

## STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-53-R-15

Study No.: 490

Title: Assessment of steelhead and brown trout populations in eastern Lake Michigan.

Period Covered: April 1, 1998 to September 30, 1999

**Study Objectives:** To evaluate the status and health of steelhead and brown trout stocks by assessing growth, abundance, diet composition, general health, and incidence of disease.

**Summary:** Small numbers of steelhead and brown trout were collected in assessment netting operations in 1998 (17 steelhead and 8 brown trout were collected from all nets set in Michigan's waters of Lake Michigan from April through September in 1998). A literature database has been compiled and is continually updated with articles related to steelhead physiology, behavior, and habitat preferences. It was difficult distinguish distributional anomalies from density and abundance factors with the small number of brown trout and steelhead observed in our surveys. The largest steelhead and brown trout catch rates occurred in the southernmost districts. Most steelhead and brown trout were captured in surface gill nets when compared to catch rates in suspended or bottom gill nets. Brown trout have never tested positive for BKD (Bacterial Kidney Disease) in assessment gill nets, and levels of infection in steelhead were relatively low.

**Job 1. Title: Evaluate relevant literature on steelhead.**

**Findings:** Literature on steelhead physiology, behavior, and habitats were collected and catalogued in an Endnote bibliographic software library. "Current Contents" searches are being conducted twice a month on relevant fisheries journals to identify journal articles and publications that might be of interest.

**Job 2. Title: Establish the distribution pattern and origin of steelhead trout and brown trout during spring and summer in eastern Lake Michigan.**

**Findings:** We have much to learn regarding the movement patterns and distributions of steelhead and brown trout within Lake Michigan. It is difficult distinguish distributional anomalies from density and abundance factors with the small number of steelhead and brown trout observed in our surveys. In MM-3, the northernmost statistical district, few steelhead or brown trout were observed (Table 1). Brown trout were more evenly distributed across statistical districts MM-5 through MM-8 (Table 1). The largest steelhead catch rates again occurred in the southernmost district (MM-8; Table 1). Most steelhead and brown trout were captured in surface gill nets (65-100%) as compared to catch rates in suspended (10-35%) or bottom gill nets (0-15%; Table 2).

**Job 3. Title: Determine relative abundance and survival rates of steelhead and brown trout in eastern Lake Michigan.**

**Findings:** For steelhead and brown trout the samples sizes from gill net assessments are highly variable from year to year. It will be difficult to establish mortality estimates or attribute catch rates to abundance until multi-state lake-wide assessments are implemented. Members of the Lake Michigan Technical Committee are in the process of designing a lakewide assessment plan for trout and salmon populations.

**Job 4. Title: Obtain data on diets of steelhead and brown trout in eastern Lake Michigan.**

**Findings:** We took stomachs from all steelhead and brown trout collected in 1998. We have archived stomach samples, but have not yet evaluated the stomach contents. Laboratory analysis is complete for stomachs collected in 1995, however these data have not been analyzed.

**Job 5. Title: Monitor the general health and prevalence of BKD in populations of steelhead and brown trout in eastern Lake Michigan.**

**Findings:** We conducted FELISA testing for BKD on steelhead and brown trout collected in 1998. All brown trout collected in lake-wide assessments tested negative for BKD. Since 1995, no brown trout collected in annual surveys have tested positive for BKD. Over the years, steelhead have tested positive at levels ranging from 0 to 25 percent of the fish tested.

**Job 6. Title: Coordinate with other studies, process and analyze data, write reports.**

**Findings:** Data collection for this project is closely coordinated with studies 486 and 485. We will also use information collected for the current study (490) in study 487. This progress report was prepared.

**Prepared by:** Jory Jonas.  
**Date:** September 30, 1998

Table 1.—Total catch of steelhead and brown in trout statistical districts (MM-3 through MM-8) listed from north to south.

	1994		1995		1996		1997		1998		TOTAL	
	Brown Trout	Steelhead	Brown Trout	Steelhead	Brown Trout	Steelhead	Brown Trout	Steelhead	Brown Trout	Steelhead	Brown Trout	Steelhead
MM-3	2	1	1	1	2	1	0	1	0	4	5	8
MM-4	0	0	0	0	0	0	0	1	0	0	0	1
MM-5	1	0	1	7	8	41	18	1	0	0	28	49
MM-6	4	13	2	31	1	44	5	3	4	5	16	96
MM-7	0	9	1	16	8	85	6	4	0	0	15	114
MM-8	0	19	0	50	2	240	10	5	2	8	14	322

Table 2.—Number of steelhead and brown trout captured in surface, suspended, and bottom gill nets. From 1994-1996, surface and suspended nets were not separated in the catch records, since only one fish was collected in a bottom gill net during this period the years have been combined. Numbers in parenthesis represent the percent captured in each gear.

	1994-1996			1997			1998		
	Bottom Net	Surface Net	Suspended Net	Bottom Net	Surface Net	Suspended Net	Bottom Net	Surface Net	Suspended Net
Brown Trout	1 (3%)	32 (97%)	6 (15%)	4 (10%)	29 (75%)	0 (0%)	0 (0%)	1 (12%)	7 (88%)
Steelhead	0 (0%)	558 (100%)	0 (0%)	4 (27%)	11 (73%)	0 (0%)	6 (35%)	11 (65%)	

Table 3.—Incidence of BKD (bacterial kidney disease) in Lake Michigan steelhead and brown trout captured in assessment netting operations. The percent frequency is given in parenthesis.

	1995		1996		1997		1998	
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Steelhead	30 (23%)	103 (77%)	41 (9%)	411 (91%)	5 (25%)	15 (75%)	0 (0%)	17 (100%)
Brown trout	0 (0%)	5 (100%)	0 (0%)	20(100%)	0 (0%)	35 (100%)	0 (0%)	5 (100%)