FISHERIES BULLETIN No. 8 (1984)

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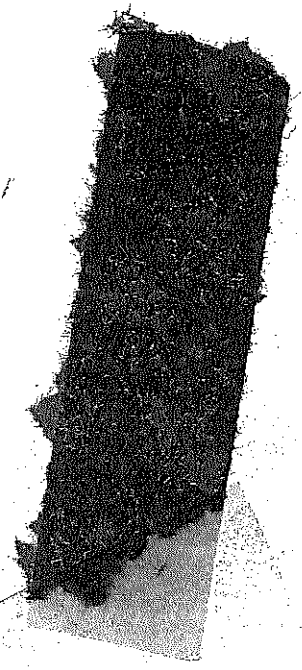
Department of Fisheries and Forestry

Dublin: Published by the Stationery Office.

Price: 40p.



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Fisheries Bulletin
Dublin
ISSN 0332-4338

Sea trout and their exploitation by draft net from the Feale and Munster Blackwater Rivers, southern Ireland

by

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Received 22nd June, 1983.

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ABSTRACT

Biological characteristics of sea trout exploited in the rivers Bride (Co. Waterford) by angling and Feale (Co. Kerry) by draft net are described from small collections of scales and life data. Both stocks are short lived, poorly conditioned and have smolts whose fork lengths range between 19 and 26cm. Draft net fishing for these trout is conducted with relatively large meshed nets (4.45cm knot to knot). In the Feale highest catches are made in June and July and fish aged two sea summers constitute the majority of captures. A draft net mesh size smaller than the ordinary statutory minimum is required to retain large numbers of post-smolt. A bunt mesh of 2.5cm knot to knot is effective in doing so.

INTRODUCTION

Salmo trutta is a widespread and plastic species occurring in a range of genetically isolated units. The development of analysis by electrophoresis has shown that even within small catchments several distinctive breeding populations can co-exist (Rymand, 1981; Fleming, 1982). In consequence trout stocks display distinctive physical and biological characteristics. The following account provides information on the biological characteristics of the sea trout stocks of the River Bride, a tributary of the River Blackwater in Co. Waterford and of the River Feale in Co. Kerry. In addition the exploitation of Blackwater and Feale trout by salmon draft net is described. This provides information comparable to that given for the exploitation of sea trout by rod and line and drift net (Fahy, 1978, 1981[b], 1981[c], 1982[b]).

Fisheries Bulletin (Dublin), 8, 1984.

MATERIALS AND METHODS

River Bride: A collection of scales and life data (fork lengths and weights) was made from 54 rod caught sea trout in the River Bride in Co. Waterford (Fig. 1) in 1978, by Mr. Paul Greene of Ballyduff Lodge Hotel. The collection was made between 23 June and 6 August inclusive. Mr. P. G. Burton of the Estate Office of Lismore Castle kindly supplied totals by weight and number of the sea trout draft net catch from 1965 to 1982 inclusive (Table 1). Draft netting takes place in the tidal waters of the River Blackwater.

River Feale: The collection of Feale sea trout scales and life data was undertaken by Mr. Brendan Quille of the Limerick Board of Conservators between 21 May and 30 June, 1980 when 162 fish were examined. All had been captured by draft net in the River Cashen (Lower Feale).

Details of terminology are given in Fahy (1979). The scale formula is written: *x.y* or *x.y*+ where *x* = number of pre-migration winters, y = post-migration winters and + = an incomplete year's growth, SM or *n*SM = one or more spewning marks. Fish of age *x*.+ are termed "post-smolt". The scales of B type smolts show freshwater growth during the year of first migration, A type scales show none.

The formulae for mean smolt age and mean age at first maturation are given in equations 1 and 2:

1. $(S1 + 2S2 + 3S3 \ldots.) \times 10^{-2}$

where S1, S2 etc. are the percentages of the sample in each smolt class.

2. $(Y1 + 2Y2 + 3Y3 \ldots) \times 10^{-2}$

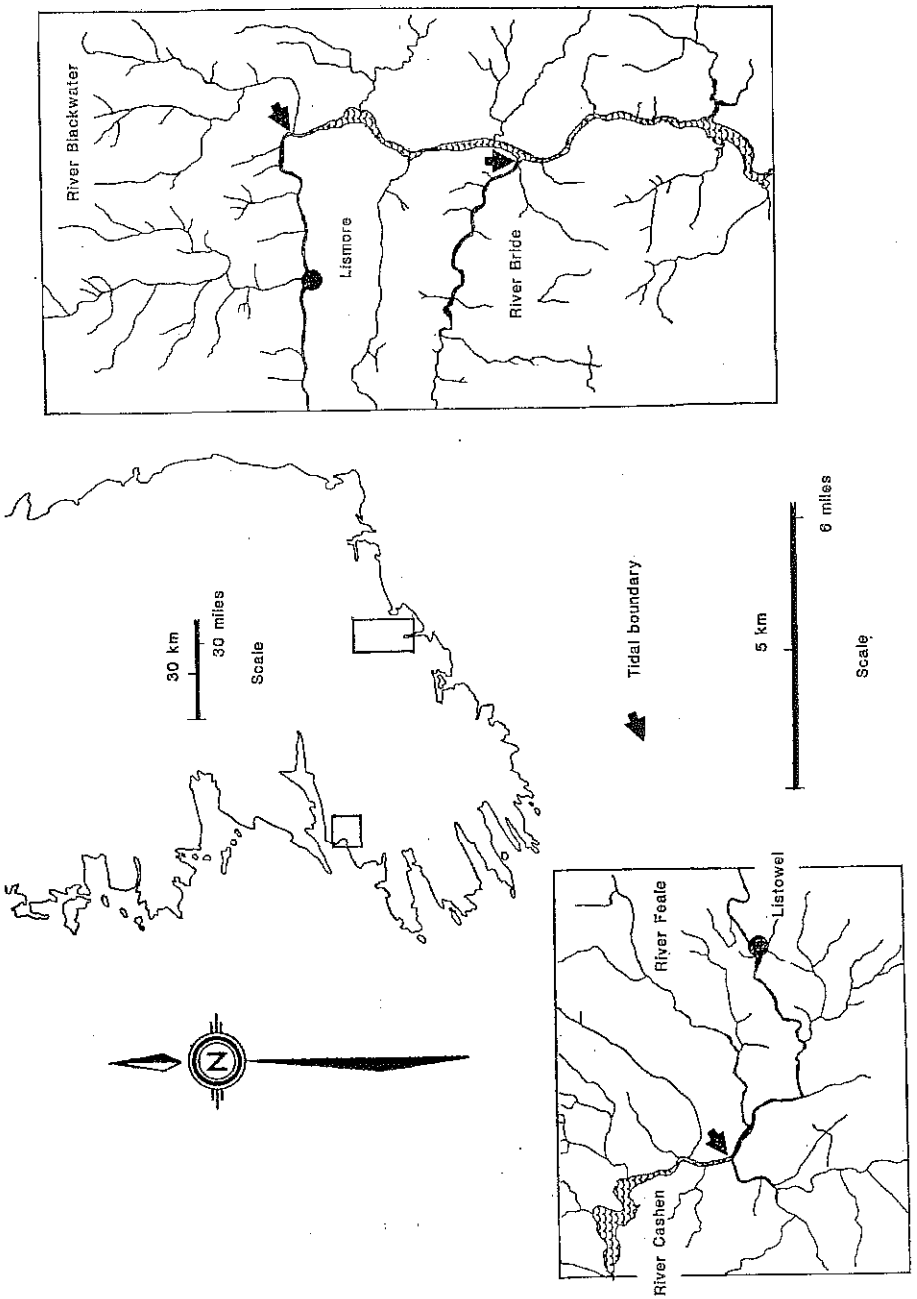
where Y1, Y2 etc. are the percentages of the sample maturing at the second, third etc. post-migration winter. Fish in the first post-migration winter, Y0, are not included.

RESULTS

Details of draft net catches from the River Blackwater are given in Table 1. The commercial fishing season on this river commences in February and since 1979 has ended on 25 July. Previously the season continued to 16 August. A catch in February was recorded only once in the 19 years under consideration and sea trout are rarely taken in April. Regular catches are recorded in May and as many fish are taken in this month as in August, but more than 90% of the annual sea trout numbers and weight are taken by draft net in June and July.

In the analysis of the 52 River Bride sea trout whose scales were deciphered (Table 2) only five age categories were present. The trout were mainly (32) post-smolt and their average weight was correspondingly low (380 g, sd 249). Average fork length was 31.4cm. Previous spawners comprised only 7.7% of the sample. Regressions of log weight on log fork length are given in Table 3.

FIGURE 1. Map showing the location of the two draft net fisheries which are carried out in tidal waters.



The overall mean smolt age (MSA) of the Bride collection was very low, 2.10 years, and 2.16 years among post-smolt. The incidence of B type growth in two year smolts was 63%, 40% in three year olds. Back calculations of length at age in freshwater are provided in Table 4. Bride sea trout migrate at fork lengths of between 19.0 and 26.0cm. In the sea two year smolt trout had reached 30.3cm (sd 5.32) at the end of their first "sea" winter (N=14) and 35.8cm (sd 3.42) at the end of the second (N=3).

River Feale

Among the 143 sets of scales interpreted satisfactorily there were 11 age categories (Table 2). The majority were fish of one sea winter and previous spawners made up 28.5% of the total. The average weight of the specimens was 527g, sd 235 and average fork length 35.4cm. Regressions of log weight on log length are given in Table 3. The mean smolt age was low, although slightly higher than in the Bride collection. Overall mean smolt age was 2.24 years; 2.20 years among post-smolt.

The overall incidence of B type smolts was 62% among two year olds and 42% in three year fish. Back calculated lengths at age in freshwater are presented in Table 4. At migration Feale sea trout ranged between 19 and 25cm fork length. In the sea Feale fish had a mean fork length of 30.7cm at the end of the first sea winter (sd 3.19; N = 61) and 39.0 at the end of the second (sd 2.11; N = 2).

DISCUSSION

Biological characteristics of the stocks

The relationship between the average individual weight in a sample of sea trout and the percentage of previous spawners it contains indicates the type of marine growth concerned and, in the majority of cases, can be used to distinguish the slim bodied Atlantic feeding sea trout from those which occur in the Irish Sea (Fahy, 1981[a]). According to the regressions already described both the Feale and the Bride trout are poorly conditioned fish. The absence of large fish from the collections and the low diversity in age categories suggest that both stocks are short lived.

The MSA of the two collections differed slightly but all of the values recorded are within the range reported for other collections sampled in or around the same years (Fahy, 1981[c], 1982[b]).

The incidence of B growth was greater in two year old smolts than in three year in both collections and this is as usually described. The majority of B type smolts were slightly longer at migration than their A type equivalents. Sea trout smolts in the River Bride were mainly between 19 and 23cm fork length at migration. In the River Feale the majority ranged between 20 and 25cm. These are moderate smolt dimensions.

Exploitation by draft net

On the weight/length data furnished for Bride sea trout an average weight of 567g (the lowest monthly average recorded) corresponds to a fork length of 35.9cm; the highest monthly average of 667g is equivalent to a fork length of 37.8cm. These fork lengths represent Bride sea trout of mainly two "sea summers", or rather, fish which had completed their second season of growth at sea.

The average weight of the individual sea trout captured varies little from one month to the next. The reduction in weight from July to August is of a kind which is frequently reported in angling fisheries (Fahy, 1982[a]) and it results from the inclusion of some large post-smolts in the catch. An equally low average weight in February might also be explained by the inclusion of some post-smolt from the previous year overwintering in freshwater but only one such catch was recorded.

In both the Rivers Feale and Bride the sea trout are poorly conditioned and hence slim bodied, life expectancy is brief and the smolts are moderately large. Exploited by rod and line both stocks would support post-smolt or finnock fisheries (Fahy, 1982[a]).

The sea trout in the sample taken by draft net in the River Feale were predominantly .1+. Older fish were a relatively small proportion of the catch, being a short lived stock, and it might be assumed that post-smolt would have been more plentiful had the samples been collected later in the year (post-smolt run into fresh water with the spring tides in July). In the Feale draft net fisheries the bunt (or central section of the net which ultimately retains the fish) has a mesh size of 4.45cm knot to knot and thus is locally regarded as too large to hold post-smolt. Innovations to repair the deficiency include the attachment to a draft net of an illegal small meshed webbing known locally as *caitin* or else the rapid beaching of the bunt, its meshes stretched obliquely rather than expanded full square, by a deft manifulation known as the *Ballyhorgan whip.*

Exploitation of sea trout by draft nets in the Rivers Feale and Blackwater is quite different from the operation of this fishery in the Dublin Fishery District where a smaller bunt mesh size of 1 inch (2.54cm) knot to knot is permitted by bye-law. This is effective in capturing large numbers of post-smolt (Fahy, 1981[a], Table 8). Like the Dublin District draft nets those in use by the Moy Fishery Company are also small meshed and more than 80% of the trout catch in the summer months belongs to the post-smolt age group.

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Table 1. Characteristics of the draft net sea trout catch from the River Blackwater summarised from data collected between 1965 and 1982 inclusive.

Month	Percentage by Numbers	Percentage by Weight	Mean individual weight (g)	Mean monthly catch by numbers	Standard deviation
February	0.02	0.02	567	0.1	0.46
March	—	—	—	—	—
April	0.58	0.64	667	2.9	5.92
May	4.41	4.47	612	22.1	24.23
June	40.05	40.32	608	200.9	136.91
July	50.36	50.17	603	252.6	130.60
August	4.59	4.38	576	22.9	26.50
TOTALS	9,029	5,462 kg	603		

Table 2. Age analysis of two collections of sea trout from the Rivers Bride and Feale.

Age Category	Bride	Percentage	Feale	Percentage
2.+	27	51.9	24	16.8
3.+	5	9.6	16	11.2
1.1+			2	1.4
2.1+	14	26.9	56	39.2
2.SM+	4	7.7	36	25.2
3.1+			1	0.6
3.SM+			1	0.6
2.2+	2	3.8	2	1.4
2.1+SM+			1	0.6
2.2SM+			3	2.1
3.2+			1	0.6
	52		143	

Table 3. Regression of log weight (g) on log fork length (cm).

	y—intercept	Slope	Number
Predictive			
River Bride	—1.9445	3.0170	49
River Feale	—1.4870	2.7158	156
Geometric mean functional			
River Bride	—2.0708	3.1070	
River Feale	—1.7220	2.8680	

Table 4. Back calculated fork lengths (cm) at end of each winter in fresh water.

	1 winter		2 winter		3 winter		at migration		
	mean	sd	mean	sd	mean	sd	mean	sd	number
River Bride									
A type									
Smolt class									
2	8.1	2.810	19.4	2.489					14
3	7.6	2.810	15.0	2.222	23.4	2.613			3
B type									
Smolt class									
2	7.2	2.781	17.3	2.532			20.7	2.091	28
3	6.1	1.193	12.8	2.212	20.5	2.428	22.6	2.350	2
River Feale									
A type									
Smolt class									
2	8.7	2.643	20.2	3.273					41
3	6.4	1.459	15.9	2.358	23.4	2.437			9
B type									
Smolt class									
2	7.8	1.580	18.6	2.374			21.4	2.161	35
3	7.1	1.235	15.9	2.656	22.5	2.885	24.8	2.745	9