

Abstract

Four groups of hatchery-raised steelhead, Salmo gairdneri, were marked and released in a Michigan tributary of northern Lake Michigan. The groups were spring yearlings, fall fingerlings, fall yearlings, and large spring yearlings. I examined smolting patterns, residual stream populations, survival from planting to smolting, and cost-to-smolting for each group. Smolting was monitored using traps installed near the mouth of the river. Estimates of residual stream populations were obtained by electrofishing. Most fish in three of the planting groups (spring yearlings, fall fingerlings, and fall yearlings) remained in the river until age 2. A significant number of the fourth group (large spring yearlings) smolted at age 1 within 2 months of planting. The majority of hatchery-raised and wild steelhead smolted during the period mid-April to mid-June, with peak migrations occurring in mid-May. Most hatchery-raised fish showed little dispersal, with 90–100% consistently found within 1.75 miles of the planting site. Planting groups which remained in the river for extended time periods suffered high losses. Only 1–2% of both the spring yearlings and the fall fingerlings survived to smolt; 7% of the fall yearlings survived to smolt. In contrast, nearly 50% of the large spring yearlings, which did not remain long in the river, survived to smolt. These large spring yearlings were by far the most economical and practical group considered, in terms of both cost-to-smolting and numbers needed to reasonably supplement a river's smolt production.