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International Council for the
Exploration of the Sea

C.M.1971/ B:11
Gear and Behaviour Committee
Ref. Demersal Fish (Northern) Comm.

Discarding in the Dutch sole fisheries in 1969 and 1970

by

J.F. de Veen and W.F. Rodenburg

(Netherlands Institute for Fishery Investigations, IJmuiden, The Netherlands)



In the Netherlands discarding at sea has taken place for a number of years. Depending largely on market demands the quantities discarded fluctuate. Mostly there is a close relation between the amount of discarding and the strength of a year-class recruiting to the fishery. A year-class of above average strength will lead to a higher amount of discarding than a poor one. The level of discarding is not very high under normal circumstances and in the case of plaice e.g. fluctuated between 5 and 20% by numbers.

In 1966/67, however, the exceptionally rich plaice year-class 1963 recruited to the fisheries. Although mainly fishing soles Dutch fishermen caught large quantities of small plaice as by-catch. This unexpected rise in the landings of small fish soon spoilt the market and most of these fish ended in fishmeal factories. This led to an increase in the minimum landing size to 27 cm in the second half of 1968.

At sea, however, discarding did not stop at 27 cm. We were informed that plaice of still larger size were discarded in great amounts. In order to assess the effect of this rejection a study of discarding was made in which length compositions and quantities of caught, discarded and landed fish were determined on board during eleven trips throughout the period October 1969 to October 1970. The trips were made on board of beamtrawlers as well as otter-trawlers of different sizes and the positions fished are indicated in figure 1. The fish species studied were: sole, plaice, cod, whiting, dab, flounder, turbot and brill.

Although the number of ships sampled is rather limited we feel confident that they are more or less representative of the whole Dutch sole fleet. The amount and the sizes of fish discarded varies from ground to ground and from skipper to skipper. In general the smaller and less powerful boats fishing inshore discard smaller amounts of fish than the larger vessels operating in deeper water (see figure 3).

The percentage of fish discarded per cm group per species was calculated by pooling the data of all trips. In this way discarding ogives were obtained for sole, plaice, cod, whiting, dab and flounder. The number of turbot and brill was too small for determining discarding percentages.

In figure 2 the discarding ogives of four demersal species of commercial interest are given.

In plaice the discarding ogive more or less begins at the international legal size limit of 25 cm. The effective minimum size, equivalent to the 50% point of the ogive is 28 cm, 1 cm higher than the 27 cm enforced in the Netherlands.

In sole the discarding ogive ends about the minimum size of 24 cm as could be expected for a species for which an insatiable market demand exists. One should expect a knife-edge selection at 24 cm for all soles are measured on board before landing by the fishermen. In practice, however, fishermen keep soles from 21 cm onwards on board and select the fish to be landed when gutting the fish. The then rejected soles will have a poor chance of surviving.

In cod as in plaice the discarding ogive starts at the international minimum size of 30 cm. Here the effective minimum size is 33 cm. The year-class 1969 is mainly responsible for the large amount of discarding. Because the 1970 year-class is also fairly strong, we may expect that discarding of cod on board of sole cutters will continue on the same scale for some time.

In whiting discarding of legal sized fish is still greater than in plaice and cod. Here an effective minimum size of 32 cm - 5 cm more than the enforced minimum size - is found. A rich year-class born in 1967 is partly responsible, whereas in addition whiting will only be kept on board in case the

total catch of other species is small and skippers tend to land everything caught.

The effect of discarding can be estimated by using the data of the discarding ogives to make corrections on the length-composition of the landed fish. On average 40% by numbers and 23% by weight of (internationally) legal sized plaice were discarded at sea. That means that in 1969 32 000 000 and in 1970 40 700 000 legal sized plaice were caught in the Netherlands but not landed. Thus the total landings in 1969 and 1970 of resp. 39 429 and 46 080 metric tons stand for a nominal catch in 1969 and 1970 of resp. 48 411 and 56 577 metric tons.

A given proportion of the fish discarded will not survive the handling on board. At the moment we do not have precise information but some progress is made in the study in this field. On average it takes fifteen minutes before unwanted fish is thrown overboard. By the use of many tickler chains in front of the net the cod-end is often filled with bottomorganisms, shell-fragments, dirt a.s.o. For this reason the surviving rate of the discarded fish will not be great and pending further research we assume that most if not all of the discarded fish will die.

In addition we calculated the number of undersized fish discarded (and for a greater part destroyed) by the Dutch sole fishery. In the period october 1969 to october 1970 65 700 000 undersized soles (below 24 cm) and 131 600 000 undersized plaice (below 25 cm) were caught and thrown overboard by the Dutch sole fishing fleet.

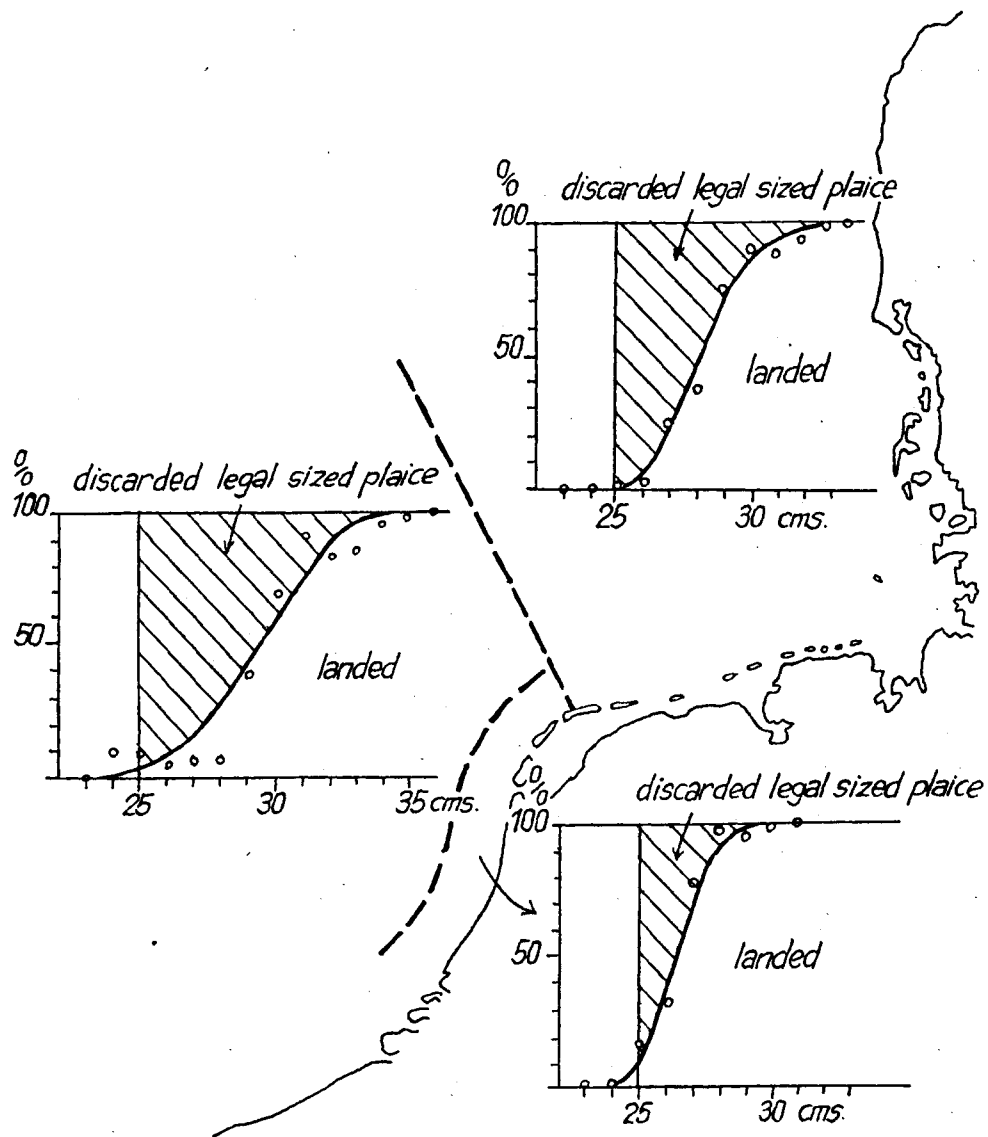


Fig. 3 discarding ogives for plaice in different areas

Fig. 1

positions visited during
11 cruises on board of
commercial vessels in the
period Oct. 69 - Oct. 70

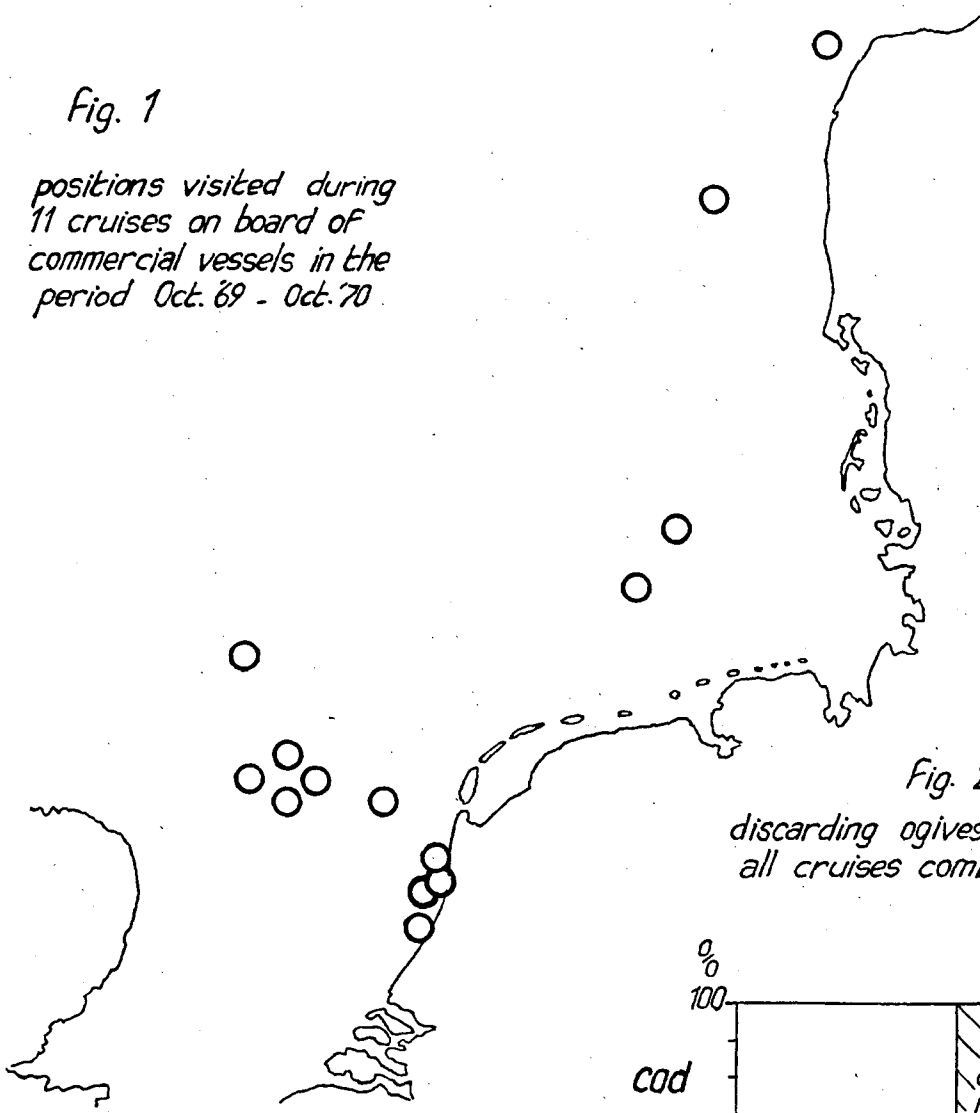
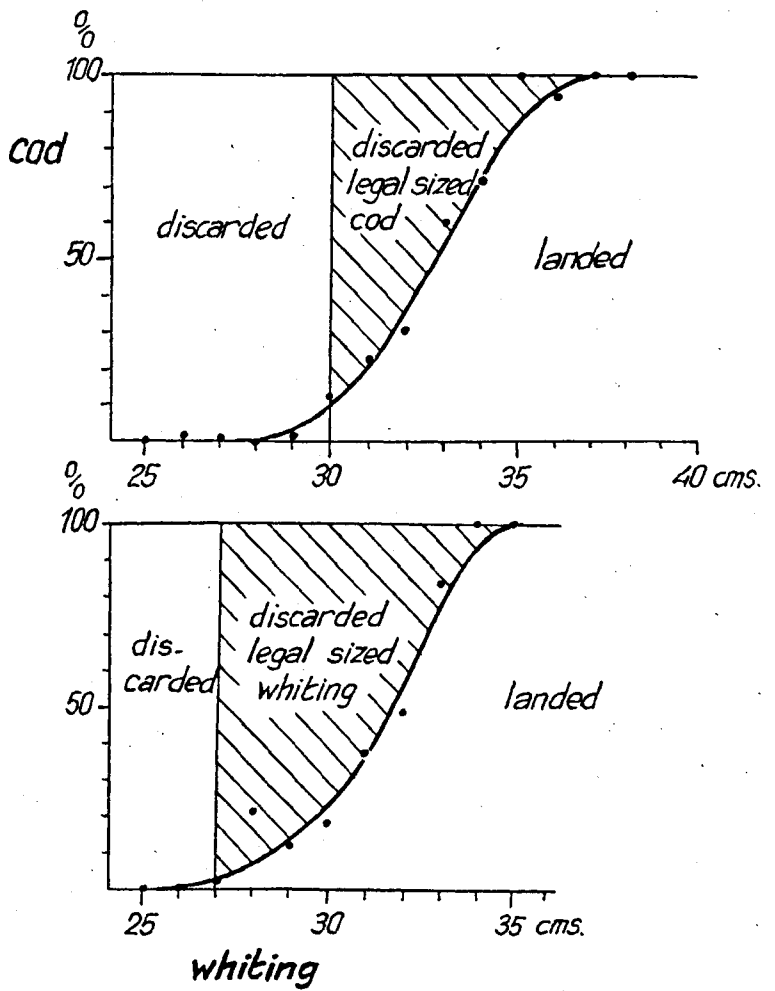
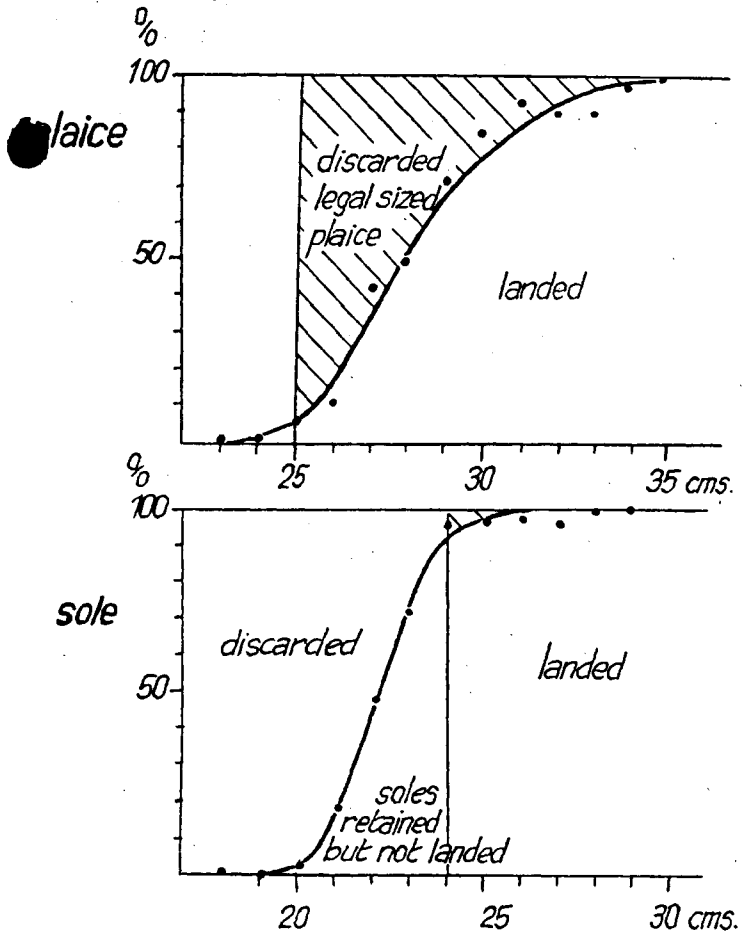
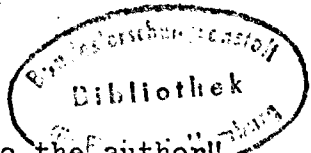


Fig. 2

discarding ogives for the data of
all cruises combined by Fish species





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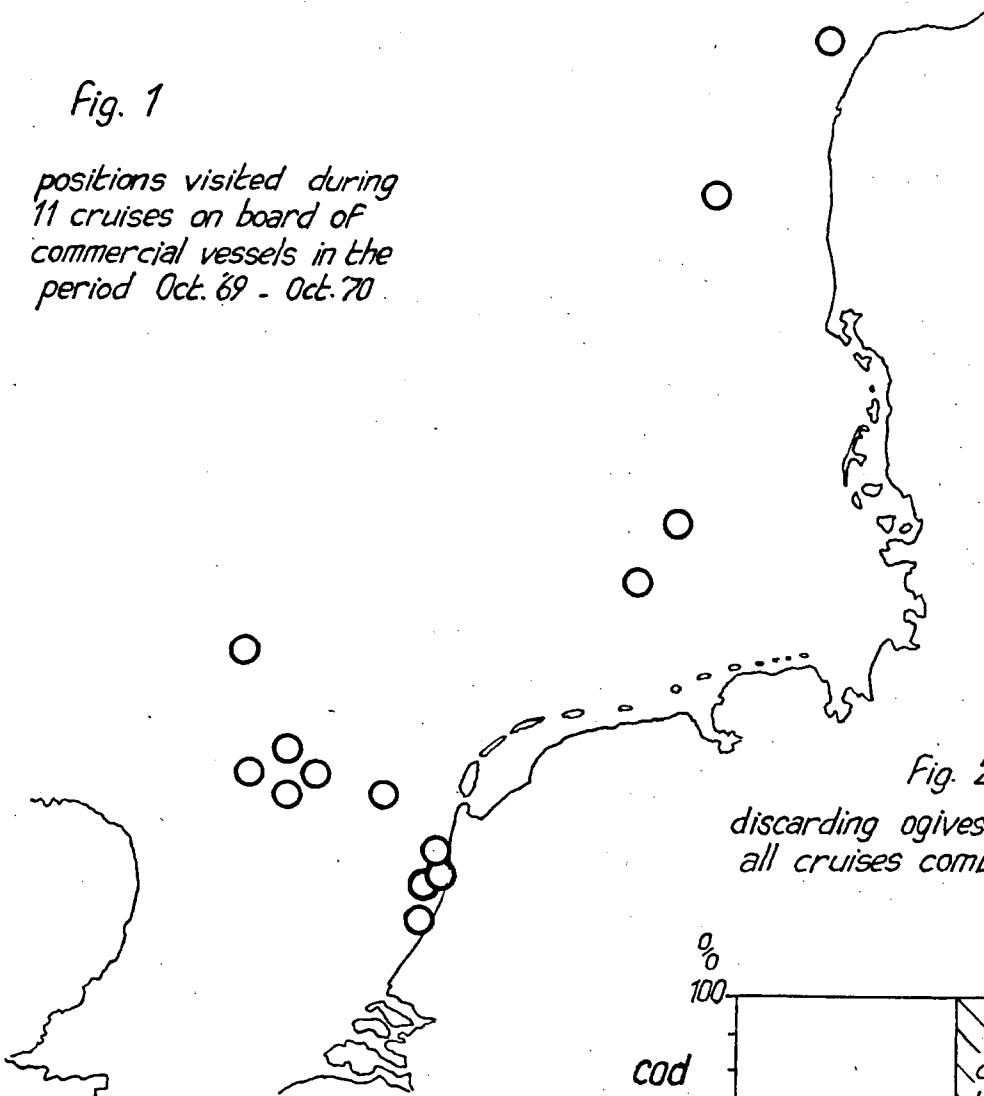
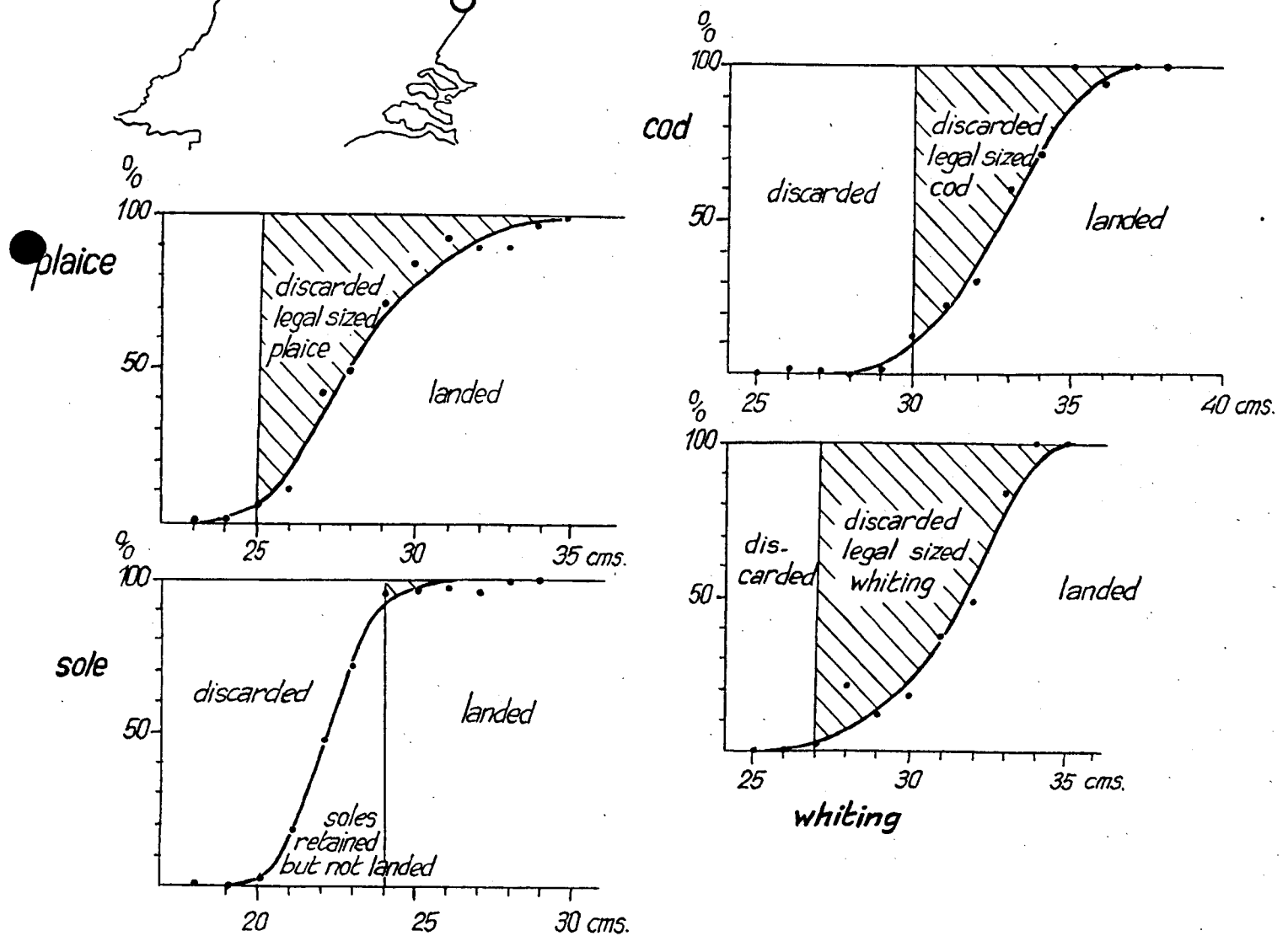


Fig. 2

discarding ogives for the data of
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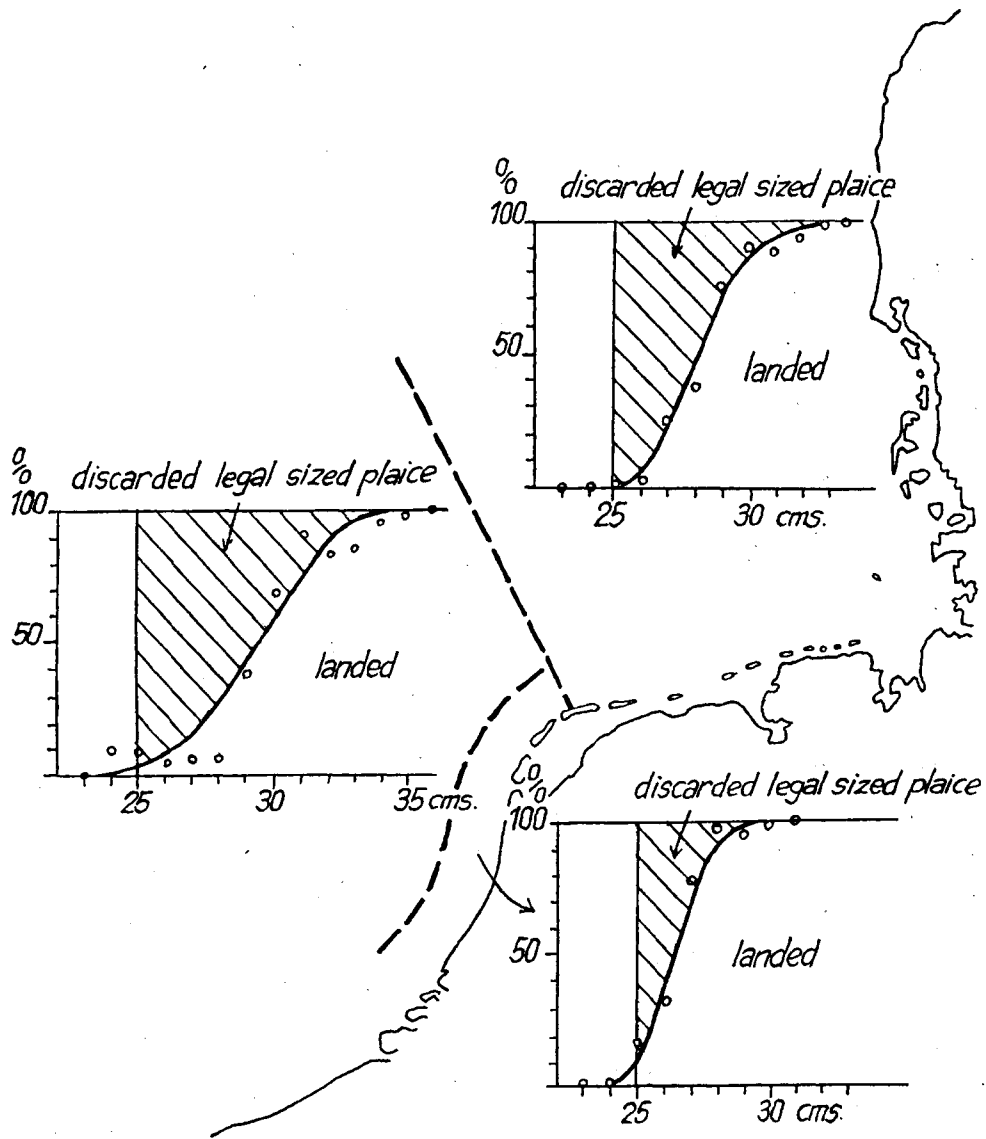


Fig. 3 discarding ogives for plaice in different areas