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**BY-CATCH OF O-GROUP SMELT IN ISAACS-KIDD MID-WATER
TRAWL HERRING CATCH OFF THE COAST OF
FINLAND IN 1980—82**

by

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Abstract

In September-October 1980-82 a total of 158 hauls were made with the Isaacs-Kidd mid-water trawl along the Finnish coast. The abundance of 0-group smelt was recorded as a by-catch in these hauls. The highest abundance of 0-group smelt was recorded in 1981. In all the years the highest abundance was observed in archipelagoes and estuaries.

Résumé

Un total de 158 halages furent effectués le long de la côte finlandaise avec un chalut Isaacs-Kidd d'eaux intermédiaires en septembre et octobre 1980-1982. L'abondance des éperlans du groupe 0 fut observée de façon résiduelle dans ces halages. L'abondance la plus élevée d'éperlans du groupe 0 fut enregistrée en 1981. Toutes ces années l'abondance la plus importante fut observée dans les archipels et les estuaires.

Introduction

Information has been published earlier on the abundance of 0-group smelt in the inner part of the Gulf of Finland and the northern Quark (POPOV 1978, HUDD et al. 1983). This report gives data on the abundance of 0-group smelt caught as a by-catch in exploratory fishing of 0-group Baltic herring with the Isaacs-Kidd mid-water trawl (IKMWT; ARO et al. 1982). The suitability of the gear for sampling 0-group smelt is also discussed.

Material and methods

The sampling was performed along the Finnish coast in September-October, from the eastern part of the Gulf of Finland through the Archipelago Sea to the Bothnian Sea. There were mainly three sampling sites per ICES statistical rectangle (Fig. 1). In 1980 40 hauls were made, in 1981 59 and in 1982 59. At each sampling station double oblique hauls were made from the surface to near the bottom. The hauling time was about 15 minutes. The trawl was lowered and lifted at a rate of 2 metres per minute and the hauling speed was about 2.5 knots. The mesh size of the cod end was 4 mm and the mouth opening about 8 m² (ARO et al. 1982).

The 0-group smelt were distinguished from older age groups with the aid of the information presented by BELYANINA (1969), TIMOLA (1970) and HUDD et al. (1983). The maximum length used for 0-group smelt was 90 mm in Sub-division 29 and 32 and 80 mm in Sub-division 30.

Results

The abundance of 0-group smelt in the by-catches varied very much depending on the year, sampling area and sampling sites. The average abundance was highest in 1981. The largest catches were made in the Gulf of Finland and the Archipelago Sea, especially close to the estuaries of the Kymijoki and Porvoo rivers (Sub-division 32) and the Varstala and Aura rivers (Sub-division 29N) (Figs. 2-4).

Discussion

The nursery grounds of smelt seem to be located in archipelagoes by the mouths of a large river or several small streams. POPOV (1978) found that 0-group smelt are distributed everywhere in the headward parts of the Gulf of Finland above the isobath of 35 m. The reason why the young smelt appeared to be unevenly distributed along the Finnish coastline may well be that the sampling program was designed for 0-group Baltic herring (ARO et al. 1982), which probably have different nursery areas from the smelt. However, the area studied by POPOV (1978), is greatly influenced by the Neva river. The differences in abundance between catches made on different dates at the same sampling site are probably due to schooling of the smelt, and to possibly uneven or continuing migration from the spawning grounds. After hatching the smelt larvae occur close to the spawning grounds or drift down to the estuaries (BELYANINA 1969, HUDD et al. 1983). Migration from these areas continues for a long time (POPOV 1983 pers. comm.), and some young smelt also overwinter in very shallow waters in the estuaries (HUDD et al. 1983).

The IKMWT operated from a single boat is probably not the best sampling gear for 0-group smelt. HUDD et al. (1983), for instance, observed much greater densities of young smelt in the estuary of the Kyrönjoki (ICES H1-2 55) when using pairtrawl. However, no detailed comparison has been made of the IKMWT and, for example, the Björkö midwater trawl used by HUDD et al. (1983).

Supplementary studies are required to show whether the densities of 0-group smelt presented here are of any relevance in population studies on smelt. The by-catches of smelt in exploratory fishing for Baltic herring are probably useful only when sampling is performed in areas close to estuaries.

References

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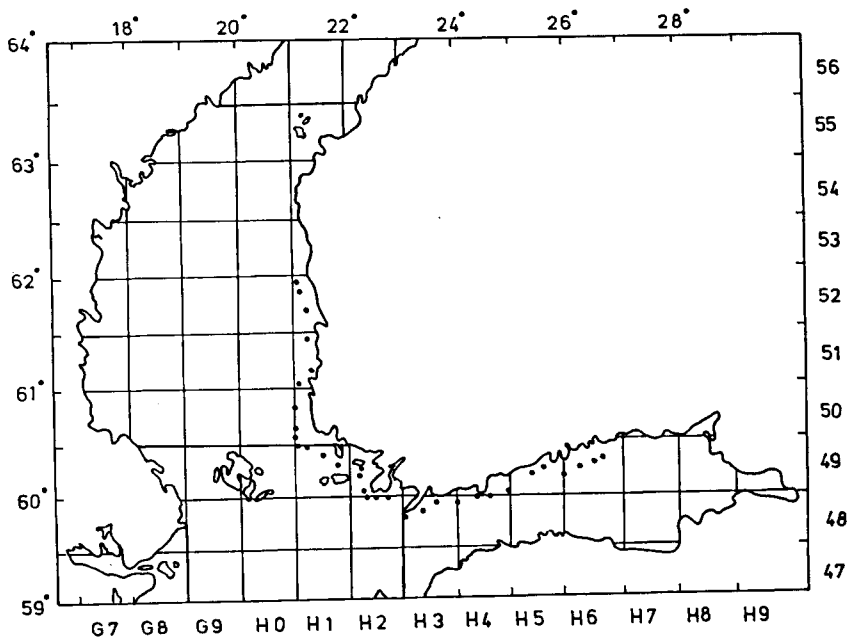


Figure 1. The sites used for sampling 0-group smelt off the coast of Finland in ICES Sub-divisions 29N, 30 and 32 in 1980-82.

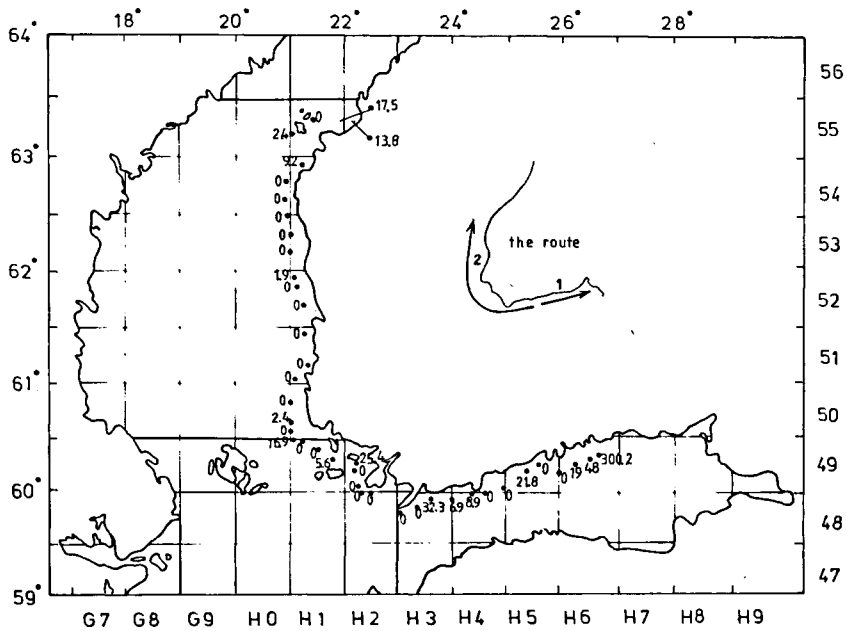


Figure 2. The by-catches of 0-group smelt (ind./trawling h) made during the cruise on 17.9.-22.10.1980.

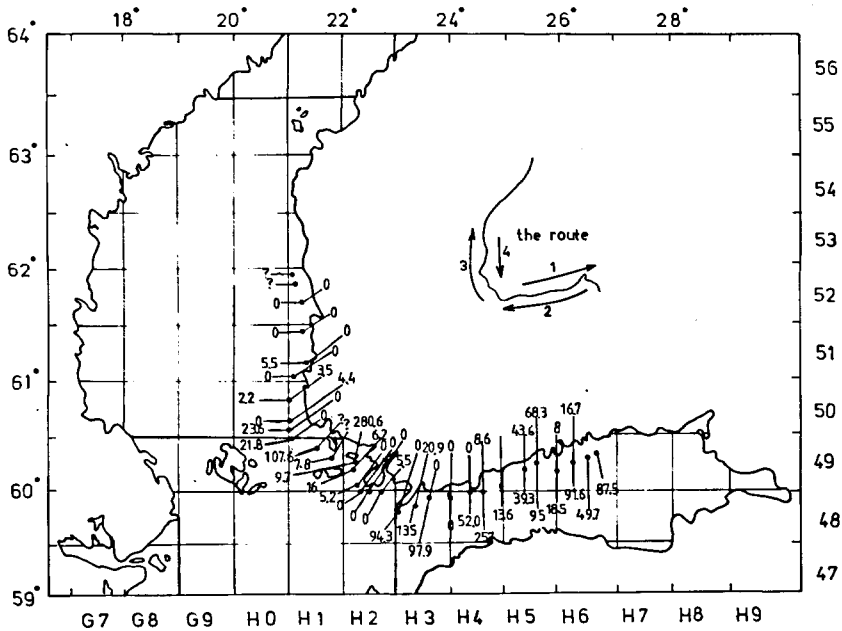


Figure 3. The by-catches of 0-group smelt (ind./trawling h) made during the cruise on 12.9.-19.10.1981.

