

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-80-R-3

Study No.: 482

Title: Investigations into causes of, and solutions for, variable survival of chinook salmon stocked into Lake Huron

Period Covered: October 1, 2001 to September 30, 2002

Summary: From 1993-98, study fish were marked, reared, and stocked at Oscoda, Swan River, and Harbor Beach as planned. Two roving "head hunters" were employed in all study years on Lake Huron to collect snouts with coded-wire tags from angler-caught chinook salmon. Coded-wire tags from chinook salmon were processed and the data entered. Tag recovery rates from the sportfishery suggested survival of pen-reared groups from Oscoda was more than twice that of conventionally-planted fish. Weir collections and fall electrofishing were used to assess return to the stocking site for mature fish. In the Au Sable River, test (penned) fish were observed more than 5 times as frequently as the control (conventionally stocked) groups in the spawning runs, suggesting pen culture there enhanced both survival and homing. Return rates from a netpen at Harbor Beach were not consistently different from conventional stockings. Wild age-0 chinook salmon were observed in seine samples taken near the Au Sable River in earlier segments of this study, but there was no evidence that natural reproduction was contributing to the spawning run there, based on examination of oxytetracycline marks in returning spawners. Biological data for the Swan and Au Sable river spawning runs were summarized. Growth was significantly slower at both sites in 1997 and 1998 than in 1996 or 1999-2001. Archived fall salmon netting data collected from the Au Sable River during 1973-1981 were compared with the 1996-2001 data. Results of this analysis indicated growth and condition of chinook salmon declined significantly after 1981 and were particularly low in 1997 and 1998. The 1995 year class from Swan River was unusually weak but was exceptionally strong in the Au Sable River. The 1997 year class appeared to be weak across all experimental stocking sites. Diet information from offshore netting and trends in growth and condition from fall sampling were used to analyze stocking rates, which in 1999 resulted in an interjurisdictional agreement to reduce chinook salmon stocking by 20 percent. Results of this study and Study 451 were used to build a Lake Huron pelagic prey consumption model, in conjunction with the Lake Huron Technical Committee and Michigan State University. Model results suggested predation rates since the mid 1990s approached or exceeded predation rates by lake trout prior to their sea-lamprey-induced collapse. A lake-wide interjurisdictional study of the contribution of wild chinook salmon to recruitment in Lake Huron was designed and implemented. Results of Study 482 were presented in the Lake Huron State of Lake Report and other forums. All data processing and reporting requirements for this study were met.

Findings: Only Job 4 was scheduled this year, and progress is reported below.

Job 4. Title: Read coded-wire tags and tetracycline marks, enter and analyze data, and prepare annual reports and publications.—Data entry for all 2001 collections is complete. Oxytetracycline and coded-wire tag processing is continuous and on schedule. The 2001-2002 annual performance report was prepared. Data from this study were used by the Lake Huron Technical Committee in the maintenance of the Lake Huron bioenergetics model. Trends in growth of chinook salmon were presented to the Lake Huron Citizen Advisory Committee, Fisheries Division internal committees, and to several meetings of interest groups.

Prepared by: James E. Johnson, Steven P. DeWitt and John Clevenger

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