

A Preliminary Report on the Mortality of Plaice in Faxe Bay

by

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Every summer since 1953 samples of plaice have been collected in Faxe Bay. Figure 1 shows the natural logarithms of the number of plaice within catch plotted against age. The slopes of the descending limbs of the curves to the right of the points marked with x show clearly the effect of the intensive fisheries before the closure of the bay in 1952. These fisheries caused a high mortality rate.

The diagrams for 1958-1960 show the results of the protection of the stock of plaice in the bay in that their slopes incline only slightly between their peaks and the points marked with x. This indicates a low mortality rate in the years after the closure.

The Bertalanffy's growth equation was tried, but was found to be unsuitable for this material. It appeared that the average length of each year-class of six years and older in the material for 1955 was about the same or even up to 1.3 cm less than that in the material for the preceding year. The reason must be availability. The question why the bigger individuals of each year-class were not available in the bay cannot be answered as yet. However, it is possible that the answer is to be found in the complicated migrations of plaice in Icelandic waters. It is well-known that on reaching maturity the plaice migrate to the spawning grounds outside Faxe Bay and return at the end of the spawning season. It is also known from tagging experiments that plaice from other areas also spawn on the same grounds. Moreover, recaptures from the tagging experiments in Faxe Bay have been coming in from all parts of the Icelandic coast, although there have been rather few returns from the north and east coasts. Therefore, it is possible that, sometimes, the bigger individuals of each year-class do not return into the bay after the spawning, but migrate to other areas.

A catch curve was now used for a rough determination of the instantaneous mortality coefficients, $F+M$, as the material does not allow other methods.

The age groups 5-10, 6-12 and 7-12, taken, respectively, from the years 1953, 1954 and 1955 (see Figure 1), were used for an approximate estimate of the mortality rate as it was before the closure of the bay. This gave $F+M = 0.68$. The corresponding yearly mortality coefficient would then be $a = 0.49$.

In the same way, the age groups 5-11 and 6-12 from the material collected in the years 1959 and 1960, respectively (see Figure 1), gave the approximate mortality coefficients for the period after the closure of the bay as $F+M = 0.19$ and $a = 0.17$. These latter values are low, but it should be borne in mind that in the period from the beginning of 1953 to July 1960, catches of plaice inside Faxe Bay were negligible and the stock was almost exclusively fished outside the bay during the spawning season. F , the instantaneous fishing coefficient, must, therefore, have been very low.

Since the middle of the year 1960 the fishing mortality in the bay must have risen a good deal as Danish seines have been in use there during the summer season.

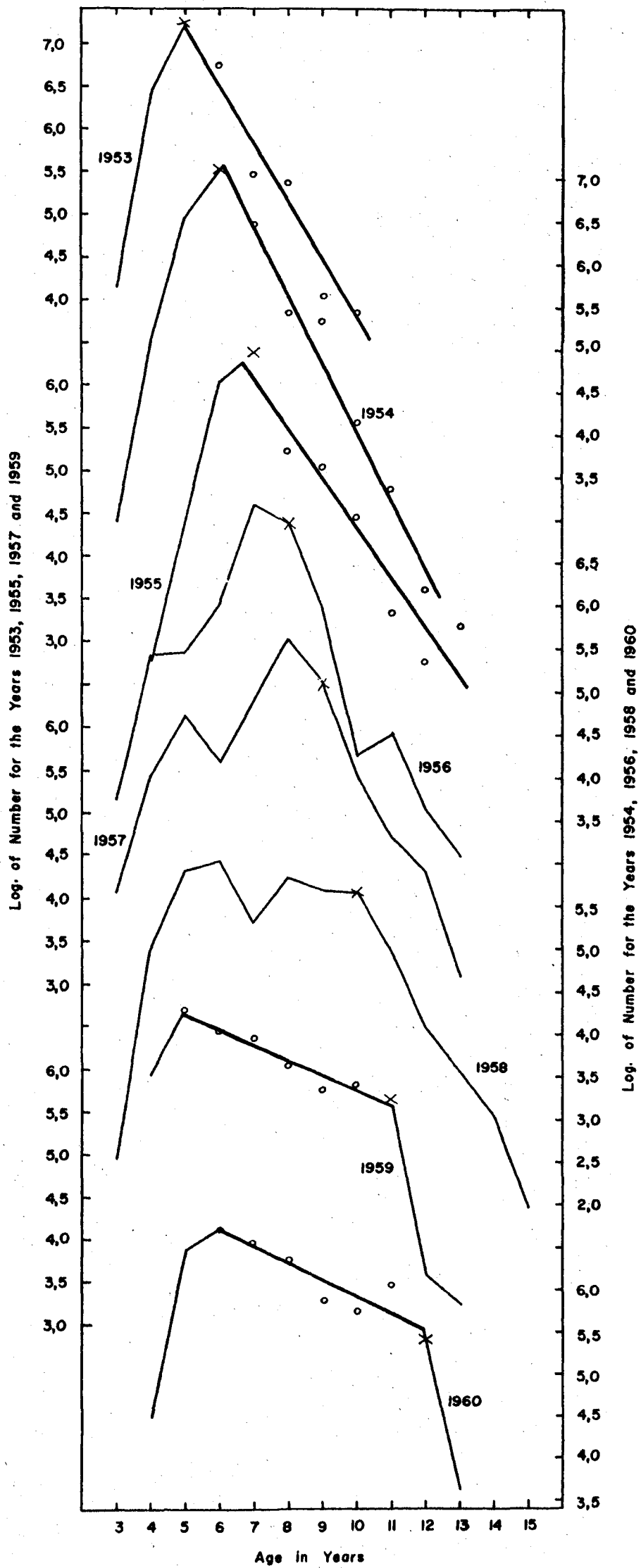


Fig. 1. Natural Logarithms of Number within Catch for the Years 1953-1960.
x the 1948 Year-Class.