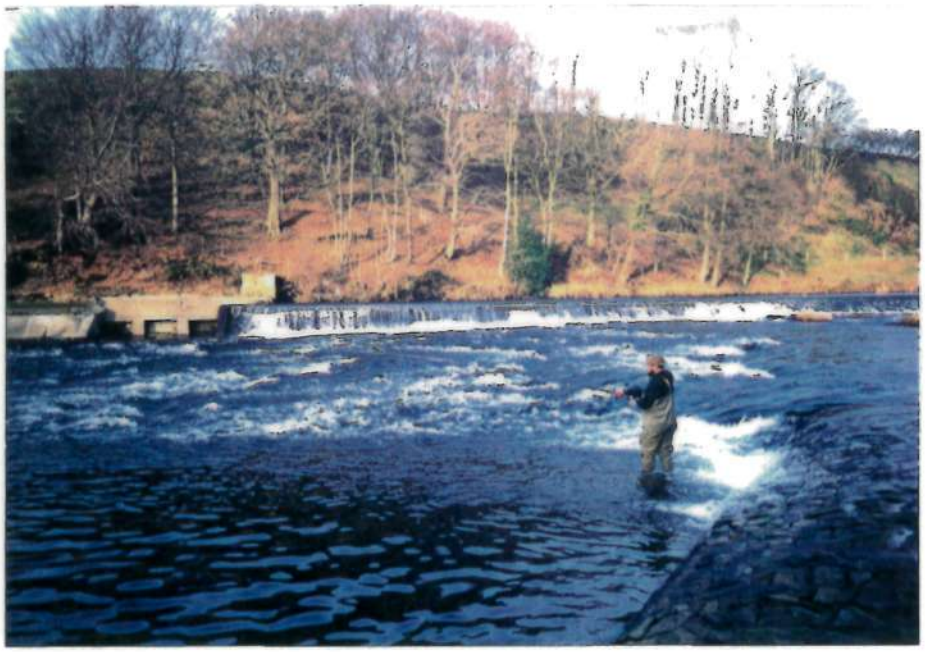
An Analysis of Migratory Salmonid Catch Effort Data, Derived From Anglers' Log Books, 1991.



NRA/NW/FTR/93/3

April 1993

AN ANALYSIS OF MIGRATORY SALMONID CATCH EFFORT DATA, DERIVED FROM ANGLERS' LOG BOOKS, 1991.

Miran W. Aprahamian

National Rivers Authority,
North West Region,
Richard Fairclough House,
Knutsford Road,
Warrington,
WA4 1HG

April 1993

Contents

Summary

1000 log books were issued to anglers of which 236 were returned, those from the rivers Derwent, Kent, Lune and Ribble accounted for the vast majority.

The Derwent had the highest catch rate of these rivers: one salmon every 13.89 hours followed by the Lune, Kent and Ribble at 16.39, 18.87 and 35.71 hours, respectively. For sea trout the Lune, Derwent and Ribble had a catch rate of approximately one fish every 10.0 hours (9.8, 10.0 and 10.64 hours), and for the Kent one fish per 16.1 hours fished.

Salmon angling visits were, in general, longer than those for sea trout being between 2 and 6 hours as opposed to 2 to 4 hours.

On the majority of visits (>80%) no fish were caught, and was the same for salmon and sea trout.

For salmon the majority of fish were caught on fly, spinner or worm, and the least on prawn. For sea trout fly predominated.

The majority of salmon caught were less than 9lb in weight and were presumed to be grilse (1 sea winter). The Ribble and the Eden had the highest proportion of fish caught which were greater than 9lb, 38.5% and 34.8% respectively. The majority of the sea trout caught weighed between 1 and 3lb.

The pattern of catch, effort, CPUE, abundance and catchability for salmon and sea trout were modelled using the data from the rivers Derwent, Kent and Lune. Flow significantly influenced catch, effort and catchability of salmon which had entered in a particular month. For sea trout flow was not significantly correlated with any of the dependent variables.

The catchability coefficient for salmon, determined from the total number of fish, remained relatively constant over the period June to October indicating that CPUE was a reasonable measure of within season abundance. This was not found to be the case for sea trout.

For sea trout the catchability coefficient, determined from the monthly count of fish, was constant over the period May - October indicating that cumulative CPUE or mean monthly CPUE provide the best measure of within season abundance.

AN ANALYSIS OF MIGRATORY SALMONID CATCH EFFORT DATA, DERIVED FROM ANGLERS' LOG BOOKS, 1991.

I. Introduction

Catch is the basic measure of fishery performance. However in many instances there is little information on the effort involved in obtaining the catch. In 1989 details of effort were requested as part of the annual catch return made by migratory salmonid anglers and took the form of total number of days fished on a particular river for that season. Though the data are suitable to examine trends in total migratory salmonid catch effort they are not refined enough to investigate what factors are influencing catch, nor are they divided into effort expended on salmon and sea trout.

In order to obtain more detailed information on catch and effort a log book scheme was introduced, in 1991, where by the daily details of an individual's catch and effort could be recorded. The aim of the scheme being to provide data which will allow:

1) Comparisons of fishery performance to be made both between and within rivers.

2) To assess the influence of stock size on catch and effort on those catchments where abundance can be determined.

3) An assessment of the influence of environmental factors, particularly flow, on the performance of the fishery.

4) Provision of a means by which the actions of management on fishery performance can be assessed.

This report summarises the catch and effort data collected from log books during 1991.

II. Materials and Methods

Anglers were asked to provide details of each angling trip, information was requested on where and when fishing was carried out, for how long and for which specie(s) together with details of the catch (Figure 1). The distribution of log books was mainly through Bailiffs encountering willing participants on the river bank.

Catch per unit of effort (CPUE) was calculated as:

$$\frac{\text{total number of fish caught in period}}{\text{total time spent fishing in hours}}$$

Figure 1. Data recording sheet.

REMEMBER: ONLY ONE TRIP TO BE RECORDED ON EACH PAGE.

RIVER		LOCATION	

DATE	PLEASE CIRCLE APPROPRIATE BOXES										
DATE	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20		
	21	22	23	24	25	26	27	28	29	30	31
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	

FISHING EFFORT	HOURS
HOURS FISHING FOR SALMON ONLY	
HOURS FISHING FOR SEA TROUT ONLY	
HOURS FISHING FOR BOTH SPECIES AT THE SAME TIME	

CATCH	IF NIL TICK BOX ⟶						
FISH No.	SPECIES (TICK BOX✓)		WEIGHT		METHOD	RETURNED IF YES TICK	TAG No.
	SALMON	SEA TROUT	LBS	OZ			
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

COMMENTS .....

.....

only visits where both catch and effort data had been recorded were used in the calculation of CPUE.

Where anglers had recorded fishing for both salmon and sea trout at the same time, the time spent fishing was used in calculation of both salmon effort and sea trout effort.

Confidence limits were determined assuming a Poisson distribution as follows:

+/- 1.96*Sqrt(Mean/Number of observations)

except in the case of weight where a normal distribution was assumed.

On the rivers Derwent, Kent and Lune an estimate of abundance was available from resistivity fish counters (NRA(NW), 1991). The counts were separated into salmon, fish greater than 4lb, and sea trout, less than 4lb in weight (Appendix 1). This was determined from the size of the electrical signal produced as the fish traversed the counting electrodes. No correction was made for missing data.

Catch data for salmon and sea trout were obtained from published catch statistics (NRA(NW), 1991). The number of fish present in the river system, at any one time, was estimated as cumulative count minus cumulative catch.

Catchability was estimated as:

Catch per Unit Effort / Abundance (Gulland, 1991)

For each time period (month) two estimates of abundance were available;

1) the total number of fish present in the system. For each month this was expressed in terms of the proportion available at the end of October (i.e. number in October = 100).

2) The proportion of the total number of fish counted between January and October which entered the system in a particular month, and termed monthly counts.

Mean monthly flows for the rivers Derwent, Kent and Lune were obtained from Camerton, Sedgewick and Caton gauging stations, respectively (Appendix 2).

Analysis was carried out using the statistical package Minitab.

III. Results

IIIA. Number of Returns

Of the 1000 log books issued to anglers 236 were returned. The number of anglers reporting fishing for salmon and sea trout, for each river is given in Table 1.

Table 1. Number of anglers reporting fishing for salmon and sea trout.

Catchment	Number of Anglers fishing for:	
	Salmon	Sea trout
Border Esk	3	1
Eden	13	3
Derwent	93	56
Ehen	8	5
Calder (W.Cumbria)	1	
Irt	1	1
Duddon	1	1
Crake	5	3
Leven	9	5
Bela	1	1
Kent	26	15
Lune	57	51
Wyre	2	
Ribble	48	45

IIIB. Total Catch, Effort and CPUE - All Rivers

The total catch and effort for salmon and sea trout is summarised in Tables 2 and 3, for each catchment.

Table 2. Summary of annual catch and effort for salmon

Catchment	Catch	Visits	Hours	CPUE
Border Esk	3	3	27	0.111
Eden	46	85	593	0.078
Derwent	439	1586	6106	0.072
Ehen	22	116	367	0.060
Calder	0	4	9	0
Irt	0	9	23	0
Duddon	0	8	24	0
Crake	11	59	152	0.072
Leven	27	85	317	0.085
Bela	0	23	78	0
Kent	121	461	2281	0.053
Lune	214	738	3502	0.061
Wyre	0	9	32	0
Ribble	65	525	2310	0.028

Table 3. Summary of annual catch and effort for sea trout

Catchment	Catch	Visits	Hours	CPUE
Border Esk	9	1	12	0.750
Eden	4	7	22	0.182
Derwent	140	482	1391	0.100
Ehen	9	75	205	0.044
Calder				
Irt	1	6	14	0.071
Duddon	1	4	10	0.100
Crake	27	54	132	0.205
Leven	19	44	145	0.131
Bela	0	22	79	0
Kent	74	306	1197	0.062
Lune	225	624	2212	0.102
Wyre				
Ribble	115	365	1219	0.094

A monthly summary of catch, effort, and catch per unit effort, for each river, are presented in Appendix 3.

IIIC. Number of Hours Fished per Visit

Salmon anglers' visits ranged in length of time from 1 to 16 hours and for sea trout from 1 to 14 hours. In general a visit spent salmon fishing was greater than one spent fishing for sea trout, the majority of the salmon visits ranged from 2 to 6 hours and for sea trout 2 to 4 hours (Figure 2 a & b). A breakdown of the time spent fishing for each species in each catchment, is summarised in Appendix 4.

IIID. Number of Fish Caught per Visit

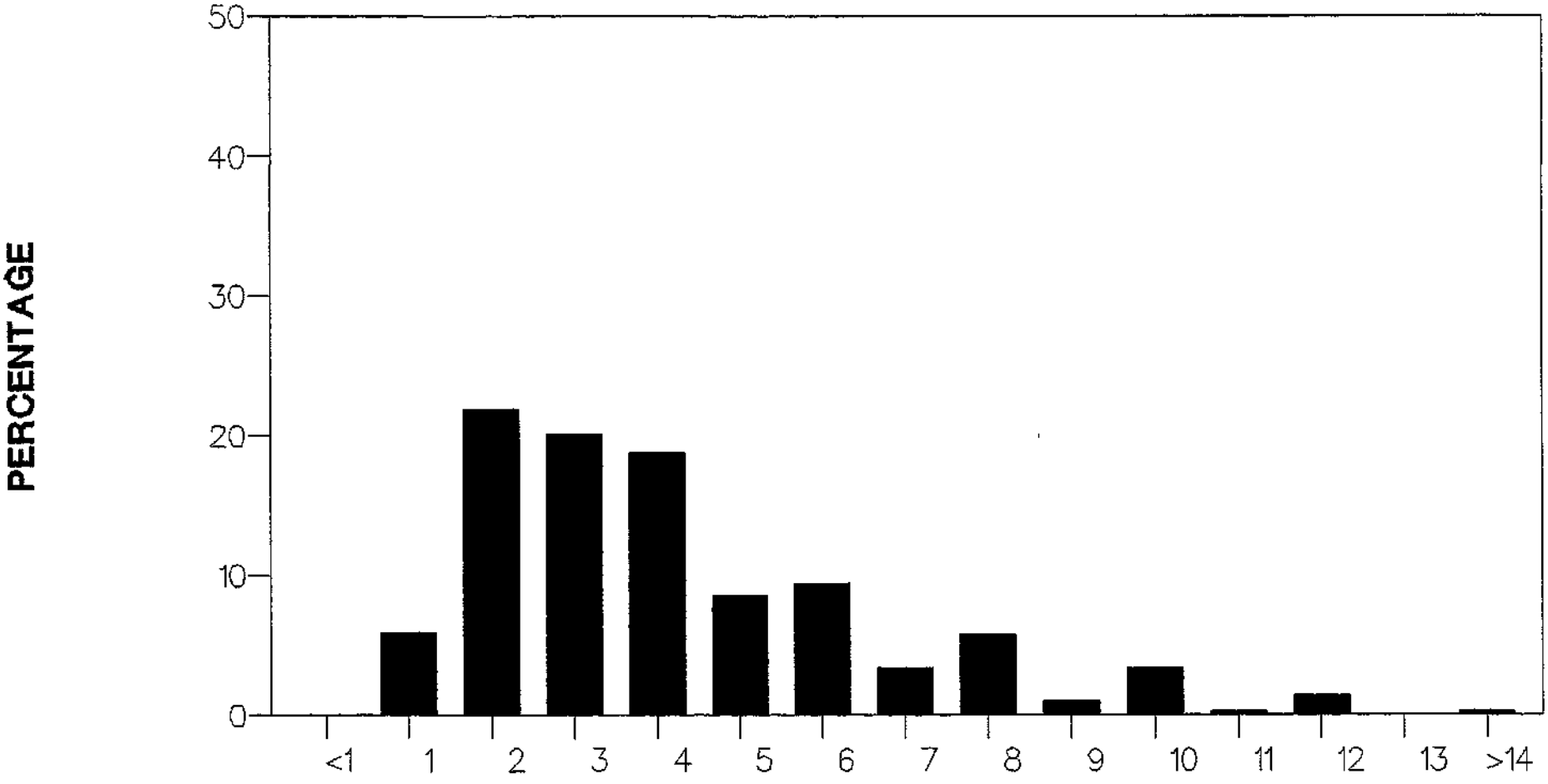
For both salmon and sea trout the vast majority of visits were unsuccessful (>80%), no fish being caught. There was little difference in the success rate between the two species. This is illustrated in Figure 3 a & b, which summarises the success rate in those rivers where more than 20 visits had been recorded. The success rate for both salmon and sea trout for all catchments investigated is recorded in Appendix 4.

IIIE. Trend in Catch, Effort and CPUE for Salmon in the Rivers Derwent, Kent and Lune

Examination of trends in the data were confined to the rivers Derwent, Kent and Lune as these were the only rivers which had reliable estimates of abundance and had returns fron 15 or more anglers. In order to combine the

FIGURE 2. NUMBER OF HOURS FISHED PER VISIT

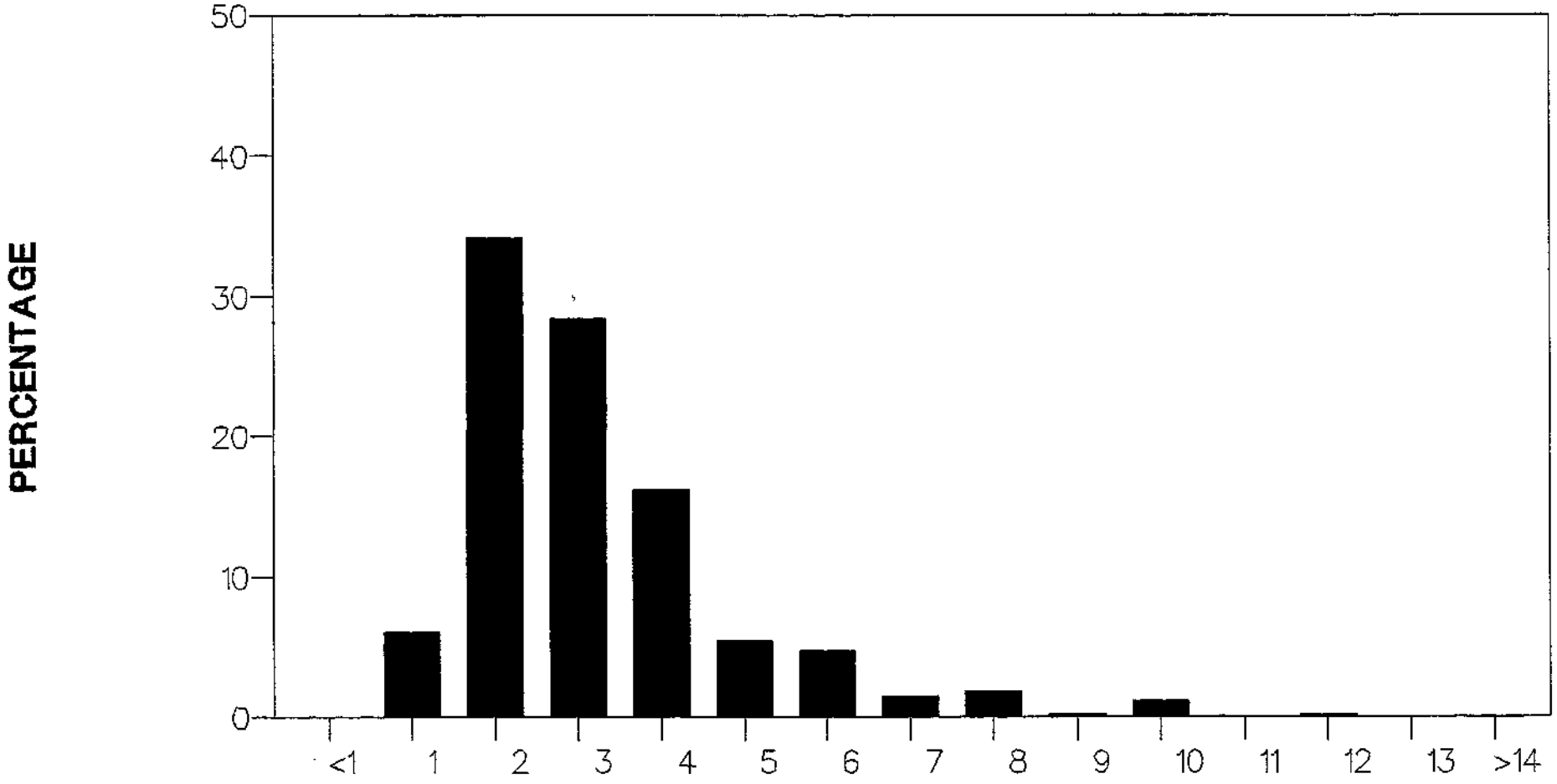
A) SALMON



ONLY INCLUDES CATCHMENTS WITH > 20 VISITS

FIGURE 2. NUMBER OF HOURS FISHED PER VISIT

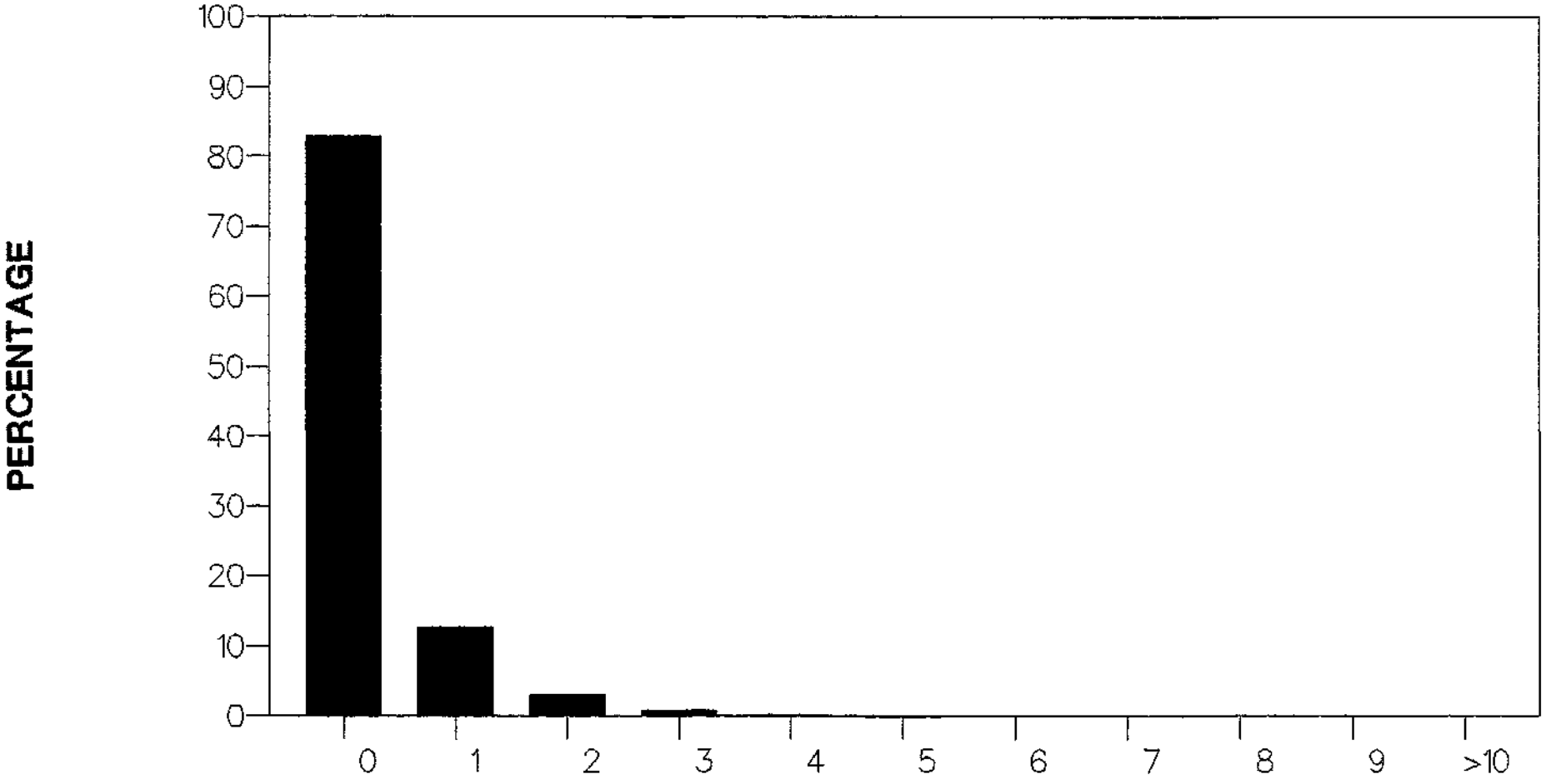
B) SEA TROUT



ONLY INCLUDES CATCHMENTS WITH > 20 VISITS

FIGURE 3. NUMBER OF FISH CAUGHT PER VISIT

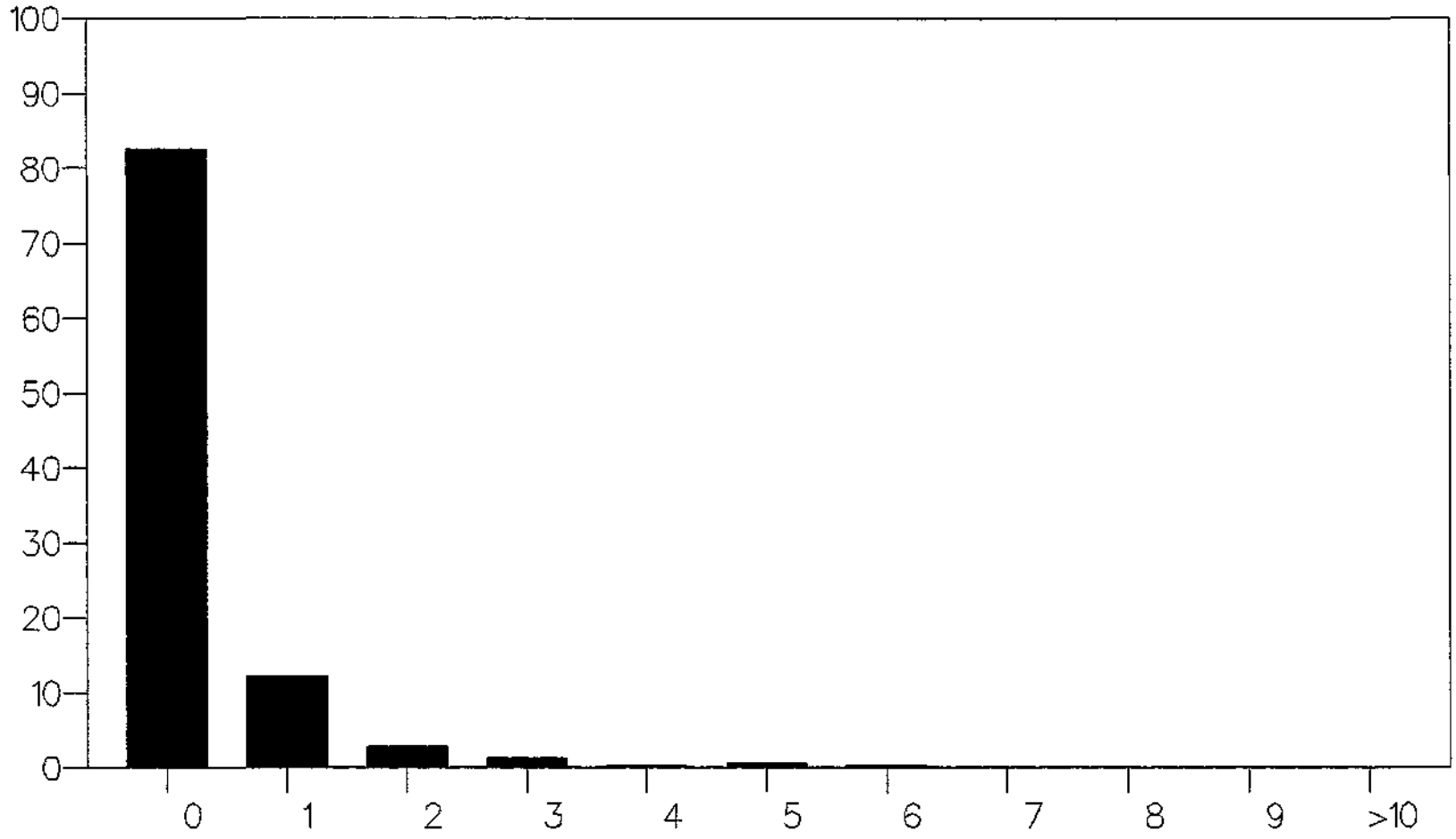
A) SALMON



ONLY INCLUDES CATCHMENTS WITH > 20 VISITS

FIGURE 3. NUMBER OF FISH CAUGHT PER VISIT

B) SEA TROUT



ONLY INCLUDES CATCHMENTS WITH > 20 VISITS

data from all three rivers the data were converted to proportions.

The trend in the proportion of the total catch, effort and CPUE per month in the rivers, Derwent, Kent and Lune can be described for salmon by the equations:

$$C_{SA} = 76.79 + (0.465*M^3) - (4.80*M^2) \qquad r^2 = 0.96$$

$$E_{SA} = 43.29 + (0.244*M^3) - (2.42*M^2) \qquad r^2 = 0.92$$

$$CPUE_{SA} = -3.08 + (0.041*M^3) \qquad r^2 = 0.83$$

where C_{SA} = proportion of total catch June - October
E_{SA} = proportion of total effort June - October
$CPUE_{SA}$ = proportion of total cpue June to October
M_{SA} = Month (value 6 - 10)

and are shown in Figure 4.

Only those months where there were > 15 visits per month were used in creating the model, for salmon this restricted the period to June - October inclusive.

The trend in catch and effort was to increase towards the end of the season, and was more rapid in the case of catch than in effort. In contrast CPUE increased steadily over the period.

The pattern of catch and effort was significantly correlated with flow. Table 4 shows the correlation coefficients for the relationships between mean monthly flow, catch, effort and CPUE (all variables expressed as a proportion of the total between June and October).

Table 4. Correlation coefficients for the relationship between monthly percentage flow, catch, effort and cpue for salmon.

	% Flow	% Catch	% Effort
% Catch	0.88*		
% Effort	0.86*	0.97*	
% CPUE	0.64	0.92*	0.86*

* = $p<0.05$

IIIF. Trend in the Abundance of Salmon in the Rivers Derwent, Kent and Lune

The pattern of abundance, in the three rivers is shown in Figure 5 together with the trend in monthly counts of salmon, and could be described by the equations:

FIGURE 4. PROPORTION OF TOTAL CATCH OF SALMON, EFFORT, AND CPUE PER MONTH, FOR PERIOD JUNE - OCTOBER

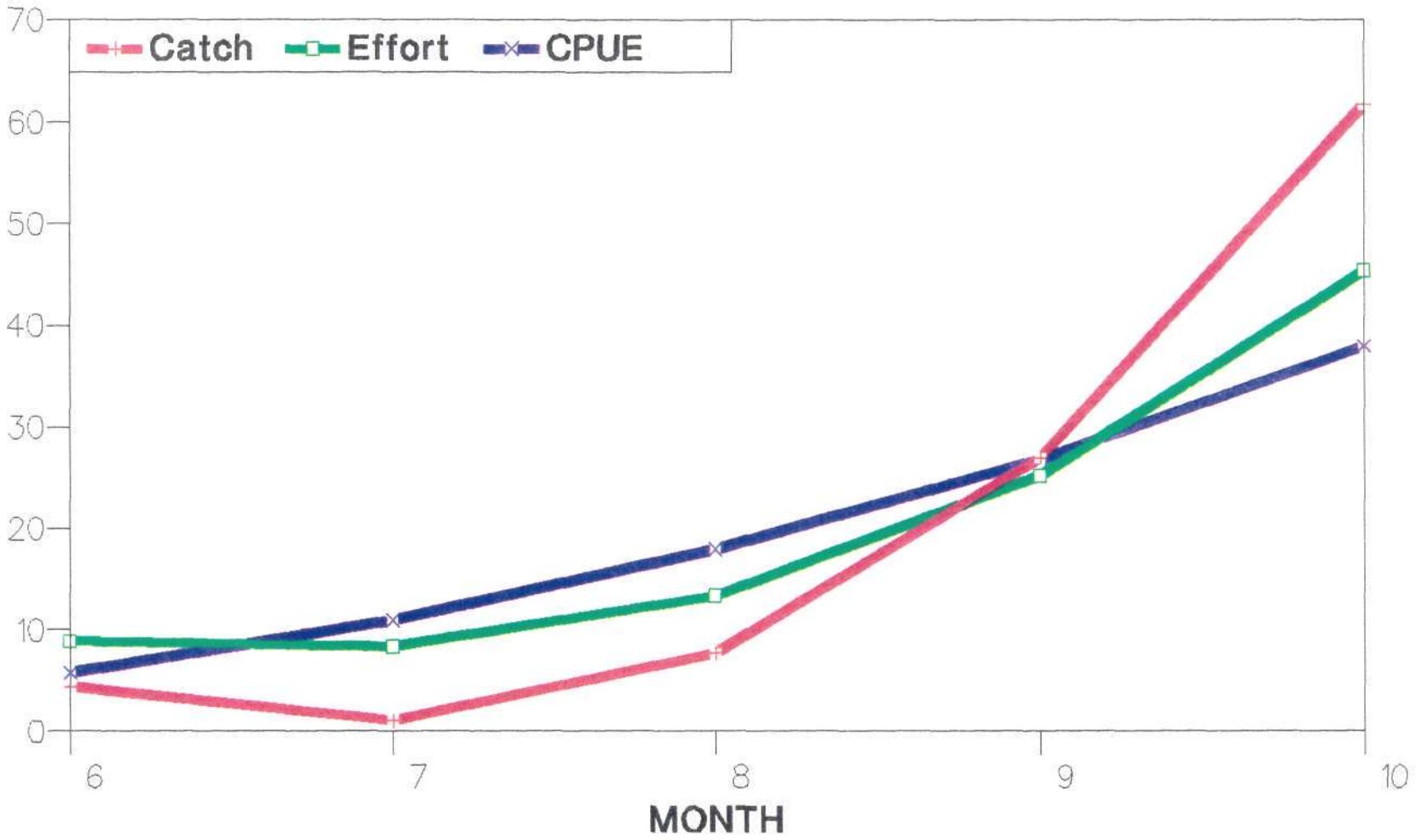


FIGURE 5. PATTERN OF ABUNDANCE FOR PERIOD JANUARY TO OCTOBER

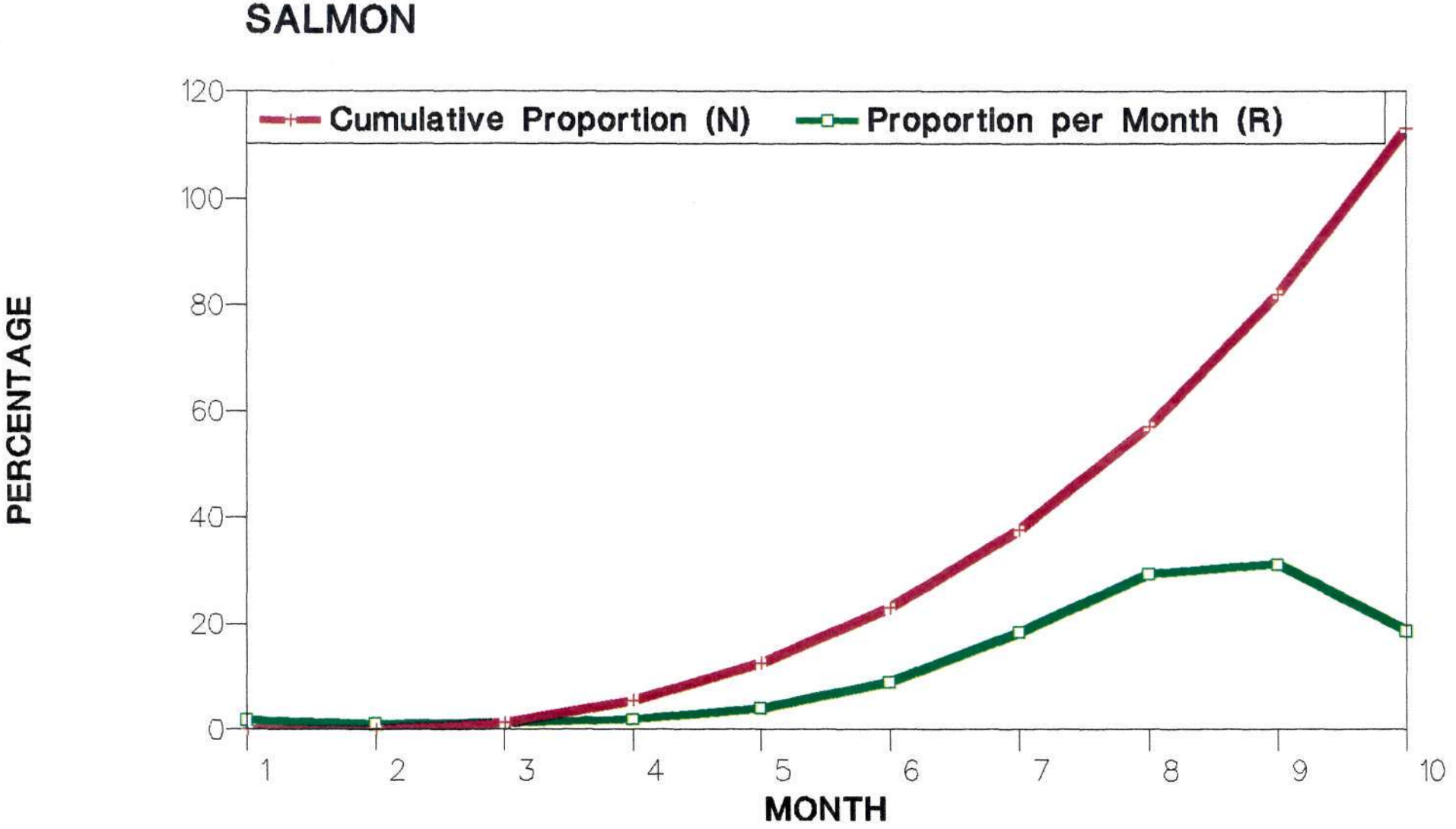
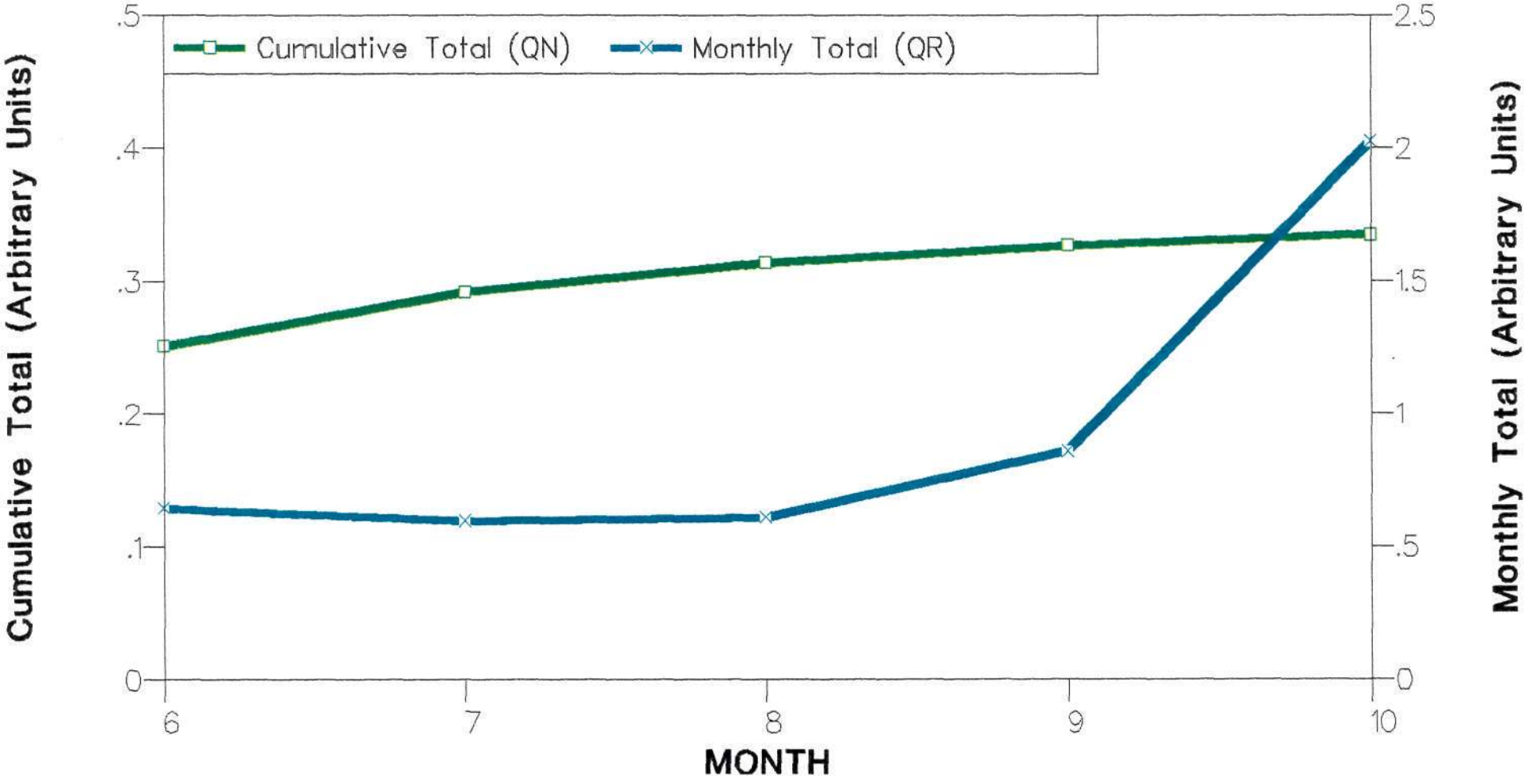


FIGURE 6. CATCHABILITY OF SALMON OVER THE PERIOD JUNE - OCTOBER.



$$N_{SA} = -1.85 + (0.115*M^3) \qquad r^2 = 0.95$$

$$\text{Log}_{10}\ (R+1)_{SA} = 0.76 - (0.70*M) - (0.012*M^3) + (0.19*M^2) \qquad r^2 = 0.93$$

where N_{SA} = the total number of fish present in the system expressed as a proportion of the number at the end of October (i.e. number in October = 100).

R_{SA} = the proportion of the total number of fish entering the system in a particular month.

M_{SA} = Month (value 1 - 10)

The number of fish present in the system increased throughout the season with the majority entering after the end of July.

IIIG. Trend in the Catchability of Salmon in the Rivers Derwent, Kent and Lune

Using the abundance and CPUE equations, the change in catchability of salmon over the period June to October, can be seen in Figure 6.

It is evident that catchability as measured against the total population increased over the period June to October, such that the value by October was 33% greater than that in June. The increase was most marked between the first two months which accounted for 50.6% of the total increase. Catchability as measured against monthly counts appeared relatively stable until September, after which it increased markedly.

The trend over the period June - October could be described by the equations:

$$QN_{SA} = -0.191 + (0.106*M) - (0.0054*M^2) \qquad r^2 = 0.99$$

$$QR_{SA} = 3.381 + (0.015*M^3) - (0.164*M^2) \qquad r^2 = 0.97$$

where QN_{SA} = catchability determined from the total population in arbitrary units

QR_{SA} = catchability determined from the number of fresh run fish in arbitrary units

M_{SA} = Month (value 6 - 10)

QR_{SA}, similar to catch and effort, was significantly correlated with mean monthly flow, as predicted from the model ($r = 0.98$), given in Appendix 2. This indicates an increase in catchability of either the fresh run fish or of the resident population or a combination of both, and that it is flow dependent.

IIIH. Trend in Catch, Effort and CPUE for Sea Trout in the Rivers Derwent, Kent and Lune.

For sea trout the trend in catch, effort and CPUE, between May and October, could be described in terms of a parabola (Figure 7), and represented by the equations:

$C_{ST} = -155 + (35.6*M) - (0.196*M^3)$ $\quad r^2 = 0.59$

$E_{ST} = -114 + (27.3*M) - (0.151*M^3)$ $\quad r^2 = 0.82$

$CPUE_{ST} = -81.4 + (19.4*M) - (0.097*M^3)$ $\quad r^2 = 0.42$

where C_{ST} = proportion of total catch May - October
E_{ST} = proportion of total effort May - October
$CPUE_{ST}$ = proportion of total cpue May - October.
M_{ST} = Month (value 5 - 10)

All three dependent variables were significantly inter-correlated, though not related to flow (Table 5).

Table 5. Correlation coefficients for the relationship between monthly percentage flow, catch, effort and CPUE for sea trout.

	% Flow	% Catch	% Effort
% Catch	-0.13		
% Effort	-0.14	0.91*	
% CPUE	0.15	0.90*	0.74*

* = $p<0.05$

IIII. Trend in the Abumdance of Sea Trout in the Rivers Derwent, Kent and Lune

Sea trout abundance, in terms of total number of fish and in terms of monthly counts over the period January to October could be described by the equations:

$N_{ST} = -7.78 + (1.147*M2)$ $\quad r^2 = 0.94$

$Log_{10} (R+1)_{ST} = 0.41 - (0.43*M) - (0.01*M^3) + (0.15*M^2)$ $\quad r^2 = 0.81$

where N_{ST} = the total number of fish present in the system expressed as a proportion of the number at the end of October (i.e. number in October = 100).
R_{ST} = the proportion of the total number of fish entering the system in a particular month.
M_{ST} = Month (value 1 - 10)

The trend in abundance is shown in Figure 8.

FIGURE 7. PROPORTION OF TOTAL CATCH OF SEA TROUT, EFFORT, AND CPUE PER MONTH, FOR PERIOD MAY - OCTOBER

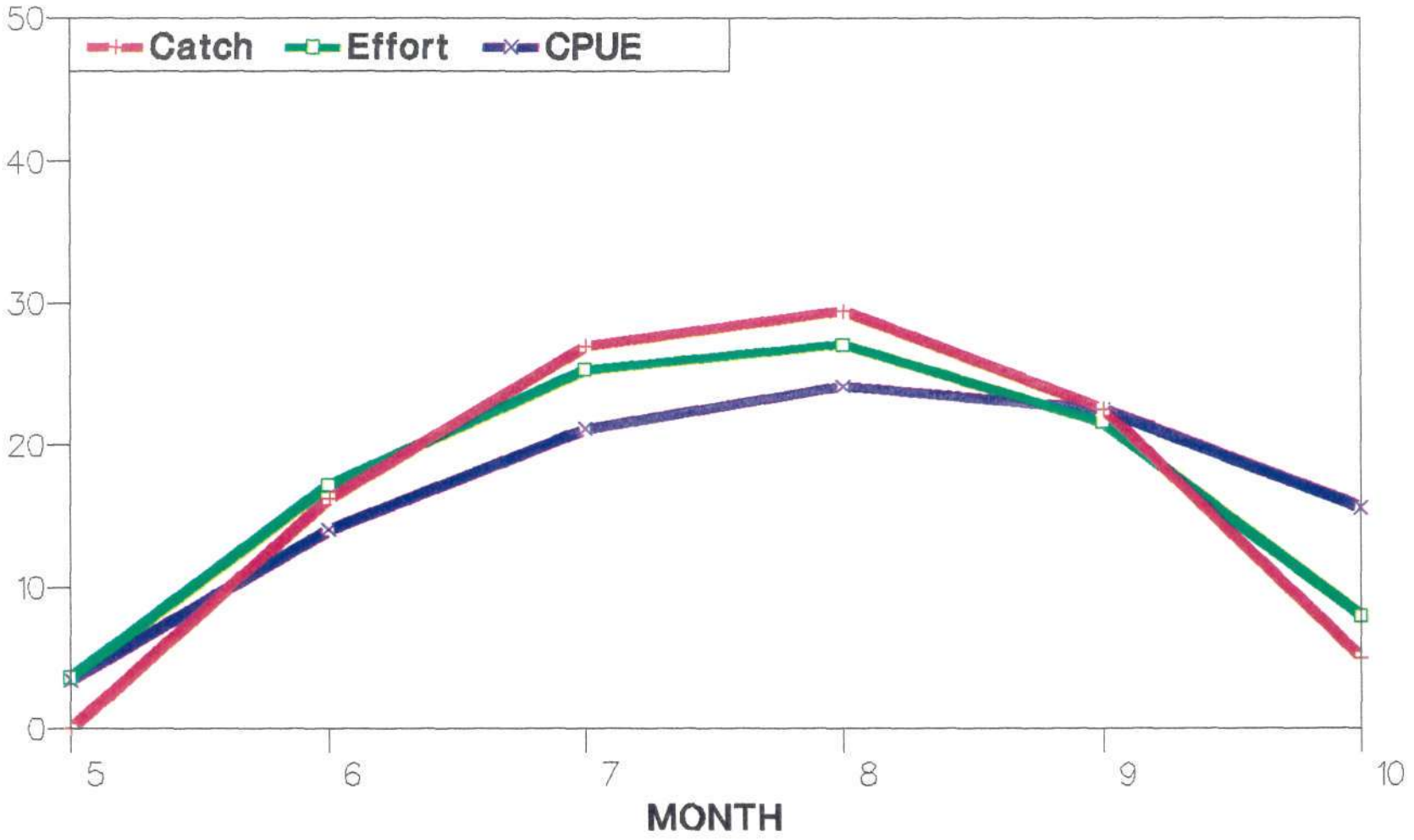


FIGURE 8. PATTERN OF ABUNDANCE FOR PERIOD JANUARY TO OCTOBER

SEA TROUT

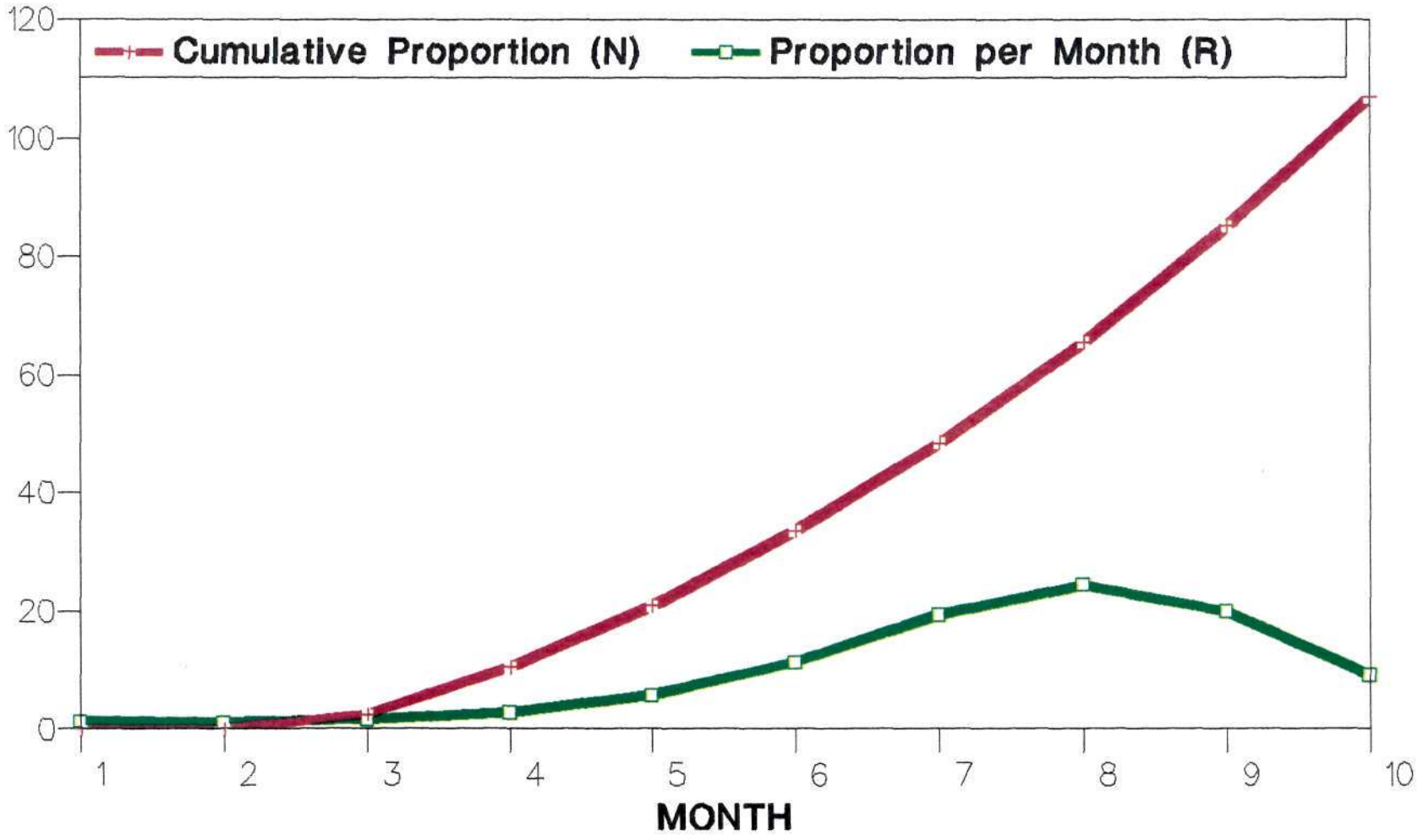
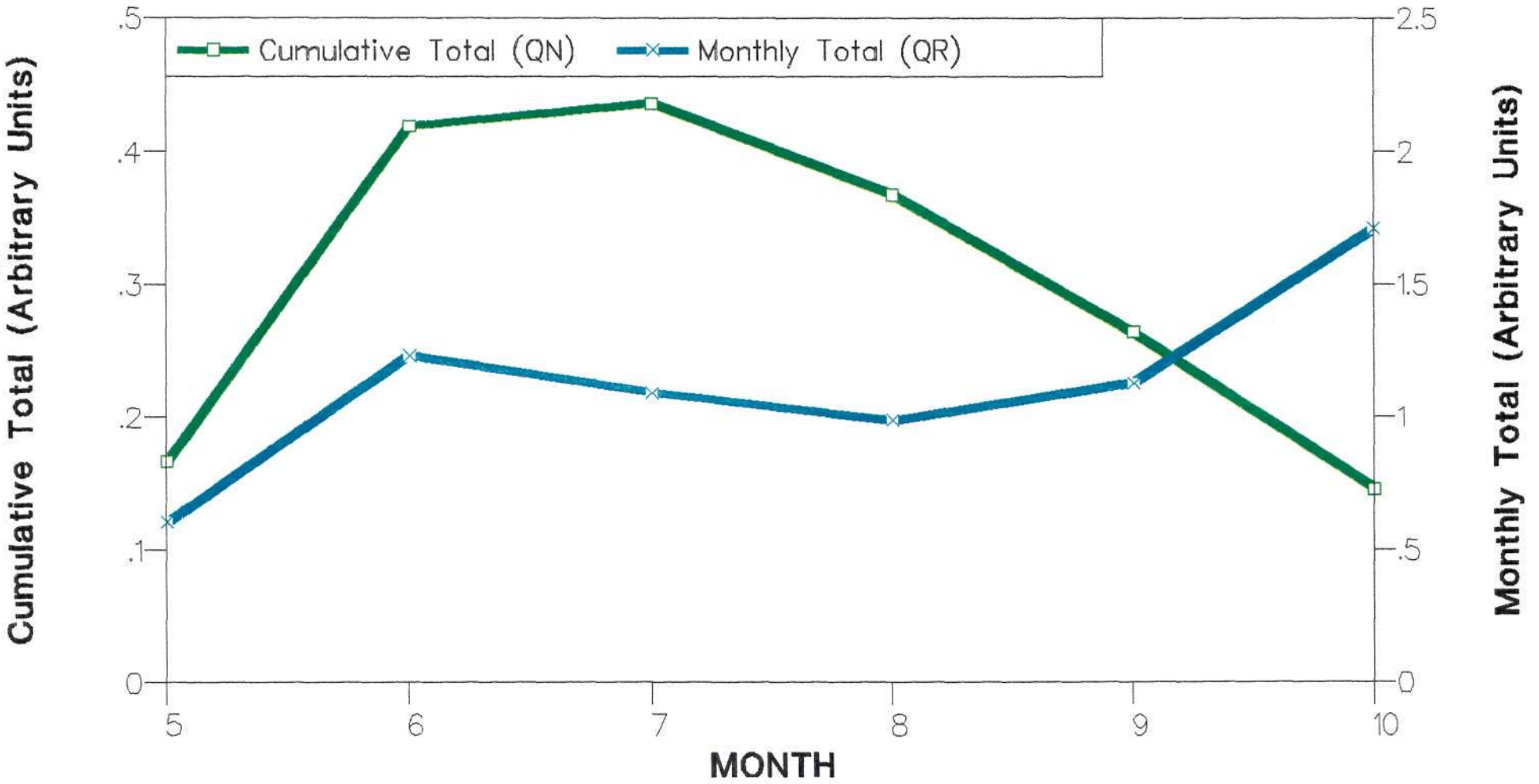


FIGURE 9. CATCHABILITY OF SEA TROUT OVER THE PERIOD MAY - OCTOBER



IIIJ. Trend in the catchability of Sea Trout in the Rivers Derwent, Kent and Lune.

The catchability of sea trout over the period May to October is shown in Figure 9, and with regard to the total population takes the form of a parabola. This is similar to that for catch, effort and CPUE, and can be described by the equation:

$$QN_{ST} = -1.07 + (0.301*M) - (0.0018*M^3) \qquad r^2 = 0.72$$

where QN_{ST} = catchability determined from the total population in arbitrary units
M_{ST} = Month (value 5 - 10)

The catchability estimated from monthly counts increased between May and June then remained relatively constant until September before increasing again in October. Over the period May to October the trend was not significantly different from zero, indicating that CPUE, and in fact catch and effort, provided an accurate estimate of the number of fish entering the river per month.

IIIK. Catch of Salmon and Sea Trout by Method

From the data collected it was not possible to determine the effectiveness of the various methods utilised to catch migratory salmonids, as no data were recorded on the length of time each method was used. However, the study does provide a breakdown of the catch according to method and indicates, for salmon, no clear domination of one particular method in the Region, though more were caught on worm, spinner and fly compared with prawn (Table 6). For sea trout fly clearly predominated (Table 7).

Table 6. Proportion of salmon caught by various methods.

Catchment	Worm	Spin	Fly	Prawn	N/R
Border Esk	0	0	100	0	0
Eden.	19.6	45.7	10.9	23.9	0
Derwent	5.2	40.8	51.0	0.7	2.3
Ehen	36.4	22.7	22.7	18.2	0
Calder	0	0	0	0	0
Irt	0	0	0	0	0
Duddon	0	0	0	0	0
Crake	81.8	18.2	0	0	0
Leven	18.5	7.4	51.9	22.2	0
Bela	0	0	0	0	0
Kent	43.0	19.0	14.0	22.3	1.7
Lune	17.3	28.5	37.4	13.1	3.7
Wyre	0	0	0	0	0
Ribble	41.5	16.9	32.3	7.7	1.5

Table 7. Proportion of sea trout caught by various methods.

Catchment	Worm	Spin	Fly	Prawn	N/R
Border Esk	0	0	100	0	0
Eden	0	25.0	75.0	0	0
Derwent	0	3.6	94.3	0	2.1
Ehen	22.2	0	77.8	0	0
Calder					
Irt	0	100	0	0	0
Duddon	0	100	0	0	0
Crake	14.8	29.6	51.9	0	3.7
Leven	0	10.5	89.5	0	0
Bela	0	0	0	0	0
Kent	10.8	0	89.2	0	0
Lune	7.1	14.2	77.8	0.4	0.4
Wyre					
Ribble	0	13.9	86.1	0	0

A monthly breakdown of catch according to method for each catchment is shown in Appendix 3.

IIIL. Weight Composition of the catch

The composition of the catch in terms of weight is shown in Table 8 a & b for salmon and sea trout respectively, a monthly breakdown is presented in Appendix 5. In the absence of any size : age data it is not possible to accurately separate catch into sea age categories or into year-classes. However if it is assumed for salmon that a weight of 9lb effectively partitions 1SW (sea winter) from multi sea winter (MSW) fish, then it is apparent from Table 8a that the salmon catch consists predominantly of grilse (1SW).

The catchment with the greatest proportion of MSW salmon (>9lb) was the Ribble with 38.5% closely followed by the Eden with 34.8%. For sea trout, the majority were between 1 and 3 lb, which probably represents a sea age of 1 or 2 sea winters.

IV. Discussion

A reasonable response to the scheme was obtained from the rivers Derwent, Lune, Ribble and Kent. Relatively few anglers contributed to the log book scheme from the other rivers. The results from the latter will therefore have a large degree of bias and should therefore be viewed with caution.

Table 8a. Number of salmon caught according to size.

	Weight categories (pounds)																	
River	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20
BORDER ESK	1		1								1							
EDEN		1	4	5	9	11	5	2	2	1	1	1	2	2				
DERWENT	6	23	71	74	85	61	39	23	5	8	6	8	7	11	4	4	1	3
EHEN		1	3	9	4	2	1	1				1						
CRAKE	3	3	1	1	1	2												
LEVEN	1	2	3	5	5	6	1	1		2		1						
KENT	15	36	25	10	9	6	9	4	1	3	2		1					
LUNE	4	16	22	36	34	30	10	11	4	6	4	7	4	1	1	5	1	1
RIBBLE	1	8	7	6	11	7	2	6	2	3	1		1	8				2

Table 8b. Number of sea trout according to size.

	Weight categories (pounds)									
River	0	1	2	3	4	5	6	7	8	9	10
BORDER ESK		8	1								
EDEN		1	2	1							
DERWENT	7	68	42	10	5	5	2		1		
EHEN		6									
IRT	1										
DUDDON		1									
CRAKE	24	3									
LEVEN	3	11	3	2							
KENT	6	32	26	6	4						
LUNE	10	89	83	19	15	6	1	1			
RIBBLE	19	43	27	20	4	1	1				

Weight category eg. 3lb = 3lb 0oz - 3lb 13oz.

Catch to a large extent will depend on the size of the system from which it is derived, as such catch per hour fished is likely to be a more equitable basis on which to compare fishery performance.

Compared with other rivers within the British Isles (Table 9) the number of salmon caught per hour for the rivers Derwent, Lune, Kent and Ribble were lower than those from the Tamar and Foyle, but, except in the case of the Ribble, exceeded the catch per hour of the other British Isles rivers. Comparison with the Frome must be made with care as it represents the returns from the IFE's beat at East Stoke (2.4km, single bank, 12km upstream of tide, mon-thurs returns only) and may not be representative of the river as a whole. However of all the studies it does provide a measure of the variability of such data.

There was no information available for sea trout for the rivers Frome, Tamar, Wye and Foyle. The number of sea trout caught per hour for the Lune, Derwent and Ribble compared favourably with that of the Tywi in 1991 which, of the rivers where comparable data existed, had the highest catch rate.

Though the log books do provide a more accurate assessment of effort the scheme is voluntary and the returns may represent those of the more successful anglers and as such may not be representative of the angling effort as a whole. Certainly Small and Downham (1985) found that CPUE from voluntary returns was usually greater than that derived from anglers whose return had been prompted. This has the effect of reducing the CPUE for the fishery.

→ Cf. Creel Census!

It was not possible to follow up non return of log books with reminders. For operational reasons it was not practical to obtain names and addresses of all the anglers issued with a log book.

A number of studies have documented the influence of flow on the catch of salmon (Alabaster, 1970; Bunt, 1990; Clarke et. al., 1990; Gee, 1980; Millichamp & Lambert, 1966). Similar findings were evident for the three rivers more intensively studied, Derwent, Kent and Lune. This relationship may, inpart, have been attributable to an increase in effort as well as to an increase in catchability.

Tagging studies (Clarke et. al., 1990; Laughton, 1991; Solomon & Potter, 1991) have found that salmon are more susceptible to capture during the initial 20 days following entry into fresh water and then again towards the end of the fishing season (September - October). Such a behaviour pattern could explain the relatively stable catchability of the "fresh run" migrants (QR_{SA}) between June and September and its subsequent increase in the autumn.

Table 9. Number of salmon and sea trout caught per hour fished, from rivers within the British Isles.

River	Year	Catch per Hour Fished	
		Salmon	Sea trout
Frome	1973	0.102	
	1974	0.065	
	1975	0.053	
	1976	0.051	
	1977	0.070	
	1978	0.056	
	1979	0.094	
	1980	0.069	
	1981	0.095	
	1982	0.048	
	1983	0.061	
	1984	0.055	
	1985	0.093	
	1986	0.101	
	1987	0.159	
	1988	0.073	
	1989	0.029	
	1990	0.034	
	1991	0.094	
	1992	0.045	
Tamar	1986	0.096	
	1987	0.068	
	1988	0.100	
	1989	0.083	
Wye	1977	0.045	
Tawe	1986	0.008	0.113
	1992	0.043	0.085
Cleddau	1967	0.035	
Tywi	1967	0.053	
	1985	0.013	0.125
	1986	0.014	0.111
	1991*	0.013	0.100
	1992	0.001	0.127
Teifi	1967	0.035	
Conwy	1982	0.053	0.026
	1983	0.022	0.010
	1984	0.010	0.008
	1986	0.032	0.018
	1987	0.021	0.016
	1988	0.037	0.020
	1989	0.029	0.021
	1990	0.026	0.018
	1991	0.015	0.018

Table 9 Continued. Number of salmon and sea trout caught per hour fished, from rivers within the British Isles.

River	Year	Catch per Hour Fished	
		Salmon	Sea trout
Dee (Welsh)	1989	0.008	0.056
	1990	0.013	0.069
	1991	0.012	0.009
Ribble	1991	0.028	0.094
Lune	1991	0.061	0.102
Kent	1991	0.053	0.062
Derwent	1991	0.072	0.100
Foyle	1966	0.094	

Source: Frome (Welton, pers. comm.); Tamar (Broad, pers. comm.); Wye (Gee, 1980), Tawe (Wightman, 1987; Stonehewer and Mee, 1993); Cleddau (SWWRB, 1968); Tywi (SWWRB, 1968; Evans, pers. comm.); Teifi (SWWRB, 1968); Conwy (Scott, 1992); Dee (Davidson, 1992); Ribble, Lune, Kent & Derwent (This study); Foyle (Hadoke, 1967).

* indicates provisional figures.

For sea trout, flow was not found to influence catch, effort, CPUE, abundance or catchability. A similar conclusion with regard to catch has been reported by Bunt (1990).

For salmon, catchability determined from the total number of fish estimated to be in the system (QN_{SA}) was relatively constant, increasing at an average of 7.6% per month during the period June - October. This indicates that CPUE provides a reasonably accurate estimate of the size of the adult stock in fresh water at any one time. Thus the number of salmon present at the end of the fishing season will be comparable to the catch per hour for October. The CPUE in October will be equivalent to a CPUE calculated from total season catch and effort, as used in Tables 2 and 10, if the relationship can be extrapolated to the period February to May. It can also be used for between year comparisons if a similar distribution of catch and effort, as evident in 1991, exists. However, the studies by Small (1990) and Peterman and Steer (1981) have shown, with annual data, that catchability is inversely related to abundance. If a similar relationship exists for within season data then catchability for the period February to May may be higher than that observed for the period June to October. It should be possible to investigate whether this is the case when a reasonable level of reporting of catch and effort for the period February to May has been achieved.

The present study suggests that salmon catchability (QN_{SA}) remains relatively constant over the period June to October, this contrast with the study of Mills *et. al.* (1986) which indicates that catchability is relatively high at the start of the season (June) declining exponentially as the season progressed. It is however apparent from their study that the catchability over the period July - October was reasonably constant.

For sea trout, catchability showed a different pattern to that of salmon, being virtually constant for "fresh run" fish (QR_{ST}) and in the form of a parabola when considering the total number of sea trout (QN_{ST}). The latter following a similar trend to the migration pattern.

The fact that QR_{ST} remained relatively constant indicates, that for each month a constant portion of the run of "fresh run" fish is removed by a unit of effort. Therefore either summing the catch per unit effort for each month over the season or the mean would provide an index of the number of fish which had entered the system during the fishing season.

The catchability of the total stock (QN_{ST}) reached its maximum during the summer, the suggestion is that the resident population remains relatively more catchable during this period. The decline in catchability towards

the autumn may be associated with the fact that the majority of sea trout were caught using fly and conditions for fly fishing deteriorate after mid august when air temperature drops below that of the water (Jarrams, 1987). Or that the resident population remain feeding during the summer months, and there is a decline in intensity towards autumn. Certain studies have indicated that sea trout feed while in fresh water (SRTI Annual Report XXX, cited by Mills *et. al.* (1986)) while others suggest that this is not the case (Harris, 1971). A decline from June to October was also reported in the study of Mills *et. al.* (1986) though in contrast to the present investigation their's was in the form of an exponential curve.

The fact that catchability (QN_{ST}) was not constant indicates that CPUE will not provide an accurate assessment of within season abundance. However, as long as the catchability follows the same pattern, between year comparisons could be made using CPUE calculated from total season catch and effort.

The accuracy of the estimate of catchability is dependent on having an accurate assessment of abundance. In this investigation abundance data were derived from fish counters. The study by Nicholson & Aprahamian (1992) has shown that the efficiency of the counter varies according to fish size. The consequence of this, is that the size of the sea trout population will be underestimated and the implications of this for QN_{ST} and QR_{ST} need to be further investigated. In addition it is important to assess the present method used to separate salmon and sea trout as well as determine some measure of the bias. There is also the possibility that if fish make repeated movements over the fish counter (Dunkley & Shearer, 1982), and the downstream movement was not detected, the estimates of abundance will be inflated. It is important therefore to determine the extent of such behaviour and the consequences for stock assessment.

In conclusion the study does suggest that CPUE can be used as an index of within season abundance though the measure of CPUE may differ between salmon and sea trout. However, the study only relates to data from one year and it is important to determine wether the pattern of catchability apparent, in 1991, is consistent between years. Further investigations are also required to examine between year variability in catchability, especially how it relates to stock size and the effect of environmental factors, in particular flow.

Acknowledgements

I should like to thank Area staff for distributing the log books, Pauline Vondy and May Lloyd for their help with inputting the data and for their comments David Cragg-Hine, Ian Small, Mukhtar Farooqi and Simon Nicholson.

References

Alabaster, J. S. (1970). River flow and upstream movement and catch of migratory salmonids. *Journal of Fish Biology* 2: 1-19.

Bunt, D. (1990). Use of rod catch effort data to monitor migratory salmonids in Wales. In *Catch Effort Sampling Strategies: Their Application In Freshwater Fisheries Management*. (Ed. I. G. Cowx). Oxford: Fishing News Books, Blackwell Scientific Publications Ltd., 15-32.

Clarke, D., Purvis, W. K. & Mee, D. (1990). Use of telemetric tracking to examine environmental influences on catch effort indices. A case study of Atlantic salmon (*Salmo salar* L.) in the River Tywi, South Wales. In *Catch Effort Sampling Strategies: Their Application In Freshwater Fisheries Management*. (Ed. I. G. Cowx). Oxford: Fishing News Books, Blackwell Scientific Publications Ltd., 33-48.

Davidson, I. C., Cove, R. J. & Milner, N. J. (1992). Dee stock assessment programme: annual report 1991. Internal Report NRA (Wales) EAN/92/6.

Dunkley, D. A. & Shearer, W. M. (1982). An assessment of the performance of a resistivity fish counter. *Journal of Fish Biology*. 20: 717-737.

Gee, A. S. (1980). Angling success for Atlantic Salmon (*Salmo salar*) in the River Wye in relation to effort and flows. *Fisheries Management*. 11:131-138.

Gulland, J. A. (1991). *Fish Stock Assessment: A manual of basic methods*. Chichester: John Wiley & Sons, 223pp.

Hadoke, G. D. F. (1967). An examination of the fishing effort of a selected number of anglers during the 1966 season. *Salmon and Trout Magazine*, 178: 245-249.

Harris, G. S. (1971). The freshwater feeding of adult sea trout in the Afon Dyfi. *Fisheries Management*, 2: 20-23.

Jarrams, P. (1987). *Sea Trout Run*. London: A&C Black 160pp.

Laughton, R. (1991). The movements of adult Atlantic salmon (*Salmo salar* L.) in the River Spey as determined by radio telemetry during 1988 and 1989. *Scottish Fisheries Research Report*, No. 50. SOAFD and Spey District Salmon Fishery Board 36pp.

Millichamp, R. I. & Lambert, A. O. (1966). On investigations into the relationship between salmon catch and flow in the River Usk during the 1965 season. In *Symposium on River Management*. (Ed. P. C. G. Isaac), London: McLaren, 119-123.

Mills, C. P. R., Mahon, G. A. T. & Piggins, D. J. (1986). Influence of stock levels, fishing effort and environmental factors on anglers' catches of Atlantic salmon, *Salmo salar* L., and sea trout, *Salmo trutta* L. *Aquaculture and Fisheries Management*, 17: 289-297.

Nicholson, S. A. & Aprahamian, M. W. (1992). Field validation of the Logie fish counter at Forge Weir on the River Lune, 1991. NRA (North West) Internal Report NRA/NW/FTR/92/3.

NRA(NW) (1991). Summary of Fisheries Statistics 1991. NRA (North West) Internal Report 41pp.

Peterman, R. M. & Steer, G. J. (1981). Relation between sport-fishing catchability coefficients and salmon abundance. *Transactions of the American Fisheries Society*, 110: 585-593.

Scott, M. (1992). Conwy fisheries monitoring programme annual report 1991. Internal Report NRA (Wales) EAN/92/01.

Solomon, D. J. & Potter, E. C. E. (1991). The measurement and evaluation of the exploitation of Atlantic salmon. Publ. Atlantic Salmon Trust, Pitlochry, Perthshire, U.K. 38pp.

Small, I. & Downham, D. Y. (1985). The interpretation of anglers' records (trout and sea trout *Salmo trutta* L. and salmon, *Salmo salar* L.). *Aquaculture and Fisheries Management*, 16: 151-170.

Small, I. (1990). Exploring data provided by angling for salmonids in the British Isles. In *Catch Effort Sampling Strategies: Their Application In Freshwater Fisheries Management*. (Ed. I. G. Cowx). Oxford: Fishing News Books, Blackwell Scientific Publications Ltd., 81-91.

Stonehewer, R. O. & Mee, D. (1993). Summary of the results of the 1992 Tawe angler logbook scheme. Internal Report NRA (Wales) TM/EAW/93/16.

SWWRB (1968). South West Wales River Authority, Third Statutory Annual Report, 1967-68. 96pp.

Wightman, R. P. (1987). The results of an angler log-book survey on the River Tawe, 1986 season. W.W.A. Report SW/87/14.

Appendix 1.

The number of fish recorded by the fish counters on the rivers Derwent, Kent and Lune.

River Derwent @ Yearl Weir

Month	Fish > 4lb	Fish < 4 lb
January	58	9
February	49	12
March	19	6
April	26	24
May	414	98
June	1260	252
July	1873	313
August	4200	392
September	2131	209
October	1215	207
November	312	90
December	288	23

River Kent @ Basinghyll

Month	Fish > 4lb	Fish < 4 lb
January	11	8
February	18	45
March	7	11
April	0	6
May	39	36
June[1]	231	819
July[2]	136	712
August	409	1129
September	368	387
October	360	925
November	204	359
December	78	77

1 13 days lost due to download fault
2 14 days lost due to lightning strikes

River Lune @ Forge Weir

Month	Fish > 4lb	Fish < 4 lb
January	10	4
February	8	3
March	6	36
April	26	297
May	90	283
June	365	2239
July	491	2487
August[3]	1204	1784
September[4]	1373	718
October[5]	587	503
November	1052	874
December	110	182

3 13 hours lost due to electricity failure
4 72 hours lost due to electricity failure
5 41 hours lost due to electricity failure

Appendix 2.

Flow Data for the Rivers Derwent, Kent and Lune, 1991

Month	Monthly flow (cumecs) Derwent @ Camerton	Kent @ Sedgewick	Lune @ Caton
Jan	47.90	14.24	49.34
Feb	28.07	11.08	56.18
Mar	42.04	13.61	47.11
Apr	29.39	8.20	34.82
May	4.13	1.39	3.70
Jun	8.95	4.08	17.60
Jul	8.18	3.81	10.48
Aug	8.57	3.38	14.34
Sep	6.72	3.16	12.18
Oct	26.61	10.81	33.12
Nov	72.00	19.03	86.02
Dec	38.51	14.28	56.21

Percentage monthly flow June - October:

$F = 90.27 + (0.367*M^3) - (4.17*M^2)$ $\quad r^2 = 0.85$

Percentage monthly flow May - October:

$F = 44.80 - (8.73*M) + (0.0766*M^3)$ $\quad r^2 = 0.62$

Where F = proportion of total flow between May or June - October.
M = Month (5/6 - 10)

Appendix 3.

Monthly catch, effort and catch per unit effort for salmon and sea trout.

Catch of salmon and sea trout, by method.

RIVER BORDER ESK YEAR 1991 SPECIES SALMON

ANGLERS 3

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	2	0	1	12	0.1667	0.2310
AUG	1	0	1	9	0.1111	0.2178
SEPT	0	0	1	6	0.0000	
OCT	0	0	0	0		
TOTAL	3	0	3	27	0.1111	0.1257

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	2	0	0
AUG	0	0	1	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	3	0	0
PERCENT	0.0	0.0	100.0	0.0	0.0

RIVER BORDER ESK YEAR 1991 SPECIES SEA TROUT

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	9	0	1	12	0.7500	0.4900
AUG	0	0	0	0		
SEPT	0	0	0	0		
OCT	0	0	0	0		
TOTAL	9	0	1	12	0.7500	0.4900

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	9	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	9	0	0
PERCENT	0.0	0.0	100.0	0.0	0.0

RIVER EDEN YEAR 1991 SPECIES SALMON

ANGLERS 13

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN	0	0	2	10	0.0000	
FEB	0	0	1	4	0.0000	
MAR	2	0	8	40	0.0500	0.0693
APR	1	0	6	40	0.0250	0.0490
MAY	2	0	9	73	0.0274	0.0380
JUNE	3	0	10	81	0.0370	0.0419
JULY	2	0	7	54	0.0370	0.0513
AUG	1	0	13	88	0.0114	0.0223
SEPT	21	1	20	156	0.1346	0.0576
OCT	14	0	9	47	0.2979	0.1560
TOTAL	46	1	85	593	0.0776	0.0224

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN	0	0	0	0	0
FEB	0	0	0	0	0
MAR	0	2	0	0	0
APR	0	1	0	0	0
MAY	0	0	2	0	0
JUNE	0	3	0	0	0
JULY	0	1	0	1	0
AUG	0	0	0	1	0
SEPT	9	5	2	5	0
OCT	0	9	1	4	0
TOTAL	9	21	5	11	0
PERCENT	19.6	45.7	10.9	23.9	0.0

RIVER EDEN YEAR 1991 SPECIES SEA TROUT

ANGLERS 3

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	3	0	4	14	0.2143	0.2425
AUG	0	0	2	4	0.0000	
SEPT	1	0	1	4	0.2500	0.4900
OCT	0	0	0	0		
TOTAL	4	0	7	22	0.1818	0.1782

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	3	0	0
AUG	0	0	0	0	0
SEPT	0	1	0	0	0
OCT	0	0	0	0	0
TOTAL	0	1	3	0	0
PERCENT	0.0	25.0	75.0	0.0	0.0

RIVER DERWENT YEAR 1991 SPECIES SALMON

ANGLERS 93

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	1	0	2	8	0.1250	0.2450
MAR	0	0	13	65	0.0000	
APR	1	0	11	48	0.0208	0.0408
MAY	0	0	2	10	0.0000	
JUNE	4	0	60	203	0.0197	0.0193
JULY	16	0	130	436	0.0367	0.0180
AUG	38	0	266	932	0.0408	0.0130
SEPT	107	0	327	1272	0.0841	0.0159
OCT	272	0	775	3132	0.0868	0.0103
TOTAL	439	0	1586	6106	0.0719	0.0067

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	1	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	1
MAY	0	0	0	0	0
JUNE	0	0	4	0	0
JULY	2	0	14	0	0
AUG	3	3	30	1	1
SEPT	3	21	80	2	1
OCT	15	155	95	0	7
TOTAL	23	179	224	3	10
PERCENT	5.2	40.8	51.0	0.7	2.3

RIVER DERWENT YEAR 1991 SPECIES SEA TROUT

ANGLERS 56

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	3	0	23	61	0.0492	0.0557
JUNE	9	0	62	177	0.0508	0.0332
JULY	49	0	168	448	0.1094	0.0306
AUG	40	1	120	360	0.1111	0.0344
SEPT	32	0	90	255	0.1255	0.0435
OCT	7	0	19	90	0.0778	0.0576
TOTAL	140	1	482	1391	0.1006	0.0167

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	3	0	0
JUNE	0	0	9	0	0
JULY	0	0	48	0	1
AUG	0	0	39	0	1
SEPT	0	0	31	0	1
OCT	0	5	2	0	0
TOTAL	0	5	132	0	3
PERCENT	0.0	3.6	94.3	0.0	2.1

RIVER EHEN YEAR 1991 SPECIES SALMON

ANGLERS 8

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	2	0	17	55	0.0364	0.0504
AUG	1	0	28	92	0.0109	0.0213
SEPT	2	0	6	17	0.1176	0.1631
OCT	17	0	65	203	0.0837	0.0398
TOTAL	22	0	116	367	0.0599	0.0250

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	1	1	0	0	0
AUG	0	1	0	0	0
SEPT	2	0	0	0	0
OCT	5	3	5	4	0
TOTAL	8	5	5	4	0
PERCENT	36.4	22.7	22.7	18.2	0.0

RIVER EHEN YEAR 1991 SPECIES SEA TROUT

ANGLERS 5

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	1	0	8	21	0.0476	0.0933
AUG	5	1	20	65	0.0769	0.0674
SEPT	1	1	4	8	0.1250	0.2450
OCT	2	1	43	111	0.0180	0.0250
TOTAL	9	3	75	205	0.0439	0.0287

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	1	0	0
AUG	2	0	3	0	0
SEPT	0	0	1	0	0
OCT	0	0	2	0	0
TOTAL	2	0	7	0	0
PERCENT	22.2	0.0	77.8	0.0	0.0

RIVER CALDER (W.CUMBRIA) YEAR 1991 SPECIES SALMON

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	1	2	0.0000	
JULY	0	0	1	2	0.0000	
AUG	0	0	0	0		
SEPT	0	0	0	0		
OCT	0	0	2	5	0.0000	
TOTAL	0	0	4	9	0.0000	

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	0	0	0
PERCENT	ERR	ERR	ERR	ERR	ERR

RIVER IRT YEAR 1991 SPECIES SALMON

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN	0	0	0	0		
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	0	0	2	4	0.0000	
AUG	0	0	2	4	0.0000	
SEPT	0	0	0	0		
OCT	0	0	5	15	0.0000	
TOTAL	0	0	9	23	0.0000	

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN	0	0	0	0	0
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	0	0	0
PERCENT	ERR	ERR	ERR	ERR	ERR

RIVER IRT YEAR 1991 SPECIES SEA TROUT

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	1	2	0.0000	
JULY	0	0	2	4	0.0000	
AUG	0	0	2	4	0.0000	
SEPT	0	0	0	0		
OCT	1	1	1	4	0.2500	0.4900
TOTAL	1	1	6	14	0.0714	0.1400

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	1	0	0	0
TOTAL	0	1	0	0	0
PERCENT	0.0	100.0	0.0	0.0	0.0

RIVER DUDDON YEAR 1991 SPECIES SALMON

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN	0	0	0	0		
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	0	0	1	3	0.0000	
AUG	0	0	4	10	0.0000	
SEPT	0	0	2	7	0.0000	
OCT	0	0	1	4	0.0000	
TOTAL	0	0	8	24	0.0000	

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN	0	0	0	0	0
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	0	0	0
PERCENT	ERR	ERR	ERR	ERR	ERR

RIVER DUDDON YEAR 1991 SPECIES SEA TROUT

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	0	0	1	3	0.0000	
AUG	1	0	2	4	0.2500	0.4900
SEPT	0	0	1	3	0.0000	
OCT	0	0	0	0		
TOTAL	1	0	4	10	0.1000	0.1960

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	1	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	1	0	0	0
PERCENT	0.0	100.0	0.0	0.0	0.0

RIVER CRAKE YEAR 1991 SPECIES SALMON

ANGLERS 5

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	1	0	5	7	0.1429	0.2800
JULY	1	0	10	28	0.0357	0.0700
AUG	0	0	13	28	0.0000	
SEPT	0	0	5	13	0.0000	
OCT	9	0	26	76	0.1184	0.0774
TOTAL	11	0	59	152	0.0724	0.0428

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	1	0	0	0
JULY	1	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	8	1	0	0	0
TOTAL	9	2	0	0	0
PERCENT	81.8	18.2	0.0	0.0	0.0

RIVER CRAKE YEAR 1991 SPECIES SEA TROUT

ANGLERS 3

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	1	0	5	10	0.1000	0.1960
JULY	3	0	18	45	0.0667	0.0754
AUG	15	12	15	35	0.4286	0.2169
SEPT	6	5	11	32	0.1875	0.1500
OCT	2	0	5	10	0.2000	0.2772
TOTAL	27	17	54	132	0.2045	0.0772

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	1	0	0	0	0
JULY	1	0	2	0	0
AUG	0	8	7	0	0
SEPT	1	0	5	0	0
OCT	1	0	0	0	1
TOTAL	4	8	14	0	1
PERCENT	14.8	29.6	51.9	0.0	3.7

RIVER LEVEN YEAR 1991 SPECIES SALMON

ANGLERS 9

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	12	36	0.0000	
JULY	0	0	6	19	0.0000	
AUG	3	0	10	31	0.0968	0.1095
SEPT	5	0	18	73	0.0685	0.0600
OCT	19	7	39	158	0.1203	0.0541
TOTAL	27	7	85	317	0.0852	0.0321

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	2	1	0
SEPT	0	0	3	2	0
OCT	5	2	9	3	0
TOTAL	5	2	14	6	0
PERCENT	18.5	7.4	51.9	22.2	0.0

RIVER LEVEN YEAR 1991 SPECIES SEA TROUT

ANGLERS 5

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	8	25	0.0000	
JULY	2	0	8	23	0.0870	0.1205
AUG	8	5	9	26	0.3077	0.2132
SEPT	8	8	11	27	0.2963	0.2053
OCT	1	0	8	44	0.0227	0.0445
TOTAL	19	13	44	145	0.1310	0.0589

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	2	0	0
AUG	0	1	7	0	0
SEPT	0	0	8	0	0
OCT	0	1	0	0	0
TOTAL	0	2	17	0	0
PERCENT	0.0	10.5	89.5	0.0	0.0

RIVER BELA YEAR 1991 SPECIES SALMON

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN	0	0	0	0		
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	1	3	0.0000	
JUNE	0	0	2	6	0.0000	
JULY	0	0	1	2	0.0000	
AUG	0	0	6	21	0.0000	
SEPT	0	0	4	16	0.0000	
OCT	0	0	9	30	0.0000	
TOTAL	0	0	23	78	0.0000	

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN	0	0	0	0	0
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	0	0	0
PERCENT	ERR	ERR	ERR	ERR	ERR

RIVER BELA YEAR 1991 SPECIES SEA TROUT

ANGLERS 1

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	0	0		
JUNE	0	0	3	13	0.0000	
JULY	0	0	2	4	0.0000	
AUG	0	0	8	29	0.0000	
SEPT	0	0	5	19	0.0000	
OCT	0	0	4	14	0.0000	
TOTAL	0	0	22	79	0.0000	

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	0	0	0
PERCENT	ERR	ERR	ERR	ERR	ERR

RIVER KENT YEAR 1991 SPECIES SALMON

ANGLERS 26

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	4	24	0.0000	
MAR	0	0	3	18	0.0000	
APR	1	0	7	44	0.0227	0.0445
MAY	0	0	7	38	0.0000	
JUNE	7	0	70	296	0.0236	0.0175
JULY	6	1	66	300	0.0200	0.0160
AUG	13	0	72	324	0.0401	0.0218
SEPT	15	0	74	392	0.0383	0.0194
OCT	79	5	158	845	0.0935	0.0206
TOTAL	121	6	461	2281	0.0530	0.0095

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	1	0
MAY	0	0	0	0	0
JUNE	2	2	0	3	0
JULY	2	0	2	2	0
AUG	4	3	3	3	0
SEPT	3	3	4	5	0
OCT	41	15	8	13	2
TOTAL	52	23	17	27	2
PERCENT	43.0	19.0	14.0	22.3	1.7

RIVER KENT YEAR 1991 SPECIES SEA TROUT

ANGLERS 15

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	0	0	4	12	0.0000	
JUNE	1	0	42	164	0.0061	0.0120
JULY	24	0	87	330	0.0727	0.0291
AUG	36	0	103	340	0.1059	0.0346
SEPT	3	0	42	194	0.0155	0.0175
OCT	10	0	28	157	0.0637	0.0395
TOTAL	74	0	306	1197	0.0618	0.0141

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	0	0	0
JUNE	0	0	1	0	0
JULY	1	0	23	0	0
AUG	3	0	33	0	0
SEPT	0	0	3	0	0
OCT	4	0	6	0	0
TOTAL	8	0	66	0	0
PERCENT	10.8	0.0	89.2	0.0	0.0

RIVER	LUNE	YEAR	1991	SPECIES	SALMON
ANGLERS	57				

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	2	0	12	47	0.0426	0.0590
MAR	12	10	20	84	0.1429	0.0808
APR	0	0	8	41	0.0000	
MAY	0	0	2	5	0.0000	
JUNE	3	0	52	236	0.0127	0.0144
JULY	2	0	50	172	0.0116	0.0161
AUG	11	0	103	494	0.0223	0.0132
SEPT	65	5	176	878	0.0740	0.0180
OCT	119	29	315	1545	0.0770	0.0138
TOTAL	214	44	738	3502	0.0611	0.0082

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	2	0	0
MAR	0	0	12	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	2	1	0	0
JULY	0	0	2	0	0
AUG	0	8	3	0	0
SEPT	15	20	24	6	0
OCT	22	31	36	22	8
TOTAL	37	61	80	28	8
PERCENT	17.3	28.5	37.4	13.1	3.7

RIVER LUNE YEAR 1991 SPECIES SEA TROUT

ANGLERS 51

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	1	0	21	59	0.0169	0.0332
JUNE	42	1	132	426	0.0986	0.0298
JULY	76	5	220	678	0.1121	0.0252
AUG	53	13	125	453	0.1170	0.0315
SEPT	39	11	91	405	0.0963	0.0302
OCT	14	10	35	191	0.0733	0.0384
TOTAL	225	40	624	2212	0.1017	0.0133

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	1	0	0
JUNE	2	3	37	0	0
JULY	0	3	72	1	0
AUG	4	5	44	0	0
SEPT	6	15	18	0	0
OCT	4	6	3	0	1
TOTAL	16	32	175	1	1
PERCENT	7.1	14.2	77.8	0.4	0.4

RIVER WYRE YEAR 1991 SPECIES SALMON

ANGLERS 2

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN	0	0	0	0		
FEB	0	0	0	0		
MAR	0	0	0	0		
APR	0	0	0	0		
MAY	0	0	0	0		
JUNE	0	0	0	0		
JULY	0	0	0	0		
AUG	0	0	1	4	0.0000	
SEPT	0	0	3	7	0.0000	
OCT	0	0	5	21	0.0000	
TOTAL	0	0	9	32	0.0000	

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN	0	0	0	0	0
FEB	0	0	0	0	0
MAR	0	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	0	0	0
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUG	0	0	0	0	0
SEPT	0	0	0	0	0
OCT	0	0	0	0	0
TOTAL	0	0	0	0	0
PERCENT	ERR	ERR	ERR	ERR	ERR

RIVER RIBBLE YEAR 1991 SPECIES SALMON

ANGLERS 48

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB	0	0	0	0		
MAR	1	0	11	32	0.0313	0.0613
APR	0	0	13	46	0.0000	
MAY	1	0	4	16	0.0625	0.1225
JUNE	4	0	31	130	0.0308	0.0302
JULY	0	0	75	353	0.0000	
AUG	3	0	82	401	0.0075	0.0085
SEPT	13	1	88	368	0.0353	0.0192
OCT	43	1	221	964	0.0446	0.0133
TOTAL	65	2	525	2310	0.0281	0.0068

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB	0	0	0	0	0
MAR	1	0	0	0	0
APR	0	0	0	0	0
MAY	0	0	1	0	0
JUNE	1	3	0	0	0
JULY	0	0	0	0	0
AUG	1	1	1	0	0
SEPT	3	1	8	0	1
OCT	21	6	11	5	0
TOTAL	27	11	21	5	1
PERCENT	41.5	16.9	32.3	7.7	1.5

RIVER RIBBLE YEAR 1991 SPECIES SEA TROUT

ANGLERS 45

CATCH, EFFORT AND CATCH PER UNIT EFFORT

MONTH	CAUGHT	RETURNED	VISITS	HOURS	CTH/HR	+/-95%
JAN						
FEB						
MAR						
APR						
MAY	1	1	5	12	0.0833	0.1633
JUNE	3	0	50	137	0.0219	0.0248
JULY	42	5	150	493	0.0852	0.0258
AUG	61	7	123	411	0.1484	0.0372
SEPT	3	0	27	116	0.0259	0.0293
OCT	5	4	10	50	0.1000	0.0877
TOTAL	115	17	365	1219	0.0943	0.0172

METHOD OF CAPTURE

MONTH	WORM	SPINNER	FLY	PRAWN	NOT REC.
JAN					
FEB					
MAR					
APR					
MAY	0	0	1	0	0
JUNE	0	1	2	0	0
JULY	0	3	39	0	0
AUG	0	7	54	0	0
SEPT	0	1	2	0	0
OCT	0	4	1	0	0
TOTAL	0	16	99	0	0
PERCENT	0.0	13.9	86.1	0.0	0.0

Appendix 4.

Number of salmon and sea trout caught per visit.

Number of hours fished per visit.

Number of salmon and sea trout caught per hour per visit.

RIVER BORDER ESK YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%		CT	NO	%	
0	1	33.33		0	0	0.00	
1	1	33.33		1	0	0.00	
2	1	33.33	MEAN 1.00	2	0	0.00	MEAN 9.00
3				3	0	0.00	
4			+/- 95 1.13	4	0	0.00	+/- 95
5				5	0	0.00	
6				6	0	0.00	
7				7	0	0.00	
8				8	0	0.00	
9				9	1	100.00	
>/= 10			>/=	10			

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%		HR	NO	%	
0	0	0.00		0	0	0.00	
1	0	0.00		1	0	0.00	
2	0	0.00		2	0	0.00	
3	0	0.00		3	0	0.00	
4	0	0.00	~ MEAN 9.00	4	0	0.00	~ MEAN 12.00
5	0	0.00		5	0	0.00	
6	1	33.33	+/- 95 3.39	6	0	0.00	+/- 95
7	0	0.00		7	0	0.00	
8	0	0.00		8	0	0.00	
9	1	33.33		9	0	0.00	
10	0	0.00		10	0	0.00	
11	0	0.00		11	0	0.00	
12	1	33.33		12	1	100.00	
13				13			
>/= 14			>/=	14			

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%		N/HR	NO	%	
0.0	1	33.33		0.0	0	0.00	
0.1	1	33.33		0.1	0	0.00	
0.2	1	33.33	~ MEAN 0.10	0.2	0	0.00	~ MEAN 0.80
0.3				0.3	0	0.00	
0.4			+/- 95 0.36	0.4	0	0.00	+/- 95
0.5				0.5	0	0.00	
0.6				0.6	0	0.00	
0.7				0.7	0	0.00	
0.8				0.8	1	100.00	
0.9				0.9			
>/=1.0			>/=	1.0			

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER EDEN YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%			CT	NO	%		
0	60	70.59			0	5	71.43		
1	17	20.00			1	1	14.29		
2	3	3.53	MEAN	0.54	2	0	0.00	MEAN	0.57
3	2	2.35			3	1	14.29		
4	1	1.18	+/- 95	0.16	4			+/- 95	0.56
5	0	0.00			5				
6	1	1.18			6				
7	1	1.18			7				
8					8				
9					9				
>/= 10			>/=		10				

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%			HR	NO	%		
0	0	0.00			0	0	0.00		
1	0	0.00			1	0	0.00		
2	8	9.41			2	3	42.86		
3	3	3.53			3	0	0.00		
4	10	11.76	~ MEAN	6.98	4	4	57.14	~ MEAN	3.14
5	5	5.88			5				
6	18	21.18	+/- 95	0.56	6			+/- 95	1.31
7	5	5.88			7				
8	11	12.94			8				
9	2	2.35			9				
10	13	15.29			10				
11	0	0.00			11				
12	8	9.41			12				
13	0	0.00			13				
>/= 14	2	2.35	>/=		14				

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%			N/HR	NO	%		
0.0	60	70.59			0.0	5	71.43		
0.1	7	8.24			0.1	0	0.00		
0.2	8	9.41	~ MEAN	0.08	0.2	0	0.00	~ MEAN	0.16
0.3	5	5.88			0.3	1	14.29		
0.4	0	0.00	+/- 95	0.06	0.4	0	0.00	+/- 95	0.29
0.5	3	3.53			0.5	0	0.00		
0.6	0	0.00			0.6	0	0.00		
0.7	1	1.18			0.7	0	0.00		
0.8	1	1.18			0.8	1	14.29		
0.9					0.9				
>/=1.0			>/=		1.0				

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER DERWENT YEAR 1991

SALMON

NUMBER CAUGHT PER VISIT

CT	NO	%
0	1256	79.19
1	258	16.27
2	50	3.15
3	15	0.95
4	2	0.13
5	3	0.19
6	1	0.06
7	1	0.06
8		
9		
>/= 10		

MEAN 0.28

+/- 95 0.03

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	103	6.49
2	368	23.20
3	390	24.59
4	258	16.27
5	132	8.32
6	159	10.03
7	57	3.59
8	84	5.30
9	5	0.32
10	14	0.88
11	4	0.25
12	9	0.57
13	1	0.06
>/= 14	2	0.13

~ MEAN 3.85

+/- 95 0.10

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	1256	79.19
0.1	44	2.77
0.2	51	3.22
0.3	114	7.19
0.4	13	0.82
0.5	70	4.41
0.6	2	0.13
0.7	12	0.76
0.8	5	0.32
0.9	0	0.00
>/=1.0	19	1.20

~ MEAN 0.08

+/- 95 0.01

SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%
0	377	78.22
1	85	17.63
2	10	2.07
3	5	1.04
4	5	1.04
5		
6		
7		
8		
9		
>/= 10		

MEAN 0.29

+/- 95 0.05

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	33	6.85
2	191	39.63
3	159	32.99
4	52	10.79
5	17	3.53
6	16	3.32
7	2	0.41
8	12	2.49
9		
10		
11		
12		
13		
>/= 14		

~ MEAN 2.89

+/- 95 0.15

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	377	78.22
0.2	16	3.32
0.4	31	6.43
0.6	37	7.68
0.8	3	0.62
1.0	13	2.70
1.2	0	0.00
1.4	1	0.21
1.6	1	0.21
1.8	0	0.00
2.0	3	0.62

~ MEAN 0.13

+/- 95 0.03

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER EHEN YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%			CT	NO	%		
0	98	84.48			0	67	89.33		
1	14	12.07			1	7	9.33		
2	4	3.45	MEAN	0.19	2	1	1.33	MEAN	0.12
3					3				
4			+/- 95	0.08	4			+/- 95	0.08
5					5				
6					6				
7					7				
8					8				
9					9				
>/= 10				>/=	10				

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%			HR	NO	%		
0	0	0.00			0	0	0.00		
1	6	5.17			1	6	8.00		
2	40	34.48			2	34	45.33		
3	34	29.31			3	21	28.00		
4	16	13.79	~ MEAN	3.16	4	7	9.33	~ MEAN	2.73
5	11	9.48			5	4	5.33		
6	6	5.17	+/- 95	0.32	6	2	2.67	+/- 95	0.37
7	0	0.00			7	0	0.00		
8	3	2.59			8	1	1.33		
9					9				
10					10				
11					11				
12					12				
13					13				
>/= 14				>/=	14				

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%			N/HR	NO	%		
0.0	98	84.48			0.0	67	89.33		
0.1	0	0.00			0.1	0	0.00		
0.2	5	4.31	~ MEAN	0.06	0.2	1	1.33	~ MEAN	0.04
0.3	8	6.90			0.3	4	5.33		
0.4	1	0.86	+/- 95	0.04	0.4	1	1.33	+/- 95	0.04
0.5	2	1.72			0.5	2	2.67		
0.6	0	0.00			0.6				
0.7	0	0.00			0.7				
0.8	0	0.00			0.8				
0.9	0	0.00			0.9				
>/=1.0	2	1.72		>/=	1.0				

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER CALDER W.CUMBRIA YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%			CT	NO	%	
0	4	100.00			0			
1					1			
2			MEAN	0.00	2			MEAN
3					3			
4			+/- 95	0.00	4			+/- 95
5					5			
6					6			
7					7			
8					8			
9					9			
>/= 10				>/=	10			

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%			HR	NO	%	
0	0	0.00			0			
1	0	0.00			1			
2	3	75.00			2			
3	1	25.00			3			
4			~ MEAN	2.25	4			~ MEAN
5					5			
6			+/- 95	1.47	6			+/- 95
7					7			
8					8			
9					9			
10					10			
11					11			
12					12			
13					13			
>/= 14				>/=	14			

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%			N/HR	NO	%	
0.0	4	100.00			0.0			
0.1					0.1			
0.2			~ MEAN	0.00	0.2			~ MEAN
0.3					0.3			
0.4			+/- 95	0.00	0.4			+/- 95
0.5					0.5			
0.6					0.6			
0.7					0.7			
0.8					0.8			
0.9					0.9			
>/=1.0				>/=	1.0			

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER IRT YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%			CT	NO	%		
0	9	100.00			0	5	83.33		
1					1	1	16.67		
2			MEAN	0.00	2			MEAN	0.17
3					3				
4			+/- 95	0.00	4			+/- 95	0.33
5					5				
6					6				
7					7				
8					8				
9					9				
>/= 10			>/=		10				

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%			HR	NO	%		
0	0	0.00			0	0	0.00		
1	1	11.11			1	1	16.67		
2	3	33.33			2	3	50.00		
3	4	44.44			3	1	16.67		
4	1	11.11	~ MEAN	2.56	4	1	16.67	~ MEAN	2.33
5					5				
6			+/- 95	1.04	6			+/- 95	1.22
7					7				
8					8				
9					9				
10					10				
11					11				
12					12				
13					13				
>/= 14			>/=		14				

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%			N/HR	NO	%		
0.0	9	100.00			0.0	5	83.33		
0.1					0.1	0	0.00		
0.2			~ MEAN	0.00	0.2	0	0.00	~ MEAN	0.05
0.3					0.3	1	16.67		
0.4			+/- 95	0.00	0.4			+/- 95	0.18
0.5					0.5				
0.6					0.6				
0.7					0.7				
0.8					0.8				
0.9					0.9				
>/=1.0			>/=		1.0				

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER DUDDON YEAR 1991

NUMBER CAUGHT PER VISIT

SALMON				SEA TROUT			
CT	NO	%		CT	NO	%	
0	8	100.00		0	3	75.00	
1				1	1	25.00	
2			MEAN 0.00	2			MEAN 0.25
3				3			
4			+/- 95 0.00	4			+/- 95 0.49
5				5			
6				6			
7				7			
8				8			
9				9			
>/= 10			>/=	10			

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%		HR	NO	%	
0	0	0.00		0	0	0.00	
1	0	0.00		1	0	0.00	
2	3	37.50		2	2	50.00	
3	2	25.00		3	2	50.00	
4	3	37.50	~ MEAN 3.00	4			~ MEAN 2.50
5				5			
6			+/- 95 1.20	6			+/- 95 1.55
7				7			
8				8			
9				9			
10				10			
11				11			
12				12			
13				13			
>/= 14			>/=	14			

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%		N/HR	NO	%	
0.0	8	100.00		0.0	3	75.00	
0.1				0.1	0	0.00	
0.2			~ MEAN 0.00	0.2	0	0.00	~ MEAN 0.13
0.3				0.3	0	0.00	
0.4			+/- 95 0.00	0.4	0	0.00	+/- 95 0.35
0.5				0.5	1	25.00	
0.6				0.6			
0.7				0.7			
0.8				0.8			
0.9				0.9			
>/=1.0			>/=	1.0			

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER CRAKE YEAR 1991

SALMON

NUMBER CAUGHT PER VISIT

CT	NO	%
0	50	84.75
1	7	11.86
2	2	3.39
3		
4		
5		
6		
7		
8		
9		
>/= 10		

MEAN 0.19

+/- 95 0.11

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	10	16.95
2	25	42.37
3	12	20.34
4	8	13.56
5	2	3.39
6	1	1.69
7	0	0.00
8	1	1.69
9		
10		
11		
12		
13		
>/= 14		

~ MEAN 2.58

+/- 95 0.41

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	50	84.75
0.1	0	0.00
0.2	0	0.00
0.3	5	8.47
0.4	0	0.00
0.5	0	0.00
0.6	0	0.00
0.7	1	1.69
0.8	0	0.00
0.9	0	0.00
>/=1.0	3	5.08

~ MEAN 0.09

+/- 95 0.08

SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%
0	39	72.22
1	9	16.67
2	2	3.70
3	3	5.56
4	0	0.00
5	1	1.85
6		
7		
8		
9		
>/= 10		

MEAN 0.50

+/- 95 0.19

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	4	7.41
2	29	53.70
3	15	27.78
4	5	9.26
5	1	1.85
6		
7		
8		
9		
10		
11		
12		
13		
>/= 14		

~ MEAN 2.44

+/- 95 0.42

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	39	72.22
0.1	0	0.00
0.2	1	1.85
0.3	2	3.70
0.4	0	0.00
0.5	4	7.41
0.6	0	0.00
0.7	0	0.00
0.8	0	0.00
0.9	0	0.00
>/= 1.0	8	14.81

~ MEAN 0.20

+/- 95 0.12

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER LEVEN YEAR 1991

SALMON

NUMBER CAUGHT PER VISIT

CT	NO	%
0	65	76.47
1	14	16.47
2	5	5.88
3	1	1.18
4		
5		
6		
7		
8		
9		
>/= 10		

MEAN 0.32

+/- 95 0.12

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	5	5.88
2	22	25.88
3	16	18.82
4	18	21.18
5	9	10.59
6	8	9.41
7	3	3.53
8	3	3.53
9	0	0.00
10	1	1.18
11		
12		
13		
>/= 14		

~ MEAN 3.73

+/- 95 0.41

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	65	76.47
0.1	3	3.53
0.2	0	0.00
0.3	3	3.53
0.4	1	1.18
0.5	8	9.41
0.6	0	0.00
0.7	1	1.18
0.8	1	1.18
0.9	0	0.00
>/=1.0	3	3.53

~ MEAN 0.12

+/- 95 0.07

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%
0	36	81.82
1	4	9.09
2	2	4.55
3	0	0.00
4	0	0.00
5	1	2.27
6	1	2.27
7		
8		
9		
>/= 10		

MEAN 0.43

+/- 95 0.19

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	3	6.82
2	15	34.09
3	10	22.73
4	7	15.91
5	2	4.55
6	5	11.36
7	2	4.55
8		
9		
10		
11		
12		
13		
>/= 14		

~ MEAN 3.30

+/- 95 0.54

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	36	81.82
0.1	0	0.00
0.2	1	2.27
0.3	1	2.27
0.4	0	0.00
0.5	1	2.27
0.6	0	0.00
0.7	1	2.27
0.8	0	0.00
0.9	0	0.00
>/=1.0	4	9.09

~ MEAN 0.13

+/- 95 0.11

RIVER BELA YEAR 1991

SALMON				SEA TROUT			
NUMBER CAUGHT PER VISIT							
CT	NO	%		CT	NO	%	
0	23	100.00		0	22	100.00	
1				1			
2			MEAN 0.00	2			MEAN 0.00
3				3			
4			+/- 95 0.00	4			+/- 95 0.00
5				5			
6				6			
7				7			
8				8			
9				9			
>/= 10			>/=	10			
NUMBER OF HOURS FISHED PER VISIT							
HR	NO	%		HR	NO	%	
0	0	0.00		0	0	0.00	
1	1	4.35		1	0	0.00	
2	3	13.04		2	3	13.64	
3	8	34.78		3	7	31.82	
4	9	39.13	~ MEAN 3.39	4	9	40.91	~ MEAN 3.59
5	1	4.35		5	2	9.09	
6	1	4.35	+/- 95 0.75	6	1	4.55	+/- 95 0.79
7				7			
8				8			
9				9			
10				10			
11				11			
12				12			
13				13			
>/= 14			>/=	14			
NUMBER CAUGHT PER HOUR PER VISIT							
N/HR	NO	%		N/HR	NO	%	
0.0	23	100.00		0.0	22	100.00	
0.1				0.1			
0.2			~ MEAN 0.00	0.2			~ MEAN 0.00
0.3				0.3			
0.4			+/- 95 0.00	0.4			+/- 95 0.00
0.5				0.5			
0.6				0.6			
0.7				0.7			
0.8				0.8			
0.9				0.9			
>/=1.0			>/=	1.0			

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER KENT YEAR 1991

SALMON

NUMBER CAUGHT PER VISIT

CT	NO	%
0	372	80.69
1	68	14.75
2	13	2.82
3	5	1.08
4	3	0.65
5		
6		
7		
8		
9		
>/= 10		

MEAN 0.26

+/- 95 0.05

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	30	6.51
2	87	18.87
3	60	13.02
4	40	8.68
5	52	11.28
6	52	11.28
7	30	6.51
8	68	14.75
9	16	3.47
10	21	4.56
11	3	0.65
12	2	0.43
13		
>/= 14		

~ MEAN 4.95

+/- 95 0.20

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	372	80.69
0.1	32	6.94
0.2	24	5.21
0.3	19	4.12
0.4	4	0.87
0.5	6	1.30
0.6	1	0.22
0.7	1	0.22
0.8	2	0.43
0.9		
>/=1.0		

~ MEAN 0.05

+/- 95 0.02

SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%
0	261	85.29
1	25	8.17
2	14	4.58
3	4	1.31
4	1	0.33
5	1	0.33
6		
7		
8		
9		
>/= 10		

MEAN 0.24

+/- 95 0.06

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%
0	0	0.00
1	32	10.46
2	84	27.45
3	64	20.92
4	31	10.13
5	22	7.19
6	18	5.88
7	11	3.59
8	26	8.50
9	4	1.31
10	13	4.25
11	0	0.00
12	1	0.33
13		
>/= 14		

~ MEAN 3.91

+/- 95 0.22

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%
0.0	261	85.29
0.2	8	2.61
0.4	11	3.59
0.6	16	5.23
0.8	2	0.65
1.0	5	1.63
1.2	0	0.00
1.4	1	0.33
1.6	2	0.65
1.8		
2.0		

~ MEAN 0.09

+/- 95 0.03

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER LUNE YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%			CT	NO	%		
0	598	81.03			0	469	75.16		
1	94	12.74			1	113	18.11		
2	31	4.20	MEAN	0.29	2	27	4.33	MEAN	0.36
3	10	1.36			3	8	1.28		
4	3	0.41	+/- 95	0.04	4	4	0.64	+/- 95	0.05
5	0	0.00			5	1	0.16		
6	1	0.14			6	1	0.16		
7	0	0.00			7	1	0.16		
8	0	0.00			8				
9	0	0.00			9				
>/= 10	1	0.14		>/=	10				

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%			HR	NO	%		
0	0	0.00			0	0	0.00		
1	35	4.74			1	26	4.17		
2	91	12.33			2	174	27.88		
3	133	18.02			3	187	29.97		
4	140	18.97	~ MEAN	4.75	4	114	18.27	~ MEAN	3.54
5	91	12.33			5	46	7.37		
6	96	13.01	+/- 95	0.16	6	33	5.29	+/- 95	0.15
7	50	6.78			7	13	2.08		
8	49	6.64			8	13	2.08		
9	16	2.17			9	4	0.64		
10	17	2.30			10	4	0.64		
11	3	0.41			11	0	0.00		
12	16	2.17			12	9	1.44		
13	0	0.00			13	0	0.00		
>/= 14	1	0.14		>/=	14	1	0.16		

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%			N/HR	NO	%		
0.0	600	81.30			0.0	469	75.16		
0.2	77	10.43			0.2	39	6.25		
0.4	30	4.07	~ MEAN	0.08	0.4	51	8.17	~ MEAN	0.12
0.6	18	2.44			0.6	49	7.85		
0.8	2	0.27	+/- 95	0.02	0.8	1	0.16	+/- 95	0.03
1.0	5	0.68			1.0	10	1.60		
1.2	0	0.00			1.2	0	0.00		
1.4	0	0.00			1.4	1	0.16		
1.6	1	0.14			1.6	2	0.32		
1.8	0	0.00			1.8	0	0.00		
>/=2.0	5	0.68		>/=	2.0	2	0.32		

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER WYRE YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%			CT	NO	%	
0	9	100.00			0			
1					1			
2			MEAN	0.00	2			MEAN
3					3			
4			+/- 95	0.00	4			+/- 95
5					5			
6					6			
7					7			
8					8			
9					9			
>/= 10				>/=	10			

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%			HR	NO	%	
0	0	0.00			0			
1	0	0.00			1			
2	4	44.44			2			
3	2	22.22			3			
4	1	11.11	~ MEAN	3.56	4			~ MEAN
5	0	0.00			5			
6	1	11.11	+/- 95	1.23	6			+/- 95
7	0	0.00			7			
8	1	11.11			8			
9					9			
10					10			
11					11			
12					12			
13					13			
>/= 14				>/=	14			

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%			N/HR	NO	%	
0.0	9	100.00			0.0			
0.1					0.1			
0.2			~ MEAN	0.00	0.2			~ MEAN
0.3					0.3			
0.4			+/- 95	0.00	0.4			+/- 95
0.5					0.5			
0.6					0.6			
0.7					0.7			
0.8					0.8			
0.9					0.9			
>/=1.0				>/=	1.0			

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

RIVER RIBBLE YEAR 1991

SALMON SEA TROUT

NUMBER CAUGHT PER VISIT

CT	NO	%		CT	NO	%	
0	468	89.14		0	285	78.08	
1	50	9.52		1	64	17.53	
2	6	1.14	MEAN 0.12	2	7	1.92	MEAN 0.32
3	1	0.19		3	3	0.82	
4			+/- 95 0.03	4	3	0.82	+/- 95 0.06
5				5	2	0.55	
6				6	1	0.27	
7				7			
8				8			
9				9			
>/= 10			>/=	10			

NUMBER OF HOURS FISHED PER VISIT

HR	NO	%		HR	NO	%	
0	0	0.00		0	0	0.00	
1	16	3.05		1	17	4.66	
2	90	17.14		2	116	31.78	
3	98	18.67		3	122	33.42	
4	136	25.90	~ MEAN 4.40	4	55	15.07	~ MEAN 3.34
5	60	11.43		5	16	4.38	
6	44	8.38	+/- 95 0.18	6	18	4.93	+/- 95 0.19
7	19	3.62		7	4	1.10	
8	22	4.19		8	1	0.27	
9	4	0.76		9	0	0.00	
10	31	5.90		10	16	4.38	
11	4	0.76		11			
12	0	0.00		12			
13	1	0.19		13			
>/= 14			>/=	14			

NUMBER CAUGHT PER HOUR PER VISIT

N/HR	NO	%		N/HR	NO	%	
0.0	468	89.14		0.0	285	78.08	
0.1	7	1.33		0.2	18	4.93	
0.2	14	2.67	~ MEAN 0.03	0.4	23	6.30	~ MEAN 0.12
0.3	26	4.95		0.6	29	7.95	
0.4	1	0.19	+/- 95 0.02	0.8	0	0.00	+/- 95 0.04
0.5	8	1.52		1.0	5	1.37	
0.6	0	0.00		1.2	1	0.27	
0.7	0	0.00		1.4	1	0.27	
0.8	0	0.00		1.6	2	0.55	
0.9	0	0.00		1.8	0	0.00	
>/=1.0	1	0.19	>/=	2.0	1	0.27	

CATEGORIES EG. 0.2 FISH/HOUR = 0.15 - 0.24

Appendix 5.

Weight of salmon and sea trout caught, per month.

RIVER BORDER ESK YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
AUG	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
PERCENT	33	0	33	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0

MEAN WEIGHT 7.50 +/- 95% 5.99

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	8	1	-	-	-	-	-	-	-	-	-
AUG	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-
OCT	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	8	1	0	0	0	0	0	0	0	0	0
PERCENT	0	89	11	0	0	0	0	0	0	0	0	0

MEAN WEIGHT 1.61 +/- 95% 0.22

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER EDEN YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	1	1	-	1	-	-	-	-	-	-	-	-
JULY	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	1	2	2	3	8	5	-	-	-	-	-	-	-	-	-	-	-	-
OCT	-	-	1	2	5	1	-	-	1	-	-	1	2	1	-	-	-	-	-
TOTAL	0	1	4	5	9	11	5	2	2	1	1	1	2	2	0	0	0	0	0
PERCENT	0	2	9	11	20	24	11	4	4	2	2	2	4	4	0	0	0	0	0

MEAN WEIGHT 9.04 +/- 95% 0.86

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	1	1	1	-	-	-	-	-	-	-	-
AUG	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	1	-	-	-	-	-	-	-	-	-
OCT	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	1	2	1	0	0	0	0	0	0	0	0
PERCENT	0	25	50	25	0	0	0	0	0	0	0	0

MEAN WEIGHT 2.50 +/- 95% 0.80

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER DERWENT YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	-	-
JULY	-	4	2	3	2	2	1	1	-	-	-	-	1	-	-	-	-	-	-
AUG	2	3	10	7	7	4	1	-	-	-	2	-	-	1	-	-	-	1	-
SEPT	1	7	11	22	26	17	6	5	1	2	-	4	-	3	1	-	-	1	-
OCT	3	9	48	42	50	37	30	14	3	6	4	4	6	7	3	4	1	1	-
TOTAL	6	23	71	74	85	61	39	23	5	8	6	8	7	11	4	4	1	3	0
PERCENT	1	5	16	17	19	14	9	5	1	2	1	2	2	3	1	1	0	1	0

MEAN WEIGHT 8.28 +/- 95% 0.30

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	1	1	1	-	-	-	-	-	-	-	-	-
JUNE	-	3	2	1	1	1	1	-	-	-	-	-
JULY	1	24	17	2	2	3	-	-	-	-	-	-
AUG	5	19	11	2	1	-	1	-	1	-	-	-
SEPT	-	16	10	5	-	1	-	-	-	-	-	-
OCT	-	5	1	-	1	-	-	-	-	-	-	-
TOTAL	7	68	42	10	5	5	2	0	1	0	0	0
PERCENT	5	49	30	7	4	4	1	0	1	0	0	0

MEAN WEIGHT 2.26 +/- 95% 0.21

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER EHEN YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
OCT	-	1	2	7	3	2	1	-	-	-	-	1	-	-	-	-	-	-	-
TOTAL	0	1	3	9	4	2	1	1	0	0	0	1	0	0	0	0	0	0	0
PERCENT	0	5	14	41	18	9	5	5	0	0	0	5	0	0	0	0	0	0	0

MEAN WEIGHT 7.32 +/- 95% 0.88

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	1	-	-	-	-	-	-	-	-	-	-
AUG	-	4	-	-	-	-	-	-	-	-	-	1
SEPT	-	-	-	-	-	-	-	-	-	-	-	1
OCT	-	1	-	-	-	-	-	-	-	-	-	1
TOTAL	0	6	0	0	0	0	0	0	0	0	0	3
PERCENT	0	67	0	0	0	0	0	0	0	0	0	33

MEAN WEIGHT 1.50 +/- 95% 0.00

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER IRT YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MEAN WEIGHT ERR +/- 95% ERR

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-
OCT	1	-	-	-	-	-	-	-	-	-	-	-
TOTAL	1	0	0	0	0	0	0	0	0	0	0	0
PERCENT	100	0	0	0	0	0	0	0	0	0	0	0

MEAN WEIGHT 0.50 +/- 95% ERR

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER DUDDON YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MEAN WEIGHT ERR +/- 95% ERR

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	1	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-
OCT	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	1	0	0	0	0	0	0	0	0	0	0
PERCENT	0	100	0	0	0	0	0	0	0	0	0	0

MEAN WEIGHT 1.50 +/- 95% ERR

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER CRAKE YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCT	2	3	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3	3	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT	27	27	9	9	9	18	0	0	0	0	0	0	0	0	0	0	0	0	0

MEAN WEIGHT 5.50 +/- 95% 1.15

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	1	-	-	-	-	-	-	-	-	-	-
JULY	3	-	-	-	-	-	-	-	-	-	-	-
AUG	13	2	-	-	-	-	-	-	-	-	-	-
SEPT	6	-	-	-	-	-	-	-	-	-	-	-
OCT	2	-	-	-	-	-	-	-	-	-	-	-
TOTAL	24	3	0	0	0	0	0	0	0	0	0	0
PERCENT	89	11	0	0	0	0	0	0	0	0	0	0

MEAN WEIGHT 0.61 +/- 95% 0.12

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER LEVEN YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
SEPT	-	-	-	1	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-
OCT	1	2	3	2	3	5	-	1	-	2	-	-	-	-	-	-	-	-	-
TOTAL	1	2	3	5	5	6	1	1	0	2	0	1	0	0	0	0	0	0	0
PERCENT	4	7	11	19	19	22	4	4	0	7	0	4	0	0	0	0	0	0	0

MEAN WEIGHT 7.76 +/- 95% 0.96

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	1	1	-	-	-	-	-	-	-	-
AUG	2	4	2	-	-	-	-	-	-	-	-	-
SEPT	-	7	-	1	-	-	-	-	-	-	-	-
OCT	1	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3	11	3	2	0	0	0	0	0	0	0	0
PERCENT	16	58	16	11	0	0	0	0	0	0	0	0

MEAN WEIGHT 1:71 +/- 95% 0.38

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER KENT YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	1	1	-	-	1	3	1	-	-	-	-	-	-	-	-	-	-	-	-
JULY	2	1	-	-	-	-	1	-	-	1	1	-	-	-	-	-	-	-	-
AUG	-	5	2	1	1	1	-	2	1	-	-	-	-	-	-	-	-	-	-
SEPT	-	7	3	2	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-
OCT	12	22	20	7	6	2	5	2	-	1	1	-	1	-	-	-	-	-	-
TOTAL	15	36	25	10	9	6	9	4	1	3	2	0	1	0	0	0	0	0	0
PERCENT	12	30	21	8	7	5	7	3	1	2	2	0	1	0	0	0	0	0	0

MEAN WEIGHT 6.24 +/- 95% 0.46

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	1	-	-	-	-	-	-	-	-	-
JULY	1	12	9	1	1	-	-	-	-	-	-	-
AUG	2	16	12	4	2	-	-	-	-	-	-	-
SEPT	-	2	-	1	-	-	-	-	-	-	-	-
OCT	3	2	4	-	1	-	-	-	-	-	-	-
TOTAL	6	32	26	6	4	0	0	0	0	0	0	0
PERCENT	8	43	35	8	5	0	0	0	0	0	0	0

MEAN WEIGHT 2.09 +/- 95% 0.22

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER LUNE YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	12
MARCH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-
JULY	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	1	1	4	2	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-
SEPT	1	3	9	11	14	7	2	4	-	3	2	3	2	-	1	3	-	-	-
OCT	2	12	8	22	20	20	7	7	4	2	2	4	1	-	-	2	1	1	4
TOTAL	4	16	22	36	34	30	10	11	4	6	4	7	4	1	1	5	1	1	16
PERCENT	2	8	10	17	16	14	5	5	2	3	2	3	2	0	0	2	0	0	8

MEAN WEIGHT 8.46 +/- 95% 0.49

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	-	1	-	-	-	-	-	-	-	-	-	-
JUNE	-	17	16	3	5	1	-	-	-	-	-	-
JULY	5	20	32	8	7	3	1	-	-	-	-	-
AUG	1	25	18	5	2	1	-	1	-	-	-	-
SEPT	4	17	13	3	1	1	-	-	-	-	-	-
OCT	-	9	4	-	-	-	-	-	-	-	-	-
TOTAL	10	89	83	19	15	6	1	1	0	0	0	0
PERCENT	4	40	37	8	7	3	0	0	0	0	0	0

MEAN WEIGHT 2.35 +/- 95% 0.15

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED

RIVER RIBBLE YEAR 1991

SALMON WEIGHT (POUNDS)

MONTH	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	>20	N/R
JAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	-	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-
JULY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUG	-	-	-	1	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-
SEPT	1	1	2	-	4	1	1	-	1	-	-	-	-	1	-	-	-	1	-
OCT	-	7	5	5	6	5	1	5	1	3	-	-	1	3	-	-	-	1	-
TOTAL	1	8	7	6	11	7	2	6	2	3	1	0	1	8	0	0	0	2	0
PERCENT	2	12	11	9	17	11	3	9	3	5	2	0	2	12	0	0	0	3	0

MEAN WEIGHT 9.30 +/- 95% 1.05

SEA TROUT WEIGHT (POUNDS)

MONTH	0	1	2	3	4	5	6	7	8	9	10	N/R
MAY	1	-	-	-	-	-	-	-	-	-	-	-
JUNE	-	2	-	1	-	-	-	-	-	-	-	-
JULY	5	17	10	7	1	1	1	-	-	-	-	-
AUG	13	22	15	10	1	-	-	-	-	-	-	-
SEPT	-	2	-	1	-	-	-	-	-	-	-	-
OCT	-	-	2	1	2	-	-	-	-	-	-	-
TOTAL	19	43	27	20	4	1	1	0	0	0	0	0
PERCENT	17	37	23	17	3	1	1	0	0	0	0	0

MEAN WEIGHT 2.10 +/- 95% 0.22

WEIGHT CATEGORY EG. 3 = 3LB 0OZ - 3LB 13OZ.
N/R = NOT RECORDED