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REPORT NO. 358

A COMPARISON OF THE MOVEMENTS OF HATCHERY-RAISED BROOK TROUT
AND BROWN TROUT WITH THE MOVEMENTS OF WILD BROOK AND BROWN TROUT,
AS SHOWN BY TAGGING EXPERIMENTS

The data which form the basis of this study were obtained from recoveries made of fish tagged from 1928 to 1932, with the exception of the wild Brown Trout tagged in the North Branch of the Au Sable. Both hatchery fish and wild fish were tagged, but the majority were hatchery fish.

Hatchery brook trout bearing tags were recovered from 24 different streams, while wild fish bearing tags were recovered in 6 streams. Unfortunately both hatchery fish and wild fish were not recovered from the same waters, with the exception of the Pigeon River. Tables 1 and 2 summarize the results for the brook trout.

Conclusions:

1. The hatchery fish were probably older individuals, since they were some two inches larger on the average. (8"-15", Hatchery) (6"-11", Wild)
2. Time between tagging and recovery was about the same for wild fish as for hatchery fish. (164+ days)
3. Hatchery fish tended to move farther than did the wild fish, both upstream and downstream.
4. Returns from both hatchery and wild brook trout in the Pigeon River show that the hatchery fish may possibly have greater migratory propensities than the wild fish. This conclusion might be attacked on the relatively few returns from both the hatchery and wild trout in that stream. The same conclusion might be reached if the results from the recoveries of wild fish in Little Beaver Creek were excluded from the summaries of the tagged wild trout. If this stream were excluded, the

TABLE 1

Hatchery Fish (Brook)

Stream	No. of Tagged Fish Recovered	No. of Fish Tagged	Average size of Recovered Fish when Tagged	Average Days Out	No. of Fish Moving Upstream	Average miles each fish moved up	No. of Fish Moving Downstream	Average miles each fish moved down	No. of fish moving down one and up another	Average miles each fish moved down and up	No. of fish showing no migration	% of recovery in stream
Big Creek	5	98	11.900	109			10				4	5.1
Green Cr.	1	99	11.000	203			4					1.4
E. Br. Escanaba	1	93	11.000	203			1					1.1
Main Au Sable	15	497	11.717	185	1 - .25	5 - 3.1					9	3.02
N. Br. Au Sable	7	296	15.210	135.7	1 - 10	4 - 5.25			1 - 16 - 4		1	2.4
Weldon Cr.	1	5	8.000	118.0							1	20.
Beaver Cr.	1	25	15.750	124.0			1 - 2.75					4.0
Big Creek (Osc.)	3	31	14.000	75.0			2 - 7.50				1	10.
Cedar River	3	34	13.330	72.0			1 - 0.5				2	9.
S. Br. Au Sable	6	207	13.125	117.6	1 - 17	3 - 8.67					2	2.9
Rifle River	3	30	14.850	68.0	2 - 1.25	1 - 2.0						10.
Thunder Bay River	3	25	13.58	78.0	1 - 1.0	1 - 2			1 - 10 - 6			12.0
Sopher Creek	5	130	8.70	211.0							5	3.8
Little Pine	9	147	8.61	218.4	1 - 0.5	2 - 3.25			1 - 1.5 - .5		5	6.1
Manistee	5	25	12.10	36			1 - 2				4	20.0
Acme Creek	2	50	9.125	222.0							2	4.0
Boyne River	6	50	11.542	159.7			3 - .667				3	12.0
Carp River	2	43	10.500	167.0							2	4.7
Adams Creek	1	113	8.000	209.0							1	.9
Clam River	2	78	8.125	227.0			1 - 2.5				1	2.6
Big Bear R. Wex.	11	172	8.795	218.2	8 - 3.0	1 - 1.0					2	6.4
Cedar Cr. (XXXX)	7	154	9.464	210.9							7	4.5
Pigeon River	4	886	8.200	224.6			3 - 7.67		1 - 22 - 4			.4
E. Br. Au Sable	1	75	14.75	132			1 - 8.5					1.3
24	104	3363	1158.290	17069.20	15 - 3.683	33 - 145.27	4 - 12.5 - 3.5				52	3.1%
			11.14	164.13		4.4	3 - 1					

TABLE 2
Wild Fish (Brook)

Stream	No. of Tagged Fish Recovered	No. of Fish Tagged	Average Size of Recovered Fish when Tagged	Average Days Out	Migration			No. of fish moving down 1 & up another	Average miles each fish moved	No. of fish showing no migration	% of recovery in the stream
					No. Fish moving Upstream	Average miles each fish moved	No. of fish moving downstream				
Little Beaver	26	314	9.572	198.7	8 - 2	6	2.33	6 - 2.1 - 1	6	8.3	
Baldwin Creek	5	146	8.6	178.0		2	2		3	3.4	
Pigeon River	8	267	8.09	181.3		1	3		7	3.0	
McDuffy Creek	1	48	11.00	58.0		1	8			2.1	
Lincoln Creek	1	15	6.00	6.00		1	1.5			6.6	
Big Beaver Creek	5	69	8.95	2.6		1	10		4	7.25	
	46	859	415.842	7583.6	8 - 2	12	3.375	6 - 2.1 - 1	20	5.36	
			9.04	164.8							

percentage of tagged wild fish showing no movement would be 70%, as compared with 50% for the tagged hatchery fish.

Hatchery Brown Trout bearing tags were recovered from 7 different streams, and wild Brown Trout bearing tags were recovered from three different streams. The table on the following pages summarizes the results on recovered Brown Trout.

Conclusions:

1. As in the brook trout, the hatchery fish seemed to be an older group, their average size being considerably greater than that of the tagged wild fish.
2. Despite this seemingly apparent age discrepancy, such recoveries as were effected on both hatchery and wild tagged trout showed that the two classes had moved or remained non-migratory in about the same proportions.

The chief objection to the data is that if ~~any~~^{it} is broken down for detailed analysis, there are not enough returns on which to base sound conclusions. Also, for a valid comparison, there should be both wild and hatchery brook trout of the same size and age groups tagged in the same stream, so that the two types of fish are subjected to the same conditions. With the exception of the Pigeon River brook trout, this was distinctly not the case. The accuracy of the data is also questionable (with the exception of Brown Trout from the North Branch), since the data were supplied by fishermen, who were not always specific as to where an individual was caught, the date of the catch, or the length.

In the near future, more reliable data on the movements of wild brook trout in the North Branch of the Au Sable will be ready. This river would be an ideal stream in which to release some tagged hatchery brook trout and compare their movements with those of the wild fish. Repeated seining after planting several thousand fish so marked would also give valuable data on the survival rate of hatchery reared stock under natural conditions. Extensive tagging experiments in the future in an attempt to solve some of these problems are highly advisable.

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TABLE 3

Hatchery Brown Trout

Stream	No. of Tagged Fish Recovered	No. of Fish Tagged	Average Size of Recovered Fish on Tagging	Average Days Out	No. Moving Upstream	No. of Miles Moved	No. Moving Downstream	No. of Miles Moved	No. Migration	% of Recovery
Traverse Bay	5	154	12.0	105					5	3.0
Little Manistee	1	270	8.60	195					1	0.3
Crystal Lake	1	73	12.0	?	1 - 3					1.3
Sauble River	10	194	13.20	170	1 - 3.5		1 - 2		8	5.0
Bear Creek	1	99	16.0	176					1	1.0
Slagle Creek	1	98	12.50	217	1 - 6					1.0
Bardman River	1	98	13.0	187					1	1.0
	20	986	12.21	159	3 - 4.1		1 - 2		16	2.0

TABLE 4

Wild Brown Trout

Stream	No. of Tagged Fish Recovered	No. of Fish Tagged	Average Size of Recovered Fish on Tagging	Average Days Out	No. Moving Upstream	No. of Miles Moved	No. Moving Downstream	No. of Miles Moved	No Migration	% of Recovery
Little S. Br.	2	42	5.90	6.5					2	5.0
Pere Marquette	1	8	7.25	264.0					1	12.5
Little Manistee	17	161	6.50	91.0	4 - 4.5				13	11.0
N. Br. Au Sable	20	211	6.48	91.4	4 - 4.5				16	9.5

SUMMARY TABLES ON COMPARISON OF
THE MOVEMENTS OF HATCHERY REARED AND
WILD BROOK TROUT AND BROWN TROUT

TABLE 5

	No. of Tagged Fish Recovered	No. of Fish Tagged	Average Size of Recovered Fish on Tagging (Weighted)	Average Days Out (Weighted)	No. of Fish Recovered Upstream	Average No. of Miles Moved	No. of Fish Moving Downstream	Average No. of Miles Moved	No. of Fish Moving Down One and Up Another Stream	Average Miles Moved Down and Then Up Another Stream	No Migration	% of Recovery
Hatchery Rec. - 24 streams	104	3363	11.14	164.1	15 - 3.7 (14.4%)	33 - 4.4 (31.7%)	4 - 12.5-3.5 (3.9%)	52 (50%)	3.1			
Wild Rec. - 6 streams	46	859	9.04	164.8	8 - 2.0 (17.9%)	12 - 3.4 (26.1%)	6 - 2.1-1.0 (12.6%)	20 (43.4%)	5.4			

TABLE 6

Pigeon R. Hatchery	4	886	8.20	224.6	3 - 7.67 (75%)	1 - 22 - 4.0 (25%)	0.4
Pigeon R. Wild	8	267	8.09	181.3	1 - 3.00 (12.5%)	7 (87.5%)	3.0

TABLE 7 - Brown Trout

Hatchery Rec. - 7 str.	20	986	12.21	159.0	3 - 4.1 (15%)	1 - 2 (5%)	16 (80%)	2.0
Wild Rec. - 3 str.	20	211	6.48	91.0	4 - 4.5 (20%)	16 (80%)	9.5	