



# Project Status Report

Upper Mississippi River  
Long Term Resource Monitoring Program  
U.S. Geological Survey

## Fish Movement on the Upper Mississippi River

The Environmental Management Technical Center is nearing completion of a two-year project to evaluate the effects of locks and dams on fish passage. As part of this project, we collected all available data from previous fish telemetry and mark/recapture studies of the Upper Mississippi River (UMR). Other data were obtained from the Wisconsin Department of Natural Resources, Minnesota Department of Natural Resources, Commonwealth Edison, Iowa Department of Natural Resources, Illinois Department of Conservation, Illinois Natural History Survey, U.S. Army Corps of Engineers, Upper Mississippi River Science Center, Normandeau Associates Inc., and Clark Thomas Moen.

We found 126 studies that examined fish movement on the UMR. We were able to obtain at least some of the original data from 84 of the studies. Studies included information for 15 species of fish: black crappie, white crappie, bluegill, northern pike, common carp, channel catfish, freshwater drum, flathead catfish, largemouth bass, paddlefish, sauger, shovelnose sturgeon, smallmouth bass, walleye, and white bass (Table 1).

Less than 10% of the marked fish were recaptured. No black crappie, white crappie, bluegill, northern pike, or common carp were found to have moved across a single lock and dam.

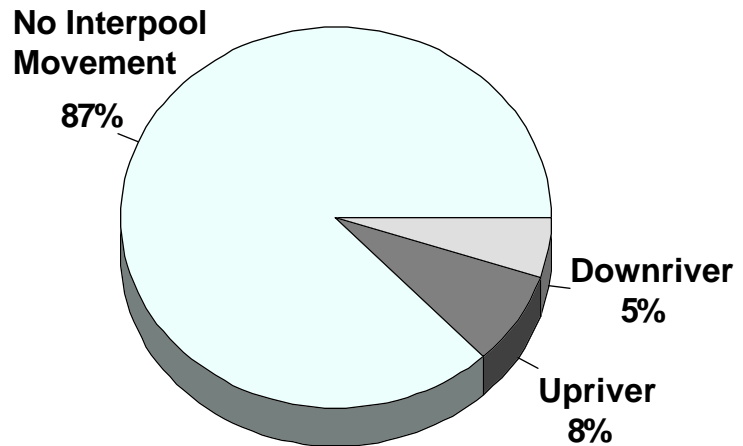


Figure 1. Interpool movement from 5,754 fish recaptured on the Upper Mississippi River.

Of the 5,253 fish recaptured in the studies we reviewed, 4,594 (87%) remained in the pool where they were initially marked, 420 (8%) moved upriver and 239 (5%) moved downriver (Fig. 1). Some of the fish crossed more than one dam. The majority of the marked and recaptured fish were walleye. Most of the recaptured walleye and sauger that moved across dams did so in an upriver direction, while most channel catfish moved downriver.

We also investigated the head differential (HD) between headwa-

ters and tailwaters when fish were at large. Unfortunately, we could not pinpoint the HD for most fish that crossed dams because of the long periods between when they were marked and recaptured. We do know, however, the HD for 68 fish. Of these 68 fish, only five crossed in a downriver direction. Four crossed with a HD of less than a foot. The fifth crossed when the HD was at six feet. Of the fish moving upriver, the majority crossed with a HD of less than one foot (Fig. 2).

A HD of around one foot usually signifies that dam gates are out of the water and open river conditions exist. (over)

**Table 1. Fish movement data from telemetry and mark/recapture studies on the Upper Mississippi River**

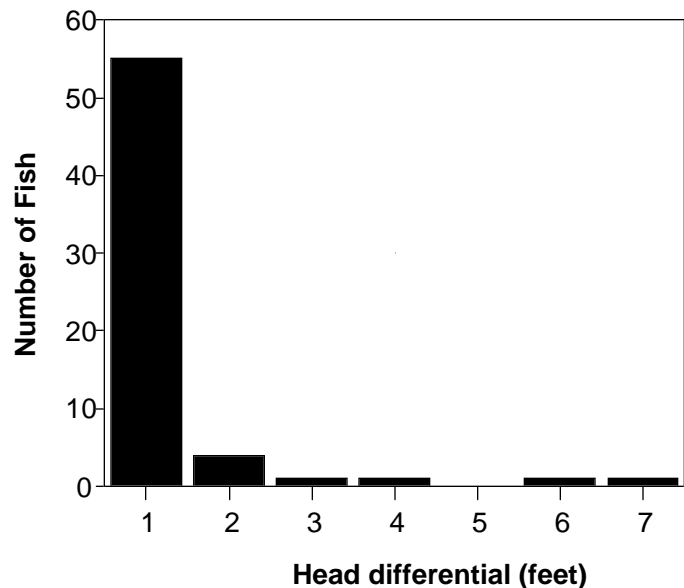
Species	Number of studies	Number marked	Number recaptured		
			Upriver	Downriver	Same pool
Walleye	33	17,493	484	133	1,860
Sauger	10	7,203	160	15	845
Channel catfish	8	7,683	14	226	223
Largemouth bass	7	12,470	11	30	613
Paddlefish	6	73	31	34	383
Smallmouth bass	3	36	4	4	0
Shovelnose sturgeon	3	116	0	3	52
Black crappie	2	426	0	0	105
Bluegill	2	446	0	0	82
Flathead catfish	2	81	1	1	10
Northern pike	2	84	0	0	12
White bass	2	1,169	5	11	59
White crappie	2	464	0	0	68
Common carp	1	NA	0	0	5
Freshwater drum	<u>1</u>	<u>14,874</u>	<u>2</u>	<u>1</u>	<u>277</u>
Totals	84	62,618	712	458	4,594

(continued)

This study can not supply conclusive proof of the effects of locks and dams on fish passage because the original 84 studies were performed with various experimental designs and most fish were at large for long periods of time. However, the study does support the view that locks and dams do adversely affect fish movement.

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**Figure 2. Movement of fish heading upriver with known head differentials**

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