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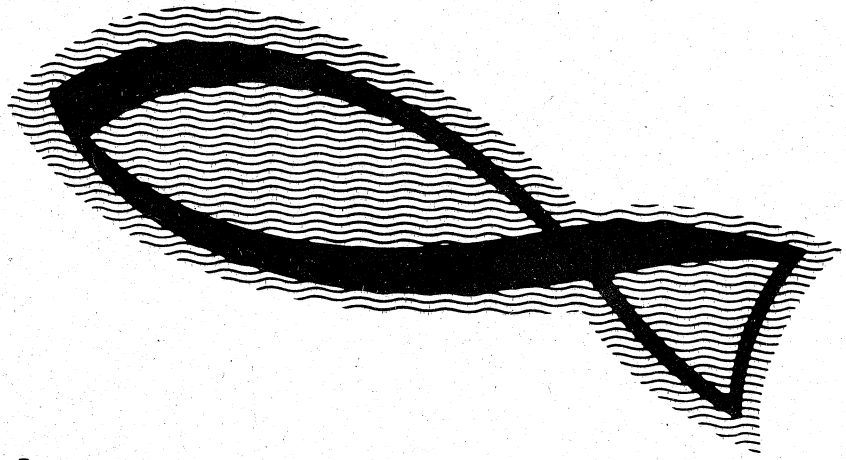
an roinn talmhaíochta agus iascaigh

Eel research 1973



by

C. Moriarty.

DEPARTMENT OF AGRICULTURE AND FISHERIES
FISHERIES DIVISION
DUBLIN.1.

EEL RESEARCH IN 1973

1. Summary of the year's work

Eel research broke new ground in 1973 by beginning a study of elvers and young eels. Elvers enter fresh water in spring and make their ways upriver. Precise information on when they arrive, in what numbers and how far they travel is very limited, although the subject was studied in the early years of the present century. Knowledge of the behaviour of eels in these early stages is essential because we have now proved that the scarcity of eels in many Irish waters is caused by the failure of the small eels to reach them. The situation could be improved by artificial transport of the young eels but first they must be caught and we must find out where and how best to catch them. In 1973 the arrival of elvers happened rather late and many were still on the move from the end of June right up to August. A study of the young eels at Parteen Weir on the River Shannon showed that there were virtually no elvers amongst them. This indicated that elvers took more than a year to travel the distance of nine miles to Parteen from the top of the tide.

To fill one of the gaps in our general information on eel stocks we sampled Lough Feeagh, a very poor bog lake in Mayo. Eels proved, as expected, to be scarce and very slow growing - one four ounce eel was 37 years old. Some grew a little faster than that and reached a pound or so in over twenty years. These results confirm the belief that there is no possibility of developing eel fishing in these lakes - a pity since there are a great many of them.

Other eel work involved the study of feeding and growth in some County Clare lakes near Newmarket-on-Fergus to assess the

the possibility of developing a fishery in the region. Growth proved good but stocks were low. In the Dublin Broadmeadow Estuary and Wexford South Sloblands annual sampling of the stocks continued which showed that it was still too early to begin commercial fishing there again. Studies of the Munster Blackwater continued and it is hoped that commercial fishing on an experimental basis may begin there in 1974. If it proves successful there are possibilities that the techniques could be applied to other southern rivers.

2. Elver and small eel studies

One of the factors limiting the national production of eels is the fact that elvers and small eels usually settle down in the first lake which they meet on their upstream migrations. This means that, while lakes such as Corrib have fairly high populations of eels, lakes far upstream are understocked. The most effective method of dealing with this problem is to transport the small eels to the more remote lakes. The Electricity Supply Board has been engaged in this work on the Shannon system for many years. The possibility of carrying elvers to stock other waters is now under consideration.

Before elvers can be carried they must be caught and studies of the young eels began in 1973 and will be intensified in 1974. Samples of the elvers were measured in three places: Adare on the River Maigue, Ardnacrusha on the Shannon and Furance on the Burrishoole River. Facilities for the work were kindly provided by the Electricity Supply Board and by the Salmon Research Trust. Besides examining elvers (the smallest eels which have just arrived from the sea), monthly samples of young eels collected by the E.S.B. at Parteen on the Shannon were measured. The purpose of these experiments is to discover the rate of growth, rate of migration and

the times of arrival and movement of the small eels so that the most effective arrangements for trapping them may be made.

Three samples of ascending elvers were measured; two in June and one in August. On June 15th, 56 specimens were caught by hand net in gravel in the River Maigue at Adare. These included one individual which had spent a year or more in freshwater and measured 87 mm. The others averaged 68 mm. On June 29th, 384 specimens averaging 68 mm were measured from an elver trap at Furnace on the Burrishoole River (see Table 1). A late run at Ardnacrusha on August 17 included 54 specimens of less than 80 mm, considered to be newly arrived and 24 larger and older, up to 199 mm. The 54 first-years averaged 71 mm, suggesting that some growth had taken place since their arrival in the tidal water downstream of Ardnacrusha.

The elver trap at Parteen is situated beside the salmon ladder which allows the passage of salmon from the main stream of the River Shannon over the dam. This trap lies approximately 9 miles upstream of the tidal boundary. Table 1 shows a gradual increase in length of the young eels through the summer, from a mean of 10.9 cm in June to 18.2 in September. This increase results partly from growth of eels and partly from an apparent tendency for the larger eels to travel later. Examination of a sample of these eels caught in 1970 showed that their ages ranged from 2 to 9 years. The most interesting point was that practically no elvers of the year reached Parteen. Taking 80 mm as the greatest length that could be attained by an elver of the year it will be seen from Table 1 that from July onwards not more than 1% of the migrants could have been new arrivals. It seems more reasonable to suppose that they were slow-growing individuals from the previous year. Specimens from 69 to 80 mm were, at 3%, a little more plentiful in the June sample.

Presumably they disappeared from the July samples as a result of increase in length. The tentative conclusion is that no elvers complete the nine mile journey to Parteen in their first summer. This investigation will be carried on in more detail in 1974.

3. Lake eels

Sampling of selected water by summer fyke nets as described in Moriarty (1972) was continued. Field assistance was given by Miss Maria Cramp and Miss Maura Leahy, zoology students and by Mr B Doolan of Fisheries Division staff. Messrs Sean O'Leary and Michael Shinners of Newmarket-on-Fergus gave a great deal of valuable voluntary help in the work on Fin Lough and Lough Gash. Some details of the results are given in Tables 2 and 3.

All of the eel stocks surveyed before 1973 were in rich waters since it had always been assumed that the acid lakes would not yield commercially important catches. Lough Feeagh, Co Mayo, on the Burrishoole Fishery was netted at the end of June. It has long been known to produce rather small silver eels and the yellow eel production of the tributary Cottage River had been studied (Rogers 1964). The yellow eel population of the lake proved to be very small. An effort of 100 net days, which would be expected to produce at least one hunderd eels in a comparable rich lake, yielded only 23 specimens. The youngest of these was 11 years and 75% of the sample were over 15. The only big specimens (over 1 lb.) were 23 years or older and the oldest was 37 years, weighing only 4 oz. The conclusion was the expected one that, under conditions of acid water, eels are scarce and grow extremely slowly.

Two West Clare lakes were sampled in July, Fin Lough and Lough Gash, both near Newmarket-on-Fergus and draining to the estuary of the River Fergus, in places by underground streams. One of these streams, at Cleenagh Castle, is being experimentally fished for

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silver eels. Fin Lough was less than ten feet deep over most of its area and had clear water and a rich growth of weed, especially Chara. The alkalinity at 1.7 m eq/l was high. Fin Lough lies about six miles from the estuary and the river draining it runs through Ballycar Lake and Lough Gash. The presence of two lakes between it and the sea would be expected to depress the nember in the eel population and the unit catch of 0.6 was a low one. As a result the sample collected was small (54 specimens only) and not sufficient to give a very reliable figure for the rate of growth. The estimate of 47 cm for age 15 is therefore probably a low one. A substantial number of specimens of less than 8 years were retained in the net indicating that the growth rate was in fact reasonably fast. No specimens of 15 years or older were secured, showing that migration takes place before this age.

Lough Gash was clearly a very rich lake; like Fin Lough it was less than 10 ft deep over most of its area. Being the nearest lake to the sea a high population of eels was expected and the figure of 4.5 for the unit catch was seven times that of Fin Lough. These eels were fast-growing and early maturing: out of a sample of 73, only one was older than 12 years. The average lengths, of 50 cm at 10 years and 61 cm at 15, were high by Irish standards. The general conclusion is that eels in these lakes may be expected to grow well and the fishery could be greatly improved by stocking with elvers.

4. Rivers and Estuaries

One new region was explored in the hopes of establishing a commercial fishery. This was the estuary of the River Laune between Killorglin and Cromane. The results from Cromane were completely negative from the point of view of eel fishing but revealed the presence of small conger eels. As such fish have rarely been

studied the results of age determinations are given in Tables 1 and 2 together with the figures for freshwater eels. The growth rate was more than double that of freshwater eels. The food of the congers included two small freshwater eels, indicating that these are present in the area in small numbers - apparently the two species cannot live in the same area on account of predation of the congers. At Ballykissane, where the salinity was too low for congers, a small population of freshwater eels was found but the numbers were not sufficient to raise any hopes of commercial fishing.

Other work included monitoring of conditions in the Broadmeadow Estuary, Co. Dublin and the South Sloblands Channel in Co Wexford. Both of these were brackish waters where overfishing had taken place. In both cases stocks had risen to a considerable degree but were still well below the figures before fishing had begun. The study of the Munster Blackwater was continued and the work there included sampling at Banteer, about 30 miles upstream of the Fermoy region where last year's work had been done. Small eels were scarce at Banteer and relatively few of 10 years or less were found there, indicating a long delay in movement so far upstream. It is hoped that experiments in commercial fishing may be tried in the Blackwater in 1974.

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Table 1. Elver and young eel measurements 1973 (percentage of n) lengths to nearest whole number downwards.

Parteen elver trap

Length (cm)	6.9-7	8-9	10-14	15-19	20-24	25-29	n	mean	SE
Date									
15 June	3	43	40	10	3	1	1385	10.9	0.10
27 July	1	12	64	18	5	0	198	12.8	0.24
17 Aug.	1	22	39	21	10	7	209	14.2	0.40
25 Sept.	1	4	22	32	25	16	130	18.3	0.50
26 Oct.	0	1	18	45	31	5	233	18.1	0.24

Elvers at tidal boundaries

Length (mm)	60-62	63-65	66-68	69-71	72-74	75-77	78-80	n	mean	SE
Maigue (June)	7	11	32	33	16	0	1	57	6.8	0.04
Furnace (June)	3	18	36	33	9	1	0	384	7.1	0.01
Ardnacrusha (August)	2	2	15	33	31	13	4	52	7.1	0.04

Table 2. Catch, weight and length figures.

	Effort (net-days)	Number measured per day	Catch per net per day	Weight per net per day g	Weight per net per day lb	% less than 40 cm (16 in)	% 40-50 cm	% over 50 cm (20in)
BROADMEADOW ESTUARY 1972	24	29	1.2	203	0.45	39	34	27
1973	30	55	1.9	238	0.52	31	63	6
L. FEEAGH	100	23	0.2	55	0.12	34	40	26
WEXFORD 1970	48	408	15.6	2252	4.98	32	54	14
SOUTH 1972	54	15	0.3	-	-	40	53	7
SLOB 1973	96	457	4.7	632	1.39	47	47	6
CROMANE (Congers)	24	9	0.4	251	0.18	0	0	100
LAUNE ESTUARY	8	15	1.9	143	0.32	87	13	0
FIN LOUGH	80	54	0.6	101	0.21	30	60	10
LOUGH GASH	16	73	4.5	97	2.15	23	49	28
BLACKWATER CAREYSVILLE	16	160	4.9	1195	2.63	39	16	45
BANTEER	11	50	4.5	1484	3.27	16	24	60

Table 3. Age distributions and calculated growth rates.

		Calculated length at 10 years (cm)	Calculated length at 15 years (cm)	Percentage of sample in age groups 4-8	9-10	11-12	13-14	15+
BROADMEADOW ESTUARY	1972	54	75	62	34	4	0	0
	1973	47	56	75	25	0	0	0
L. FEEAGH		33	39	0	0	13	13	74
WEXFORD SOUTH SLOB	1970	47	59	40	22	20	9	9
	1973	47	57	74	15	7	2	2
CROMANE (Congers)		118	160	100	0	0	0	0
LAUNE ESTUARY		0	0	69	23	8	0	0
FIN LOUGH		44	47	12	48	30	10	0
LOUGH GASH		50	61	62	26	11	0	1
BLACKWATER CAREYSVILLE		34	43	1	11	20	21	47
BANTEER		46	53	4	4	18	16	56