STUDY PERFORMANCE REPORT

State: Michigan **Project No.:** F-80-R-16

Study No.: 230702 **Title:** Effects of sediment traps on Michigan river channels

Period Covered: October 1, 2014 to September 30, 2015

Study Objectives: The objective of this study is to quantify the effect of sediment removal efforts on the channel morphology of select Michigan streams. Specifically, we will identify the rate and spatial extent of change in riverbed elevation and substrate conditions. We will relate these data to hydrologic, gradient, and valley characteristics of each stream. We will assess suitability of different river types for sediment traps, and provide recommendations for spacing traps along rivers to better achieve desired results.

Summary: Study results showed that excavation of sediment traps generally had only small effects on mean channel depth and substrate in the streams studied, with changes occurring both upstream and downstream of the trap. The lateral position of the channels examined remained constant, indicating little side cutting had occurred. Changes in channel area were variable and appeared as likely to occur at transects proximal to the sediment traps as at transects located further upstream or downstream. These results suggest that sediment trap development and maintenance has not achieved the desired goals of increased downcutting and exposure of coarse substrates downstream of the sediment traps studied.

Findings: Jobs 6 and 7 were scheduled for 2014-15, and progress is reported below.

Job 6. Publish research manuscript.−Progress on manuscript publication was delayed by a change in the principal investigator's position and job duties. The study was amended to continue this job for the next fiscal year.

Job 7. Write final report.−The study was amended to continue this job for the next fiscal year given the delay in Job 6. This annual performance report was prepared and a summary of the study is provided (Attachment 1).

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Date: September 30, 2015

Effects of Sediment Traps on Michigan River Channels

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Background

Sand that is moved from excessive erosion caused by land development and deteriorating road-stream crossings is the primary source of pollution in many of Michigan's rivers. It is of particular concern in trout streams because it smothers the coarse gravel and cobbles that trout and salmon need to spawn. Sediment traps are deep holes dug into the bottom of streams and rivers (Photo 1) that are intended to catch excess sand as moves downstream, with the expected result being cleaner gravel, cobble, and rocks below the trap as well as an increase in stream depth. While sediment traps have been widely used by Fisheries Division, our partner agencies, and non-profit groups to catch and remove excess sand in Michigan streams for years, they are costly to maintain and little information exists to evaluate their effectiveness in actually rehabilitating fish habitat. This project is designed to help fisheries managers determine if sediment trapping efforts are achieving their intended purpose throughout the state.

Photo 1. Excavation of a sediment trap in a Michigan stream.

What do the results show?

In the streams and rivers that we surveyed in the Upper and Northern Lower Peninsulas, the excavation of sediment traps had only small effects on average depth and bottom condition in the streams studied, with changes occurring both upstream and downstream of the trap. These results suggest that sediment trap maintenance has not achieved the desired goals of increased depth and exposing coarse gravel, cobble, and rock substrates downstream of the traps studied.

What do the results mean for fisheries managers and anglers?

Overall, these results do not support the use of sediment traps as a stand-alone habitat restoration tool. Our findings and previous assessments of sediment traps suggest that fisheries managers carefully consider their stream or river and all potential management options, including stocking or addition of woody habitat, when deciding which will provide the best return on investment.