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Analysis of illegal fishery for cod in the Barents Sea

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REPORT

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by

WWF-Russia and WWF Barents Sea Program

For further information contact:

Mikhail Kalentchenko

Project Leader,
WWF-Russia

Barents Sea Ecoregion Project

E-mail: 1HMKalentchenko@wwf.ru

Tel: +7 (8152) 421551

Fax: + 7 (8152) 456569

183016 Russia, Murmansk
S. Perovskoy St., 17, office 324

Dag Nagoda

Ecoregion Coordinator
WWF-Arctic Program

Barents Sea Ecoregion Project

E-mail: 2Hdnagoda@wwf.no

Tel: + 47 93 44 56 77,

Fax: + 47 22 20 06 66

P. O. Box 6784, St. Olavs plass
NO-0130 Oslo, Norway

Maren Esmark

Marine Coordinator
WWF-Norway

Barents Sea Ecoregion Project

E-mail: 3Hmesmark@wwf.no

Tel: + 47 97 18 33 79

Fax: + 47 22 20 06 66

P. O. Box 6784, St. Olavs plass
NO-0130 Oslo, Norway

REPORT

Analysis of cod fishery regulations and IUU fishing impact on cod stocks in the Barents Sea

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1. Countries participating in cod fishery, total allowable catches (TACs), allocation of quotas to different countries.

Participating in cod fishery in the Barents Sea and adjacent waters (ICES Divisions I, IIa and IIb)¹ are Russia, Norway, the Faroe Islands, France, Germany, Poland, Denmark, Estonia, Greenland, Iceland, Ireland, the Netherlands, Portugal, Spain and the Great Britain (Table 1).

The fishery on Northeast Arctic cod is mainly conducted in three areas, viz. off the northwest coast of Norway (Division IIa), in the Bear Island-Spitsbergen area (Division IIb), and in the southern Barents Sea (Division I). Cod caught off the Norwegian coast is primarily mature and large immature (“capelin cod”, or “spring cod”) fish. The bulk of catches taken in the Bear Island-Spitsbergen area and in the southern Barents Sea is made up by immature individuals younger than 8 years old (Boitsov et al., 2003; Aglen, Drevetnyak, Sokolov, 2004).

Ca. 67% of the total cod catch by all nations in 1932-2003 are taken in the feeding areas, 50% in the southern Barents Sea and 17% in the Bear Island-Spitsbergen area. The commercial importance of different fishing areas may considerably vary by years and decades. The major part of cod catches is represented by “skrei”, i.e. fish caught on spawning grounds. Norwegian catch statistics for “skrei” has been collected since 1866. In 1866 - 1900, mean annual catch of cod on the spawning grounds off the northwest coast of Norway (in particular, in Vest Fjord) amounted to ca. 40-50 million individuals of 5-6 kg average weight, or 200 000 - 300 000 tons (Boitsov et al., 1996).

By literature data (1932-1960) and official catch statistics existing since 1961, the catch of cod in the Barents Sea taken in 1932-2003 was ca. 41 million tons. Historically, major part of catches has been taken by Norway (17 million tons), Russia (15 million tons), Great Britain (6 million tons) and Germany (1 million tons). However, the role of these nations has varied. The share of Russia in the total catch of cod varied from 15 to 47%, that of Norway – from 31 to 62%. From 1932 to 2003, Norway caught on the average 41%, Russia 36%, Great Britain 15% and Germany 3% of the total catch. The portion of catches taken by other nations was 5% of the total catch (Table 2).

In the 1930s, mean annual catch of cod by all nations was 500 000 tons. The highest annual mean (866 000 tons) was reached in the middle of the last century, while in the 1960s and 1970s, annual catch of cod amounted to 761 000 - 727 000 tons. In the 1980s, mean annual catch of cod declined to 354 000 tons. In the 1990s and in the beginning of the 21st century, mean annual catches of cod stabilized at 435-565 000 tons. Long term mean catch of cod for 1932-2003 constituted 639 000 tons (Table 3).

After the introduction, in 1976 *de jure* and in 1978 *de facto*, of 200 n.mile economic zones in the Barents Sea and adjacent waters, the cod stock inhabiting a single ecological complex of the region fell under the jurisdiction of two coastal states, Russia and Norway. Since that time the fishery has been bilaterally regulated within the framework of the intergovernmental Joint Russian-Norwegian Fisheries Commission which meets every year, providing mutual access to fisheries in the waters of the two countries.

The Joint Russian-Norwegian Fisheries Commission has developed the most comprehensive, as compared to other commercial species, complex of measures regulating cod fishery, which includes setting of the total allowable catch (TAC), its distribution into national quotas, young fish protection (regulations concerning commercial size, allowable catches of undersized fish, fishing gear restrictions etc.) and protection of fish on spawning grounds (Boitsov et al., 2003).

¹ by ICES Division Scheme (Fig.1).

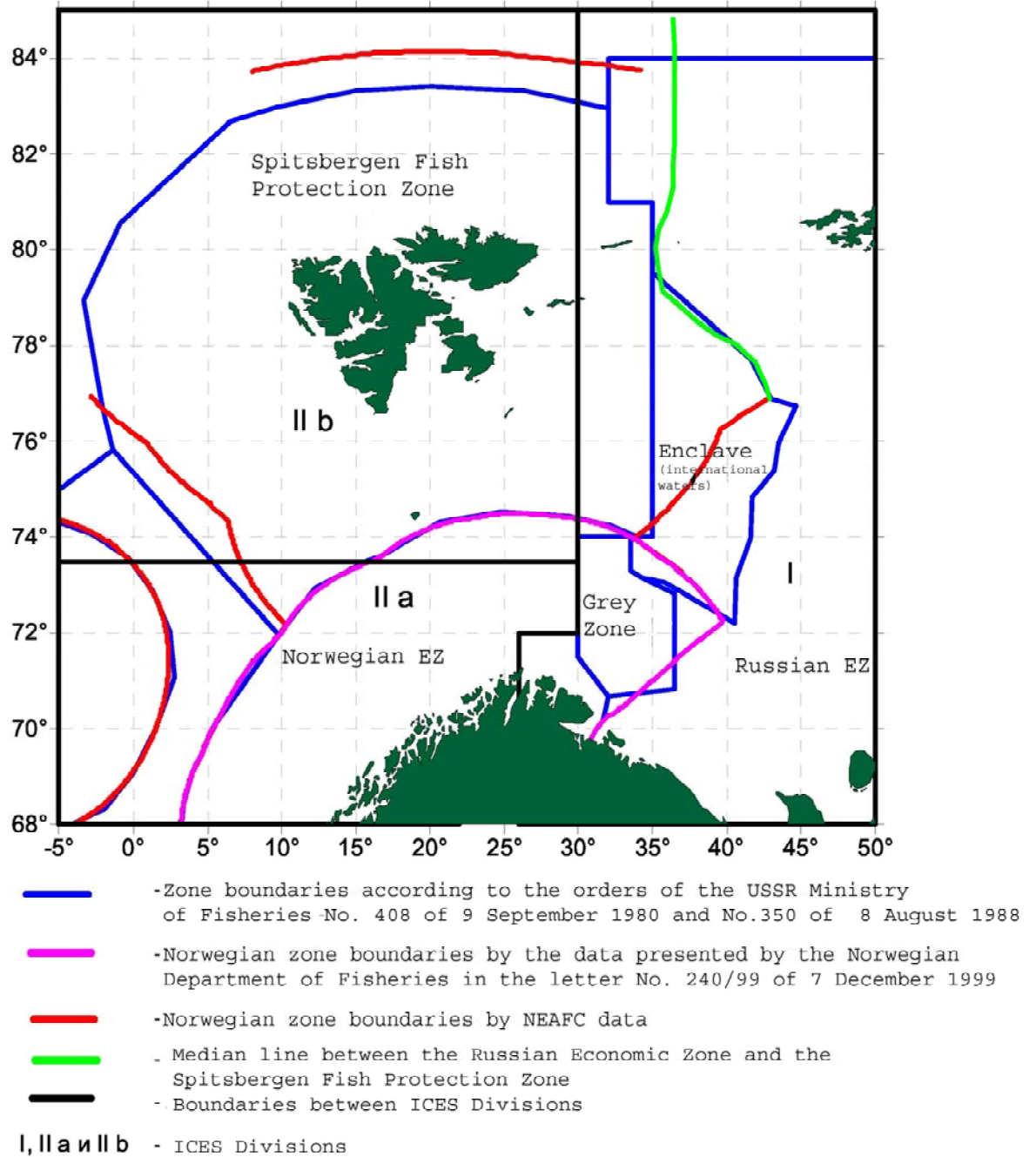


Fig.1. ICES Divisions and Economic Zones.

Table 1

Official catches of cod by fishing fleets of different countries in the Barents Sea and adjacent waters in 1961-2003, tons (ICES Divisions I, IIa and IIb) (Anon., 2004)

Year	Faroe Islands	France	GDR	FRG	Norway	Poland	Great Britain	Russia ²	Iceland	Other countries	Total
1961	3934	13755	3921	8129	268377		158113	325780		1212	783221
1962	3109	20482	1532	6503	225615		175020	476760		245	909266
1963		18318	129	4223	205056	108	129779	417964			775577
1964		8634	297	3202	149878		94549	180550		585	437695
1965		526	91	3670	197085		89962	152780		816	444930
1966		2967	228	4284	203792		103012	169300		121	483704
1967		664	45	3632	218910		87008	262340		6	572605
1968			225	1073	255611		140387	676758			1074084
1969	29374		5907	5543	305241	7856	231066	612215		133	1197226
1970	26265	44245	12413	9451	377606	5153	181481	276632			933246
1971	5877	34772	4998	9726	407044	1512	80102	144802		215	689048
1972	1393	8915	1300	3405	394181	892	58382	96653		166	565287
1973	1916	17028	4684	16751	285184	843	78808	387196		276	792686
1974	5717	46028	4860	78507	287276	9898	90894	540801		38453	1102434
1975	11309	28734	9981	30037	277099	7435	101843	343580		19368	829377
1976	11511	20941	8946	24369	344502	6986	89061	343057		18090	867463
1977	9167	15414	3463	12763	388982	1084	86781	369876		17771	905301
1978	9092	9394	3029	5434	363088	566	35449	267138		5525	698715
1979	6320	3046	547	2513	294821	15	17991	105846		9439	440538
1980	9981	1705	233	1921	232242	3	10366	115194		8789	380434
						Spain					
1981	12825	3106	298	2228	277818	14500	5262	83000			399037
1982	11998	761	302	1717	287525	14515	6601	40311			363730
1983	11106	126	473	1243	234000	14229	5840	22975			289992
1984	10674	11	686	1010	230743	8608	3663	22256			277651
1985	13418	23	1019	4395	211065	7846	3335	62489		4330	307920
1986	18667	591	1543	10092	232096	5497	7581	150541		3505	430113
1987	15036	1	986	7035	268004	16223	10957	202314		2515	523071
1988	15329	2551	605	2803	223412	10905	8107	169365		1862	434939
1989	15625	3231	326	3291	158684	7802	7056	134593		1273	332481
1990	9584	592	169	1437	88737	7950	3412	74609		510	187000
1991	8981	975	Greenland	2613	126226	3677	3981	119427 ³		3278	269158
1992	11663	2	3337	3911	168460	6217	6120	182315		1209	383234
1993	17435	3572	5389	5887	221051	8800	11336	244860	9374	3907	531611
1994	22826	1962	6882	8283	318395	14929	15579	291925	36737	28568	746086
1995	22262	4912	7462	7428	319987	15505	16329	296158	34214	15742	739999
1996	17758	5352	6529	8326	319158	15871	16061	305317	23005	14851	732228
1997	20076	5353	6426	6680	357825	17130	18066	313344	4200	13303	762403
1998	14290	1197	6388	3841	284647	14212	14294	244115	1423	8217	592624
1999	13700	2137	4093	3019	223390	8994	11315	210379	1985	5898	484910
2000	13350	2621	5787	3513	192860	8695	9165	166202	7562	5115	414870
2001	12500	2681	5727	4524	188431	9196	8698	183572	5917	5225	426471
2002	15693	2934	6419	4517	202559	8414	8977	184072	5975	5484	445045
2003 ¹	14668	2941	7026	4732	191976	7924	8711	182160	5961	5850	431949

¹- Preliminary data

²- Before 1991 – the USSR

³- Including the Baltic countries

Table 2

Cod catches in the Barents Sea and adjacent waters by periods and countries (ICES Divisions I, IIa and IIb) (above the line – thousand tons, below the line - %).

Period, years*	Russia	Norway**	Great Britain	Germany	Other countries	Total
1932-1938	<u>542</u> 15	<u>2020</u> 57	<u>630</u> 18	<u>320</u> 9	<u>26</u> 1	<u>3530</u> 100
1947-1950	<u>681</u> 21	<u>1109</u> 35	<u>1236</u> 39	<u>131</u> 4	<u>37</u> 1	<u>3193</u> 100
1951-1960	<u>3359</u> 39	<u>2680</u> 31	<u>1860</u> 21	<u>301</u> 4	<u>457</u> 5	<u>8658</u> 100
1961-1970	<u>3551</u> 47	<u>2407</u> 31	<u>1390</u> 18	<u>74</u> 1	<u>188</u> 2	<u>7612</u> 100
1971-1980	<u>2714</u> 37	<u>3274</u> 45	<u>650</u> 9	<u>227</u> 3	<u>406</u> 6	<u>7271</u> 100
1981-1990	<u>962</u> 27	<u>2212</u> 62	<u>62</u> 2	<u>42</u> 1	<u>267</u> 8	<u>3546</u> 100
1991-2000	<u>2374</u> 42	<u>2532</u> 45	<u>122</u> 2	<u>54</u> 1	<u>575</u> 10	<u>5657</u> 100
2001-2003	<u>550</u> 42	<u>583</u> 45	<u>26</u> 2	<u>14</u> 1	<u>131</u> 10	<u>1303</u> 100
1932-2003	<u>14733</u> 36	<u>16817</u> 41	<u>5976</u> 15	<u>1163</u> 3	<u>2087</u> 5	<u>40770</u> 100

* - Data for the first three periods (1932 - 1960) are given after by Yu.K.Benko and V.P.Ponomarenko (1972), data for other periods are provided by the ICES Arctic Fisheries Working Group (Anon, 2004).

** - Norwegian “coastal cod” not included

Table 3

Mean annual catch of cod by all nations by ICES Divisions (above the line – thousand tons, below the line - %).

Period*	ICES Division			Bzero
	I	IIa	IIIb	
1932-1938	<u>170</u> 34	<u>251</u> 50	<u>83</u> 16	<u>504</u> 100
1947-1950	<u>398</u> 50	<u>254</u> 32	<u>147</u> 18	<u>799</u> 100
1951-1960	<u>508</u> 50	<u>183</u> 32	<u>175</u> 18	<u>866</u> 100
1961-1970	<u>449</u> 59	<u>154</u> 20	<u>158</u> 21	<u>761</u> 100
1971-1980	<u>414</u> 57	<u>230</u> 32	<u>83</u> 11	<u>727</u> 100
1981-1990	<u>116</u> 33	<u>196</u> 55	<u>42</u> 12	<u>354</u> 100
1991-2000	<u>209</u> 37	<u>252</u> 45	<u>104</u> 18	<u>565</u> 100
2001-2003	<u>163</u> 37	<u>198</u> 46	<u>74</u> 17	<u>435</u> 100
1932-2003	<u>319</u> 50	<u>211</u> 33	<u>110</u> 17	<u>639</u> 100

* - Data for the first three periods (1932 - 1960) are given after by Yu.K.Benko and V.P.Ponomarenko (1972), data for other periods are provided by the ICES Arctic Fisheries Working Group (Anon, 2004).

The TAC is divided into quotas allocated to different countries on the following basis: first, the catch of “Murman coastal” cod, which will be included in the total Russian quota, is subtracted from the TAC of Northeast Arctic cod. The remaining part of TAC is divided in two between Russia and Norway, ca.14% of catch by the third countries not being taken into account. Then the catch of “Norwegian coastal” cod, which is equal to that of the “Murman” cod, is added to the Norwegian quota.

Total allowable catches and national quotas of Russia and Norway established by the Joint Russian-Norwegian Fisheries Commission are given in Table 4.

Table 4

Total allowable catches and national quotas of Russia and Norway established by the Joint Russian-Norwegian Fisheries Commission in 1994-2005

Year	TAC, thou.tons ¹	Quota of the third countries	Russian quota, thou.tons	Norwegian quota, thou.tons
1994	660+80	88.0	316.0	336.0
1995	660+80	88.0	314.0	338.0
1996	660+80	88.0	318.0	334.0
1997	810+80	104.0	347.0	359.0
1998	614+80	80.0	301.0	313.0
1999	440+80	59.0	224.5	236.5
2000	350+80	55.2	181.4	193.4
2001	355+80	55.9	183.55	195.55
2002	355+80	55.9	183.55	195.55
2003	355+80	55.9	183.55	195.55
2004	466+40	68.8	212.6	224.6
2005	464+42	66.6	213.7	225.7

Official catch by different countries in 1961-2003 is presented in Table 1. Official catch of cod by ICES Divisions for 1961-2003 and unreported catches for 1990-1994 and 2002-2003 are given in Table 5.

In 1993, experts of the ICES Arctic Fisheries Working Group, on the basis of the logbook data on cod catches provided by the Norwegian inspection authorities, and the total amount of fishing days estimated the unreported catch of cod at 130 000 tons. Using different data sources, the experts revealed overfishing also in 1990-1991 and 1993-1994 and estimated it at respectively 25 000, 50 000, 50 000 and 25 000 tons (Anon, 1994, 1995).

In 2004, at the ICES Arctic Fishery Working Group meeting, by request of the Norwegian delegate in ICES, the Norwegian delegation presented data on the annual unreported catches in 2002 and 2003 in the amount of 80 000 -100 000 tons. These data were obtained during the implementation of the Norwegian state project for the control of international fisheries. The estimates took into account the inspections of fishing vessels at sea, the inspections of transport vessels transshipping catch at sea, the results of satellite tracking of all vessels fishing in the Spitsbergen area and in the Grey Zone. On the basis of these data, the official catch of cod in 2002 and 2003 was estimated to be higher by 90 000 tons each year, reaching 535 000 and 521 000 tons, respectively (Table 5).

Reports showing overfishing of cod in 2002-2004 by Norwegian estimates can be found at the website of the Norwegian Directorate of Fisheries at http://www.fiskeridir.no/fiskeridir/ressursforvaltning/rapporter/russisk_fangst_av_torsk_omlasting_p_havet

Table 5

Catches of cod in the Barents Sea and adjacent waters by ICES Divisions in 1961-2003 (ICES Divisions I, IIa и IIb), tons (Anon, 2004)

Year	ICES Divisions			Unofficial catch ¹	Total catch
	I	IIa	IIb		
1961	409694	153019	220508		783221
1962	548621	139848	220797		909266
1963	547469	117100	111768		776337
1964	206883	104698	126114		437695
1965	241489	100011	103430		444983
1966	292253	134805	56653		483711
1967	322798	128747	121060		572605
1968	642452	162472	269254		1074084
1969	679373	255599	262254		1197226
1970	603855	243835	85556		933246
1971	312505	319623	56920		689048
1972	197015	335257	32982		565254
1973	492716	211762	88207		792685
1974	723489	124214	254730		1102433
1975	561701	120276	147400		829377
1976	526685	237245	103533		867463
1977	538231	257073	109997		905301
1978	418265	263157	17293		698715
1979	195166	235449	9923		440538
1980	168671	199313	12450		380434
1981	137033	245167	16837		399037
1982	96576	236125	31029		363730
1983	64803	200279	24910		289992
1984	54317	197573	25761		277651
1985	112605	173559	21756		307920
1986	157631	202688	69794		430113
1987	146106	245387	131578		523071
1988	166649	209930	58360		434939
1989	164512	149360	18609		332481
1990	62272	99465	25263	25000	212000
1991	70970	156966	41222	50000	319158
1992	124219	172532	86483	130000	513234
1993	195771	269383	66457	50000	581611
1994	353425	306417	86244	25000	771086
1995	251448	317585	170966		739999
1996	278364	297237	156627		732228
1997	273376	326689	162338		762403
1998	250815	257398	84411		592624
1999	159021	216898	108991		484910
2000	137197	204167	73506		414870
2001	142628	185890	97953		426471
2002	184789	189013	71242	90000	535045
2003 ²	162826	217620	51503	90000	521949

¹- Data used by the ICES Arctic Fisheries WG in cod stock assessment

²- Preliminary data

2. **Region-based allocation of quotas in the Russian Federation, Russian companies participating in cod fishery, number of fishing vessels.**

On November 20, 2003, the Regulations of the Government of the Russian Federation No.704 “On Quotas for Fishing (Harvesting) Aquatic Biological Resources” entered into force. The Regulations were aimed at improving state management of aquatic biological resources.

Pursuant to the Regulations, **the Government of the Russian Federation**, by the proposal of the State Committee for Fisheries of the RF (Federal Agency for Fisheries since 2004) annually approves the **total quotas** for fishing (harvesting) aquatic biological resources in the inland waters, territorial waters, on the continental shelf, in the exclusive economic zone of the Russian Federation, in the Sea of Azov and the Caspian Sea and in the lower reaches of the rivers flowing into the seas, as well as in the fisheries area regulated by the Joint Russian-Norwegian Fisheries Commission. The approved quotas are differentiated by fishing (harvesting) areas and by the ways of their utilization within the limits of the established TAC of the mentioned resources, including the following:

- total volume of quotas for fishing (harvesting) aquatic biological resources for personal needs (personal consumption) of the indigenous peoples and ethnic communities of the European North, the Siberia and the Far East of the Russian Federation, whose way of life, employment and economy have been traditionally based on these resources. The quotas are allocated to the coastal regions of the Russian Federation;
- total volume of quotas for commercial fishing (harvesting) aquatic biological resources in the inland waters, territorial waters, on the continental shelf, in the exclusive economic zone of the Russian Federation in the Baltic and the Black Seas, as well as in the Sea of Azov and the Caspian Sea and in the lower reaches of the rivers flowing into the seas (coastal fishery). The quotas are allocated to the coastal regions of the Russian Federation;
- total volume of quotas for commercial fishing (harvesting) aquatic biological resources on the continental shelf and in the exclusive economic zone of the Russian Federation (except the Baltic and the Black Seas), as well as in the area regulated by the Joint Russian-Norwegian Fisheries Commission;
- total volume of quotas for fishing (harvesting) aquatic biological resources for foreign states established in accordance with the international fisheries treaties of the Russian Federation;
- total volume of quotas for fishing (harvesting) aquatic biological resources for research, educational and cultural purposes;
- total volume of quotas for fishing (harvesting) aquatic biological resources with the purpose of their reproduction and acclimatization;
- total volume of quotas for fishing (harvesting) aquatic biological resources used for recreational fishery with the allocation to the coastal regions of the Russian Federation.

In order to fulfill the annual quota regulations of the Russian Government and pursuant to the Decision of the Interdepartmental Commission (established under the Regulations No.704) of 08.01.2004 (Protocol No.12) on the **allocation of shares** in the total volume of quotas for commercial fishing (harvesting) aquatic biological resources on the continental shelf and in the

REZ to the applicants for 2004-2008, the **Federal Agency for Fisheries of the RF** annually **establishes user quotas**.

The quota shares were allocated by the Interdepartmental Commission for a five year period (2004-2008) on the basis of the following:

- a) the preceding 3 years' licences (permissions) for the commercial fishing of aquatic biological resources in the inland waters, territorial waters, on the continental shelf and in the exclusive economic zone of the Russian Federation (except the Baltic and the Black Seas), as well as in the areas regulated by the Joint Russian-Norwegian Fisheries Commission. The licences should be issued in accordance with the established procedure on the basis of the orders of the State Committee for Fisheries of the RF;
- b) the preceding 3 years' licences (permissions) for the commercial fishing on aquatic biological resources in in exclusive economic zones of foreign states and in the areas regulated by international fisheries treaties of the Russian Federation;
- c) the preceding 3 years' licences (permissions) for fishing of aquatic biological resources issued according to the schedule of resource investigations and monitoring of aquatic biological resources approved by the State Committee for Fisheries of the RF;
- d) information of the RF Ministry of Economic Development and Trade for the preceding 3 years about auction winners who has fully paid for the purchased lots for the fishing of aquatic biological resources.

Pursuant to Regulations No.704, the grounds for the rescission of an agreement with an applicant for a quota share allocated for a five year (2004-2008) period are as follows:

- a) damage to aquatic biological resources caused by the user, which has been proved in the order stipulated by the law of the Russian Federation;
- b) non-compliance with the lawful claims of public officials to stop the vessel at sea for inspection and making obstructions to these officials performing their duties;
- c) breach of international treaties of the Russian Federation related to conservation and exploitation of aquatic biological resources;
- d) breach of the obligation to take onboard, for the period not exceeding 10% of the total period of fishing activity in the User's license (permission) area, scientists (maximum 2 scientists) from the research institutions of the State Committee for Fisheries of the Russian Federation who conduct state monitoring of aquatic stocks, and to pay their expenses during their stay onboard;
- e) the User's catch of biological water resources in each of the succeeding two years is below 50% of the quota shares allocated to the User.

Thus, the names and number of fisheries organisations participating in cod fishery in 2004-2008, will remain virtually unchanged (on the condition the companies still exist and do not commit the violations listed in Regulations No.704 and resulting in the rescission of the agreement).

Total quotas for 2005 were set up by the Decree of the Russian Government No.1668-r of 18.12.2004. Quotas for 2005 by fishing (haresting) areas, resource type and the ways of their

utilization were established by the Orders of the Federal Agency Nos. 171, 177, 178, 179, 180, 182 and 240.

In 2005, the quota of the Barents Sea cod will be fished on by 200 fishing companies (Table 6) from 8 regions of the Russian Federation (Murmansk region, Arkhangelsk region, Karelian Republic, Nenets Autonomous Area, Kaliningrad region, Moscow, Leningrad region and St.Petersburg). The major part of the quota was allocated to three regions - Murmansk region, Arkhangelsk region, and Karelian Republic.

The main part (above 70%) of the cod quota is traditionally utilised in directed trawl and longline fishery. Besides, cod makes up the main part of by-catches in longline fishery for other demersal fishes (in the Spitsbergen area and in the Grey Zone) and in trawl fishery for haddock (primarily in the Grey Zone and the REZ).

In 2004, cod fishery was conducted by ca. 200 Russian medium and large-size ocean-going vessels and ca. 150 small-size (below 15 m length) coastal fishing vessels. No considerable changes in the number or composition of the Russian fishing fleet are likely to happen in the nearest years.

Table 6
Fishing companies and their cod quotas in 2005

No.	COMPANY	
I	MURMANSK REGION	
1.	Iceberg Plus Ltd.	2145
2.	AKMT Ltd.	10
3.	Arktikpak Ltd.	164
4.	Arktitflot Ltd.	590
5.	Andromeda Ltd.	391
6.	Anklav Ltd.	619
7.	ARGO Ltd.	272
8.	Argo-M Ltd.	621
9.	JSC Arktikservis	952
10.	ArktikFishProdLimited	1394
11.	JSC Akktikholding	841
12.	Asasifish Ltd.	1746
13.	Babichev V.a., individual enterpriser	12
14.	Barentsfish Ltd.	458
15.	Barentsfish-Murmansk Ltd.	220
16.	JSC Barentsmoreprodukt	563
17.	Fisheries Kolkhoz "Belomorsky Rybak"	1646
18.	Fisheries Kolkhoz "Belryba"	91
19.	Bereznyak V.A., individual enterpriser	29
20.	Bios-Arktik Ltd.	311
21.	Bios-Shelf Ltd.	138
22.	Bionord Ltd.	370
23.	Biofriz Ltd.	24
24.	JSC Vega, Research-Production Company	4288
25.	Velikanov N.N., individual enterpriser	15
26.	Vitte Ltd.	837
27.	Fisheries Kolkhoz "Vidyaevets"	33
28.	Fisheries Kolkhoz "Vskhody Kommunizma"	3952
29.	Fisheries Kolkhoz "Vyuzhny"	278
30.	Gela Ltd.	540
31.	JSC Grumant	478
32.	Fisheries Kolkhoz "Zarya"	1778
33.	Zolotaya Rybka Ltd.	199

34.	Kalinikhin N.P., individual enterpriser	79
35.	Kanopus Ltd.	1545
36.	JSC Karat-1	2316
37.	Karat Ltd.	1265
38.	Kirichev A.E., individual enterpriser	25
39.	Kozin A.G., individual enterpriser	27
40.	Antares Ltd.	138
41.	LKT Ltd.	2266
42.	JSC Kors	410
43.	Kruglov P.N., individual enterpriser	106
44.	Kurator Ltd.	114
45.	JSC Lodfish	654
46.	Magnetik Ltd.	1275
47.	JSC Morskoe Sodruzhestvo	867
48.	NPP Morresursprojekt Ltd.	619
49.	JSC MTF	16551
50.	JSC MTF-1	3604
51.	JSC MTF-2	5080
52.	JSC MTF-3	3688
53.	JSC MTF-4	5406
54.	JSC Murmanskiiy Gubernskiy Flot	3162
55.	JSC Murmanrybprom	56
56.	JSC Murman SeaFood	2143
57.	Fisheries Kolkhoz Murman	1422
58.	JSC Murmanrybflot-2	2573
59.	JSC Murmanseld-2	3613
60.	MurmanFishProducts Ltd.	2378
61.	Murman Company Ltd.	180
62.	Nekton Ltd.	376
63.	Nord-Kap Ltd.	1726
64.	JSC Nord-West FC	872
65.	Nord Piligrim Ltd.	2573
66.	Fisheries Kolkhoz Pavlovsky	725
67.	JSC Parallel-M	755
68.	Fisheries Kolkhoz Petrovsky	26
69.	Persey Ltd.	347
70.	Research-Fisheries Company Persey Ltd.	999
71.	Polevach E.N., individual enterpriser	76
72.	Polaris Ltd.	291
73.	Fisheries Kolkhoz Ponoj	704
74.	Fisheries Kolkhoz Ponoj-Lakhta	1054
75.	JSC Prom.Kol.Severa AB	893
76.	Pribrezhnye Promysly Ltd.	349
77.	Fisheries Kolkhoz Pribrezhny	41
78.	Fisheries Kolkhoz Pribrezhny Flot	91
79.	Putina Ltd.	253
80.	Relit Ltd.	1226
81.	Ritmik Ltd.	91
82.	Rico-Fish Ltd.	125
83.	Robinzon Ltd.	73
84.	JSC Ros-1	1075
85.	JSC Rus-Ryba	31
86.	Ruspromcity Ltd.	160
87.	JSC Rybprominvest	6079
88.	Saami Ltd.	5085
89.	Fisheries Kolkhoz Savelievsky	60
90.	Severnaya Osnova Ltd.	66
91.	JSC Severny Nauchno-Issled.Flott	971
92.	Production Cooperative Severnaya Zvezda	1552
93.	Fisheries Kolkhoz Sever	611

94.	Severny Project Ltd.	574
95.	Sev.Mor.Manufaktura Ltd.	593
96.	Sevros Ltd.	1316
97.	RPSB Sevryba Ltd.	635
98.	JSC Sevrybkom-1	248
99.	JSC Sevrybkom-2	444
100.	Sevrybflot Ltd.	356
101.	Sevrybkomflot Ltd.	438
102.	Sev.Rybolovets.Comp. Ltd.	347
103.	Sedov V.I., individual enterpriser	164
104.	Sedykh A.E., individual enterpriser	15
105.	Sem Ostrivov Ltd.	271
106.	Sodruzhestvo-Plus Ltd.	427
107.	Sorokoumov A.Yu., individual enterpriser	13
108.	Sprut 2003 Ltd.	16
109.	SZRK-Murmansk Ltd.	1631
110.	JSC Sevrybkhodflot	2206
111.	JSC Sfen	1795
112.	Fisheries Kolkhoz Tersky	337
113.	Teriberskaya Bukhta Ltd.	15
114.	Teriberskaya Nov Ltd.	29
115.	Tetis Ltd.	56
116.	Troyanov A.A., individual enterpriser	15
117.	Fisheries Kolkhoz Udarnik	550
118.	Fisheries Kolkhoz Udarnik-2	1379
119.	Fisheries Kolkhoz Chapoma	637
120.	Sharin V.M., individual enterpriser	6
121.	Shchekinov O.V., individual enterpriser	157
122.	Fisheries Kolkhoz Energia	766
123.	Yakovlev V.P., individual enterpriser	5
124.	Fisheries Kolkhoz Yarusny	89
	TOTAL	129542
II	ARKHANGELSK REGION	
1.	Federal State Unitary Enterprise "Arkh.OpytnyVodor.Comb."	112
2.	Federal State Unitary Enterprise ABTF	14091
3.	Belomorryba Ltd.	225
4.	Belomorsky Rybokombinat Ltd.	222
5.	Fisheries Kolkhoz Belomor	450
6.	Ryb.Comp.Breeze Ltd.	232
7.	Voznesenie Ltd.	446
8.	JSC Gavan	330
9.	JSC Gavan-Solovki	1169
10.	Dimas Ltd.	516
11.	Fisheries Kolkhoz Zarya	715
12.	Fisheries Kolkhoz Zimnyaya Zolotitsa	383
13.	Fisheries Kolkhoz im.Kalinina	715
14.	Fisheries Kolkhoz im.Lenina	715
15.	Fisheries Kolkhoz im.40 let Oktyabrya	715
16.	JSC ConservFish	846
17.	Kotlasrybprom Ltd.	111
18.	Fisheries Kolkhoz Krasnoe Znamya	2998
19.	Fisheries Kolkhoz Osvobozhdenie	2080
20.	Fisheries Kolkhoz Priliv	683
21.	Fisheries Kolkhoz Sever	1468
22.	Sevmoreprodukt Ltd.	221
23.	Sevnauchflot Ltd.	362
24.	JSC Sogra, Fisheries Kolkhoz	4724
25.	Fisheries Kolkhoz Soyana	459
26.	Stomar Ltd.	801
27.	JSC Flotarkhangelskprom	399

28.	Yagry Ltd.	3898
	TOTAL	40085
III	REPUBLIC OF KARELIA	
1.	Fisheries Kolkhoz "12 th Godovsh.Oktyabrya"	472
2.	Akvarius Ltd.	598
3.	Alternativa Ltd.	2532
4.	Fisheries Kolkhoz Barents Rybak	1260
5.	JSC BBPLR	498
6.	Fisheries Kolkhoz Belomor	665
7.	Belomorje Ltd.	60
8.	Bussol Ltd., Industrial-Commercial Company	789
9.	Virma Ltd.	2072
10.	Fisheries Kolkhoz Virma	508
11.	Fisheries Kolkhoz Gridino	91
12.	Fisheries Kolkhoz Grumant	621
13.	Fisheries Kolkhoz Zarya Severa	250
14.	Iriy Ltd.	83
15.	Kapitan-2 Ltd.	777
16.	JSC Karel.Moreprod.	3488
17.	Karelyryba Ltd., Industrial-Commercial Company	818
18.	Karelyryba-1 Ltd., Industrial-Commercial Company	106
19.	Fisheries Kolkhoz Keret	353
20.	Fisheries Kolkhoz Kuzema	1327
21.	Markab Ltd.	304
22.	Fisheries Kolkhoz Pobeda	444
23.	JSC Pomortral	291
24.	Sev-Zap.Rybopr.Comp.-2 Ltd.	639
25.	Sev-Zap.Rybopr.Comp. Ltd.	300
26.	Sever-Trust Ltd.	207
27.	Forpost Ltd.	922
	TOTAL	20474
IV	NENETS AUTONOMOUS AREA	
1.	Fisheries Kolkhoz Andeg	1481
2.	Fisheries Kolkhoz Zapolyarye	256
3.	Fisheries Kolkhoz im.Lenina	1112
4.	Nenetsky Rybakkolkhozsoyuz Ltd.	421
5.	Fisheries Kolkhoz Pobeda	547
6.	Fisheries Kolkhoz Rodina	706
7.	Fisheries Kolkhoz Severny Polyus	468
8.	Fisheries Kolkhoz Sula	509
	TOTAL	5499
V	KALININGRAD REGION	
1.	JSC Atlantrybflot, Research-Industrial Association	1727
2.	Fisheries Kolkhoz Za Rodinu	285
3.	JSC Zapadny Rumb	127
4.	JSC Zaprybflot	438
5.	Fishing Company "Mirovoy Okean Ltd."	544
6.	Morskaya Zvezda Ltd.	181
7.	Obyed.Mor.Kompaniya Ltd.	110
	TOTAL	3412
VI	MOSCOW	
1.	JSC RPF Variant	2538
2.	Federal State Unitary Enterprise "Nats.Ryb.Resursy"	747
	TOTAL	3285
VII	ST.PETERSBURG	
1.	Atlas-Neva Ltd.	550
2.	JSC Soed.Ryb.Konpaniya	151
3.	JSC ROSS	283
	TOTAL	984
VIII	LENINGRAD REGION	

3. Methods to incorporate cod overfishing in TAC estimation. Expert assessment of the illegal catch dynamics (increase/decrease).

a) Methods to incorporate cod overfishing in TAC estimation

To assess stocks by the Virtual Population Analysis (VPA) which is the basis for the Xtended Survival Analysis (XSA) used by the Working Group, historical catch-at-age matrices expressed in the yearly number of individuals are applied.

The catch is calculated by the age-based division of the total catch (in tons) made on the basis of weight-at-age, i.e. the portion and mean weight of fish from each age group in catches.

The mentioned portion of fish is calculated by applying the age composition in samples to the entire catch using mass measurement data for fishing vessels.

Mean weight-at-age in catches is derived on the basis of biological age samples collected throughout the year onboard fishing vessels.

Thus derived catch-at-age expressed in individuals is directly related to the total catch, i.e. the greater (or smaller) the total catch (in tons), the greater (or smaller) the catch-at-age (in individuals). Only the portion of each age group in the catch.

The greater the annual catch-at-age, the greater the abundance and consequently biomass of fish in the current year, as the VPA model calculates abundance using the standard catch equation

$$C(a,y) = N(a,y) * (1 - e^{-Z(a,y)}) * F(a,y) / Z(a,y)$$

where

$C(a,y)$ is catch (in individuals) at age “a” in the year “y”

$N(a,y)$ is abundance at age “a” in the year “y”

$F(a,y)$ is fishing mortality at age “a” in the year “y”

$Z(a,y)$ is total mortality at age “a” in the year “y”

The abundance of fish from a certain yearclass in the previous period is calculated by the following stock equation:

$$N(a,y) = N(a+1,y+1) / e^{-Z(a,y)}$$

where $N(a+1,y+1)$ is abundance at age “a+1” in the year “y+1” (the abundance of $N(a,y)$ fish in the next year).

Thus, the models based on catch-at-age data show that changes in the total catch (e.g. addition of the illegal catch) cause the corresponding changes in the stock size.

b) Expert assessment of the illegal catch dynamics (increase/decrease)

The accounting of all cod catches by the official catch statistics is currently quite a challenging issue for both Russia and Norway .

“Even by the official statistics, the “allmenning”, currently existing Norwegian law institution, allows no less than 40 000 additional tons of cod catch above the established quota. Due to this, northern Norwegians can conduct recreational fishery for cod in the coastal areas, and not only fish for home use, but also sell their catches.

Until recently, the restrictions concerned only fishing gears. In 2004, the limitation of the total annual amount of cod sold by a recreational fisher to 3 tons and below was legitimised. However, catches were not limited. In Russia, fishing by indigenous population is taken into account in quota allocation and included in the TAC” (Parlamentskaya Gazeta, 2005).

Data proving the inconsistency of the Norwegian official catch statistics are also presented in the working documents submitted to the Arctic Fisheries WG (AFWG, WG #8, 2000; AFWG, WG #14, 2002).

In 2004, PINRO carried out an investigation concerning the reliability of fisheries statistics. This research can be used to develop the foundations and methodological approaches to the estimation of possible cod catches left out of account by the official fisheries statistics. Three methods of revealing unreliable and doubtful statistical data were applied.

The first unreliability indicator for catch per unit effort (CPUE) and daily catch is the difference in the catch rates of the same vessels in the main fishing areas (NEZ, Bear Island-Spitsbergen, REZ + the Grey Zone). Despite the possible, and inevitable, temporal and spatial variability of CPUE due to biological (cod and capelin stock size, length and age composition of the population etc.), abiotic (heat condition of the sea, number of stormy days etc.) and fisheries (trawl mesh size) factors, this variability remains more or less constant and must be compatible if reliable data are provided.

The comparison of daily catch rates of medium-size vessels per fishing day in 2004 by economic zones is given in Fig.2. As can be seen, the gap between CPUE indices for different economic zones is improbably large, with a more than three times difference. Doubts as to the statistics reliability for such vessels are also confirmed by the following circumstance. Mean catch rate of these vessels in the NEZ and the Bear Island-Spitsbergen area was respectively 19 and 15 tons per fishing day, which is by 3 tons and 1 ton more than the catch rate of other vessels of the same type fishing in the same areas, the statistics for which is considered more or less reliable. Meanwhile, the catch per fishing day of the “unreliable” vessels in the REZ and in the Grey Zone was as low as 5 tons compared to 13 tons for “reliable” vessels. Thus, the catch of the “reliable” vessels in the NEZ, the Bear Island-Spitsbergen area and the Grey Zone + REZ constituted 16, 14 and 13 tons, respectively, the ratio being 1 : 1.2 : 1.2, while the corresponding indices for the “unreliable” vessels were 19, 15 and 5 tons and 1 : 1.3 : 3.7 (Fig.3).

The second method used to reveal the unreliable statistics was the comparison of CPUE for the same vessels in the years with undoubtedly reliable data, with the same indices for the recent years when the quality of such data is likely to have deteriorated. Catch rate analysis for certain vessels fishing in the Grey Zone and in the REZ in 2004 indicates that the official CPUE values are improbably low - the lowest in the last four years, despite the recently observed growth of the cod stock proved by an increased catch rate and high CPUE in other fishing areas.

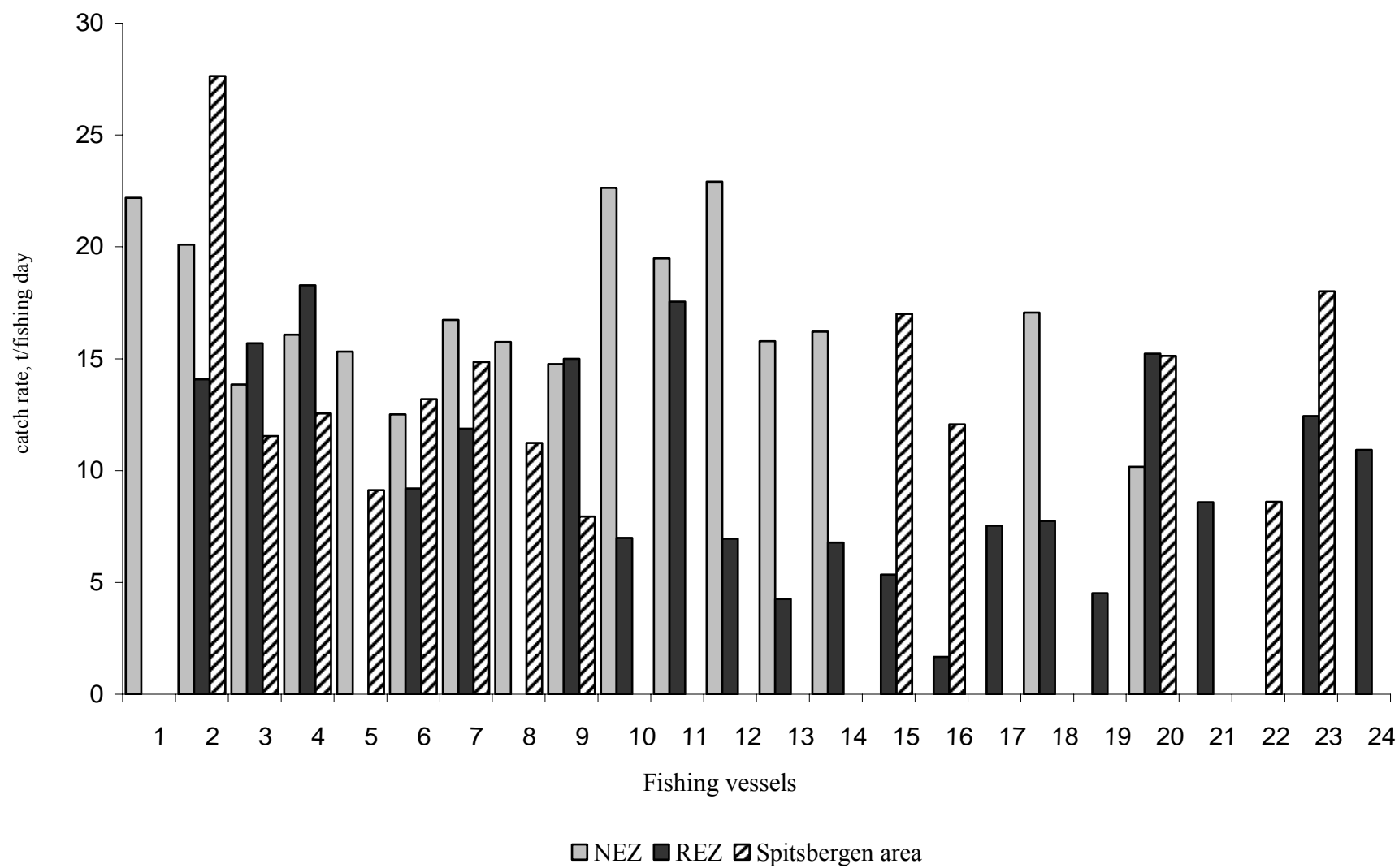


Fig.2. Catch rates of medium-size vessels in the directed fishery on cod in 2004

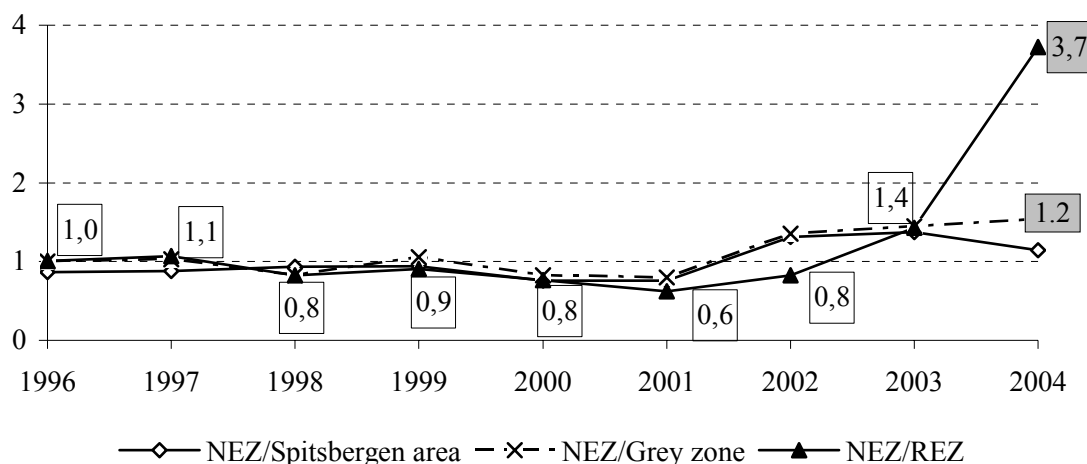


Fig.3. The comparison of catch rates for some medium-size vessels by fishing areas in the directed fishery on cod in 1996-2004

The third method to check up the reliability of catch statistics is the comparison of CPUE of fishing vessels with that of research-fishing vessels of the same type with PINRO observers onboard conducting state monitoring of stocks in September-December 2004. CPUE of the vessels with observers onboard was found out to be almost the double of CPUE for other vessels of the same type and almost three times higher than that of the vessels with doubtful catch statistics.

The mentioned approaches to the obtaining of reliable CPUE statistics for different vessel types can be used to estimate actual catches of cod. The reliable data on catch rates of different vessel types and the fishing period of “suspicious” vessels can help to roughly estimate the unreported catch and incorporate the obtained data in future stock assessments.

Illegal catches taken in 2004 and, consequently, total catch data to be used by the Arctic Fisheries WG for cod stock assessment in 2005, are likely to be close to the estimates for 2002-2003.

c) Measures to curb illegal catches

At the 33rd session of the Joint Russian-Norwegian Fisheries Commission the parties discussed the data related to unreported catches of cod in the Barents and Norwegian Seas and expressed their concern over the existing situation.

Being aware of considerable unreported catches of cod in the Barents Sea, Russia and Norway prioritised at the revealing and prevention of such illegal actions by **all possible means**.

Russia pointed out that, according to the catch statistics, Norway has been considerably overfishing its cod quota in the recent years. The Norwegian party reported on the major changes in the coastal fishery management system, which had caused quota overfishing in the last three years. Nonetheless, the scope of overfishing has been decreasing with time. The Norwegian party intends to solve this problem in 2005.

The Russian party reported that it would continue its work at the collection of data on deliveries to the third countries. The parties agreed to cooperate in order to obtain such data. The Norwegian party expressed the desire to continue the receiving of data on the landings of Norwegian vessels in Russia. A proposal was made to bring the data submission format into

compliance with that used by the Norwegian authorities for the submission of statistical data to Russia on a monthly basis according to the Memorandum on Control of 17.11.2000.

Russia and Norway decided to continue the cooperation between their fisheries management authorities in order to further enhance the effectiveness of resource control and fisheries management. Any joint Russian-Norwegian projects, including the investigations related to fishing on the joint stocks of the Barents and Norwegian Seas, should be considered by the Joint Russian-Norwegian Fisheries Commission and approved by the Ministry of Agriculture of the Russian Federation and the Norwegian Ministry of Fisheries and Coastal Affairs. Each country undertakes to inform the other party about the quotas allocated and obtained within the frameworks of such projects and about the landings of fish caught against such quotas.

The Fisheries Commission instructed the Permanent Committee to continue the elaboration of the draft document "Agreed Measures for the Improvement of the Regulation and Control System for Fisheries in the Barents and Norwegian Seas". The document shall comprise the following issues:

- analysis of the existing regulatory and control measures related to fisheries;
- substantiation of the criteria required for the development of the most effective fisheries regulation and control scheme;
- agreed measures aimed at the optimization of fisheries regulation and control;
- analysis of factors which could complicate such optimization, and proposals concerning the possible ways of their elimination.

Russia and Norway agreed that the Memorandum of Cooperation is a good basis for the improvement of control and cooperation and emphasised the necessity of further work at its implementation.

On the basis of the cooperation within the framework of the Memorandum, the Russian party suggested the investigation of the possibility to draw up a bilateral agreement for the exchange of data on import, export and reexport of fish products of Russian and Norwegian origin in order to combat their illegal sales.

The Fisheries Commission stated the necessity of strict fisheries control in the Barents and Norwegian Seas and discussed the following control measures:

- control of the Russian vessels' landings in Norwegian ports;
- strengthening of control over transshipments at sea and landings in the third countries;
- introduction of the following mandatory reporting procedure for fishing and transport vessels making transshipments at sea:
 - A fishing vessel reports on an intended transshipment 24 hours in advance;
 - The receiving vessel sends a report within 1 hour of the end of transshipment;
 - The report should contain: time and position of transshipment; volume of the transhipped fish products by species (in round weight); data on the vessels unloading and receiving the catch.
 - The receiving vessel also reports about the intended port (position) of landing no later than 24 hours in advance.

Until the introduction of an electronic messaging system, messages are transmitted in the manual regime according to the law in force.

On leaving the economic zones of the parties, fishing vessels intending to land their catches in the third countries should report on the place of landing.

Russia and Norway agreed to prohibit catch transshipment to the vessels with no right to fly the NEAFC flag, or to the vessels of the countries without the status of a cooperating non-contracting party to NEAFC.

The parties agreed to seek a full scope data exchange on quotas, satellite tracking and at-sea transshipments, and to provide, by request of the other party, data on the following:

- at-sea transshipments or landings in the third countries of the species constituting joint Barents and Norwegian Sea stocks, at the level of an individual vessel;
- satellite tracking in all areas of the Barents and Norwegian Seas, at the level of an individual vessel;
- valid licences (permissions) for cod and haddock fishery in the Barents and Norwegian Seas, at the level of an individual vessel.

The parties agreed that the transport vessels receiving catches are subjected to satellite tracking alongside with the fishing vessels.

The Parties agreed to start, from 1 March 2005, the exchange of monthly data on cod and haddock quotas north of 62°N at the level of an individual vessel/company. The parties will try to make these data available in the Internet in 2005.

Norway reported that, in the connection with the major problem of unreported cod catches in the Barents and Norwegian Seas, the licencing procedure will be toughened, up to the denial of a licence to the vessels hiding or keeping back the information from the control authorities during inspections. Russia will apply similar measures to foreign vessels. In case unreported catches are revealed, the parties will exchange the confirming documents which can serve as a proof in court.

The parties agreed upon the necessity to expand the dialogue with the third countries in order to obtain a more detailed information on the landings of the parties' vessels, and instructed the Permanent Committee to maintain the contacts with the third countries concerning the exchange of such data.

The parties restated that by the quota agreements with the third countries the latter should take a responsibility to limit their fishery by the quotas allocated to them by the coastal states, irrespective of whether the fishery is conducted within or without Russian and Norwegian fisheries jurisdiction.

The parties discussed fishery of the third countries in the Barents and Norwegian Seas and agreed to continue the operative control over this fishery so that it could be closed after the utilization of the allocated quotas.

The parties confirmed that the regulatory measures for the Northeast Arctic cod stock apply to the entire area of its distribution.

Further development of the situation related to illegal fishing on cod in the Barents Sea will to a great extent depend not only on the mentioned control measures, but also on the elaboration of management decisions, including legislative ones, which would aim at a more strict regulation of both recreational and commercial fishery (limitation of fishing

period, seasonal and area restrictions of fishery on the spawning grounds and in the areas with high densities of juveniles etc.). This could minimise the potential possibilities for illegal fishing.

4. Estimation of eventual effects of illegal fishery on the cod stock

The effects of illegal fishery and the resulting overfishing of aquatic resources are well known. Overexploitation of commercial fish stocks leads to such dangerous consequences as the reduction in the commercial and spawning stock biomass and higher possibility of a drastic abundance decline in the next yearclasses (Kushing, 1979). Overfishing also causes other stable biological changes in the commercial stock resulting in a changed quality and composition of the spawning stock, population fecundity and specific reproductive capacity. Uncontrolled fishing together with very large illegal catches may deny the very possibility of biomass growth in a yearclass.

The history of fishery for Northeast Arctic cod has witnessed a lot of examples when a very heavy exploitation (e.g. of one of the strongest yearclasses of 1970) kept the fisheries biomass at the previous year level instead of the expected maximum increase and did not ensure growth of the commercial and spawning stocks.

5. Additional regulatory/control measures which could effectively influence/ensure the reduction of illegal fishery in the Barents Sea

After falling of the cod stock under the jurisdiction of just two countries, Russia and Norway, the bilateral management of the stock within the framework of the Joint Russian-Norwegian Fisheries Commission was introduced.

The Commission has developed a complex of regulations for cod fishery, which includes the limitation of annual catch by total allowable catch (TAC) and young fish protection (commercial size, allowable bycatches of undersized fish in the fishery for gadoid species, other fish and invertebrates, temporal or permanent closure of fishery on the spawning grounds and in the areas with high densities of juveniles, mandatory use of selective grids).

Additional regulations of cod fishery were introduced in 2001 by Order No.341 of 28.12.2000 "On the Introduction of Amendments and Additions into the Rules of Fisheries in the Barents Sea". The Order introduced the estimated minimal catches of cod and haddock per fishing day. Similar regulations were established for 2002 (Order No.418 of 24.12.2001) and 2003 (Order No.486 of 26.12.2001). These regulations set up the fishing period on the basis of the quota and stipulated by the Order mean daily catch rate of the vessel. For instance, if the quota of a medium-size freezing trawler (SRTM) in 2003 was 200 tons, the fishing period for this vessel should not exceed 43 days (200 tons : 4.7 tons/fishing day = 43 fishing days).

ESTIMATED MINIMAL CATCHES OF COD AND HADDOCK
PER FISHING DAY

(cod and haddock)

1.	RS (Fishing Vessel)	1.3 tons
2.	SChS (Medium Size Black Sea Seiner)	1.0 tons
3.	MRT RB (Small Size Fishing Freezer Trawler)	2.8 tons
4.	SRTR (Medium Size Fishing Freezer Trawler)	3.1 tons
5.	MKRTM (Small Size Fishing Shrimp Freezer Trawler)	3.6 tons
6.	STRA (Refrigerating Seiner-Trawler, type "Alpinist")	4.8 tons
7.	SRTM (Medium Size Fishing Freezer Trawler, type "Barentsevo More")	6.5 tons
8.	PST (Salter Trawler)	6.6 tons
9.	ZRS (Sealer)	8.0 tons
10.	BMRTPT (Large Size Fishing Freezer Trawler)	9.0 tons
11.	STM (Freezer Seiner-Trawler, type "Orlenok")	9.0 tons
12.	Vessels built abroad with main engine capacity below 1000 kW	5.5 tons
13.	Vessels built abroad with main engine capacity 1000-2000 kW	8.0 tons
14.	Vessels built abroad with main engine capacity 2000-3000 kW	14.5 tons
15.	KMRT (Stern Fishing Freezer Trawler), type "Ivan Shankov" with main engine capacity 1920 kW	12.0 tons
16.	TFMF (Factory Fillet Freezer Trawler), types "Sevryba", "Karelia" with main engine capacity 2250-2940 kW	14.0 tons

ESTIMATED MINIMAL CATCHES OF COD AND HADDOCK
PER FISHING DAY

(formulated by the Order of the State Committee for Fisheries of the RF No.109 of 07.03.2002)

		Cod	Haddock
1.	SChS (Medium Size Black Sea Seiner) (in the formulation of the Order of the State Committee for Fisheries of the RF No.109 of 07.03.2002)	0,4 tons	-
2.	RS (Fishing Vessel) (in the formulation of the Order of the State Committee for Fisheries of the RF No.109 of 07.03.2002)	0.5 tons	-
3.	SRTR (Medium Size Fishing Freezer Trawler)	2.4 tons	2.2 tons
4.	MRTB (Small Size Fishing Freezer Trawler) (in the formulation of the Order of the State Committee for Fisheries of the RF No.109 of 07.03.2002)	0.6 tons	-
5.	MKRTM (Small Size Fishing Shrimp Freezer Trawler) (in the formulation of the Order of the State Committee for Fisheries of the RF No.109 of 07.03.2002)	1.0 ton	-
6.	STRA (Refrigerating Seiner-Trawler, type "Alpinist")	3.8 tons	3.1 tons
7.	SRTM (Medium Size Fishing Freezer Trawler, type "Barentsevo More")	4.7 tons	3.8 tons
8.	PST (Salter Trawler)	5.5 tons	5.8 tons
9.	ZRS (Sealer)	7.1 tons	-
10.	BMRTPT (Large Size Fishing Freezer Trawler)	6.0 tons	4.8 tons
11.	STM (Freezer Seiner-Trawler, type "Orlenok")	7.0 tons	5.3 tons
12.	KRMT (Stern Fishing Freezer Trawler)	8.0 tons	5.7 tons
13.	TFMF (Factory Fillet Freezer Trawler)	10.7 tons	9.4 tons
14.	Non-serial vessels -1	6.6 tons	3.3 tons
15.	Non-serial vessels -2	5.8 tons	5.3 tons
16.	Non-serial vessels -3	12.0 tons	9.5 tons

ESTIMATED MINIMAL CATCHES OF COD AND HADDOCK
PER FISHING DAY

		Cod	Haddock
1.	RS (Fishing Vessel)	0,7 tons	0,6 tons
2.	SChS (Medium Size Black Sea Seiner)	0,8 tons	0,5 tons
3.	SRTR (Medium Size Fishing Freezer Trawler)	1.2 tons	2.2 tons
4.	MRTK (Small Size Fishing Trawler)	1.3 tons	0,7 tons
5.	MKRTM (Small Size Fishing Shrimp Freezer Trawler)	3.0 tons	1.2 tons
6.	STRA (Refrigerating Seiner-Trawler, type "Alpinist")	4.2 ton	3.3 tons
7.	SRTM (Medium Size Fishing Freezer Trawler, type "Barentsevo More")	4.7 tons	4.1 tons
8.	PST (Salter Trawler)	6.3 tons	6.2 tons
9.	ZRS (Sealer)	7.1 tons	-
10.	BMRTPT (Large Size Fishing Freezer Trawler)	6.4 tons	5.2 tons
11.	STM (Freezer Seiner-Trawler, type "Orlenok")	6.9 tons	5.7 tons
12.	KRMT (Stern Fishing Freezer Trawler)	8.1 tons	6.1 tons
13.	TFMF (Factory Fillet Freezer Trawler)	12.8 tons	10.1 tons
14.	Non-serial vessels -1	6.9 tons	5.7 tons
15.	Non-serial vessels -3	9.0 tons	9.0 tons
16.	Longliner	2.0 tons	-

Annex 2 to the Order of the Ministry of Agriculture
of the Russian Federation of 15.10.2004 No.498MINIMAL QUOTA ALLOCATIONS FOR FISHING (HARVESTING) OF AQUATIC BIOLOGICAL
RESOURCES FOR THE VESSELS BY VESSEL TYPES, FISHING GEARS AND RESOURCE TYPE (THE
NORTHERN BASIN)

Vessel type	Type of aquatic biological resource	Fishing gears	Yearly quota, tons
Large Size Fishing Freezer Trawler, type "Sotrudnichestvo"	All types, except crab	Trawl	7000
Fishing Freezer Canner Trawler, type "Moonzund"			7000
Fishing Krill Trawler, type "Antarktida"			7000
Large Size Fishing Freezer Trawler, type "Pulkovsky Meridian"			5100
Fishing Freezer Trawler, type "Gorizont"			5000
Large Size Fishing Freezer Trawler, types "Prometey", "Ivan Bochkov"			4200
Large Size Fishing Freezer Trawler, types "Kronshtadt", "Mayakovsky", "Pioner Latvii", "Leskov"			2200 2100 2300
Large Size Seiner Trawler "Murman-2"			7000
Fishing Freezer Trawler, type "Atlantik"			2300
Freezer Seiner-Trawler, type "Orlenok"			2100
Medium Size Fishing Freezer Trawler, types "Sterkoder", "Mys Korsakova"			2300
Medium Size Fishing Freezer Trawler, types "Sevryba-1", "Sevryba-2"			2300
Medium Size Fishing Freezer Trawler, types "Obolon", "Ivan Shankov", "Barentsevo More" (freezer), (fresher)			1800 960 (780)
Medium Size Fishing Freezer Trawler, type "Arius"			960

Medium Size Fishing Freezer Trawler, types “Zhelezny Potok”, “Vasily Yakovenko”, “Andrey Smirnov”			620		
Medium Size Fishing Freezer Trawler, types “Olga”, “Mayak”, “Sargassa”			620		
Refrigerating Seiner-Trawler, types “Alpinist”, “Nadezhny”			550		
Medium Size Fishing Trawler, type “Okean”			500		
Medium Size Fishing Vessel universal, types “Primorye”, SPS-001”			360		
Squid Vessel, type “Golitsyno”			360		
Small Size Shrimp Freezer Trawler, types “Laukuva”, “Leda”, “Omar”			360		
Fishing Seiner, types “RS-300”, “Kerchanin”			60		
Small Size Fishing Seiner, type “Yagry”			360		
Small Size Fishing Seiner, types “SChS-150”, “MRS-150”, “MRS-80”, “RV-80”			180		
Small Size Fishing Freezer Trawler, types “Karelia”, “Girulyai”, “Sokol”, proj.21280, “Baltika”			180 90		
Small Size Fishing Seiner-Trawler, types “Kerch”, “MRS-225”			180		
Small Size Fishing Vessel, types “Orion”, “RS-150”, proj. 697, 1338, 13301			180		
Fishing Processing Vessel, types “Volga”, “Moryana”			420		
Freezer Seiner-Trawler, type “Orlenok”	All types, except crab	Longline	420		
Medium Size Fishing Freezer Trawler, types “Sterkoder”, “Mys Korsakova”			420		
Medium Size Fishing Freezer Trawler, types “Sevryba-1”, “Sevryba-2”			420		
Medium Size Fishing Freezer Trawler, types “Obolon”, “Ivan Shankov”, “Barentsevo More” (freezer), (fresher)			420 380		
Medium Size Fishing Freezer Trawler, type “Arius”			420		
Medium Size Freezer Longliner, types “Antias”, “Kapitan Kartashov”			420		
Medium Size Fishing Freezer Trawler, types “Zhelezny Potok”, “Vasily Yakovenko”, “Andrey Smirnov”			420		
Medium Size Fishing Freezer Trawler, types “Olga”, “Mayak”, “Sargassa”			420		
Refrigerating Seiner-Trawler, types “Alpinist”, “Nadezhny”			340		
Medium Size Fishing Vessel universal, types “Primorye”, SPS-001”			360		
Squid Vessel, type “Golitsyno”			360		
Small Size Shrimp Freezer Trawler, types “Laukuva”, “Leda”, “Omar”			180		
Fishing Seiner, types “RS-300”, “Kerchanin”			180		
Small Size Fishing Seiner, type “Yagry”			180		
Small Size Fishing Seiner, types “SChS-150”, “MRS-150”, “MRS-80”, “RV-80”			180		
Small Size Fishing Freezer Trawler, types “Karelia”, “Girulyai”, “Sokol”, proj.21280, “Baltika”			180		
Small Size Fishing Seiner-Trawler, types “Kerch”, “MRS-225”			180		
Small Size Fishing Vessel, types “Orion”, “RS-150”, proj. 697, 1338, 13301			180		
Freezer Seiner-Trawler, type “Orlenok”				Purse seine	2100
Medium Size Fishing Freezer Trawler, types “Sterkoder”, “Mys Korsakova”			All types, except crab		2100

Medium Size Fishing Freezer Trawler, types “Sevryba-1”, “Sevryba-2”			2100		
Medium Size Fishing Freezer Trawler, types “Obolon”, “Ivan Shankov”, “Barentsevo More” (freezer), (fresher)			1800 960 (780)		
Medium Size Fishing Freezer Trawler, type “Arius”			1800		
Medium Size Fishing Freezer Trawler, types “Zhelezny Potok”, “Vasily Yakovenko”, “Andrey Smirnov”			620		
Medium Size Fishing Freezer Trawler, types “Olga”, “Mayak”, “Sargassa”			550		
Refrigerating Seiner-Trawler, types “Alpinist”, “Nadezhny”			550		
Medium Size Fishing Vessel universal, types “Primorye”, SPS-001”			360		
Squid Vessel, type “Golitsyno”			360		
Small Size Shrimp Freezer Trawler, types “Laukuva”, “Leda”, “Omar”			180		
Fishing Seiner, types “RS-300”, “Kerchanin”			360		
Small Size Fishing Seiner, type “Yagry”			180		
Small Size Fishing Seiner, types “SChS-150”, “MRS-150”, “MRS-80”, “RV-80”			180		
Small Size Fishing Freezer Trawler, types “Karelia”, “Girulyai”, “Sokol”, proj.21280, “Baltika”			90		
Small Size Fishing Seiner-Trawler, types “Kerch”, “MRS-225”			90		
Small Size Fishing Vessel, types “Orion”, “RS-150”, proj. 697, 1338, 13301			90		
Fishing Processing Vessel, types “Volga”, “Moryana”			250		
Medium Size Fishing Freezer Trawler, types “Zhelezny Potok”, “Vasily Yakovenko”, “Andrey Smirnov”	All types, except crab	Fixed/bottom gill nets	250		
Medium Size Fishing Freezer Trawler, types “Olga”, “Mayak”, “Sargassa”			250		
Refrigerating Seiner-Trawler, types “Alpinist”, “Nadezhny”			250		
Medium Size Fishing Vessel universal, types “Primorye”, SPS-001”			250		
Squid Vessel, type “Golitsyno”			250		
Small Size Shrimp Freezer Trawler, types “Laukuva”, “Leda”, “Omar”			200		
Fishing Seiner, types “RS-300”, “Kerchanin”			200		
Small Size Fishing Seiner, types “SChS-150”, “MRS-150”, “MRS-80”, “RV-80”			200		
Small Size Fishing Freezer Trawler, types “Karelia”, “Girulyai”, “Sokol”, proj.21280, “Baltika”			200		
Small Size Fishing Seiner-Trawler, types “Kerch”, “MRS-225”			200		
Small Size Fishing Vessel, types “Orion”, “RS-150”, proj. 697, 1338, 13301			200		
Medium Size Fishing Freezer Trawler, types “Obolon”, “Ivan Shankov”, “Barentsevo More” (freezer), (fresher)			Crab	Traps	120
Fishing Freezer Vessel, types “Kaspiy”, “Zelenodolsk”, “Kaspryba-1”					110
Medium Size Fishing Freezer Trawler, type “Arius”	120				
Medium Size Fishing Freezer Trawler, types “Zhelezny Potok”, “Vasily Yakovenko”, “Andrey Smirnov”	120				
Medium Size Fishing Freezer Trawler, types “Olga”, “Mayak”, “Sargassa”	120				
Refrigerating Seiner-Trawler, types “Alpinist”, “Nadezhny”	120				

Medium Size Fishing Vessel universal, types "Primorye", SPS-001"			100
Squid Vessel, type "Golitsyno"			80
Small Size Shrimp Freezer Trawler, types "Laukuva", "Leda", "Omar"			80
Fishing Seiner, types "RS-300", "Kerchanin"			80
Small Size Fishing Seiner, type "Yagry"			80
Small Size Fishing Seiner, types "SChS-150", "MRS-150", "MRS-80", "RV-80"			80
Small Size Fishing Freezer Trawler, types "Karelia", "Girulyai", "Sokol", proj.21280, "Baltika"			80
Small Size Fishing Seiner-Trawler, types "Kerch", "MRS-225"			80
Small Size Fishing Vessel, types "Orion", "RS-150", proj. 697, 1338, 13301			80

In 2004, the regulatory measure based on estimated minimal catches per fishing day was cancelled and a new one was introduced. The new regulation established the minimum quota allocations for fishing (harvesting) aquatic biological resources by vessel types, fishing gears and types of resource (Order No.491 of 31.12.2003). This regulation was prolonged into 2005 by the Order No.488 of 15.10.2004. Pursuant to the Order, vessels were permitted to go to sea during the whole year only on the condition that the summarized quota of all aquatic resources available for this vessel was not lower than that established by the Order.

Thus, the efficacy of these regulations depended mostly on the correspondence of measures set up by the Orders (mean daily catch rate and annual catch) and the actual capacity of different vessel types.

As an example, we shall analyse mean daily catch rates of different vessel types in 2003 (the first regulatory measure still in force) and in 2004 (after the introduction of the second regulatory measure).

Mean daily catch rate of different vessel types taking more than 90% of the total cod catch in the directed fishery for cod, as well as estimated minimal catches of cod set up for 2003 by Order No.486, are shown in Fig.4.

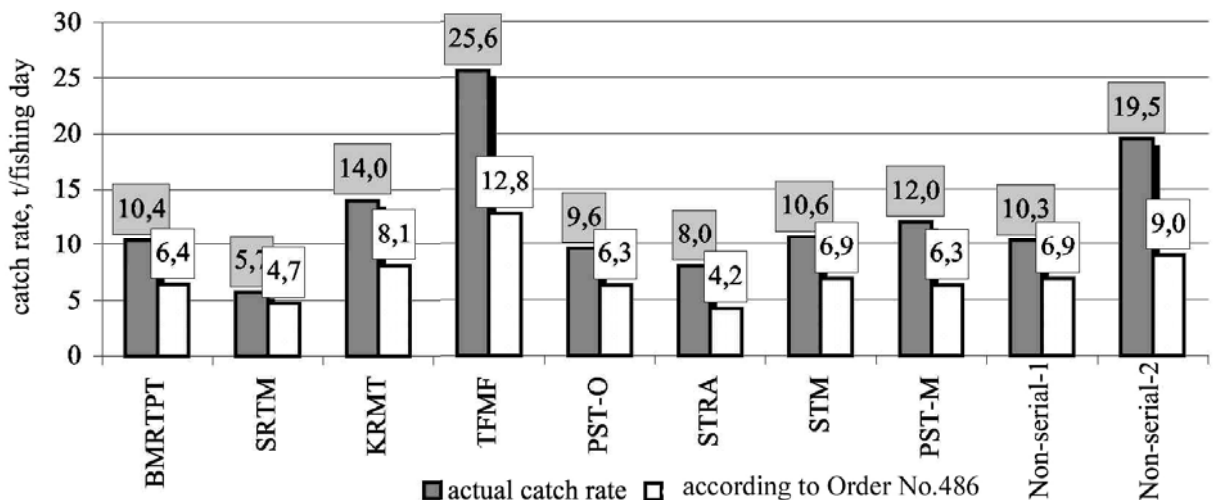


Fig.4. Mean daily catch rates of different vessel types and estimated minimal catches of cod for 2003

As can be seen, there was not a single vessel type for which catch estimates established by the Order exceeded actual catch rates in 2003. Moreover, actual daily catches were considerably higher than expected (from 1.2 times for SRTM vessels to 2.2 times for non-serial-2 vessels). It must be taken into account that the actual capacity of the trawl fleet in cod fishery is now at least twice as high as the resource supply, and the quotas of most vessels are insufficient. In practice this could increase the difference between the actual and estimated catch rates in the high fishing season (usually May-August), when the catch rates are well above the annual mean, to the notably higher level than shown in Fig.5. Similar picture was observed in cod fishery in 2001-2002.

Virtually the same situation was observed in 2004, after the introduction of a new regulatory measure for cod fishery. With an allowance for the actual catch rates in 2004 and average statistical number (ca.260) of fishing days, the annual catch of cod by all vessel types could have been notably higher than envisaged by the Order. It should be also remembered that the Order sets up minimal catches for all aquatic biological resources, not only for cod. For example, a SRTM vessel, for which a minimal quota required for starting fishery is 620 tons, can begin to fish even with a 400 tons cod quota, if it also has haddock (100 tons) and polar cod (100 tons) quotas.

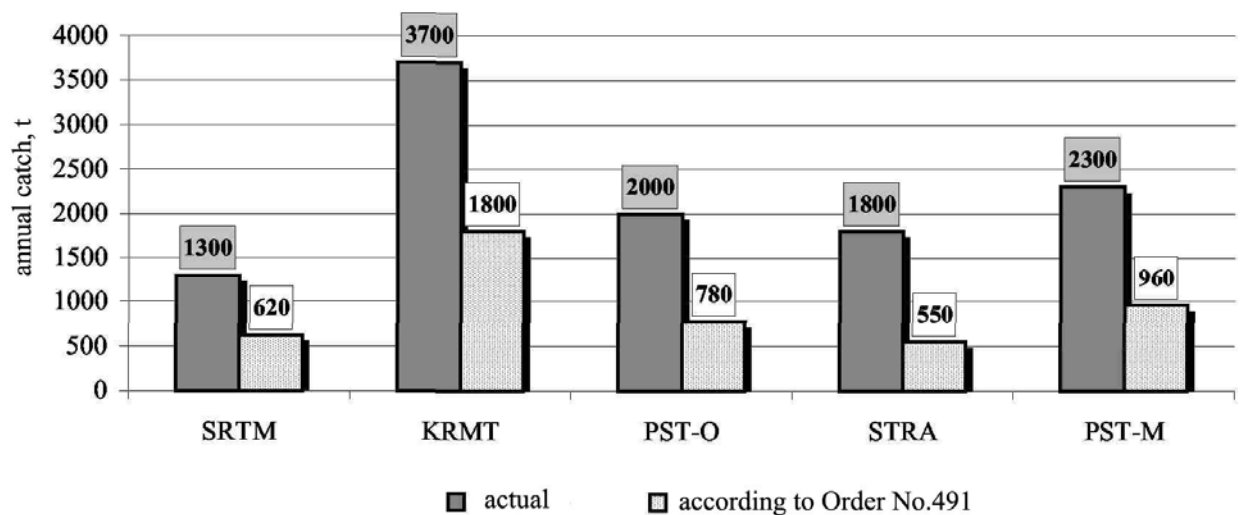


Fig.5. Minimal quota allocations for fishing (harvesting) aquatic biological resources by the main vessel types and their possible catch in 2004

The described discrepancy between the regulatory measures and the potential capacity of the fishing fleet may (and, in some cases, do) lead to illegal fishery. In absence of fisheries control the difference between actual and prescribed by the Orders catch rates can be used by unscrupulous vessel owners for illegal fishery.

Thus, the revision of the existing regulatory measures should primarily be aimed at bringing the actual catch rates (annual catch) of different vessel types into compliance with the estimated minimal catch (minimal quota allocation) of cod. This could be an effective step forward towards the optimization of Russian fishery in the Barents Sea.

Rational exploitation of the cod stock does not, however, involve only the regulations concerning the number of participating vessels or fishing period. With limited cod quotas, deliveries of the major part of fish products to the foreign market and a considerable weight-dependent price differentiation, the problem of discarding small- and medium-size fish has become as challenging as never before. To increase profitability, unscrupulous vessel owners discard a considerable part of catches, leaving onboard only the largest and the most expensive fish. The Polar Research Institute has developed methodological approaches to estimating the portion of discarded cod of different lengths, and the recommendations on discard reduction are being elaborated. Cutting the discards of cod, which could have been made possible due to a number of additional fisheries management measures, would already in a short-term outlook yield a marked biological and economic effect.

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7. WWF recommendations

The above report of WWF related marine biology scientific experts shows that joint management of the resources in Barents Sea gives good results despite of estimated high level of IUU fishing. There are ways to improve the situation but Norwegian and Russian sides thanks to close mutual supervision and disputes over the TAC distribution keep good knowledge and control of the resource. Because of these efforts they have so far managed reduce the negative impact of IUU fishing on cod stock in Barents Sea.

Next step in IUU fishing reduction or elimination may be introduction of standard fishing effort documentation common and obligatory for all fishing vessels and export documents for fish products. Keeping under control all fish product sales with corresponding tonnage to the TAC share of particular fishing vessel may bring all poachers to the courtroom.

In any case, only fishermen themselves may stop IUU fishing when they realize their dependence on the resources. But it should take time to bring up their responsibility. It may happen in Russia while the most TAC shares concentrate in few large efficient fishing companies. The excessive fishing capacity will be removed from the area.

Also Barents Sea is known for the biggest cod stock in the world and it is vital to establish its status as Particularly Sensitive Area to protect the natural resources from threats from the increasing shipping of oil and due to high intensity industrial works on the shelf. WWF also urge for Marine Protected Areas to be established for biodiversity protection and maintaining ecosystem functions. The problems are complex and the only way to find solutions are close cooperation of the Russian and Norwegian authorities with non-governmental organizations and other stakeholders.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity
- ensuring that the use of renewable natural resources is sustainable
- promoting the reduction of pollution and wasteful consumption



for a living planet®

WWF Russia

19-3 Nikoloyamskaya St.,
109240 Moscow Russia

Tel.: +7 095 727 09 39

Fax.: +7 095 727 09 38

russia@wwf.ru

<http://www.wwf.ru>