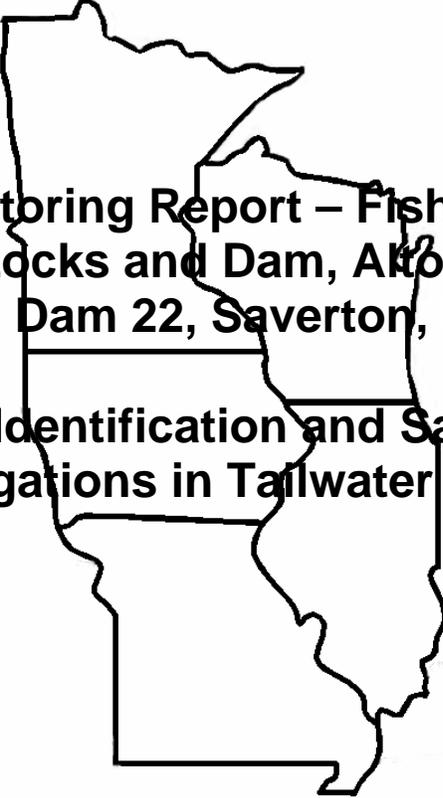
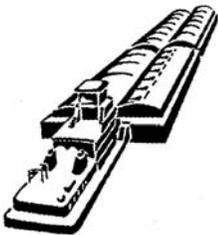


TECHNICAL REPORT FOR THE UPPER MISSISSIPPI RIVER – ILLINOIS WATERWAY NAVIGATION AND ECOSYSTEM RESTORATION PROGRAM



**2005 Monitoring Report – Fish Passage
Melvin Price Locks and Dam, Alton, Illinois and
Lock and Dam 22, Saverton, Missouri**

**Hydroacoustic Identification and Sampling of Fish
Aggregations in Tailwater Areas**



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ABSTRACT

The study areas of the 2005 Monitoring Report – Fish Passage Program include the tailwater sections of Melvin Price Locks and Dam (RM 200.8) and Lock and Dam 22 (RM 301.2) on the Upper Mississippi River. The U.S. Army Corps of Engineers is in the planning stage for construction of fish passage structures at these dams. Preconstruction monitoring activities in 2005 involved the hydroacoustic identification of fish aggregations in tailwater areas and the sampling of these aggregations to identify fish species and size structure. Information about species identification and the locations in tailwaters where fish aggregate is important in locating fishway entrances and establishing feasible alternatives. Hydroacoustic and fish capture surveys were conducted in late May, June, and early July 2005. The bathymetry, fish, and hydraulic conditions surveys were all conducted using hydroacoustic systems, including using a multibeam echo sounder, a split beam echosounder, and an acoustic Doppler current profiler (ADCP). Fish capture, identification, length measurement, and enumeration were performed by the U.S. Fish and Wildlife Service, Carterville Fisheries Resources Office, using multifilament gill nets and trammel nets. Deepwater electrofishing was unsuccessfully attempted.

In the Melvin Price Locks and Dam tailwaters, hydroacoustic surveys revealed several concentrations of large (>40 inches) fish between the lock chambers; below the 600-foot lock on the Illinois side of the channel; and at the head of Maple Island on the Missouri side of the channel. Hydroacoustic survey of the Melvin Price Locks and Dam tailwater aggregation size estimate was 241,267 fish (95 percent confidence integral 192,255 - 298,321). The overall catch at Melvin Price Locks and Dam was 83 fish representing 13 species, with the most abundant species being shovelnose sturgeon (N=44) and blue catfish (N=10).

In the Lock and Dam 22 tailwaters, hydroacoustic data showed clustering of fish on the east side of the river in the main channel border and below the spillway. A variety of fish sizes was observed. The fish aggregation size estimate from hydroacoustic survey of the Lock and Dam 22 tailwater was 27,779 fish (95 percent CI 20,946 - 37,080), whereas the overall catch at Lock and Dam 22 was 248 fish representing 10 species, with the most abundant species being shovelnose sturgeon (N=230).

Hydroacoustic data indicated that the fish identified at Melvin Price Locks and Dam in May were generally larger and more abundant than those at Lock and Dam 22 in June. Changes in dam operating and temporal conditions may have contributed to the differences in fish aggregations between the two sites. Open river conditions (all dam gates raised out of the water) occurred for 8 days at Melvin Price Locks and Dam in January and February 2005, whereas at Lock and Dam 22 open river conditions occurred for 8 days in mid April.

A radio-tagged lake sturgeon moving through Lock and Dam 22 during this period was documented by the Missouri Department of Conservation. Several species of Asian carp (bighead, silver, and grass) were captured during sampling. In order to limit size bias and to increase catch, it is recommended that future tailwater fish aggregation surveys use deep-water electrofishing equipment during times of the year when the water temperature is below 20°C in combination with a limited number of bottom-set nets to continue monitoring benthic species that may not be caught by electrofishing.

Future monitoring activities are tied to the project goals and objectives and monitoring activities identified by the Project Delivery Team with the assistance of the Science Panel. Near-term studies include repeating hydroacoustic and fisheries sampling during the fall, early spring, and late spring; monitoring fish movements through the dam gates with hydroacoustic equipment; and using telemetry to monitor movements of silver carp, shovelnose sturgeon, paddlefish, skipjack herring, and white bass. In order to provide potential design information for fishway entrance areas, concurrently-obtained fish location and hydraulic data from the tailwater fish surveys will be analyzed in an attempt to model the hydraulic environment selected by fish aggregating in the tailwater areas.