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A comparative study of the length and weight of Atlantic salmon in an offshore drift net fishery, an inshore seine net and a fixed trap fishery in Irish waters.

by

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Abstract

The commercial catch of Atlantic salmon (*Salmo salar*) was analysed for length and weight by three different methods of capture over a short period in 1979. There was a significant difference in the size range of fish taken in the drift net fishery when compared with the trap net fishery and seine net fishery. The difference however was much more marked between the seine net fishery and drift net fishery in the same area of the coast than between the drift net fishery and the fixed trap fishery..

Introduction

The majority of salmon taken in the Irish commercial fishery belong to the 1+ sea winter age group. The fishery is concentrated over a short period - mid June to mid July. Drift nets account for between 75% and 80% and inshore seine nets together with fixed engines contribute between 15% and 20% of the annual catch.

The mesh size of the drift net used is standard throughout the country at 127mm, the legal length varies from 800 metres to 1500 metres. The nets are made mostly of monopy which consists of a series of very fine nylon threads slightly twisted. Monofilament is also used to some extent although its use has been declared illegal since 1976. The seine

net has a minimum mesh size of 88mm. It operates by encircling fish as they enter the estuaries. The fixed trap or weir fisheries consist of a series of traps which partly span the river. Each trap consists of a box, the upper end consisting of horizontal iron bars with an opening of 100mm and the lower end a pair of vertical converging walls with a gap between the walls to allow salmon to enter.

Method

From mid June to mid July the commercial catch of salmon was sampled at four different sites along the west coast (Fig. 1). Sampling was carried out from drift nets in Galway Bay and from the fixed trap net at the mouth of the Corrib in order to get comparative size range from drift net caught fish and trap net caught fish in the same area. There is evidence from tagging experiments that a proportion of the salmon taken in the Galway Bay drift net area are destined for the River Corrib (McCarthy, 1980). Likewise, Killala Bay drift net caught fish were comparable with the seine net caught fish in the inner portion of the Bay i.e. the Moy estuary. There is evidence that salmon in this area are homing to the River Moy, Moriarty (1968) Browne (1978).

Length, weight and scales for age determination were taken at all four sites from mid June to July 1979. Mesh marked fish were recorded in the inshore seine net fishery.

Results

The fork length frequency in 5cm groups for the various methods are given in Table 1. The weight frequencies in $\frac{1}{2}$ kg groups are given in Table 2.

In the Galway Bay area and the Corrib traps a total of 546 and 579 salmon respectively were sampled. The weight range was from 2.5kg to 5.0kg and the length range was from 45cm to less than 84cm. The data showed that there was a significant difference in frequency of capture between the trap and the nets ($\chi^2 = 25.44$ for the weight data and $\chi^2 = 16.39$ for the length data $P < .001$). The fish in the lower size range were dominant in the

trap caught fish. When the range groups in excess fo 3.6 were compared for both methods of capture there was no significant difference ($\chi^2 = 3.9$ or $P = <.05$).

In Killala Bay area and in seine nets operating in the Moy estuary a total of 1109 and 941 fish were sampled for length and weight. There was a very marked difference in size range of fish taken by both these methods of capture ($\chi^2 = 324.13$ and $P = <.001$ for length data, $\chi^2 = 435.48$, $P = <.001$ for weight data). The major portion of the fish taken in the seine nets were 2.5kg or less whereas the drift net caught fish were > 2.6 kg; similarly length frequencies showed a similar trend. The peak in the seine net caught fish was in the 55-59cm group whereas in the drift net caught fish it was in the 60-64cm group.

Discussion

The analysis of length and weight data of salmon taken in the drift net fishery and from a fixed trap fish in Galway Bay and the drift net fishery in Killala Bay and a seine net in the estuary of the River Moy (Fig. 1) indicate that the size range of fish exploited by all three methods of capture are similar. There is evidence however that the fish in the smaller size range are less frequent in the drift net fishery than by the other two methods of capture.

Both the seine net and traps are capable of exploiting the entire range of fish whereas the fish taken in drift nets is governed by the mesh size and there is a tendency for the smaller fish to drop out of the nets. There was evidence of this in the case of the River Moy where it was noted that up to 58% of the fish were recorded with mesh marks at the height of the fishing season in 1979. Indications were, therefore, that the dropouts from the drift net fishery form a large proportion of the River Moy catch and were accountable for the smaller size range recorded in the River Moy seine net catch when compared to the drift net catch in Killala Bay.

References

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Table 1. Fork length frequency distribution of salmon taken in the four sampling sites.

5cm Groups	Galway Bay Drift nets	River Corrib Fixed trap	Killala Bay Drift nets	River Moy Seine nets
45 - 49		2	3	24
50 - 54	3	12	30	212
55 - 59	80	98	258	331
60 - 64	307	237	518	267
65 - 69	164	152	240	92
70 - 74	23	37	30	10
75 - 79	4	6	15	2
80 - 84	3	2	12	3
85 - 89	1	-	3	-
Total	585	546	1109	941

Table 2. Weight frequency distribution of salmon taken in the four sampling sites.

½kg Groups	Galway Bay Drift nets	River Corrib Fixed trap	Killala Bay Drift nets	River Moy Seine nets
1.0 - 1.5		-	17	175
1.6 - 2.0	3	38	74	257
2.1 - 2.5	94	114	233	212
2.6 - 3.0	169	145	369	158
3.1 - 3.5	177	128	223	78
3.6 - 4.0	84	64	129	48
4.1 - 4.5	33	41	31	9
4.6 - 4.9	9	10	9	1
5.0	9	6	24	3
Total	579	546	1109	941

