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(Department of Agriculture and Fisheries)

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EEL RESEARCH IN 1970.

by

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The summer of 1970 was the third in which a standard set of fyke nets was used to make a detailed study of the eel stocks in a particular lake. The lake chosen was Lough Key which lies on the Boyle River, a tributary near the source of the River Shannon. Miss Ann Fortune and Miss Christine Royle, zoology students, were employed on bursaries for the field and some of the laboratory work. The method of working has been described in previous Leaflets (Nos. 9 and 21). In brief it consists of fishing daily with a standard set of eight nets (sixteen traps with eight leaders arranged in line) which have a cod-end mesh size of 10 mm. The eels were measured, weighed and sexed and otoliths and stomachs were preserved for examination.

Throughout July the fishing was done in water of less than 2 m ($6\frac{1}{2}$ ft.) deep. At the end of August an attempt to see whether the eels had any preferred depth was made. The nets were set from the shore down to $22\frac{1}{2}$ m (74 ft.). The catches were fairly uniform (average 6 eels) down to 19 m (62 ft.) but only one eel was caught in the final setting at 19 to $22\frac{1}{2}$ m. Unfortunately it was not possible to make more than one trial at this depth.

For the whole of July and for a few days at the end of August one train of eight nets was set in the same place in one bay. It caught 18 eels on its first night and a total of 37 in its first eight nights of operation. The second period of eight nights yielded 2 eels, the third period 4 and the fourth 2. Three weeks later a catch of 4 was made on the first of four nights. This experiment indicated that the fyke net can catch practically all of the eels close to it in a period of eight days and that it may take more than seven weeks for the stock to be replaced to any extent. It has not yet been possible to determine what area around a set net is affected.

Four other projects were undertaken. In May a sample of the young eels which are caught by the Electricity Supply Board at Parteen Weir for transplanting was taken. This gave surprising results. The largest eel in the sample, measuring ten inches and weighing less than an ounce, was

ten years old. The smaller ones, from 4 inches to nine inches were aged from 2 to 10 years, the majority being between 4 and 6. Unfortunately, as this very large range of ages had not been anticipated, the sample taken was rather too small to give a useful figure of the age distribution of the entire run.

In June, in the course of a two-week cruise on the Shannon system from Lough Key to Portumna, samples were taken at a number of points with the standard set of nets. The length distribution of the catches is given in Fig. 1. The samples were necessarily small but indicated that the stocks in the river system were fairly uniform as far downstream as Clonmacnoise. At Portumna the proportion of small eels (12 to 16 inches approx.) was substantially higher than in the upper waters. Two sites in Lough Ree were netted : Blackbrink Bay on the western shore and Killinure Lough to the south-east. Both of these had fair stocks - a result contrasting with the very poor catch in the main body of Lough Ree in 1969.

In August the nets were used for four days on a private water, the Channel of the South Sloblands in County Wexford. Compared with previous results the catch here was enormous. This experiment was of particular value because it was certain that this population had never been subjected to fishing. Long-lining had taken place in all of the other waters under investigation. Full analysis of the results should show whether it might be possible to increase the stocks in other waters to a comparable density or whether the conditions in the Channel are exceptional.

In November nets were set again in Lough Key and caught no eels in the course of a week. The water temperature was 6°C and it would appear that the eels had gone into hibernation. It is hoped to take monthly samples from early in the year to discover when activity begins again.

In the laboratory, age determination from otolith reading of all of the eels collected was completed and work is in progress on the analysis of the stomach contents. A feeding experiment is also in progress which indicates that an eel of 42 grams (2 oz.) can eat up to 10 grams of food in the course of a week - roughly one quarter of its body weight.

The length and age distributions of Lough Key and South Sloblands eels are shown in Figs. 2 and 3. The catch and fishing effort are shown in Table 1, with the 1969 figures included for comparison. Corrib System ages are shown in Fig. 4.

Table 1. Catch and fishing effort.

	Number of Eels	Weight (grams)	Number of days fishing	Number per net per day	Weight per net per day	Percentage by weight of eels exceeding 40 cm (16")
1969						
R. Corrib	33	4,386	3	1.3	182	65.5
L. Corrib S.	389	69,934	18	2.7	485	78.3
L. Mask	77	14,277	8	1.2	223	87.0
L. Carra	71	15,838	13	0.6	152	92.5
Reservoir	57	8,865	7	1.1	180	88.3
L. Derg	269	52,197	23	1.6	324	93.7
L. Ree	12	4,583	10	0.1	65	100.0
1970						
Lough Key	287	81,191	34	1.1	298	94.4
South Sloblands	408	72,064	4	12.7	2,252	83.1

The figures from the South Sloblands show that the fyke nets are highly efficient instruments for eel fishing. They confirm the conclusion drawn from previous results that the rather poor catches in inland waters indicate that the stocks are low. The length and age distributions show that, besides the small population of eels of all sizes, there is a very marked scarcity of young eels in the upper reaches of all of the river systems. The fact that this shortage is apparent in the Corrib River System where there are no major obstructions to upstream movement suggests that the eels take a very long time to reach the upper parts. These results make it clear that the population of eels could be very substantially increased by overland transport of elvers. The effect that such stocking might have on the population of other fish

species is not yet known. The studies made so far on the food of the eels suggests that their feeding will not necessarily have a detrimental effect. The extent to which they prey on young salmon and trout in lakes is negligible.

The food studies made to date suggest that direct competition for food will not take place to a serious degree. In lakes eels do not prey on young salmon and trout to any noticeable extent.

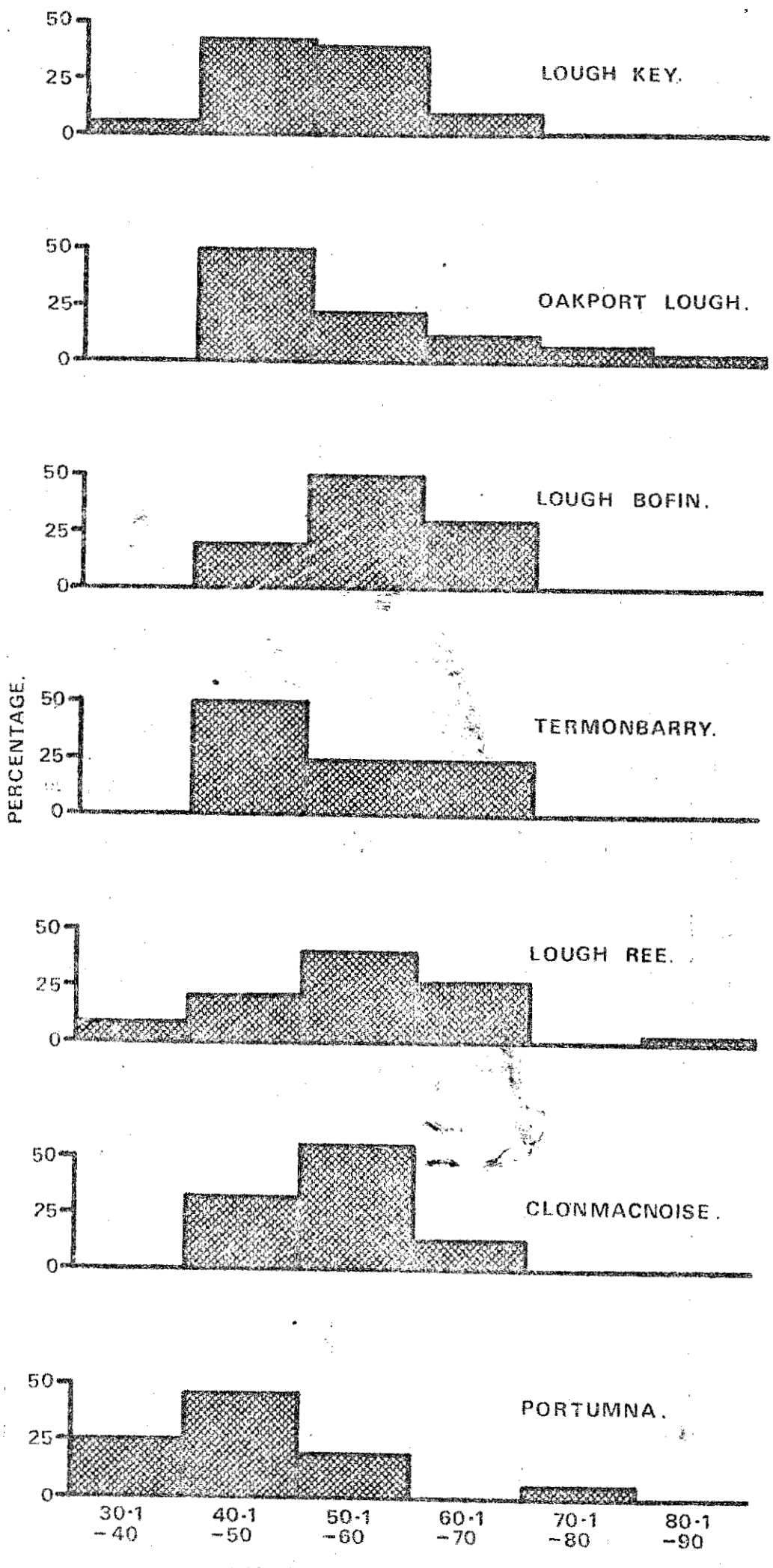
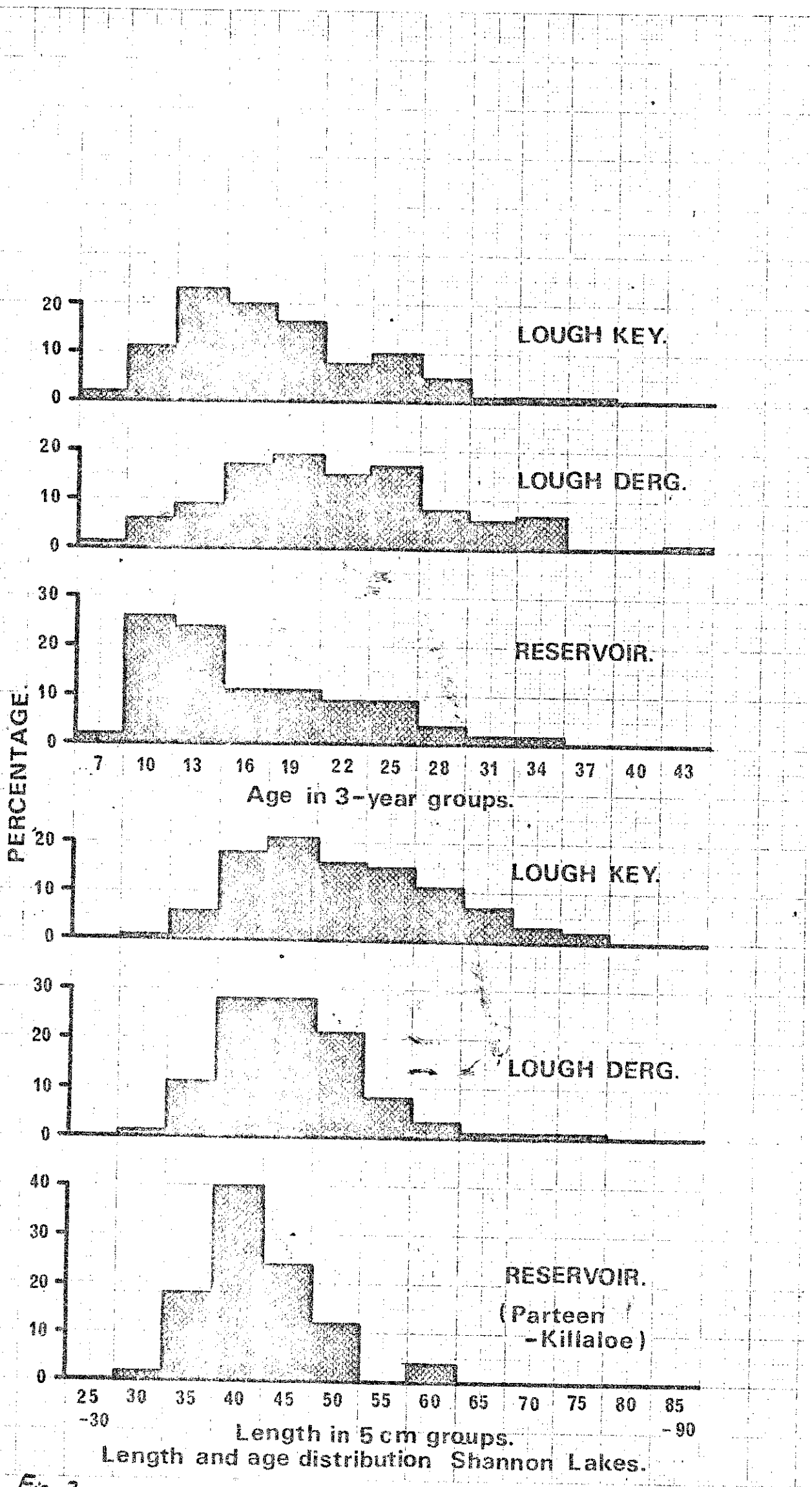

50
25
0
LOUGH KEY.
OAKPORT LOUGH.
LOUGH BOFIN.
TERMONBARRY.
LOUGH REE.
CLONMACNOISE.
PORTUMNA.
PERCENTAGE.
30·1 -40
40·1 -50
50·1 -60
60·1 -70
70·1 -80
80·1 -90
LENGTH DISTRIBUTION JUNE 1970.

Fig 1.

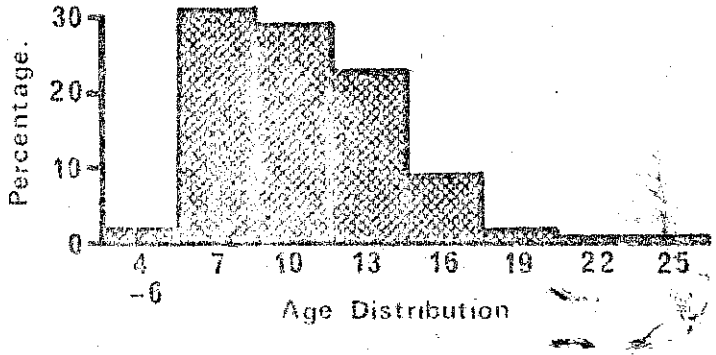


Length and age distribution Shannon Lakes.

Fig 2

SOUTH SLOB CHANNEL

AUGUST 1970.



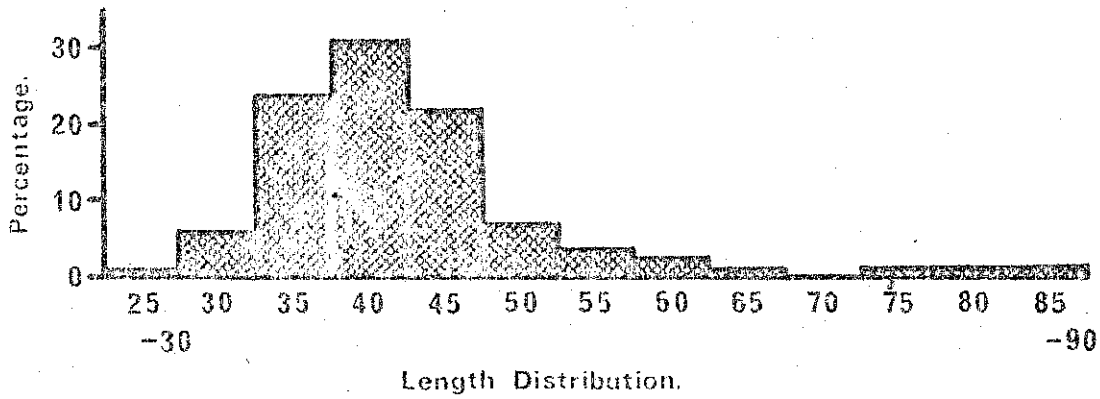
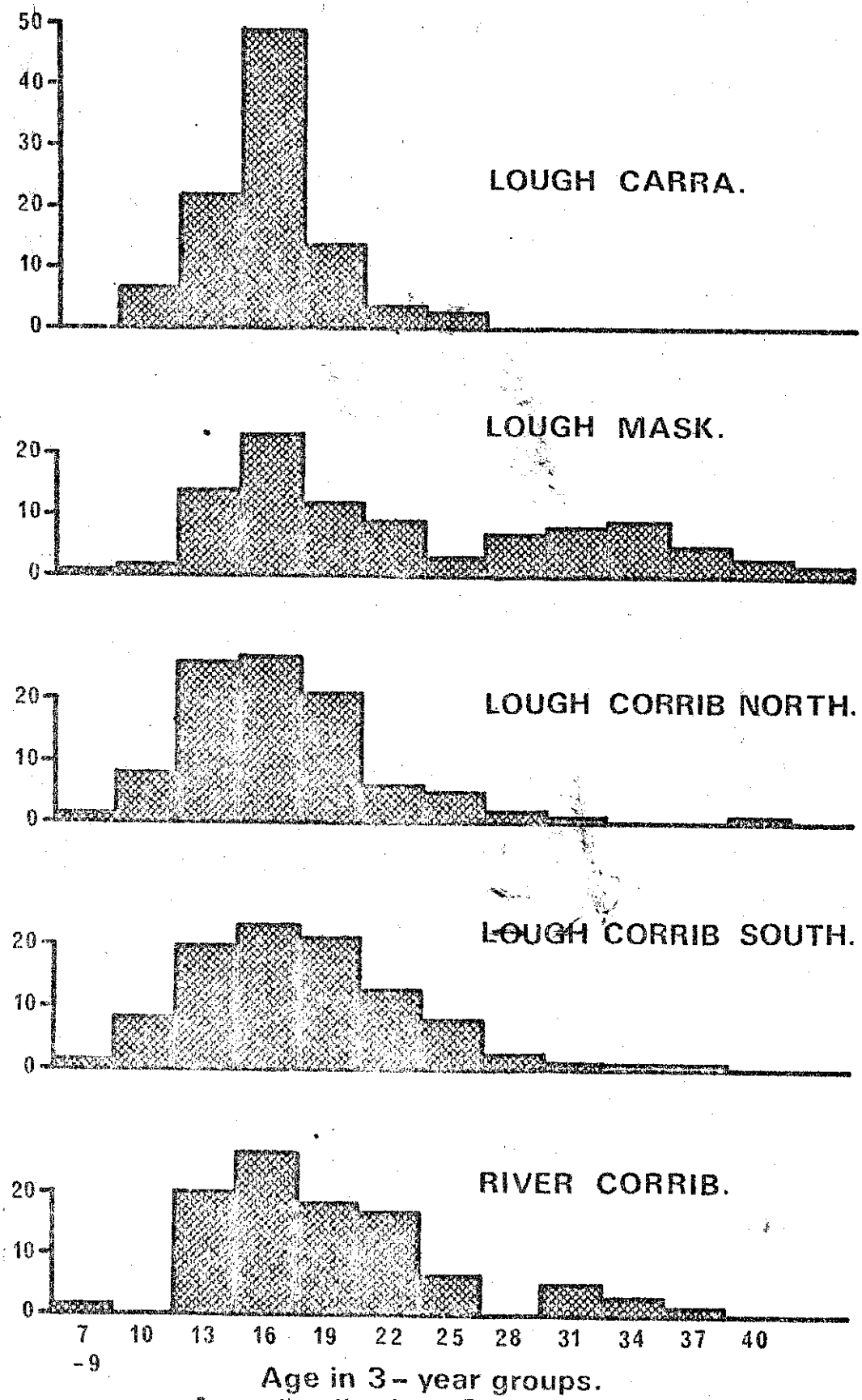


Fig 3



Age distribution Corrib System.

Fig 4