FISHERY AND AQUACULTURE COUNTRY PROFILES	Food and Agriculture Organization of the United Nations	FID/CP/RUS
PROFILS DES PÊCHES ET DE L'AQUACULTURE PAR PAYS	Organisation des Nations Unies pour l'alimentation et l'agriculture	
PERFILES SOBRE LA PESCA Y LA ACUICULTURA POR PAíSES	Organización de las Naciones Unidas para la Agricultura y la Alimentación	November 2007

NATIONAL FISHERY SECTOR OVERVIEW

THE RUSSIAN FEDERATION

1. GENERAL GEOGRAPHIC AND ECONOMIC DATA

The Russian Federation ("Russia") has the largest land area of any country, with a vast EEZ. The coastline is the second longest in the world after Indonesia. Russia has access to 12 seas of three oceans: the Atlantic (Sea of Azov, Black Sea, Baltic, Barents Sea and White Sea), the Arctic Ocean (Kara Sea, Laptev Sea, East Siberian Sea and Chuckchi Sea), and the Pacific (Bering Sea, Sea of Okhotsk and Sea of Japan), together with the Pacific Ocean itself and the landlocked Caspian Sea.

There are more than 2 million rivers, the largest of which are Severnaya Dvina, Pechora, Dnieper, Don, Volga, Ob', Enissei, Lena, Kolyma, Indigirka and Amur. The biggest lakes are Baikal (23 000 km^2), Ladoga (19 100 km^2) and Onega (9 700 km^2).

Area:	17.1 million km^2
Water area:	7 million km^2
Shelf area:	5 million km^2
Length of continental coastline:	32 043 km
Population (2006)	142.8 million
GDP at purchaser's value (2006)(1):	US$ 988 billion
GDP per head (2006)(2):	US$ 10 346
Agricultural GDP (2006):	US$ 34.41 billion
Fisheries GDP (2006):	US$ 3.02 billion

(1) converted from Russian roubles (RUR) at the exchange rate on 01 January 2007.
(2) Calculated from GDP at PPP value given by IEA/OECD, 2007.

2. FISHERIES DATA

2003	Production	Imports	Exports	Total Supply	Per Caput Supply
	tonnes liveweight				kg
Fish for direct human consumption	3 389 932	815 155	1 374 894	2 481 542	17.3
Fish for animal feed	348 652	-	-	-	

and other purposes					

Estimated Employment (2005):	
(i) Primary sector (including aquaculture):	370 000
(ii) Secondary sector:	na
Gross value of fisheries output (2005):	US$ 3.02 billion
Value of fisheries imports (2006):	US$ 1 437 769 000
Value of fisheries exports (2006):	US$ 2 120 737 000

3. FISHERY SECTOR STRUCTURE

3.1 Overall fishery sector

Russian fisheries have three main subsectors: marine fisheries (including anadromous species, estuarine fisheries and brackishwater species); inland fisheries; and aquaculture. Marine fisheries are based on the 12 seas surrounding Russia; the landlocked Caspian Sea; high seas beyond Russia's Exclusive Economic Zone (EEZ). Marine capture fisheries in Russia's territorial seas, internal marine waters and the EEZ provided up to 75 percent of the total reported catch for 1996–2005. The reported catch in EEZs of foreign states was stable at 13–16 percent of the total reported catch. Catch on the high seas increased in the 2000s, but barely more than 10 percent of the total catch. Inland fisheries are found everywhere in river basins and freshwater bodies, but the catch has constituted only a very small fraction of the total catch. Inland commercial fishery production amounted to 2.7 percent of the total catch in 2005. Aquaculture (mainly freshwater) production is relatively small compared to capture fisheries, but is growing (3.6 percent of total fishery production in 2005). According to the Federal Law "On Fishery and Protection of Aquatic Biological Resources" (hereafter the Law "On Fishery"), fishery is divided into three main categories (besides special fishery for scientific, educational and replenishment purposes), namely industrial, recreational, and subsistence fishery of indigenous groups. Industrial fishery includes coastal fishery. This definition has been challenges and is under review. There is no legally adopted term for artisanal fishery. In fact, what is usually called "artisanal fishery", (i.e. fisheries conducted with largely traditional gear with production delivered to the market, but also used for subsistence) in Russia covers also several kinds of fisheries classified as industrial, such as salmon, whitefish, chars, navaga, flounders and greenling fisheries in the Baltic, the Arctic and the Far Eastern Seas. Subsistence fishery of indigenous groups can also be considered. This fishery is mainly in estuaries, lagoons and rivers (for anadromous fish). Indigenous fishers are legally bound to use the catch only for local consumption and are not allowed to sell their catch. In reality, this is not always the case.

3.2 Marine subsector

3.2.1 Catch profile

In 2004–2005, the northeast Atlantic (including the Barents Sea and the North-East Atlantic Fishery Commission (NEAFC) area) provided 40 percent of the total national catch, while the northwest Pacific (mainly the seas of the Russian Far East) contributed 56 percent. Most of the catch consisted of Alaska Pollock (44%), herring (13%), cod (10%) and Pacific salmon (9%). A more detailed catch profile is presented in Table 4.

Table 4 Catch (tonne) of main aquatic biological resources in 2004 and 2005. Source: ROSSTAT.

Resource	2004	2005
Alaska pollock	853 000	957 000
Herring (mainly Pacific herring)	309 000	345 000
Blue whiting (from NEAFC area)	346 000	327 000
Cod (mainly Atlantic cod)	234 000	232 000
Pink salmon(1)	120 000	209 000
Plaice	71 000	90 000
Saury	82 000	89 000
Mackerel (Atlantic)	115 000	89 000
Horse mackerel (Atlantic)	69 000	88 000
Squid	71 000	76 000
Red fish	46 000	38 000
Crabs	34 000	33 000
Baltic sprat	25 000	30 000
Chum salmon	28 000	28 000
Sockeye salmon	21 000	26 000
Halibuts	23 000	20 000
Caspian and anchovy sprat	17 000	17 000
Shrimps	12 000	9 000
Other	439 000	476 000
Total	2 194 000	3 178 000
Notes: Mainly northwest Pacific; small quantity from introduced stocks in the White and Barents Seas.		

3.2.2 Landing sites

The most important landing sites in the northwestern Pacific are Vladivostok and Nakhodka (Primorye Province), both with annual landing of up to hundreds of thousands of tonnes. Secondary fishing harbours include Nevelsk and Korsakov (Sakhalin Administrative Area); Petropavlovsk (Kamchatka); and Magadan (Magadan Administrative Area), with annual landing of up to tens of thousands of tonnes. Tertiary (annual landing <10 000 t) fishing ports include Okhotsk, Nikolaevsk on Amur, and Sovetskaya Gavan' (Khabarovsk Province); Alexandrovsk, Kholmsk (Sakhalin); Severo-Kurilsk and Yuzhno-Kurulsk (Kuril Islands); and Preobrazhenie and Slavyanka (Primorye Province). On the Barents and White Seas the most important, and in fact the only, fishing harbours are Murmansk, Belomorsk and Arkhangel (>10 000 t). In the Baltic area, the primary ports are Kaliningrad and St. Petersburg, and in the Caspian Sea area it is Astrakhan' (>10 000 t).

3.2.3 Fishing production means

In 2002, the offshore fleet comprised ca. 2500 fishing vessels, 46 floating factories, and 366 transport vessels. Of the fishing vessels, ca. 17 percent were large (>64 m LOA), half were medium (34–65 m LOA) and one-third small (24–34 m LOA) (State Committee for Fisheries, Concept for fisheries development up to the year 2020). Smaller vessels are not registered with the State Marine Register but are controlled by the Sate

Inspection of Small Size Fleet (GIMS). In 2005, there were 2491 such registered vessels. The inland fleet consists of 5500 small motor boats.

The main fishing gear are midwater trawls used by large- to mid-size freezing and processing trawlers, for Alaska Pollock and redfish; bottom trawls, used but with numerous restrictions by medium- to large-sized trawlers, for cod, halibuts, redfish, flounders and other demersal fishes; shrimp trawls used mostly by specialized mid-size shrimp trawlers; bottom nets deployed by small- to mid-size vessels targeting cod, halibut and flounders; bottom seines or *snuurevaud,* mostly used by small-sized vessels for cod, flounders, halibut and other demersal fishes); and drift nets used mostly by specialized mid-size vessels for salmon. Bottom longlines for cod, halibut and redfish, and traps and pots for crabs, some shrimps and whelks, are usually deployed by small- to mid-size specialized vessels, while seines, pound nets (herring, whitefish) and dredges (clams) are deployed from small vessels. Small vessels and boats (often only a few metres long) are used with kiddles for salmon, and for harvesting by divers (sea urchins, scallops, sea cucumber, kelp).

3.2.4 Main resources

In all, 160–170 species of finfish and invertebrates are taken in various fisheries (Table 5). Marine mammal hunting is based on ca. 7 species (besides of Gray and Bowhead whales taken by indigenous people of Chukotka according to the IWC quotas). Seaweed harvesting covers ca. 10 species

Table 5. The numbers of species used by fisheries in different parts of Russia's territorial waters and EEZ.

Area	Finfish	Invertebrates	Total
Northeastern Atlantic (Barents, White and Baltic Seas)	Ca. 40	8	48
Caspian, Black and Azov Seas	26(1)	4	30
Northwestern Pacific (Bering, Okhotsk and Japan Seas, and oceanic waters)	Ca. 65	Ca. 35	100

Note: Excludes freshwater species fished in brackish waters.

Source: State Committee for Fisheries of the Russian Federation and the Federal Agency of Fisheries of the Russian Federation, Total Allowable Catch Lists for 2000 – 2007.

3.2.5 Management applied to main fisheries

The Law "On Fishery and Protection of Aquatic Biological Resources" of December 2004 requires setting Total Allowable Catch (TAC) levels for fishery stocks, and defines it as "scientifically justified annual catch of aquatic biological resources of particular species in a fishing area" (Paragraph 1.12 of the Law). At the same time the Law states that industrial fishery is not necessarily based on the TAC determination. In Article 19.1 it reads:

> "Industrial fishery in the internal waters of the Russian Federation, including the internal marine waters and the territorial sea of the Russian Federation is conducted … for those species of biological resources which are subject to TAC determination and for those which are not subject to TAC determination".

The Law does not give any further explanation, but instead calls for a special statute for TAC setting, which has to be issued by the Federal Government (Article 28.4). Currently prepared amendments to the "Law on Fishery" will be most probably adopted in the year 2007 or 2008 and will specify the stocks and fisheries subject to TAC setting. The principal stock that will probably not have TAC will be Pacific salmon, where management will be by means of regulating fishing effort.

Besides TAC setting for industrial fishery, all categories of fisheries are regulated by so-called Fishing Rules ("*Pravila rybolovstva*"), which are set separately for several major

areas: The Western Basin (the Baltic and its catchment), the Northern Basin (Barents, White Sea, Onega Lake, and other lakes and rivers of the catchment), the Arctic Ocean Basin (including the catchments of Siberian rivers), the Far East Basin, the Black Sea–Azov Sea Basin, and the Caspian Basin.

All Fishing Rules specify closed areas, seasonal closures, limitations of particular gear, minimum mesh sizes, minimum allowable size of catch, and allowable by-catch. The management of fishery has been changing since the break up of the former USSR, and more changes are expected.

3.2.6 Fisher communities

There are several associations of fishing enterprises, which are organized for public representation of the interests of the fishery industry. Originally, most of associations were established on a regional basis, such as the Association of the fishing enterprises of Primorye Province, or the Association of fishing entrepreneurs of Sakhalin (ARS). In general, each coastal region with a developed fishing industry, have one or more regional associations. These associations have taken a lead in public debate on particular governmental initiatives that were thought to limit fishing industry interests, such as quota auctions introduced in 2001–2003. There are also smaller associations of small enterprises based in certain administrative areas and specialized in coastal fishery. A relatively recent phenomenon is the formation of associations of enterprises specialized in certain kinds of fishery, such as the Association of Alaska Pollack Catchers, the Association of the Shrimp Catchers of the Far East or the Association of the Crab Catchers of the North. These associations have recently become involved in promoting measures to protect resources and establish rights-based regulation of particular kinds of fishery. They, in particular the Association of Alaska Pollack Fishers, also plan to work towards Marine Stewardship Council (MSC) certification for their products. Several companies are, however, not members of any such association.

3.3 Inland subsector

3.3.1 Catch profile

Some 60 species are caught in the inland fisheries of Russia (Reshetnikov, 2002). In terms of volume, whitefish (Coregonidae), cyprinids, zanders and perch are most important. In 2005, the official catch in the inland waters was 72 000 t (Ministry of Natural Resources, 2006). The main areas for inland water fishery are listed Table 6. In 2005, these water bodies produced 63 percent of the official catch of the entire inland commercial fisheries. Most important fishing area was the Ob'–Irtysh River Basin (around 27 percent of the total catch). Other important areas are the water reservoirs of Volga (7.6 percent) where mostly cyprinids, perch and sander are fished, Ladoga and Onega Lake (69 percent) where besides of cyprinids and perch whitefish is landed in significant quantity, Pskovsko-Chudskoe Lake (5.6 percent; cyprinids, smelt and coregonids) and Baikal Lake (3.5 percent, mostly whitefish).

Table 6. Fish catches in the most important inland areas of the Russian Federation in 2003–2005 ('000 tonne). Source: Ministry of Natural Resources, 2006.

Water bodies or drainage areas	**2003**	**2004**	**2005**
Ob'-Irtysh catchment (West Siberia)	20 600	16 800	19 200
Enisssei catchment	1 500	1 570	1 150
Lakes			
Ladoga	3 000	2 800	2 900
Onega	1 700	1 880	2 100
Chudsko-Pskovskoe (Peipsi) (shared with Estonia)	4 800	3 600	4 000
Ilmen'	1 400	1 200	1 380

Baikal	3 200	2 500	2 500
Water reservoirs			
Rybinskoe	1 020	1 300	1 040
Kuibyshevskoe	2 040	1 940	2 110
Saratovskoe	600	670	600
Volgogradskoe (on the Volga)	1 500	1 690	1 720
Tsimnlyanskoe (on the Don)	6 400	6 300	6 900

3.3.2 Landing sites

Landing is dispersed along river banks and lacustrine shores. The most important landing sites for the lacustrine fisheries include Pskov (Chudskoe and Pskovskoe Lakes); Priozersk and St. Petersburg (Ladoga Lake); and Listvyanka and Olkhon Island (Baikal). Important landing sites on big rivers include Narian-Mar (Pechora); Astrakhan' (Volga); Rostov (Don); Salekhard (Ob'); Dudinka and Igarka (Enissei); Yakutsk (Lena); and Khabarovsk and Komsomolsk (Amur).

3.3.3 Main resources

The main resources of the inland fisheries are concentrated in big lakes such as the Chudskoe (Peipsi) Lake on the Russian–Estonian border, Ladoga Lake, Onega Lake, several lakes of north European Russia in Karelia and the Vologda Oblast', and Lake Baikal. The major catches are whitefish (*Coregonus* spp.), various cyprinid fishes, and perch. Other important inland fisheries are found in the basins of the great rivers, which can be divided intro three groups: those of the Arctic Basin (Severnaya Dvina, Pechora, Ob', Enissei and Lena), those entering the southern seas (Don, Kuban' and Volga), and those of the Pacific Basin (primarily the Amur River). The most important stocks in the northern rivers include whitefish (mostly semi-anadromous species) and cyprinids; in the Don and the Volga and the water reservoirs the resources are cyprinids, zander and sturgeons (the latter in terms of value, not volume), and in the Amur River the fisheries are based on a variety of endemic cyprinid species and the anadromous species Chum salmon. Formerly, sturgeon made up a considerable fraction of catch both in the basin of the Sea of Azov and the Caspian Sea, in the Siberian Rivers and in the Amur River. Currently, sturgeon stocks are heavily depleted and remain under constant pressure from poaching.

3.3.4 Fishing production means

Most of the inland water commercial catch is obtained using set nets. Other gear includes seine (big rivers and lakes) and small trawls (big lakes).

3.3.5 Management applied to main fisheries

Inland fishery is regulated by the same Federal Law "On Fishery". However, a few provisions in this Law refer specifically to inland fisheries. There are specific *Fishing Rules* for various catchments or river systems. These documents specify closed areas, seasonal closures, gear restrictions, minimum mesh sizes and minimum catch size.

3.4 Recreational subsector

Recreational fishing is well developed everywhere in Russia. It is difficult to distinguish from subsistence fishing, particularly as the two are governed by the same *Fishing Rules*. Most recreational and subsistence fishers are independent, but there is some growth in organized tourist fishing, particularly in the northwest (Murmansk Oblast' and Karelia) and the Lower Volga Basin. The total catch of the recreational and subsistence fishery in inland waters amounted in 1999 to 4 300 t, mostly cyprinids and perches (Yatskevich *et al.*, 2000). No estimates for later periods are available. In terms of investment and benefits, the most important recreational fishery is Atlantic salmon fishery on Kola Peninsula (Murmansk Oblast').

3.5 Aquaculture subsector

Over 60 species of fish, invertebrates and seaweed are considered suitable for aquaculture (Federal Agency of Fishery, 2006). Commercial aquaculture is based on carp, grass carp (*Ctenopharyngodon idella*), silver carp (*Hypophthalmichthys molithrix*), buffalo, rainbow trout, mussels, scallops and *Laminaria*. Aquaculture enterprises numbered 260 in 2003, and exceeded 300 in 2007 (Mitupov, 2007). Aquaculture comprises both marine (mariculture) and freshwater aquaculture. Freshwater aquaculture is mostly restricted to European Russia (especially the northwest Region, where trout farming is strong), the south of Siberia, and the Far East, and constitutes over 95 percent of the total production, which in 2003–2006 was between 100 000 and 115 000 t. Potential areas for freshwater aquaculture include 960 000 ha of agricultural waterbodies and 143 000 ha of ponds, in addition to areas of big lakes and water reservoirs suitable for cage farming (Federal Agency of Fishery, 2006).

Mariculture development in European Russia is limited to some areas of the Barents, White and Black Seas, where limited salmon, trout and blue mussel farming has been practised in the past and currently shows some indications of revival. The leading position in mariculture is Primorye Province (Sea of Japan coast). In 2006, the area of marine farms in Primorye amounted to 10 000 ha, while production (mainly *Laminaria*, scallop [*Mizuhopecten yessoensis*], and blue mussel) amounted to 1 340 (Markovtsev, 2007).

4. POST-HARVEST USE

4.1 Fish utilization

Frozen fish is the fishery product (62 percent of total food production), followed by herring (mainly salted) at 14 percent, and live or chilled fish at 9 percent (ROSSTAT data).

Table 7. Quantity and estimated value of particular commodities derived from Russia's catch (Source ROSSTAT information report to the Standing Committee of the State Duma for economic policy, entrepreneurship and tourism, doc. reg. # IU-03-11/ 557 of 14.03.2006).

Customs code and category		2000		2003		2004		2005	
		'000 t	US$×10^6	'000 t	US$×10^6	'000 t	US$×10^6	'000 t	US$×10^6
0302	Fish live or chilled	104	75	81	26	45	151	22	13
	Rate of annual change	-	-	-	-65%	-	471%	-	-92%
0303	Fish frozen	818	847	1 005	957	10 422	1 066	1 191	1 392
	Rate of annual change	-	-	-	13%	-	11%	-	31%
0304	Fillet	139	225	68	157	49	138	59	184
	Rate of annual change	-	-	-	-30%	-	-12%	-	33%
0305	Fish dried or salted	46	39	10	19	16	28	8	23
	Rate of annual change	-	-	-	-50%	-	44%	-	-17%
0306	Crustacean live, chilled, salted	47	226	34	246	27	175	26	194
	Rate of annual change	-	-	-	9%	-	-29%	-	11%
0307	Molluscs live, fresh, chilled, frozen, dried, salted	21	44	11	26	12	27	18	36
	Rate of annual change	-	-	-	-42%	-	6%	-	34%
1 604	Processed and canned fish, sturgeon caviar and caviar surrogates prepared from roe of other fish	16	42	23	36	34	48	46	71

	Rate of annual change	-	-	-	-15%	-	33%	-	49%
1 605	Processed or canned commercial invertebrates	3	19	4	24	3	17	4	19
	Rate of annual change	-	-	-	27%	-	-29%	-	13%
03	Total fish and invertebrates	-	1,46	-	1,43	-	1,45	-	1,85
	Rate of annual change	-	-	-	-2%	-	1%	-	27%

4.2 Fish markets

The biggest national markets for fish and seafood are Moscow (with Moscow Oblast') and St. Petersburg (with Leningrad Oblast'). Domestic fisheries supply these cities with Pacific herring, Pacific salmon, Pacific salmon and salmon roe, squid, Alaska pollock and its roe (from the Russian Far East), cod, redfish, halibut, capelin and plaice from the Barents Sea, pike perch from the Azov Sea, Caspian roach and pike perch from the Caspian Sea, and also freshwater fish and production from pond fish culture. Together with Kaliningrad Oblast', these regions are also the biggest markets for imported products (Table 8), handling 86 percent by weight and 91 percent by value of total imports. Although this production is further redistributed over the country, Moscow and St. Petersburg populations consume a significant part. St. Petersburg is also an important destination for produce from fishery in the biggest lakes of the Russian northwest. The six top kinds of fish and seafood (by net weight) sold by an average Moscow supermarket in 2005 were shrimps, herring, squids, farmed Atlantic salmon, crabs, and farmed trout (Norge-Fish, 2006).

These biggest and richest cities in Russia have been also a market for illegal fishery products, in particular the bulk of illegal black caviar from the Caspian Sea and the Pacific salmon roe (red caviar) from the Russian Far East is sold there (WWF Russia analysis).

Important markets are also found in the biggest fishing port cities, such as Murmansk, Vladivostok, Petropavlovsk on Kamchatka, Kaliningrad, Astrakhan' and administrative centres of fishing regions such as Rostov and Yuzhno-Sakhalinsk. Although located not on seashore but on the bank of Amur River, Khabarovsk is a very important transport node and probably the most important destination for fish supplied for the domestic market from over all the Far East of Russia.

Table 8. Top fish and seafood importing regions of Russia in 2005. Source: Federal Customs Service.

Regions	**Proportion by weight**	**Proportion by value**
Moscow and Moscow Oblast'	36%	47%
St. Petersburg and Leningrad Oblast'	35%	31%
Kaliningrad Oblast'	15%	13%

The international markets differ with regard to kinds of products. The export of fresh and chilled fish from Russia amounted in 2005 to approximately 3 700 t (data from the State Customs Service). The top three countries for Russian exports of live and chilled fish were the Baltic states: Lithuania, Estonia and Poland, altogether amounting to 80 percent of the total export by volume and 87 percent by value. Most of the production comes from the Baltic and inland waters of the Baltic catchment. The top five countries importing frozen fish from Russia are presented in Table 9. Altogether, they take 94 percent in both net weight and value of these exports. The absolute leader is China, which imports 52 percent of total frozen fish officially exported by Russia.

Table 9. Leading importers of Russian frozen fish in 2005. Source: Federal Customs Service.

Rank	Country	Value (US$)	Net weight (kg)
1	China	118 140 208	124 175 483
2	Korea (South).	64 529 013	44 350 632
3	Japan	68 458 306	30 790 634
4	Kazakhstan	7 969 315	13 262 655
5	Ukraine	4 970 674	10 612 219
	Other	15 587 731	13 901 791
	Total	279 655 247	237 093 414

The export market for frozen filet is dominated by Atlantic cod (43 percent of the total net weight), exported mostly to the countries of the European Union The top ten importing countries, taking 91 percent of export in value and 87 percent in net weight, are presented in Table 10. The leading buying country is Germany, which imports 42 percent of filet by value and 39 percent by net weight.

Table 10. Leading importers of Russian frozen filet in 2005. Source: Federal Customs Service.

Rank	Country	Value (US$)	Net weight (kg)
1	Germany	35 666 816	7 673 893
2	Estonia	12 028 192	2 185 331
3	UK	5 113 257	1 322 964
4	USA	6 442 533	1 164 490
5	Denmark	4 117 142	1 131 647
6	Poland	3 654 690	922 262
7	Korea (South)	1 854 377	883 030
8	Norway	3 178 737	710 477
9	Belgium	2 689 675	684 182
10	Netherlands	2 302 757	590 930
	Other	7 306 811	2 431 233
	Total	84 354 987	19 700 439

In the export of dried, smoked fish, fish roe and other products of special processing Portugal holds a lead importing 42 percent of the total value and only 30 percent of net weight of the production. The product exported to Portugal is mainly klippfisk (dried salted cod; bacalao) or specially dried cod. Other important importers of klippfisk are Norway and Spain. The principal invertebrate exported by Russia are crabs, mainly king crabs, but also snow crabs (*Chionocoetes* sp.) and hairy crabs (*Erimacrus isenbecki*). They constitute 92 percent in total by value and 84 percent by net weight. The principal

importing countries are the Republic of Korea, Japan, USA, Ukraine, Norway and the Netherlands, which together take 96 percent of imports by value and 94 percent by volume (Table 11).

Table 11. Leading importers of Russian commercial crustaceans in 2005. Source: Federal Customs Service.

Rank	Country	Value (US$)	Net weight (kg)
1	Korea (South)	14 133 608	1 535 060
2	Japan	3 715 043	503 143
3	USA	3 171 384	287 932
4	Ukraine	530 749	234 435
5	Norway	3 436 999	210 709
6	Netherlands	2 905 403	184 744
7	China	764 532	93 648
8	Kazakhstan	152 137	57 155
9	Thailand	133 243	18 803
10	Kyrgyzstan	46 390	13 546
	Other	41 182	15 799
	Total	29 030 670	3 154 974

5. FISHERY SECTOR PERFORMANCE

5.1 Economic role of fisheries in the national economy

Officially recorded production of fisheries amounts to ca. US$ 5 billion, equivalent to 0.3 percent of GDP. The fishery sector has remained generally stable in absolute terms in recent years, so it share of GDP has reduced as the economy in general has expanded. The fishery industry provides employment to ca. 145–150 thousand people (Industry in Russia, 2002) (ca. 0.2 percent of total employment and ca. 1 percent of total industrial employment). Other sources (State Committee of Fishery, 2003) estimate employment in the fisheries industry to be ca. 370 thousand. This difference is probably explained by seasonal doubling of the number of workers in several fisheries, i.e. salmon, herring and saury, which is not adequately reflected in the ROSSTAT data.

5.2 Demand

In Russia, the target fish and seafood consumption is 23.5 kg/person/year, and the consumption rate in USSR in its later years was near this figure.

5.3 Supply

Average per caput supply of fish and seafood in 2003 was 17 kg. There are considerable differences between regions: from 7 kg in Central European Russia, middle Volga region, and the North Caucasus, to 14–15 kg in the Russian Far East and the Kaliningrad Oblast' (Dvoryankov, 2001). In Murmansk Oblast', annual per head fish consumption is estimated to be 20–21 kg (Zilanov, 2007). A survey conducted in Sakhalin, one of the most important maritime regions of Russia, indicated that per capita supply of fish and seafood in such regions could be as high as 30 kg/year (Spiridonov, 2003).

The ROSSTAT survey establishes ten classes of households based on incomes. The lowest category is characterized by annual per capita supply of fish and seafood of 6 kg, while the highest one consumes 23 kg per capita (Food Market in Russia, 2002).

5.4 Trade

The principal kinds of fish and seafood imported to Russia in 2004 and 2005 were herring, farmed Atlantic salmon, farmed trout, mackerel, sprat, capelin, blue whiting and cod. Russia is simultaneously both an important exporter and importer of seafood. A special characteristic of Russian imports is the inclusion of fish and seafood caught in Russia's EEZ or by Russian vessels in international waters but either introduced through customs clearance or landed in foreign seaports and delivered (often after additional processing) to Russia. This mainly applies to cod, blue whiting and Atlantic herring.

The principal supplier of fish to Russia is Norway, which contributes up to 95 percent of farmed salmonid import, 92 percent of frozen herring import and 37 percent of frozen fillet imports. Other important suppliers are Mauritania (sardines), Lithuania (sprat, mackerel), UK (mackerel), Denmark (northern shrimp - *Pandalus borealis*), Spain (frozen fillet), China, Thailand and Chile (squids).

From 2000 to 2005, the value of imports of fish and seafood to Russia increased by a factor of (Table 12).

Table 12. Dynamics of Russian import of fish and seafood. Source: Federal Customs Service.

Characteristics	2000		2003		2004		2005	
	Amount (t)	Value, US$ '000	Amount (t)	Value, US$ '000	Amount (t)	Value, US$ '000	Amount (t)	Value, US$ '000
Total import (codes 03, 1604 & 1605)	469 253	171 162	711 920	494 594	830 778	758 514	979 351	1 117 061
Ratio to previous year			52%	189%	17%	53%	18%	47%

5.5 Food security

The role of fisheries in providing food security in Russia is potentially very important. However, Russian fisheries are currently unable to meet domestic demand for fish and seafood due to the decreasing catch and the growing export to the East Asia markets (which remain much more attractive for the fishing enterprises than delivery to the domestic market). The lack of balance between demand and actual supply has negative consequences for the future (the deficiency in healthy protein food). The negative balance is compensated by growing imports (in big cities), and, where possible, by increased recreational and subsistence fishing or the IUU catch market.

5.6 Employment

It is estimated that there are around 100 000–150 000 directly employed, and applying a rule of thumb of 1:7 indicates roughly 700 000-1 050 000 in the secondary sector. The Aquaculture sector in 2004 employed 22 000, with 5 000 employees working on individual farms, which were partly specialized in aquaculture (Federal Agency of Fishery, 2006). In the maritime areas, fishery industry employment is important: in the 10 administrative regions of the Russian Far East (total population 4.625 million) primary employment in the fishery industry in 2002–2003 represented almost 18 percent of all jobs. In Kamchatka, this value exceeded 50 percent (Sinyakov, 2006).

5.7 RURAL DEVELOPMENT

The social role of fisheries, especially with regard to the rural population, has often been lauded, but rarely analysed. In the villages scattered along the coast of the White Sea, the annual cycle of fishery still governs the traditional mode of life of the Pomor (traditional Russian settlers of European Russia's North) population (Tzetlin, 2000). Fishing played a similar role in the life of most indigenous groups, and among the Russian settlers in the north of Siberia and along the Pacific Coast, and on the coasts of big lakes. However, this lifestyle was disrupted by administrative decisions in the late 1960s to abandon numerous coastal villages and re-settle people in fewer, bigger settlements. Loss of the link to the traditional way of life has been associated with

increasing poverty and alcohol abuse The revival of cultural identity and traditions, the process of which is very slowly progressing, requires also the revival of the sustainable fisheries that govern the annual structure of the daily life such rural populations.

6. FISHERY SECTOR DEVELOPMENT

6.1 Constraints

The major constraints faced by the fishery sector may be broadly divided into biological, economical, institutional and political.

Amongst the major biological constraints are the declines of several important stocks as the result of natural fluctuations (Pacific pilchard), a combination of natural fluctuations and overfishing (Atlantic and Pacific herring, Alaska Pollock, capelin in the Barents Sea), overfishing and continuing IUU (sturgeons, Atlantic salmon, red king crab, sea cucumber), a combination of pollution and overfishing (whitefish and Atlantic salmon in the Pechora drainage basin, whitefish and sturgeon in the Ob' drainage basin, most of the stocks in the Amur Basin), and ecosystem transformation due to the introduction of alien species (sprat in the Black and the Caspian Seas).

Amongst the economic constraints, the most significant is poverty, which contributes to poaching, forest fires in catchments and other threats to fishery resources. Poverty forces people to depend more on natural resources and use resources unsustainably to meet their basic needs. The lack of public awareness and public involvement in the management of local resources is another reason why people are more likely to participate in poaching, overfishing, and other kinds of illegal activities. Local people have little incentive to use fish or other aquatic resources in a sustainable way and to protect them. Casual poaching by private individuals feeds into the industrial IUU catch, and together they constitute a vicious cycle. The former serves as a source for the latter, and the existence of the latter supports the moral justification of the former.

Another economic constraint is the growing demand for fish and seafood in the East Asian market, which encourages the fishing industry to devastate resources in Russia's EEZ. Well-developed relationships between illegal exporters in Russia and importers in China, Japan and South Korea; involvement of criminal groups and corruption; short distances for seafood transportation from South Sakhalin, Tatar Strait and South Kurils to Japan—all these magnify the effects. Massive development of fish processing in China based on extremely cheap labour costs stimulates export of unprocessed fish from Russia to China.

Of particular importance is ageing of the fishing fleet. Two-thirds of fishing vessels exceed the norms of safe exploitation. Capital investment in the fishery industry decreased in 2000 by 30 percent compared to 1990. The number of qualified specialists in navigation, fishing and processing technologies decreased at least by 30–40% (Zilanov, 2001; State Committee for Fisheries, 2003). The dominance of old ineffective vessels is well illustrated by the analysis of the Barents Sea cod fishery (Kalentchenko *et al.*, 2007), but similar situations are characteristic for other fisheries. In 2002–2005, 40 percent of the total effort in the demersal fish fishery was by the old middle-sized freezing trawlers. At the same time, these vessels produced only 25 percent of the total official catch. Their daily effectiveness was 1.5 times lower than the effectiveness of most other types of vessel, and 3-4 times lower than the respective value for the most modern vessels. Low efficiency of the old vessels leads to their involvement in IUU catch.

Institutional constraints are related to governmental mismanagement of the Russian fisheries, with frequent re-structuring of the governmental institutions responsible for fishery management and control. Beginning from 1992, the fishery authority was re-organized at least 5 times. No one of the seven heads of the fishery authority that replaced one another in the office since 1999 was a fishery professional. Most experts agree that no consistent fishery policy has been developed until now (Titova, 2007; Zilanov, 2007). The problem of regulating fishing capacity and many other important problems were never really recognized by the governmental institutions.

Extreme bureaucratization of port calls and landing procedures leads to stagnation of coastal processing and increased export of unprocessed fish and seafood. Similarly, there are many bureaucratic difficulties in development of aquaculture: obtaining a licence for water use and necessary sanitary certificates remains a very time consuming procedure, which at the same time is very formal and does guarantee real environmental and health safety.

The experiments of the federal government in quota allocation via auctions provoked numerous social and political conflicts in 2001–2003 and negatively affected the economic health of the Russian fishery (Zilanov, 2001; Titova, 2007). Parts of quotas were bought in the auctions by companies that often did not even have fishing capacity and used quotas for speculation. Furthermore, many quotas were bought by foreign companies or by using foreign credit, thus increasing financial imbalance for Russian companies, gave importers much more favourable conditions than exporters. Furthermore, it enormously stimulated the IUU catch used by companies to compensate for the high prices of quotas at the auctions (Titova, 2007). Three years of auctions resulted in ca. 75 percent increase in the debts of Russian fishing companies (from ca. RUB 40 billion in 2001 to RUB ca. 70 billion in 2004) and considerably slowed down investment (Kiselev, 2005; Titova, 2007). In 2003, a new principle of quota allocation was adopted, based on a company's recent fishing history. The companies received shares in the TAC of particular stocks based on their quotas averaged over the previous three years. As these three years were the years of the auction trade in quotas, many shares came to speculators who had no real fishing history but had bought quotas in the auctions in 2001–2003 and became now so called "quota rentiers". They lease their shares to fishermen without access to the resources and receive rent. The growing expenses of fishing again and again push fishermen to practice IUU catch and to discard by-catch.

6.2 Development prospects and strategies

Governmental strategy to address the necessary development activities is presented in the "Concept for Development of the Fishery Industry of the Russian Federation until the year 2020" approved by the government of the Russian Federation on 2 September 2003. In the first phase, the Concept sets the strategic directions as:

- development of necessary legislation;
- development of a long-term mechanism for the management of aquatic resources;
- decrease of fishing pressure on the resources via relocation of part of the fishing fleet to the EEZs of other states and to the high seas;
- matching fishing capacity to resources;
- research and development in fish stocks assessment, TAC determination and increasing scientific capacity;
- improvement of fishery enforcement and the export control;
- working for the revival of distant water fishery on the high seas;
- development of effective ship-building projects;
- measures to improve environmental and epizootic situations in fisheries and aquaculture grounds;
- measures to develop industrial aqua- and mariculture; and
- administrative reform of the institutions subordinated to the State Committee for Fisheries.

The Federal Law "On Fishery" was adopted in December 2004 and a new institutional structure was developed (see below).

Four years after the adoption of the Concept, the Session of the State Council (an advisory body to the President of the Russian Federation) in Astrakhan' on 31 August 2007 declared a general dissatisfaction with the development of fishery and aquaculture. There is a strong move to remove the Federal Agency of Fishery from the Ministry of

Agriculture and to make it a separate Ministry or State Committee.

Special attention has recently been given to the development of aquaculture. A target of 1 400 000 t/yr from freshwater aquaculture and 400 000 t/yr from mariculture by 2020 was set within the National Project on Agricultural Sector development (Federal Agency of Fishery, 2006). The Federal Government is considering subsidising two-thirds of credit needs for construction and modernization of aquaculture facilities.

6.3 Research

In the Soviet Union the then Ministry for Fishery Industry maintained an extensive system of research institutes, active in research in oceanography; biology of marine organisms; resource assessment and fishery regimes; and fishing gear and processing technology. A considerable part of this work was done outside of Russia's waters to meet the needs of the distant water fishery. Until October 2007 there were several institutes of marine fisheries and oceanography (NIRO) responsible for resource assessment and research in fishery science. The most important were PINRO in Murmansk, with a branch in Arkhangel (North Atlantic, Barents and White Seas); AtlantNIRO in Kaliningrad (Baltic and Atlantic); AZNIRH in Rostov on Don (Sea of Azov); KASPNIRH in Astrakhan' (Caspian Sea); TINRO-Centre in Vladivostok, with branches in Khabarovsk and Anadyr (northwest Pacific scale studies and work in the Sea of Japan along the mainland coast); SakhalinNIRO inYuzhno-Sakhalinsk (waters around Sakhalin and Kuril Islands); MagadanNIRO in Magadan (northwestern Sea of Okhotsk); and KamchatNIRO in Petropavlovsk on Kamchatka (waters around Kamchatka). General, methodology and coordination issues in fisheries research were the remit of the central fishery institute, VNIRO, in Moscow. In October 2007, all regional institutes were subordinated to VNIRO, formally becoming branches of VNIRO. The central institute, GOSNIORH in St. Petersburg, and several regional institutes maintain research in inland fisheries. There are several other institutions, in particular VIERH in Moscow, responsible for economic studies, and GIPRORYBFLOT in St. Petersburg, focused on technical studies and engineering for fishing vessels and processing capacities.

6.4 Education

Five technical universities (in Kaliningrad, Murmansk, Astrakhan', Vladivostok and Petropavlovsk on Kamchtaka) are specially focused on education and training of specialists in fishery. There are programmes for navigation, marine engineering, processing and processing machinery, economics of fishery, fishery biology and aquaculture. Several agricultural universities are of importance for aquaculture specialisations. Altogether, nine universities have graduate programmes for aquaculture specialists and four professional schools are graduating middle level professionals. Between 110 and 130 aquaculture specialists graduate annually (Federal Agency of Fishery, 2006). In addition, specialists in fishery oceanography and biology graduate from biological faculties of several universities (traditionally the geographical faculties of Moscow and St. Petersburg universities, St. Petersburg Hydrometeorological Institute and biological faculties of the Moscow State University, Kazan' State University, Perm' State University and the Far East State University have been of particular importance).

6.5 Foreign aid

There are no ongoing or planned projects involving foreign aid.

7. FISHERY SECTOR INSTITUTIONS

Until 2004, management of fisheries as the use of a state property (including governance, interagency coordination of "rational use", monitoring and research, protection of stocks and their environment, and stocks replenishment was a responsibility of the State Committee for Fishery. In 2004, the State Committee for Fishery was abolished and the function of governance of fisheries became the responsibility of the Ministry for Agriculture and Fisheries, and the affiliated Federal Agency for Fisheries and

Fisheries Directorate of the Federal Service for Veterinary and Phytosanitary control (Rosselkhoznadzor).

The Department of Fishery of the Ministry develops policy and prepares regulations. Within the frame of this Ministry there was the Federal Agency of Fishery, which had a mandate for conducting government policy with regard to fisheries, including regulation of access to resources, monitoring, research and representation of the Russian Federation in international fisheries agreement and regional fishery organizations. The Fisheries Directorate of the Rosselkhoznadzor had a watching role.

In October 2007, a new reform removed the Agency of Fishery and Fisheries Directorate of the Rosselkozndazor from the Ministry of Agriculture. The State Committee for Fishery was re-established as an institution directly under the Federal Government. It will combine the functions of the Department for Fisheries (policy and development), Federal Agency of Fishery (management on behalf of the state), and the Fisheries Directorate of the Rosselkhoznadzor (control). Further structural changes are expected, in particular at the regional level, so providing an organigram is currently unrealistic.

In addition, coordination of enforcement of marine biological resources is the task of another federal body, the Border Service, *Pogranichnaya Sluzhba* (PS). Since 2003, this service is subordinated to the Federal Security Service (FSB).

8. GENERAL LEGAL FRAMEWORK

According to the Law of the Russian Federation “On the Animal World” (1995), fisheries—including harvesting of benthic invertebrates and hunting marine mammals—is one of the categories of use of the Animal World. Animal organisms inhabiting the territorial sea, the internal marine waters, the continental shelf and the EEZ of the Russian Federation (all notions in the juridical sense), those migrating between two or more administrative regions, and those subject to international agreements, are federal property. Thus, it is a responsibility of the federal institutions to manage, monitor and enforce marine fisheries. This Law contains general requirement for TAC setting in using the kinds of the Animal World and declares a conservation priority in case fishery as part of use of the Animal World influences endangered species listed in the Red Data Book of the Russian federation.

The Federal Laws “On the Continental Shelf of the Russian Federation” (1995) and “On the Exclusive Economic Zone of the Russian Federation” [EEZ] (1998) set the principles of sovereignty of the Russian Federation over the aquatic biological resources of the Continental Shelf and the EEZ of the Russian Federation, and provide general regulation for scientific research including the fishery research.

The Federal Law “On Fishery and Protection of Aquatic Biological Resources:” (2004) sets the general framework for fishery regulation. The goals and objectives that the government wishes to achieve within the fishery sector are not clearly defined in the regulatory documents. The Federal Law “On Fishery” states that

> “regulation of relationship in the field of fishery and conservation of aquatic biological resources is performed on the basis of perceiving them as a natural entity, protected as most important component of Nature, a natural resource, used by human being for human consumption and also a basis of performing economic and other activities, and, at the same time as a property right object” (Article 2.1).

The Law also declares “priority of conservation and rational use of aquatic bio-resources over the use of bio-resources as property right objects” (Article 2.2).

The most detailed and directly applicable part of this Law refers to fishing rights. For a company’s or a person’s right for industrial fishery a share in the TAC for particular stocks is required. The share is given to a particular stakeholder on the basis of historical record. Shares in the TAC of newly exploited stock should be allocated by means of auctions. Zilanov (2004) analysed this law provisions and estimated that in order to be a working regulation the law must be complemented by 42 various additional regulatory documents (new fishing rules, governmental statutes, ministerial orders and circular

letters, regional laws). By the end of 2007, a full set of additional statutes had yet to be put in place. The Basin Fishing Rules were approved by the Ministry of the Agriculture and registered in the Ministry of Justice in spring 2007. They regulate the condition of fishery in particular areas and specify fishing closures, gear regulation, minimum allowable size of commercially caught specimens of particular species, and allowable by-catch of non-target species.

The Law also gives a definition of a fishing unit area (*rybopromyslovyzi uchastok*) and sets general principles of their use. Compiling lists of fishing unit areas is delegated to regional authorities. As the Law has gaps and its application is criticized by parliamentarians and stakeholders, further amendments of legislation are expected.

It may be expected that in the next coming years at least two new Federal Laws "On the Coastal Fishery" and "On Aquaculture" will be considered by Russian legislators.

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USEFUL LINKS

Association of Alaska Pollack Catchers — http://www.pollack.ru/en

Association of the Shrimp Catchers of the Far East — http://www.dalryba.ru/partners/?viewmode=print&a=44&s=18&p=1

State Committee for Fishery — http://www.gkr.ru