

Long-term Assessment of Habitat and Trout Population Responses to Habitat Improvement in a Small, Southwest Michigan Stream

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Abstract.—Stream habitat improvement is a common technique used by fisheries managers desiring to increase production and angler catch rates of important sport fishes. However, high costs of assessment combined with a lack of rigorous scientific evaluation (e.g., long-term data, pre-treatment information, and control sites) and thorough statistical analyses have led to much criticism of this practice in recent years. To address this issue, we measured the physical habitat and trout population in Silver Creek, Michigan before and after the addition of instream structure and control of bank erosion. Channel width decreased in the treated zone and additional coarse substrate was exposed after habitat improvement. These beneficial changes to channel morphology have persisted for more than a decade after project completion and did not cause adverse changes such as increased bank erosion in untreated portions of the stream. Total brown trout *Salmo trutta* biomass in a treatment zone (TZ) where instream structures were added significantly increased over time in comparison to a reference zone (RZ) without habitat improvement. Increases were driven by an increase in the number of fish in the 8–12 in size group. When compared to RZs in two nearby streams, the average density of acceptable-size (greater than 8 in) brown trout was variable among periods (before habitat improvement, after habitat improvement, and after a regulation change) and zones. Abundance of acceptable-size trout increased over time in the TZ while holding steady or decreasing in the other RZs. Although volunteer reports from anglers indicated that fishing effort in Silver Creek was nearly four times higher in the TZ than the RZ, catch rates were similar and the brown trout population was able to persist. Total brown trout biomass in the TZ remained nearly 40% higher in 2005–07 compared to the 5-year period before habitat improvement was completed in 1995 likely due to improved spawning or nursery habitat and the presence of instream structures.