

Field Performance of One Wild and Two Domestic Brown Trout Strains in Seven Michigan Rivers

Todd C. Wills

Michigan Department of Natural Resources
Hunt Creek Fisheries Research Station
1581 Halberg Road
Lewiston, MI 49756

Abstract.—In 1995–96, Michigan obtained a wild broodstock of brown trout from Gilchrist Creek (GC) in hopes that progeny of this stock would exhibit better survival and returns to anglers after stocking than the domesticated strains then available, Wild Rose (WR) and Seeforellen (SF). I evaluated the relative survival, growth, and return to anglers of the three brown trout strains in seven Michigan rivers where paired plantings of yearling fish were made from 1997 to 2000. The results of this study, with the exception of the Muskegon River, indicated that the wild GC strain brown trout greatly outperformed the domesticated SF and WR strains, despite being smaller at the time of stocking. The total density of GC strain brown trout was significantly higher ($P < 0.001$) than that of the other strains. GC brown trout survived to age 2 over 100 times better than the SF strain and over six times better than the WR strain. In addition, initial growth of the GC fish from stocking to the time of first sampling was nearly an inch higher than the SF brown trout and over $\frac{3}{4}$ of an inch higher than the WR brown trout. However, on average, the densities and biomass of all stocked brown trout were lower than the densities and biomass of unclipped resident brown trout. Relative angler returns of the stocked wild and domestic brown trout strains varied in two of the study systems for which creel data were available. GC brown trout appear better suited to stocking into streams with minimum size limits >10 inches because they survive better to older ages, grow faster, and consequently are more likely to reproduce, whereas WR fish may be better suited to streams with 8-inch minimum size limits where most of the angler harvest occurs during the year they are stocked. SF brown trout exhibited the lowest survival and immediate post-stocking growth of the three brown trout strains and should be stocked with caution. Fisheries managers must consider the performance of stocked brown trout strains, the performance of stocked brown trout in general, and returns to the angler when implementing or reviewing brown trout stocking programs.

Introduction

Michigan has a long history of stocking trout into rivers where low natural reproduction or some habitat feature limits the quality of trout fisheries. Traditionally, domesticated strains have been selectively bred to improve survival, growth, maturity, fecundity, and disease resistance in the hatchery. Such selection may

be an intentional or an unintended consequence of hatchery rearing conditions. Many fisheries managers believe that the poor post-stocking survival and return to anglers frequently exhibited by domesticated trout strains are the direct result of years of inbreeding and forced selection to achieve these attributes (Vincent 1960; Avery et al. 2001). Such selective processes leave the domesticated strains