).

- 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 2005 season was 90; no new species were added to this total since 1997.
 - Several species were collected that are listed on Wisconsin's rare fish list, including the following: 3 pallid shiners (endangered), 2 lake sturgeon (special concern), 1 silver chub (special concern), 1,205 weed shiners (special concern), 159 pugnose minnows (special concern), 41 river redhorse (threatened), 1 western sand darter (special concern), and 2 mud darters (special concern) ([Table 3.2](#)).
 - Mean catch-per-unit-effort and standard error for fish collected using stratified random and fixed-site sampling for each stratum are shown in [Pool 8 tables](#). Length distributions for selected species of fish are shown in [Figures 1 to 17](#).
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