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Russian Research Report for 2009

by

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SUBAREAS 1+2

A. Status of fisheries

Greenland halibut

The directed trawl fishing of Greenland halibut was carried out in August-November. In accordance with quota, being divided into two areas, the fishery off the West Greenland was executed to the north (Div. 1A) and south (Div. 1CD) of 68° N.

In the area north of 68° N, three medium-tonnage trawlers were engaged in the fishery. The fishery covered a relatively small area between 68°41' N– 70°03' N and 58°57' W– 60°51' W at the depths of 630 – 1230 meters. According to the preliminary data, 516.9 t of Greenland halibut were caught. In the by-catch skates (8.8 t) predominated. The catch rate was, on the average, 9.3 t per a fishing day and 0.51 t per a hauling hour.

In the area south of 68° N, up to four medium-tonnage trawlers participated in fishery. The vessels operated from August to November, in the area between 63°29' N– 64°36' N and 55°23' W– 57°58'W, at 700 – 1500 m depths. The catch rate varied from 3.9 t to 13.4 t and, on the average, amounted to 10.1 tons per a fishing day and 0.60 t per a hauling hour. By the preliminary data, the catch of Greenland halibut was estimated at 1057.0 t. The by-catch included the Northern wolffish, skates, roughhead and roundnose grenadiers as single fish.

On the whole, in the area off the West Greenland, Russian annual catch of Greenland halibut amounted to 1574.0 t (Table 1).

Other fish species

There was no directed fishery for other fish species.

B.Research studies

Biological data on Greenland halibut from Divs.1AD were collected by observers aboard Russian fishing vessels.

Greenland halibut

In Div.1A, the halibut length in catches ranged from 26 to 96 cm, fish specimens as long as 44 – 48 cm prevailed. The average length of males was 49.1 cm, of females – 54.4 cm (Table 2). Sex ratio was approximately 1:1.

In Div. 1D, Greenland halibut individuals 26 – 112 cm in length were recorded, fish as long as 50 – 54 cm prevailed. The mean length of males was 52.4 cm, of females – 58.3 cm. Sex ratio was 2.4: 1.

In Divs. 1AD the age of halibut varied from 3 to 22 years, predominating were fish aged 6-8 (Table 3).

Vulnerable Marine Ecosystems

In accordance with the results of researches conducted by observers in the fishing zone of Greenland, 6 species of corals belonging to orders *Pennatulacea* and *Antipatharia* as well as sponges *Geodia* spp. were found.

Marine mammals

According to the results of observations, in August-November, bottle-nosed whales, sperm whales and seals occasionally occurred in Divs.1AD (Table 4).

SUBAREA 3

A. Status of fisheries

Greenland halibut

Directed fishing of Greenland halibut was conducted by 5 medium-tonnage trawlers from January to December. The vessels operated on the continental slope adjacent to the Flemish Pass (Divs. 3L and 3M), between 46°08' N – 48°31' N, at 480 – 1410 m depth. Sometimes the fishery was carried out in Div. 3N, at the depths of 500 – 1150 m as well. On the whole, in that area, the catch rate was, on the average, 9.1 t per a fishing day and 0.60 t per a hauling hour.

In total, the annual catch in the directed fishery was estimated at 1603.0 t of Greenland halibut. Besides, 12.03 t were caught in redfish fishery. According to the preliminary data, the total catch of Greenland halibut amounted to 1615.0 tons (with the national quota of 1512.0 tons)(Table 1). The by-catch included roughhead grenadier (33.0 t), roundnose grenadier (13.2 t), skates (7.5 t), red hake (8.2 t), redfishes (4.0 t). Also, the American plaice, the witch flounder, the Northern wolffish and the Atlantic halibut occurred as single fish.

Atlantic redfishes

In 2009, on the Flemish Cap Bank, Russian targeted fishery for redfish was conducted occasionally, from January to December. One-two medium-tonnage trawlers operated between 46°08'N – 48°16' N and 46°15'W – 43°53' W, at 250-1100 m depths. The catch rate amounted to, on the average, 16.2 t and 1.81 t per a fishing day and a hauling hour, respectively.

All in all, in 2009, during the directed fishery, Russian vessels caught 1153.8 t. Moreover, those species were taken in small quantities (29.8 t) in the Greenland halibut fishery. By the preliminary data, the total Russian catch of redfish species on the Flemish Cap Bank was estimated at 1183.6 t (Table 1).

From January to December, Russian trawlers operated occasionally during 14 days in Div.3O. The fishery was carried out between 43°07'N – 43°22' N and 51°47'W – 51°08' W, at the depths of 290 – 520 m. On the whole, in the directed fishery, the annual Russian catch was 164.1 t of redfish species. Small quantities (4.6 t) of redfishes were caught in the Greenland halibut fishery. In Div.3O, the total Russian catch of redfish was equal to 168.7 t. The by-catch included 4.8 t of the American plaice, 1.4 t of cod, 7.2 t of witch flounder, 1.0 t of skates and 1.0 t of white hake, as well as single individuals of the Atlantic halibut and roundnose grenadier.

Shrimp

In Div. 3L, shrimp fishing was carried out in February – May, between 46°30'N – 47°55' N and 47°18' – 47°39' W, at the depths of 250 – 370 m by two medium-tonnage vessels. The catch rate equaled to 8.1-12.4 t per a fishing day and, on the average, 9.4 t per a fishing day (Table 1). The total catch was 335.0 t (Table 1).

Two medium-tonnage vessels occasionally conducted fishery in Div.3M, between 47°14' N – 48°08' N and 45°11' W– 46°15' W, at the depths of 310 – 417 m in March. The mean catch rate was 4.5 tons, the total catch - 20.0 tons.

Other fish species

There was no directed fishery for other fish species. In the course of directed fisheries the by-catch of other fish species amounted to 1 – 23 %.

B. Research studies

There were no special surveys to assess the stocks of the target species. Biological data were collected by NAFO observers aboard fishing vessels.

Greenland halibut (Reinhardtius hippoglossoides)

In Div. 3L, Greenland halibut 24 – 98 cm in length occurred, the fish average length was 50.1 cm. Fish as long as 46 – 52 cm predominated (Table 5).

The length of fish in Div. 3N varied from 24 to 96 cm. The bulk of catches was made up by individuals 46 – 52 cm (on the average, 51.4 cm) in length.

As a whole, in Divs. 3LN, Greenland halibut 24 – 98 cm in length, with the mean length of 50.3 cm, occurred. The age of fish determined by scale varied from 3 to 22 years (Table 6). Specimens aged 7-8 made up the bulk of the catches.

Roughhead grenadier (Macrourus berglax)

The total length of roughhead grenadier in catches in Div.3L ranged from 30 to 93 cm; the prevailing length was 42-45 cm (with the mean one of 49.0 cm) (Table 7).

In Div. 3N, the fish length distribution varied from 27 to 84 cm. Fish 57-63 cm in length predominated in catches.

On the whole, in Div. 3LN, roughhead grenadier with 27 – 93 cm length occurred, the mean length was 50.8 cm (Table 7).

Deep-water redfish (Sebastes mentella)

In Div.3L, the length of deep-water redfish ranged from 25 to 43 cm (primarily, 34-35 cm), the mean length was 33.7 cm. Sex ratio was approximately 1:1 (Table 8).

In Div. 3N, the length distribution fluctuated between 29 and 41 cm, the mean length was 34.9 cm (Table 8).

As a whole, in Divs. 3LN, the catches consisted of redfish aged 9-21. Fish aged 13-14 predominated (Table 9).

American plaice (Hippoglossoides platessoides)

In Div. 3L, the length distribution of American plaice taken in the Greenland halibut fishery was characterized by 26 – 58 cm fish (mainly, 38-40 cm). The mean length was 39.6 cm (Table 10).

Witch flounder (Glyptocephalus cynoglossus)

In Div. 3L the length distribution of witch flounder from by-catches in the Greenland halibut fishery was presented by fish 30 – 50 cm in length, the mean length was 39.5 cm (Table 11).

In Div.3N, the length of fish varied from 38 to 52 cm, the mean length was 44.0 cm. Fish 40 – 42 cm in length made up the bulk of catches (Table 11).

Threebeard rockling (Gaidropsarus ensis)

In Div. 3L, the length of threebeard rockling varied from 28 to 49 cm, the mean length was 41.6 cm (Table 12). Individuals 40-43 cm in length made up the bulk of catches.

In Div.3N, threebeard rockling 34 – 49 cm in length were caught, the mean length was 42.4 cm.

Roundnose grenadier (Macrourus rupestris)

In Div.3L, roughhead grenadier with the total length of 36-78 cm (the mean one was 52.4 cm) was found (Table 13).

In Div.3N, the length distribution was represented by fish 36-57 cm in length, with the average length of 49.0 cm (Table 13).

Thorny skate (Amblyraja radiata)

In Div. 3L, during the Greenland halibut fishery, thorny skate specimens 46 – 76 cm in length occurred . The average length was 63.4 cm (Table 14).

Black dogfish (Centroscyllium fabricii)

This species was mainly recorded in by-catches in the halibut fishery in Divs.3LN. The length of fish varied from 39 to 75 cm, the mean length was 61.9 cm (Table 15). Specimens 60 – 63 cm in length made up the bulk of the catches.

The Northern wolffish (Anarhichas denticulatus)

In Div. 3L, the length of the Northern wolffish ranged from 40 to 130 cm, the mean length was 70.2 cm (Table 16).

In Div. 3N, the length distribution of the species varied from 40 to 118 cm. The average length was 65.2 cm.

Blue hake (Antimora rostrata)

In Divs. 3 LN, the length distribution of blue hake varied from 21 to 60 cm, the mean length was 39.0 cm. The bulk of catches was made up by fish 36 – 39 cm in length (Table 17).

Common grenadier (Nezumia bairdii)

In Divs. 3LN, the total length of common grenadier ranged from 25 to 43 cm (mainly, 34-37), the mean length was 35.6 cm (Table 18).

Other fish species

In the course of the fishery, the eel-pouts, haddock, lumpsucker, spotted wolffish, chimaeras, the Greenland shark, *Notacanthidae* and other fish species occurred in by-catch as single fish.

Vulnerable marine ecosystems

In Divs. 3LN, the catches of 11 cold-water corals related to 4 orders, *Alcyonacea*, *Pennatulacea*, *Antipatharia*, *Gorgonacea*, and sponges *Geodia* spp. were recorded.

On the whole, the catches of cold-water corals and sponges were below a threshold level and did not exceed 0.8 kg and 2 kg per a haul, respectively.

Marine mammals

According to results of observations aboard fishing vessels, dolphins, bottle-nosed whales, sperm whales and harp seals were registered in Divs.3LN in March-July (Table 19).

OTHER STUDIES

A. Catch and CPUE data on Greenland halibut fishery.

Variations in the fishing efficiency and main fishing areas for the Russian fleet conducting directed fishery for Greenland halibut (*Reinhardtius hippoglossoides*) on Flemish Cap and the Grand Newfoundland Bank (Div. 3LMNO) are presented based on the data obtained by Russian observers in 1998-2009.

Information on catches was transmitted to PINRO from fishing vessels in accordance with the Programme of monitoring for aquatic biological resources as daily reports which include data on weight and composition of the catches as well as duration, depth and coordinates of trawling. The fisheries scientific information was collected by PINRO scientists who work as NAFO observers.

The data from the fishing vessels which met the necessary technical standards and had a history of many years of fishery for Greenland halibut in this area was used (Table 20).

In 1999-2001, the highest fishing efficiency was reported at depths of 600-700 m and 1200-1300 m. In 2002-2006, a total decline in the fishing efficiency was observed for all depths. In 2009, the highest catches were taken at depths of 900-1100 m (Figure 1).

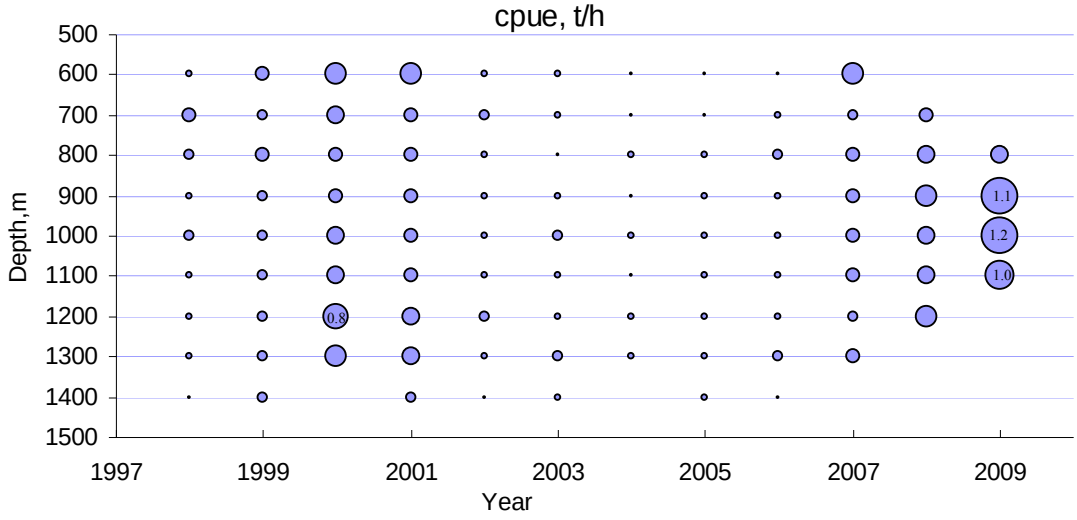

Figure 1. Average efficiency of Greenland halibut fishery at depth ranges in Div. 3LMNO, 1998-2009.

From 1998 to 2003, the highest catches were taken by Russian fishing vessels at a depth of 700-1000 m. In 2004-2006, the fishery was shifted at a depth of 800-1100 m. In 2007-2009, the depth of fishery was 900-1100 m (Figure 2).

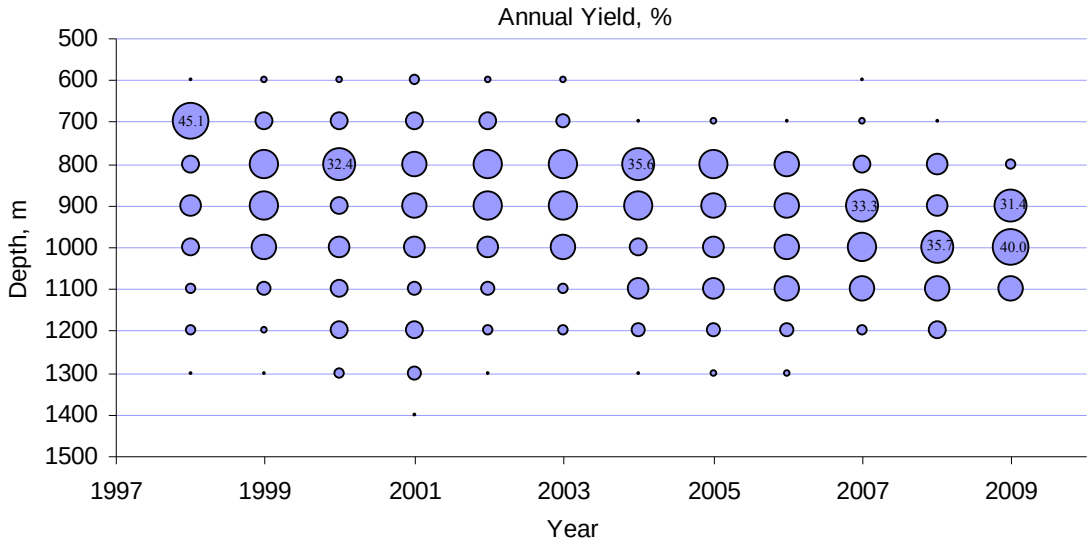

Figure 2. Distribution of Russian catches of Greenland halibut at depth ranges (%) in Div. 3LMNO, 1998-2009.

Based on the statistics on the Russian fishery, the highest fishing efficiency was recorded in 1999-2001 and in 2007-2009, and the lowest - in 2002-2005. (Figure 3).

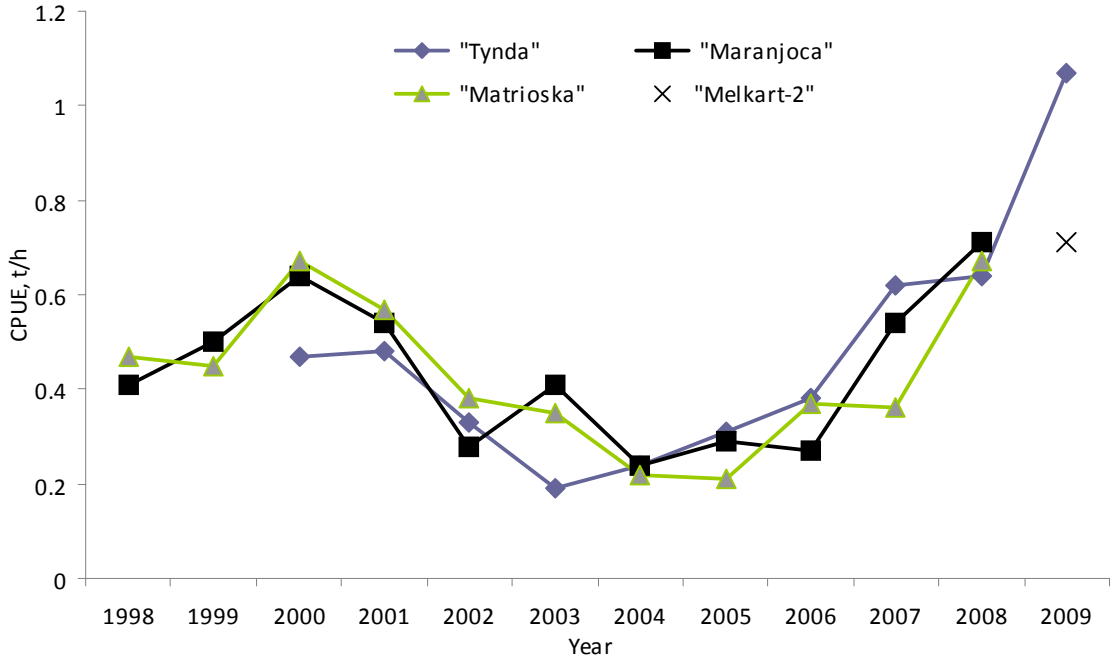

Figure 3. Efficiency of Greenland halibut fishery in Div. 3LMNO, 1998-2009.

B. <u>Environmental information.</u>

Routine works on decoding and analysing satellite information on sea-surface temperature (SST) in the NAFO Conventional Area were continued by experts from AtlantNIRO.

TABLE 1. Preliminary catches taken by Russian trawlers in NAFO SA 1-3 in 2009.

Species	Division	Catch, t
Greenland halibut	1A	509
	1B	8
	1C	154
	1D	903
	1ABCD	**1574**
Greenland halibut	3L	1273
	3M	82
	3N	260
	3LMN	**1615**
Atlantic halibut	**3N**	1
American plaice	3M	24
	3N	18
	3O	13
	3MNO	**55**
Yellowtail flounder	**3N**	3
Witch flounder	3M	42
	3N	3
	3O	19
	3MNO	**64**
Roughhead grenadier	3L	19
	3N	14
	3LN	**33**
Roundnose grenadier	3L	16
	3M	23
	3N	2
	3LMN	**41**
Deep-sea redfish	**1F**	
Redfish spp.	3L	
	3M	1184
	3N	1
	3O	169
	3MNO	**1354**
Skate	3L	6
	3M	8
	3N	3
	3O	1
	3LMNO	**18**
Atlantic cod	3M	87
	3N	6
	3O	8
		101
Wolffishes	**3M**	**8**
Shrimp	3L	335
	3M	20
	3LM	**355**

TABLE 2. Greenland halibut (*Reinhardtius hippoglossoides)* length composition (ind.) of the Russian trawl catches in NAFO Divs. 1AD in 2009.

Length, cm	1A			1D			Total 1AD		
	Males	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**
26	1		**1**				1		**1**
28				1		**1**	1		**1**
30	2		**2**				2		**2**
32					1	**1**		1	**1**
34	2		**2**	1		**1**	3		**3**
36	2	1	**3**	1		**1**	3	1	**4**
38	7	3	**10**	8	3	**11**	15	6	**21**
40	21	12	**33**	30	9	**39**	51	21	**72**
42	28	18	**46**	73	22	**95**	101	40	**141**
44	99	37	**136**	277	51	**328**	376	88	**464**
46	76	51	**127**	523	107	**630**	599	158	**757**
48	70	58	**128**	1008	209	**1217**	1078	267	**1345**
50	54	42	**96**	1568	310	**1878**	1622	352	**1974**
52	44	38	**82**	1477	344	**1821**	1521	382	**1903**
54	49	40	**89**	1446	456	**1902**	1495	496	**1991**
56	22	28	**50**	807	325	**1132**	829	353	**1182**
58	12	34	**46**	476	311	**787**	488	345	**833**
60	13	21	**34**	207	261	**468**	220	282	**502**
62	6	8	**14**	81	197	**278**	87	205	**292**
64	5	12	**17**	64	182	**246**	69	194	**263**
66	6	8	**14**	40	109	**149**	46	117	**163**
68	2	11	**13**	10	92	**102**	12	103	**115**
70	1	13	**14**	10	65	**75**	11	78	**89**
72		9	**9**	5	56	**61**	5	65	**70**
74	1	10	**11**	4	34	**38**	5	44	**49**
76		6	**6**		34	**34**		40	**40**
78		4	**4**		36	**36**		40	**40**
80		1	**1**		30	**30**		31	**31**
82		2	**2**		18	**18**		20	**20**
84		3	**3**		17	**17**		20	**20**
86					21	**21**		21	**21**
88					11	**11**		11	**11**
90					11	**11**		11	**11**
92					3	**3**		3	**3**
94		1	**1**		4	**4**		5	**5**
96		1	**1**		3	**3**		4	**4**
98					1	**1**		1	**1**
100					1	**1**		1	**1**
102					1	**1**		1	**1**
104									
106									
108									
110					1	**1**		1	**1**
112					1	**1**		1	**1**
Total	**523**	**472**	**995**	**8117**	**3337**	**11454**	**3809**	**8640**	**12449**
Mean length, cm	**49.1**	**54.4**	**51.6**	**52.4**	**58.3**	**54.1**	**52.2**	**57.8**	**53.9**

TABLE 3. Greenland halibut (*Reinhardtius hippoglossoides)* age-length composition of the Russian trawl catches (ind.) in the NAFO Divs. 1AD in 2009

Length, cm	Age, years																			Total	Weight, g
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
28	1																				**1**	**175.0**
30		2																			**2**	**217.5**
32		1																			**1**	**255.0**
34		1	2																		**3**	**316.7**
36		2	2																		**4**	**370.0**
38			15	6																	**21**	**448.6**
40			24	48																	**72**	**511.9**
42			23	118																	**141**	**593.0**
44			28	323	112																**464**	**710.9**
46				395	362																**757**	**806.1**
48				149	897	299															**1345**	**920.9**
50					538	1436															**1974**	**1095.7**
52					76	1675	152														**1903**	**1211.4**
54						1472	519														**1991**	**1362.8**
56						463	668	51													**1182**	**1538.0**
58							577	256													**833**	**1708.5**
60							96	239	167												**502**	**1861.0**
62								173	106	13											**292**	**2137.7**
64								69	126	69											**263**	**2355.7**
66									41	90	33										**163**	**2499.3**
68									13	77	26										**115**	**2876.7**
70										21	37	31									**89**	**3181.2**
72										20	30	20									**70**	**3496.1**
74											28	14	7								**49**	**3743.9**
76											7	20	13								**40**	**4208.8**
78												16	20	4							**40**	**4774.0**
80													6	25							**31**	**5098.5**
82													2	4	14						**20**	**5855.5**
84														15	5						**20**	**6397.9**
86														6	8	6					**21**	**6919.0**
88															2	9					**11**	**7311.0**
90															2	6	2	2			**11**	**8340.7**
92																3					**3**	**9090.0**
94																			5		**5**	**8965.0**
96																			4		**4**	**11850.0**
98																				1	**1**	**11160.0**

100																	1			**1**	**9760.0**
102																				**0**	**0.0**
104																				**0**	**0.0**
106																				**0**	**0.0**
108																				**0**	**0.0**
110																		1		**1**	**12395.0**
112																			1	**1**	**12095.0**
Total	**1**	**6**	**94**	**1040**	**1986**	**5343**	**2012**	**788**	**453**	**289**	**159**	**101**	**49**	**54**	**31**	**24**	**2**	**3**	**10**	**2**	**12447**	
Mean weight. g	**175.0**	**271.0**	**484.8**	**656.0**	**875.9**	**1240.6**	**1608.7**	**1936.6**	**2250.9**	**2776.3**	**3328.4**	**3848.8**	**4548.6**	**5973.5**	**6580.6**	**7536.7**	**8235.0**	**9482.5**	**11070.0**	**11627.5**		
Mean length, cm	**29.00**	**33.20**	**39.96**	**43.43**	**47.59**	**52.70**	**57.23**	**61.21**	**63.61**	**67.74**	**71.58**	**74.33**	**78.07**	**82.96**	**84.75**	**89.00**	**90.00**	**95.00**	**100.67**	**106.00**		

TABLE 4. Occurrence of marine mammals off West Greenland in 2009 (according to observer's data)

Date	Position	Observed marine mammals	Number	Notes
20.08—15.09	63°34'N- 63°54'N 56°55'W-58°01' W	Sperm whale	1 — 2	Observed when heaving trawl
20.08—15.09	63°34'N -63°54'N 56°55'W-58°01' W	Bottle nosed whale	1 —4	Observed when heaving trawl
20.08—15.09	63°34'N-63°54'N 56°55'W-58°01' W	Seal	1	Observed when heaving trawl

TABLE 5. Greenland halibut (*Reinhardtius hippoglossoides)* length composition (ind.) in the Russian commercial trawl catches by month in NAFO Divs. 3LN in 2009

Length, cm	Division 3L						Division 3N			Total 3LN
	III	IV	V	VI	VII	Total	VI	VII	Total	
24					1	1				1
26							1		1	1
28				2	4	6				6
30		1		3	6	10	4		4	14
32		47	4	4	6	61	14		14	75
34	4	91	9	7	18	129	12		12	141
36	12	137	16	19	38	222	35		35	257
38	19	263	33	53	93	461	64	1	65	526
40	45	517	64	113	173	912	165	4	169	1081
42	60	831	138	213	365	1607	301	13	314	1921
44	102	976	242	302	686	2308	448	25	473	2781
46	170	1371	412	527	847	3327	604	28	632	3959
48	229	1538	490	503	1392	4152	829	50	879	5031
50	269	1126	453	468	1454	3770	972	66	1038	4808
52	166	729	351	430	1407	3083	888	53	941	4024
54	78	377	260	236	1272	2223	764	48	812	3035
56	59	199	147	162	761	1328	420	48	468	1796
58	40	103	88	130	530	891	267	28	295	1186
60	21	55	42	67	266	451	168	9	177	628
62	14	39	36	43	169	301	90	8	98	399
64	10	28	24	20	147	229	65	5	70	299
66	8	16	16	15	86	141	44	7	51	192
68	7	9	13	14	48	91	31	6	37	128
70	2	5	7	11	33	58	36	0	36	94
72	2	9	5	10	36	62	22	4	26	88
74	2	2	1	8	25	38	16	0	16	54
76	2	6	8	9	14	39	25	4	29	68
78	1	1	5	10	14	31	5	0	5	36
80	2	2	3	4	17	28	8	4	12	40
82	1	2	4	3	7	17	2	1	3	20
84	1	2	1		8	12	4		4	16
86	1			1	3	5	5		5	10
88			1	1	4	6	2		2	8
90					2	2				2
92			1	1		2	1		1	3
94							1	1	2	2
96							1		1	1
98					1	1	1		1	2
Total	**1327**	**8482**	**2874**	**3389**	**9933**	**26005**	**6315**	**413**	**6728**	**32733**
Mean length, cm	**50.0**	**47.42**	**50.26**	**52.0**	**51.8**	**51.1**	**51.3**	**53.3**	**51.4**	**50.4**

TABLE 6. Greenland halibut age composition of the Russian commercial trawler catches in NAFO TABLE 6. Greenland halibut (*Reinhardtius hippoglossoides)* age composition in the Russia commercial trawler catches in NAFO Divs.3LN in 2009

Age, years	**Division 3L**		**Division 3N**		**Total 3LN**	
	n	%	n	%	n	%
3	12	0.04	1	0.01	13	0,03
4	123	0.47	29	0.43	152	0,46
5	855	3.28	165	2.45	1020	3,11
6	4873	18.73	960	14.26	5833	17,81
7	7360	28.30	2065	30.69	9425	28,79
8	8326	32.01	2084	30.97	10410	31,80
9	2370	9.11	849	12.61	3219	9,83
10	947	3.64	223	3.31	1170	3,57
11	489	1.88	152	2.25	641	1,95
12	291	1.11	103	1.53	394	1,20
13	167	0.64	26	0.38	193	0,58
14	90	0.34	33	0.49	123	0,37
15	43	0.16	16	0.23	59	0,18
16	33	0.12	12	0.17	45	0,13
17	17	0.06	4	0.05	21	0,06
18	3	0.01	1	0.01	4	0,01
19	2	0.00	3	0.04	5	0,01
20	3	0.01	1	0.01	4	0,01
21	1	0.00			1	0,00
22			1	0.01	1	0,00
Total	**26005**	**100**	**6728**	**100**	**32733**	**100**

TABLE 7. Length composition (ind.) of Roughhead grenadier (*Macrourus berglax*) in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3LN
27		2	2
30	19	1	20
33	63	10	73
36	168	14	182
39	369	52	421
42	515	78	593
45	423	79	502
48	287	80	367
51	161	37	198
54	128	68	196
57	128	105	233
60	104	129	233
63	111	126	237
66	71	74	145
69	66	47	113
72	47	10	57
75	22	12	34
78	22	4	26
81	5	2	7
84	7	1	8
87	4		4
90	3		3
93	1		1
Total	**2724**	**931**	**3655**
Mean length, cm	**49.0**	**55.0**	**50.8**

TABLE 8. Length composition (ind.) of deep- water redfish (S*ebastes. mentella*) in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	Division 3L			Division 3N			Total		
	Males	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**
25		1	1					1	**1**
26		1	1					1	**1**
27	6	2	8				6	2	**8**
28	6	4	10				6	4	**10**
29	22	18	40	1	1	2	23	19	**42**
30	30	27	57	1		1	31	27	**58**
31	40	35	75	2	4	6	42	39	**81**
32	52	43	95	4	4	8	56	47	**103**
33	39	50	89	4	1	5	43	51	**94**
34	49	57	106	5	3	8	54	60	**114**
35	63	70	133	2	1	3	65	71	**136**
36	52	46	98	2	1	3	54	47	**101**
37	28	34	62	1	3	4	29	37	**66**
38	16	20	36	4	1	5	20	21	**41**
39	6	13	19	2	2	4	8	15	**23**
40	3	2	5	1	3	4	4	5	**9**
41		1	1	3		3	3	1	**4**
42		2	2					4	**2**
43		1	1					2	**1**
Total	**412**	**427**	**839**	**32**	**24**	**56**	**444**	**451**	**895**
Mean length, cm	**33.5**	**33.9**	**33.7**	**35.0**	**34.7**	**34.9**	**33.6**	**33.5**	**33.8**

TABLE 9. Age-length composition of deep-water redfish (*Sebastes mentella*) in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	Age, years													Total	Weight, g
	9	10	11	12	13	14	15	16	17	18	19	20	21		
26	1													1	**220.0**
27	5	3												8	**263.3**
28	2	5	3											10	**310.0**
29		11	20	11										42	**354.7**
30		16	16	26										58	**382.7**
31			35	25	20									80	**405.0**
32				27	43	33								103	**462.6**
33				13	43	34	4							94	**499.5**
34					31	57	21	5						114	**566.8**
35					6	40	48	31	11					136	**619.2**
36						10	26	55	10					101	**650**
37							18	30	18					66	**668.2**
38								7	21	14				42	**747.5**
39									4	6	6	6		22	**837.3**
40												9		9	**927.5**
41															
42													2	2	**990.0**
43													1	1	**1170.0**
Total	**8**	**35**	**74**	**102**	**143**	**174**	**117**	**128**	**64**	**20**	**6**	**6**	**2**		
Mean weight, g	**256.7**	**319.2**	**372.6**	**417.3**	**488.7**	**556.4**	**625.6**	**644.7**	**716.7**	**788.6**	**863.3**	**927.1**	**1080**		
Mean length, cm	**27.0**	**28.7**	**29.8**	**30.9**	**32.8**	**34.0**	**35.2**	**35.9**	**36.9**	**38.4**	**39.0**	**39.6**	**42.5**		

TABLE 10. Length composition (ind.) of American plaice (*Hippoglossoides platessoides)* in Russian trawl catches in NAFO Div. 3L in 2009

Length, cm	3L
26	2
28	1
30	11
32	17
34	25
36	76
38	116
40	122
42	81
44	57
46	25
48	21
50	13
52	9
54	4
56	2
58	1
Total	**583**
Mean length, cm	**39.6**

TABLE 11. Length composition (ind.) of Witch flounder *(Glyptocephalus cynoglossus)* in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3LN
30	3		3
32	10		10
34	7		7
36	15		15
38	11	4	15
40	22	1	23
42	12	8	20
44	6	7	13
46	4	3	7
48	7	4	11
50	1		1
52		1	1
Total	**98**	**28**	**126**
Mean length, cm	**39.5**	**44.0**	**40.52**

TABLE 12. Length composition (ind.) of Threebeard rockling *(Gaidropsarus ensis)* in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3LN
28	1		1
31	4		4
34	22	2	24
37	51	4	55
40	77	7	84
43	78	10	88
46	31	4	35
49	10	1	11
Total	**274**	**28**	**302**
Mean length, cm	**41.6**	**42.4**	**41.7**

TABLE 13. Length composition (ind.) of Roundnose grenadier (*Coryphaenoides rupestris*) in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3LN
36	2	1	3
39	2		2
42	4	2	6
45	4		4
48		1	1
51	1	3	4
54	1	1	2
57	1	1	2
60	3		3
63	1		1
66			
69			
72	1		1
75			
78	2		2
Total	**22**	**9**	**31**
Mean length, cm	**52.4**	**49.0**	**51.4**

TABLE 14. Length composition (ind.) of Thorny skate *(Amblyraja radiata)* in Russian trawl catches in NAFO Div. 3L in 2009

Length, cm	3L
46	1
49	3
52	1
55	4
58	7
61	13
64	10
67	11
70	6
73	2
76	1
Total	**59**
Mean length, cm	**63.4**

TABLE 15. Length composition (ind.) of Black dogfish (*Centroscyllium fabricii)* in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3NO
39		2	2
42			
45			
48		2	2
51	1	5	6
54	6	10	16
57	5	12	17
60	15	12	27
63	20	13	33
66	9	7	16
69	7	2	9
72	6	1	7
75	2		2
Total	**71**	**66**	**137**
Mean length, cm	**64.1**	**59.5**	**61.9**

TABLE 16. Length composition (ind) of Northern wolffish (*Anarchichas denticulatus*) in Russian trawl catches in NAFO Divs. 3LN in 2009.

Length, cm	3L	3N	3NO
40	1	2	3
43	5	4	9
46	10	10	20
49	4	6	10
52	13	16	29
55	18	14	32
58	15	14	29
61	31	8	39
64	17	8	25
67	17	10	27
70	26	8	34
73	21	8	29
76	23	7	30
79	12	6	18
82	10	5	15
85	7	2	9
88	4	1	5
91	7	2	9
94	5		5
97	2		2
100	3		2
103	2	2	4
106	3		3
109		1	1
112		2	2
115	2	1	3
118		1	1
121			1
124	1		
127			
130	1		1
Total	**260**	**138**	**398**
Mean length, cm	**70.2**	**65.2**	**68.5**

TABLE 17. Length composition (ind.) of Blue hake (*Antimora rostrata*) in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3LN
21	4		4
24	6		6
27	19		19
30	41	1	42
33	43	11	54
36	33	27	60
39	30	55	85
42	17	16	33
45	17	11	28
48	18	6	24
51	9	4	13
54	7	5	12
57	1		1
60	2		2
Total	**247**	**136**	**383**
Mean length, cm	**37.9**	**41.0**	**39.0**

TABLE 18. Length composition (ind.) of Common grenadier (*Nezumia bairdii*) in Russian trawl catches in NAFO Divs. 3LN in 2009

Length, cm	3L	3N	3LN
25	7		7
28	20	4	24
31	71	9	80
34	155	45	200
37	118	63	181
40	19	14	33
43	2		2
Total	**392**	**135**	**527**
Mean length, cm	**35.2**	**36.6**	**35.59**

TABLE 19. Occurrence of marine mammals off West Greenland in 2009 (according to observer's data)

Date	NAFO Division	Position	Species	Number	Notes
12.03-15.03	3L	48°08'N -48°20'N 46°30'W-47°38'W	Sperm whale	3 — 6	Observed when heaving up the trawl
13.03.09	3L	48°19'N 46°31'W	Dolphin	4	Observed when heaving up the trawl
18.03.09	3L	47°00'N 47°27' W	Harp seal	About 25	During the ship's drift
04.04.09	3L	46°44'N -46°45'N 52°30'W-52 °27'W	Harp seal	About 20	On ice floes
05.04-30.04	3L	48°07'N-48 °20'N 46°30'W-47 °40'W	Harp seal Sperm whale	1 — 3 4 — 8	Observed when heaving up the trawl
06.04.09	3L	48°15'N 46°42'W	Sperm whale	About 7	During trawlings
22.04.09	3L	48°09 N 47°25' W	Sperm whale	About 5	During trawlings
01.05-04.05	3L	48°07'N - 48°20 N 46°30'W-47 °40 W	Sperm whale	3 — 6	Observed when heaving up the trawl
27.05-07.06	3L	46°12' N-47°58'N 46°32'W-47°04'W	Sperm whale Bottle-nosed whale Dolphin	1 — 4 1 — 3 3	Observed when heaving up the trawl
15.06-16.06	3L	46°14'N-46 °58'N 46°22'W-46 °45'W	Sperm whale	2 — 3	Observed when heaving up the trawl
04.07-27.07	3L	46°20'N-48 °14'N 46°31'W-47 °38'W	Sperm whale Bottle-nosed whale Dolphin	2 — 6 3 —6 3 — 7	Observed when heaving up the trawl
23.06.09	3N	45°38'N-45 °48'N 45°38'W-48 °05'W	Sperm whale	1	Observed when heaving up the trawl

TABLE 20. Characteristics of vessels, which was used for analysis

Vessels of Russian Federation	Year and place of build	Total power output, kW	Length, m	Breadth, m	Gross Tonnage, r.t.	Working period
1	USSR, 1976	1470	76.36	14.00	2853	2000-2009
2	Spain, 1988	1270	68.50	9.50	1017	1998-2008
3	Spain, 1983	1360	63.90	10.50	1139	1998-2008
4	Norway, 1987	2940	56.00	14.00	1725	2009