

## **Estimates of Fish Passage on the St. Joseph River in 1993 Using Time-Lapse Video Recording**

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*Abstract.*—Monitoring of total fish passage at the Berrien Springs, Niles, and South Bend dams was accomplished from 16 February through 9 December 1993 using time-lapse video recording. This was the first complete year of monitoring at all three dam sites since completion of the five fish ladders on the lower St. Joseph River in 1992. Total passage of fish varied from 29,993 at the Berrien Springs dam to 10,106 at the South Bend dam. Warmwater and coolwater species accounted for 6.9% of the total observations at the Berrien Springs and Niles dams. Members of the sucker family accounted for over 67% of warmwater and coolwater fish passage. No enumeration of these species was attempted at the South Bend ladder. Potamodromous salmonines comprised 94.4% of all observations at the three facilities. Steelhead and chinook salmon were the most prevalent species passed, respectively. Approximately 25% of the total ladder movements at all three facilities occurred at night (2000 to 0800 EST). The South Bend ladder showed the highest night-time usage, as occurred in 1992. Evaluation of the accuracy of video readers and video recordings compared to manual counts showed no significant differences. Fish passage at the Berrien Springs ladder was considerably higher in 1993 compared to previous years. However, this was most likely due to the extended open ladder period. Distribution of salmonines throughout the available 63 miles of river was not evenly distributed as we thought might occur. The use of video time-lapse photography proved to be a good method for estimating returns of salmonines and passage of resident river species. With video, filming can take place continuously, improving fish passage, identification and counting in order to help meet program management goals.

The St. Joseph River, located in southwest Michigan and northwest Indiana, is the third largest river basin in Michigan. It drains a watershed of approximately 2,600 square miles

in Michigan and 1,685 square miles in Indiana. The average discharge (measured at the river mouth in St. Joseph, Michigan) is 4,598 cubic feet per second. The river is 306 miles long and