

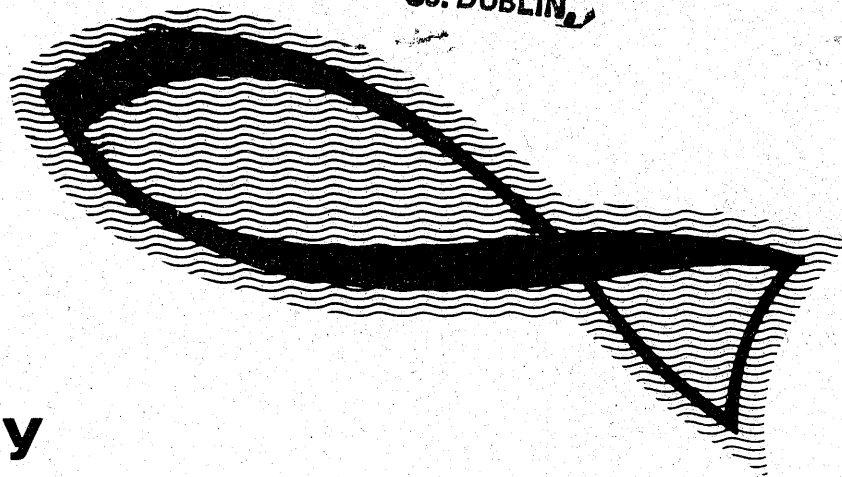


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Number 101
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**an roinn
iascaigh agus
foraoiseachta**

**Performance of the Crumlin
sea-trout Fishery, Co. Galway**

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by

Edward Fahy

**Department of Fisheries
and Forestry
Trade and Information Section
Dublin 2**

Summary

The physical features of the Crumlin catchment, a small sea-trout fishery in Co Galway, are described. Its sea-trout stock is examined and found to be typical of others in the region: the fish are slow growing in the sea, poorly conditioned, mortality in the stock is high and the fish have a low weight at capture. Fishery statistics date from 1896. The main influence on the numbers taken by anglers appears to have been the two wars. Individual catch weights do not show any inverse relationship with catch numbers of the kind that has been reported already in the vicinity. Catch per effort has not altered in keeping with any identifiable long-term trend but is within the range recently reported elsewhere in the region. Regulations designed for the protection of smolts in past years also protect about 20% of post-smolts (finnock) currently captured. Yield from Crumlin has most in common with output from a small neighbouring fishery. It is tentatively suggested that sea-trout production from the Connemara catchments is dependent primarily on the physical features of the systems concerned.

Introduction

Some sea-trout fisheries of the Connemara region have already been described with the objective of discovering factors of importance to their management (Fahy, 1978a). All of those fisheries investigated to date are in the area controlled by the Connemara Board of Fishery Conservators. The fishery considered here, Crumlin, adjoins the Connemara Board but is situated in the area controlled by the Galway Conservators. Sea-trout from the catchment are described from a small collection of scales and physical measurements.

Information on the fishery is contained in a number of fishery registers or logs and the MS copy of a book of miscellany attributed to a Mr Lowndes and compiled c. 1915. In addition to the usual catch numbers and weights these papers contain notes on the fauna and flora of the catchment and details of the management of the fishery.

The Crumlin Catchment

Like its neighbours in eastern Connemara the Crumlin fishery is situated on acidic igneous bedrock. Its small river and lake system is the most eastward of those whose sea-trout catches have so far been evaluated (Fahy, 1978a) and it is situated in the Galway Fishery District, just outside the Connemara District whose south-eastern boundary, in addition to being the watershed of the Cashla and Fermoye (Costelloe) fisheries, marks the northern limit of the Crumlin catchment (Fig. 1).

In area the Crumlin catchment is 25.7 km^2 so it is the fifth largest of the fisheries hitherto described (counting Cashla and Fermoye as two). Its lake area, 1.28 km^2 , is 5% of the catchment surface, a proportion which resembles the nearby Furnace (7%) and Fermoye (8%) basins. River lengths (calculated from the $\frac{1}{2}$ inch O.S. map) total 15.4 km a figure which exceeds only the rivers of Lettermuckoo and Cashla (separate from Fermoye).

Sea-trout of the Crumlin system

The sea-trout which frequent Crumlin are described on the results of a limited stock assessment based on rod caught fish from which scales were removed and life data noted in 1978. The material was assembled between 20 July and 10 October, within a period which is representative of the usual brief Connemara fishing season; 84 sets of scales were amassed. The stock is here described in the usual terminology a fuller discussion of which is to be found in Fahy, 1978b.

The average individual weight of the fish sampled was 371 g (0.82 lb) and the proportion of previously spawned fish in the sample 1.3%. The relationship of these two characteristics can be a good indication to the kind of sea-trout population concerned and the low readings in this case place the Crumlin fish with the slim-bodied (i.e. poor conditioned), Atlantic type of sea-trout stocks.

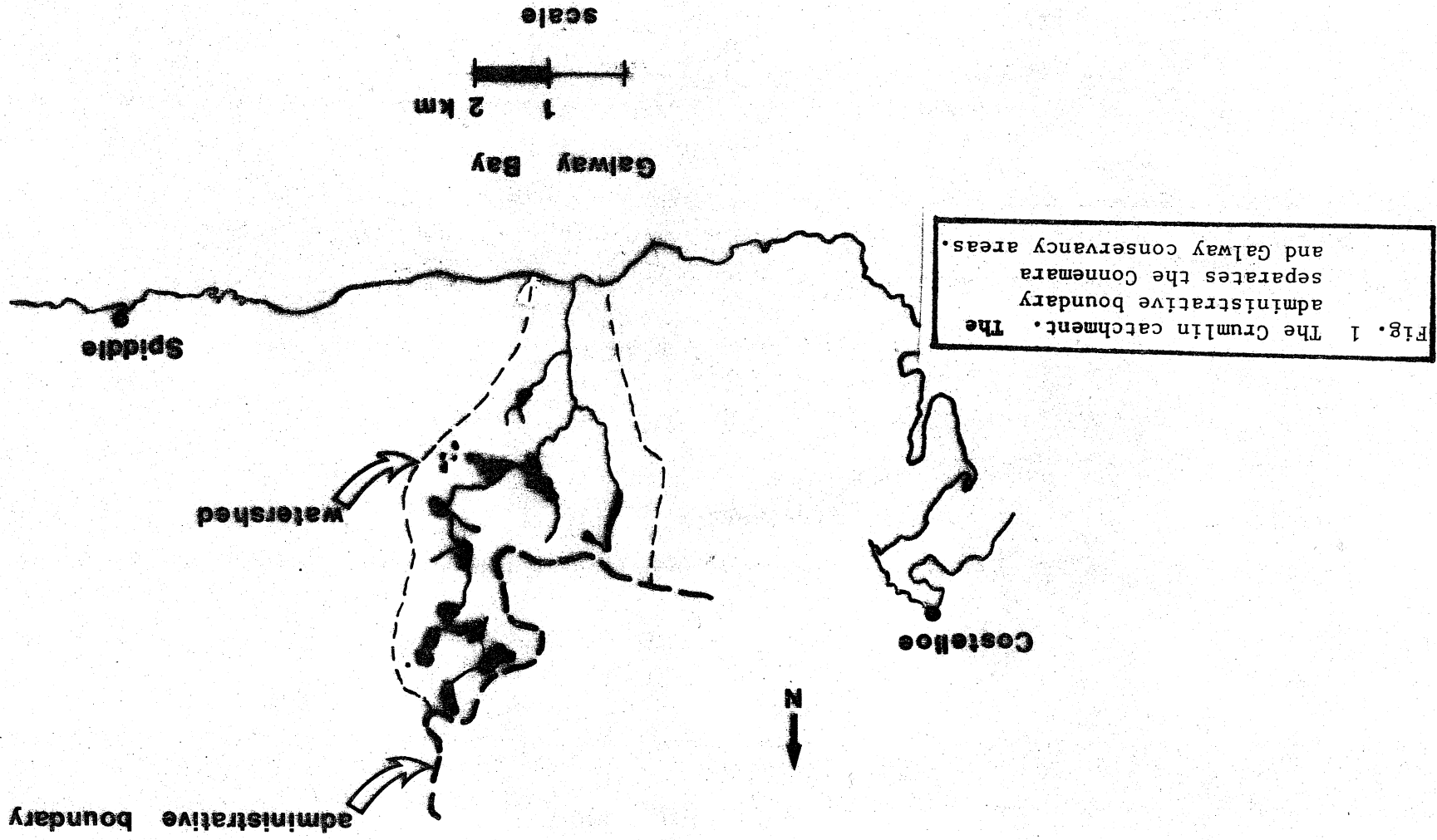
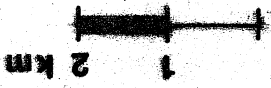


Fig. 1 The Crumlin catchment. The administrative boundary separates the Connemara and Galway conservancy areas.

scale



Galway Bay

Spiddie

watershed

Costelloe



administrative boundary

The pre-migratory freshwater phase of the Crumlin fish (from this sample) is notable for its duration. The mean age at smoltification (that is the age at which the fish migrate for the first time (known as the MSA)) has, in recent stock evaluations from other fisheries been in the vicinity of 2 years of age. In this small collection there were a large number of three year old smolts and the MSA was 2.56 years, arrived at as follows:

Smolt age classes :	1	2	3	4
Percentage composition of Crumlin stock :	0	44.9	53.8	1.3 %

It is customary in stock analyses to describe fish which go directly to sea in their year of migration (i.e. before any new growth for that year is identifiable on the scale) as A type smolts; those which feed in the course of moving seawards or prior to migration are B type fish. B type growth is regarded as compensatory, bringing slower growing individuals to a larger dimension (already reached by A type fish in the same catchment) for migration. Usually the incidence of B type growth is greater in the younger smolts, declining as the smolt classes are ascended. Again the small numbers involved in the present sample could have a distorting effect on the outcome of the calculation: 73% of the sample were B type smolts and 27% A type. The incidence of A type fish is comparatively high although it is in keeping with other estimates of the occurrence of A type fish in Irish sea-trout populations in recent years. Of the two largest smolt classes: 63% of the two year olds were B type smolts as were 81% of the three year old fish.

The length at age data (back-calculated from the scales) of the parr and smolts are summarised in Table 1. A number of criteria observed elsewhere are satisfied by the measurements. The length of the younger parr and smolt classes at any time exceeds that of older smolt fish of the same age. B type growth takes fish which display it from a below average length for the smolt age class to a marginally longer fish than its A type counterpart.

Table 1: Length at age of 2 and 3 year old A and B type smolts.

A type fish:

Smolt age	Number	Length (cm) at end of years:		
		1	2	3
2	12	8.6	21.0	-
3	8	7.1	14.5	19.9

B type fish:

Smolt age	Number	Length (cm) at end of years:			
		1	2	3	At migration
2	22	8.5	18.7	-	22.1
3	33	7.9	15.2	20.2	22.8

Back-calculation of the lengths of the fish at the end of the first post migration or "sea" winter could be carried out on only 7 individuals and their mean calculated length was 31.2 cm. Only one back calculation was possible for length at the end of the second winter after migration and this gave a measurement of 36.1 cm. Both of these statistics are low and in keeping with the lengths at similar ages for sea trout in other fisheries - particularly those along the west coast of Ireland.

The fishery

Whether 1896 marked the commencement of a management regime for Crumlin is not known but documents surviving from that year record regulations for the control of fishing effort, the allocation of beats and a size limit (12 inches) for fish retained.

Like those fisheries whose catches have hitherto been described the logs from Crumlin are a daily record of fish taken. Statistics include the number of fish caught, total weight of the daily bag (here expressed as a decimalised lb. unit) and the number of days spent on the fishery. These figures are summarised graphically in Fig. 2. As in other parts of the region the angling season is brief in Crumlin - from June (more often July) to mid October.

Annual catch

This statistic, shown in Fig. 2 as a 3 year moving average, is the most constantly recorded of the catch figures. Its characteristic features are those already remarked in eastern Connemara, a reduction in catch numbers corresponding with the period about and following the two wars, this being more marked in the case of Crumlin than for any of the other fisheries so far investigated.

Weight of individual fish caught

Previously reported is the inverse relationship which can exist between catch numbers and average weight of fish taken in Connemara. Similar correlations for the Crumlin fishery were unsuccessful. The fragmentary nature of the weight data is thought to be responsible for this. The data in Fig. 2 suggests there has been a downward tendency in catch weights since the turn of the century.

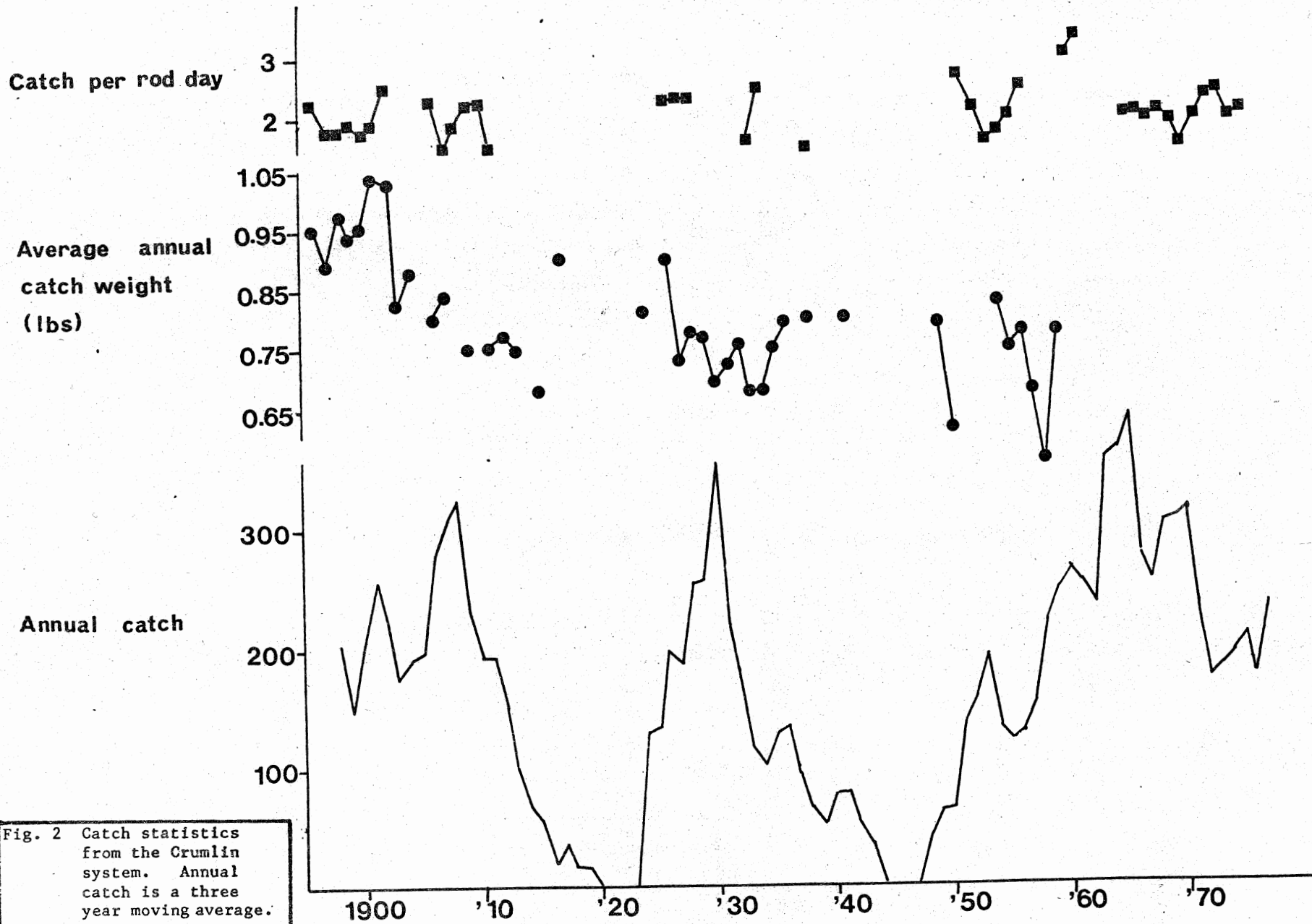


Fig. 2 Catch statistics from the Crumlin system. Annual catch is a three year moving average.

Catch per effort

The unit of effort for these fisheries is the number of days fished by the number of anglers (rod days). This statistic was erratically recorded - hence the gaps in Fig. 2. The catch per effort at Crumlin does not display any long term trends - indeed it is a less variable statistic than for some of the other fisheries in the region. In recent years a catch of between 1 and less than 4.4 fish per rod day is the norm in Connemara and the catch at Crumlin is within this range throughout the period covered by the records.

Undersized fish

Rules for the Crumlin fishery include one which specified that fish of less than 12 inches should be returned to the water (the current limit is 10 inches). Between 1897 and 1904 details of undersized and rejected fish were included. The details are summarised in Table 2. In the month of May all fish were sub-limit. This fact again underlines the short lived nature of the stock concerned. In May one might expect incoming "spring" fish although these would in any case be outnumbered by migrating smolts. Although the number of fish on which the May percentage in Table 2 is based was small some adult sea-trout might have been expected among them. After May the proportion of fish rejected because they were undersized fell until in October a mere 9% of the catch did not reach the limit; 24% of the sample whose scales were read from the months of August, September and October were less than 30cm in length; this compared with a figure of 16% rejected for the same months in the years 1897 - 1904. Sub-sized fish in the material whose scales were read were post-smolts. The original size limit, thought it might have been intended as a smolt conservation measure (such regulations generally were), extended protection to returning fish.

Fishery yield

Output from the Connemara fisheries has been estimated as annual catch per km of river and per km² of lake; the relative importance of lake and river in the catch statistics is not known. As in earlier studies output is estimated here as the total weight of fish for years in which the average weight of individuals caught exceeded 0.75 lbs (340g). At Crumlin 8.2 lbs (37kg) were produced per km of river and during the best five years of the fishery 9.4 lbs (4.3kg) was the average yield. The figure is low but compares well with Furnace, only five of whose recent years qualified for the calculation. There 9.1 lbs. (4.1kg) of sea-trout were produced per km of river length. For all

other fisheries hitherto investigated yield per km ranged between 32 (14.5kg) and 55 lbs (24.4kg) per km averaging at 44.1 lbs (20kg) (for the Costelloe catchment both fisheries are considered together).

Production in relation to lake surface was 99 lbs (44.9kg) per km² (average of all years in which the mean weight of captured individuals exceeded 0.75lbs) and 113 lbs (51.3kg) for the best five years. Furnace has a record of yield which averaged at 284 lbs (128.8kg) per km². For Screebe the yield for the best five years was 231 lbs (104.8kg)/km² but Furnace, Screebe and Crumlin were consistently less than Costelloe (498 lbs; 225.9kg), Inver (446 lbs; 202.3kg) and Gowla (352 lbs; 159.7kg).

Discussion

The majority (88%) of the Crumlin sample were post smolts (i.e. fish in the summer of their first migration to sea; also known as finnock). This fact highlights again the short lived nature of the stocks in the Connemara region, a factor which contributes more than any other to the small average size at capture of the fish.

The freshwater (parr) phase of sea-trout can vary considerably from one catchment to another and some further observations on the Crumlin smolts are appropriate. The most comprehensive account of smolt sizes for the Connemara region is contained in Nall's (1931) paper where figures for Ballinahinch, Inver, Screebe, Gowla and Costelloe are given. Nall did not take B type growth into account in his work so that his measurements would be shorter than those calculated by the methods employed here. Nall's 2 year old smolts averaged between 16.3 and 17.5 cm and 3 year olds 18.1 - 19.7 cm; Went's (1949) measurements for the Gowla fishery gave 20.3 cm as the average length at migration of 2 year old smolts and 21.6 cm for 3 year olds. Average lengths of smolts from the Cashla River (Went, 1956) were: 2 year olds 19.4 cm and 3 year old smolts 21.1 cm. The latest calculations for the Crumlin fish are thus in good agreement with previously reported length at age data from the region.

Also worthy of comment is the apparent decline in average catch weight (Fig. 2) which might represent a reduction in mean weight of sea-trout taken since records began. In fact another explanation may apply. The strict adherence to the 12 inch size limit during the early years of the records has been relaxed as is clearly shown by the average weight of fish currently taken and by the length composition of the sample on which an evaluation of the stock is based.

Table 2: Percentage of the sea-trout catch returned to the water as undersized in the months between May and October inclusive of the years 1897 - 1904.

Month	Number of years in which fishing took place	Percentage of catch returned to the water	Number of fish
May	2	100.0	29
June	2	50.0	48
July	6	20.2	238
August	7	21.0	757
September	7	17.7	268
October	7	9.0	190

In yield as in physical characteristics the Crumlin fishery would appear to have most in common with the nearby Furnace catchment. As further pieces of information come to light a tentative picture is emerging of two kinds of fishery in the region. Possibly because the larger catchments have a greater lake surface area and so, it is assumed wider streams, they produce a heavier output of sea-trout each year. Information on fisheries elsewhere in the west of Ireland should provide further clarification.

BIBLIOGRAPHY

- Fahy, E (1978a). Performance of a group of sea-trout rod fisheries. Fish. Mgmt. 9(1) : 22-31.
- Fahy, E (1978b). Variation in some biological characteristics of British sea-trout, Salmo trutta L. J. Fish. Biol. 13 : 123-138.
- Nall, G. H. (1931). Irish sea-trout. Proc. R. Ir. Acad. 40 B(1) : 36pp.
- Went, A. E. J. (1949). Sea-trout from the Owengowla (Gowla) River. Sci. Proc. R.D.S. 25 (N.S.)(5) : 55-64.
- Went, A. E. J. (1956). Sea-trout from the Cashla River. Salm.Trout Mag. 146 : 63-76.