

## 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
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)  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)	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, and 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.
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.
2002	Implement sampling efficiencies	<a href="#">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)</a>	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.
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.	<a href="#">Some information provided in the FY2003 Scope of Work agreement.</a>	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.
2004	Sampling occurred in all six reaches with six gears. Sampling effort was allocated independently and equally across three sampling periods.	<a href="#">See FY2004 Scope of Work agreement.</a>	
2005–2007	Sampling occurred in all six reaches with six gears. Sampling effort was allocated independently and equally across two sampling periods.	<a href="#">See FY2007 Scope of Work agreement</a>	Budget-driven rescission.
2008 to Present	Sampling occurred in all six reaches with six gears. Sampling effort was allocated independently and equally across three sampling periods.	<a href="#">See FY2008 Scope of Work agreement</a>	