

Growth, Mortality, Recruitment, and Management of Lake Trout in Eastern Lake Michigan

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Abstract.—In 1985, the State of Michigan and the Indian tribes of Sault Ste. Marie, Bay Mills, and Grand Traverse entered a court-sanctioned agreement which mandated the setting of catch quotas for lake trout in the treaty waters of northern and eastern Lake Michigan. The objectives of this report are: (1) to describe growth, recruitment, mortality, and management of lake trout stocks in eastern Lake Michigan from 1984-88, and (2) to provide the catch quotas set annually during 1984-89.

Analysis of growth rate-at-age of the 1970-84 year classes showed no statistically significant trends. Growth rates were highly variable but neither declined nor increased for more than three successive years.

Since 1975, annual total mortality rates of lake trout stocks recruited to the fisheries have ranged from 46%-77%. In the primary rehabilitation zone, annual total mortality rates ranged from 69% in 1984-85 to 77% in 1988-89.

Reproductive failure may have been due to insufficient numbers of spawning lake trout caused by the excessive mortality rates. Spawning frequency averaged 0.2 times/stocked female lake trout in the primary rehabilitation area during 1985-88. If recommended catch quotas were adhered to in the primary rehabilitation zone, then in 15 years the spawning frequency would increase to 1.5 times/stocked female lake trout, and potential egg production would increase from the 1985-88 average of 8 million to 89 million.

During 1984-89, annual harvest quotas in all zones ranged from 6.9-29.1 thousand lake trout. However, annual fishing rates exceeded the target fishing rate by 2.8-5.3 times during 1984-88.

Lake Michigan's lake trout resource can be fairly characterized as plant, grow, and harvest, because management efforts have failed to control exploitation of the species. Either more effective regulations need to be devised and enforced, or the goal of reconstructing the lake trout population in eastern Lake Michigan should be abandoned. A forthrightly stated policy should be formulated jointly by the Michigan Department of Natural Resources and the Indian tribes which sets the direction that management of lake trout stocks is to take in eastern Lake Michigan.

In 1985, the State of Michigan and the Indian tribes of Sault Ste. Marie, Bay Mills, and Grand Traverse entered a court-sanctioned agreement to resolve the dispute overfishing rights in the upper Great Lakes

exercised under the Treaty of 1836. Part of the agreement mandated that lake trout (*Salvelinus namaycush*) in the treaty waters of northern and eastern Lake Michigan be managed by catch quotas.