

**MANAGEMENT OF TROUT FISHING
IN A
METROPOLITAN AREA**

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MANAGEMENT OF TROUT FISHING IN A
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By L. M. Carl, J. R. Ryckman¹ and W. C. Latta

Abstract

Rainbow trout of legal size or larger were stocked in a 5-mile length of the Huron River, Oakland County, Michigan, where conditions of flow and temperature are favorable for trout only during the spring months. Special fishing regulations were enacted. For April and May only artificial flies could be used and all trout caught had to be released. In June, bait was restricted to flies or other artificial lures, the creel limit was two trout, and the minimum legal size was 10.0 inches. Between July 1 and September 30, natural bait or artificial lures could be used, the creel limit was five trout and the minimum size was 10.0 inches (normal state-wide trout regulations). From April through September trout anglers fished 10,411 hours in 3,297 trips. Sixty-four percent of the fishing took place in April and May. A total of 5,706 trout were caught. Each fish was caught approximately 2.35 times. Fishermen spent an average of \$10.92 per trip. Total net benefits for the program were \$37,375 and the total expenses were \$3,708, giving a benefit-to-cost ratio of 10.1 to 1. The mean personal income of the anglers was \$14,570, well above the average. Fishermen traveled an average of 50.4 miles for each fishing trip. The program was successful in utilizing hatchery trout efficiently to provide fishing in an urbanized area.

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Introduction

Trout fishing in the seven-county metropolitan area of southeastern Michigan is scarce. Currently only three or four small streams are considered capable of sustaining trout year around. The closest streams that can provide quality trout fishing are 150 to 200 miles north of the metropolitan area. With 54% of the 9 million people in Michigan living in this seven-county area, it would be desirable to create attractive and economically feasible trout fishing closer to where most of the people live. Cooper (1959) and Everhart, Eipper and Youngs (1975) have cited the undesirable aspects of crowds of anglers and spiraling costs associated with "put-and-take" or "catchable" stocking programs but the variation on this type of stocking described here seems to have the potential for avoiding these excesses.

Sections of the upper Huron River in Oakland County are quite suitable for trout in the spring and early summer. The section below Moss Lake has good holes and cool water during the spring, and it is wadable and free of overhanging obstructions for fly fishing. Unfortunately, the river flow drops drastically in the summer and water temperature rises to 80 F. In 1974, the Michigan Fly Fishing Club obtained permission from the Michigan Department of Natural Resources to stock trout in this stretch of river and to post voluntary regulations limiting the fishing to flies-only in April and May. Following a successful season in 1974, the Club asked the Department to stock the river in 1975. The Department agreed to provide the trout and special regulations were devised which required flies-only, catch-and-release fishing during the first 2 months of the season, a limited harvest for a month, and then allowed normal harvest with state-wide rules applying. The regulations were meant to allow fishermen to use the waters when the river was favorable for trout and harvest the fish before river conditions became intolerable for trout.

The purpose of this study was to evaluate the program as a management tool to provide a variety of trout fishing for the anglers in the metropolitan area.

Methods

The experimental area was divided by land section into three portions (Fig. 1). Area I was the upstream portion which started at Moss Lake (T. 2 N., R. 8 E., Sec. 17) and extended down to Wixom Road. Area II was bound by Wixom Road and Burns Road. Area III was the downstream portion which extended from Burns Road to Milford Road in Milford (T. 2 N., R. 7 E., Sec. 11). All three areas were in 1-mile land sections with actual river mileage between 1 and 2 miles. Areas I and II were within the Proud Lake Recreation Area of the Michigan Department of Natural Resources.

A stratified, random-sampling scheme was used to count anglers, with weekends and week days each sampled equal amounts of time for a total of 1 to 4 days per week, depending on the month. The time of the work shift was randomly chosen from three possible shifts covering the daylight hours. Total angler counts were made one to two times each work shift by motor vehicle or by canoeing the river.

Fishermen were interviewed at one of six sites after they had completed their fishing trip. One clerk interviewed all respondents and asked all questions in a standard way. The interview form consisted of two pages of questions designed to evaluate and elucidate the various aspects of the program (see Appendix A). Each interview took 2 to 4 minutes. If a fisherman had been interviewed before, only catch data were collected; the survey questions were not asked twice. A majority of the interviews were conducted in April and May (Appendix B). No interviews were made in September and therefore only angler hours were calculated for that month. Angler trips for September were estimated by dividing angler hours for September by the mean hours fished per fisherman over the total fishing season. September is not included in Appendix B because of the lack of interviews.

On March 28, 1975, approximately 2,430 rainbow trout (Salmo gairdneri) weighing 1 pound each and averaging 13.0 inches in length were planted at the upper and lower ends of Area I (Fig. 1). The fishing season started 4 days later on April 1. Between April 1 and May 31, lures were restricted to artificial flies and all trout caught had to be released. Between June 1 and June 30, lures were restricted to either artificial flies, spinners, spoons, or plugs; the daily creel limit was two trout and minimum legal size was 10.0 inches. Between July 1 and September 30, either natural bait or artificial lures could be used, and the legal size was 10.0 inches with a daily creel limit of five trout (normal state-wide trout regulations).

Results

From April 1 through September 30, anglers fished 14,397 hours in the experimental area (Table 1). One-third of the total fishing took place during April and 94% of the April fishing was recorded in Area I. For Areas II and III only angler hours were estimated because there were not enough interviews in these areas for reliable estimates of catch. Out of a total of 213 interviews there were only 11 from these two areas. Anglers fished 10,600 hours in 4,631 trips to Area I (Table 2) and caught 5,706 fish (Table 3). During April and May, 5,081 fish were caught and released. Of the 2,430 fish planted, 625 were harvested in June and July for a rate of exploitation of 26%. The catch per hour for the season averaged 0.54 fish (Table 3). The ratio of total fish caught by fishermen to fish planted was 2.35 (Table 4).

Fishermen spent, on the average, \$3.30 per trip for all expenses other than transportation. They drove an average of 50.8 miles for each fishing trip. At \$0.15 per mile this represented \$7.62 per trip for transportation. Thus the total trip expenses were estimated to be \$10.92.

Forty-nine fishermen were willing to accept \$5.61 per hour to give up their fishing right for the day, and 110 fishermen were willing

to pay \$1.57 for each hour they fished on the study area. Average income for the fishermen was \$14,570.

The average age of the fishermen interviewed was 29.4 years and 98.6% were white males. Each angler fished an average of 2.58 hours on each trip. The average distance of fishermen's homes to the Proud Lake Recreation Area was 22.1 miles.

The majority of fishermen waded and fly fished (Table 5). Of the fishermen interviewed, 37.7% stated they had fished in the area before and 17.5% of them had fished last year for trout. Each angler had fished 2 years prior to 1975 in this area of the Huron River and had fished approximately 1.5 times in the experimental area at the time of the interview in 1975.

In response to the question "Will you return?" 96.6% of 145 fishermen said yes. Most of the fishermen (99.3%) who responded to "Was fishing the main reason for your visit today?" answered yes. Over 77% of all the interviewed fishermen said they ate the fish they caught, and 94.4% of the June-through-August fishermen said they would "fish-for-fun" i.e., not keep any fish they caught. Those who were fishing in April and May were not asked this question because they were "fishing-for-fun" at the time of the interview.

Many fishermen (69.7%) felt their fishing experience was good or very good and more than 91% thought the river was pleasant or very pleasant. Of the 92.7% aware of the program, 95.6% rated it good or very good (Table 6).

Answers to questions on number and size of trout that fishermen prefer to catch are summarized in Table 7. Seventy-one percent of 143 fishermen chose five 1/2-pound trout over one 2-pound trout; 67% of 144 fishermen preferred five 7-inch trout over one 12-inch trout; and 51% of 148 fishermen, when "fishing-for-fun", chose twenty 8-inch trout over five 12-inch trout.

Discussion

Angling pressure at Proud Lake was concentrated primarily in the first 2 months of the season (Table 1). Angler hours in Area I decreased steadily from April to August, then rose slightly in September (Table 2). Angler hours during the last 2 months were probably for other fish (sunfish, bass, carp, etc.) and not a result of the trout program because most trout undoubtedly moved to cooler water or were caught by August. Water temperatures were well within tolerance limits for rainbow trout until late May when midday temperatures reached a high of 76 F. The census clerk reported seeing very few trout in the stream in July when midday temperatures averaged 80 F. Conversely, little or no angling for fish other than trout occurred during April and most of May because of high water, cool air temperatures and restrictive regulations. This was especially true of areas II and III (Fig. 1). The river is slow and deep (and not convenient for fishing) with access sites only at bridges on the river in both of these areas. Trout fishermen, new to the river, tried wading or fishing these two areas near bridges without success. By June, most trout fishermen concentrated their effort in Area I where wading and casting from shore were easier.

For an evaluation of the experimental trout program, angler hours and trips should include a combination of the total hours for April and May when no significant panfishing occurred in areas II and III, and include only Area I for June and July. Trout fishermen had learned by the first of June that Area I provided the best fishing. No trips were made by trout fishermen in August or September. Therefore, a better estimate of trout fishing pressure than Area I hours or total area hours would be the sum of total area hours for April and May plus Area I hours for June and July. Unfortunately, angler trips could not be estimated for the total area; therefore trout-angler trips have to be the sum of the Area I trips from April to July. Thus the best estimate for trout-angler hours is 10,411 and for angler trips, 3,297.

Total fish caught in May and June was down sharply from April. This reflects a decline in the catch rate in these latter months and a decrease in angler hours. The July catch rose due to a much higher catch rate (Table 3). As shown in Table 4, fish were caught, on the average, 2.35 times which is a better use of hatchery fish than would be the case with catch-and-keep regulations. The estimate of 2.35 (95% confidence band 1.2-3.5) is probably low since the divisor is the number of fish planted rather than the number surviving in the stream at any time.

As stated previously, fishermen were willing to spend \$1.57 for each hour of fishing at the Proud Lake-Huron River Area. Fishermen also stated that it would be necessary to pay them \$5.61 per hour to forfeit their fishing right for the day. The amount they were willing to pay would be a minimum worth of the fishery. The dollars they requested to forfeit their fishing right is not a maximum estimate since the fishermen who would not give up their rights for any price were not included in this mean value. Since these were on-site interviews, no alternative recreation was available and presumably the fishermen would demand more than if they were planning the trip and other alternatives were available. Pearse and Laub (1971) used the "amount demanded to forfeit the fishing right" to calculate the net worth of the Kootenay Lake sport fishery. We believe a simple average of the two hourly estimates (\$3.59) gives a more representative value. Transportation costs were \$7.61 per trip; other costs were \$3.30 per trip. Converting these to an hourly rate by dividing by 2.58 hours per trip gives values of \$2.95 per hour and \$1.28 per hour, respectively. Costs to the fishermen totaled \$2.95 + \$1.28, or \$4.23 on an hourly rate. Adding the \$3.59 per hour value figure and \$4.23 per hour for costs and multiplying this by the estimated trout fishing hours, gives an estimate of \$81,414 as the worth of the fishery $[(\$4.23/\text{hr} + \$3.59/\text{hr}) \times 10,411 \text{ hr}]$. The net value of the fishery alone would be $(\$3.59 \times 10,411 \text{ hr})$ \$37,375.50 (Matthews and Brown, 1970).

The costs of the project were \$3,258 for planting the fish and an estimated \$450 for enforcement of fishing regulations. A net benefit-to-cost ratio [$\$37,375.50 \div (\$3,258 + \$450)$] of 10.1 was calculated, or for each dollar spent a benefit of \$10.10 was estimated to accrue to the fisherman. Looking only at April and May, the total net value to the fishermen was \$28,989.25 [(total April angler hours of 4,769 + total May angler hours of 3,306) \times \$3.59]. Thus 78% of the total net value of the fishery occurred during the catch-and-release fly fishing and indicates that much of the success of the program was because of this feature.

The fisherman's average income was \$14,570 which is high compared with the \$9,300 reported by fishermen in 1974 in a study done on the impoundments of the Huron River in and near Ann Arbor where trout were not available.

Certain changes in fisherman response to questions occurred after May. The mean number of years previously fished in the area was significantly lower (99% level in a one-way analysis of variance) during April and May than during June, July and August (1.4 years for April and May vs 5.6 years for June, July and August). The early season regulations requiring fly fishing and release of fish attracted people who normally would not fish the area, and therefore they had not fished in the area more than a year or two before. (In 1974, flies-only, voluntary catch-and-release regulations were adopted when 400 rainbow trout were planted by the Michigan Fly Fishing Club.) In April and May, fishermen were aware of the catch-and-release program and few were interested in keeping the fish. In June, July and August few fishermen knew of the program. Significantly fewer fishermen were aware the river had been stocked in June, July and August ($74.1 \pm 16.9\%$) than in April and May ($96.7 \pm 3.2\%$). Also, more of these later fishermen, who had fished longer and more often, indicated they wanted to eat the fish they caught than the spring fishermen. (At the 95% confidence level, significantly more fishermen said they ate the fish they caught: $96.3 \pm 7.2\%$ for June, July and August vs $73.2 \pm 8.0\%$ for April and May.) It is

likely that more "regular" Huron River fishermen, who fish the river year after year, fished in the latter months than in the beginning of the program when the restrictive regulations were in force.

As was expected, fishing methods changed when the regulations changed (Table 5). After May, shore fishing increased while wading and fly fishing declined.

Responses to "Do you usually eat the fish you catch?" were very similar to other studies. In a 1972 census of the Huron River near Ann Arbor, 74.9% said yes; 78.9% in 1974. A St. Louis, Missouri, study reported 78% of the fishermen ate the fish they caught (Ikeda 1971). A similar percentage of the Proud Lake fishermen (77.3% for the whole season) said they usually ate the fish they caught.

The response to the program and river environment was very good (Table 6). Most fishermen felt their fishing experience on the river was good and even more approved of the management program. Without doubt the fishermen felt the program was successful in terms of aesthetics and fishing quality.

Fishermen appear to prefer more small fish to one or a few larger fish. In two questions relating size and weight to number of fish, fishermen preferred smaller fish. In a fish-for-fun question, 51.4% of the Proud Lake Area fishermen interviewed stated they preferred to catch and release twenty 8-inch brook trout to five 12-inch trout. Here again they preferred a larger number of smaller trout even when given the opportunity to catch and release a sizable number of larger trout.

Acknowledgments

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Table 1. --Angler hours for whole area (with 95% confidence limits)

Date	Angler hours
<u>1975</u>	
April	4769 ± 1973
May	3306 ± 1160
June	2029 ± 1407
July	2059 ± 849
August	868 ± 198
September	1366 ± 1105
Total	14,397 ± 3033

Table 2. --Angler hours and angler trips for Area I (Wixom Road upstream to Moss Lake), with 95% confidence limits

Date	Angler hours	Angler trips
<u>1975</u>		
April	4493 ± 1962	1731 ± 782
May	2343 ± 1074	775 ± 398
June	1528 ± 1366	589 ± 538
July	808 ± 432	202 ± 108
August	588 ± 457	608 ± 221
September	840 ± 686	726 ± 601
Totals	10,600 ± 2783	4,631 ± 2,021

Table 3. --Number of trout caught and catch rates for Area I, with 95% confidence limits

Date	Number of trout caught	Trout per hour
<u>1975</u>		
April	4435 ± 2580	0.99 ± 0.38
May	646 ± 818	0.28 ± 0.33
June	154 ± 172	0.10 ± 0.07
July	471 ± 791	0.58 ± 0.93
August	0 ± 0	0.00 ± 0.00
September	0 ± 0	0.00 ± 0.00
Totals and means	5706 ± 2825	0.54 ± 0.41

Table 4. --Ratios of trout caught by fishermen in Area I to trout planted

April and May (catch-and-release)	2.10 ± 1.11
June, July, August, September (catch-and-keep)	0.26 ± 0.33
April-September	2.35 ± 1.16

Table 5.--Fishing type, method and bait used by fishermen

	Percent- age	Num- ber
<u>Fishing type</u>		
Boat	2.5	5
Shore	41.7	83
Wading	55.8	111
<u>Fishing method</u>		
Still	5.2	11
Casting	16.9	36
Fly	77.9	166
<u>Bait used</u>		
Worms	5.7	12
Minnows	1.9	4
Artificials	12.3	26
Flies	78.7	167
Other	1.4	3

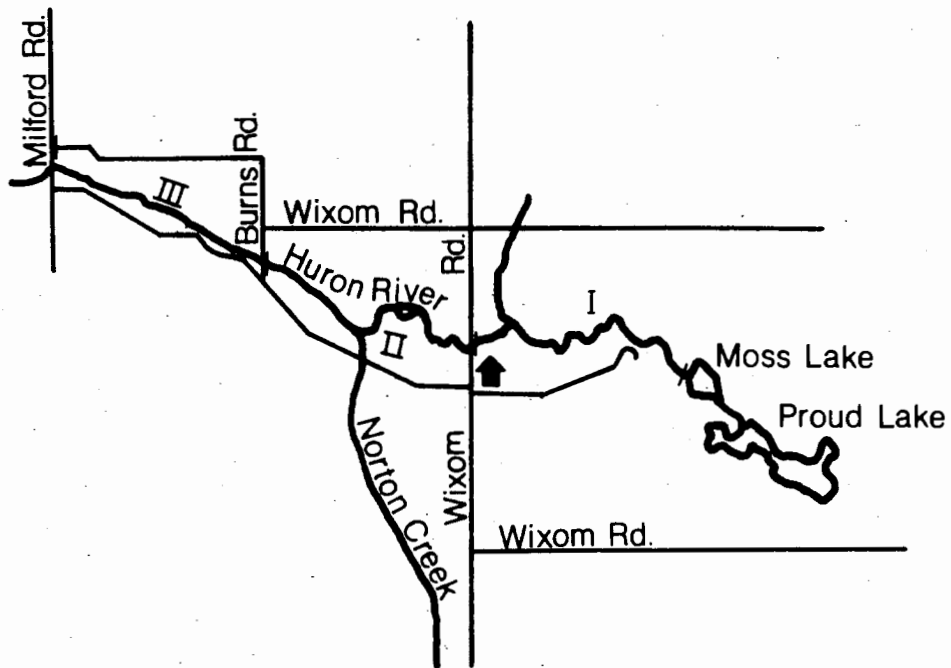
Table 6. --Fishermen responses to program and area quality

	Percent-	Num-
	age	ber
<u>Quality of total fishing experience at this site</u>		
Very good	23.2	33
Good	46.5	66
Indifferent	8.5	12
Poor	15.5	22
Very poor	6.3	9
<u>Aesthetic quality of the river banks and adjacent land area</u>		
Very pleasant	35.1	52
Pleasant	56.1	83
Indifferent	5.4	8
Unpleasant	3.4	5
Very unpleasant	0.0	
<u>Rating the program (overall)</u>		
Very good	62.8	86
Good	32.8	45
Average	3.6	5
Poor	0.8	1
Very poor	0.0	

Table 7. --Catch preferences of fishermen

	Percent-	Num-
	age	ber
<hr/>		
Choice of one 2-pound trout or five 1/2-pound trout		
One 2-pound trout	29.4	42
Five 1/2-pound trout	70.6	101
Choice of five 7-inch brook trout or one 12-inch brook trout		
Five 7-inch brook trout	66.7	96
One 12-inch brook trout	33.3	48
Fishing for fun: Choice of twenty 8-inch brook trout or five 12-inch brook trout		
Twenty 8-inch brook trout	51.4	76
Five 12-inch brook trout	48.6	72

HURON RIVER Proud Lake Recreation Area Oakland Co, Michigan



LEGEND

- ▲ - Headquarters
- Area I - Moss Lake to Wixom Rd.
- Area II - Wixom Rd. to Burns Rd.
- Area III - Burns Rd. to Milford Rd.

Figure 1

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Report approved by W. C. Latta

Typed by M. S. McClure

Appendix A. --Survey questionnaire (first page)

HURON RIVER TROUT FISHERMEN SURVEY - 1975

Date _____ Time _____ AM _____ PM Area _____ Trip: Comp. _____ Incomp. _____

Day of week: _____ Hours fished _____ Locality: _____ Form: S L

Sex: Male _____ Female _____ Spouse _____ Race _____ Age _____

	Number of $\sqrt{}$ fish taken	Fishing type: Boat _____ Shore _____ Wading _____	
		<u>Fishing Method</u>	<u>Bait Used</u>
Rainbow trout	_____	Still _____	Worms _____
Other	_____	Casting _____	Minnows _____
Other	_____	Fly _____	Artificials _____
TOTAL	_____		Flies _____
Club Affiliation	_____		Other _____
Access Site	_____		

$\sqrt{}$ (#) = fisherman's estimate of his catch, # = fish seen by interviewer.

Appendix A. --Survey questionnaire (second page)

1. Have you fished the river in this area before? ___ If yes, did you fish last year for trout? ___ If yes, how many years before this? ___
2. How many trips this year to date? ___ Will you return? ___
3. For this trip how many miles will you travel? ___ How much did you spend on all other expenses related to your trip today? ___
4. Was fishing the main reason for your visit to the river today? Yes ___ No ___
5. Do you usually eat the fish you catch? ___
6. (Ignore for April and May) Would you continue to fish the river if you were not allowed to keep any of the fish? In other words, would you "fish for fun"? ___
7. How would you rate the quality of your total fishing experiences at this site? Very good ___ Good ___ Indifferent ___ Poor ___ Very poor ___
8. How would you rate the aesthetic quality of the river banks and adjacent land area? Very pleasant ___ Pleasant ___ Indifferent ___ Unpleasant ___ Very unpleasant ___
9. How much would I have to pay you per hour to forfeit your fishing right today? ___
10. Let's assume that you have just finished a weekend fishing trip. The first day you caught one 2-lb trout. The second day you caught five 1/2-lb trout. Which day would you consider more successful? #1 ___ #2 ___
11. A fisherman has just taken 5 brook trout which were 7 inches long. His friend caught 1 brook trout which was 12 inches long. Which fisherman do you think more successful? #1 ___ #2 ___
12. Assume that for two days you are going to fish for fun. In other words, you are not going to keep any of the fish. On the first day you take 20 brook trout which average 8 inches long. On the second day, you take 5 brook trout which average 12 inches long. On which day would you consider you were more successful? #1 ___ #2 ___
13. Are you aware that the river has been stocked with rainbow trout? Yes ___ No ___
14. How would you rate this program? Do you think it is: Very good ___ Good ___ Average ___ Poor ___ Very poor ___?
15. This question is only meant to get an idea of how much you value fishing here. We are not going to use this amount for charging fishermen. How much would you be willing to pay for each hour you fished today? \$ ___
16. Into which category does your income fall?
\$1-5,000 ___, \$5-8,000 ___, \$8-11,000 ___, \$11-14,000 ___,
\$14-17,000 ___ \$17-20,000 ___ \$20-25,000 ___, \$25-30,000 ___,
Over \$30,000 ___.

Appendix B. --Answers to questionnaire by month with 95% confidence limits (\pm CL)

B-1: Results from first page of questionnaire

Mean number of hours anglers fished :

Month	Number	Mean	\pm CL
April	123	2.55	0.29
May	30	3.02	0.70
June	42	2.60	0.48
July	7	2.39	1.15
August	7	1.43	0.40
Total	209	2.58	0.23

Average distance from residence in miles:

Month	Miles	Mean	\pm CL
April	125	21.7	0.9
May	30	26.2	0.9
June	41	19.6	0.9
July	7	27.5	0.9
August	7	20.4	0.9
Total	210	22.1	0.9

Sex of fishermen:

Month	Male			Female		
	Number	Percent	\pm CL	Number	Percent	\pm CL
April	126	100.0	0.0	0	0.0	0.0
May	29	96.7	6.5	1	3.3	6.5
June	41	97.6	4.7	1	2.4	4.7
July	7	100.0	0.0	0	0.0	0.0
August	5	71.4	32.4	2	28.6	32.4
Total	208	98.1	1.9	4	1.9	1.9

Appendix B--continued

Race of fishermen:

Month	White			Black			Oriental		
	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL
April	126	99.2	1.6	0	0.0	0.0	1	0.8	1.6
May	30	100.0	0.0	0	0.0	0.0	0	0.0	0.0
June	42	100.0	0.0	0	0.0	0.0	0	0.0	0.0
July	5	71.4	40.4	2	28.6	40.4	0	0.0	0.0
August	7	100.0	0.0	0	0.0	0.0	0	0.0	0.0
Total	210	98.6	1.6	2	0.9	1.3	1	0.5	+1.0

Age of fishermen:

Month	Number	Average age	±CL
April	121	30.9	2.7
May	30	27.3	4.2
June	42	28.4	4.4
July	7	34.0	9.8
August	7	13.4	7.8
Total	207	29.4	2.0

Fishing type of fisherman:

Month	Boat			Shore			Wading		
	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL
April	0	0.0	0.0	41	35.3	8.9	75	64.7	8.9
May	3	10.4	11.3	7	24.1	15.9	19	65.5	17.7
June	2	4.9	6.7	25	61.0	15.2	14	34.1	14.8
July	0	0.0	0.0	4	57.1	44.2	3	42.9	44.2
August	0	0.0	0.0	6	100.0	0.0	0	0.0	0.0
Total	5	2.5	2.2	83	41.7	7.0	111	55.8	7.0

Appendix B--continued

Fishing method of fishermen:

Month	Still			Casting			Fly		
	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL
April	1	0.8	1.6	6	4.7	3.8	120	94.5	4.0
May	0	0.0	0.0	3	10.0	11.0	27	90.0	11.0
June	0	0.0	0.0	25	59.5	15.1	17	40.5	15.1
July	3	42.8	44.2	2	28.6	40.4	2	28.6	40.4
August	7	100.0	0.0	0	0.0	0.0	0	0.0	0.0
Total	11	5.2	3.0	36	16.9	5.1	166	77.9	5.7

Bait used by fishermen:

Month	Worms		Minnows		Artificials		Flies		Other	
	Num- ber	Per- cent ±CL	Num- ber	Per- cent ±CL	Num- ber	Per- cent ±CL	Num- ber	Per- cent ±CL	Num- ber	Per- cent ±CL
April	1	0.8 1.6	2	1.6 2.2	0	0.0 0.0	120	95.2 3.8	3	2.4 2.7
May	0	0.0 0.0	0	0.0 0.0	3	10.0 11.0	27	90.0 11.0	0	0.0 0.0
June	2	4.8 6.6	0	0.0 0.0	21	50.0 15.4	19	45.2 15.4	0	0.0 0.0
July	2	28.6 40.4	2	28.6 40.4	2	28.6 40.6	1	14.2 31.3	0	0.0 0.0
August	7	100.0 0.0	0	0.0 0.0	0	0.0 0.0	0	0.0 0.0	0	0.0 0.0
Total	12	5.7 3.2	4	1.9 1.9	26	12.3 4.5	167	78.7 5.6	3	1.4 1.6

Appendix B--Results of second page of questionnaire

Response to "Have you fished the river before?"

Month	Yes			No		
	Number	Percent	±CL	Number	Percent	±CL
April	34	35.1	9.7	63	64.9	9.7
May	6	25.0	17.7	18	75.0	17.7
June	7	46.7	25.8	8	53.3	25.8
July	5	71.4	40.4	2	28.6	40.4
August	3	100.0	0.0	0	0.0	0.0
Total	55	37.7	8.0	91	62.3	8.0

Response to "Did you fish last year for trout?"

Month	Yes			No		
	Number	Percent	±CL	Number	Percent	±CL
April	17	21.2	9.1	63	78.8	9.1
May	2	10.0	13.4	18	90.0	13.4
June	1	12.5	27.0	7	87.5	27.0
July	0	0.0	0.0	3	100.0	0.0
August	0	0.0	0.0	3	100.0	0.0
Total	20	17.5	7.1	94	82.5	7.1

Previous year's fishing experience on the Huron River, below Proud Lake

Month	Num-ber	Mean years	±CL
April	94	1.5	0.8
May	24	1.0	0.9
June	13	7.0	7.8
July	4	5.3	9.8
August	3	0.0	0.0
Total	138	2.0	1.0

Appendix B --continued

Number of trips made by fishermen:

Month	Num- ber	Aver- age trips	±CL
April	73	1.1	0.4
May	24	1.2	0.7
June	16	3.8	2.2
July	7	1.7	2.2
August	3	1.0	0.0
Total	123	1.5	0.4

Response to "Will you return?"

Month	Yes			No		
	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL
April	96	98.0	2.8	2	2.0	2.8
May	22	100.0	0.0	0	0.0	0.0
June	14	87.5	16.5	2	12.5	16.5
July	5	83.3	37.2	1	16.7	37.2
August	3	100.0	0.0	0	0.0	0.0
Total	140	96.6	3.0	5	3.4	3.0

Number of miles fishermen said they traveled on their round trip for that day:

Month	Num- ber	Miles	±CL
April	99	52.2	5.7
May	23	44.1	8.0
June	16	53.3	15.5
July	7	57.1	10.0
August	3	30.0	0.0
Total	148	50.8	4.4

Appendix B --continued

Amount reported by fishermen as expenses other than transportation (dollars):

Month	Number	Dollars	±CL
April	97	4.16	2.04
May	23	1.55	1.16
June	16	1.70	1.68
July	7	2.08	1.50
August	3	0.00	0.00
Total	146	3.30	1.39

Response to "Was fishing the main reason for your visit today?"

Month	Yes			No		
	Number	Per-cent	±CL	Number	Per-cent	±CL
April	99	100.0	0.0	0	0.0	0.0
May	23	95.8	8.2	1	4.2	8.2
June	17	100.0	0.0	0	0.0	0.0
July	6	100.0	0.0	0	0.0	0.0
August	3	100.0	0.0	0	0.0	0.0
Total	148	99.3	1.4	1	0.7	1.4

Response to "Do you usually eat the fish you catch?"

Month	Yes			No			Undecided		
	Number	Per-cent	±CL	Number	Per-cent	±CL	Number	Per-cent	±CL
April	71	71.7	9.1	27	27.3	9.5	1	1.0	2.0
May	19	79.2	16.6	5	20.8	16.6	0	0.0	0.0
June	17	100.0	0.0	0	0.0	0.0	0	0.0	0.0
July	6	85.7	31.3	1	14.3	31.3	0	0.0	0.0
August	3	100.0	0.0	0	0.0	0.0	0	0.0	0.0
Total	116	77.3	6.8	33	22.0	6.8	1	0.7	1.4

Appendix B--continued

Response to "Would you fish for fun?"

Month	Yes			No			Undecided ¹ ↓		
	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL	Num- ber	Per- cent	±CL
April	...	....	...	...	....	...	...	....	...
May	...	....	...	...	....	...	...	....	...
June	8	100.0	0.0	0	0.0	0.0	0	0.0	0.0
July	6	85.7	31.3	0	0.0	0.0	1	14.3	31.3
August	3	100.0	0.0	0	0.0	0.0	0	0.0	0.0
Total	17	94.4	10.6	0	0.0	0.0	1	5.4	10.6

¹↓ Response was noncomittal.

Response to "How would you rate the quality of your total fishing experience at this site?"

Month	Very good		Good		Indifferent		Poor		Very poor	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
		±CL		±CL		±CL		±CL		±CL
April	25	26.6	46	48.9	9	9.6	9	9.6	5	5.3
		9.1		10.3		6.1		6.1		4.6
May	4	17.4	7	30.4	1	4.4	9	39.1	2	8.7
		15.8		22.6		8.5		20.3		11.8
June	0	0.0	10	66.7	2	13.3	3	20.0	0	0.0
		0.0		24.3		17.5		20.7		0.0
July	4	57.1	0	0.0	0	0.0	1	14.3	2	28.6
		44.2		0.0		0.0		31.3		40.4
August	0	0.0	3	100.0	0	0.0	0	0.0	0	0.0
		0.0		0.0		0.0		0.0		0.0
Total	33	23.2	66	46.5	12	8.5	22	15.5	9	6.3
		7.1		8.4		4.7		6.1		4.1

Appendix B--continued

Response to "How would you rate the aesthetic quality of the river bank and adjacent land area?"

Month	Very pleasant		Pleasant		Indifferent		Unpleasant		Very unpleasant	
	Num-ber	Per-cent ±CL	Num-ber	Per-cent ±CL	Num-ber	Per-cent ±CL	Num-ber	Per-cent ±CL	Num-ber	Per-cent ±CL
April	35	35.4 9.6	55	55.6 10.0	4	4.0 3.9	5	5.0 4.4	0	0.0 0.0
May	8	33.3 19.2	13	54.2 20.3	3	12.5 13.5	0	0.0 0.0	0	0.0 0.0
June	4	25.0 21.7	12	75.0 21.7	0	0.0 0.0	0	0.0 0.0	0	0.0 0.0
July	2	33.3 47.1	3	50.0 49.9	1	16.7 37.2	0	0.0 0.0	0	0.0 0.0
August	3	100.0 0.0	0	0.0 0.0	0	0.0 0.0	0	0.0 0.0	0	0.0 0.0
Total	52	35.1 7.8	83	56.1 8.2	8	5.4 3.7	5	3.4 3.0	0	0.0 0.0

Amount reported in response to "How much would I have to pay you per hour to forfeit your fishing right today?"

Month	Num-ber	Dollars	±CL	Number	
				? ¹	∞ ²
April	37	5.91	1.48	39	18
May	5	6.22	7.32	14	4
June	6	3.71	2.79	3	7
July	1	3.00	0.00	3	2
August	0	0.00	0.00	3	0
Total	49	5.61	1.36	62	31

¹ Response was noncommittal.

² Respondents who were unwilling to give up their right to fish at any price.

Appendix B--continued

Response to "Let's assume that you have just finished a weekend fishing trip. The first day you caught one 2-pound trout. The second day you caught five 1/2-pound trout. Which day would you consider more successful?"

Month	One 2-pound trout			Five 1/2-pound trout		
	Num-ber	Per-cent	±CL	Num-ber	Per-cent	±CL
April	32	34.0	9.8	62	66.0	9.8
May	2	8.3	11.3	22	91.7	11.3
June	5	33.3	24.3	10	66.7	24.3
July	3	42.9	44.2	4	57.1	44.2
August	0	0.0	0.0	3	100.0	0.0
Total	42	29.4	7.6	101	70.6	7.6

Response to "A fisherman has just taken five brook trout which were 7 inches long. His friend caught one brook trout 12 inches long. Which fisherman do you think was more successful?"

Month	Five 7-inch trout			One 12-inch trout		
	Num-ber	Per-cent	±CL	Num-ber	Per-cent	±CL
April	56	58.9	10.1	39	41.1	10.1
May	20	83.3	15.2	4	16.7	15.2
June	12	80.0	20.7	3	20.0	20.7
July	5	71.4	40.4	2	28.6	40.4
August	3	100.0	0.0	0	0.0	0.0
Total	96	66.7	7.9	48	33.3	7.9

Response to "Assume that for 2 days you are going to fish for fun. In other words you are not going to keep any of the fish. On the first day you take 20 brook trout which average 8 inches long. On the second day you take 5 brook trout which average 12 inches long. On which day would you consider you were more successful?"

Month	Twenty 8-inch trout			Five 12-inch trout		
	Num-ber	Per-cent	±CL	Num-ber	Per-cent	±CL
April	48	49.0	10.1	50	51.0	10.1
May	14	58.3	20.1	10	41.7	20.1
June	9	56.2	24.8	7	43.8	24.8
July	2	28.6	40.4	5	71.4	40.4
August	3	100.0	0.0	0	0.0	0.0
Total	76	51.4	8.2	72	48.6	8.2

Appendix B--continued

Response to "Are you aware that the river has been stocked with rainbow trout?"

Month	Yes			No		
	Num-ber	Per-cent	±CL	Num-ber	Per-cent	±CL
April	96	97.0	3.4	3	3.0	3.4
May	23	95.8	8.2	1	4.2	8.2
June	16	94.1	11.4	1	5.9	11.4
July	3	42.9	44.2	4	57.1	44.2
August	1	33.3	86.6	2	66.7	86.6
Total	139	92.7	4.2	11	7.3	4.2

Response to "How would you rate this program? Do you think it is:"

Month	Very good		Good		Average		Poor		Very poor	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
		±CL		±CL		±CL		±CL		±CL
April	68	70.1	28	28.9	1	1.0	0	0.0	0	0.0
		9.3		9.2		2.0		0.0		0.0
May	11	47.8	8	34.8	4	17.4	0	0.0	0	0.0
		20.8		19.9		15.8		0.0		0.0
June	6	42.9	7	50.0	0	0.0	1	7.1	0	0.0
		28.4		28.7		0.0		14.7		0.0
July	1	33.3	2	66.7	0	0.0	0	0.0	0	0.0
		86.6		86.6		0.0		0.0		0.0
August	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
		0.0		0.0		0.0		0.0		0.0
Total	86	62.8	45	32.8	5	3.6	1	0.8	0	0.0
		8.3		8.0		3.2		1.5		0.0

Appendix B--concluded

Amount reported in response to question, "How much would you be willing to pay for each hour you fished today?"

Month	Number	Dollars	±CL
April	75	1.39	0.47
May	15	2.32	1.62
June	12	1.48	0.51
July	6	2.42	2.29
August	3	0.00	0.00
Total	110	1.57	0.41

Response to "Into which category does your income fall?"
(for fishermen 18 years old and older)

Yearly income (dollars)	Percentage and number ¹ responding				
	April	May	June	July	Season ²
000	1.2±2.4 (1)	11.1±14.8 (2)	13.3±17.5 (2)	0.0± 0.0 (0)	4.1±3.6 (5)
1-5,000	9.8±6.6 (8)	0.0± 0.0 (0)	6.7±12.9 (1)	0.0± 0.0 (0)	7.4±4.7 (9)
5-8,000	8.5±6.2 (7)	0.0± 0.0 (0)	6.7±12.9 (1)	0.0± 0.0 (0)	6.5±4.5 (8)
8-11,000	12.2±7.2 (10)	16.7±17.6 (3)	13.3±17.6 (2)	16.7±37.2 (1)	13.1±6.1 (16)
11-14,000	15.9±8.1 (13)	27.7±21.1 (5)	20.0±20.7 (3)	50.0±49.9 (3)	19.7±7.2 (24)
14-17,000	9.8±6.6 (8)	11.1±14.8 (2)	20.0±20.7 (3)	16.7±37.2 (1)	11.5±5.8 (14)
17-20,000	18.3±8.5 (15)	11.1±14.8 (2)	0.0± 0.0 (0)	0.0± 0.0 (0)	13.9±6.3 (17)
20-25,000	21.9±9.1 (18)	11.1±14.8 (2)	0.0± 0.0 (0)	16.6±37.2 (1)	17.2±6.8 (21)
25-30,000	2.4±3.4 (2)	5.6±10.8 (1)	6.7±12.9 (1)	0.0± 0.0 (0)	4.1±3.6 (5)
30,000+	0.0±0.0 (0)	5.6±10.8 (1)	13.3±17.5 (2)	0.0± 0.0 (0)	2.5±2.8 (3)
Average income	\$14,490	\$14,806	\$14,000	\$4,167	\$14,570

¹ Number in parentheses.

² Only one interview in August.