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Reliability of total trawl survey data

by

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Abstract

In the paper the reliability of using the data of the total trawl survey on cod, haddock, redfish, long rough dab and dab has been confirmed. Results of the survey on Greenland halibut, flounder and grenadier cannot be used at present.

Introduction

The total trawl surveys provide the opportunity to observe all the variations in the abundance and biomass of the main commercial stocks of demersal fishes occurred in the Newfoundland area.

At a given stage of the survey we could not use the absolute indices of abundance and biomass which had not been obtained because of the lack of catchability coefficients of bottom trawl. The data of the relative abundance and biomass were used, i.e. the number of fish in specimens and kg, taken per hour trawling.

Methods

Total trawl survey within the Newfoundland area has been carried out since 1971. A series of standard hour trawling^{were} conducted at the constant positions from the buffer zone boundary to a 400 m depth. In 1977 the fish determination on the Flemish Cap Bank was carried out up to a 600 m depth, but in other areas off Newfoundland it was conducted up to a 500 m depth. These investigations were regularly conducted aboard the same FRV "Perseus III" with the bottom trawl.

The detailed method of the total trawl surveys is described in the papers submitted to the previous ICNAF Annual Meetings (Chekhova, 1973; Postolaky, 1972).

Discussions

Fish counting trawlings completely cover the distribution area of such commercial species as cod, haddock, redfish, long rough dab and dab and also fishes non-commercial at present inhabiting at the depth up to 500 m.

The reliability of trawl survey data can be confirmed by cod investigations. Thus, the catch per hour trawling with the fish counting bottom trawl in Division 3K well agrees with the total yield taken by all countries in Divisions 2J + 3K (Table I)

Table 1. Catch per hour trawling (kg) taken by fish counting trawl in Division 3K and total cod yield taken by all countries in Divisions 2J + 3K (thou. t).

Years	Catch with trawl	Yield by all countries	Years	Catch with trawl	Yield by all countries
1971	77	24.3	1974	36	28.5
1972	134	31.0	1975	19	21.7
1973	33	23.1	1976	123	135.8

In fact, a sharp reduction in the catch per hour trawling taken with the fish counting trawl, that took place in 1975, was not incidental. The total cod yield taken by all countries in 1977 was also minimum.

In 1976 the index of biomass obtained on the basis of ^{the} data on catches with a fish counting trawl increased by 6.5 times compared to that of 1975. The total yield taken by all countries increased by 6.2 times. This coincidence showed that trawl survey rather accurately reflected the dynamics of variations in the abundance and biomass of the stock.

At present, using the data of the trawl survey we tried to assess the absolute abundance and biomass of the Flemish Cap Bank cod (Che-

khova, Chumakov and Postolaky, 1978). The data obtained for 1972-1977 are confirmed by variations in the size-age and weight compositions as well as by the catches taken on the bank during these years.

The reliability of the trawl survey data was also confirmed by the fact that over the whole distribution area, occupied by the same stock the fish abundance and biomass of the stock varied similarly. For instance, one and the same cod stock distributed within the Divisions 3K and 3L. It is clear from Table 2, that the abundance and biomass registered within both divisions were maximum in the same 1972, but these were decreasing up to 1975, inclusively, and increased again in 1976.

Table 2. Cod abundance and biomass per hour trawling with fish counting trawl in total trawl survey in Division 3K and 3L.

Year	Division 3K		Division 3L	
	Catch per hour trawling in spec	Catch per hour trawling in kg	Catch per hour trawling in Spec	Catch per hour trawling in kg
1971	97	77	184	138
1972	158	134	205	163
1973	41	33	29	19
1974	32	36	40	33
1975	27	19	24	20
1976	98	123	57	48

* Statistical Bulletin ICNAF, vol. 22-26

Trawl survey data are not always representative for fishes distributed at the depth above 500 m. In this case the coincidence of the survey terms is necessary. Thus, in 1976 the trawl survey took place earlier than in the previous years. As a result the indices of the beaked redfish abundance and biomass were underestimated, since their main concentrations kept at the great depths that were not covered by the fish counting trawlings.

Total trawl survey data on Greenland halibut, flounder and rock grenadier are absolutely not reliable because their distribution area is not referred to the depths covered with the above mentioned trawlings.

Conclusions

1. Total trawl survey data are reliable for the fishes distributed within the area limited by a 500 m depth.
2. The reliability of the trawl survey data is confirmed by:
 - a) the fishery results;
 - b) similar variations in the abundance and biomass of the same commercial stock, occupying the whole area.
3. It is possible to use the data of the beaked redfish trawl survey only when the survey terms are strictly maintained.
4. Trawl survey data on Greenland halibut, flounder and grenadier are not reliable.

References

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