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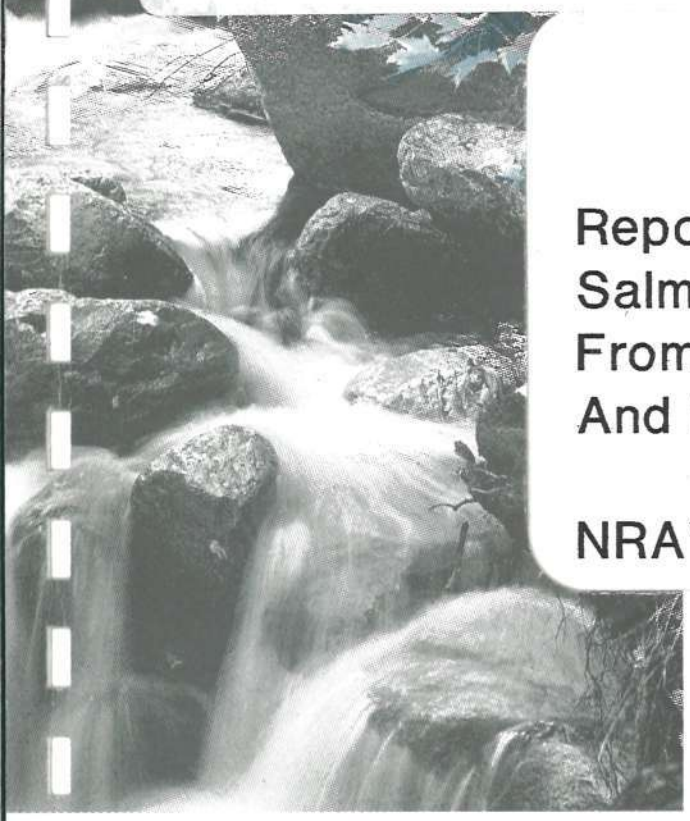

NRA

National Rivers Authority
North West Region

Report On The Collection Of Salmon Creel Census Data From The Rivers Ribble And Hodder.

NRA\NW\FTR\95\12.

GUARDIANS OF THE WATER ENVIRONMENT

REPORT ON THE COLLECTION OF SALMON CREEL CENSUS DATA FROM THE RIVERS RIBBLE AND HODDER.

January 1995.

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CONTENTS

1. INTRODUCTION

Following on from the work instigated by Viscount Mills (Area FRE manager) in 1993, the River Ribble bailiff team completed a total of 377 salmonid creel censuses by interviewing anglers fishing on the banks of the Rivers Ribble and Hodder during 1994. The study was undertaken for a number of reasons:

(i) To determine which areas of the river were fished by anglers.

(ii) To ascertain which fishing methods were used in these areas.

(iii) To identify the success of each fishing method within each area of the River Ribble system.

In a limited 1993 sampling programme, 55 censuses were carried out. Results from these indicated that fishing with worm as bait was the most common method (39% of anglers interviewed) and also resulted in the greatest number of salmon being caught (61% of all salmon).

The 1994 census data were collected from all areas of the Ribble system during the months of June to October. The data presented here are for anglers fishing for salmon only or for those fishing for salmon and sea trout at the same time. All of the fish caught were salmon.

The results from anglers fishing only for sea trout are not included in this report. A limited effort was expended (a total of 73.5 hours) resulting in only 5 sea trout being caught during the survey period.

2. METHODS

Creel census forms were distributed to the team of 8 bailiffs on the River Ribble system. It was each bailiff's objective to complete at least 10 forms per month from June to the close of the fishing season in October. This objective was not achieved each month because of constraints on bailiffs' time and a lack of anglers to sample during periods of the fishing season.

For the purpose of this report the River Ribble system was divided into three areas:

Area 1. The River Ribble downstream of its confluence with the River Hodder.

Area 2. The River Ribble upstream of its confluence with the River Hodder.

Area 3. The River Hodder.

The following information was recorded on each completed creel census form: the time spent fishing for salmon or for salmon and sea trout, the fishing method (fly, worm, spinner or shrimp), and the number of salmon or sea trout caught. From this information, it was possible to determine the total time spent in each area fishing each of the methods. An example of a completed creel census is shown in the appendix.

It was also possible to calculate Catch Per Unit Effort (CPUE) values for each method and each area. The CPUE is defined as the average number of fish caught per hour. Using these CPUE values, it is possible to compare the effectiveness of each fishing method both within and between areas and to determine which are the most successful.

3. RESULTS

For each area of the Ribble system; the number of censuses carried out, the hours spent fishing, and the salmon catch are shown in Tables 1 to 3. The percentage time spent fishing with each method and salmon catch for each area are shown in Figures 1 and 2.

3.1 Number of censuses received.

A total of 377 creel censuses was collected from all areas of the Rivers Ribble and Hodder, including a significant proportion (36%) from the Ribble, below Hodder foot.

Table 1. Creel census returns

MONTH	DOWNSTREAM HODDER FOOT	UPSTREAM HODDER FOOT	RIVER HODDER	TOTAL
JUNE	15	2	9	26
JULY	4	5	11	20
AUGUST	42	34	15	91
SEPTEM.	35	41	20	96
OCTOBER	41	84	19	144
TOTAL	137	166	74	377

3.2 Catch per unit effort.

A total of 73 salmon was recorded on the creel census forms from all areas of the Ribble system. (Table 2). A single salmon was caught by an unknown method in the area of the River Ribble above Hodder Foot. This fish is included in calculations of CPUE for the whole River system but is ignored when specific methods are discussed.

Although the greatest number of salmon were caught on the River Ribble above Hodder Foot, the Catch Per Unit Effort (CPUE) remains approximately the same for each of the areas on the Ribble system (Table 2). These data suggest that the average fishing time required to catch a salmon on the Ribble system was between 14 and 17 hours in 1994.

Table 2. Catch per unit effort.

AREA	NUMBER CENSUSES	NUMBER HOURS	NUMBER FISH CAUGHT	CATCH PER UNIT EFT.
DOWNSTREAM HODDER FT.	137	383	24	0.06
UPSTREAM HODDER FT.	166	686	38	0.06
RIVER HODDER	74	156	11	0.07

3.3 River Ribble downstream of Hodder Foot.

In this area the two most popular forms of fishing were spinner and shrimp. Spinning accounted for 29% of the total time spent fishing and shrimping 27%.

The majority of salmon taken were caught on spinner (54%). The effectiveness of spinning, in this area of the lower Ribble, is further emphasised by the CPUE for this fishing method of 0.12 fish per hour, the highest recorded.

The percentage of fish caught on shrimp (17%) was much lower than the percentage time spent fishing with shrimp (27%). From the CPUE data, fishing with shrimp (0.04) is a far less effective method than using a spinner (0.12) or a worm (0.06) and was only marginally more effective than fly fishing (0.03).

3.4 River Ribble upstream of Hodder Foot.

The most popular fishing method in this area was worm, accounting for 46% of the total time spent fishing and 39% of the fish caught (CPUE value of 0.05).

The percentage of fish caught on spinner (37%) was far greater than the percentage time spent fishing by this method (23%). The CPUE value for spinning (0.09 fish per hour) was higher than for worming (0.05), as was the case below Hodder Foot.

The greatest CPUE value (0.21 fish per hour), and therefore the most successful technique in this area was the use of shrimp. This reflects a low total number of hours fished combined with a single highly successful days fishing and is probably an anomaly. In October, at Stainforth Force, a single angler fishing with shrimp took three salmon in four hours. The angler's comment on his spell at the site was, not surprisingly, "A great days fishing" (see also appendix 1.).

Fishing with fly in this area was the least effective method with a CPUE value of only 0.03 fish per hour.

Table 3. Catch per unit effort data

METHOD	DOWNSTREAM HODDER FOOT	UPSTREAM HODDER FOOT	RIVER HODDER	TOTAL
FLY				
hours	70	177	27	274
catch	2	6	2	10
%catch	8.7	15.8	18.2	13.9
CPUE	0.03	0.03	0.07	0.04
WORM				
hours	71	313	26	410
catch	4	15	0	19
%catch	17.4	39.5	0	26.4
CPUE	0.06	0.05	0	0.05
SPIN				
hours	112	159	106	377
catch	13	14	9	36
%catch	56.5	36.8	81.8	50
CPUE	0.12	0.09	0.08	0.10
SHRIMP				
hours	103	14	-	117
catch	4	3	-	7
%catch	17.4	7.9	-	9.7
CPUE	0.04	0.21	-	0.06
			Total Catch	72

3.5 The River Hodder.

On the River Hodder the most popular fishing method was spinning (67% of the total time spent fishing) and this technique accounted for 82% of the total number of salmon caught.

Unlike the other areas of the Ribble system, the percentage of salmon caught by fly fishing on the Hodder (18%) was similar to the percentage time spent fishing with this method (17%). The CPUE's for fishing with fly and spinner are both similar (0.07 and 0.08 fish per hour respectively).

3.6 The Ribble system as a whole.

On the river system as a whole, fishing with worm and spinner were the two most popular methods (33% and 31% respectively of the total number of hours spent fishing). Spinning accounted for the largest percentage of salmon caught (50%) and also gave the highest CPUE of 0.10 fish per hour.

Fishing with shrimp was the least recorded method giving the lowest total number of hours fished (10%), and the lowest total number of fish caught (10%) but gave the second highest CPUE of 0.06 fish per hour.

Fishing with fly or worm showed similarly low CPUE values (0.05 and 0.04 fish per hour respectively). Fly fishing was therefore the least successful fishing method in 1994.

3.7 Summary of 1993 creel census data.

In 1993, a total of 55 creel censuses was taken. Analysis showed that: 39% of anglers interviewed were using worm, 15% spinner, 16% fly, and 8% used shrimp. In addition, for 23% of the censuses an undisclosed method or variety of methods (fly, shrimp or worm) was used.

The majority (61%) of the salmon caught were by worm fishing, 6% by spinner, 11% by fly, and 22% by shrimp.

3.8 Comparison of 1993 and 1994 creel census data.

The results from the creel censuses taken in 1993 and 1994 are compared in Table 4.

Table 4.
Creel censuses per method

	1993		1994	
Method	Percent. censuses returned	Percent. salmon caught	Percent. censuses returned	Percent. salmon caught
Fly	16	11	27	14
Worm	39	61	19	26
Spin	15	6	23	50
Shrimp	8	22	9	10
Not Known	23	-	22	-

The most popular fishing methods recorded in 1993 were fishing with worm (39%), and in 1994 fly fishing (27%). Fishing with worm also produced the greatest percentage of fish caught in 1993 (61%) though spinner was the most successful in 1994. Fishing with shrimp constituted a nearly equal percentage of anglers in both years (8% in 1993 and 9% in 1994), but was more successful in 1993 (22% and 10% of the total recorded catch in 1993 and 1994 respectively). The percentage of anglers fishing a combination of methods, or whose method was not recorded on the creel census forms (as indicated in the row "Not Known") was approximately the same in both years (23% in 1993 and 22% in 1994).

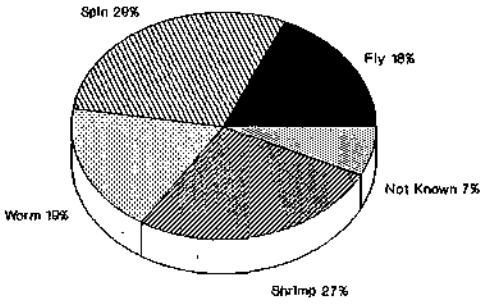
Figure 1.

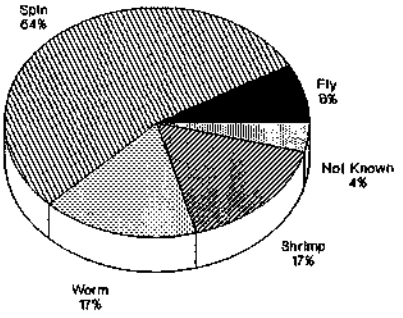
Salmon Creel Census 1994

Fishing Methods

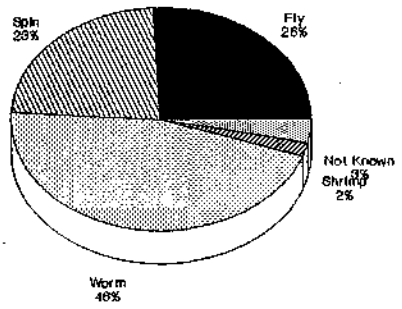
Catch per Method

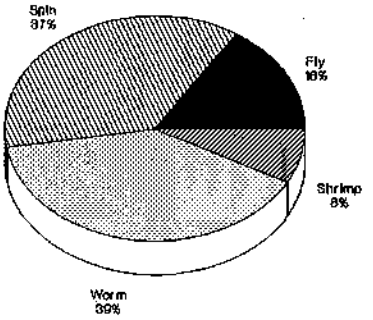
1. River Ribble Downstream of Hodder Foot



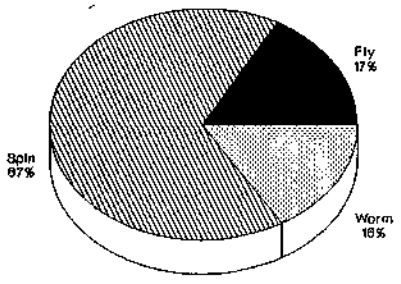


2. River Ribble Upstream of Hodder Foot





3. River Hodder



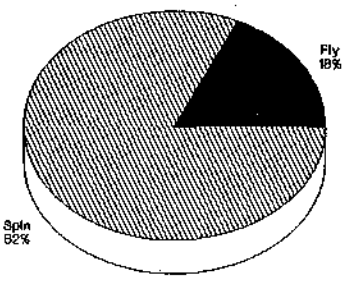
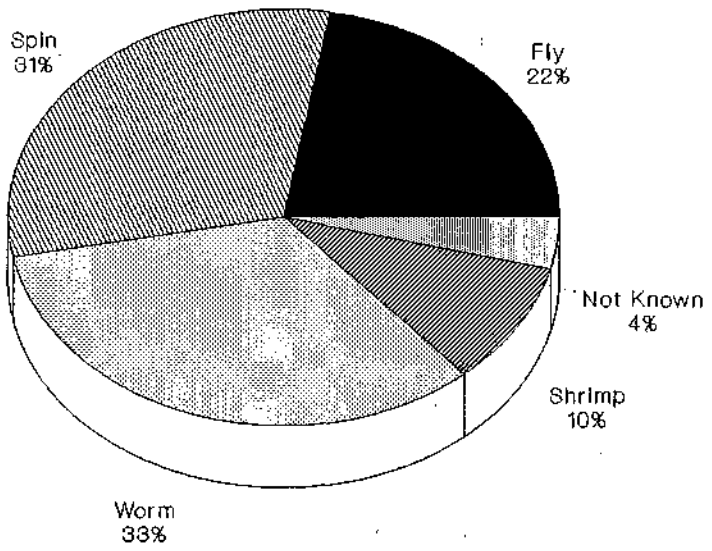


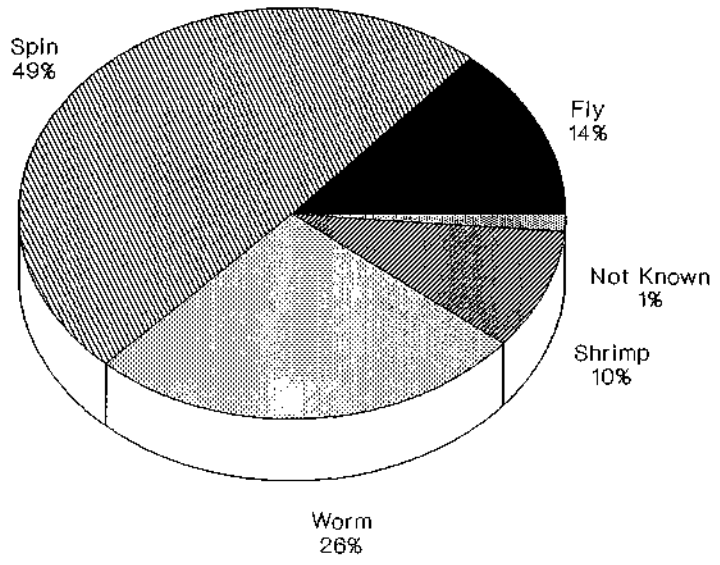
Figure 2.

Salmon Creel Census 1994
Rivers Ribble and Hodder

Fishing Methods



Catch per Method



4. DISCUSSION

4.1 Spinning.

In 1994, the most effective fishing method, based on the percentage of fish caught, the percentage of time spent fishing and the CPUE data, in all areas of the Ribble system was spinning. The high usage of spinning is likely to result from it being a method that is favoured by anglers since there is no need to collect bait and it is acceptable to most angling clubs. It is also suitable for a wide range of fishing conditions, from the generally low river levels found in early summer 1994 to the spate conditions experienced at the end of the season.

The facets of spinning that made it popular in 1994 might also be expected to have proved similarly popular in 1993. The relatively low percentage usage and catch of salmon by spinner in 1993 may be an artifact of the low number of census forms received in that year, or may reflect a real difference in fishing methods from season to season.

4.2 Shrimp fishing

Shrimping appears to have been far less effective than is perceived by the general angling fraternity. Although it has the second highest CPUE value in 1994, it had the lowest total number of hours fished and the lowest number of salmon caught. This being the case, the capture of any single fish on this method is likely to have a greater effect on the overall CPUE value (see section 3.4). The low number of hours recorded using this method, even during periods when the rivers were low and clear, (ideal conditions for shrimp fishing) would appear to suggest that shrimp fishing on the Ribble is controlled by fishing club rules or by the choice of the fishermen themselves.

The similar percentage usage of shrimp in 1993 and in 1994 would tend to support the above conclusion that shrimp fishing is controlled by angling clubs and anglers themselves. The relatively high percentage catch in 1993 may be due to the generally low flows in September and October of 1993 creating successful shrimp fishing conditions. Alternatively it may be a sampling error or artifact due to the overall low numbers of salmon caught by all methods in this year.

4.3 Fishing with worm

Fishing with worm as bait was the most popular method in 1994, especially on the River Ribble upstream of Hodder Foot. It was not, however, particularly successful, generating an overall CPUE of 0.05 fish per hour. This may be due to unsuitable water conditions for successful worm fishing during the majority of the fishing season.

The relative success of worm fishing in 1993 may be due to more favourable river conditions for worm fishing in this year, or could be a sampling error caused by the low number of censuses received. Alternatively it may result from bias if bailiffs, pressurised by constraints of targets and available time, undertook censuses under particular fishing conditions in 1993 where they knew fishermen would be present.

4.4 Fly fishing

Of all the angling methods, fly fishing appears to have been the least successful in 1994. Fly only is dictated by a number of clubs on stretches of the Rivers Ribble and Hodder. Since it is probable that fly fishing is most successful over only a limited range of flow conditions and is a relatively skilled method of angling requiring both successful selection and presentation of the fly to the fish it is likely to be the least successful method overall.

The high degree of expertise and the narrow band of flow conditions required to be a successful fly fisherman appears to result in anglers spending a long time fishing for little reward. This will be the case in most fishing seasons and so the CPUE value for this method is always likely to be the lowest.

4.5 Potential problems.

Potential problems with the collection of catch data on the river bank by creel censuses are that it may lead to the generation of unrepresentative results. This can be for several reasons.

(i) A disproportionate number of censuses may be carried out in sections of the river where one particular method of fishing is favoured.

(ii) The collection of census data may be targeted to times when fishing conditions are such that bailiffs are confident that large numbers of anglers will be on the river (eg. a falling spate) and may therefore only reflect the methods used under such conditions.

(iii) Similarly, biases may arise from seasonal variations in stock availability, angling conditions, and the number of anglers fishing particular areas or methods.

These biases can only be compensated for by the implementation of a strategic programme of census taking, targeted to give the best possible temporal and spatial coverage in terms of area and season and carried out over a number of years.

5. RECOMMENDATIONS

5.1 Number of censuses taken.

The number of censuses taken and the distribution of these across the river system in 1994, was of increased significance when compared to 1993. It is recommended that, if creel censuses are continued, a similar level of effort would need to be expended in future years. Comparisons of data generated over several years should even out the effects of flow conditions and stock availability for any individual year and thereby give a true reflection of the situation over time.

5.2 Catch Per Unit Effort data

The creel census data is the most effective means of gathering accurate Catch Per Unit Effort data for the various fishing methods and thereby identifies the relative success of each. It would also be possible, by comparing several years CPUE data, to identify changes in the methods of exploitation of the salmon population of the Ribble system.

APPENDIX 1.

Completed Creel Census Form.

National Rivers Authority
Migratory Salmonid Creel Census.

River: RIBBLE Location: STAINFORTH Date: 27-10-91
Grid Ref:

Fishing conditions: SPATE (Running off)

Anglers Name and Address;.....

.....

.....

Do you fish the Ribble for salmon regularly? Yes / ~~No~~.

Fishing Method.	Hours
Fly	2
Worm	2
Spinner	
Shrimp	4

Fishing Effort	Hours
Hours fishing for salmon only	8
Hours fishing for sea trout only	
Hours fishing for both species at the same time	

Catch					If nil, tick box		
Fish	Species		Weight		Method	Returned?	Tagged?
	Salmon	Sea Trout	lbs	oz		(Tick if yes)	(Tick if yes)
1	✓HEN		11	8	SHRIMP		
2	✓HEN		11	—	"		
3	✓HEN		9	1/2	"		
4							
5							

Comments: ...Great..days...fishing.....