

Fisheries Survey - River Avon, 1962

The object of the survey was to investigate the present distribution and relative abundance of salmonid fish in the river.

Methods of Investigation

Nine sampling stations were selected as follows. The date each section was fished is in brackets.

Avon Dam Bridge - A section immediately downstream of the first bridge below the Avon Dam (26.7.62)

Woolholes Bridge - A section just downstream of second bridge below the Avon Dam (30.7.62)

Didworthy - A section opposite Didworthy Hospital (22.8.62)

Bridge Farm - A section about two fields (rt bank) downstream from A.38 road bridge (22.8.62)

Brushford - A section immediately downstream of Brushford Bridge (30.8.62)

Topsham Bridge - A section starting approximately 100 yds downstream of Topsham Bridge (9.10.62)

Knapp Mill - A section starting about 300 yds downstream of Knapp Mill (10.10.62)

Bala Brook - A section just downstream of Zeal Bridge (21.8.62)

Glaze Brook - A section just upstream of confluence with main river (21.8.62)

The above sampling stations were selected as reasonably representative of the different reaches of the river with the added advantage that they had easy access for the fishing equipment and did not contain pools too deep to be fished by an operator wearing breast waders. No account was taken of the physical environment of the sections nor of the presence or absence of water plants, bankside vegetation, pools, etc. Therefore the results of any one section may not be strictly compared with those of any other.

Sampling

Each section was isolated by stop nets and then electric fished using two positive electrodes and moving upstream through the section. This process was repeated until it was felt that most of the fish in the section had been removed. Salmonid fish were retained in keep tanks supplied with oxygen before being identified, measured for length, and returned to the water. Small coarse fish were returned to the river unharmed but, at the request of the fishery owners, eels were removed and killed.

Identification

It is problematical whether or not it is possible to distinguish between brown trout parr and those which will eventually go to sea as sea-trout smolts. Avon brown trout tend to be very dark and richly coloured with pronounced spotting and all had a very heavy white line on the outside edge of the pelvic fin and often on other fins too. Also in the brown trout the caudal peduncle or 'wrist' is very thick. For the purpose of the present survey those parr which did not bear the typical characters of salmon or the typical Avon brown trout were inspected very carefully and if they had small slender 'wrists' they were regarded as sea-trout parr.

The identification of the fry and parr stages of salmon, sea-trout and brown trout is extremely difficult and depends to a large extent on the experience of the person involved. It is therefore a possible source of error in a survey

/such

such as this.

Results

Salmon Parr

Table 1 shows the size frequency and distribution of the salmon parr encountered during the survey. It can be seen that:-

- (a) No salmon parr were encountered at the three stations above Lydia Falls.
- (b) Salmon parr were abundant in the sections at Bridge Farm and Brushford.
- (c) Only a few salmon parr were taken in the two sections in the lower reaches of the river.
- (d) No salmon parr were taken in the Bala Brook.
- (e) Only four salmon parr were taken in the Glaze Brook.

Comment

Whilst taking into account the differences in environment between sections it seems clear from the above results that the main salmon nursery in the Avon is in the main river fairly high up but downstream of Lydia falls. The absence of salmon parr above this obstacle is no doubt evidence that the falls are a complete barrier to a adult salmon on their upstream spawning migration, and the absence of salmon parr from the Bala Brook is not therefore surprising. However, the almost complete absence of these fish from the Glaze Brook, previously regarded as an excellent salmon nursery and in which spawning salmon are often seen, is contrary to expectations and would seem to indicate that this tributary makes little contribution to the smolt production of the river.

Sea-trout Parr

Table 2 shows the size frequency and distribution of the sea-trout parr encountered during the survey. The similarity of these results with those for salmon parr is quite marked and the following observations can be made thereon:-

- (a) No sea-trout parr were encountered at the three stations above Lydia Falls.
- (b) Sea-trout parr were abundant in the sections at Bridge Farm and Brushford.
- (c) Only a few sea-trout parr were taken in the two sections in the lower reaches of the river.
- (d) No sea-trout parr were taken in the Bala Brook.
- (e) Only one sea-trout parr was taken in the Glaze Brook.

Comment

The total number of sea-trout parr taken was quite small; less than half the number of salmon parr. This is a rather unexpected finding in view of the good sea-trout run in the river and could be explained by any one or a combination of the following:

- (i) The main sea-trout nursery of the Avon was missed by the survey.
- (ii) More sea-trout parr than salmon parr survive to return to the river.
- (iii) Errors in identification of parr, including the possibility that it is not possible to tell which of the brown trout parr will subsequently

migrate as sea-trout, i.e. the sea-trout smolt run being derived from the brown trout population.

(iv) The Avon is not entirely self-supporting with regard to sea-trout, a proportion of the annual run of adult sea-trout and whitling being derived from adjoining rivers. In this aspect it is interesting to record that during the survey at Knapp Mill section on 10th October a sea-trout 14 $\frac{3}{4}$ " was taken which had been tagged by the Ministry of Agriculture, Fisheries and Food trap on the River Axe at Colyford. The fish had migrated up the Axe on 8th November, 1961, and had gone downstream through the trap again on the 9th March, 1962.

Brown Trout

Table 3 shows the size frequency and distribution of brown trout and from these figures and observations made during the survey the following generalizations can be made:

1. Trout in sections 1 and 2 were predominantly small and appeared to be quite old although no scale readings were made to test this observation.
2. There were very few fish in section 3. This section was composed particularly of very fast water and the river-bed was mainly of solid rock.
3. It can be seen that there were more trout of the large size groupings in the more downstream sections.
4. Only a few trout were present in the Bala Brook.
5. The Glaze Brook supported a good number of trout of assorted sizes.
6. Although a total of 488 trout were taken during the survey, only 10 were over 10" in length and there was a marked absence of large "cannibal" fish.

Comment

As stated above it would not be wise to compare too closely different sections with regard to brown trout on the basis of the results obtained in the survey. Apart from the question of environmental differences, such factors as 'fishing pressure' could greatly alter the size composition of a population at any one station. It is known for instance that one angler took five brown trout out of the Bridge Farm section in the week before the survey and it was impossible to take this kind of factor into account.

No attempt was made to investigate the growth rates and general ecology of the Avon brown trout. Such an investigation would require a longer period of study with considerable attention to detail and is quite beyond the present resources of a River Board. It is the type of investigation which is more within the capacity of a University research department.

Adult Migratory Fish

Several Whitling^x and sea-trout were encountered throughout the survey and the capture of two whitling at Didworthy on 22nd August is of particular interest since this sampling station was above Lydia falls. No adult salmon were encountered during the survey.

(^xSea-trout returning to the river in the same year as it went to sea as a smolt).

Coarse Fish

Only small bottom feeding coarse fish were encountered. These were returned unharmed to the river.

Eels

Eels were taken at all sampling stations. They were common but not abundant and their distribution in each section was very localised.

Pollution

It is possible that the poor fish population in the Bala Brook may be the results of periodic flushes of pollutive matter down this stream and this possibility is being taken up with the authority concerned.

Tagged Fish

On 2nd and 3rd May, 1962, 490 tagged brown trout were introduced into the river at the following points:-

| | |
|-------------------------------------|--------|
| 125 at New Mill Bridge, Loddiswell. | 3.5.62 |
| 114 at New Bridge, Loddiswell. | 3.5.62 |
| 125 at Avonwick Station. | 2.5.62 |
| 126 at Hazelwood Boathouse. | 2.5.62 |

A fishing returns leaflet was distributed and anglers were invited to send in details of all fish caught whether tagged or otherwise. At the date of writing this report (20.11.62) 48 returns have been received and the information contained thereon can be summarised as follows:-

(a) Twelve tagged fish with confirmed tag numbers were taken and Table 4 shows the places and times of introduction and recapture of these fish.

(b) Two returns were made quoting a tag number which had not been used in the survey and the tag was not enclosed for confirmation. One angler reported that he had caught a tagged fish but had lost the tag before being able to read the number.

(c) A number of anglers reported that they had caught undersized tagged fish but, as requested, returned them to the river without trying to read the number. One of these returns read:-

"Two tagged fish caught and returned. Both 8" and in good trim.
Above Hatch Bridge on day's fishing, 7th May, 1962."

(d) Sixteen 'Nil' returns were received.

(e) The 32 anglers who disclosed the number of untagged fish they had caught since 1st May had a total bag of 457. Individual success varied enormously, one fisherman having 56 fish in two weeks whilst only three others had over 30.

Since there are an enormous number of unknown factors influencing the total number of fish an angler will catch, it is not considered worthwhile to derive an average catch per angler or a ratio of tagged to untagged fish taken. These figures would have no scientific significance or practical value, and the statistics given above are for general interest only.

Information resulting from Tagging Experiment

It is difficult to derive much information from so few recaptures but it is significant that a number of the marked fish which were recovered had undergone a considerable downstream migration from the point of stocking. No upstream migration was recorded although some fish were shown to have remained in roughly the same area in which they were introduced. That the downstream migration can occur immediately after stocking is illustrated well by 4397 which was caught at Topsham Bridge after having migrated about one mile downstream less than 24 hours after its introduction to the river.

It is not known whether tagging itself in any way influences the behaviour of a fish and it is difficult to account for these migrations. It is possible of course that some of the marked fish went out to sea and it will

be interesting to see whether any return next season as sea-trout.

No tagged fish bearing the Devon River Board tag were taken during the survey.

Summary of Conclusions

From the results obtained the following broad conclusions can be drawn:

1. The river above Lydia falls appears to be at present of little value as a fishery or as a nursery for migratory fish.

2. The evidence shows that side streams may not be making a significant contribution to the fish production of the river, especially so far as salmon and sea-trout are concerned.

3. The middle and upper middle reaches of the river are clearly very productive and important to salmon, sea-trout and brown trout alike.

4. Whilst eels are common in the Avon they were not encountered in exceptional numbers during the survey. The nature of their relationship with the populations of salmonid fish was not investigated.

20th November, 1962.

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Fisheries Officer.

TABLE 1

SIZE AND FREQUENCY AND DISTRIBUTION
OF
SALMON PARR (*Salmo salar*)

| Size in inches Sampling Station | 1 | 1/4 | 1/2 | 3/4 | 2 | 1/4 | 1/2 | 3/4 | 3 | 1/4 | 1/2 | 3/4 | 4 | 1/4 | 1/2 | 3/4 | 5 | 1/4 | 1/2 | 3/4 | 6 | 1/4 | 1/2 | 3/4 | 7 | Total |
|------------------------------------|---|-----|-----|-----|---|-----|-----|-----|--------------------|-----|-----|-----|------|-----|-----|-----|----|-----|-----|-----|---|-----|-----|-----|---|-------|
| Avon Dam Bridge | - | - | - | - | - | - | - | - | - | - | - | - | None | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| Woolholes Bridge | - | - | - | - | - | - | - | - | - | - | - | - | None | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| Didworthy | - | - | - | - | - | - | - | - | - | - | - | - | None | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| Bridge Farm | - | - | 1 | - | 1 | - | 3 | - | - | - | 3 | - | 5 | 11 | 15 | 3 | - | - | 3 | - | - | - | - | - | - | 45 |
| Brushford | - | - | - | 2 | 3 | 11 | 21 | 13 | 4 | 2 | - | - | - | - | 3 | 2 | 9 | 6 | 4 | 9 | 1 | 1 | 1 | - | - | 92 |
| Topsham Bridge | - | - | - | - | - | 5 | 4 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 1 | 1 | - | - | - | - | - | 16 |
| Knapp Mill | - | - | - | - | - | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | - | - | 4 |
| | | | | | | | | | <u>TRIBUTARIES</u> | | | | | | | | | | | | | | | | | |
| Bala Brook | - | - | - | - | - | - | - | - | - | - | - | - | None | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| Glaze Brook | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - | 1 | - | 1 | - | 1 | - | - | - | 4 |
| Total in each size group | 0 | 0 | 1 | 2 | 5 | 17 | 29 | 15 | 4 | 2 | 3 | 0 | 5 | 11 | 19 | 5 | 11 | 8 | 8 | 12 | 2 | 1 | 1 | 0 | 0 | 161 |

TABLE 4

TAGGED FISH RECORD

| Stocked | | | Recovered | | Notes |
|---------|--------|---|-----------|--|---|
| Tag No. | Date | Place | Date | Place (as named by Angler on return sheet) | |
| 4145 | 2.5.62 | Avonwick Station (Length $8\frac{3}{4}$ ") | 2.6.62 | Lower Hatch (Length $9\frac{1}{4}$ ") | Consider d/s migration |
| 4158 | 2.5.62 | " " (" $8\frac{1}{2}$ ") | 8.9.62 | " " (" $9\frac{1}{4}$ ") | " " " |
| 4203 | 2.5.62 | " " (" $8\frac{1}{2}$ ") | 2.6.62 | Avonwick Station Pool (Length $8\frac{1}{2}$ ") | Remained where stocked |
| 4273 | 3.5.62 | " " (" $8\frac{1}{2}$ ") | 17.5.62 | 300yds u/s Hatch Bridge (" $8\frac{1}{4}$ ") | Considerable d/s migration |
| 4292 | 2.5.62 | " " (" 9") | 16.8.62 | Just below Hatch Bridge | Considerable d/s migration |
| 4397 | 2.5.62 | Hazelwood Boathouse | 4.5.62 | Topsham Bridge (Seen at 10 a.m. 3.5.62) returned to water | D/s migration of approx. 1 mile in less than 24 hours |
| 4466 | 3.5.62 | New Mill Bridge, Loddiswell (Length $8\frac{1}{2}$ ") | 11.8.62 | Below Loddiswell Bridge (Length $8\frac{7}{8}$ ") | ----- |
| 4469 | 3.5.62 | Just u/s New Mill Bridge, Loddiswell (Length $8\frac{3}{4}$ ") | 7.6.62 | Just d/s Hatch Bridge | ----- |
| 4496 | 3.5.62 | New Bridge, Loddiswell (Length $8\frac{1}{4}$ ") | 12.7.62 | Immediately d/s Loddiswell Road Bridge (Length $9\frac{1}{8}$ ") | ----- |
| 4606 | 3.5.62 | " " " (Length $8\frac{1}{2}$ ") | 28.7.62 | 150yds below Main Road Bridge, Loddiswell (Length $9\frac{1}{4}$ ") | ----- |
| 4638 | 3.5.62 | " " " (Length $7\frac{3}{4}$ ") | 23.7.62 | 150yds d/s Loddiswell Bridge (Length $9\frac{1}{4}$ ") | ----- |
| 4671 | 3.5.62 | " " " | 7.6.62 | Just d/s Hatch Bridge | ----- |