Michigan Department of Natural Resources
Fisheries Research Report No. 1956, 1991

Assessment and Management of Lake Trout Stocks in Michigan Waters of Lake Superior, 1970-87

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Abstract.—Eighteen years (1970-87) of lake trout (*Salvelinus namaycush*) population assessment data from Lake Superior waters contiguous with Michigan's Upper Peninsula shoreline have been reviewed and summarized in this report. Commercial-size and pre-recruit lake trout populations in these waters shifted in composition from mostly hatchery to mostly wild during 1970-87. Wild lake trout abundance increased in all management zones during the late 1970s and early 1980s, but this increase was offset by a decrease in hatchery lake trout abundance. The initial decrease in hatchery lake trout abundance was attributed to a reduction in the number of yearlings planted, but abundance continued to decrease even though planting rates had remained relatively constant after 1971. Wild lake trout abundance also decreased in some zones during the 1980s. The decrease in lake trout abundance in most zones coincided more with increased lake trout catch by tribal fisheries than other factors. Factors such as planting rates since 1971, sea lamprey (*Petromyzon marinus*) predation, and catch in the sport fishery had not changed appropriately in recent years to link them to changes in lake trout abundance. Large lake trout abundance decreased in all zones. The loss of large lake trout was evident on most spawning reefs where spawner abundance in the 1980s was less than in the 1970s. Planting yearlings on spawning reefs rather than shoreline sites provided a greater contribution than cohort strays to subsequent spawning populations, but contribution to the total spawning population was significant only on the reef where total spawner abundance was low and made up primarily of hatchery fish. Lake trout tagged on spawning reefs were recovered mainly within the zone where tagged, but some were recovered in zones over 100 miles away. Michigan's lake trout management efforts during 1970-87 included restricting gill-net fisheries to waters 60 fathoms and deeper, prohibiting retention of lake trout taken in trap nets, reducing the sport-fish creel from five to three, planting yearlings on spawning reefs, and participating in interagency efforts to manage lake trout stocks in Lake Superior. Assessment recommendations are (1) continue the commercial-size assessment with elimination of one fishing ground in MI-4 and addition of one fishing ground in MI-6, (2) do pre-recruit assessment in all management zones at least every 2 years, (3) assess spawning lake trout populations every 5 years, (4) determine the conversion factors necessary to switch from multifilament to monofilament nylon mesh in assessment gill nets, and (5) use otoliths to age lake trout age-8 and older. Management recommendations are (1) maintain current restrictions on lake trout catch and effort in Michigan-licensed fisheries, (2) continue to participate in interagency management of lake trout, (3) maintain an assessment of the lake trout sport fishery at major ports, (4) plant yearling lake trout only on spawning reefs where spawner abundance is low, and (5) evaluate survival of hatchery lake trout cohorts from different hatcheries and in other Great Lakes.