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Fisheries Research Report No. 1980
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MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

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Arthur Ostaszewski[1]

Michigan Department of Natural Resources
District Office 14
2455 N. Williams Lake Road
Pontiac, Michigan 48054

Abstract.—A portion of the Huron River in the Proud Lake Recreation Area, Oakland County, has been stocked yearly with legal-size trout since 1974. Special regulations provide a catch-and-release flies-only season prior to the regular statewide trout season. A creel census was conducted in 1975 and again in 1987 to evaluate the program. Total angler hours in 1987 were equal to those of 1975, but were concentrated in fewer angling days (21 and 30 days, respectively). Anglers had a higher catch per effort and stock utilization in 1987 than in 1975. Economic return generated by anglers' expenses resulted in a benefit/cost ratio of 2.78:1. In 1987, the value of the program to the anglers in terms of dollars was $174,632. The program cost was $8,686. The benefit to the angler/cost ratio for 1987 was 20.1:1. In 1975, this benefit/cost ratio was 10.1:1.

Stocked trout were efficiently recycled during the catch-and-release season. Catch data indicated stocked trout were caught an average of 3.45 times. Catch per effort over the study period was 0.82 fish per hour. During the regular season an intense harvest occurs over a short period of time. The program is successful because it provides a substantial amount of stream fly fishing for big trout at a time when anglers are anxious to fish but have few opportunities. Under such conditions a relatively few adult trout support heavy angling effort yet provide high success rates due to the catch-and-release feature. The program is highly valued by the anglers and is economically beneficial. The Huron River trout program fills a void with quality trout angling in lower Michigan.

Few streams in southeast Michigan are capable of supporting trout populations year-round. This is primarily due to high water temperatures in the mid- to late summer. Angler desire for stream trout fishing near the metropolitan area has always been very strong. In 1974, an early season catch-and-release trout program was initiated in cooperation with the Michigan Fly Fishing Club on a section of the Huron River located in the Proud Lake Recreation Area, 18 miles northwest of Detroit. Special regulations limited the angling to "flies only" during the months of April and May.

Due to the popularity of the initial stocking, the Michigan Department of Natural

[1]Present address: Michigan Department of Natural Resources, Environmental Response Division, Environmental Laboratory, 315 N. Clippert St., Lansing, MI 48912

Resources, Fisheries Division, has continued to annually release catchable size trout in this area. Regulations currently allow for "catch-and-release — flies only" in the designated quality trout stream section from April 1 through the last Friday in April. Thereafter, regular statewide rules apply. The regulations are meant to provide quality trout angling during the catch-and-release season and harvest of the fish before the river becomes unsuitably warm during the regular season.

In 1975, this program was evaluated by the Fisheries Division (Carl et al. 1976). The objective of the present study was to reevaluate the following aspects: 1) angler attitudes concerning the program; 2) angler numbers, effort, and success during the catch-and-release and the regular season; and 3) economic aspects of the fishing including benefit/cost and angler value.

Materials and Methods

On March 31, 1987, 2,200 trout, primarily rainbow (*Oncorhynchus mykiss*), averaging 16 inches long were released at two sites on the quality trout stream section of the Huron River. This 1.5-mile section lies between Moss Lake Dam and Wixom Road, (2N, 8E, Sec. 18). Data collection started the opening day of the catch-and-release season, April 1, 1987, and concluded 1 week after the regular statewide opener, May 3, 1987. The catch-and-release season lasted 21 days in 1987, shorter than the 30-day season in 1975.

Angler counts were made twice daily at randomly stratified times by canoeing this section of the stream. Three weekdays and all weekend days were sampled. Upon completion of their trip, anglers were interviewed at either one of the two sites that provided vehicle parking.

One census clerk was assigned to the project and asked all questions in a standard format. The interview duplicated several questions from the 1975 survey and added new questions designed to better evaluate economic and social value information (Appendix 1). Interview questions concerned angler demographics, effort, success, and preferences. Each interview lasted approximately four minutes.

The value of the fishery to the anglers was calculated using the contingent value method (Sorg et al. 1985), where anglers' willingness to pay for a day's fishing was determined by the amount of money they would pay above and beyond what they had already spent. The method for evaluating the net value used the answer to a question that asked how much the fishermen would have had to have been paid per hour to forfeit their fishing right (Mathews and Brown 1970). This method was also used in the 1975 study.

Results

A total of 293 anglers were interviewed during the 1987 study. All values presented are estimates derived from this surveyed sample. The responses to individual questions are presented in Tables 2 and 3.

Total angler hours for the 1987 trout program were 10,675. The average hours/trip was 4.0 ± 0.5, and an estimated total of 2,652 ± 432 angler trips were made to the site (Table 1). Anglers averaged 0.82 fish/hour over the study period. Trout caught outnumbered trout planted by a ratio of 3.45:1. A total of 5,971 were caught and released and 1,589 were taken during the regular season. Most anglers were satisfied with the size and quantity of the trout. Male anglers constituted 97% of the total with 70% either in their 20's or 30's. Most anglers (88%) waded the stream to fish and 75% used flies.

Over 80% of the anglers had previously fished in the Huron River for trout. Anglers averaged 5.3 years of experience with this program. When asked if they expected to return to the special regulations trout fishing section at a later date, 94% of all anglers responded "yes". Anglers asked if catching fish was the main reason for their trip responded "yes" 88% of the time. Over half of all anglers interviewed responded "yes" when asked if they usually ate the fish they caught.

The average angler traveled 41.4 miles round trip to fish at the site. The number of

anglers per group vehicle was 1.9. Average annual income was approximately $27,000. The total individual cost per trip equaled $9.07; 38% was for travel costs ($3.39 per trip), while 62% went for other expenses ($5.68). When asked how much more they would be willing to pay for their trip (Question 10, Appendix 1), the average response was $13.58. This is the average for 152 respondents. However, it is lower than the true figure, because it does not include 43 people (18%) who would have paid more than $30 in additional costs; 40 people (17%) were non-respondents. Of anglers asked if they would increase this value if they could double the catch of fish, only 37% agreed. These few anglers would increase the amount they spent per trip by an additional $29.53 if they could catch twice as many fish.

Anglers were asked to rate the aesthetic quality of the river banks and adjacent land area: 58% responded good or very good. More than 75% of the anglers rated their overall fishing experience as either good or very good. Fishermen rated the Huron River trout program as good or very good by a wide margin, 96%.

River temperatures usually reached a peak near 3:00 pm, and were coolest at the start of the census day, 7:00 am. Before mid-April 1987, the temperature of the Huron River in the study area remained below 15°C (60°F). By the third week, early afternoon temperatures were above 21°C (70°F), with early morning temperatures around 12°C (54°F).

During both the catch-and-release and the regular season, anglers homed in on four areas of stream that harbored a large majority of the fish. These were deep holes with cover in close proximity to where the fish were released. Other parts of the river have deep places, but lack cover that is needed to hold the stocked trout.

Benefit/Cost

The cost of the 1987 trout program to the Michigan Department of Natural Resources, Fisheries Division, was $8,686, of which $7,686 was for the 2,200 trout (R. Pointer, personal communication, Oden Hatchery), and an estimated $1,000 was for expenses such as law enforcement and initial stocking. Anglers spent $24,054 to fish the Huron River for trout in 1987. Of that total, $8,900 was in transportation costs, and $15,154 in other expenses. The minimum benefit/cost ratio, in terms of economic return alone was 2.78:1. The value of the Huron River program to the anglers in 1987 amounted to $60,068, as calculated using the contingent value method of Sorg et al. (1985). The ratio of the benefit to the anglers/cost to the MDNR was 6.92:1.

Using the method of Mathews and Brown (1970), the net value amounted to $174,632, with a benefit to the angler/cost ratio of 20.1:1. For the whole year of 1975, the net value was only $37,375, and a benefit to the angler/cost ratio of 10.1:1.

Little information is available concerning economic return from fisheries projects in southeast Michigan. It is encouraging to see that revenues to sporting goods stores, convenience stores, and service stations generated by this 6-week program are substantial.

Catch-and-Release versus Regular Season Anglers

Catch-and-release anglers on the average spent more money per trip than regular anglers, due in part to traveling in smaller groups and spending more on non-transportation items. In the case of economic return, catch-and-release anglers accounted for more than two-thirds of the money spent by all Huron River trout anglers during 1987.

Although regular season anglers accounted for slightly less than a third of the total economic return generated by the program, it should be noted that their activity was concentrated into a 9-day period, and that the regular trout season opening weekend generated 23.5% of the total economic return alone.

According to the contingent value method, which uses a per trip index, catch-and-release anglers accounted for 61.4% of the value in 1987. By contrast, the Mathews and Brown

method indicated that regular anglers valued the fishery more in 1987, and the catch-and-release portion of the program was more highly valued in 1975.

Discussion

Even though slightly fewer fish were stocked in 1987 than in 1975 (2,200 versus 2,430), anglers caught and released trout more efficiently (3.95 fish/trip versus 2.53), and harvested a higher percentage (72% versus 26%). Catch per effort was also greater in 1987 than 1975 (0.82 versus 0.74). The primary reason for this occurrence is the fact that more angler hours were concentrated into the month and 1 week of the 1987 season than in all the 1975 season. Other factors include the slow dispersal of trout from the areas stocked in 1987, anglers having more experience with the program, and the apparent increased use of barbless hooks (personal observation).

Some hooking mortality was noticed, but no quantitative estimate was possible. One frequent angler commented that out of 50 trout he caught, he had left the fly in the fish twice. Other anglers had caught trout with flies in the lip, or snagged on the body. Fish were noticed with scars and marks in increasing numbers in late April and May. Other factors of mortality, primarily violations during the catch-and-release season, were noted but appeared to be minor. Park officials and conservation officers did patrol the area throughout the course of the special regulations, but anglers still witnessed some poaching, mainly late at night. It is also impossible to estimate the number of stocked trout that emigrated out to the catch-and-release special regulations zone before the regular season opener. Counts were made on a daily basis of trout holding above and below Moss Lake Dam. It is possible that 100 to 300 fish moved upstream into Proud Lake. Reliable reports indicate trout traveled downstream as far as 6 miles.

The program has grown in terms of the number of angler trips and angler hours since its inception in 1974. In 1975, angler effort was 21.7 angler trips/day and 49.8 angler hours/day. In 1987 effort was 71.7 angler trips/day and 288.5 angler hours/day. Park personnel at the Proud Lake Recreation Area estimate total park attendance on a daily basis with vehicle counts. During the period of April and the first week of May, attendance has fluctuated since recording began in 1978. The highest count was 46,353 in 1985; the lowest 15,246, occurred in 1981. The 1987 attendance was 27,588, 10% above the 9-year average. Park staff feel there is a strong correlation between angler attendance and total park attendance in the months of April and May.

Conclusion

The Huron River Trout Program provides quality trout fishing in southeast Michigan for all types of anglers. The angling experience is highly valued by both catch-and-release and regular season anglers. The fish stocked by the Michigan Department of Natural Resources, Fisheries Division, are recycled heavily during the special regulations season, and a high percentage make it to the angler creel. The program is very successful from a benefit/cost standpoint. Angler satisfaction with the current program is high.

Acknowledgments

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Table 1.—Number of anglers surveyed and estimates of the total angler hours and total angler trips for the Huron River trout program, Proud Lake Recreation Area, for 1975 and 1987.

	Catch and release		Keep		Total	
	1975	1987	1975	1987	1975	1987
Number of anglers surveyed	156	212	56	81	212	293
Total angler hours	6,836	5,379	3,764	5,296	10,600	10,675
Total angler trips	2,506	1,537	2,125	963	4,631	2,652

Table 2.—Summary of angler information obtained in the 1987 survey concerning the Huron River trout program in the Proud Lake Recreation Area. Responses are stratified by date: during the catch-and-release season and during the regular keep season. Responses from the 1975 questionnaire are included for comparison. The total number of responses (*N*) is given in parentheses.

Information	Response	1987			1975	
		C/R	Keep	Total	April	June
Sex	(*N*)	(197)	(81)	(278)	(126)	---
	Male (%)	97	98	97	100	---
	Female (%)	3	2	3	0	---
Age	(*N*)	(208)	(79)	(287)	---	---
	<10	0	0	0	---	---
	11-20	13	16	14	---	---
	21-30	44	43	44	---	---
	31-40	26	30	27	---	---
	41-50	8	8	8	---	---
	>50	9	3	7	---	---
Locality	(*N*)	(211)	(80)	(291)	---	---
	Lower parking (%)	73	77	74	---	---
	Upper parking (%)	27	23	26	---	---
Hours fished per trip trip	(Average)	3.5	5.5	---	---	---
Belong to outdoor organization	Yes (%)	17.9	8.6	---	---	---
Number in group	(Average)	1.8 (212)	2.3 (81)	1.9 (293)	---	---
Number caught and released per person	Rainbow trout (average)	3.95 (212)	0.22 (81)	2.92 (293)	2.53 (123)	---
Number kept per person per trip	Rainbow trout (average)	0 (212)	1.36 (81)	---	---	0.26 (42)
Fishing type	(*N*)	(211)	(77)	(280)	(115)	---
	Boat (%)	2	5	3	0	---
	Shore (%)	2	29	9	35	---
	Wading (%)	96	66	88	65	---
Fishing method	(*N*)	(211)	(70)	(281)	(127)	---
	Still (%)	0	31	8	1	---
	Casting (%)	3	57	17	5	---
	Fly (%)	97	12	75	94	---
Bait used	(*N*)	(211)	(75)	---	(126)	(42)
	Worms (%)	0	51	---	1	5
	Minnows (%)	0	0	---	2	0
	Corn (%)	0	0	---	0	0
	Flys (%)	100	12	---	95	45
	Lures (%)	0	15	---	0	50
	Other (%)	0	22	---	2	0

Table 3.—Summary of anglers' responses to the 1987 survey concerning the Huron River trout program in the Proud Lake Recreation Area. Responses are stratified by date: during the catch-and-release season and during the regular keep season. Responses from the 1975 questionnaire are included forcomparison. The total number of responses (*N*) is given in parentheses.

Question	Response	1987 C/R	1987 Keep	1987 Total	1975 April	1975 June
1. a) Number of trips?	Average number		3.54 (70)		1.1 (73)	---
b) Expect to return?	Yes (%)	94 (174)	94 (81)	94 (255)	98 (98)	---
2. Catching fish main reason?	Yes (%)	83 (168)	98 (81)	88 (249)	100 (99)	---
3. Continue if couldn't keep?	Yes (%)	---	68 (75)	---	---	100 (8)
4. Interviewed before?	Yes (%)	26 (179)	14 (81)	22 (260)	---	---
5. Know about stocking?						
6. a) Fished here before?	Yes (%)	87 (156)	83 (70)	85 (226)	35 (97)	---
b) Last year?	Yes (%)	86 (115)	72 (62)	81 (177)	21 (80)	---
c) No. of years before 1987	Years	5.2 (156)	5.6 (70)	5.3 (226)	1.5 (94)	---
7. Amount paid to forfeit?	$/h (average)	15.57 (75)	18.06 (35)	16.36(110)	5.91 (37)	---
	# bids>$30/h	48	29	77	18	---
	# no response	42	6	48	39	---
8. Usually eat fish caught?	Yes (%)	50 (125)	68 (75)	56 (200)	72 (99)	100 (17)
9. a) Miles traveled round trip?	Miles	37.2 (156)	50.7 (70)	41.4 (226)	52.2 (99)	---
b) Travel costs today (gas)?	$ (average)	3.64 (156)	2.86 (70)	3.39 (226)	---	---
c) Other costs?	$ (average)	6.26 (156)	4.39 (70)	5.68 (226)	4.16 (97)	---
10. Pay more for this trip?	$ (average)	12.61 (98)	15.35 (54)	13.58 (152)	---	---
	# bids>$30	31	12	43	---	---
	# no response	36	4	40	---	---
11. a) Increase if double fish?	Yes (%)	34 (128)	47 (24)	36 (152)	---	---
	No (%)	66 (128)	54 (24)	64 (152)	---	---
	# no response	28	46	74	---	---
b) If "yes", what's bid increase?	$ (average)	15.61 (43)	17.27 (11)	15.95 (54)	---	---
12. Income category	$ (average)	27,288 (156)	26,357 (70)	26,999 (226)	14,490 (82)	---
13. Prefer:	(*N*)	(212)	(81)	(293)	---	---
more fish of smaller size		11	23	14	---	---
less fish of larger size		6	7	7	---	---
no change		83	70	79	---	---
14. Rate river banks:	(*N*)	(176)	(81)	(257)	(99)	---
	Very good (%)	25	6	19	35	---
	Good (%)	37	42	39	56	---
	Fair (%)	25	28	26	4	---
	Poor (%)	10	7	9	5	---
	Very poor (%)	3	17	7	0	---

Table 3.—Continued:

Question	Response	1987 C/R	1987 Keep	1987 Total	1975 April	1975 June
15. Rate fishing experience:	(*N*)	(176)	(81)	(257)	(94)	---
	Very good (%)	37	6	34	27	---
	Good (%)	43	42	42	49	---
	Fair (%)	17	28	16	10	---
	Poor (%)	3	7	5	10	---
	Very poor (%)	0	17	3	4	---
16. Rate trout program:	(*N*)	(166)	(68)	(234)	(97)	---
	Very good (%)	68	63	67	70	---
	Good (%)	28	32	29	29	---
	Fair (%)	2	2	2	1	---
	Poor (%)	2	3	2	0	---
	Very poor (%)	0	0	0	0	---

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Alan D. Sutton, Graphics
Grace M. Zurek, Word Processor

Appendix I.—Interview form used in the 1987 survey of trout anglers (retyped for reproduction in this report).

Huron River Trout Fisherman Survey
1987 Interview

Date_____ Locality_____
Day of Week_____ Time Started_____am pm
Time_____am pm Hours Fished_____
Trip (Complete/Incomplete)_____ Club Affiliation_____
Sex (M/F) Number in Group_____
Age____

	Number caught & released	Number kept
Rainbow Trout	_____	_____
Other_____	_____	_____

Fishing Type (Boat-Shore-Wading)_____
Fishing Method (Still-Casting-Fly)_____
Bait Used (Worms-Minnows-Corn-Flys-Lures)____

1) How many trips to this area have you made this year?_____
   Do you expect to return? (Y-N)_____
2) Was catching fish the main reason for your visit to the river today? (Y-N)_____
3) (Ignore for Catch and Release season) Would you continue to fish the river if not allowed to keep any fish? (Y-N)_____
4) Have you been interviewed before? (Y-N)_____
   If "Yes" go to question 13. If "No" continue interview.
5) Are you aware that the river has been stocked with trout? (Y-N)_____
6) Have you fished the river in this area before? (Y-N)_____
   If "Yes", did you fish here last year for trout? _____
   How many years prior to 1987? _____
7) How much would you have to be paid per hour to forfeit your fishing right today? Could I have paid you:
   $ 1 3 5 7 10 12 15 20 25 30 + per/hour not to fish here?
8) Do you usually eat the fish you catch? (Y-N)_____
9) How many miles will you travel, round trip, to fish here? _____
   How much will you spend on travel costs today (gas)? $_____
   How much have you spent on expenses other than travel for this trip (beverage, food, lures)? $_____
10) Assume that the trip became more expensive—transportation cost, park fees, etc.—but the general fishing conditions remained unchanged. You indicated that $_____ was spent on this trip. Would you have paid
    $ 0 1 3 5 7 10 12 15 10 25 30 + more to fish here today?
11) Would your bid increase if you could catch double the fish? (Y-N)_____
    If "Yes", by how much? $_____
12) Into what category does your annual income fall? $0-$5,000; 5,000-10,000; 10,000-20,000; 20,000-30,000; 30,000-40,000; 40,000-50,000; 50,000 and up.
13) Would you prefer: a) More fish of smaller size. b) Less fish of larger size. c) No change.
14) How would you rate the quality of the river banks and adjacent land area?
    Very good Good Fair Poor Very poor.
15) How would you rate the quality of your total fishing experience at this site today?
    Very good Good Fair Poor Very poor.
16) How would you rate the Huron River Trout Program?
    Very good Good Fair Poor Very poor.