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White, Ray J. (Ray Jonathan)
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ABILITY OF ANGLERS TO IDENTIFY SPECIES OF TROUT

by
Ray J. White
Biologist

WISCONSIN CONSERVATION DEPARTMENT
Division of Research and Planning

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ABSTRACT

A survey was conducted during various periods early in the 1960 and 1961 trout fishing seasons on three Wisconsin trout streams in which anglers having trout in the creel were asked to identify their catch by species.

Of anglers who had brown trout in the creel, 23 per cent did not correctly identify them; of those who had brook trout, 17 per cent made wrong identification; and of those who had rainbow trout, only 6 per cent misidentified them. The anglers who were more skillful in catching trout were also more skillful in identifying them. Anglers who could not correctly identify their trout more often called them "rainbow" or "speckled" trout than brook or brown trout.

The results may have implications for the management of Wisconsin's stream-trout fishery, as the need for setting separate angling regulations for one or more of the species arises, and also suggest the need for increased educational effort on trout identification.

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INTRODUCTION

As this report was being prepared, the Wisconsin Conservation Department announced a new regulation on brook, brown, and rainbow trout for the 1962 fishing season: a creel limit of 10 trout, of which not more than 5 may be rainbow trout. This was a change from a previous creel limit of 10 for all three species. Hence, the results of this survey may be of special interest at this time.

Background of the Study

Research is bringing facts about trout into focus. As we learn about the lives and needs of these fish, the differences between Wisconsin's three stream-dwelling trout species, brook, brown, and rainbow, are becoming more apparent: their lengths of life, rates of growth, reproductive habits, migratory habits, habitat needs, harvest potentials, and "catchabilities." Wisconsin Conservation Department trout researchers believe that this type of knowledge is building up to a point where fish managers may soon be justified biologically in managing each species differently according to its unique ecology.

Part of such specific management would be differential regulation of angler's harvest of the various species of trout. If differential regulation is to be effective, however, it will be necessary for anglers to correctly identify the trout they catch. Through years of contact with anglers in the course of creel census on streams, WCD researchers came to suspect that a substantial proportion of the trout fishing public was unable to identify species of trout.

An analogous situation in game management has been the attempt of several years' standing to regulate hunting differentially on certain ducks -- in the face of widespread inability among the hunting public to identify species of ducks.

In anticipation of the day when differential regulations on trout might be advisable, a pilot survey was made during 1960 and 1961 to determine anglers' ability to identify trout. This survey was conducted as an inexpensive sideline project in the course of normally scheduled creel census activities on streams in which the trout were being studied for another purpose.

Description of the Census Areas

The census areas consisted of five to six miles of the best trout water on each of three popular trout streams: Black Earth and Mt. Vernon Creeks, Dane County, in south-central Wisconsin's fertile agricultural land, and Big Roche-a-Cri Creek, Waushara County, in the central sand country.

All three streams are, as Wisconsin trout streams go, of small or medium volume depending on whether one is at the head or the lower end of the census area. Black Earth and Mt. Vernon Creeks are of moderate gradient having rubble, gravel and silt bottoms. There are numerous riffles and many stretches are wide with sparse bank vegetation; thus Black Earth and Mt. Vernon Creeks are well suited to fly fishing as well as other types of angling. Big Roche-a-Cri Creek is of low gradient having mainly a sand and silt bottom with gravelly riffles only in the two miles of headwaters. Much of the stream is hemmed in by dense growths of brush and trees, hence it is mainly a bait-fishing stream.

No one of the three areas censused contained more than two of Wisconsin's three stream-dwelling trout species, brook, brown, and rainbow. In several cases, both wild and hatchery-reared fish of a single species were present in the same stream.

Black Earth and Mt. Vernon Creeks, because they are near Madison and in an area of relatively few trout streams, are heavily fished. Big Roche-a-Cri Creek is remote from cities and is in an area of abundant trout streams, hence it is relatively less heavily fished.

Because the surveys on all the streams were made in the early part of the season, the main method of fishing reported by anglers was worm-fishing. Of the three surveys, only the one on Black Earth Creek extended well into the season. Since the latter survey encompassed most of the "May fly season", it included many fly-fishermen.

METHODS

In the course of normally scheduled creel census operations, anglers who had trout in their creels were asked to identify their catch. The angler's identification of each trout was recorded beside the census taker's identification.

Identifications by anglers were recorded as either: "brown", "brook", "speckled"[1/], "rainbow", or "unknown". The answer "German brown" was recorded as "brown".

Because in a few instances when time was short or when anglers refused to cooperate or when the census taker was unable, a small percentage of the anglers was not questioned concerning identification of their catch.

RESULTS

1. Of the anglers who had brown trout in the creel, 23 per cent did <u>not</u> correctly identify them (Table 1).

2. Of the anglers who had brook trout in the creel, 17 per cent did <u>not</u> correctly identify them (Table 1).

[1/] A legitimate colloquialism for brook trout (Eddy and Surber, 1943).

3. Of the anglers who had rainbow trout in the creel, 6 per cent did not correctly identify them (Table 1).

4. A few fishermen were not even sure whether the fish they had were trout.

5. Those anglers who had succeeded in creeling 5 or more trout were somewhat better at identifying their catch than those who had less than 5 in the creel (Table 3).

6. Anglers who could not identify their trout, but guessed anyway, appear to have been somewhat more likely to call them either "rainbows" or "speckles" than they were to call them brown or brook trout (Table 4).

7. On "opening days" of the trout fishing seasons, the percentage of anglers who could not identify their catch was larger than later in the season (Table 2).

8. On Mt. Vernon Creek, 15 per cent of the anglers who had trout in the creel admitted they were unable to identify trout and did not attempt to guess. On other streams, anglers appear to have been more sure of their ability (Table 2).

DISCUSSION

Sources of Bias in the Survey Method

The method of interview, specifically the method of the census taker's approach, was not carefully controlled. The census takers were merely required to "ask the fisherman what kind of fish he has" and were instructed how to record the answers.

The percentage of anglers who correctly identified their catch in this survey was greater than the percentage who actually knew how to identify the various species. Our data included right and wrong guesses by anglers who pretended to know as well as right and wrong (sure) answers by anglers who were positive of their identifications. No systematic attempt was made to differentiate between sure answers and guesses by use of any special method of interview. A more detailed explanation of the purpose and value of the survey and assurance that their names would remain confidential, seemed to increase the tendency for anglers simply to admit their ignorance without attempting to guess. This approach was used on Mt. Vernon Creek and may explain the high percentage of anglers who admitted inability to identify trout there (Table 2).

Seasonal Distribution of Fishing Pressure and the Survey Sample

On the three streams surveyed, the heaviest fishing pressure of the season commonly occurs on opening day and the first few week ends of May (Brynildson and Snow, 1957; White, 1958 and 1959). Early in the season

and especially on opening day, there is a greater percentage of novice anglers on the streams than later -- as evidenced by the difference in abilities of opening-day anglers vs. those fishing later in the season to identify trout (Table 2). This survey covered various periods early in the season only. Hence, the results probably are higher in the error columns than if the survey had covered the whole season.

Reasons Behind the Types of Answers Given by Anglers

The accuracy of identifications in this survey undoubtedly resulted from varying degrees of ignorance influenced by various types of impressions, information and misinformation; e.g., the similarity of appearances among different species, the variability of appearances within species, the reputation of the stream as a fishery for some particular species, the amount of publicity accorded to releases of hatchery-reared trout, even the very natures of the species' names -- their popularity and descriptiveness.

The answer "rainbow trout" by anglers who really do not know whether their catch is a rainbow trout is especially interesting. We had long suspected from talking with anglers and from the results of previous creel censuses that among inexperienced fishermen, the term most likely to be applied to trout, whether correct or not, is "rainbow." Rainbow trout seem to be the most publicized species; furthermore, "rainbow" is a glamorous term. In addition, stream-dwelling trout in Wisconsin, especially wild trout, are likely to exhibit several intense colors literally suggestive of a rainbow. Anglers with brook trout in their creel sometimes insisted that they were rainbow trout "because they have a red stripe." For reasons such as these, many of the apparently correct identifications of rainbow trout in the creel probably were merely right guesses, which probably accounts for the low error in identification of rainbow trout (Table 1).

The rainbow trout included in this survey were stocked in Black Earth Creek as an experiment in stocking procedures. Because they had been in the stream for more than eight months under extraordinarily good conditions, their appearance probably was not typical of those usually caught in Wisconsin. It is probable that most rainbow trout caught by anglers in Wisconsin streams are recently stocked, hatchery-reared trout[1]. These are typically of a greenish-gray hue, dull compared to either their wild counterparts or rainbows from hatcheries which have been resident for several months or years. Fisheries workers have observed that newly stocked rainbow trout often bear a close resemblance to hatchery-reared brown trout. The rainbows in Black

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[1] Truly wild rainbow trout occur in few Wisconsin streams. Rainbow trout are commonly stocked by the State in many streams, but because of their high "catchability" and possibly for other reasons, their year-to-year survival is poor and few "carryovers" are caught by anglers (Brynildson and Christenson, 1961).

Earth Creek had taken on relatively bright coloration. They had also grown to a larger size, 10 to 14 inches, than trout from recent releases would have grown. Hence the identifiability of these rainbow trout was probably higher than is usual in Wisconsin. Thus, for several reasons, our figures for misidentification of rainbow trout should be considered to be minimal.

The answer "speckled trout" (or "speckle") was often misapplied. In Wisconsin, perhaps particularly in the north, these are commonly used terms. Thus, having heard them often, an unknowledgeable angler, from this region especially, may call his catch a "speckled trout" or "speckle" merely because it has spots on its body. All three of Wisconsin's species of stream-trout have spots. Ironically, and probably adding to the angler's confusion, brook trout, the only species for which "speckled" is a recognized name (Eddy and Surber, 1943), is the one which usually has the fewest obvious spots or "speckles."

The answer "brown trout" was correctly given in only 77 per cent of total cases where anglers had brown trout in the creel. In the survey on Mt. Vernon Creek, May 1, 1960, brown trout were correctly identified by only 71 per cent of anglers who had them in the creel. Brown trout appear to have been the most confusing and least identifiable species. They are, perhaps, for most people the least distinctively marked of the three species in question. Hatchery-reared brown trout, particularly those freshly stocked, may be especially nondescript. In this survey, the name speckled trout was more often misapplied to brown trout than to rainbow trout (Table 1).

The answer "brook trout" was correctly given in 88 per cent of cases on Big Roche-a-Cri Creek, which was generally reputed to be a "brook trout stream" within the segment surveyed. On the other hand, Mt. Vernon Creek, known among anglers as a "brown trout stream," contained an experimental, hence, probably less publicized than ordinarily, stock of hatchery-reared brook trout. There, only 67 per cent of anglers who had brook trout in the creel identified them correctly. Some anglers said they were confused because they did not expect to catch brook trout in Mt. Vernon Creek. Another factor must be considered: The brook trout is less common than brown or rainbow trout in the south-central part of the state where Mt. Vernon Creek is located.

Number of Species Present in the Catch vs. Success of Identification

It seems reasonable that having two or more types of trout in the hand might lead to ease of identification by anglers because they could compare them. It may also be that having only a single species in the total catch might raise the success of identification on a given stream because anglers would come to know the species by the reputation of the stream. No analyses of these aspects of the problem were made in this survey; however, in looking

at Table 1, one might draw the conclusion that anglers on Big Roche-a-Cri Creek had the highest success of identification partly because the catches from that stream included only one species. That situation I believe to be of less importance to the high success of identification than the fact that brown trout, the confusing species, were not present in the catch.

Angling Skill vs. Success of Identification

It is also possible, although we have no direct evidence to support it, that the people who fished Big Roche-a-Cri Creek were more experienced than those who fished Black Earth and Mt. Vernon Creeks, these latter streams being nearer a large population center, Madison, therefore, attracting a greater percentage of novices. Presumably, anglers who live close to the stream and those who are enthusiastic enough to travel long distances to fish[1]/will be the most skillful anglers, hence possibly the best able to identify species of trout. That skillful anglers are better able to identify trout is born out by comparing an analysis of success in identification by anglers who creeled 5 or more trout (Table 3) with a similar analysis of answers by all the anglers surveyed (Table 1).

MANAGEMENT IMPLICATIONS

The results of this survey may be useful in assessing the difficulty of effectively administering species-differential regulations. Inability among the fishing public to identify trout may be an important obstacle which might be remedied by a program of education and information.

Analogy with Identification of Waterfowl by Hunters

It appears that fish managers will face less confusion in carrying out differential regulations on trout than do waterfowl managers with similar regulations for duck hunting. Information from waterfowl researchers indicates relatively low ability of Midwestern hunters to identify ducks[2]/. That is understandable. Duck hunters are confronted with about seventeen common species in Wisconsin. Furthermore, within each species of duck there may be confusing differences in appearance between the sexes, molt stages, and age groups. On the other hand, stream-trout fishermen need learn only three species, plus, perhaps, the extremely rare brook x brown trout hybrid. The appearances of the different sexes and ages of trout are more uniform than among the ducks.

1/These were the two types comprising the majority of anglers on the Big Roche-a-Cri.

2/Jahn and Hunt (unpub. data), Lee (1956), Geis and Carney (1961) Atwood (unpub. ms. 1959).

In this survey, brown trout, the hardest species to identify, was misidentified in 23 per cent of the cases. Probably less than half of the ducks are identified that well by hunters.

In all the duck-identification surveys cited, hunters who misidentified ducks tended to call them mallards, presumably because mallards are more commonly known. This tendency also resulted in a falsely high percentage of correct identifications of mallards. The situation is analogous to the apparent "over-identification" of rainbow trout in our survey.

How Fishermen and the Sport May be Affected

Apart from the biological consequences of having a creel limit which differs for one or more of Wisconsin's three stream-dwelling species of trout, the sport of trout fishing may be affected not only by the more complicated array of regulations confronting the angler, but possibly also by the necessity of learning to identify the different species. Although some anglers may be discouraged from fishing for trout and some may risk violating the regulations rather than learning to identify the three species, some, hopefully most, will take the trouble to learn to know their quarry. This should add considerable interest and enjoyment to their sport.

Any educational program on trout identification should apply to all species, not just the one or two species under special regulations. It not only will be important for the fisherman to know how to identify rainbows, for instance, under the 1962 regulations for trout (creel limit of 10, of which only 5 may be rainbows), but he should also be able to positively identify brown and brook trout so that he can be sure when he doesn't have a rainbow.

CONCLUSIONS

A substantial proportion of the people who fished for trout in the three streams surveyed could not correctly identify according to species the trout they caught. About one-fourth or more of those who caught brown trout did not know they were brown trout; approximately a fifth or more who caught brook trout could not identify them; and a minimum of about one-tenth of the anglers with rainbow trout in the creel didn't know it. When the fisherman guessed at identification, he was more likely to call his catch "rainbow" or "speckled" than "brown" or "brook."

The degree of ability of anglers to identify trout may have bearing on the degree of effectiveness of separate angling regulations for one or more species of trout. By increasing the ability of fishermen to identify trout, the use of differential regulations as a management practice should be more effective. There appears to be need for increased educational effort on trout identification.

TABLE 1

Identification of Trout by Fisherman
(Correct answers are circled)

Trout Species Present in Creel	No. Creels Censused	Number of Anglers Who Identified Catch As: Brook	"Speckled"	Brown	Rainbow	Unknown**	Total Anglers Who: Could Identify Catch No.	Per Cent	Could Not Identify Catch No.	Per Cent
Black Earth Creek May 1 through June 30, 1960 (271 successful* anglers questioned)										
Brown	121	1	5	(96)	9	10	96	79	25	21
Rainbow	170	0	1	7	(159)	3	159	94	11	6
Mt. Vernon Creek May 1, 1960 (65 successful* anglers questioned)										
Brown	56	3	3	(40)	1	9	40	71	16	29
Brook	21	(13)	1	1	4	2	14	67	7	33
Big Roche-a-Cri Creek April 29-30 and May 6-7, 1961 (68 successful* anglers questioned)										
Brook	68	(54)	6	5	3	0	60	88	8	12
Total of All Streams (404 successful* anglers questioned)										
Brook	89	(67)	7	6	7	2	74	83	15	17
Brown	177	4	8	(136)	10	19	136	77	41	23
Rainbow	170	0	1	7	(159)	3	159	94	11	6

* A successful angler defined as one who had creeled at least one trout.
** The number of anglers who could not make any identification.

TABLE 2

Percentages of Anglers Making Correct or Incorrect Identifications

Stream	Census Period	Number of Successful Anglers Censused	Per Cent of Successful* Anglers Who: Made CORRECT Identification of All Trout in Creel	Made INCORRECT Identification of: Some of Trout in Creel	Made INCORRECT Identification of: All of Trout in Creel	Admitted Inability to Identify Their Trout	Total Per Cent Who Did Not Identify Correctly
Black Earth Creek	May 1, 1960**	37	81	3	16	0	19
	May 1-June 30, 1960	271	86	1	7	5	13
Mt. Vernon Creek	May 1, 1960**	65	66	8	11	15	34
Big Roche-a-Cri Creek	April 29, 1961**	25	84	4	12	0	16
	April 29, 30, May 6, 7, 1961	68	90	3	7	0	10

* Successful angler defined as one who creeled at least one trout.

** Opening day of the trout fishing season.

TABLE 3

Identification of Trout by Fishermen Having Five or More Trout in the Creel
(Correct answers are circled. Compare these results
with those in the totals for Table 1)

Trout Species Present in Creel	No. Creels Censused	Number of Anglers Who Identified Catch as:					Total Anglers Who:			
		Brook	"Speckled"	Brown	Rainbow	Unknown*	Could Identify Catch		Could Not Identify Catch	
							No.	Per cent	No.	Per cent
Brook	24	(20)	1	2	1	0	20	83	4	17
Brown	20	0	2	(17)	0	1	17	85	3	15
Rainbow	21	0	0	1	(19)	1	19	90	2	10

* The number of anglers who could not make any identification.

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