

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-2

Study No.: 485

Title: Assessment of chinook and coho salmon populations and their prey in eastern Lake Michigan

Period Covered: October 1, 2000 to September 30, 2001

Study Objectives: To assess the health of chinook and coho salmon stocks in Lake Michigan through continuous monitoring of distribution, relative abundance, growth, mortality, diet composition, and clinical indicators of disease.

Summary: Data collection through fishery-independent sampling programs is an essential component of fisheries stock assessment and management. Michigan Department of Natural Resources (MDNR) experimental sampling of Pacific salmon in Michigan waters of Lake Michigan began only in 1990, and we were not routinely successful in collecting these fish until 1994. This study is a continuation of the sampling program initiated in 1990.

Because the survey vessel *Steelhead* was being used for other studies, we were only able to complete parts of the first (spring) and second (summer) assessment cruises in 2001. Results of the sampling completed this year showed that chinook and coho salmon distributions were similar to those observed in previous years. Total catch of chinook salmon (N=124) was greater than coho salmon catch (N=23). Complete biological data, including information on age and growth, incidence of bacterial kidney disease (BKD), diet, and lamprey wounding were recorded for all salmonines collected. Processing of these data and samples is ongoing.

The revised design of our netting program implemented in 1997 included forage fish assessments at the netting site, to enable us to determine selectivity by salmonine predators for piscine prey items. Forage samples were collected again in 2001. Analysis of forage fish data collected in 1997-2001 is ongoing.

Job 1. Title: Establish the distribution pattern, relative abundance, and origin of chinook and coho salmon in eastern Lake Michigan.

Findings: *Distribution and Relative Abundance.* –Sampling during the 1994-96 seasons was conducted in one sweep of the lake, moving from south to north beginning in the spring. This design was based on the assumption that distribution of salmonine species in Lake Michigan remained constant throughout the sampling period. A revised sampling protocol was implemented in 1997 to better define the spatial and temporal variation in fish distribution. By attempting to sample inshore and offshore thermal habitats, and by covering the entire lake in two south to north sweeps during the spring and summer, we hoped to be able to better define the distribution of salmonine populations in Lake Michigan.

In 2001, we were only able to complete parts of the first (spring) and second (summer) assessment cruises. Chinook salmon and coho salmon were sampled during June in Statistical District MM-8, during July in District MM-6, and again in August in District MM-8. As in

previous years, total catch of chinook salmon (N=124) was greater than coho salmon catch (N=23; Table 1). Chinook salmon distribution was, for the most part, similar to that observed in previous years. However, a higher percentage of chinook salmon were captured in suspended nets in 2001, compared with previous years (Table 2).

Job 3. Title: Coordination with other studies, process and analyze data; write report.

Findings: This performance report was completed on schedule. The information presented was also used in preparing MDNR research summaries to the Great Lakes Fishery Commission and Lake Michigan Technical Committee. Coordination activities included study design assistance and fish collection for a Great Lakes Fishery Trust-funded study investigating disease incidence and energy dynamics in Lake Michigan chinook salmon (Mike Jones and Jim Bence, Michigan State University unit of the Partnership for Ecosystem Research and Management - PERM, principal investigators).

Prepared by: David F. Clapp

Dated: September 30, 2001

Table 1.–Catch (number of fish) of chinook salmon and coho salmon in assessment netting in eastern Lake Michigan, 1994-2001.

Sample year	Chinook salmon	Coho salmon
1994	719	4
1995	898	20
1996	1,072	12
1997	409	24
1998	479	42
1999	186	181
2000	134	33
2001	124	23

Table 2.–Percent of total assessment catch of chinook salmon in spring (May-June) and summer (July-August) by statistical district and net type (surface or suspended gillnet), 1998-2001.

Statistical district	Season			
	Spring		Summer	
	Surface	Suspended	Surface	Suspended
	<u>1998</u>			
MM-3	0	<1	0	6
MM-6	10	9	37	37
MM-8	79	2	2	18
	<u>1999</u>			
MM-3	0	1	0	16
MM-6	20	9	26	43
MM-8	51	18	1	13
	<u>2000</u>			
MM-3	---	---	---	---
MM-6	27	16	---	---
MM-8	43	14	---	---
	<u>2001</u>			
MM-3	---	---	---	---
MM-6	---	---	13	45
MM-8	40	60	1	40

1 – Samples not collected due to vessel maintenance.

2 – Samples not collected due to conflicts with other assessment activities.