STUDY PERFORMANCE REPORT

State: Michigan **Project No.:** F-80-R-3

Study No.: 703 **Title:** Lakewide assessment of the contribution of natural recruitment to the chinook salmon population of Lake Huron.

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

Study Objective:

(1) To estimate annual natural recruitment of chinook salmon to Lake Huron for the 2000 to 2003 year classes;
(2) To determine contributions from natural reproduction to the spawning populations of selected tributaries to Lake Huron;
(3) To refine recruitment modules of Lake Huron's bioenergetics and catch-at-age models, which will, in turn, be used to prescribe stocking levels for Lake Huron.

Summary: This was the first year of funding for this project. All chinook salmon stocked in lakes Huron and Michigan, except those stocked by Ontario, were marked using oxytetracycline, administered in feed. All chinook salmon stocked in Ontario waters of Lake Huron were fin clipped. Quality control samples of vertebrae were received during May and June 2002 from Michigan, Illinois, Indiana, and Wisconsin hatcheries. Most quality control samples from spring 2002 have yet to be checked for quality of the oxytetracycline mark. The Alpena Fishery Station invested in ultraviolet microscope equipment and imaging software, using nonfederal funding, to enhance reproducibility and specimen processing speed. Vertebrae images can now be electronically archived. A database for storage of oxytetracycline mark and fin clip results was designed, as were field data sheets and field collection methods. These products were shared with other cooperating agencies on the Lake Huron Technical Committee. This year was the first year of field collections, and creel clerks and coded-wire tag recovery personnel were trained in gathering vertebrae for the recruitment study. Alpena Fishery Station provided staff to collect vertebrae at fishing tournaments at Alpena and Rogers City. Volunteer groups assisted in collections. The "Thumb Steelheaders" in particular, collected over 100 vertebrae using the prescribed methodology. Lake Superior State University collected over 300 vertebrae from the St. Marys River. Ontario Ministry of Natural Resources collected vertebrae from Georgian Bay and the south-east main basin of Lake Huron. These vertebrae samples were still being received by the Alpena Fishery Station at the time of this report. An analysis of mark composition of age 1 and age 2 chinook from 2002 collections will be presented in next year's progress report.

Findings: Jobs 1, 2, 3, 4, and 5 were scheduled for 2001-02, and progress is reported below.

Job 1. Title: Quality control on fish marking.–Stocking of marked chinook salmon began in 2001, a year prior to the initiation of this study, in anticipation the work would be funded. In 2001 and 2002, all chinook salmon stocked in lakes Michigan and Huron were marked with oxytetracycline by administering the antibiotic shortly prior to stocking or, in the case of Ontario, by fin clipping. Quality control samples were sent to Alpena for analysis. All quality control samples from 2001 have been analyzed; those from 2002 were still being received at time of this report. A summary of mark quality by agency and hatchery will be provided in next year's annual report. There were no departures from the study plan with respect to Job 1.

Job 2. Title: **Monitoring of composition of open-water chinook harvest.**–A database for storage of chinook salmon biological data and laboratory results of vertebrae analysis was designed, as were field data sheets and instructions for field collections. These products were shared with other cooperating agencies on the Lake Huron Technical Committee. This year was the first year of field collections, and creel clerks and coded-wire tag recovery personnel were trained in gathering vertebrae for the recruitment study. Alpena Fishery Station provided staff to collect vertebrae at fishing tournaments at Alpena and Rogers City. Volunteer groups assisted in collections. The "Thumb Steelheaders", in particular, collected over 100 vertebrae using the prescribed methodology. Ontario Ministry of Natural Resources collected vertebrae from Georgian Bay and the south-east main basin of Lake Huron. These vertebrae samples were still being received by the Alpena Fishery Station at the time of this report. Sample size quotas were met for north-central Lake Huron, but collections fell somewhat short in southern Lake Huron and perhaps in Ontario waters. Collections were nearly completed for 2002 at time of this report. A summary of results will be prepared for next year's performance report and for review by the Lake Huron Technical Committee. Staffing requirements for meeting sample quotas in 2003 will be taken up by the Lake Huron Technical Committee at its January 2003 meeting.

Job 3. Title: **Monitoring of composition of spawning escapement chinook salmon on selected spawning tributaries.**–Escapement was sampled in the AuSable River in October 2001 by electrofishing. Biological samples of escaping chinook salmon were also taken at Swan River by sampling at the harvest weir. Both of these efforts were conducted according to the study plan but were also elements of Study 482 and are reported in the Study 482 report. The field collection portion of Study 482 was completed in September 2002. Monitoring of the AuSable River and Swan River spawning runs will be reported under Study 703 beginning with next year's performance report. Nearly all salmon returning to these two rivers appeared to be of hatchery origin.

Escapement sampling was also conducted on the St. Marys River. Lake Superior State University collected over 300 vertebrae from the St. Marys River by sampling the recreational catch in September 2002. These vertebrae samples have not yet been received by the Alpena Fishery Station. Mark composition will be reported in the 2002-2003 progress report.

Only age 1 and age 2 chinook salmon were marked as of 2002. More tributaries will be sampled in 2003 and 2004 when most or all hatchery chinook salmon will be marked. Design of stream sampling for 2003 will be conducted in collaboration with the Lake Huron Basin Team of the Fisheries Division and with the Lake Huron Technical Committee at its January and July 2003 meetings.

Job 4. Title: **Laboratory analysis.**–In September 2002 Alpena upgraded its oxytetracycline detection equipment by acquiring a florescence dissecting stereoscope and imaging software using nonfederal funds. The new equipment will allow archiving and peer review of our image analysis, using electronically saved images. This equipment will be used to analyze vertebrae collected during 2002 by the Alpena Station and cooperating agencies. A report of mark composition by collection area will be presented in the 2002-2003 progress report.

Job 5. Title: **Data analysis, preparation of annual and final reports, report layout and publication, and presentation of findings at technical and public meetings.**–The first annual progress report for October 2001-September 2002 was prepared. Data from the first year of this study were still being collected at the time of this report. Analysis of these data will be done in fall 2002 and presented at Lake Huron Technical Committee and Lake Huron Basin Team meetings during 2003 and in the 2002-2003 annual federal-aid progress report.

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