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CORRIGENDUM

SCIENTIFIC COUNCIL MEETING - JUNE 1997

Stock Assessment of Redfish in Division 3M by Data  
From 1996 Russian Trawl Survey

by

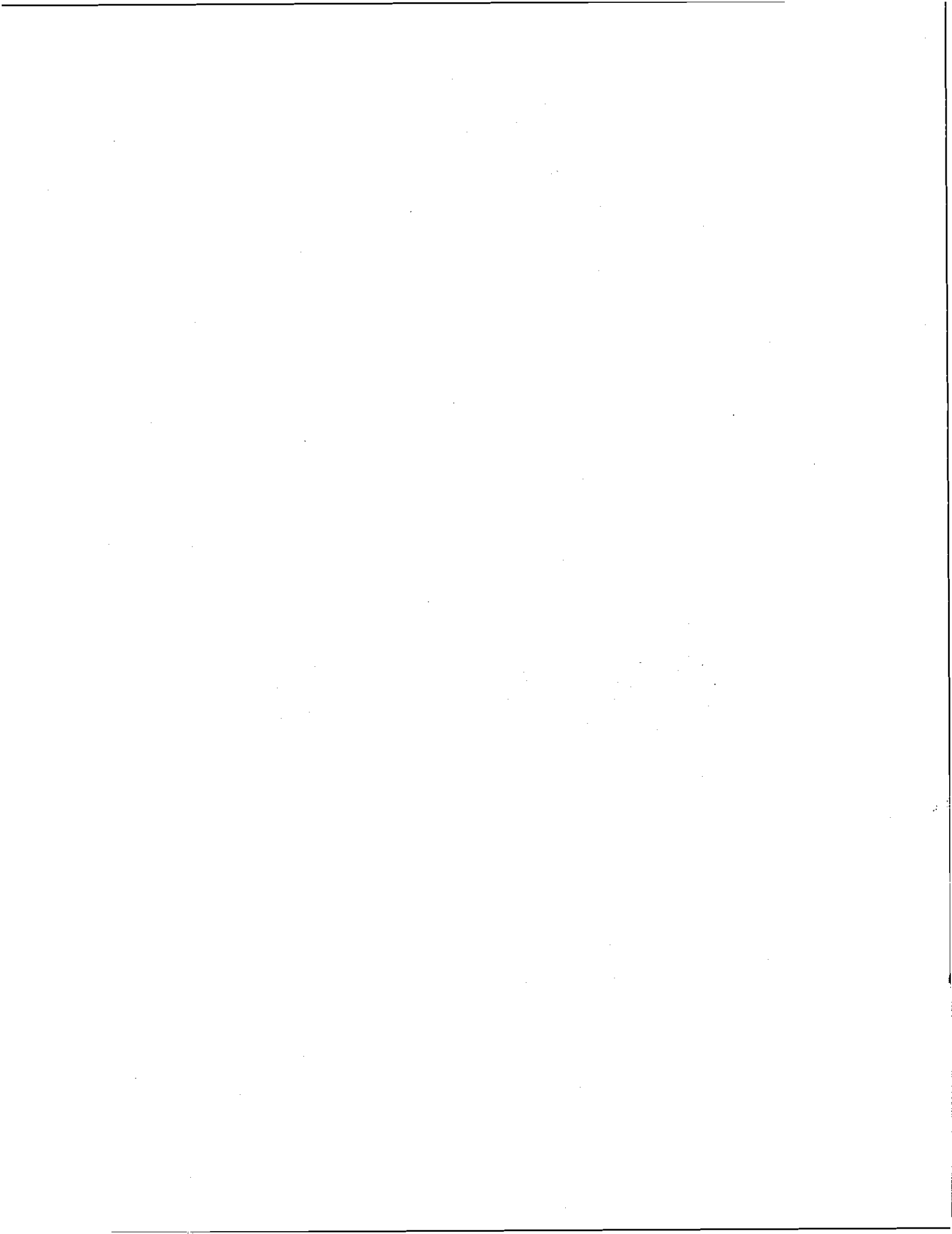
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CORRECTION:

Page 2 "Results", para. 7, should read:

"Biomass of S. mentella and S. fasciatus, by the data from the 1996 trawl survey, made up 10.0 thou.t and abundance - 62.3 mill. spec. (Table 3). The obtained results are the lowest for the period from 1987 to 1996. Besides, it should be noted that in 1996 the survey was carried out over the larger area."



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ABSTRACT

Estimates for abundance and biomass of refish from Sebastes genus are given by results from the trawl survey (TS) carried out on the Flemish Cap Bank in May 1996.

Data on length-age composition and distribution of group of S.mentella and S.fasciatus are also presented in the paper.

In 1996, based on the TS the abundance and biomass of the stock of S.mentella and S.fasciatus on the Flemish Cap Bank (Div.3M) were set at 62.3 mill.spec. and 10.0 thou.t, respectively. Total abundance of redfish from Sebastes genus constituted 71.9 mill.spec. and biomass - 15.9 thou.t.

Length of S.mentella and S.fasciatus at age 2-23 from catches varied from 7 to 50cm. Fish 20-23cm long at age 6-7 from the 1990-1989 high abundant yearclasses made up the main portion.

A lack of abundant yearclasses during the period of 1991-1996 indicates a poor recruitment to the redfish stock.

INTRODUCTION

The results presented in the paper were obtained during the trawl survey carried out by RV "Olaïne" (MI-8339) on the Flemish Cap Bank in May 1996.

Three species of redfish from Sebastes genus inhabit the Flemish Cap Bank, i.e. S.mentella, S.fasciatus and S.marinus. Estimates for redfish stocks are given in the paper for mixed aggregations of S.mentella and S.fasciatus and summarized for Sebastes genus. Data on redfish stock status presented earlier (Vaskov, Karsakov, 1996) did not include estimate for abundance and biomass of S.marinus.

MATERIALS AND METHODS

The trawl survey was carried out according to stratified random method (Doubleday, 1981; Bulatova, Chumakov, 1986) and agrees with the investigations performed earlier.

Hauls were done during 24 hours using a sampling bottom trawl with small-meshed insertion in a codend (a=10-12mm). On the whole 76 half-hour valid hauls were performed (Fig.1). The investigations were carried out to 914m depth in the area of the strata 501-520, 524, 528 and 533, according to the area stratification suggested in Bishop's paper (Bishop, 1994). 11961 sq.miles were covered by the trawl survey.

Due to a complication of exact identification the redfish were separated into two groups. The first group included mixed aggregations of S.mentella and S.fasciatus; the second one - S.marinus.

Fish were aged by scales.

No TS was carried out on the Flemish Cap Bank in 1994.

In 1995-1996 acoustic survey was not conducted.

#### RESULTS

In May, redfish were registered in catches taken from the whole area investigated on the Flemish Cap Bank (Tables 1 and 2). As a rule, mean catches of redfish in strata at 127-546m depths did not exceed 10 kg per 1 valid haul. In deeper strata below 550m mean catches varied from 10 to 27 kg. The densest aggregations of redfish were registered in stratum 519 (136.4 kg) at 550-731m depths.

Results from calculations have shown the main portion of S.mentella and S.fasciatus stock on the Flemish Cap Bank to be obtained in strata with 367-732m depths in 1996.

Length frequency of S.mentella and S.fasciatus from catches taken by valid bottom trawl varied from 7 to 50cm (Fig.2). Small-size immature redfish 20-23cm long from the 1989-1990 strong yearclasses made up the bulk of catches.

Redfish males in catches were presented by specimens at age 3-17 (Fig.3). Females were at age 3-23. On the whole 26 specimens of young redfish 7-12cm long at age 2-3 were caught during the survey period. Males and females at age 6-7 from the 1990-1989 strong yearclasses constituted a bulk of catches.

The investigations have shown that prior to 1991 an appearance of strong yearclasses of redfish was observed on the Flemish Cap Bank with a 4-5-year periodicity. No abundant yearclass was registered in that area from 1991 to 1996.

Further reduction in redfish spawning stock is noted. In 1995 a portion of fish at age above 10 made up 30% and the amount of these fishes decreased to 21.8% in 1996.

Biomass of S.mentella and S.fasciatus, by the data from the 1996 trawl survey, made up 20.7 thou.t and abundance - 137.9 mill.spec. (Table 3). The obtained results are the lowest for the period from 1987 to 1996. Besides, it should be noted that in 1996 the survey was carried out over the larger area.

During the period 1987-1996 total stock of redfish from Sebastes genus varied from 71.9 to 2008.0 mill. spec. by abundance and from 15.9 to 110.7 thou.t by biomass. In connection with this an increase in S.marinus stock level should be noted in 1996. Analogous estimates for the stock of this species of redfish on the Flemish Cap Bank were obtained in 1987 and 1989.

By the results from Spanish trawl survey carried out in 1995 (Vazquez, 1996) an increase in biomass of S.mentella from 35.7 to 59.3 thou.t was noted compared to 1994. In spite of this, the total stock for redfish of the whole Sebastes genus has decreased by 1.7 times. Data from the survey indicate a sharp reduction in the stock of young redfish to 15cm length. From 49.2 thou.t in 1994 the young redfish biomass reduced to 0.2 thou.t in 1995.

#### CONCLUSIONS

By results from the trawl survey carried out on the Flemish Cap Bank a reduction in redfish stock was registered. Compared to 1995, the biomass of S.mentella and S.fasciatus decreased from 20.7 to 10.0 thou.t and abundance - from 137.9 to 62.3 mill.spec. in 1996. Total biomass of redfish from Sebastes genus constituted 15.9 thou.t and abundance - 71.9 mill.spec. in 1996.

Fish 20-23cm long at age 6-7 made up the bulk of catches.

During the period 1991-1996 no abundant yearclasses were observed that indicated a poor recruitment to the redfish stock on the Flemish Cap Bank.

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Table 1. Results from the trawl survey for *S.mentella* and *S.fasciatus* in Div 3M. 1996.

| Stratum | Depth,  | Area,    | Nos  | Mean catch/ |       | Abundance, | Biomass, |
|---------|---------|----------|------|-------------|-------|------------|----------|
|         | m       | mile sq. | of   | 1 valid tow | fish  | '000       | tons     |
|         |         |          | tows | kg          |       |            |          |
| 501     | 127-146 | 342      | 3    | 11,7        | 1,5   | 295,6      | 37,4     |
| 502     | 147-183 | 838      | 4    | 0,8         | 0,1   | 46,6       | 4,8      |
| 503     | 184-256 | 628      | 3    | 0,3         | 0,04  | 15,5       | 1,9      |
| 504     | "-      | 348      | 3    | 3,3         | 0,4   | 77,3       | 10,8     |
| 505     | "-      | 703      | 3    | 3,3         | 0,3   | 173,6      | 16,7     |
| 506     | "-      | 496      | 3    | 4,7         | 0,3   | 171,5      | 12,7     |
| 507     | 258-366 | 822      | 3    | 11,7        | 0,6   | 710,4      | 37,9     |
| 508     | "-      | 646      | 3    | 2,3         | 0,3   | 111,6      | 14,4     |
| 509     | "-      | 314      | 3    | 23,0        | 2,6   | 535,0      | 61,2     |
| 510     | "-      | 951      | 3    | 40,3        | 3,9   | 2841,3     | 278,1    |
| 511     | "-      | 806      | 3    | 51,0        | 5,6   | 3044,9     | 333,2    |
| 512     | 367-546 | 670      | 3    | 27,0        | 3,7   | 1340,0     | 183,2    |
| 513     | "-      | 249      | 3    | 4,7         | 0,7   | 86,1       | 12,0     |
| 514     | "-      | 602      | 3    | 88,3        | 11,1  | 3939,0     | 494,1    |
| 515     | "-      | 666      | 3    | 130,7       | 17,1  | 6446,2     | 842,9    |
| 516     | 550-731 | 634      | 3    | 79,3        | 19,1  | 3725,7     | 897,7    |
| 517     | "-      | 216      | 4    | 94,8        | 15,0  | 1516,0     | 240,4    |
| 518     | "-      | 210      | 5    | 188,4       | 27,0  | 2930,7     | 419,7    |
| 519     | "-      | 414      | 3    | 808,3       | 136,4 | 24788,9    | 4183,8   |
| 520     | 732-914 | 525      | 4    | 110,3       | 23,0  | 4287,5     | 894,1    |
| 524     | "-      | 253      | 5    | 119,2       | 19,2  | 2233,9     | 360,8    |
| 528     | "-      | 530      | 3    | 55,7        | 14,2  | 2185,4     | 556,2    |
| 533     | "-      | 98       | 3    | 104,7       | 14,6  | 759,8      | 106,2    |
| Total   |         | 11961    | 76   |             |       | 62262,3    | 9999,9   |

Table 2. Data on average catches (kg) per one valid tow from the Russian trawl surveys for *S.mentella* and *S.fasciatus* in Div. 3M by stratum in 1989-1996\*.

| Stratum | Depth, m | Area, nm <sup>2</sup> | 1989  | 1990 | 1991  | 1992  | 1993  | 1995  | 1996  |
|---------|----------|-----------------------|-------|------|-------|-------|-------|-------|-------|
| 501     | 128-146  | 342                   | -     | -    | 0.04  | -     | -     | 0.04  | 1.5   |
| 502     | 147-183  | 838                   | -     | -    | 0.4   | -     | -     | -     | 0.1   |
| 503     | 185-256  | 628                   | 84.9  | -    | 0.4   | 1.7   | 0.4   | 0.4   | 0.04  |
| 504     | "        | 348                   | 0.5   | 0.01 | 0.6   | -     | -     | 1.8   | 0.4   |
| 505     | "        | 703                   | 0.4   | -    | 1.0   | 0.1   | 0.3   | 1.2   | 0.3   |
| 506     | "        | 496                   | 0.9   | 0.2  | 1.2   | 2.3   | -     | 0.6   | 0.3   |
| 507     | 258-366  | 822                   | 45.1  | 3.8  | 23.7  | 7.7   | 319.7 | 1.8   | 0.6   |
| 508     | "        | 646                   | 259.1 | 1.9  | 1.0   | 10.3  | 94.0  | 0.8   | 0.3   |
| 509     | "        | 314                   | 191.1 | 44.9 | 12.0  | -     | 350.4 | 18.3  | 2.6   |
| 510     | "        | 951                   | 112.7 | 94.2 | 25.3  | 19.1  | 161.0 | 44.1  | 3.9   |
| 511     | "        | 806                   | 363.3 | 42.2 | 190.8 | 8.3   | 119.4 | 5.1   | 5.6   |
| 512     | 367-549  | 670                   | 286.3 | 39.9 | 32.4  | 35.2  | 65.2  | 6.0   | 3.7   |
| 513     | "        | 249                   | 68.2  | 25.0 | 22.1  | -     | 266.9 | 35.4  | 0.7   |
| 514     | "        | 602                   | 70.2  | 32.1 | 61.9  | 14.0  | 59.4  | 131.0 | 11.1  |
| 515     | "        | 666                   | 83.5  | 29.7 | 88.8  | 91.6  | 110.6 | 4.9   | 17.1  |
| 516     | 550-731  | 634                   | 75.5  | 18.7 | 50.4  | 59.5  | 12.0  | 127.2 | 19.1  |
| 517     | "        | 216                   | 88.0  | 33.0 | 18.6  | -     | 104.8 | 51.1  | 15.0  |
| 518     | "        | 210                   | 23.6  | 12.9 | 533.1 | 20.5  | 29.2  | 140.4 | 27.0  |
| 519     | "        | 414                   | 65.7  | 7.6  | 333.7 | 171.1 | 9.1   | 16.7  | 136.4 |
| 520     | 732-914  | 525                   | -     | -    | -     | -     | -     | -     | 23.0  |
| 524     | "        | 253                   | -     | -    | -     | -     | -     | -     | 19.2  |
| 528     | "        | 530                   | -     | -    | -     | -     | -     | -     | 14.2  |
| 533     | "        | 98                    | -     | -    | -     | -     | -     | -     | 14.6  |

\* No investigations were carried out in 1994.

Table 3. Estimates provided by the trawl survey for redfish in Div. 3M for 1987-1996.

| Year | <i>Sebastes marinus</i>       |                 | <i>Sebastes mentella</i> and <i>S.fasciatus</i> |                 | Total                         |                 |
|------|-------------------------------|-----------------|---|-----------------|-------------------------------|-----------------|
|      | Numbers, fish 10 <sup>6</sup> | Biomass, thou.t | Numbers, fish 10 <sup>6</sup>                   | Biomass, thou.t | Numbers, fish 10 <sup>6</sup> | Biomass, thou.t |
| 1987 | 12.5                          | 4.3             | 463.2   | 106.4           | 475.7                         | 110.7           |
| 1988 | 29.7                          | 14.4            | 183.1   | 47.0            | 212.8                         | 61.4            |
| 1989 | 15.1                          | 6.8             | 283.8   | 83.3            | 298.9                         | 90.1            |
| 1990 | 6.4                           | 3.0             | 74.7  | 17.7            | 81.1                          | 20.7            |
| 1991 | 1.9                           | 0.1             | 2006.1  | 45.4            | 2008.0                        | 45.5            |
| 1992 | 0.6                           | 0.3             | 119.5   | 18.2            | 120.1                         | 18.5            |
| 1993 | 8.1                           | 2.8             | 681.7   | 69.8            | 689.8                         | 72.6            |
| 1994 | -                             | -               | -   | -               | -                             | -               |
| 1995 | 2.7                           | 0.9             | 137.9   | 20.7            | 140.6                         | 21.6            |
| 1996 | 9.6                           | 5.9             | 62.3  | 10.0            | 71.9                          | 15.9            |

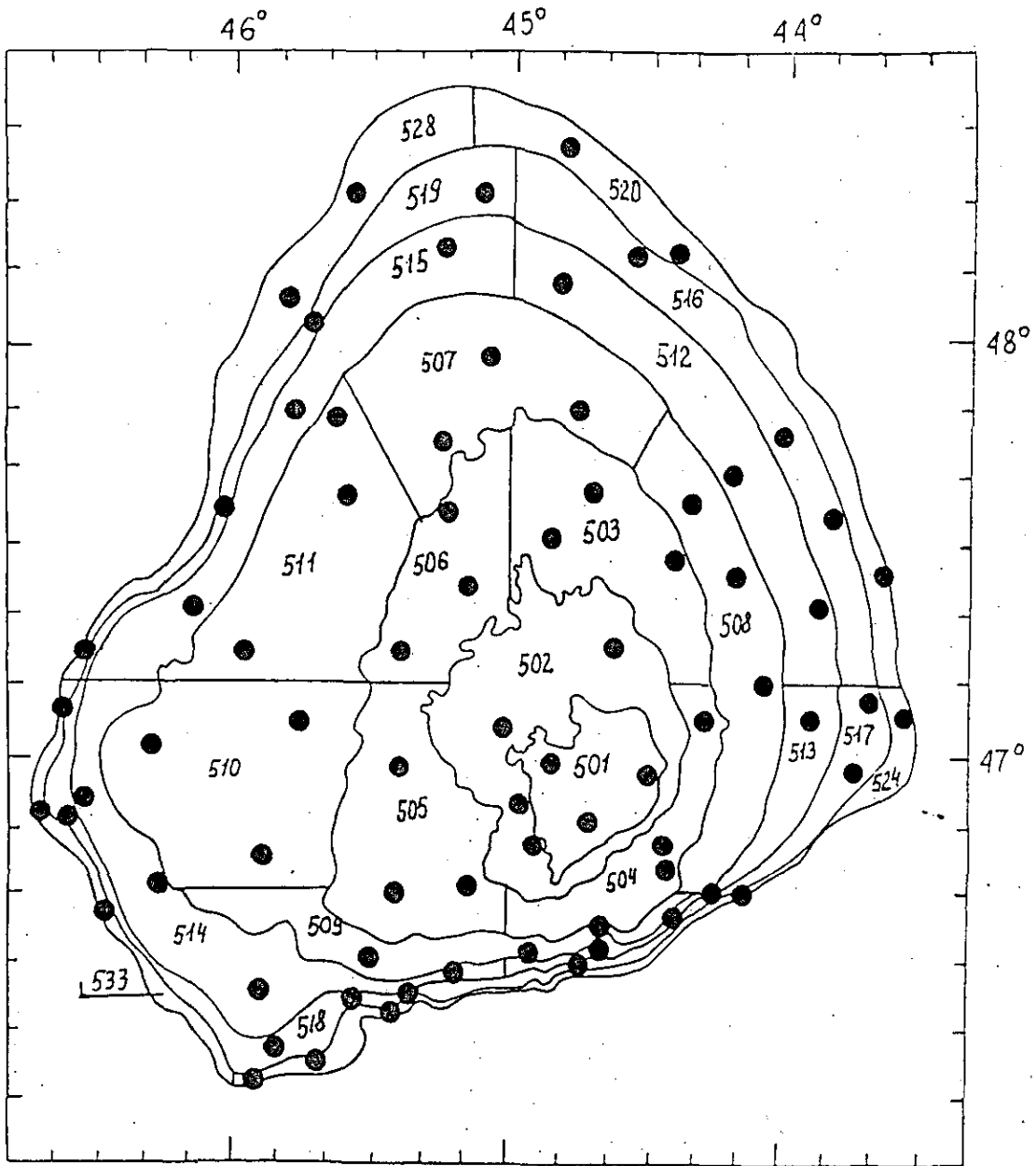


Fig. 1. Position of trawl stations in Div. 3M in 1996.

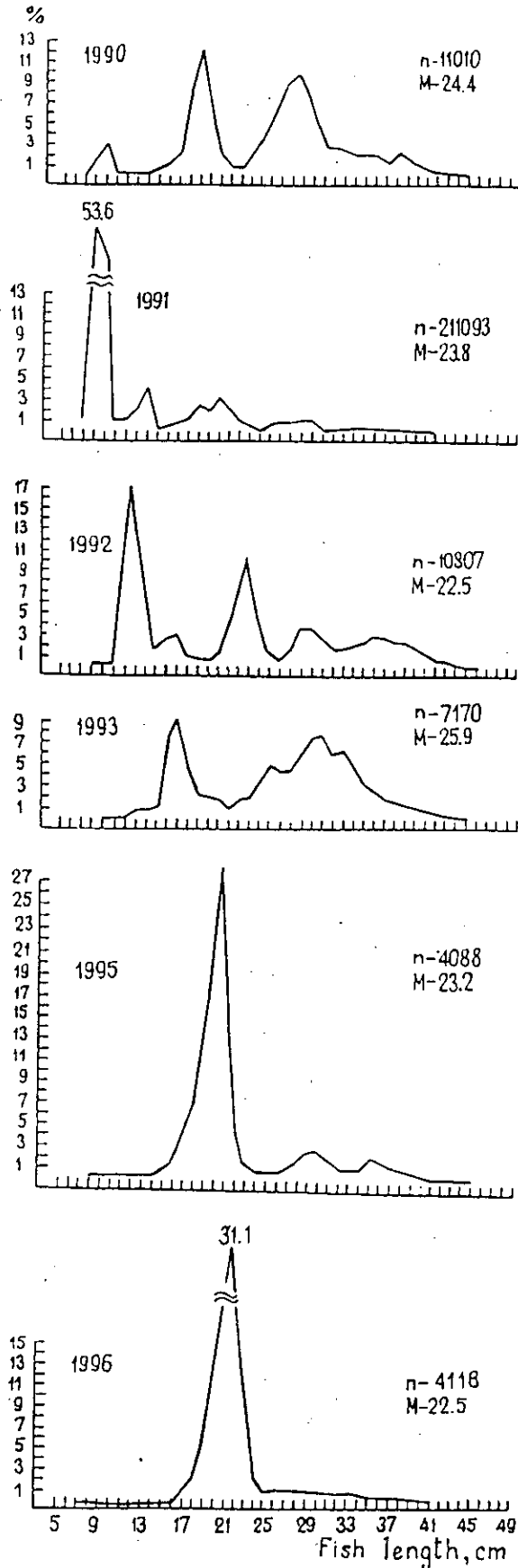


Fig. 2. Size composition of *S. mentella* and *S. fasciatus* in catches taken with a small-meshed trawl in Div. 3M in 1990-1996.



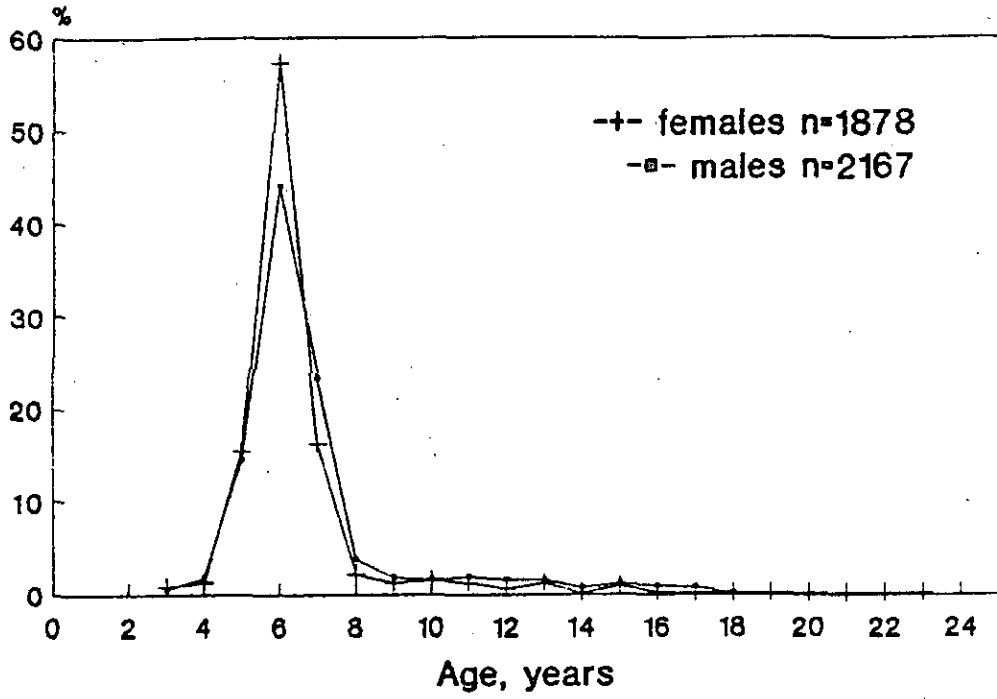


Fig.3. Age composition of *S. mentella* and *S. fasciatus* in the Flemish Cap. May, 1996.