

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-80-R-4

Study No.: 696

Title: Comparison of the recreational fisheries produced by stocking of spring and fall yearling brown trout, Lake Huron.

Period Covered: October 1, 2002 to September 30, 2003

Study Objective:

- (1) To test the hypothesis that yearling brown trout stocked in fall will contribute more to angler harvest than smaller yearlings stocked in spring in Thunder and Tawas bays, Lake Huron;
- (2) Determine whether the return to creel of fall-stocked brown trout is sufficient to compensate for their higher cost;
- (3) To examine food habits and distribution of yearling brown trout during their first 30 days after stocking.

Summary: This was the second year of funding for this project. The two study groups were stocked with inconsequential departures from the stocking plan at Tawas and Thunder bays. Netting was conducted as planned after stocking in 2002 and 2003. Spring gillnet assessments suggest alewife numbers have declined in Thunder Bay. Stocking success for spring yearlings appears to be positively correlated with adult alewife abundance at the time of stocking. Mature lake trout and chinook salmon predominated in the fall gillnet assessment catch. Most predator stomachs were void in the fall survey but recently stocked brown trout were seen in three predator fish species. Creel census was conducted in both years. Brown trout harvest remained low at Thunder Bay but appears to have recovered in Tawas Bay. Creel census observations were supplemented with biological data collections from angler harvest during the 2003 annual Alpena Brown Trout Festival. Data from spring netting, fall netting, creel survey, and Festival survey are being entered. Analysis of results from 2003 will be presented in next year's report.

Findings: Jobs 1, 2, 3, and 4 were scheduled for 2002-03, and progress is reported below.

Job 1. Title: Stock test groups of brown trout during spring and fall.—Stocking began in 2001, a year prior to the initiation of this study, in anticipation the work would be funded. Stocking to date is summarized in Table 1.

The study plan called for stockings of 30,000 fall yearlings and 60,000 spring yearlings at each site annually for three years. The actual numbers of fish were somewhat different than requested. The study documents called for right-ventral fin clips for spring plants and left-ventral fin clips for fall plants; however, the fin clip allocation was reversed by the hatchery. The study plan calls for weighting harvest estimates based on number of each study cohort stocked, which will correct for annual differences in numbers stocked. The reversal of fin clips was maintained for all three years of the study. Thus, neither change in stocking numbers nor the reversal of mark will affect the outcome of the study in any way.

The final installment of the stocking phase is October 2003. Those numbers will be reported in next year's report.

Job 2. Title: Assess conditions of the receiving water in Thunder Bay.—Five graded-mesh gillnets were fished for two days each in Thunder Bay in June 2002 and June 2003; immediately prior to, or during, stocking. The objective was to assess relative abundance of alewives in spawning condition and to index numbers of piscine predators at time of stocking. Alewives are thought to be an important buffer against predation on newly stocked trout during the spring stocking period. Catch from the 2002 spring assessment is given in Table 2. Adult alewives were the most common fish in the catch while walleyes were the principal predator fish (Table 2). The catch of alewives in 2002 and 2003 was the lowest since 1998 (Table 3). The catch of alewives in the spring assessment appears to be positively correlated with harvest of brown trout (Table 3) one year later ($R^2 = 0.86$). Thus, the low alewife catch rates in 2002 and 2003 may be followed by further declines in the brown trout fishery in Thunder Bay. Only the alewife catch from the spring 2003 survey has been summarized to date. The balance of the data from spring 2003 have been entered and the catch has been aged. Results of 2003 spring predator netting will be presented in next year's progress report.

Gillnetting near the stocking site was conducted in fall 2002 to index relative abundance of the two study groups and to assess abundance of piscine predators at the stocking site. However, the catch was dominated by mature lake trout (Table 4) and 6 (15%) of the lake trout were unclipped, potentially wild fish. Only 8% of the catch was brown trout. Thus, the amount of gear set was limited to 4 nets to prevent killing excessive numbers of spawning-stage lake trout. Only 6 of the 10 brown trout sampled were identifiable as study fish, based on fin clips; all 6 fin clipped brown trout were from fall yearling stockings of either 2001 (age 2) or 2002 (age 1) (Table 5). The age 1 brown trout had been stocked only three weeks earlier and averaged 247 mm total length. Of the predators in the catch, only walleyes showed much evidence of feeding. The lake trout and chinook salmon catch was composed of mature fish, most of which were evidently not feeding (Table 6). However, one recently stocked brown trout was observed in each of three predator species: northern pike, lake trout, and walleye (Table 6).

Job 3. Title: Determine return to creel of stocked fish.—Creel census was conducted as per the study plan in 2002 and 2003 at Tawas and Alpena. The preliminary harvest estimates for Tawas and Alpena in 2002 were 1,987 and 237, respectively. These data do not include reported harvest by charter operations, which when known will increase the estimates slightly. Biological data were recorded from all brown trout observed during creel census activities. However, the biological data from neither 2002 nor 2003 were yet available for analysis from Study 427 at the time of this report. Fin clips and age determinations from the biological data will be used in next year's report to estimate the proportions of harvest contributed by the two study groups to brown trout harvest at Tawas and Alpena. To augment creel observations of brown trout, Alpena Station personnel were assigned to monitor recreational catch during the annual Alpena Brown Trout Festival during July 2003. This additional effort may, in combination with creel census biological data, provide sufficient numbers of observations to enhance comparison of the two study groups in the recreational fishery. Analysis of creel census data will be done by Study 427 personnel at the Charlevoix Fishery Station. The Alpena Station is entering the Brown Trout Festival data.

Job 4. Title: Data analysis, preparation of annual and final reports, and presentation of findings at technical and public meetings.—Data from jobs 1-3 from 2003 are presently being entered and analyzed. The annual progress report was prepared as per study documents. The Project Leader presented progress of the study to local recreational fishing groups and the Alpena City Council.

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Date: September 30, 2003

Table 1.–Stocking of brown trout study groups, Tawas and Thunder bays, 2001-2003.

Location	Test group	Fin clip	2001	2002	2003
Tawas	Spring	Left ventral	60,000	79,328	66,000
	Fall	Right ventral	33,415	30,393	*
Thunder Bay	Spring	Left ventral	72,967	65,737	48,000
	Fall	Right ventral	35,417	35,544	*

*Not yet stocked

Table 2.–Catch and catch per unit effort, by species, June gillnet sets, Thunder Bay, 2002.

Species	Number	Catch/305 m ¹	Mean length (mm)	Mean weight (gm)
Alewives	139	55.6	169	0.04
Gizzard shad	4	1.6	415	0.77
Northern pike	5	2.0	794	3.27
Channel catfish	7	2.8	435	0.85
Freshwater drum	5	2.0	390	0.80
Brown trout	1	0.4	373	0.62
Carp	1	0.4	675	4.16
White sucker	11	4.4	486	2.15
Bluegill	1	0.4	114	0.02
Smallmouth bass	1	0.4	321	0.45
Walleye	27	10.8	539	1.61

¹Effort = ten 76-m graded-mesh gillnets

Table 3.—Catch rate of alewives in graded-mesh gillnets and recreational harvest of brown trout one year after gillnet survey.

Survey year	Alewife catch/305 m	Brown trout harvest 1 yr after survey
1990	154.7	500
1991	269.1	2,284
1992	220.0	3,908
1993	737.3	3,698
1994	405.5	3,524
1995	312.7	2,069
1996	No survey	896
1997	No survey	869
1998	11.0	161
1999	No survey	330
2000	144.7	46
2001	168.0	237
2002	55.6	Not yet available
2003	32.0	Not yet available

Table 4.—Catch in graded-mesh gillnets¹ set in October, 2002, Thunder Bay.

Species	Number caught	Catch/305 m	Average length (mm)	Average weight (gm)
Bowfin	1	0.8	532	1.69
Gizzard shad	42	35.0	465	1.53
Northern pike	1	0.8	665	1.99
Lake whitefish	4	3.3	558	1.53
Chinook salmon	16	13.3	668	2.77
Brown trout	10	8.3	514	2.27
Lake trout	41	34.2	661	2.64
White sucker	7	5.8	533	1.58
Walleye	5	4.2	554	1.77

¹Effort = four sets of 91-m graded nylon mesh.

Table 5.—Composition of brown trout catch in fall survey gillnets, Thunder Bay, 2002.

Fin clip	Study group	Age	Count
Right Ventral	Fall yearlings	1	2
	Fall yearlings	2	3
Left ventral	Spring yearlings		0
No clip	Not study fish	2	1
	Not study fish	3	4

Table 6.—Summary of stomach contents of predator fish sampled in fall gillnets, Thunder Bay, October 2002.

Predator species	Number examined	Number void	Prey item		
			Brown trout	Goby	Unidentifiable fish
Northern pike	1	0	1		
Chinook salmon	16	16			
Brown trout	10	10			
Lake trout	41	40	1		
Walleye	5	2	1	1	1