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Russian Research Report for 2004

by

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**SUBAREAS 1+ 2**

**A. Status of the Fisheries**

*Greenland halibut*

From the late August to the early October, in Division 1A, 1-3 trawlers were engaged in Greenland halibut fishery for 26 fishing days. The fishing took place in a comparatively small area between 69°00'-70°00'N and 59°00'-60°00'W where at the depth of 1 000-1 250 m 241 tons of halibut were caught. Mean daily catch was 7.6 tons and it was maximal – 10.4 tons - in September.

In the area to the south of 68° (Div.1CD), up to 5 trawlers operating during 141 fishing days participated in the fishery. The trawl fishery took place from August to October, in the area between 63°30'-64°30'N, 55°30'-58°00'W, at the depth of 1 000-1 500 m. 1 214 tons of Greenland halibut were caught. Mean daily fishing efficiency was 7.4 t and it was maximal – 9.4 tons – in August.

In the trawl catches the Greenland halibut made up, on the average, 99%. The main objects of by-catch were roughheaded and roundnosed grenadiers, as well as the small numbers of threebeard rockling and skates.

By preliminary data, in 2004, off the West Greenland, 1 480 tons of fish including 1 455 tons of Greenland halibut and about 25 tons of by-catch objects were caught by home fleet (Table 1).

*Deep-water redfish*

Russian fishing of pelagic deep-water redfish in Div. 1F, 2J was executed at 190-330 m depths, in July-September. Participating were 1-14 vessels of STM, RTMS and BMRTIB-types. The highest vessel efficiency was in August when the mean catch equaled to 19.5-27.8 tons per a fishing-day. In September, trawl efficiency was somewhat lower amounting to 8.3-11.0 tons per a fishing day. According to the preliminary data, the total catch of pelagic redfish equaled to 12 083 tons. About 75% of total redfish catch were taken in Div.1F.

Other fish species. There was no directed fishery of the other fish species. The by-catch of grenadier, skate, wolffishes and the other species amounted to about 2%.

## B. Special Research Studies

Biological data were collected by scientists from PINRO being aboard the research vessels as NAFO observers in NAFO Convention Area during the fishery period.

### *Greenland halibut*

In August, in Div. 1D, halibut 32-99 cm in length were recorded, fish as long as 46-53 cm prevailed. The average length of males was 49.3 cm, of females – 58.0 cm (Table 2).

In Div. 1D, halibut age varied from 4 to 16 years, predominating were individuals aged 6-7 (Table 3).

### *Deep-water redfish*

63 899 fish were measured, the analysis of feeding and maturity was made for 12 346 individuals, the age of 1165 ones was analyzed. In Div. 1F, in the catches, the length of deep-water redfish varied from 24 to 43 cm, the mean length was 34.1 cm (Table 4). Fish 33-36 cm in length aged 12-15 made up the bulk of catches (Table 5). Sex ratio was 1.4:1. About 10% of fish were immature. Redfish feeding was moderate. Zooplankton *Calanus* and *Themisto* made up the bulk of food diet.

In Div. 2J, the mean length of redfish was 33.7 cm. Fish with the length of 34-37 cm at the age of 11-15 years old prevailed in catches. Sex ratio was 1.5:1. The portion of immature fish amounted to 9%. Redfish fed intensively. *Calanus* and *Themisto* predominated in feeding.

## SUBAREA 3

### A. Status of the Fisheries

#### *Greenland halibut*

Russian quota for 2004 in Div. 3LMNO amounted to 1 890 tons. Directed fishery was conducted by 7 vessels during the year. In 2004, Russian catch of halibut was 1 680 tons .

The vessels operated on the continental slope, in the areas adjacent to the Flemish Pass (Div. 3L and adjacent areas of Div. 3M) at 640-1 360 m depth. Mean fishing efficiency was 200 kg of halibut per fishing hour. 80% of the total halibut catch, were taken in that area. Catches contained skates – 5%, redfishes – 3%, grenadiers – 3%, hakes – 2%, American plaice – 1%, witch flounder – 1% and the other fish species – 1%.

In Div. 3NO, at 690-1 310 m depths, five vessels fished from time to time. Mean fishing efficiency was 200 kg of halibut per a fishing hour. In those divisions the by-catch was larger: skates - 14, grenadiers – 11, redfishes – 3, American plaice – 2, witch flounder – 2, hakes – 1, wolffishes – 1, Atlantic halibut – 1 and the other species – 1%.

#### *Redfish*

In 2004, there was no directed fishery of redfish on the Flemish Cap Bank. According to the preliminary data, the total catch taken as by-catch in halibut fishing equaled to 6 tons.

In Div. 3O, redfish sometimes was fished from January to April. The two vessels of STM-type operated at 300-600 m depth. Hakes, American plaice and cod made up the bulk of by-catches in redfish fishery. As a whole, in the period of fishing the efficiency of vessels of STM-type was 11.0 tons. By preliminary data, in this area the total catch of redfish amounted to 243 tons.

#### *Skates*

In Div. 3N, the directed fishery of skates was conducted by the two vessels of SRTMK-type (1 000-2 000 kW) at 40-150 m depth from August to November. The main fishing object was thorny skate (*Amblyraja radiata*). As a whole, during directed fishery the efficiency of SRTMK-type vessels was 25.9 t/fishing day. By the preliminary data, in Div. 3N, in the directed fishery, the catch of skates equaled to 2 835 tons.

In Div. 3LMO, thorny skate occurred only as by-catch in halibut fishery.

By the preliminary data, the total catch of skates in Div. 3LMNO made up 3 415 tons.

#### *Other species*

No directed fishery for other fish species was carried out. By-catch of the other fish species in the directed fisheries accounted for 1-10%.

### **B. Special Research Studies**

In 2004, in NAFO Regulation Area, conducted were some investigations to study selectivity of redfish in Div. 3O. They were carried out by bottom trawl using the method of small-meshed cover.

From January to February 2004, the trawler “*Vladimir Gavrilov*” carried out works to determine selectivity of codends with mesh size of 99.7 and 105.8 mm for redfish from Div. 3O. The data on the results of works in these cruises are presented in some papers.

#### *Greenland halibut*

There were no special surveys to estimate the stock of Greenland halibut. Aboard fishing vessels biological data were collected by the observers from PINRO.

In Div. 3LMN, Greenland halibut 21-104 cm in length occurred in the catches of fishing vessels, the mean length was 43.2 cm (Tables 6, 7, 8). Individuals from 38-44 cm length groups predominated. Small immature fish made up the bulk of catches. The by-catch of halibut with the length of less than allowable one (30 cm) accounted for less than 0.6%.

#### *Roughhead grenadier*

It is one of abundant by-catch objects in the fishery of Greenland halibut. In Div. 3L, the total length of roughhead grenadier varied from 21 to 93 cm, the mean length was 48.7 cm (Table 9). Fish as long as 42-45 cm prevailed.

In Div. 3N, fish size varied from 12 to 83 cm, the mean length was 52.9 cm. Grenadier as long as 48-51 cm made up the bulk of catches.

As a whole, in Div. 3LN, roughhead grenadier with 12-93 cm length occurred, the mean length was 51.7 cm.

#### *Deep-water redfish (Sebastes mentella)*

In Div. 3L, the length of deep-water redfish in by-catch in Greenland halibut fishery ranged from 20 to 46 cm with the mean length of 29.9 cm (Table 10). Prevalent were fish of 28-29 cm length.

In Div. 3M, redfish length distribution fluctuated from 23 to 44 cm. Fish with length of 29-33 cm made up the bulk of catches.

In Div. 3N, redfish length was equal to 21-43 cm with the average one of 30.3 cm. In the catches, fish 28-30 cm in length were predominating

In Div. 3O, redfish length ranged from 17 to 42 cm with the mean length of 27.6 cm. Catches contained mainly fish of 24-26 cm in length.

#### *Acadian redfish (S. fasciatus)*

In 2004, observers at Russian vessels separated deep-water redfish from Acadian redfish in catches and biological data on those species were collected. In Div. 3O, *S. fasciatus* 18-36 cm in length occurred, the mean length was equal to 25.2 cm (Table 11). Prevailing were fish 23-25 cm in length.

*American plaice*

In Div. 3L, length distribution of American plaice was characterized by 20-60 cm fish.

In Div. 3N, in the fishery of skate, in by-catch, the length of American plaice varied from 18 to 74 cm with the mean one of 46.7 cm. Predominating were fish 36-38 cm and 54-56 cm in length (Table 12).

In Div. 3O, the length distribution of American place varied from 18 to 54 cm, the mean length was 32.8 cm.

*Yellowtail flounder*

It was mainly recorded in by-catch in the skate fishery in Div. 3N. In Div. 3L, only single fish occurred in catches. In Div. 3N, fish length fluctuated from 20 to 54 cm; the mean length amounted to 37.0 cm (Table 13). Fish 34-38 cm in length predominated in catches.

*Witch flounder*

In Div. 3L, the length distribution of witch flounder in by-catches in the fishery of Greenland halibut was characterized by fish as long as 24-56 cm with the average length of 38.8 cm (Table 14).

In Div. 3N, fish length in by-catches varied from 20 to 62 cm, the mean one was 46.7 cm. Individuals 38-40 cm in length were predominating in catches.

The length distribution of witch flounder from Div. 3O varied from 30 to 54 cm.

*Cod*

The largest cod was registered in Div. 3N, in the catches during the directed fishery of skates. Length distribution varied from 30 to 144 cm, with the mean length of 88.0 cm (Table 15).

In Div. 3O, cod as long as 36-90 cm were recorded in catches; fish average length was 57.4 cm. Individuals 63-66 cm in length made up the bulk of catches.

*Three beard rockling*

This species occurred as by-catches in the directed fishery of Greenland halibut. The length of examined fish in Div. 3L ranged from 24 to 51 cm with the mean length of 39.4 cm (Table 16). Catches were dominated by fish of 39-41 cm length.

The length of fish in Div. 3N was 24-51 cm.

*White hake*

In Div. 3N, this species length varied from 39 to 75 cm with the mean length of 54.8 cm.

In Div. 3O, fish length varied from 27 to 78 cm with the mean one of 55.8 cm (Table 17). In the catches fish 54-60 cm in length prevailed.

*Thorny skate*

In Div. 3L, in the fishery of Greenland halibut, the skate length varied from 24 to 84 cm, the average length amounted to 44.7 cm (Table 18).

In Div. 3N, the length of caught individuals varied from 15 to 96 cm with the mean length of 59.2 cm. The catches were predominated by fish with 54-63 cm length.

The length of thorny skate from Div. 3O fluctuated from 33 to 69 cm with the mean one of 48.0 cm

*Spinytail skate*

Single fish were recorded in catches in all the areas. The length of spinytail skate varied from 18 to 138 cm, the mean length was 39.5 cm (Table 19).

*Black dogfish*

They were registered in by-catches in the fishery of halibut, at 800-1 500 m depths. The length of fish from Div. 3LMNO varied from 36 to 114 cm; mean length was 63.6 cm (Table 20). In the catches predominating were fish 60-66 cm in length.

*Northern wolffish*

They were registered in the fishery of halibut. In Div. 3L, the length of northern wolffish varied from 33 to 123 cm, the mean length amounted to 57.9 cm (Table 21). The catches were predominated by individuals 45-48 cm in length.

In Div. 3N fish length varied from 39 to 117 cm, the average length was 65.0 cm

*Other fish species*

In the period of fishery, occurring as by-catch were Atlantic halibut, common grenadier, Atlantic and common wolffishes, roundnose grenadier, chimaeras, longfin hake, Notacanthidae, blue hake and other fish species.

#### SUBAREA 4

##### A. Status of the Fisheries

In 2004 Russian fishery for silver hake (*Merluccius bilinearis*) was carried out by one vessel of TSM type from the last day of February to the early April. The total catch amounted to 543 tons. The catch per fishing day varied within 15-30 tons and considerably exceeded the level of the previous year.

The biomass seems to increase as a result of the stock recruitment with a strong year-class 2002 (DFO, 2003). As regards the next year-class, the updated data of AtlantNIRO indicated that oceanographic conditions during hake spawning in 2003 did not facilitate high survival of fish at the early development stages. Nevertheless, in 2005 the increase of the fishing stock stipulated by increase of the year-class 2002 weight and low fishery mortality will evidently continue.

##### B. Special Research Studies

###### 1. Environmental Researches

###### a) Hydrographic studies

In 2003 the monitoring of sea-surface temperature (SST) was continued. For this purpose the mean monthly SST deviation from the long-term mean values for the period from 1977 to 2002 at 13 points located in NAFO Subdiv. 2J, 3KLMN, 4VWX and adjacent open-sea area (Fig. 1). These data analysis indicated the following SST trends in 2004.

In points 1, 4, 6 and 8 located in the Labrador current and to the north of Flemish Cape (point 7) positive deviations of SST were observed which were close to or slightly higher than in 2003. Insignificant negative deviations were noted only in winter.

In the North Atlantic current area (points 3 and 5) SST values were slightly below the norm in spring, while in other seasons positive deviations were recorded, which actually do not differ from the level of 2003.

On the Grand Bank shelf (point 9) SST was close to the long-term mean and to the level of 2003. Low negative anomalies were recorded also in spring.

In the eastern shelf of New Scotland (point 10) SST was close to the norm and was slightly lower than in 2003. The lowest SST values were observed on the shelf slope (point 11), where negative anomalies occurred in winter, spring and autumn. In all seasons SST values in this area were lower than in 2003. The similar SST pattern was recorded in the Slope water mass of the adjacent ocean area (point 12). In the Gulf Stream front boundary (point 13) positive anomalies of SST were observed during 2004 similar to 2003.

Therefore, in the most areas considered SST values exceeded the norm and were higher than in 2003. Only on the shelf slope of New Scotia and in the Slope water mass SST values were below the long-term mean level and lower than in 2003.

### C. Miscellaneous Studies

The possibility of evaluating the effect of density dependence and environment factors on recruitment formation and abundance dynamics was studied in 13 stock units of commercial fishes in NAFO area with reference to fishery management. The purpose was to differentiate the stock units considered according to possibility to applying in fishery management based on assessment of the spawning biomass reference points  $B_{lim}$  and  $B_{buf}$ . The analysis was carried out by means of ad hoc and rather simple approaches. The results obtained are disputable and preliminary. These researches are not finished and will be continued.

### References

DFO. 2003. Silver hake on the Scotian Shelf (Div. 4VWX). *Sci. Stock Status Rep.*, No. 2003/052.

TABLE 1. Preliminary data on catch taken by Russian trawlers in NAFO SA 1-3 in 2004.

Species	Division	Catch, t
Greenland halibut	1A	241
	1C	154
	1D	1 060
	<b>1ABCD</b>	<b>1 455</b>
	3L	1 303
	3M	33
	3N	338
	3O	6
	<b>3LMNO</b>	<b>1 680</b>
Atlantic halibut	3L	2
	3M	1
	3N	12
	3O	1
	<b>3LMNO</b>	<b>16</b>
American plaice	3L	24
	3M	4
	3N	180
	3O	19
	<b>3LMNO</b>	<b>227</b>
Yellowtail flounder	3N	<b>140</b>
Witch flounder	3L	12
	3M	2
	3N	51
	3O	9
	<b>3LMNO</b>	<b>74</b>
Roughhead grenadier	3L	143
	3M	19
	3N	352
	3O	7
	<b>3LMNO</b>	<b>521</b>
Redfish spp.	1F	8 943
	2J	3 139
	<b>1F2J</b>	<b>12 082</b>
	3L	38
	3M	6
	3N	46
	3O	243
	<b>3LMNO</b>	<b>333</b>
Skate	3L	94
	3M	6
	3N	3 290
	3O	25
	<b>3LMNO</b>	<b>3 415</b>
Atlantic cod	3M	2
	3N	88
	3O	8
	<b>3MNO</b>	<b>98</b>
Wolffish spp.	3L	5
	3M	6
	3N	4
	3O	2
	<b>3LMNO</b>	<b>17</b>
Three beard rockling	3L	44
	3M	2
	3N	2
	<b>3LMN</b>	<b>48</b>
White hake	3O	<b>75</b>

TABLE 2. Greenland halibut length composition (No. of individuals) in the Russian trawl catch in NAFO Div. 1D in 2004.

Length, cm	M	F	Total
32- 33	1	1	2
34- 35	0	0	0
36- 37	5	3	8
38- 39	13	4	17
40- 41	30	16	46
42- 43	68	27	95
44- 45	141	38	179
46- 47	219	50	269
48- 49	228	64	292
50- 51	199	79	278
52- 53	143	56	199
54- 55	86	52	138
56- 57	50	33	83
58- 59	18	14	32
60- 61	14	19	33
62- 63	9	15	24
64- 65	13	20	33
66- 67	7	9	16
68- 69	5	12	17
70- 71	0	13	13
72- 73	0	10	10
74- 75	0	18	18
76- 77	0	8	8
78- 79	0	12	12
80- 81	0	6	6
82- 83	0	14	14
84- 85	0	12	12
86- 87	0	14	14
88- 89	0	6	6
90- 91	0	8	8
92- 93	0	3	3
94- 95	0	8	8
96- 97	0	3	3
98- 99	0	2	2
<b>TOTAL</b>	<b>1 249</b>	<b>649</b>	<b>1 898</b>
Av. length, cm	49.3	58.0	52.2



TABLE 3. Greenland halibut age composition in Russian trawl catch (No. of individuals) in NAFO Div.1D in 2004.

Length, cm	Age, years													Total	Weight, g	
	4	5	6	7	8	9	10	11	12	13	14	15	16			
32- 33	2														2	247.5
34- 35															0	
36- 37	2	6													8	399.4
38- 39		15	2												17	472.5
40- 41		39	7												46	532.1
42- 43		48	48												95	622.8
44- 45		51	128												179	730
46- 47			218	51											269	815.7
48- 49			97	195											292	972.9
50- 51			63	202	13										278	1 091.6
52- 53				199											199	1 236.5
54- 55				117	21										138	1 398
56- 57				32	47	4									83	1 579.5
58- 59					14	18									32	1 673.4
60- 61					7	23	3								33	1 985.3
62- 63						18	6								24	2 208.3
64- 65						5	23	5							33	2 433.5
66- 67							10	6							16	2 600
68- 69							3	13	1						17	3 079.6
70- 71							1	10	1						13	3 790
72- 73								7	3						10	4 025
74- 75								3	15						18	4 210.9
76- 77									7	1					8	4 600.7
78- 79									7	5					12	5 229.1
80- 81									5	1					6	5 604.2
82- 83									3	11					14	6 140.9
84- 85									1	11					12	6 863.3
86- 87										8	6				14	7 504
88- 89											6				6	7 617
90- 91											7	1			8	8 970.6
92- 93											3				3	8 812.5
94- 95											5	3			8	10 041
96- 97											1		2		3	11 021.7
98- 99													2		2	10 887.5
Total	4	159	563	796	101	68	47	44	43	38	27	6	2		1 898	
%	0.2	8.4	29.6	41.9	5.3	3.7	2.5	2.3	2.3	2.0	1.4	0.3	0.1		100	

TABLE 4. Length composition of redfish (individuals) in catches by Russian trawlers in NAFO Div. 1F, 2J in 2004.

Length, cm	Division 1F			Division 2J			Total		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
25	+	15	15	-	-	-	+	15	15
26	19	59	78	4	4	8	23	63	86
27	122	148	270	21	15	36	143	163	306
28	327	280	607	65	31	96	392	311	703
29	552	486	1 038	119	66	185	671	552	1 223
30	857	662	1 519	181	114	295	1 038	776	1 814
31	1 432	853	2 285	261	145	406	1 693	998	2 691
32	1 862	1 044	2 906	349	169	518	2 211	1 213	3 424
33	2 952	1 266	4 218	478	187	665	3 430	1 453	4 883
34	4 017	1 573	5 590	645	218	863	4 662	1 791	6 453
35	3 648	1 897	5 545	503	231	734	4 151	2 128	6 279
36	2 459	2 324	4 783	347	257	604	2 806	2 581	5 387
37	1 269	1 912	3 181	143	288	431	1 412	2 200	3 612
38	657	1 221	1 878	68	242	310	725	1 463	2 188
39	245	662	907	33	163	196	278	825	1 103
40	39	236	275	11	80	91	50	316	366
41	+	59	59	4	21	25	4	80	84
42	-	15	15	-	3	4	-	18	18
43	-	+	+	-	-	-	-	+	+
<b>Total</b>	<b>20 457</b>	<b>14 712</b>	<b>35 169</b>	<b>3 232</b>	<b>2 234</b>	<b>5 466</b>	<b>23 689</b>	<b>16 946</b>	<b>40 635</b>
<b>Length av., cm</b>	<b>33.8</b>	<b>34.5</b>	<b>34.1</b>	<b>33.5</b>	<b>33.9</b>	<b>33.7</b>	<b>33.8</b>	<b>34.4</b>	<b>34.1</b>

TABLE 5. Redfish age composition (individuals) in NAFO Div. 1F, 2J in 2004.

Age, years	Division 1F			Division 2J			Total		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
6	-	+	+	-	-	-	-	+	+
7	39	73	112	9	16	25	48	89	137
8	180	205	385	35	45	80	215	250	465
9	443	367	810	95	84	179	538	451	989
10	897	749	1 646	191	169	360	1 088	918	2 006
11	1 960	1 265	3 225	367	251	618	2 327	1 516	3 843
12	3 317	1 543	4 860	569	271	840	3 886	1 814	5 700
13	5 694	2 028	7 722	892	314	1 206	6 586	2 342	8 928
14	3 992	2 941	6 933	569	388	957	4 561	3 329	7 890
15	3 030	3 440	6 470	390	438	828	3 420	3 878	7 298
16	587	1 396	1 983	71	178	249	658	1 574	2 232
17	261	661	922	38	75	113	299	736	1 035
18	+	44	44	6	5	11	44	49	93
19	-	+	+	-	-	-	-	+	+
20	+	-	+	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-
23	57	-	-	9	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>29 225</b>	<b>14 712</b>	<b>35 169</b>	<b>3 232</b>	<b>2 234</b>	<b>5 466</b>	<b>23 670</b>	<b>16 946</b>	<b>40 616</b>
<b>Av. age, years</b>	<b>13.0</b>	<b>13.5</b>	<b>13.1</b>	<b>13.0</b>	<b>13.1</b>	<b>12.7</b>	<b>13.0</b>	<b>13.4</b>	<b>13.2</b>

TABLE 6. Greenland halibut length composition (No. of individuals) in Russian commercial trawlers' catch by months in NAFO Div. 3L in 2004.

Length cm	Division 3L, by months										Total 3L
	II	III	IV	V	VI	VII	X	XI	XII		
26	1	4	10								15
28	7	15	36				2				60
30	53	90	127	11			7	4	2		294
32	141	270	271	77			32	17	1		809
34	263	495	525	144			100	64	10		1 601
36	516	943	1 147	335	1	3	204	202	31		3 382
38	703	1 541	1 689	385	10	15	332	341	69		5 085
40	815	1 709	1 872	363	23	36	419	438	123		5 798
42	765	1 404	1 765	386	29	48	455	480	168		5 500
44	710	1 089	1 284	309	39	43	490	461	141		4 566
46	543	775	923	299	40	54	342	375	136		3 487
48	360	562	649	200	41	42	256	318	110		2 538
50	213	384	417	130	27	30	236	261	74		1 772
52	114	276	271	120	24	26	187	176	67		1 261
54	64	177	191	93	18	22	144	125	38		872
56	19	116	102	68	13	7	94	118	32		569
58	16	80	68	57	11	3	48	70	10		363
60	12	53	27	35	9	7	24	60	13		240
62	9	33	28	24	6	2	18	28	5		153
64	2	15	13	20	3	2	11	26	5		97
66	2	10	7	8	1		4	11	3		46
68	3	8	1	7	1		4	12	5		41
70		2	2	6			4	14	2		30
72			2	6			2	11	6		27
74	1	1	1	1			2	8	2		16
76			1					9	4		14
78	1						1	3	3		8
80			1				4	2	1		8
82							3	7	1		11
84	1						4	3	2		10
86								2	3		5
88											
90								1			1
92							1	1			2
94								1	1		2
96								1			1
98											
100											
102											
104									1		1
<b>Total</b>	<b>5 334</b>	<b>10 052</b>	<b>11 430</b>	<b>3 084</b>	<b>296</b>	<b>340</b>	<b>3 430</b>	<b>3 650</b>	<b>1 069</b>	<b>38 685</b>	
<b>Av. length, cm</b>	<b>42.3</b>	<b>42.4</b>	<b>42.2</b>	<b>43.9</b>	<b>48.6</b>	<b>47.0</b>	<b>45.1</b>	<b>46.1</b>	<b>46.8</b>	<b>43.3</b>	

TABLE 7. Greenland halibut length composition (No. of individuals) in Russian commercial trawlers' catch by months in NAFO Div. 3M in 2004.

Length cm	Division 3M, by months					Total 3M
	II	III	IV	X	XII	
28	3					3
30	19					19
32	37	4	1		1	43
34	33	8	4	2	1	48
36	55	11	6	6	3	81
38	40	11	12	10	4	77
40	24	14	13	7	9	67
42	6	21	19	6	9	61
44	12	13	29	8	12	74
46	11	10	25	4	10	60
48	7	16	31	5	9	68
50		17	24	2	5	48
52		17	13	2	4	36
54		14	11	2	4	31
56		7	6	2	1	16
58		8	4		3	15
60		6	1		1	8
62		8	2	1	3	14
64		5	1	1		7
66		6	1			7
68		7				7
70		1				1
72		1				1
74		1				1
76		1				1
<b>Total</b>	<b>247</b>	<b>207</b>	<b>203</b>	<b>58</b>	<b>79</b>	<b>794</b>
<b>Av. length, cm</b>	<b>37.1</b>	<b>49.5</b>	<b>46.9</b>	<b>44.0</b>	<b>46.5</b>	<b>44.3</b>

TABLE 8. Greenland halibut length composition (no. of individuals) in Russian commercial trawlers' catch by months in NAFO Div. 3N and Div. 3LMN combined in 2004.

Length cm	Division 3N, by months							Total 3N	Total 3LMN
	III	IV	V	VI	IX	X	XI		
20			1					1	1
22	1		2					3	3
24			17					17	17
26			61	3				64	79
28		1	83	6		1	1	92	155
30	5	12	153	16		14	21	221	534
32	37	61	199	18	1	25	38	368	1 220
34	33	106	286	20	3	41	50	529	2 178
36	55	167	485	25	7	88	98	946	4 409
38	40	186	538	44	19	111	80	1 100	6 262
40	24	243	622	58	22	154	87	1 381	7 246
42	6	215	469	40	24	167	103	1 220	6 781
44	12	137	304	14	29	176	70	846	5 486
46	11	123	234	15	43	109	40	688	4 235
48	7	63	165	16	23	93	24	454	3 060
50		57	150	7	26	57	33	396	2 216
52		51	166	8	20	43	28	386	1 683
54		36	123	6	10	44	21	302	1 205
56		28	102	3	5	27	17	210	795
58		16	52	4	4	12	3	116	494
60		15	35	2	4	15	5	89	337
62		7	33	3	3	7	1	58	225
64		3	33			2	4	54	158
66		2	17	2		4	1	27	80
68		2	14	1	1	4	2	24	72
70		3	7	1		4		15	46
72		1	10	1	1		2	15	43
74		1	3	1		2	1	8	25
76			2	1		1	1	5	20
78			3			2		5	13
80		1	2				1	4	12
82		1	3					4	15
84		1	3			1		6	16
86		2	1					3	8
88						1		1	1
90			2					3	4
92			1					1	3
94		1						1	3
96									1
98									
100									
102									
104									1
<b>Total</b>	<b>1 242</b>	<b>1 542</b>	<b>4 381</b>	<b>315</b>	<b>246</b>	<b>1 207</b>	<b>730</b>	<b>9 663</b>	<b>4 9142</b>
<b>Av. length, cm</b>	<b>44.7</b>	<b>42.7</b>	<b>42.1</b>	<b>41.5</b>	<b>46.8</b>	<b>44.5</b>	<b>42.2</b>	<b>42.9</b>	<b>43.2</b>

TABLE 9. Length composition (no. of individuals) of roughhead grenadier in Russian trawlers' catches in NAFO Div. 3LN in 2004.

<b>Length, cm</b>	<b>3L</b>	<b>3N</b>	<b>3LN</b>
12		3	3
15		5	5
18		8	8
21	1	21	22
24	5	37	42
27	13	46	59
30	24	61	85
33	31	55	86
36	66	64	130
39	147	141	288
42	290	272	562
45	314	404	718
48	209	545	754
51	93	511	604
54	68	463	531
57	46	377	423
60	54	360	414
63	22	254	276
66	33	148	181
69	23	113	136
72	18	72	90
75	20	39	59
78	16	23	39
81	7	15	22
84	9	9	18
87	7	3	10
90	2	2	4
93	2	1	3
<b>Total</b>	<b>1 520</b>	<b>4 052</b>	<b>5 572</b>
<b>Av. length, cm</b>	<b>48.7</b>	<b>52.9</b>	<b>51.7</b>

TABLE 10. Length composition (No. of individuals) of deep-water redfish (*S. mentella*) in Russian trawlers' catches in NAFO Div. 3LMNO in 2004.

Length, cm	3L	3M	3N	3O	3LMNO
17				3	3
18				7	7
19				23	23
20	3			49	52
21	2		2	90	94
22	4		7	140	151
23	16	1	30	284	331
24	37	2	42	383	464
25	111	3	99	297	510
26	159	13	210	295	677
27	264	33	334	286	917
28	301	29	373	220	923
29	283	35	390	159	867
30	250	24	372	110	756
31	161	32	315	89	597
32	148	26	311	92	577
33	124	35	274	89	522
34	113	26	206	85	430
35	95	27	165	99	386
36	70	11	93	112	286
37	45	10	58	108	221
38	23	8	30	49	110
39	17	3	26	32	78
40	12	2	14	15	43
41	4		4	6	14
42	1	2	3	1	7
43			3		3
44	2	1			3
45					
46	1				1
<b>Total</b>	<b>2 246</b>	<b>323</b>	<b>3 361</b>	<b>3 123</b>	<b>9 053</b>
<b>Av. length, cm</b>	<b>29.9</b>	<b>31.3</b>	<b>30.3</b>	<b>27.6</b>	<b>29.3</b>

TABLE 11. Acadian redbfish (*S. fasciatus*) length composition (no. of individuals) in Russian trawlers' catch by months in NAFO Div. 3O in 2004.

Length, cm	Males	Females	Total
18	8		8
19	26	11	37
20	42	19	61
21	62	34	96
22	130	105	235
23	274	142	416
24	304	198	502
25	238	238	476
26	101	222	323
27	53	361	414
28	19	238	257
29	8	166	174
30	6	60	66
31	2	40	42
32	3	20	23
33	1	13	14
34		11	11
35		10	10
36		1	1
<b>Total</b>	<b>1 277</b>	<b>1 889</b>	<b>3 166</b>
<b>Av. length, cm</b>	<b>23.8</b>	<b>26.2</b>	<b>25.2</b>

TABLE 12. Length composition (no. of individuals) of American plaice in Russian trawlers' catches in NAFO Div. 3LNO in 2004.

Length, cm	3L	3N	3O	3LNO
18		2	1	3
20	1	1	3	5
22	2	10	15	27
24	9	23	19	51
26	26	76	31	133
28	32	114	27	173
30	35	134	32	201
32	46	227	58	331
34	61	321	29	411
36	91	435	9	535
38	117	504	8	629
40	124	348	8	480
42	118	324	10	452
44	79	332	9	420
46	36	285	6	329
48	20	313	5	338
50	9	350	4	363
52	11	336	3	350
54	3	505	2	510
56		410		410
58		366		366
60	1	259		260
62		165		165
64		124		124
66		48		48
68		30		30
70		12		12
72		3		3
74		4		4
<b>Total</b>	<b>821</b>	<b>6 061</b>	<b>281</b>	<b>7 163</b>
<b>Av. length, cm</b>	<b>38.8</b>	<b>46.7</b>	<b>32.8</b>	<b>45.2</b>



TABLE 13. Length composition (no. of individuals) of yellowtail flounder in Russian trawlers' catches in NAFO Div. 3N in 2004.

Length, cm	Month				Total
	VIII	IX	X	XI	
20		2		1	3
22		3	1	3	7
24		7		5	12
26	1	19	3	8	31
28	1	51	20	42	114
30	4	154	69	78	305
32	10	281	98	118	507
34	8	302	193	148	651
36	8	291	186	165	650
38	14	326	199	177	716
40	6	190	152	111	459
42	6	132	81	69	288
44	3	84	67	42	196
46	2	45	43	21	111
48	3	29	24	11	67
50		11	6	8	25
52		1	1	2	4
54			2		2
<b>Total</b>	<b>66</b>	<b>1 928</b>	<b>1 145</b>	<b>1 009</b>	<b>4 148</b>
<b>Av. length, cm</b>	<b>37.6</b>	<b>36.7</b>	<b>37.8</b>	<b>36.8</b>	<b>37.0</b>

TABLE 14. Length composition (no. of individuals) of witch flounder in Russian trawlers' catches by NAFO Div. 3LNO in 2004.

Length, cm	3L	3N	3O	3LNO
20		1		1
22		3		3
24	1	11		12
26	4	26		30
28	6	48		54
30	27	47	1	75
32	64	96	3	163
34	92	158	9	259
36	120	241	25	386
38	130	290	39	459
40	119	250	36	405
42	101	230	37	368
44	51	166	28	245
46	29	95	21	145
48	20	55	9	84
50	6	31	10	47
52	5	28	4	37
54		12	2	14
56	1	5		6
58		2		2
60		2		2
62		1		1
<b>Total</b>	<b>776</b>	<b>1 798</b>	<b>224</b>	<b>2 798</b>
<b>Av. length, cm</b>	<b>38.8</b>	<b>39.5</b>	<b>41.8</b>	<b>39.5</b>

TABLE 15. Length composition (No. of individuals) of Atlantic cod in Russian trawlers' catches in NAFO Div. 3NO in 2004.

Length, cm	3N	3O	3NO
30	1		1
33			
36		7	7
39	6	9	15
42	11	12	23
45	13	24	37
48	21	21	42
51	21	14	35
54	27	26	53
57	32	27	59
60	22	16	38
63	47	23	70
66	41	39	80
69	58	11	69
72	71	9	80
75	63	3	66
78	74	3	77
81	66		66
84	72		72
87	48	1	49
90	39	1	40
93	44		44
96	29		29
99	51		51
102	46		46
105	53		53
108	68		68
111	45		45
114	65		65
117	45		45
120	32		32
123	24		24
126	14		14
129	8		8
132	2		2
135	2		2
138			
141			
144	1		1
Total	1 262	246	1 508
Av. length, cm	88.0	57.4	83.0

TABLE 16. Length composition (no. of individuals) of red hake in Russian trawlers' catches in NAFO Div. 3LN in 2004.

Length, cm	3L	3N	3LN
24	3	2	5
27	16	10	26
30	61	17	78
33	111	34	145
36	204	52	256
39	293	42	335
42	204	38	242
45	95	19	114
48	22	4	26
51	3	1	4
Total	1 012	219	1 231
Av. length, cm	39.4	38.2	39.2

TABLE 17. Length composition (No. of individuals) of white hake in Russian trawlers' catches in NAFO Div. 3NO in 2004.

Length, cm	3N	3O	3NO
27		3	3
30			
33		1	1
36		4	4
39	6	17	23
42	13	37	50
45	32	78	110
48	50	77	127
51	42	93	135
54	41	102	143
57	44	90	134
60	24	117	141
63	20	85	105
66	15	55	70
69	10	20	30
72	4	7	11
75	2	1	3
78		3	3
<b>Total</b>	<b>303</b>	<b>790</b>	<b>1 093</b>
<b>Av. length, cm.</b>	<b>54.8</b>	<b>55.8</b>	<b>55.5</b>

TABLE 18. Length composition (No. of individuals) of thorny skate in Russian trawlers' catches in NAFO Div. 3LNO in 2004.

Length, cm	3L	3N	3O	3LNO
15		6		6
18		21		21
21		33		33
24	18	61		79
27	24	79		103
30	25	103		128
33	57	147	1	205
36	86	306	8	400
39	166	684	39	889
42	207	1 211	36	1 454
45	156	1 721	43	1 920
48	104	2 342	32	2 478
51	73	2 462	22	2 557
54	47	2 956	23	3 026
57	46	3 094	11	3 151
60	23	2 907	8	2 938
63	13	2 965	6	2 984
66	14	2 153	4	2 171
69	4	1 974	1	1 979
72	1	1 674		1 675
75	1	1 278		1 279
78	1	872		873
81		329		329
84	1	138		139
87		48		48
90		12		12
93		4		4
96		1		1
<b>Total</b>	<b>1067</b>	<b>29 581</b>	<b>234</b>	<b>30 882</b>
<b>Av. length, cm.</b>	<b>44.7</b>	<b>59.2</b>	<b>48.0</b>	<b>58.6</b>

TABLE 19. Length composition (no. of individuals) of spinytail skate in Russian trawlers' catches in NAFO Div. 3LMNO in 2004.

<b>Length, cm</b>	<b>Males</b>	<b>Females</b>	<b>Total</b>
18	5	7	12
21	14	9	23
24	14	16	30
27	29	25	54
30	15	37	52
33	8	23	31
36	11	20	31
39	12	22	34
42	6	14	20
45	8	13	21
48	4	11	15
51	3	8	11
54	3	4	7
57		4	4
60	2	3	5
63		6	6
66	3	1	4
69		3	3
72	1	1	2
75		1	1
78			
81		4	4
84		2	2
87	1	3	4
90	1	2	3
93			
96		1	1
99	1		1
102		1	1
105			
108		1	1
111			
114			
117			
120	1		1
123			
126			
129			
132			
135		1	1
138	1		1
<b>Total</b>	<b>143</b>	<b>243</b>	<b>386</b>
<b>Av. length, cm.</b>	<b>36.8</b>	<b>41.0</b>	<b>39.5</b>

TABLE 20. Length composition (No. of individuals) of black dogfish in Russian trawlers' catches in NAFO Div. 3LMNO in 2004.

Length, cm	Males	Females	Total
36		1	1
39			
42	1		1
45		1	1
48		5	5
51	3	3	6
54	9	8	17
57	14	12	26
60	23	12	35
63	22	17	39
66	16	14	30
69	4	7	11
72		13	13
75	3	3	6
78		5	5
81			
84		1	1
114		1	1
<b>Total</b>	<b>95</b>	<b>103</b>	<b>198</b>
<b>Av. length, cm.</b>	<b>62.1</b>	<b>64.5</b>	<b>63.6</b>

TABLE 21. Length composition (No. of individuals) of Northern wolffish (*Anarchichas denticulatus*) in Russian trawlers' catches in NAFO Div. 3LNO in 2004.

Length, cm	3L	3N	3O	Total
33	1			1
36	5			5
39	8	5		13
42	19	8		27
45	23	6	1	30
48	27	12		39
51	15	8		23
54	15	6		21
57	6	8	1	15
60	12	4	3	19
63	8	9		17
66	8	6		14
69	8	6	1	15
72	5	3		8
75	5	2		7
78	2	1		3
81	3	3		6
84	3	4		7
87	1	2		3
90	1	3		4
93		2		2
96		2		2
99	1	2		3
102	2	4		6
105	1			1
108	2			2
111	1	1		2
114	2	1		3
117		1		1
120				
123	1			1
<b>Total</b>	<b>185</b>	<b>109</b>	<b>6</b>	<b>300</b>
<b>Av. length, cm.</b>	<b>57.9</b>	<b>65.0</b>	<b>59.5</b>	<b>60.5</b>

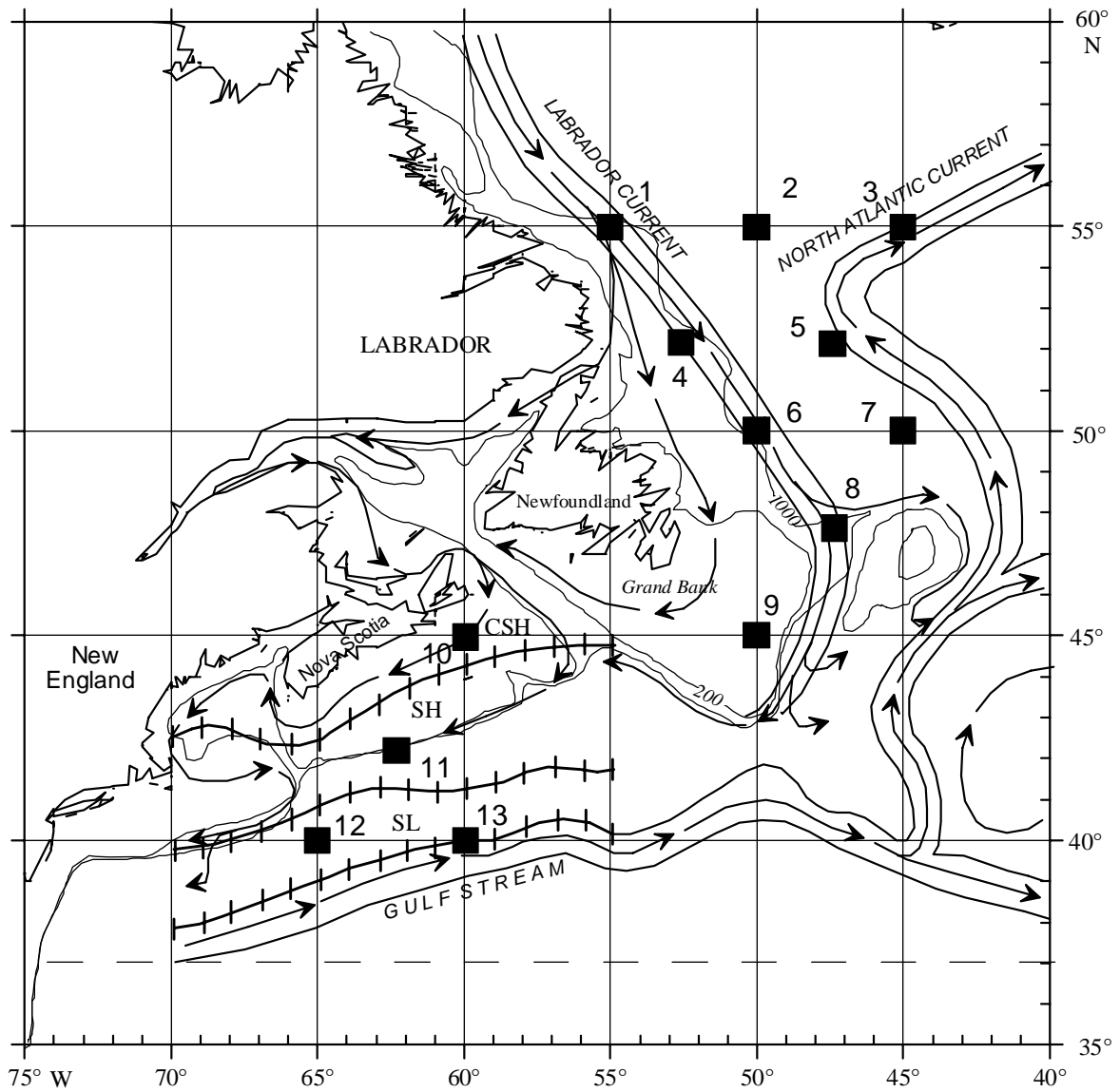


Fig. 1. Location of points for SST control in NAFO area.