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UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

August 1, 1951

REPORT NO. 1295

THE RECOVERY PATTERN OF TAGGED ADULT HATCHERY-REARED BROWN TROUT RELEASED AT DIFFERENT SEASONS IN THE MIO-MCKINLEY BRIDGE AREA OF THE MAIN AU SABLE RIVER

By

David S. Shetter

ABSTRACT

To determine the time of year at which hatchery-reared brown trout should be released so that the most fish are ultimately recaptured by the angling public, a series of five plantings of approximately 1,000 tagged brown trout of 7 inches or larger was released in the Main Au Sable River (Oscoda County) between Mio Dam and McKinley Bridge during the period November 6, 1947 - October 20, 1948. From 132 recoveries (2.7 percent) received to date from anglers fishing in the 1948, 1949 and 1950 trout seasons it can be shown that the release of April , 1948 gave far better results than any of the other plantings, both in numbers of tagged fish recaptured during the 1948 season, as well as in later seasons. Mortality of unknown extent among the May, 1948 and June, 1948, plantings of tagged fish possibly reduced the number of survivors to the creel from those releases.

In comparison with survivors from the November, 1947 and October, 1948 plantings, the average growth of the survivors from, April, May and June of 1948 was in most instances better than average increases in size noted for survivors from the fall releases.

The planted brown trout move about only locally in the stream area stocked.

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In 1946, the Fish Division marked all trout planted in the Au Sable River system by removing the right pectoral fin as part of a state-wide demonstration project to show the anglers what part of their catch originated from artificial stocking. All stocking of trout in streams was done between April 1 - September 15.

In 1947, anglers in the Mio-McKinley Bridge section of the Main Au Sable River began to catch a higher percentage of 1946-clipped brown and rainbow than had been observed in earlier marking studies. Despite the fact that the 1946 releases had been made during the spring and summer, some anglers concluded that the presence of the fin-clipped trout which had survived a winter in the stream was evidence in favor of fall planting. Other fishermen suggested that it was entirely possible that a fall planting of brown trout might have an economically justifiable survival rate in the type of water prevailing between Mio Dam and Alcona Dam. A similar situation and angler-sentiment prevailed to some degree concerning that portion of the Rifle River below M-55.

The general conclusion arrived at by some of the anglers was at variance with results noted earlier from plantings of marked brown trout in Michigan trout streams in the period 1939-1942 (Shetter, 1947), from which it can be demonstrated that 0.9 percent of spring-planted brown trout were recaptured after one winter in the stream, as against 0.3 percent recapture of fall-planted brown trout. After two winters in the stream approximately 0.1 percent recovery was noted on plantings at both seasons.

Both the Main Au Sable River in the Mio-McKinley Bridge area and the Rifle River downstream from M-55 bridge are large, wide streams which have excellent cover and deep pools. In theory at least they contain better-than-average habitat for trout during winter months. In addition, the stretch of the Main Au Sable River in question lies at the head of the lake-like backwaters of the Consumers Power Company Alcona Dam, which might well provide wintering quarters for some of the larger trout which live and spawn in the waters upstream during the more temperate months.

The point in question--whether fall plantings of brown trout in "big" water might give returns to the angler as good as spring and summer releases--is important in determining Fish Division management policies for this and similar stream sections. An answer could not be given without a more detailed study, so it was decided to release jaw-tagged hatchery-reared brown trout at five different times over the period of a year in the Mio-McKinley Bridge portion of the Main Au Sable River. Where fin-clipped fish had given a clue only as to the year of release, the tag records would provide information not only as to the year of planting, but the month as well.

Accordingly a series of plantings was made at five different dates between November 6, 1947 and October 20, 1948. Approximately 1,000 tagged brown trout of legal size or larger were released at each planting. The fish were measured

and tagged by personnel of the Institute for Fisheries Research at the State Fish Hatchery at Grayling, Michigan, and released by hatchery personnel at the numerous landings between Mio Dam and McKinley Bridge, about 15 miles by river downstream. All but 16 of the brown trout were larger than 7 inches and ranged in size from 6.5 to 12.8 inches at the time of release.

The dates of planting were, November 26, 1947; April 9, 1948; May 24, 1948; June 17, 1948; and October 20, 1948. The numbers of tagged fish released, the range in size, and the numbers of recoveries subsequently reported are given in Table 1.

Reasonably wide publicity was given the experiment among the anglers in the vicinity of Mio by letter and by personal contacts, and also through the personnel of the District Field Administration Headquarters located in Mio. Conservation Officers cooperated by checking anglers' catches for tagged fish in the course of creel census operations. The random week-end creel census of the Mio-McKinley Bridge area during the 1948 trout season, conducted by Henry J. Vondett, Institute Technician, yielded information on 33 recoveries. Voluntary returns by interested anglers contributed noticeably to the total. A breakdown of the source of the returns is as follows:

From Conservation Officers' records - 51;
From random week-end creel census - 33;
Voluntary returns by anglers (either directly, or through District Fisheries Supervisor H. L. Peterson) - 48.

For the 4,972 tagged brown trout released, the 132 recoveries reported to date constitute a recovery percentage of 2.7. By far the most recoveries were reported from the April 1948 release (73), followed by recoveries from the releases of May, 1948 (23), June, 1948 (19), and the fall release of

Table 1. Summary of the numbers of tagged hatchery-reared brown trout planted and the numbers of recoveries reported to date from the Mio-McKinley Bridge portion of the Main Au Sable River. (The size range of fish planted is given in inches in parentheses in the second column.)

Date of release	Number of tagged fish released alive	Number of tag recoveries in season of			Total recoveries to 1/15/51	Percentage of recovery to date
		1948	1949	1950		
November 26, 1947	992 (7.3-12.8)	2	1	0	3	0.3
April 9, 1948	993 (7.0-12.3)	54	11	8	73	7.4
May 24, 1948	992 (7.0-11.3)	21	1	1	23	2.3
June 17, 1948	1,000 (7.0-11.2)	17	1	1	19	1.9
October 20, 1948	995 (6.5-10.3)	---	10	4	14	1.4
Totals	4,972	94	24	14	132	2.7

October, 1948 (14). The November, 1947 planting so far has yielded only three returns.

On the basis of the above data the April, 1948 release has given the most fish to the anglers on all counts. More recaptures (54) were reported during the first season of availability, and also more recaptures originating from this planting were taken after spending one winter (11) and two winters (8) in the stream.

A higher survival to the creel might have been expected from the May, 1948, and June, 1948 releases on the basis of previous experience. However, it is known that mortalities of tagged fish from these two plantings occurred--four for May, six for June, and also two for the April release. Data on these mortalities were supplied by Conservation Officers Willis Copeland and Verne Dockham. Except for the two deaths noted for the April, 1948 planting, the others were picked up dead within 10 days after the May and June plantings. Also it was reported to Henry Vondett on June 5, 1948 by an angler (a Mr. Nelson) that "some fin-clipped fish as well as tagged fish were to be noted" dead in the log jam at the Old Comins Place in T. 26N, R. 3E. This was the site of recovery of the dead tagged fish from the May planting. The finding of these experimental fish, plus the comparatively low percentage of recovery during the 1948 season, suggests that the May and June plantings of 1948 may have been reduced materially by unknown causes before they became available to the anglers.

On the other hand, it is entirely possible that all, or at least a portion of the observed mortality was the result of angler-activity, i.e; hooking loss from bait-fishing or fly-fishing, or actual discarding of smaller tagged fish from the creel to be replaced by larger specimens as caught (as recorded a number of years ago during creel census activities on the pine River in Lake County).

For 79 of the recoveries, length data were furnished from which some indication of the growth of the planted brown trout may be obtained. These data are

summarized in Table 2. The average total length at time of planting of the fish later recovered is given, along with the average gain in length for the 1948, 1949, and 1950 seasons for all plantings.

Those fish caught during the same year they were released made an average growth ranging from 1.6 (June, 1948 planting) to 1.9 (May, 1948 planting) inches. After spending one winter in the stream average growth ranged from 2.8 inches (October, 1948 planting) to 7.5 inches (May, 1948 planting). Average gains after two winters of stream life varied between 2.8 (June, 1948 planting) to 8.2 (May, 1948 planting) inches. There is some suggestion that the larger fish from any planting are taken during the first season they are available, while the recoveries taken in succeeding seasons were somewhat smaller at the time of release. In those instances of recapture later than the first season of availability, the fish which were largest at release showed smaller average gains (recoveries from November, 1947; October, 1948 plantings recaptured in 1949 and 1950; from June, 1948 planting made in 1950). If recoveries from the April, 1948 release are taken as indicative of growth possibilities of the hatchery-reared product in this general stream section of the Main Au Sable, these fish (which enjoyed their stream freedom for varying portions of the entire trout season grew as follows: The 31 measured recaptures grew from an average size of 9.0 to 11.7 inches during the 1948 trout season; the 11 recaptures taken in 1949 grew in average length from 8.3 inches at planting to 14.1 inches at recapture in 1949; the 8 recaptures in 1950 grew from an average size of 8.3 inches at release in 1948 to 16.3 inches during the 1950 season.

As detailed records of the tag numbers of the trout planted at the several landings were not kept, there is no information at hand on the local migrations of the planted fish. The furthest downstream that any tag recoveries were reported was from the vicinity of McKinley Bridge. The Consumers Power Company

Table 2. The available growth data from the plantings of tagged hatchery-reared brown trout released in the Mio-McKinley Bridge area of the Main Au Sable River. Measurements are given in inches and the number of recaptures on which length measurements were furnished is given in parentheses.

Date of release	Recovered during 1948		Recovered during 1949		Recovered during 1950	
	Average size at planting[1]	Average gain	Average size at planting	Average gain	Average size at planting	Average gain
November 26, 1947	9.4 (2)	no meas.	10.6 (1)	+3.4(1)	----------	------
April 9, 1948	9.0 (31)	+1.7(31)	8.3(11)	+5.8(11)	8.3 (8)	+8.0(8)
May 24, 1948	9.1 (10)	+1.9(10)	8.5 (1)	+7.5(1)	8.3 (1)	+8.2(1)
June 17, 1948	9.4 (1)	+1.6(1)	8.5 (1)	+5.5(1)	10.2 (1)	+2.8(1)
October 20, 1948	not fished over		9.0 (8)	+2.8(8)	9.0 (4)	+6.6(4)

[1] The average sizes at planting listed are the averages of the lengths at planting of those fish which were later recovered.

Dam at Mio stopped any upstream movement. One tagged fish was caught in Perry Creek near the mouth; another was taken in Comins Creek about 1/4 mile from the Au Sable. Any migration would appear to be purely local in character in view of the absence of any reports of recaptures outside the stream area planted.

Discussion

Although only a relatively small number of tagged fish from the plantings just outlined were reported, the trend of the results suggest strongly that fall plantings of brown trout are very inefficient in making fish available to the angling public compared with brown trout releases in April or May. The plantings in May and June might well have given much better results had not mortality of these plantings taken place. Earlier experiments in other waters of Michigan have indicated that open season releases of brown trout have given just as good results as pre-season plantings in the spring (Shetter and Hazzard, 1942).

There are three good reasons for planting trout in April and May as soon as stream conditions are suitable:

1. Pre-season and early-season plantings are made available to more anglers, as the general angling pressure distribution on Michigan trout waters is heaviest in the first ten weeks of the trout season.

2. Unpublished researches by Dr. Edwin L. Cooper, In Charge of the Pigeon River Trout Research Station, indicate that the spring period, roughly between April 1 - July 1 is the time when most of a trout's growth takes place. These hatchery-reared trout released early in the spring can take advantage of the natural food and rising water temperatures to increase in size and condition during this period. As has been noted in making studies in Michigan and elsewhere, the great bulk of hatchery trout planted in the spring or open season, which are recovered, will be taken during the first season of availability. Those fish which escape the angler and natural predators will be in much better physical

condition to enter the winter and a larger number of survivors will be present during succeeding trout seasons.

3. In comparison with survivors of a fall planting during the same calendar year, overwinter survivors of spring plantings will have had the advantage of two spring growing seasons rather than one, and are likely to be a larger average size (see Table 2.)

Considering all factors involved, the evidence at hand indicates that the most brown trout and probably larger brown trout can be given the anglers of the Mio-McKinley Bridge area of the Main Au Sable River by pre-season or early-season releases.

Acknowledgments

The assistance in handling the fish for tagging, and in planting the fish, by various members of the Grayling Hatchery staff, is gratefully acknowledged. Thanks are also due to Conservation Officers Verne Dockham, Willis Copeland, Clarence Roberts and Robert Van Camp for their efforts to obtain tag recoveries and the data concerning them. District Fisheries Supervisor Hans L. Peterson also aided materially in this activity. Gratitude is hereby expressed to the individual fishermen who mailed in the data concerning their tag recoveries.

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