

## Rehabilitation of a Lake Superior Steelhead Population by Stocking Yearling Smolts

James W. Peck

Michigan Department of Natural Resources  
Marquette Fisheries Station  
484 Cherry Creek Road  
Marquette, Michigan 49855

*Abstract.*—The steelhead *Oncorhynchus mykiss* population in the upper Chocolay River was successfully rehabilitated in the 1980s after being below carrying capacity for around 30 years. Rehabilitation was accomplished by stocking large (175-184 mm), yearling Michigan-strain steelhead smolts in 1983, 1984, and 1985 at an upstream location with good spawning substrate. Most adult steelhead sampled in the 1986-88 spawning runs were hatchery fish, and all of these were the Michigan strain stocked in 1983-85. The composition of steelhead spawning runs in the upper Chocolay River changed from mostly hatchery to all wild during 1986-92. Steelhead spawning activity stabilized at about 0.9 adults and 0.6-0.8 redds per 100 m of stream. Juvenile steelhead abundance in the upper Chocolay River increased in 1985 and 1986, then leveled off between 1986 and 1992 at what appeared to be carrying capacity. Numbers of age-0 steelhead in one 305-m section of the Chocolay River increased from less than 50 to more than 1,900 between 1984 and 1985, then stabilized at just over 1,200 during 1986-92. Numbers of age-1 steelhead in this section increased from 79 to 273 between 1985 and 1986, then stabilized at just over 200 during 1987-92. A similar increase in juvenile abundance was observed in another Chocolay River section sampled during 1983-86, and constant abundance was recorded for a third section during 1986-92. Densities of age-0 steelhead in the Chocolay River sections were lower than in two nearby Lake Superior tributaries (the Little Garlic River and Chinks Creek), but were less variable. Densities of age-1 steelhead in the Chocolay River sections were as high and more stable than in the two Lake Superior tributaries, and comparable to density in a Lake Michigan tributary (Little Manistee River). No further steelhead stocking should be done in the upper Chocolay River unless juvenile populations decrease substantially, and future stocking of hatchery fish should only be done in streams with steelhead populations below carrying capacity.

The Chocolay River, a Lake Superior tributary in Marquette County, Michigan, historically had sizable population of naturally-reproducing steelhead (anadromous rainbow trout *Oncorhynchus mykiss*). Michigan Department of Natural Resources (MDNR) stream surveys during 1950-51 indicated an abundance of juvenile steelhead in the upper river

and tributaries (Unpublished data, Marquette Fisheries Station, Marquette). However, the increased abundance of sea lamprey *Petromyzon marinus* later in the 1950s resulted in reduced abundance of steelhead and other large salmonine fishes throughout Lake Superior and its tributaries (Smith and Tibbles 1980). Electrical barrier weirs were installed on the Chocolay