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OBSERVATION ON BROWN TROUT AND BROWN TROUT SPAWNING AREAS

IN THE AU SABLE RIVER SYSTEM, OCTOBER-NOVEMBER, 1944

by

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Reasons for Survey

The Au Sable River and its various tributaries have been well-known and heavily fished for many years. Originally this stream system gained fame as Grayling water, and with the passing of this colorful fish, about 1885, the Au Sable was successfully stocked with brook trout. At about that time also, approximately between 1877 and 1891, rainbow trout and brown trout were introduced. Of late years, brown trout appear to have been the dominant species in the angler's catch, and the stream received considerable angling pressure from fishermen who enjoy testing their skill against the two- to four-pound brown trout which are not uncommon.

However, during the past two years, numerous complaints have reached the Fish Division that the Au Sable is "fished out," that "big" browns are rare. In contradiction to these complaints, there is testimony available from guides and cabin owners that would indicate that the angling in recent years is no better or no worse than usual.

So that some factual information might be obtained, the writer was instructed by F. A. Westerman, Chief of the Fish Division, through Dr. A. S. Hazzard, Director of the Institute for Fisheries Research, to

cruise the more important parts of the Au Sable River System by boat during the brown trout spawning season in order to count the number of spawning beds seen, and to make other pertinent observations that might contribute to our knowledge of the brown trout in this drainage.

Method of Observation

Because of the considerable stream mileage to be covered, drifting the various streams by boat was the only feasible means of checking the several areas. Two or three individuals wearing polaroid glasses made the runs. Usually one man poled or rowed the boat while the other(s) acted as observer(s), keeping record of the number of redds seen, and the number of trout observed. After the first day's drift on the North Branch of the Au Sable, the trout were classified as to whether or not they were 7 to 12 inches long, or larger than 12 inches. Almost all spawning areas were readily distinguished without the aid of the polaroid glasses because they were usually of considerable area--a polished portion of gravel and rubble often from 1 to 5 feet in width and from 3 to 10 feet in length. Such areas stood out quite markedly from the surrounding stream bottom except where current wash under or around the end of a log made close inspection necessary. The polaroid glasses were extremely helpful in observing the numbers of fish.

The brown trout redds were found almost entirely in those stream areas where the bottom consisted of gravel or small rubble. Usually they were made in water from one to three feet deep; seldom deeper. The speed of the current in the vicinity of the redd was, more often than not, of moderate to rapid speed, rarely if ever slow or sluggish. Depending on the presence of suitable bottom materials the location of the redds may be anywhere in the stream where there is a moderate to rapid flow of water. The typical site on which redds were noted was somewhere on the gravelly riffles separating the pools, or along the edges of a moderately deep

gravel "run." Where logs lay on or above suitable bottom, the brown trout spawned alongside or under such cover. The upstream side of stream improvement deflectors, and just off the downstream ends of deflectors were also observed to be favored localities in the South Branch of the Au Sable in the vicinity of Chase's Bridge.

Certain difficulties which undoubtedly led to an underestimation of the number of redds present should be mentioned here. These are: (1) the extreme width of the various parts of the stream--some riffles were over 100 feet in width, (2) the speed of the boat and the depth of the water; and (3) the character of the light. Good light conditions for observation were encountered on all but two days. The only factor that would make for an overestimation was the calling of current-washed areas as spawning redds. Usually unless there was an obvious egg pocket, or unless fish were present over the polished area, such localities were not counted. Insofar as possible, each egg pocket was counted as one redd. Thus the number of redds given in the tables indicates the number of egg pockets. This number is a minimum figure, because on large redds in fast water it was not always possible to enumerate the total number of egg pockets accurately.

Many fish were observed in the course of drifting the various streams. The species of fish most frequently observed was the common sucker (C. commersonii). This fish is present in extremely large numbers in the Main Au Sable, and in moderate abundance in the South and North Branches. Many hog suckers (Hypentilium nigricans) were noted in the North Branch. No count was kept on the suckers observed, since to attempt to do so would have interfered with the counting of the trout seen. The trout listed in the tables are, for the most part, brown trout. We made no attempt to separate the trout by species, although in some instances brook trout or rainbow trout were observed. The trout could be distinguished in deep

water from the suckers and other fish by their mode of swimming (they started off more quickly and appeared to vibrate their tails faster than did the suckers), and also by the smoother body profile (the common sucker's profile when seen from above is thickest in the vicinity of the gill covers and tapers more abruptly from there to the snout, while the trout is thickest in the vicinity of the dorsal fin and tapers smoothly toward the snout).

Our counts on the number of fish seen should not be taken to indicate the entire legal trout populations of any of the sections of streams cruised. The number of trout seen depended on the light, the speed of the water, and the relationship of the trip with regard to the advancement of the spawning season, and also whether or not the bottom of the stream was light or dark. The fish were most easily seen in the North Branch of the Au Sable, where the bottom of much of the section cruised, particularly in the deeper water, is composed of clay. Just what percentage of the trout population we observed would be anybody's guess, since as many or more trout could have passed unobserved in some of the deeper pools, or among the underwater snags.

The length of the sections of stream drifted were determined from the Master Plan county maps used by the Field Administration Division. A map measurer was used to measure the mileages between the various points.

Results of Observations

A tabulation of the numbers of redds counted and the numbers of trout seen in the drifting of the various stream sections is presented in Table 1. A partial map of the Au Sable River system showing the various portions of stream cruised (between the stars) is appended also.

The North Branch of the Au Sable was cruised on October 18 and 19. The drift on October 18 was made from Dam 4 to Kellog's Bridge by Robert

Barber and the writer. From Dam 4 to The Public Fishing Site, a total of 80 redds and 134 legal trout were observed. From the Public Fishing Site to Kellog's Bridge, 144 redds and 110 legal trout were counted. For the 5 1/2 miles of stream covered a total of 224 redds and 244 trout were observed, or 40.2 redds per mile and 44.4 legal trout per mile of stream drifted. Many fine stretches of fishing water lie in this piece of the river. Because of extensive private ownership along the banks in this vicinity, much of this water is inaccessible to all but the more hardy of the wading anglers.

On October 19, Pat Galvin and Robert Barber made the run from Kellog's Bridge to the confluence of the North Branch with the Main Stream, a distance of 5 miles. Although the stream below Kellog's Bridge has much the same characteristics as the stream above, few spawning areas were observed--only 11 were seen. A total of 143 trout from 7 to 12 inches in size were counted, and 22 larger than 12 inches were noted. Some of the pools in this run were so deep as to prevent proper visibility. The number of redds seen per mile was 2.2, the average total number of legal trout observed was 33.0.

Judging from the actions of what trout were seen in the North Branch, the spawning season was well under way, but had not reached its peak. Temperatures at the time of cruising the North Branch were as follows:

October 18 - Noon - Nash Camp - Air 58°, water 45°

October 19 - 2:30 P.M. - Foot Bridge - Air 56°, water 46°

The Main Au Sable was cruised on October 20, October 24, and November 10. That portion of the stream between Stephan's and Wakeley's Bridge was drifted on October 20 by the writer and Basil V. Hughes, apparently at the height of the spawning in that part of the stream, which is 4 1/4 miles long. A total of 189 redds were counted, or 44.5 redds per mile. The

trout seen amounted to 98 fish between 7 inches and 12 inches (or 23.1 per mile), and 47 fish larger than 12 inches (or 11.1 per mile). It is of interest to note that this stretch of stream is the area which has been said to be "fished out" by numerous anglers, yet the largest concentration of redds and the second largest number of legal trout were observed here.

On October 24, accompanied by Supervisor Peterson of the Grayling Hatchery District, the 8 1/4 miles of water between Grayling and Stephan's Bridge was inspected by O. M. Corbett and the writer. A total of 171 spawning areas was noted (20.7 per mile), and 107 trout in the 7-12 inch size class, along with 38 trout larger than 12 inches were seen (13.0 and 4.6 per mile respectively). There appears to be adequate spawning ground from Grayling to what is locally known as "Beaver Island." From the latter point downstream to the vicinity of the "Blockhouse" there is good depth of water and ample cover for trout, but the bottom is almost entirely sand, silt and muck, and the current is comparatively sluggish. This latter stretch is inhabited by thousands of common suckers. From the "Blockhouse" on down to Stephan's Bridge good spawning territory is present.

The drift from Wakeley's Bridge to Connor's Flats was made on November 10 by Basil Hughes and O. M. Corbett. In this 5 3/4 miles cruise, a total of 81 redds (or 14.1 per mile) were noted, all but 5 of them above the mouth of the South Branch. Through what is called the "Stillwater," and which extends from about one mile upstream from the South Branch mouth to shortly above Connor's Flats, neither the bottom nor the current velocity are favorable for spawning, as the current is sluggish, and there is much sand and silt in the stream bed.

Apparently the spawning was almost over on this date, as only 30 trout 7-12 inches were counted, and only 2 trout over 12 inches were seen (5.2 and 0.3 per mile respectively). In the deeper runs of the "Stillwater" many suckers were again noted, and also one northern pike.

The South Branch of the Au Sable was cruised on October 26 and November 6. The upper stretch of 9 miles, from Chase's Bridge to Smith's Bridge, was drifted on October 26 by the writer and Robert Barber. The best spawning water, judged by the counts, was in the vicinity of the bridges, where 23 redds were noted in the mile of water below Chase Bridge and 24 redds in the mile of stream above Smith's Bridge. Although there is some flat, sluggish water in the middle of this run, in general, good spawning ground for brown trout (and some brook trout) was noted in all parts of this section of stream. A total of 147 redds were seen, or 16.3 redds per mile.

A total of 58 trout in the 7-12 inch size class were counted, and 68 trout larger than 12 inches (the only locality where the large fish outnumbered the smaller), or 6.4 small and 7.6 larger trout per mile of stream cruised. On the day this drift was undertaken, visibility was generally poor except in the shallow pools and over the riffles. Most of the fish observed were seen in the vicinity of the redds.

The lower South Branch from Smith's Bridge to the junction with the Main Stream was drifted on November 6 by the writer and Pat Galvin. Although the stream had much the same characteristics of the water above Smith's Bridge, the number of redds observed was considerably fewer, although there were some in all but the last mile of stream. A total of 23 redds was observed, or 5.8 per mile. Ten trout between 7 and 12 inches were noted, or 2.5 small and 2.3 large trout respectively per mile of stream drifted. This portion of the South Branch was the only area in which the Menominee whitefish (Prosopium quadrilaterale) was observed. In certain

pools, several hundred of these fish were congregated, replacing the ubiquitous suckers. These fish could be distinguished in the water by the smooth taper of their profile from the middle toward both ends, by the presence of an adipose fin, and somewhat by the sheen of the sides of the fish in the water.

Night observations

On October 27, 1944, the Main Au Sable was cruised between Stephan's and Wakeley's Bridge with the aid of a Coleman lantern by Hughes, Corbett, Barber and the writer. A quarter-moon hindered observations to some extent. Only about half as many redds (91) were seen as during the daylight trip a week earlier. The chief difficulty was that only about one-third of the river was illuminated. However, several new redds were noted which had not been seen a week earlier. This latter fact would indicate that our count of October 20 for this stream section was a minimum figure. Fish were observed working on the redds at night, and were less frightened on our approach. Although not as many fish were seen as during the daylight trips (26 small, 19 large), the proportion of large fish to small fish was somewhat greater, possibly indicating that many of the larger brown trout go through their spawning activities at night.

Summary

1. Seven sections of the Au Sable River system were cruised by boat between October 18 and November 10, 1944. These sections were from 4 to 9 miles in length. According to measurements on Field Administration maps, a total of 41 3/4 miles were covered in the course of the study.

2. The largest number of redds seen per mile (44.5) of stream cruised was found between Stephan's and Wakeley's Bridge on the Main Au Sable, followed by the Dam 4 - Kellog's Bridge section (40.2 per mile) of the North Branch. The greatest number of trout observed was also found

in these two stream sections. (See figures in parentheses in Table 1.)

3. An ample amount of spawning gravel was observed on all the streams cruised. In no locality was there any evidence of superimposition of redds.

4. The numbers of trout observed, particularly between Stephan's and Wakeley's Bridge, demonstrate that this, and other stream sections, still have a fair trout population. As spawning redds, and both large and small trout were noted above and below this area, it is reasonable to assume that many of the fish noted in the vicinity of the redds in the Stephan - Wakeley Bridge area also were present there during the fishing season just past.

5. Some type of creel census for these waters is needed. At present we have no knowledge of the size of the catch nor of the angling pressure (except that it is reported as "heavy"). Some indications as to the trend of the angling quality might be obtained if the guides, canoe-liverymen, and camp operators could be persuaded to keep records of the hours of fishing and the success of their clients.

INSTITUTE FOR FISHERIES RESEARCH

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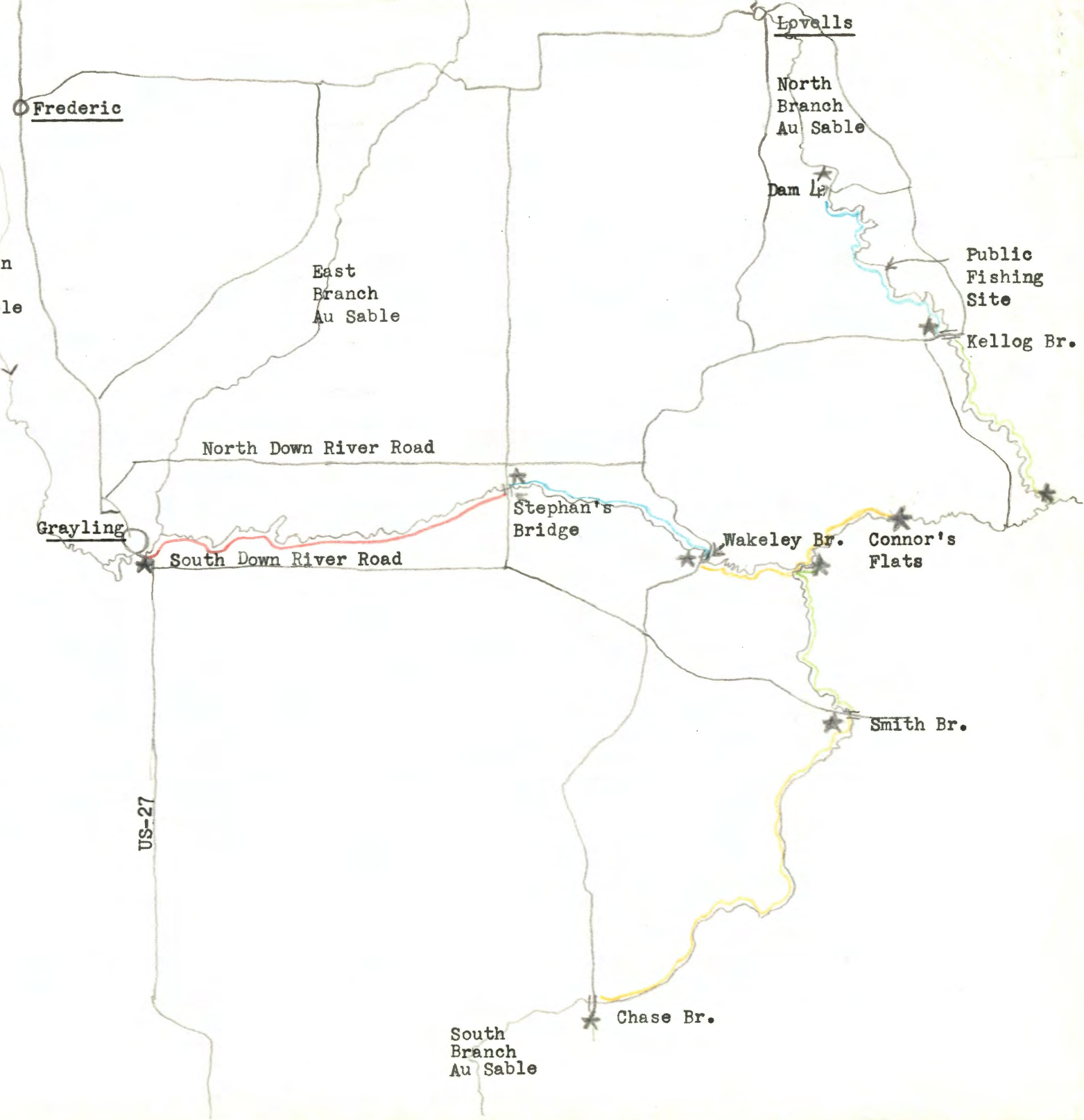
TABLE 1

THE NUMBER OF REDDS AND TROUT OBSERVED IN SEVEN DIFFERENT SECTIONS
OF THE AU SABLE RIVER SYSTEM, OCTOBER-NOVEMBER, 1944

Stream cruised	Section drifted	Length in miles	Date	Redds seen	Number per mile	Trout observed		Trout observed per mile		Total trout observed per mile
						7"-12"	Over 12"	7"-12"	Over 12"	
North Branch Au Sable	Dam 4 to Kellog's Br.	5 1/2	10/18/44	224	40.2(2)	244		44.4 (1)
	Kellog's Br. to Mouth	5	10/19/44	11	2.2(7)	143	22	28.6	4.4	33.0 (3)
Main Au Sable	Grayling to Stephan's Br.	8 1/4	10/24/44	171	20.7(3)	107	38	13.0	4.6	17.6 (4)
	Stephan's Br. to Wakeley Br.	4 1/4	10/20/44	189	44.5(1)	98	47	23.1	11.1	34.2 (2)
	Wakeley Br. to Connor's Flat	5 3/4	11/10/44	81	14.1(5)	30	2	5.2	0.3	5.5 (6)
South Branch Au Sable	Chase Br. to Smith Br.	9	10/26/44	147	16.3(4)	58	68	6.4	7.6	14.0 (5)
	Smith Br. to Mouth	4	11/ 6/44	23	5.8(6)	10	9	2.5	2.3	4.8 (7)

Partial map of Au Sable River system, showing stream sections cruised during 1944 to observe trout redds

- ★ - ★ = sections drifted
- = over 40 redds per mile
- = 20-30 redds per mile
- = 10-20 redds per mile
- = 0-10 redds per mile



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