International Commission for the Northwest Atlantic Fisheries

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ANNUAL MEETING - JUNE 1974

# GERMAN (FRG) RESEARCH REPORT, 1973

## Section I. Subarea 1 and East Greenland

by

A. Meyer and M. Stein

## A. STATUS OF THE FISHERIES

### 1. General Trends

Table 1 gives the nominal catch off West and East Greenland, taken by the Federal Republic of Germany fleet in 1963 and from 1968 to 1973. The total output decreased again by 52% to 24 000 t only. This is by far the lowest catch since 1955 and only 9.6% of the maximum catch in 1963. Also the catch per fishing day never was so small as in 1973, although nearly all fishing was carried out only during the months with the highest fish concentrations.

Table 1. (Section I)
Subarea 1 and East Greenland: FRG nominal catches including industrial fish (tons), 1963 and 1968-1973

| | | | COD | | | REDFISH | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Year | Days fishing | Catch | Catch per day | % ind. | Catch | Catch per day | % ind. | Catch | Catch per day | % ind. |
| Subarea 1 | 1963 | 7,175 | 152,934 | 21.3 | 4.2 | 44,355 | 6.2 | 4.7 | 202,923 | 28.3 | 8.6 |
| | 1968 | 5,819 | 132,498 | 22.8 | 5.3 | 11,858 | 2.0 | 1.8 | 146,432 | 25.2 | 5.3 |
| | 1969 | 3,234 | 67,431 | 20.9 | 4.0 | 6,964 | 2.2 | 5.2 | 75,293 | 23.3 | 4.3 |
| | 1970 | 1,722 | 38,551 | 22.4 | 4.0 | 4,501 | 2.6 | 9.1 | 44,283 | 25.7 | 5.9 |
| | 1971 | 1,545 | 37,950 | 24.6 | 1.9 | 3,335 | 2.2 | 2.0 | 42,482 | 27.5 | 2.4 |
| | 1972 | 1,312 | 16,963 | 12.9 | 0.3 | 2,650 | 2.0 | 1.9 | 20,732 | 15.8 | 1.8 |
| | 1973 | 672 | 6,048 | 9.0 | 0.5 | 2,209 | 3.3 | 1.5 | 9,735 | 14.5 | 9.4 |
| E.Greenland | 1963 | 2,182 | 13,677 | 6.3 | 0.5 | 31,368 | 14.4 | 1.4 | 47,700 | 21.9 | 2.2 |
| | 1968 | 1,361 | 9,825 | 7.2 | 0.2 | 15,432 | 11.3 | 2.0 | 26,417 | 19.4 | 2.0 |
| | 1969 | 2,164 | 14,292 | 6.6 | 0.9 | 24,587 | 11.4 | 4.6 | 40,505 | 18.7 | 4.2 |
| | 1970 | 1,532 | 14,388 | 9.4 | 0.9 | 15,672 | 10.2 | 4.5 | 31,104 | 20.3 | 3.3 |
| | 1971 | 1,737 | 28,735 | 16.5 | 0.6 | 14,037 | 8.1 | 2.9 | 44,062 | 25.4 | 2.4 |
| | 1972 | 1,732 | 21,664 | 12.5 | 0.4 | 7,153 | 4.1 | 1.6 | 29,742 | 17.2 | 0.9 |
| | 1973 | 931 | 9,286 | 10.0 | 0.0 | 4,480 | 4.8 | 0.2 | 14,309 | 15.4 | 1.2 |
| Total | 1963 | 9,357 | 166,611 | 17.8 | 3.9 | 75,723 | 8.1 | 3.3 | 250,623 | 26.8 | 7.4 |
| | 1968 | 7,180 | 142,323 | 19.8 | 4.9 | 27,290 | 3.8 | 1.9 | 172,849 | 24.1 | 4.8 |
| | 1969 | 5,398 | 81,723 | 15.1 | 3.5 | 31,551 | 5.8 | 4.8 | 115,798 | 21.5 | 4.3 |
| | 1970 | 3,254 | 52,939 | 16.3 | 3.2 | 20,173 | 6.2 | 5.5 | 75,387 | 23.2 | 4.9 |
| | 1971 | 3,282 | 66,685 | 20.3 | 1.3 | 17,372 | 5.3 | 2.8 | 86,544 | 26.4 | 2.4 |
| | 1972 | 3,044 | 38,627 | 12.7 | 0.4 | 9,803 | 3.2 | 1.7 | 50,474 | 16.6 | 1.3 |
| | 1973 | 1,603 | 15,334 | 9.6 | 0.2 | 6,689 | 4.2 | 0.7 | 24,044 | 15.0 | 4.5 |

2. West Greenland (Subarea 1)

The decrease in catch was most pronounced in the catches of cod in Subarea 1. The 1973 catch was with 6000 t only 36% of the catch in the preceding year and only 4% of the maximum catch in 1963. These figures drastically demonstrate the poor state of the Subarea 1 stock of cod and it should be born in mind that 1973 the obstructions by ice were far less than in the preceding ice-years 1969 to 1972. Also the catch per fishing day was with 9 t by far the smallest since German fishing started in Subarea 1 in 1952. The cod fishery was carried out from January to July and in December. Most cod came from Division 1E, the rest equally from 1D and 1F.

The catches of redfish decreased further to 2200 t which is only less than 4% of the maximum catch in 1962. Redfish mostly was caught in Division 1E and 1F.

3. East Greenland

As forecasted in the 1972 report the catches off East Greenland declined considerably from 30 000 t to 14 000 tons. This is mainly due to the considerable decrease in cod catches from 22 000 t to 9000 t and is the consequence of the decreasing size of the East Greenland spawning stock. Also the redfish catches decreased to 6700 t, which is the lowest yearly catch of redfish since the fishing for redfish off East Greenland started in 1955.

4. Forecast for 1974

The Greenland fishing grounds temporary will loose their attractivity for the German fleet. This is due to the poor state of both cod stocks especially the West Greenland stock, and the improving fishing conditions in the Northeast Atlantic.

## B. SPECIAL RESEARCH STUDIES

1. Environmental Studies

The location of the hydrographic sections performed by R.V. Walther Herwig during Nov./Dec. 1973 is shown in Fig.1. For further details on the positions of the different sections see Table 2 .

Table 2. (Section I)

| Section | Stations | Positions | Date |
|---|---|---|---|
| IV | 955/960 | from 66.59 N, 54.11 W to 66.45 N, 57.00 W | 28-29/11-73 |
| V | 964/971 | from 66.13 N, 55.19 W to 65.11 N, 52.49 W | 29-30/11-73 |
| VI | 976/980 | from 64.01 N, 52.19 W to 63.48 N, 53.55 W | 1/12-73 |
| VII | 989/992 | from 61.57 N, 50.00 W to 61.50 N, 50.49 W | 5/12-73 |
| VIII | 993/997 | from 60.42 N, 48.10 W to 60.20 N, 48.40 W | 5/12-73 |
| IX | 1006/1008 | from 59.14 N, 44.00 W to 59.42 N, 43.59.5 W | 7/12-73 |

The polar component of the West Greenland Current ($t < 0$, $S < 34^{o}/oo$, $\sigma_t < 27.32$) can be seen on the southern sections VI (Fylla Bank), VIII (Cape Desolation), and IX (Cape Farewell). Its magnitude extends from about 50 m thickness of layer to 100 m in section IX.

Off Holstensborg (IV) and Sukkertoppen (V) the stratification in the surface layer is nearly horizontal. A very narrow mixed layer separates the thin and cold surface layer (temperatures less $0^{o}C$ to $1^{o}C$, salinities less $33^{o}/oo$) from the warmer and more haline deeper layers of these sections, which are partly influenced by the Irminger component of the West Greenland Current - $t = 3.50 - 4.00^{o}C$, $S = 34.92^{o}/oo$, $\sigma_t = 27.74 - 27.80$ - (section V).

Sections VI to IX are mainly characterized by the inclined isotherms and isohalines, indicating the dynamic activity of the West Greenland Current. Below a nearly dissolved, broad mixed layer the influence of the Irminger component of the West Greenland Current is visible:

Downwards from 250 m depth (see section VIII) the water column is characterized by temperatures $> 4^{o}C$ and salinities $\geq 34.9^{o}/oo$. Nearly the same hydrographic situation has been recorded throughout sections V to IX with the exception of section VII.

The hydrographic investigations are shown in Fig.2 and 3.

A comparison of the hydrographic conditions in Nov./Dec. 1972 with those of Nov./Dec. 1973 shows the following:

a) The bottom water on the southern end of the Great Halibut Bank was more than $1^{o}C$ warmer in 1973.

b) The Little Halibut Bank bottom temperatures were deeper than in 1972.

c) The strength of the Irminger component was larger in 1972, e.g. the temperature difference amounted to $1^{o}C$ at Cape Desolation (section VIII).

d) The hydrographic situation at Cape Farewell (section IX) was nearly the same in both years.

2. Biological Studies

In 1973 20 810 measurements and 5432 age determinations of cod were made in the Greenland area. Nearly all samples taken in March, April, June, and December in Subarea 1 in Divisions 1C and 1F on board of commercial trawlers showed the great predominance of the 1968 year class varying between 55 and 87 %. The 1968 year class seems to be of equal strength as well in the West Greenland stock as in the cod stock of East Greenland origin. The more or less small catches per hour trawling make clear that even this dominating 1968 year class is only of moderate size and that the whole stock is in a poor state. Although R.V. Walther Herwig operated with a small meshed cod end only few cod of the younger year classes 1969 to 1972 were found as well in the area of the West Greenland stock (1C, 1D) as in the area of the East Greenland stock (1F).

In the research catches in December off Cape Farewell within the fishery limits the prespawners of the moderate 1964 and 1962 and the good 1963 and 1961 East Greenland year classes dominated with 54 %. The still immature 1968 cod made up 27 %.

In the fishery on the spawning schools off Southeast Greenland in late winter and spring the 1964 and 1963 year classes dominated with 34 and 31 % respectively. On the northern grounds of Angmagssalik and Dohrn Bank the 1963 year class again dominated (37 %) followed by the 1964 cod (24 %). The size of the East Greenland spawning stock is now decreasing, because the rich 1961 and 1963 year classes have emigrated to Iceland and have been heavily fished. The average daily catch during the spawning period dropped from 16.5 to 10.0 t from 1971 to 1973. It is uncertain whether the 1968 year class when going for spawning in 1975 and 1976 will be in the position to increase the daily output of cod in East Greenland waters about the 1973 level.

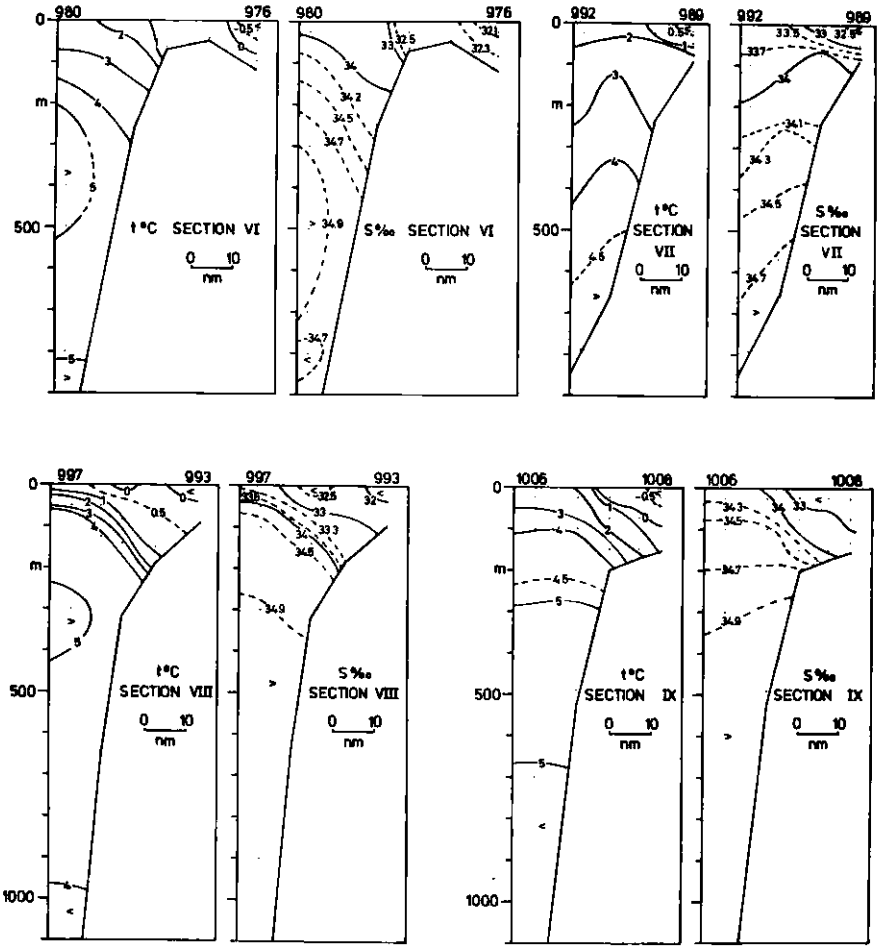


Fig.3 Temperature and salinity plot of sections VI to IX (SectionI)

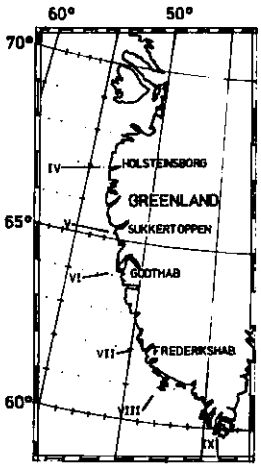


Fig.1 Location of hydrographic sections off West Greenland during Nov./Dec.1973 (Section I)

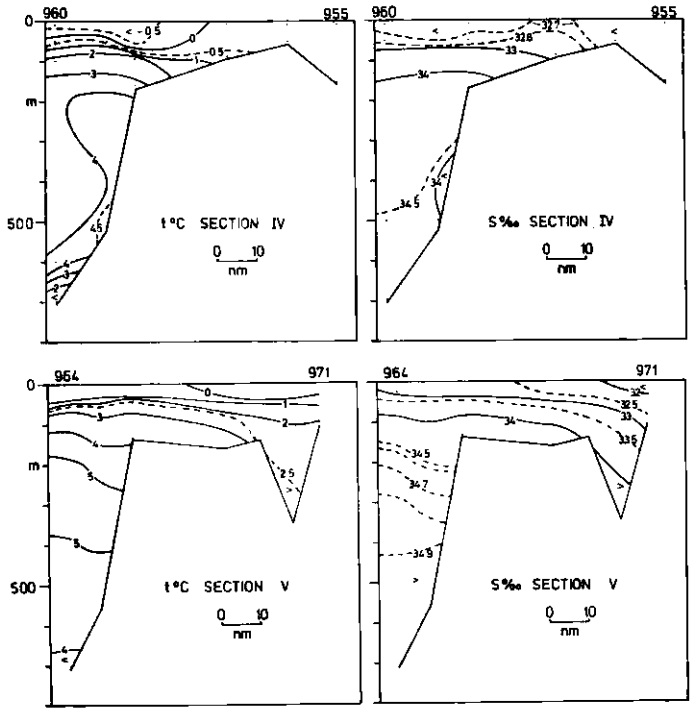


Fig.2 Temperature and salinity plot of sections IV and V (Section I)

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ADDENDUM 1

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## Section II. Subareas 2-4 (excluding herring)

by

J. Messtorff

### Subarea 2

A. Status of the Fisheries

The nominal catches as well as catch per day taken by German trawlers in 1973 are given in Table 1 separately according to areas of existing quota regulations. For comparison the nominal catches since 1969 are arranged in the same way in Table 2.

Total catches from Divisions 2G and H mainly consisting of cod decreased sharply since 1969 from over 11,000 tons to only 133 tons in 1973 due to increasing severe ice conditions off Labrador. By the same reason the total catch from Division 2J decreased to only 13% of the 1969 catch. Combined catches of Divisions 2J and 3KL stabilized in 1971-72 at about 50% of the 1969 catch but increased again slightly in 1973.

On account of the ice situation the fishing activity was as in recent years restricted to a very short season. Over 60% of the total catch was already taken in January. Cod amounted to 85% of the total catch in Subarea 2. The combined cod catches from Subarea 2 and Divisions 3KL amounted to 86% of the allocated national quota. The redfish by-catch remained at a low but stable level of 5% of the total catch. The quantities of discarded fish were small but showed some increase against 1972 as shown in Table 3.

B. Special Research Studies

1. Environmental Studies

Hydrographic observations were obtained by R/V Walther Herwig in November consisting of three sections across the Labrador Shelf (Fig. 1) and additional BT-casts at fishing stations. As compared to recent years water temperatures of the Arctic component of the Labrador Current on the shelf were somewhat higher but lower in the offshore (West Greenland) component of the current along the continental slope.

2. Biological Studies

R/V Walther Herwig conducted a groundfish survey during the second part of November. In order to achieve an optimum coverage the surveyed area was restricted to Division 2J (46 hauls) including Division 3K (26 hauls) of Subarea 3. Trawling stations were selected at random based on a revised stratification scheme (Res.Doc. 74/4). A standard bottom trawl with small meshed liner inside the codend was used throughout the survey. Towing time and speed were 30 minutes at 4 knots. Priority species, especially cod, were sampled for length frequencies and age composition. All finfish species were at least recorded by number and weight.

Due to limited vessel time only few trawling stations, mainly for cod sampling purposes, could be obtained in Divisions 2H (6) and 2G (8).

Sampling of commercial catches was carried out on board a factory trawler in Division 2J in April 1973.

Both in research vessel and commercial catches the 1967 year-class (age 6) of cod was most abundant. Cod of age 5 and younger amounted to 21% of the research catches in Division 2J but to only 9% in commercial catches.

## Subarea 3

A. Status of the Fisheries

Catches of German (FRG) trawlers increased considerably by 14,000 tons in Division 3K against 1972 due to a diversion of effort from Subarea 2. During the short main season in January-February 77% of the total catch was taken. Fishing operations were combined on a low level until June; 81% of the catches consisted of cod. Redfish catches amounted to about 9% of the total catch in Division 3K.

Fishing activity and catches in Division 3L also increased against former years but remained at a relatively low level. Only few catches were taken in Division 3M.

Nominal catches in 1973 in Subarea 3 are given in Table 1, those since 1969 in Table 2. An increase of discarded fish against 1972 was observed, but the share of the total catch was only 0.6% (Table 3).

B. Special Research Studies

1. Environmental Studies

Hydrographic observations were obtained during a survey of R/V Walther Herwig in November by BT-casts at trawling stations distributed over the whole shelf area in the northern part of Division 3K.

2. Biological Studies

R/V Walther Herwig conducted a groundfish survey in November in the northern part of Division 3K

extending into Subarea 2; 26 trawling stations were selected at random based on a revised stratification scheme (see remarks under Subarea 2).

Sampling of commercial catches was carried out on board a factory trawler in Division 3K in April 1973.

Both in research vessel and commercial catches the 1967 year-class (age 6) of cod was most abundant (30% and 21% respectively). Cod of age 5 (year-class 1968) made up 25% of the research catches but only 8% in the commercial fishery.

## Subarea 4

### A. Status of the Fisheries

Besides some herring (see Section III) negligible catches of groundfish were taken in Division 4Vn (Table 1).

### B. Special Research Studies

R/V Walther Herwig conducted cod selection experiments in Divisions 4R, T and Vn in April-May 1973.

Table 1. (Section II) Nominal catches (tons) in Subareas 2 - 5 (excluding herring and squid fishery) in 1973 (including industrial fish = converted to fish meal on board)

| | Division | Days fished | COD Catch | COD catch p. day | COD % ind. | REDFISH Catch | REDFISH Catch p. day | REDFISH % ind. | OTHER FISH Catch | OTHER FISH Catch p. day | OTHER FISH % ind. | ALL SPECIES Catch | ALL SPECIES Catch p. day | ALL SPECIES % ind. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 G | - | - | - | | - | - | - | | | | - | - | - |
| | H | 7 | 120 | 17.1 | - | 2 | 0.3 | - | 11 | 1.6 | 90.9 | 133 | 19.0 | 7.5 |
| | Total | 7 | 120 | 17.1 | - | 2 | 0.3 | - | 11 | 1.6 | 90.9 | 133 | 19.0 | 7.5 |
| | 2 J | 343 | 6 724 | 19.6 | 2.6 | 413 | 1.2 | 40.9 | 768 | 2.2 | 71.0 | 7 905 | 23.0 | 10.9 |
| | 3 K | 896 | 27 523 | 30.7 | 2.8 | 2 952 | 3.3 | 21.4 | 3 538 | 3.9 | 45.4 | 34 013 | 38.0 | 8.8 |
| | L | 84 | 1 321 | 15.7 | - | 366 | 4.4 | 30.3 | 609 | 7.2 | 38.6 | 2 296 | 27.3 | 15.1 |
| | Total | 1 323 | 35 568 | 26.9 | 2.6 | 3 731 | 2.8 | 24.4 | 4 915 | 3.7 | 48.6 | 44 214 | 33.4 | 9.5 |
| | 3 M | 39 | 21 | 0.5 | - | 773 | 19.8 | 19.9 | 108 | 2.8 | 74.1 | 902 | 23.1 | 25.9 |
| Total | Subarea 2 | 350 | 6 844 | 19.6 | 2.2 | 415 | 1.2 | 40.7 | 779 | 2.2 | 71.3 | 8 038 | 23.0 | 10.8 |
| Total | " 3 | 1 019 | 28 865 | 28.3 | 2.7 | 4 091 | 4.0 | 21.9 | 4 255 | 4.2 | 45.2 | 37 211 | 36.5 | 9.6 |
| Total | " 2 + 3 | 1 369 | 35 709 | 26.1 | 2.6 | 4 506 | 3.3 | 23.6 | 5 034 | 3.7 | 49.2 | 45 249 | 33.1 | 9.8 |
| | 4 Vn | 2 | 73 | 36.5 | - | - | - | - | 16* | 8.0 | 68.7 | 89 | 44.5 | 12.4 |

*) including 5 t Pollack

Table 2. (Section II) Nominal catches (tons) 1969 - 1972 in Subarea 2 and 3

| Division | COD | | | | REDFISH | | | | OTHER FISH | | | | ALL SPECIES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 69 | 70 | 71 | 72 | 69 | 70 | 71 | 72 | 69 | 70 | 71 | 72 | 69 | 70 | 71 | 72 |
| 2 G | - | - | 277 | - | - | - | 3 | - | - | - | 3 | - | - | - | 283 | - |
| H | 11 389 | 4 957 | 1 283 | 113 | 8 | 116 | 24 | 11 | 137 | 13 | 17 | 13 | 11 534 | 5 086 | 1 324 | 137 |
| Total | 11 389 | 4 957 | 1 560 | 113 | 8 | 116 | 27 | 11 | 137 | 13 | 20 | 13 | 11 534 | 5 086 | 1 607 | 137 |
| 2 J | 60 391 | 45 050 | 18 120 | 10 052 | 139 | 292 | 40 | 190 | 314 | 92 | 187 | 124 | 60 844 | 45 434 | 18 347 | 10 366 |
| 3 K | 229 | 11 856 | 10 355 | 19 465 | - | 31 | 27 | 269 | 5 | 8 | 116 | 192 | 234 | 11 895 | 10 498 | 19 926 |
| L | - | - | 171 | 16 | - | - | 9 | 17 | - | - | 7 | 5 | - | - | 187 | 38 |
| Total | 60 620 | 56 906 | 28 646 | 29 533 | 139 | 323 | 76 | 476 | 319 | 100 | 310 | 321 | 61 078 | 57 329 | 29 032 | 30 330 |
| 3 M | - | - | 1 628 | 506 | - | - | 10 | 306 | - | - | 18 | 28 | - | - | 1 656 | 840 |
| N | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| O | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pn | - | - | - | - | - | - | - | 29 | - | - | - | - | - | - | - | 29 |
| Ps | - | - | - | - | - | - | - | 7 | - | - | - | 110* | - | - | - | 117 |
| Total | - | - | 1 628 | 506 | - | - | 10 | 342 | - | - | 18 | 138 | - | - | 1 656 | 986 |
| Total Subarea 2 | 71 780 | 50 007 | 19 680 | 10 165 | 147 | 408 | 67 | 201 | 451 | 105 | 207 | 137 | 72 378 | 50 520 | 19 954 | 10 503 |
| Total Subarea 3 | 229 | 11 856 | 12 154 | 19 987 | - | 31 | 46 | 628 | 5 | 8 | 141 | 335 | 234 | 11 895 | 12 341 | 20 950 |
| Total Subarea 2 +3 | 72 009 | 61 863 | 31 834 | 30 152 | 147 | 439 | 113 | 829 | 456 | 113 | 348 | 472 | 72 612 | 62 415 | 32 295 | 31 453 |

*) Herring

Table 3. (Section II) Discarded fish (tons) in Subareas 2 - 5 (excluding herring and squid fishery) in 1973 (1972 in brackets)

| Division | COD | REDFISH | OTHER FISH | ALL SPECIES |
|---|---|---|---|---|
| 2 J | 18 (5) | 2 (-) | 2 (3) | 22 (8) |
| 3 K | 162 (82) | 45 (-) | 3 (8) | 210 (90) |

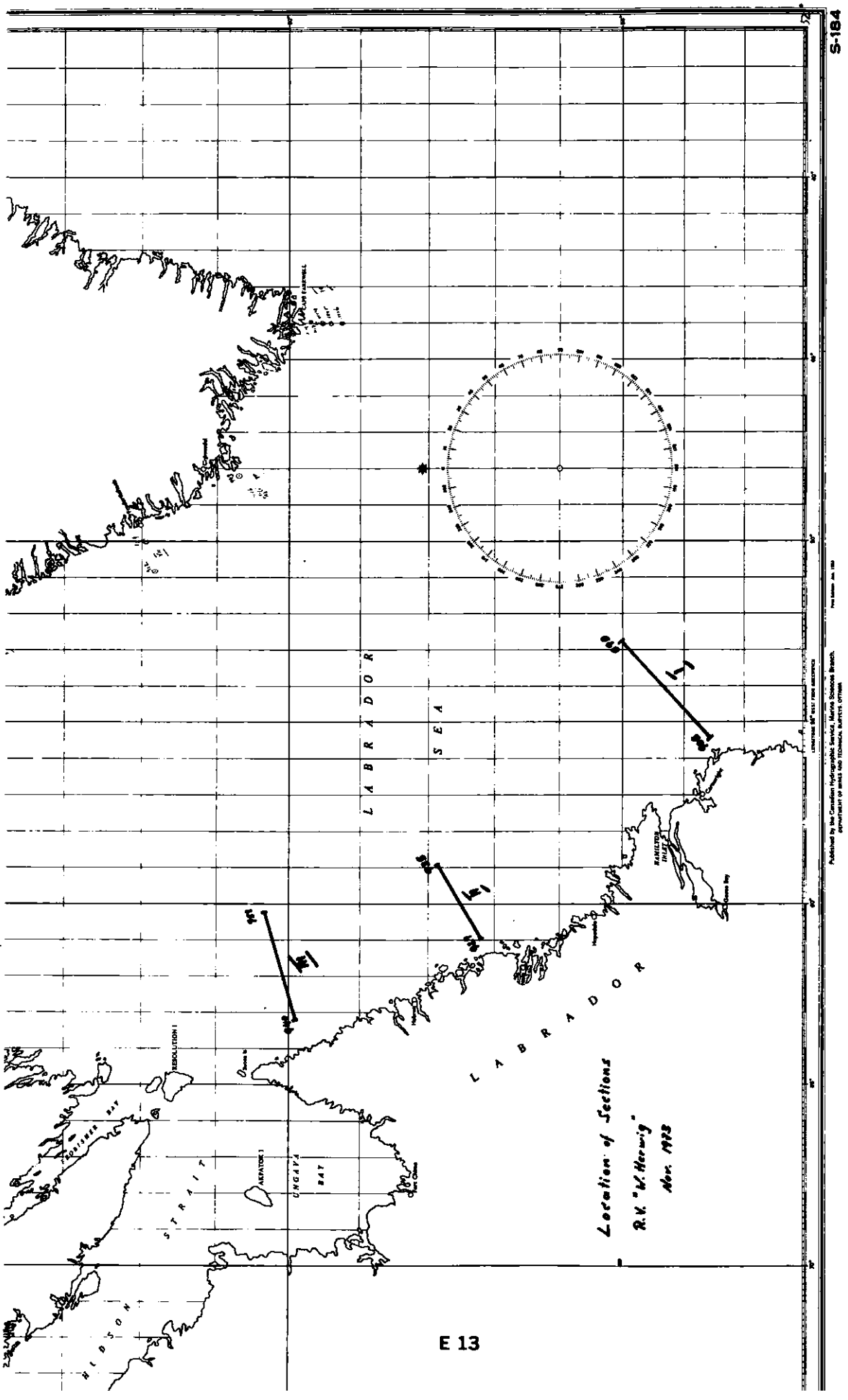
S-184
LABRADOR SEA
LABRADOR
HAMILTON INLET
Goose Bay
Location of Sections
R.V. "W. Herwig"
Nov. 1978
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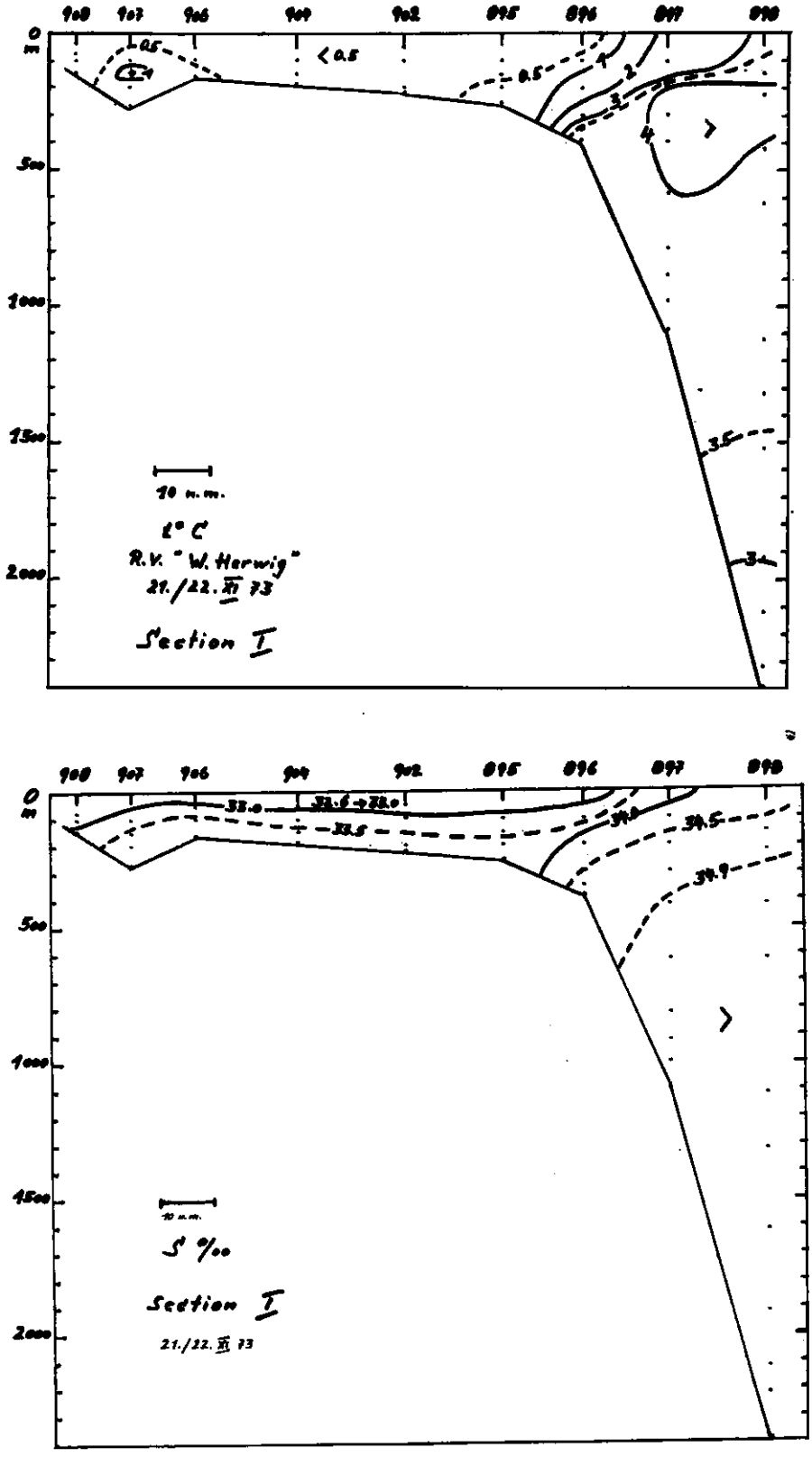
Fig. 1.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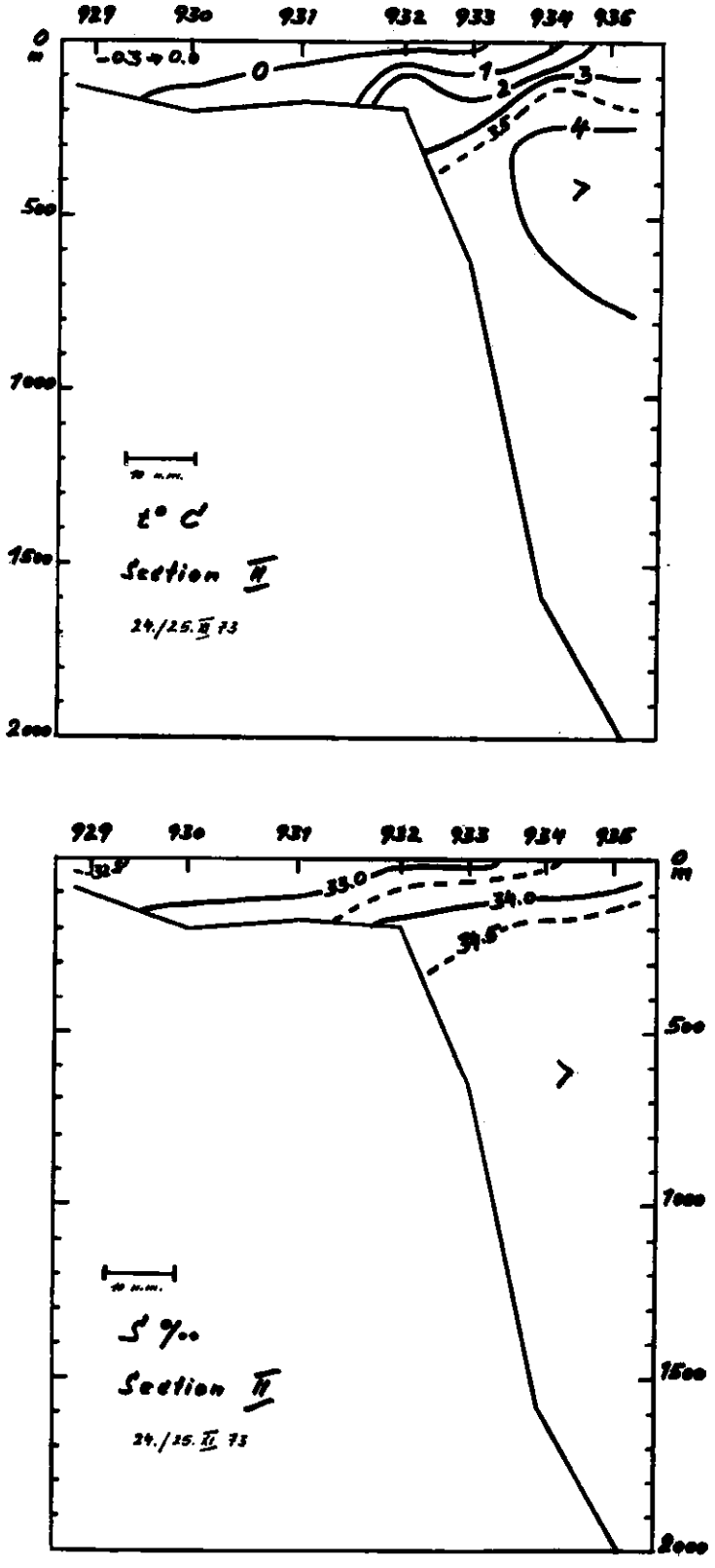
21./22. XI 73

Fig. 2.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Section II
24./25. II 73
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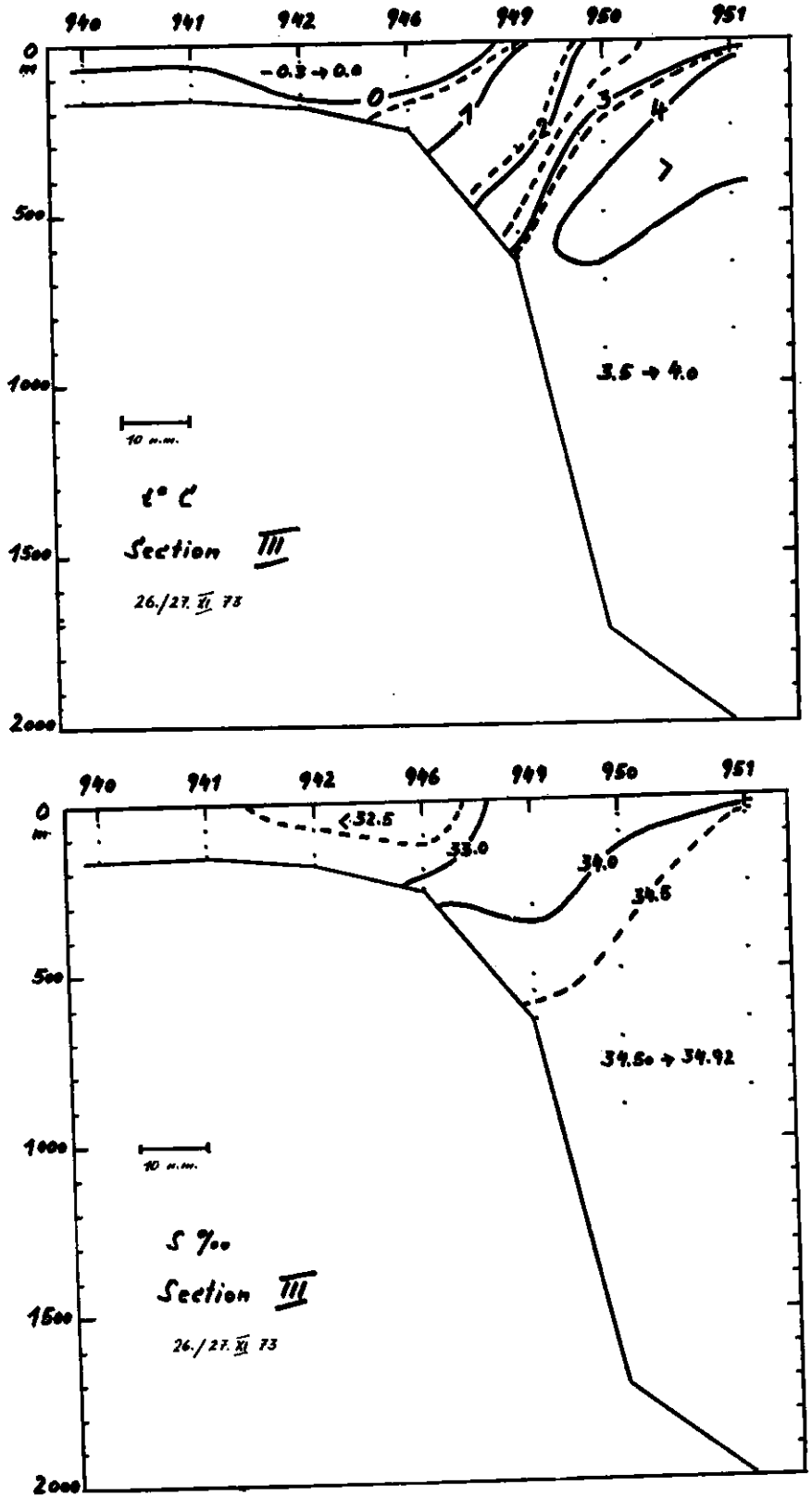
Section II
24./25. II 73

Fig. 3.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Section III
26./27. XI 73
940
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34.50 → 34.92
10 n.m.
S ‰
Section III
26./27. XI 73

Fig. 4.

## Section III. Subareas 4, 5 and 6 (pelagic species only).

by

Kurt Schubert

### A. Status of the fisheries

5 stern freezer trawlers were fishing with pelagic nets from January to March in 6 A, 6 B, 6 C, 5 Zw and 5 Ze, whereas in the herring season 13 ships participated in this fishery in 4 Vn, 4 Vs, 4 X, 5 Y, 5 Ze and 5 Zw. The average gross registered tonnage of German (FRG) trawlers fishing with pelagic trawls in areas 4-6 was 3016 GRT (1568 GRT - 3600 GRT).

Table 1 shows the nominal catch (tons), effort (days fished), catch per unit effort (tons) and discards (tons) of German (FRG) freezer trawlers in 4, 5 and 6 in 1973.

In January/February some trawlers fished in 6 A to 6 C. The main fishing was for squid. In January the catch amounted to 656 t squid in 6 A. The by-catch consisted of 9 t mackerel and 2 t other fish. In February only 32% (254 t) of the catch were squid, 32% mackerel and 36% other fish. The fishery in February in 6 B and 6 C was unimportant, only 10 t were caught in 6 B and 1 t in 6 C. In 5 Zw the squid catch was poor , too, only 47 t were caught in January, 72 t in February and 1 t in March. In February and March 509 t and 179 t, respectively, of mackerel were caught. A trial fishery in February in 5 Ze was not really successful, only 13 t squid, 2 t mackerel and 24 t other fish were caught.

The herring season started in the middle of July in 5 Ze, 1879 t herring were taken in this month. The main fishing months August and September yielded 12965 t and 13098 t, respectively. In October only 3123 t were caught. In July the fishery happened mainly in the Nantucket area. In the middle of August the fishery had changed to the NW-edge of the Georges-Bank/Franklin-Howell-Swell, respectively. The catches consisted mainly of prespawning fish, only sporadically some smaller concentrations of spawning herring were met. The spawning time, however, started on the 21. September in the area Great South Channel (Nantucket) and lasted until end of this month in this area. The best catches of spawning herring were made between 12° to 14°C in trawling depth. Prespawning herring were mainly met between 5.5° to 8°C. Presumably as the result of a cold water inflow - the temperature dropped to 5°C - the catches ceased suddenly at the end of the month. The fleet changed to the northern edge of the Georges-Bank. It seems that the spawning time ceased in the first decade of October in this area. Figure 1 shows the herring catch in baskets/day on an average of about 5 days in 5 Ze. The figure indicates that the largest catches during the spawning season in 1972 equal the lower catches in 1973 in the same period which leads to the conclusion of a higher stock abundance in the 1973 fishing season.

Fishing in 5 Y in September and October yielded 876 t. Another 114 t were caught in 5 Zw in October.

From July to September a small fishing took place in 4 X. The total catch amounted to 228 t herring. In 4 V during September/October 675 t were fished, in 4 Vn in October 557 t.

B. Special Research Studies

1. Environmental Studies

Hydrographical work was carried out in February/March in parts of areas 4, 5 and 6. Results are given in ICNAF Res. Doc. 73/84, Addendum 1.

2. Biological Studies

From research cruise in February, March and May 43 samples with a total of 10651 specimens were investigated: 4 X in February 3 samples, 4 T in May 2 samples, 5 Ze in March 30 samples, 5 Zw in March 5 samples and 6 A 4 samples. During the main herring fishing season investigations on board of 2 commercial freezer trawlers were carried out from July to October. In July 1 sample, in August 11 samples, in September 67 samples and in October 10 samples all from 5 Ze were examined with 57478 herring, besides 4 samples were investigated in August from 5 Y 2314 herring.

Table 2 shows length - composition, mean length and mean weight of herring in the different areas.

Table 3 shows the mean length-at-age for herring sampled in 4, 5 and 6 in 1973.

Table 4 gives the mean $l_1$ for herring sampled in the same areas.

Table 5 gives information about the stages of maturity of herring catches.

The age composition of samples is shown in Table 6. In February the year-class 1971 (982 ‰) was predominant in 4 X. In March the samples of 5 Zw and 6 A consisted of year-class-70 herring exclusively. Also in 5 Ze in the same month the bulk of the catches (856 ‰) were formed out of the 1970 year-class; some older year-classes were present, too. From July to October the 1970 year-class was predominant (713 to 987 ‰). In 5 Y the same year-class was dominant with 930 ‰, too. The age - composition of spring-spawners in 4 T shows the predominance of older year-classes (5-9 years old).

Tables 7-9 show the average number of vertebrae, gillrakers and keeled scales.

Table 1 (Section III)

Nominal catch (tons), effort (days fished), catch-per-unit effort (tons) and discards (tons) of German (GFR) freezer trawlers in Subarea 4 and 5 and Stat. Area 6 in 1973.

Fishery for pel. species

| Div. | Month | Nominal catch | | | | | | | Effort | Catch per day | | | | | | | Discards | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Her | Shad | Mac | Pol | Squid | Of | Total | DF | Her | Shad | Mac | Pol | Squid | Of | Total | Spiny dogf. | OF | Total |
| 4Vn | Oct. | 557 | - | - | - | - | 1 | 558 | 7 | 79.6 | - | - | - | - | 0.1 | 79.7 | - | - | - |
| 4Vs | Sep. | 229 | - | - | - | - | - | 229 | 3 | 76.3 | - | - | - | - | - | 76.3 | - | - | - |
| | Oct. | 446 | - | - | - | - | - | 446 | 5 | 89.2 | - | - | - | - | - | 89.2 | - | - | - |
| 4X | Jul. | 10 | - | - | - | - | - | 10 | 1 | 10.0 | - | - | - | - | - | 10.0 | - | - | - |
| | Aug. | 114 | - | - | - | - | - | 114 | 2 | 57.0 | - | - | - | - | - | 57.0 | - | - | - |
| | Sep. | 104 | - | - | - | - | - | 104 | 2 | 52.0 | - | - | - | - | - | 52.0 | - | - | - |
| | Dec. | 9 | - | - | - | - | 1 | 10 | 1 | 9.0 | - | - | - | - | 1.0 | 10.0 | - | - | - |
| SA 4 | Total | 1469 | - | - | - | - | 2 | 1471 | 21 | 70.0 | - | - | - | - | 0.1 | 70.1 | - | - | - |
| 5Y | Sep. | 191 | - | - | - | - | + | 191 | 3 | 63.7 | - | - | - | - | + | 63.7 | - | - | - |
| | Oct. | 685 | - | - | - | - | - | 685 | 13 | 52.7 | - | - | - | - | - | 52.7 | - | - | - |
| | Dec. | - | - | - | 499 | - | - | 499 | 10 | - | - | - | 49.9 | - | - | 49.9 | - | - | - |
| 5Ze | Feb. | - | - | 2 | - | 13 | 24 | 39 | 3 | - | - | 0.7 | - | 4.3 | 8.0 | 13.0 | - | - | - |
| | Jul. | 1879 | 6 | - | - | - | 16 | 1901 | 36 | 52.2 | 0.2 | - | - | - | 0.4 | 52.8 | 10 | - | 10 |
| | Aug. | 12965 | - | 7 | - | - | 23 | 12995 | 236 | 54.9 | - | + | - | - | 0.2 | 55.1 | - | 8 | 8 |
| | Sep. | 13098 | 302 | 5 | - | - | 79 | 13484 | 247 | 53.0 | 1.2 | + | - | - | 0.4 | 54.6 | 158 | - | 158 |
| | Oct. | 3123 | - | 265 | - | - | 97 | 3485 | 59 | 52.9 | 4.5 | - | - | - | 1.7 | 59.1 | - | - | - |
| | Nov. | 66 | - | 234 | - | - | 10 | 310 | 11 | 6.0 | - | 21.3 | - | - | 0.9 | 28.2 | - | - | - |
| | Dec. | 57 | - | - | - | - | 7 | 64 | 3 | 19.0 | - | - | - | - | 2.3 | 21.3 | - | - | - |
| 5Zw | Jan. | - | - | - | - | 47 | - | 47 | 7 | - | - | - | - | 6.7 | - | 6.7 | - | - | - |
| | Feb. | - | - | 509 | - | 72 | 86 | 667 | 25 | - | - | 20.4 | - | 2.9 | 3.4 | 26.7 | - | - | - |
| | Mar. | - | - | 179 | - | 1 | - | 180 | 8 | - | - | 22.4 | - | 0.1 | - | 22.5 | 2 | - | 2 |
| | Oct. | 114 | - | 20 | - | - | 18 | 152 | 3 | 38.0 | - | 6.7 | - | 6.0 | - | 50.7 | - | - | - |
| | Nov. | 153 | - | 30 | - | 4 | 25 | 212 | 6 | 25.5 | - | 5.0 | - | 0.7 | 4.1 | 35.3 | - | - | - |
| | Dec. | 48 | - | - | - | - | 6 | 54 | 3 | 16.0 | - | - | - | - | 2.0 | 18.0 | - | - | - |
| SA 5 | Total | 32379 | 308 | 1251 | 499 | 137 | 391 | 34965 | 673 | 48.1 | 0.5 | 1.9 | 0.7 | 0.2 | 0.6 | 52.0 | 170 | 8 | 178 |
| 6A | Jan. | - | - | 9 | - | 656 | 2 | 667 | 44 | - | - | 0.2 | - | 14.9 | 0.1 | 15.2 | - | 79(Mac) | 79 |
| | Feb. | - | - | 253 | - | 254 | 293 | 800 | 42 | - | - | 6.0 | - | 6.0 | 7.0 | 19.0 | - | - | - |
| | Nov. | - | - | 85 | - | 116 | 132 | 333 | 16 | - | - | 5.3 | - | 7.2 | 8-3 | 20.8 | - | - | - |
| | Dec. | - | - | - | - | 6 | 2 | 8 | 1 | - | - | - | - | 6.0 | 2.0 | 8.0 | - | - | - |
| 6B | Feb. | - | - | - | - | 10 | 3 | 13 | 3 | - | - | - | - | 3.3 | 1.0 | 4.3 | - | - | - |
| | Nov. | - | - | 0 | - | 391 | 323 | 714 | 47 | - | - | 0 | - | 8.3 | 6.9 | 15.2 | - | - | - |
| | Dec. | - | - | - | 280 | 58 | 10 | 348 | 18 | - | - | - | 15.6 | 3.2 | 0.5 | 19.3 | - | - | - |
| 6C | Feb. | - | - | - | - | 1 | 1 | 2 | 2 | - | - | - | - | 0.5 | 0.5 | 1.0 | - | - | - |
| | Nov. | - | - | - | - | 11 | 1 | 12 | 3 | - | - | - | - | 3.7 | 0.3 | 4.0 | - | - | - |
| SA 6 | Total | - | - | 347 | 280 | 1503 | 767 | 2897 | 176 | - | - | 2.0 | 1.6 | 8.5 | 4.4 | 16.5 | - | 79 | 79 |

Average gross registered tonnage of German (F.R.) trawlers fishing with pelagic trawls, Subarea 4-6: 3016 GRT (1568-3600)

Table 2 (Section III)

Length composition (‰) sampled in Subarea 4, 5 and 6 in 1973.

| Length cm | 4T May R* | 4X Feb R | Mar R | Jul C | 5Ze Aug C | Sep C | Oct C | 5Zw Mar R | 5Y Aug C | 6A Mar R |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | | 29 | | | | | | | | |
| 11 | | 234 | | | | | | | | |
| 12 | | 357 | + | | | | | | | |
| 13 | | 161 | + | | | | | | | |
| 14 | | 34 | 1 | | | | | | | |
| 15 | | 27 | 1 | | | | | | | |
| 16 | | 12 | + | | | | | | | |
| 17 | | 12 | 2 | | | | | | | |
| 18 | | 22 | 5 | | | | | | | |
| 19 | | 34 | 17 | | | | | 8 | | |
| 20 | | 24 | 45 | | | + | | 20 | | 1 |
| 21 | | 10 | 106 | | | - | 1 | 67 | | 11 |
| 22 | | 15 | 169 | | + | + | 20 | 139 | + | 46 |
| 23 | | 10 | 218 | | 1 | + | 214 | 298 | 1 | 162 |
| 24 | | 10 | 210 | 25 | 8 | 3 | 436 | 241 | 10 | 362 |
| 25 | | 5 | 130 | 275 | 88 | 46 | 239 | 160 | 86 | 300 |
| 26 | 5 | 2 | 39 | 287 | 344 | 253 | 50 | 45 | 327 | 78 |
| 27 | 5 | - | 9 | 162 | 354 | 380 | 10 | 18 | 352 | 11 |
| 28 | 9 | - | 10 | 50 | 112 | 164 | 10 | 2 | 110 | 1 |
| 29 | 66 | - | 14 | 75 | 22 | 37 | 10 | 2 | 26 | 1 |
| 30 | 137 | 2 | 12 | 113 | 19 | 27 | 6 | | 18 | 9 |
| 31 | 254 | | 7 | - | 20 | 25 | 3 | | 24 | 9 |
| 32 | 292 | | 4 | 13 | 17 | 27 | 1 | | 22 | 7 |
| 33 | 142 | | 1 | | 10 | 20 | + | | 15 | - |
| 34 | 47 | | + | | 4 | 11 | | | 6 | 1 |
| 35 | 33 | | | | 1 | 5 | | | 2 | 1 |
| 36 | 5 | | | | | 2 | | | 1 | |
| 37 | 5 | | | | | + | | | | |
| Total ‰ | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| No. of Samples | 1 | 3 | 30 | 1 | 11 | 67 | 10 | 5 | 4 | 4 |
| No. Measured | 212 | 410 | 8856 | 80 | 6928 | 43232 | 7238 | 510 | 2514 | 703 |
| MeanLength(cm) | 32.06 | 13.78 | 23.79 | 26.94 | 27.40 | 27.92 | 27.31 | 23.94 | 27.52 | 24.91 |
| Mean eight(kg) | 0.274 | 0.019 | 0.091 | 0.185 | 0.167 | 0.163 | 0.145 | 0.093 | 0.167 | 0.102 |

*: R-Research vessel, C-Commercial fishing

Table 3 (Section III)

Mean length-at-age (cm) for herring sampled in Subareas 4, 5 and 6 in 1973.

| Year-class | Age | | 4T May | 4X Feb | 5Ze Mar | 5Ze Jul | 5Ze Aug | 5Ze Sep | 5Ze Oct | 5Zw Mar | 5Y Aug | 6A Mar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1972 | 1 | $\bar{x}$ | - | - | - | - | - | - | - | - | - | - |
| | | $s^2$ | | | | | | | | | | |
| | | n | | | | | | | | | | |
| 71 | 2 | $\bar{x}$ | - | 12.49 | 17.67 | | | | | | | |
| | | $s^2$ | | 1.325 | 6.566 | - | - | - | - | - | - | - |
| | | n | | 164 | 6 | | | | | | | |
| 70 | 3 | $\bar{x}$ | 26.50 | 17.50 | 22.57 | 26.24 | 26.26 | 26.79 | 26.67 | 23.61 | 26.25 | 23.87 |
| | | $s^2$ | - | - | 3.299 | 0.661 | 1.164 | 0.917 | 0.832 | 1.553 | 0.688 | 1.265 |
| | | n | 1 | 3 | 650 | 57 | 434 | 738 | 146 | 100 | 93 | 100 |
| 69 | 4 | $\bar{x}$ | 29.10 | | 28.38 | 28.73 | 28.94 | 29.40 | 28.50 | | 28.50 | |
| | | $s^2$ | 0.300 | - | 1.005 | 1.192 | 0.795 | 0.869 | 2.000 | - | 1.000 | - |
| | | n | 5 | | 48 | 13 | 16 | 68 | 2 | | 3 | |
| 68 | 5 | $\bar{x}$ | 30.74 | | 29.64 | 30.36 | 30.67 | 31.41 | | | 32.00 | |
| | | $s^2$ | 0.590 | - | 0.580 | 0.143 | 0.966 | 0.921 | - | - | 0.500 | - |
| | | n | 21 | | 36 | 7 | 6 | 44 | | | 2 | |
| 67 | 6 | $\bar{x}$ | 31.32 | | 31.30 | 31.17 | 32.50 | 31.67 | | | 31.50 | |
| | | $s^2$ | 0.963 | - | 1.200 | 1.333 | - | 0.776 | - | - | - | - |
| | | n | 11 | | 5 | 3 | 2 | 42 | | | 2 | |
| 66 | 7 | $\bar{x}$ | 32.10 | | 31.06 | | 33.00 | 32.76 | | | | |
| | | $s^2$ | 0.568 | - | 0.527 | - | 0.500 | 1.656 | - | - | - | - |
| | | n | 20 | | 9 | | 2 | 23 | | | | |
| 65 | 8 | $\bar{x}$ | 32.23 | | 32.50 | | 32.83 | 33.32 | | | | |
| | | $s^2$ | 0.588 | - | - | - | 0.333 | 0.763 | - | - | - | - |
| | | n | 22 | | 3 | | 3 | 11 | | | | |
| 64 | 9 | $\bar{x}$ | 33.55 | | | | | 33.50 | | | | |
| | | $s^2$ | 2.155 | - | - | - | - | - | - | - | - | - |
| | | n | 20 | | | | | 2 | | | | |
| < 64 | > 9 | $\bar{x}$ | | | 32.00 | | | 34.86 | | | | |
| | | $s^2$ | | - | 0.500 | - | - | 0.454 | - | - | - | - |
| | | n | | | 2 | | | 11 | | | | |
| Total | | $\bar{x}$ | 31.84 | 12.58 | 23.46 | 27.19 | 26.50 | 27.74 | 26.70 | 23.61 | 26.54 | 23.87 |
| | | $s^2$ | 2.469 | 1.746 | 8.861 | 3.230 | 2.216 | 4.790 | 0.879 | 1.553 | 1.957 | 1.265 |
| | | n | 100 | 167 | 759 | 80 | 463 | 939 | 148 | 100 | 100 | 100 |

Table 4 (Section III)

Mean $L_1$ (cm) for herring sampled in Subareas 5 and 6 in 1973.

| Year-class | Age | | Mar | Jul | 5Ze Aug | Sep | Oct | 5Zw Mar | 5Y Aug | 6A Mar |
|---|---|---|---|---|---|---|---|---|---|---|
| 1972 | 1 | | - | - | - | - | - | - | - | - |
| 71 | 2 | | - | - | - | - | - | - | - | - |
| 70 | 3 | $\bar{x}$ | 15.98 | 15.96 | 16.16 | 16.00 | 16.10 | 16.69 | 15.54 | 17.13 |
| | | $s^2$ | 2.840 | 2.602 | 2.901 | 2.205 | 2.201 | 2.429 | 1.693 | 1.809 |
| | | n | 42 | 13 | 99 | 219 | 57 | 16 | 24 | 24 |
| 69 | 4 | | 18.00 | 14.50 | 14.25 | 14.85 | | | | |
| | | | 0.500 | - | 2.196 | 2.742 | - | - | - | - |
| | | | 2 | 1 | 4 | 17 | | | | |
| 68 | 5 | | 14.00 | 15.50 | 16.25 | 13.94 | | | 18.50 | |
| | | | 4.500 | - | 6.916 | 3.777 | - | - | - | - |
| | | | 2 | 1 | 4 | 9 | | | 1 | |
| 67 | 6 | | - | - | 19.50 | 14.18 | | | 15.50 | |
| | | | | | - | 6.117 | - | - | - | - |
| | | | | | 1 | 19 | | | 1 | |
| 66 | 7 | | - | - | - | 14.50 | | | | |
| | | | | | | 3.800 | - | - | - | - |
| | | | | | | 11 | | | | |
| 65 | 8 | | - | - | 15.83 | 13.00 | | | | |
| | | | | | 2.333 | 1.666 | - | - | - | - |
| | | | | | 3 | 4 | | | | |
| 64 | 9 | | - | - | - | 17.50 | | | | |
| | | | | | | - | - | - | - | - |
| | | | | | | 1 | | | | |
| <64 | >9 | | - | - | - | 14.50 | | | | |
| | | | | | | 4.000 | - | - | - | - |
| | | | | | | 7 | | | | |
| Total | | $\bar{x}$ | 15.98 | 15.83 | 16.11 | 15.61 | 16.10 | 16.69 | 15.65 | 17.13 |
| | | $s^2$ | 3.055 | 2.381 | 3.130 | 3.116 | 2.201 | 2.429 | 1.895 | 1.809 |
| | | n | 46 | 15 | 111 | 287 | 57 | 16 | 26 | 24 |

Table 5 (Section III)

Maturity stage composition (‰) of herring sampled in Subarea 4, 5 and 6 in 1973.

| Stages of Maturity | 4T May R* | 4X Feb R | Mar R | Jul C | 5Ze Aug C | Sep C | Oct C | 5Zw Mar R | 5Y Aug C | 6A Mar R |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | - | 1000 | 37 | - | - | - | - | - | - | - |
| 2 | - | - | 828 | - | 43 | 26 | 27 | 1000 | 60 | 1000 |
| 3 | 30 | - | 3 | 346 | 265 | 31 | 13 | - | 40 | - |
| 4 | 10 | - | - | 407 | 376 | 199 | 27 | - | 360 | - |
| 5 | 410 | - | - | 235 | 316 | 505 | 753 | - | 530 | - |
| 6 | 530 | - | - | - | - | 212 | 106 | - | 10 | - |
| 7 | 20 | - | - | - | - | 20 | 47 | - | - | - |
| 8 | - | - | 132 | 12 | - | 7 | 27 | - | - | - |
| Total | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| No.sampled | 100 | 167 | 762 | 81 | 370 | 950 | 150 | 100 | 100 | 100 |

* R-Research vessel, C-Commercial fishing

Table 6 (Section III)

Age composition (‰) of herring sampled in Subarea 4, 5 and 6 in 1973.

| Year-class | Age | 4T May R* | 4X Feb R | Mar R | Jul C | 5Ze Aug C | Sep C | Oct C | 5Zw Mar R | 5Y Aug C | 6A Mar R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1972 | 1 | - | - | - | - | - | - | - | - | - | - |
| 71 | 2 | - | 982 | 8 | - | - | - | - | - | - | - |
| 70 | 3 | 10 | 18 | 856 | 713 | 937 | 785 | 987 | 1000 | 950 | 1000 |
| 69 | 4 | 50 | - | 63 | 163 | 35 | 72 | 13 | - | 30 | - |
| 68 | 5 | 210 | - | 47 | 87 | 13 | 47 | - | - | 20 | - |
| 67 | 6 | 110 | - | 7 | 37 | 4 | 45 | - | - | 20 | - |
| 66 | 7 | 200 | - | 12 | - | 4 | 25 | - | - | - | - |
| 65 | 8 | 220 | - | 4 | - | 7 | 12 | - | - | - | - |
| 64 | 9 | 200 | - | - | - | - | 2 | - | - | - | - |
| <64 | >9 | | - | 3 | - | - | 12 | - | - | - | - |
| Total | | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| Nn.aged | | 100 | 167 | 759 | 80 | 430 | 939 | 148 | 100 | 100 | 100 |

Table 7 (Section III)
Average number of vertebrae in herring sampled in Subareas 4, 5 and 6 in 1973.

| Year-class | Age | | 4T May | 4X Feb | 5Ze Mar | 5Ze Jul | 5Ze Aug | 5Ze Sep | 5Ze Oct | 5Zw Mar | 5Y Aug | 6A Mar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1972 | 1 | | - | - | - | - | - | - | - | - | - | - |
| | | $\bar{x}$ | | 56.48 | 56.33 | | | | | | | |
| 71 | 2 | $s^2$ | - | 0.337 | 0.266 | - | - | - | - | - | - | - |
| | | n | | 162 | 6 | | | | | | | |
| | | | 56.00 | 56.33 | 56.37 | 56.33 | 56.33 | 56.39 | 56.30 | 56.33 | 56.37 | 56.24 |
| 70 | 3 | | - | 0.333 | 0.375 | 0.440 | 0.399 | 0.409 | 0.333 | 0.387 | 0.411 | 0.520 |
| | | | 1 | 3 | 644 | 57 | 352 | 530 | 100 | 99 | 92 | 96 |
| | | | 56.40 | | 56.27 | 56.38 | 56.56 | 56.38 | | | 57.00 | |
| 69 | 4 | | 0.300 | - | 0.457 | 0.423 | 0.277 | 0.450 | - | - | - | - |
| | | | 5 | | 48 | 13 | 9 | 58 | | | 3 | |
| | | | 56.38 | | 56.40 | 56.43 | 56.75 | 56.27 | | | 55.50 | |
| 68 | 5 | | 0.347 | - | 0.305 | 0.285 | 0.916 | 0.313 | - | - | 0.500 | - |
| | | | 21 | | 35 | 7 | 4 | 37 | | | 2 | |
| | | | 56.70 | | 56.80 | 56.33 | | 56.38 | | | 56.50 | |
| 67 | 6 | | 0.455 | - | 0.200 | 0.333 | - | 0.386 | - | - | 0.500 | - |
| | | | 10 | | 5 | 3 | | 29 | | | 2 | |
| | | | 56.70 | | 56.44 | | | 56.50 | | | | |
| 66 | 7 | | 0.431 | - | 0.277 | - | - | 0.264 | - | - | - | - |
| | | | 20 | | 9 | | | 18 | | | | |
| | | | 56.73 | | 56.00 | | 56.00 | 56.60 | | | | |
| 65 | 8 | | 0.493 | - | - | - | - | 0.266 | | | | |
| | | | 22 | | 3 | | 2 | 10 | | | | |
| | | | 56.65 | | | | | 57.00 | | | | |
| 64 | 9 | | 0.239 | - | - | - | - | - | - | - | - | - |
| | | | 20 | | | | | 1 | | | | |
| | | | | | 56.50 | | | 56.13 | | | | |
| <64 | >9 | | | - | 0.500 | - | - | 0.125 | - | - | - | - |
| | | | | | 2 | | | 8 | | | | |
| | | $\bar{x}$ | 56.61 | 56.47 | 56.36 | 56.35 | 56.34 | 56.39 | 56.30 | 56.33 | 56.37 | 56.24 |
| Total | | $s^2$ | 0.386 | 0.336 | 0.373 | 0.407 | 0.400 | 0.399 | 0.333 | 0.387 | 0.420 | 0.520 |
| | | n | 99 | 169 | 752 | 80 | 367 | 691 | 100 | 99 | 99 | 96 |

Table 8 (Section III)

Average number of gillrakers in herring sampled in Subareas 4, 5 and 6 in 1973.

| Year-class | Age | | 4T May | 4X Feb | 5Ze Mar | 5Ze Jul | 5Ze Aug | 5Ze Sep | 5Ze Oct | 5Zw Mar | 5Y Aug | 6A Mar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1972 | 1 | | - | - | - | - | - | - | - | - | - | - |
| 71 | 2 | $\bar{x}$ | - | 45.06 | 48.00 | - | - | - | - | - | - | - |
| | | $s^2$ | | 2.589 | 3.600 | | | | | | | |
| | | n | | 109 | 6 | | | | | | | |
| 79 | 3 | | 44.00 | 49.00 | 48.85 | 49.12 | 48.98 | 49.23 | 49.31 | 48.94 | 48.97 | 49.16 |
| | | | - | - | 2.432 | 2.038 | 2.361 | 2.463 | 2.397 | 1.895 | 2.705 | 2.661 |
| | | | 1 | 2 | 648 | 57 | 355 | 529 | 100 | 100 | 93 | 100 |
| 69 | 4 | | 46.00 | | 49.06 | 49.15 | 49.11 | 49.00 | | | 48.00 | |
| | | | 0.500 | - | 2.786 | 1.641 | 2.861 | 1.964 | - | - | - | - |
| | | | 5 | | 48 | 13 | 9 | 58 | | | 3 | |
| 68 | 5 | | 46.38 | | 49.03 | 48.14 | 49.25 | 49.46 | | | 49.50 | |
| | | | 1.447 | - | 1.913 | 2.476 | 4.250 | 3.033 | - | - | 0.500 | - |
| | | | 21 | | 36 | 7 | 4 | 37 | | | 2 | |
| 67 | 6 | | 46.45 | | 48.60 | 50.00 | | 49.58 | | | 49.50 | |
| | | | 3.072 | - | 0.800 | 1.000 | - | 1.784 | - | - | 0.500 | - |
| | | | 11 | | 5 | 3 | | 31 | | | 2 | |
| 66 | 7 | | 46.45 | | 51.33 | | | 49.50 | | | | |
| | | | 2.365 | - | 2.750 | - | - | 2.852 | - | - | - | - |
| | | | 20 | | 9 | | | 18 | | | | |
| 65 | 8 | | 47.23 | | 49.33 | | 49.50 | 50.30 | | | | |
| | | | 3.136 | - | 6.333 | - | 0.500 | 2.677 | - | - | - | - |
| | | | 22 | | 3 | | 2 | 10 | | | | |
| 64 | 9 | | 47.85 | | | | | 50.00 | | | | |
| | | | 2.134 | - | - | - | - | - | - | - | - | - |
| | | | 20 | | | | | 1 | | | | |
| < 64 > | 9 | | | | 48.50 | | | 50.00 | | | | |
| | | | | - | 0.500 | - | - | 1.750 | - | - | - | - |
| | | | | | 2 | | | 9 | | | | |
| Total | | $\bar{x}$ | 46.84 | 45.13 | 48.90 | 49.08 | 48.99 | 49.28 | 49.31 | 48.94 | 48.96 | 49.16 |
| | | $s^2$ | 2.600 | 2.820 | 2.501 | 2.019 | 2.365 | 2.439 | 2.397 | 1.895 | 2.564 | 2.661 |
| | | n | 100 | 111 | 757 | 80 | 370 | 693 | 100 | 100 | 100 | 100 |

Table 9 (Section III)

Average number of keeled saales in herring in Subareas 4, 5 and 6 in 1973.

| Year-class | Age | | 4T May | 4X Mar | 5Ze Mar | 5Ze Sep* | 5Zw Mar | 6A Mar |
|---|---|---|---|---|---|---|---|---|
| 1972 | 1 | | - | - | - | - | - | - |
| 71 | 2 | $\bar{x}$ | - | 14.17 | 14.17 | | | |
| | | $s^2$ | | 0.752 | 0.166 | - | - | - |
| | | | | 151 | 6 | | | |
| 70 | - 3 | | 13.00 | 14.00 | 14.10 | 14.39 | 14.22 | 14.24 |
| | | | - | - | 0.584 | 0.668 | 0.759 | 0.771 |
| | | | 1 | 3 | 644 | 122 | 100 | 90 |
| 69 | 4 | | 13.75 | | 14.15 | 14.35 | | |
| | | | 0.270 | - | 0.477 | 0.635 | - | - |
| | | | 4 | | 47 | 26 | | |
| 68 | 5 | | 13.48 | | 14.03 | 14.33 | | |
| | | | 0.361 | - | 0.969 | 0.750 | - | - |
| | | | 21 | | 35 | 9 | | |
| 67 | 6 | | 13.45 | | 13.80 | 14.22 | | |
| | | | 0.472 | - | 1.700 | 0.418 | - | - |
| | | | 11 | | 5 | 18 | | |
| 66 | 7 | | 13.55 | | 13.89 | 13.78 | | |
| | | | 0.365 | - | 0.361 | 0.944 | - | - |
| | | | 20 | | 9 | 9 | | |
| 65 | 8 | | 12.86 | | 13.50 | 14.83 | | |
| | | | 0.828 | - | 0.500 | 0.566 | - | - |
| | | | 21 | | 2 | 6 | | |
| 64 | 9 | | 13.15 | | | | | |
| | | | 0.660 | - | - | - | - | - |
| | | | 20 | | | | | |
| ∠64 | >9 | | | - | 14.00 | 14.43 | | |
| | | | | | - | 0.619 | - | - |
| | | | | | 2 | 7 | | |
| Total | | $\bar{x}$ | 13.30 | 14.16 | 14.09 | 14.35 | 14.22 | 14.24 |
| | | $s^2$ | 0.581 | 0.738 | 0.592 | 0.657 | 0.759 | 0.771 |
| | | n | 98 | 154 | 750 | 197 | 100 | 90 |

* - maturity stage 6 only

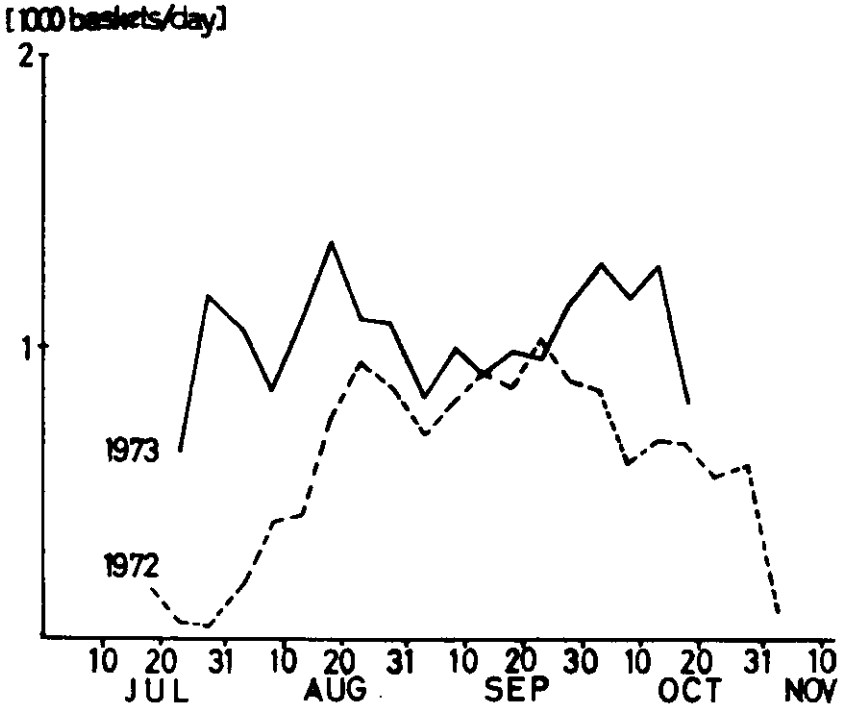


Fig. 4: Herring catch/day (baskets) on an average of about 5 days in Subdiv. 52e.
(Section III)