

Survival Rates of 1- and 2-Year-Old Hatchery-Reared Lake Trout in the West Arm of Grand Traverse Bay, Lake Michigan

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Abstract.—The objectives of the study were to determine the survival rate of hatchery-reared lake trout (*Salvelinus namaycush*) stocked as yearlings in the West Arm of Grand Traverse Bay, Lake Michigan during the 10-day period following planting, and the annual survival rate as 1-, 2-, and 3-year-old fish. Average survival of the yearling lake trout during the 10-day period following planting was estimated to have been 68%, which included removals by experimental fishing. The annual survival rate (including post-planting losses) of yearlings was determined to have averaged 40%. For 2-year-old lake trout the mean annual survival rate was estimated to have been 59%. The annual survival rate of 3-year-old lake trout could not be determined because 4-year-old lake trout were not fully vulnerable to the trawl. In the West Arm of Grand Traverse Bay, lake trout planted as fall fingerlings survived to 2 years of age at one-half the rate of the same year class planted as spring yearlings.

In settling the fishing dispute between Indian tribes and the State of Michigan, rulings issued by the federal court in 1979 and the 1985 consent agreement mandated management of lake trout (*Salvelinus namaycush*) by catch quotas. The consent agreement also stipulated that lake trout stocks in areas designated as high priority rehabilitation zones would be managed to maximize the reproductive potential of the species. The number of catchable lake trout is an essential statistic in the computation of catch quotas. Because stocks of lake trout in Lake Michigan are sustained by planting known numbers of hatchery-reared fish, estimates of standing stocks can be calculated when annual survival rate at each age is known. Although survival rates of the fishable portion of the stocks have been estimated, those for the pre-recruited segment have not. The objectives of this study were to determine the survival rate

of hatchery-reared yearling lake trout in the West Arm of Grand Traverse Bay, Lake Michigan, during the 10-day period following planting, and the annual survival rate as 1-, 2-, and 3-year-old fish.

Methods

Study area.—The West Arm of Grand Traverse Bay, Lake Michigan (Figure 1) was selected as the study area because: (1) much of the area was trawlable; (2) the size and configuration of the basin maximized the probability that the juvenile lake trout could be tracked for a suitable time period; (3) there was a typical predator population; and (4) the basin was well protected from prevailing westerly winds, which minimized lost sampling opportunity caused by storms.