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Soviet Investigations in the ICNAF Area, 1958

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As in the previous two years, the redfish was the main object of Soviet trawl fishery in the Northwest Atlantic, contributing 93 per cent to the total catch by Soviet trawlers in the Convention Area, 85 per cent falling to the share of Sebastes mentella. Therefore, the greatest attention was paid to the redfish investigations and to the exploration of the redfish fishing areas. Some cod samples were obtained, but in most cases cod constituted an insignificant by-catch of the redfish catch (5.2 per cent, on the whole).

Commercial trawlers operated on the eastern and northeastern slopes of the Great Newfoundland Bank (Subdivisions 3K, 3L and 3M) and in the southern part of the Labrador area (Subdivision 2J) only, mostly in water layers preferred by redfish (300 to 550-600 m.). Exploratory vessels (Odessa, Zapad, Novorossiisk) carried out their operations also mainly within the areas fished, sometimes moving out to Subdivisions 3N, 3O, 3P, 2H, and 2G.

Investigations were conducted in some of the areas which were not fished by Soviet commercial trawlers in 1958: namely, the west coast of Greenland was actively explored during the period from April to October inclusively, with short intervals.

Soviet investigators were mainly engaged in biological research: distribution of fish aggregations, size, age and sex compositions of the exploited fish stocks. Hydrological investigations were conducted on a limited scale, and they seem to point to a considerable increase in temperature level in 1958, particularly on the Great Newfoundland Bank.

Subarea 1

Explorations in this area were conducted by the trawler Novorossiisk from the middle of April to the middle of June, and from late July to the middle of September, and by the trawler Zapad in October. Both trawlers operated mainly in Subdivisions 1C and 1D, where during all that time commercial quantities of Sebastes marinus and cod were observed (Sebastes mentella were completely absent). Explorations in Subdivision 1E were carried out at the beginning and at the end of every trip, but without much success. No commercial aggregations were found in Subdivision 1B, which was explored by the Novorossiisk in July and August.

Redfish kept to the western slopes of the banks, particularly the Lille Hellefiske Bank, at depths of 250 to 350 m. and with temperatures in the bottom layers of 2° to 4°C (up to 5°C later).

Cod was caught together with redfish everywhere, but the greatest cod catches were obtained in shallower places, and particularly on the slopes of the deeps between the Lille Hellefiske Bank and the Fylla Bank and between Fylla and Fiskenes at a much lower temperature (sometimes lower than 1°C).

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Data on the size composition of redfish in the area of the greatest aggregations (Table 1) seem to show that prior to July the females were smaller in size than the males, and that in June the percentage of females in catches decreased considerably. This seems to point to the fact that in the West Greenland area the shedding of larvae takes place in June, and that by this time the females pass the Lille Hellefiske Bank on their way to the breeding places which may be situated in deeper and warmer waters. The age composition of the catches shows that redfish were youngest in June, when the males predominated and the oldest females were absent.

The smallest (about 50 centimeters) and the youngest (mainly 4 to 5 years) cod were caught in Subdivision 1C (Table 2). In Subdivisions 1D and 1E cod were of approximately the same size (about 60 centimeters on the average) and at an age of 5 to 8 years. The cod size measurements in Subdivision 1B (July to August) showed that small catches in this area consisted of still larger fish. Two age samples of cod taken in Subdivisions 1C (May) and 1D (June) indicate that the 1953 generation in West Greenland seems to be rich.

Subarea 2

Explorations at the Labrador coast were carried out by the Odessa and the Novorossijsk from the middle of August to late December, 1958. In August the northern part of this subarea was explored (Subdivisions 2G and 2H), but no commercial aggregations were found. Small quantities of cod were caught (from several fish to several hundred kilograms) of the average size of 52 centimeters.

Commercial quantities of fish were found in Subdivision 2J, particularly in its southern part on the slope of the continental shelf. The greatest catches consisted of Sebastes mentella taken at a depth of about 300 m., with a bottom temperature of about 3°C. Sebastes marinus was almost always present in the by-catch (15 per cent and more). Cod was also present at times, particularly in shallower places. The redfish were relatively large, the ground conditions favourable, and therefore most Soviet trawlers moved to that area by September.

Size and age compositions of catches are given in tables and figures[1].

In Sebastes mentella catches, females predominated prior to November, particularly in September and October. The condition of gonads showed that mating took place in August. Starting in November, the percentage of females began to decrease. The catches in Subdivision 2J were stable to the end of the year, but beginning in October a tendency was observed to the displacement of Sebastes mentella aggregations (females in the first place) southeastward, to the northeastern slope of the Great Newfoundland Bank and to greater depths.

All data available seem to indicate that Subarea 2 may be considered the place of summer feeding for the redfish and, ice conditions permitting, this fish may be caught in its southern half during the greater part of the year, the males predominating there during the earlier part of the year, whereas both sexes inhabit it during the latter half.

Almost everywhere Sebastes marinus was present in the catches of Sebastes mentella in different quantities. At the coasts of Labrador these stocks mix to a much greater extent than in any other area of the Atlantic, even during the mating period. Therefore, quite a great number of redfish with mixed characteristics may be observed there.

1) Figures 1-5 will be contained in the ICNAF Annual Proceedings, Vol. 9.

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The material on cod is very limited; it was based on the cod from the by-catch. The by-catch consisted of fish 20 to 120 centimeters in length and age 3 to 14 years. The greater part of cod consisted of fish 40 to 70 centimeters in length and age 5 to 9 years.

Subarea 3

The northeastern and eastern slopes of the Newfoundland Bank (Subdivisions 3M, 3L, and 3K) were the main fishing areas for a group of Soviet trawlers, which fished in the Convention Area. Only 9.7 per cent of the total catch was obtained at the Labrador coast, the rest were taken on the Newfoundland Bank: 52.6 per cent in Subdivision 3M, 27.2 per cent in Subdivision 3L and 10.5 in Subdivision 3K.

The exploratory vessels operated mainly in the same areas in March to June, August to September, and November to December. The banks of the southwestern and southern slopes were explored in April, May, November, and December, but the commercial trawlers did not move there, as no fish aggregations as large and as stable as those on the eastern and northeastern slopes were found there.

On the Flemish Cap Bank, the fleet operated from January to September, but this fishing ground was of particular importance in January to March and June to August. Subdivision 3L was fished by commercial trawlers from April to September, and particularly in April to May. In October to December the entire fleet operated in Subdivision 3K.

In all these subdivisions the catch was based on Sebastes mentella, which form particularly dense aggregations at depths of 300 to 450 m. (on the Flemish Cap to 600-650 m. during the winter months) and at a temperature of 3° to 4°C. Sebastes marinus was always present in the by-catch, particularly in Subdivision 3K. Cod was caught in smaller quantities, and mostly on the Flemish Cap Bank, particularly in March (over 10 per cent) and in June to July (about 10 per cent).

In all subdivisions of Subarea 3 the females of redfish predominated somewhat, and in Subdivision 3L they constituted over 70 per cent of the total catch by the end of the year. Fishing operations and size and sex compositions of the redfish catch show that the same stock is fished at the Labrador coast and on the eastern slope of the Newfoundland Bank, this stock moving southward in winter and northward in summer. The shedding of larvae takes place on the eastern and southeastern slopes of the Newfoundland Bank in May.

On the Flemish Cap Bank the redfish are, on the whole, smaller in size and they apparently do not mix with the Newfoundland redfish, but move along the slopes of the Flemish Cap, where extremely uniform hydrological conditions and a closed circular current are observed. The shedding of larvae takes place on the southern and southwestern slopes of the Flemish Cap, the feeding of males and females and the hibernation of males and immature females, on the northern slope.

The spawning of cod in the shallow places of the Flemish Cap and on its slopes takes place in March and the by-catch of cod at this time increases considerably. The age of spawning cod is mainly 7 to 9 years.

Table 1

Size composition of S. marinus in Subdivision 1C (%)

	APRIL		MAY		JUNE		JULY		AUGUST	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
30	1,0	0,7	0,7	0,4	1,1	0,9	-	-	0,2	0,2
31 - 32	2,1	1,6	0,6	2,2	0,8	1,3	-	-	0,2	0,2
33 - 34	4,1	2,2	0,9	1,0	1,3	1,9	-	-	0,2	0,2
35 - 36	9,4	9,0	4,8	4,2	3,6	6,6	3,0	1,9	0,3	0,3
37 - 38	11,5	12,8	7,5	8,2	13,8	18,0	4,4	4,7	1,1	1,3
39 - 40	14,3	19,7	12,3	13,3	14,0	17,5	4,1	5,9	2,4	3,3
41 - 42	21,2	22,8	15,9	15,2	10,8	11,3	3,7	3,1	5,9	4,9
43 - 44	12,3	16,3	12,1	11,8	12,2	10,3	4,8	6,2	10,2	9,1
45 - 46	7,0	5,2	16,8	15,6	12,9	14,0	13,7	11,3	8,3	7,8
47 - 48	2,9	0,9	7,8	8,2	8,2	5,1	5,6	7,0	7,6	7,6
49 - 50	1,3	1,7	5,1	4,8	4,9	3,3	14,5	14,1	6,3	6,2
51 - 52	1,0	0,7	1,6	2,4	4,5	3,5	9,3	10,9	6,4	6,8
53 - 54	0,6	0,5	1,5	0,9	2,5	2,0	13,7	14,5	7,5	7,7
55 - 56	1,0	0,2	2,0	2,2	2,8	1,6	5,6	5,1	5,7	5,8
57 - 58	1,1	0,7	2,4	1,3	2,3	1,0	7,4	9,0	5,0	5,3
59 - 60	2,1	0,7	0,3	1,6	1,5	0,4	4,4	3,5	4,9	4,9
➢ 60	7,1	4,2	7,3	5,9	2,7	1,2	5,6	2,6	28,0	28,1
No. of fish	617	577	943	671	1,947	1,222	269	256	5,774	5,106
Av. size	42,63	41,59	44,77	44,39	44,10	42,27	49,35	49,35	52,43	52,55
(%)	51,7	48,3	58,3	41,6	61,5	38,5	51,2	48,8	53,1	46,9

Table 2

Size composition of cod in West Greenland area in 1958 (%)

	IB		IC	ID			IE
	July	August	May	April	May	June	May
16 - 20	-	-	-	-	-	-	0,1
21 - 25	-	-	-	-	-	-	0,1
26 - 30	-	-	1,1	0,1	0,1	-	0,2
31 - 35	-	-	3,4	0,1	0,3	0,2	2,3
36 - 40	-	-	11,3	0,8	0,3	3,1	0,6
41 - 45	1,4	1,3	18,5	4,5	1,9	7,5	3,2
46 - 50	10,8	3,8	16,4	13,3	11,2	12,2	12,5
51 - 55	14,6	4,2	18,1	30,3	14,6	18,6	34,2
56 - 60	18,6	21,6	11,5	24,6	17,6	14,6	22,3
61 - 65	22,3	35,0	4,0	13,7	10,6	8,2	6,9
66 - 70	16,2	17,9	3,0	4,6	11,5	9,1	6,8
71 - 75	8,7	7,2	1,4	5,1	13,2	11,6	5,2
76 - 80	3,8	5,9	1,1	1,7	5,5	7,8	2,7
81 - 85	1,8	2,3	0,1	0,7	2,3	4,8	1,4
86 - 90	1,2	0,7	0,1	0,2	0,5	1,7	1,0
91 - 95	0,6	-	0,1	0,2	0,2	0,4	0,6
96 - 100	-	-	-	-	-	0,1	-
> 100	-	-	-	-	-	0,1	-
No. of fish	3,541	1,078	5,369	2,524	4,361	4,361	1,454
Av. size	61,80	63,55	49,26	56,08	60,75	60,61	56,94

Table 3

Size composition of S. mentella catches in Subdivision 2J (%)

	August		September		October		November		December	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
20	-	-	-	-		-	-	-	-	-
21 - 22	+	0,1	-	0,1	0,1	0,3	+	0,1	-	-
23 - 24	0,2	0,6	0,1	0,4	0,3	0,6	0,1	0,1	0,1	0,1
25 - 26	1,0	2,0	1,5	2,0	1,0	1,7	0,9	0,5	0,3	0,3
27 - 28	3,3	3,9	4,2	5,6	4,6	5,7	3,0	1,4	1,9	0,6
29 - 30	4,5	2,9	9,4	7,5	8,3	7,1	8,0	2,5	6,3	2,2
31 - 32	17,0	6,5	33,5	14,6	38,8	15,8	17,2	6,3	13,6	4,1
33 - 34	26,5	7,2	28,2	8,5	28,2	11,5	24,0	6,3	28,1	4,2
35 - 36	27,6	10,9	18,2	11,8	17,4	11,1	28,5	11,1	38,5	7,0
37 - 38	16,4	18,1	4,3	13,2	2,5	13,2	12,3	14,2	9,6	9,2
39 - 40	2,8	17,6	0,6	17,2	0,7	16,3	4,2	21,5	1,5	23,0
41 - 42	0,6	18,2	+	12,1	0,1	11,0	1,3	19,4	0,1	25,9
43 - 44	0,1	8,6	-	4,8	-	4,0	0,3	8,5	-	14,5
45 - 46	-	2,7	-	1,8	-	1,2	0,1	6,2	-	6,5
47 - 48	-	0,6	-	0,4	-	0,4	+	1,4	-	1,0
49 - 50	-	0,1	-	+	-	0,1	+	0,4	-	0,3
> 50	-	-	-	-	-	-	-	0,1	-	+
No. of fish	3959	4481	4691	7723	1922	3061	5863	5474	4156	2968
Av. size	34,11	37,53	32,64	35,88	32,53	35,51	34,04	38,63	34,08	39,70
%	46,9	53,1	37,8	62,2	36,6	63,4	51,7	48,3	58,3	41,7

Table 4

Size composition of S. mentella catches in Subdivision 3M (%)

	March		April		May		August		Sept.		Dec.	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
21 - 22	0,1	0,2	+	-	+	-	-	+	-	-	-	+
23 - 24	0,2	0,4	0,1	0,2	0,2	0,3	0,1	0,1	+	+	0,2	0,3
25 - 26	1,7	1,7	0,8	1,3	4,6	2,7	0,6	1,0	0,7	1,2	0,8	1,0
27 - 28	6,6	4,9	5,0	4,2	13,2	9,4	4,5	4,1	2,8	3,4	1,8	3,8
29 - 30	10,2	7,0	11,5	9,0	18,2	12,1	22,9	16,6	14,7	10,2	11,5	10,1
31 - 32	23,0	12,4	21,1	13,2	25,3	14,8	24,4	19,6	22,4	13,3	29,1	14,2
33 - 34	23,7	14,8	27,4	14,9	22,9	18,2	17,3	15,7	20,2	13,8	33,5	14,5
35 - 36	23,8	22,9	24,6	21,1	11,8	17,1	20,8	18,6	26,1	23,3	20,2	28,5
37 - 38	7,6	17,4	8,2	14,7	3,2	17,3	6,1	10,9	8,5	15,5	2,6	17,5
39 - 40	2,4	10,5	1,3	12,3	0,4	6,2	2,7	9,5	3,7	13,0	0,3	8,5
41 - 42	0,7	5,4	-	7,5	+	1,5	0,5	2,9	0,5	4,1	-	0,8
43 - 44	0,1	1,8	-	1,2	-	0,2	+	0,9	0,2	1,7	-	0,8
45 - 46	+	0,4	+	0,3	-	+	+	0,2	0,1	0,7	-	-
47 - 48	-	+	-	-	-	-	-	+	-	+	-	-
49 - 50	-	-	-	-	-	-	-	-	-	+	-	-
> 50	-	-	-	-	-	-	-	-	-	-	-	-
No. of fish	7939	8503	1700	2251	2029	2431	5472	8152	8915	12253	1133	1432
Av. size	33,06	34,93	33,14	35,01	31,35	33,43	32,63	33,83	33,40	34,07	32,67	34,40
%	48,3	51,7	43,0	57,0	15,5	84,5	40,2	59,8	42,1	57,9	44,2	55,8

Table 4A

Size composition of *S. mentella* catches in Subdivision 3L (%)

	April		August		September		December	
	♂	♀	♂	♀	♂	♀	♂	♀
21 - 22	-	-	-	+	-	0,1	-	+
23 - 24	0,1	+	0,1	+	0,6	0,6	+	0,1
25 - 26	0,3	0,2	0,5	0,7	2,5	5,7	0,4	0,6
27 - 28	1,4	1,0	1,4	1,3	6,7	7,7	0,4	0,7
29 - 30	2,5	1,3	4,6	3,7	13,9	10,3	3,8	3,1
31 - 32	12,7	2,9	16,6	8,5	23,9	10,3	14,0	8,0
33 - 34	29,9	4,9	18,5	8,5	21,5	10,1	17,0	9,9
35 - 36	31,1	9,8	19,9	15,7	22,0	13,3	28,8	15,1
37 - 38	13,5	20,5	13,5	13,7	6,2	8,3	13,4	12,6
39 - 40	3,9	20,0	9,3	18,9	2,1	14,6	14,5	19,7
41 - 42	2,6	19,1	3,8	13,5	0,3	9,3	4,6	13,0
43 - 44	0,8	12,8	1,1	7,8	0,1	6,1	2,8	8,7
45 - 46	0,1	5,4	0,6	6,3	0,2	3,1	0,6	5,9
47 - 48	-	1,5	0,1	1,1	-	0,4	-	2,5
49 - 50	-	0,3	+	0,2	-	0,1	-	0,6
> 50	-	0,1	-	+	-	-	-	0,1
No. of fish	3,528	4,651	5,745	10,059	879	1,707	2,090	5,119
Av. size	34,74	38,27	35,05	37,85	32,68	34,16	35,71	38,11
%	43,1	56,9	36,4	63,6	34,0	66,0	19,0	71,0

TABLE 4B

Size composition of S. mentella catches in Subdivision 3K (%)

	3K					
	OCTOBER		NOVEMBER		DECEMBER	
	♂	♀	♂	♀	♂	♀
21 - 22	-	-	-	-	-	+
23 - 24	+	0,1	0,1	0,1	0,2	0,6
25 - 26	0,8	0,7	0,6	1,2	1,0	2,8
27 - 28	3,2	2,7	3,7	5,4	3,0	2,8
29 - 30	6,2	4,6	7,6	6,5	9,6	6,7
31 - 32	13,8	8,2	16,1	10,3	14,9	6,3
33 - 34	17,8	10,8	19,4	14,5	23,3	6,7
35 - 36	31,1	20,3	28,0	18,7	35,4	10,7
37 - 38	14,4	16,8	14,0	12,0	8,9	11,1
39 - 40	5,7	14,3	6,2	11,8	3,0	22,9
41 - 42	4,8	13,2	4,2	10,2	0,2	16,0
43 - 44	1,7	5,8	+	7,2	0,1	7,1
45 - 46	0,5	2,2	+	2,0	0,1	4,6
47 - 48	+	0,3	-	0,1	+	0,8
49 - 50	-	+	-	-	0,1	0,5
> 50	-	-	-	-	+	+
No. of fish	9,943	13,189	2,957	3,606	2,754	4,043
Av. size	34,87	36,80	34,43	35,96	33,84	37,42
%	43,0	57,0	45,1	54,9	40,5	59,5

Table 5

Size composition of cod in Newfoundland area in 1958 (%)

	3M					3L			3N	3O
	March	April	May	August	Sept.	April	Aug.	Dec.	Apr.	Apr.
21 - 25	-	0,6	0,2	-	-	-	0,6	0,1	-	-
26 - 30	-	-	0,2	0,1	-	1,2	1,5	0,7	0,2	-
31 - 35	0,5	3,1	1,2	0,2	-	0,7	0,9	1,6	1,7	0,9
36 - 40	5,6	12,8	5,7	4,1	0,3	2,5	2,5	4,5	3,2	2,4
41 - 45	12,0	30,5	21,1	21,8	9,6	12,5	1,2	6,7	11,3	10,7
46 - 50	11,2	22,9	17,0	26,4	18,7	15,5	4,6	10,0	25,4	15,2
51 - 55	22,5	14,6	12,0	23,3	22,2	22,8	7,4	14,6	36,7	20,3
56 - 60	24,3	6,9	13,4	13,4	21,9	20,4	10,1	20,0	9,9	11,9
61 - 65	14,1	4,6	9,8	6,3	12,5	12,1	16,9	15,9	4,6	11,4
66 - 70	5,8	3,1	7,3	1,9	6,1	5,5	11,7	14,3	3,4	7,2
71 - 75	2,0	0,3	5,7	1,1	2,4	2,1	5,2	5,8	1,9	7,2
76 - 80	0,6	-	2,5	0,6	1,1	1,2	8,3	3,0	0,2	4,5
81 - 85	0,3	-	1,2	0,1	0,3	1,3	6,8	0,9	0,4	4,4
86 - 90	0,4	-	0,8	0,2	2,1	1,3	6,4	1,0	0,2	1,9
91 - 95	0,2	-	0,6	0,4	1,1	0,6	4,9	0,2	0,4	0,9
96 - 100	+	-	-	-	0,5	-	4,3	0,2	-	0,3
> 100	0,3	0,3	1,0	0,3	1,1	0,4	6,8	0,7	0,2	0,7
No. of fish	4,513	350	467	1,126	375	678	326	1,515	475	845
Av. size	54,82	47,64	53,28	51,18	57,07	55,23	70,17	58.40	52,17	58,85