

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-80-R-5

Study No.: 230696

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

Period Covered: October 1, 2003 to September 30, 2004

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 third year of funding for this project. The two study groups were stocked at Tawas and Thunder bays with one departure from the stocking plan: Thunder Bay received 48,000 spring yearlings instead of the targeted 60,000. Netting was conducted as planned after stocking in 2002, 2003, and 2004. Alewives and walleyes were the most frequently caught species in the spring 2003 gillnet assessment. Spring assessments suggest alewife numbers are declining in Thunder Bay. Stocking success for spring yearlings appears to be correlated with adult alewife abundance at the time of stocking. Recently stocked brown trout and mature lake trout predominated in the fall 2003 gillnet assessment catch. Lake whitefish, white suckers, lake trout, and round gobies were the lead species in trapnet catches in fall 2003. Most predator stomachs were void in the fall. Recently stocked yearling brown trout also had void stomachs. Creel census was conducted each year. Brown trout harvest recovered at both ports from 2001-2003, particularly at Tawas Bay. Creel census observations were supplemented with biological data collections from angler harvest during the 2004 annual Alpena Brown Trout Festival. Data from 2004 spring netting, fall netting, creel survey, and Festival survey are being entered. Analysis of results from 2004 will be presented in next year's report.

Findings: Jobs 1, 2, 3, and 4 were scheduled for 2003-04, 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 stocked were somewhat different than requested. More than the requested numbers were stocked in all events except spring 2003 at Alpena, when 12,000 less than the requested number was stocked (Table 1). 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.

The final installment of the stocking phase was October 2003. Thus, Job 1 is now completed.

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 2003 and June 2004 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. Catch from the 2003 spring assessment is given in Table 2. Adult alewives were the most common fish in the catch while walleyes were the principal predator fish. The catch of alewives in 2003 and 2004 was the lowest since 1998 (Table 3). Alewives are thought to be an important buffer against predation on newly stocked trout during the spring stocking period; thus, the low alewife catch rates in 2003 and 2004 may be followed by further declines in the brown trout fishery in Thunder Bay. Only 2 brown trout were caught in the spring 2003 survey. The alewife catch from the spring 2004 survey has been summarized (Table 3). The balance of the data from spring 2004 is still being analyzed and will be presented in next year's progress report.

Gillnetting near the stocking site was conducted in fall 2003 to index relative abundance of the two study groups and to assess abundance of piscine predators at the time of fall stocking. However, predominantly wild, mature lake trout were caught in both fall of 2002 and 2003. Thus, fall gillnet effort was limited to 3 net nights in 2003 to prevent killing excessive numbers of spawning-stage lake trout. Trapnets are a nonlethal sampling method. A total of 28 lifts of small trapnets were made in place of some of the gillnet effort. A total of 74 brown trout were caught in fall 2003, gillnets and trapnets combined. Of the total, 65 were fin clipped trout stocked immediately prior to the fall survey, 4 were from the fall 2002 stocking, one was from the spring 2001 stocking, and 5 bore no identifiable fin clip. Only 5 study (fin clipped) fish were sampled that had survived at least one winter, four were from fall stockings and one from spring (tables 4, 5, and 6). Only the stomach of one freshwater drum contained food; the balance of stomachs examined were void. Chinook salmon and lake trout seldom feed when in spawning condition. Most of the recently stocked brown trout, however, were immature. Round gobies were abundant in Thunder Bay; yet they did not appear in brown trout stomachs (Table 7). No recently stocked brown trout were observed in the guts of predator species during the 2003 surveys (Table 7).

Job 3. Title: Determine return to creel of stocked fish.—Creel census was conducted as per the study plan in 2002, 2003, and 2004 at Tawas (Tawas Bay) and Alpena (Thunder Bay). Harvest of brown trout had declined at both ports from 1996 through 2001, but rose in 2002 and again in 2003. The magnitude of increase was higher at Tawas than Thunder Bay. (Table 8). 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 (the Great Lakes Creel Census study) 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 2002, 2003, and 2004. 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.

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 2004 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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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	33,554
Thunder Bay	Spring	Left ventral	72,967	65,737	48,000
	Fall	Right ventral	35,417	35,544	37,000

Table 2.—Catch and catch per unit effort, by species, June gillnet sets, Thunder Bay, 2003.

Species	Number	Catch/305 m ¹	Mean length (mm)	Mean weight (gm)
Alewives	80	32.0	174	0.04
Brown trout	2	0.8	235	0.18
Carp	1	0.4	779	5.37
Channel catfish	7	2.8	493	1.22
Freshwater drum	6	2.4	398	0.77
Gizzard shad	15	6.0	433	1.11
Northern pike	3	1.2	735	2.69
Rock bass	5	2.0	141	0.08
Smallmouth bass	1	0.4	432	1.24
Walleye	39	15.6	458	1.27
White sucker	4	1.6	461	0.99

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, Thunder Bay.

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	560
2003	32.0	Not yet available
2004	5.6	Not yet available

Table 4.—Catch in graded-mesh gillnets¹ set in October, 2003, Thunder Bay.

Species	Number caught	Catch/305 m	Average length (mm)	Average weight (gm)
Chinook salmon	1	1.3	686	4.43
Brown trout	69	92.1	319	0.48
Lake trout	10	13.3	638	2.35
White sucker	1	1.3	478	1.22
Walleye	1	1.32	298	0.31
Freshwater drum	2	2.7	423	2.00

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

Table 5.–Catch in trapnets¹ set in October, 2003, Thunder Bay.

Species	Number caught	Catch/305 m	Average length (mm)
Burbot	8	0.3	614
Lake whitefish	147	5.4	520
Round whitefish	1	0.0	450
Brown trout	5	0.2	264
Lake trout	20	0.7	646
Longnose sucker	2	0.1	380
White sucker	43	1.6	526
Rock bass	1	0.0	141
Smallmouth bass	2	0.1	296
Walleye	2	0.1	219
Round goby	45	1.7	164

¹Effort = 28 lifts of 2 m high by 3 m wide small mesh traps.

Table 6.–Composition of brown trout catch in fall survey gillnets and trapnets, Thunder Bay, 2003.

Fin clip	Study group	Age	Count
Right Ventral	Fall yearlings	1	64
Right Ventral	Fall yearlings	2	4
Left ventral	Spring yearlings	3	1
No clip	Not study fish	1	1
No clip	Not study fish	2	1
No clip	Not study fish	NA	3

Table 7.—Summary of stomach contents of predator fish sampled in fall gillnets, Thunder Bay, October 2003.

Predator species	Number examined	Number void	Prey item		
			Brown trout	Goby	Unidentifiable fish
Freshwater drum	2	1			1
Chinook salmon	1	1			
Brown trout	69	69			
Lake trout	10	10			
Walleye	1	1			

Table 8.—Estimated brown trout recreational Harvest, Tawas and Thunder Bays, 1986-2003.

Year	Tawas Bay	Thunder Bay
1986	6,782	3,873
1987	1,445	3,107
1988	578	656
1989	127	
1990		
1991	200	395
1992	310	2,011
1993	284	3,366
1994	1,715	3,322
1995	3,665	3,167
1996	4,543	1,899
1997	1,310	855
1998	765	822
1999	668	156
2000	1,026	314
2001	459	46
2002	1,987	237
2003	2,304	560