IP(08)08

Fisheries Management Focus Area Report

Russian Federation

FOCUS AREA REPORT ON MANAGEMENT OF SALMON FISHERIES

Submitted by the Russian Federation

The approach to management of salmon fisheries in Russia is based on applying the Precautionary Approach, NASCO Decision Structure and enforcing the adopted regulations. It is one of the structural elements under the Implementation Plan for meeting the objectives of NASCO's agreements. Implementing such an approach helps ensure the diversity and high abundance of salmon stocks.

1. **A brief description of the fisheries, including an overview of the stocks exploited, gear types, fishery location, magnitude of the fishery, current management restrictions and others planned.**

In accordance with the Federal Law "On fisheries and conservation of aquatic biological resources" (No. 166-FZ, 2004) fishing for salmon can only be conducted under the TAC established annually and on the basis of quotas allocated to different types of fishery (fishery to support traditional way of living of indigenous small nations of the North; scientific fishery; fishery for enhancement purposes; recreational fishery; commercial fishery). In 2007 TACs, one for the White Sea basin (117.9 t) and one for the Barents Sea basin (23.9 t), were adopted by the Order of the Ministry of Agriculture of the Russian Federation. Quotas allocated to the subjects of the Federation and according to the type of fishery were established by the Order of the Federal Agency for Fisheries of the Russian Federation (the State Committee of the Russian Federation on Fisheries from September 2007)(Section 4.1 of the Implementation Plan).

Quotas for commercial fishery were allocated to users by the Federal Agency for Fisheries on the basis of fixed percentages allotted as their shares in the total quota established for the region. The fishery could only be conducted at the fishing sites allotted to the users.

Quotas to the users identified as eligible for carrying out the fishery as indigenous small nations of the North and for recreational fishery were allocated by the subjects of the Federation from the total quota established for a region. Local administrations also regulate the dates for the start and close of the fishing season. The fishery could only be conducted at the fishing sites allotted to the users.

The level of the total quota for scientific research fishing and for enhancement purposes was determined on the basis of applications from research institutions and regional directorates for enhancement of fish stocks and was allocated according to the applications and scientific programmes from the total quota established for the sea basin.

All types of fishery were carried out on the basis of licences, which were issued by Rosselkhoznadzor (control and enforcement authority) only provided that a user had been allocated a quota. The licence for fishing of aquatic biological resources included, depending on the type of fishery, information on the user of aquatic biological resources and fishing site, species allowed for fishing, size of quota, permitted fishing gear, methods and times of fishing and other conditions regulating the harvest and ensuring protection of salmon habitat. Users, owners of quotas, were required to maintain accurate records in fishing logbooks and provide catch data to Rosselkhoznadzor every 10 days. After all of the allocated quota had been fished fishery at a fishing site closed. Users, owners of quotas for recreational fisheries, organized fishing on allotted fishing sites and issued permits to anglers.

The fisheries were carried out according to the fisheries regulations applicable to each type of fishery, which were revised and adopted for the Northern fisheries basin in 2007 (Section 4.1 in the Implementation Plan). Regulations for scientific fishing are somewhat different from those established for other types of fishery in that they do not impose any restrictions on the fishing gear, their number, times of fishing and some other limitations.

In 2007 salmon fisheries operated on the Barents Sea and White Sea rivers and in the coastal waters of the White Sea in the Murmansk and Archangelsk regions, Republics of Karelia and Komi and Nenets Autonomous Region.

In 2007 quotas for commercial fishery were allocated to only two regions – Murmansk and Arkhangelsk.

In the Murmansk region the fishery operated from August to December at sea netting stations along the coast from estuary of the Ponoi river to the estuary of the Varzuga river and exploited a mixed stock with trap nets. The catch was 21.2 t (Table 1), 54% less than the average catch in the previous five years and 67% less than in the previous 10 years. There were 153 fishermen engaged in the fisheries. The allocated quota was not fully fished in 2007 due to delayed salmon run. Commercial fisheries for salmon at barrier fences introduced in the 1950s, which allowed rational harvesting of salmon stocks of individual rivers, were closed in 2004.

In the Arkhangelsk region commercial fisheries operated from early June to early November at 42 coastal netting stations (mixed stock fisheries) and at 21 in-river fishing sites (rivers Severnaya Dvina, Onega and Megra). Trap nets and nets were used for fishing, including 82 gear in coastal waters, 24 in rivers. 177 fishermen participated in the fisheries, of them 114 at coastal netting stations and 63 at in-river sites. The catch at sea stations was 9.9 t and 3.9 at river sites (Table 1).

Table 1. Catches of salmon in the Murmansk and Arkhangelsk regions according to quota types in 2007, tonnes.

Quota type	Murmansk region		Arkhangelsk region	
	Quota	Catch	Quota	Catch
To indigenous small nations of the North	2.00	0.00	-	-
Scientific research fishing	20.55	2.65	4.20	1.83
For enhancement purposes	3.20	1.60	1.40	0.74
Recreational fisheries	47.08	17.08	2.47	0.23
Commercial fisheries	34.87	21.18	16.90	13.78
Total	***107.70***	***42.51***	***24.97***	***16.58***

Since the fishery on a mixed stock may have adverse effect on the status of individual river stocks the quota for commercial fisheries in coastal waters of the White Sea is, as stated in the Implementation Plan of the Russian Federation (Section 4.1), being gradually reduced. For instance, the coastal fishery quota allocated to the Murmansk region in 2005 was 51.00 t, in 2006 it was 44.00 t, and 34.87 t in 2007. In the Arkhangelsk region it was 44.00 t in 2005, 38.30 t in 2006, and 16.9 t in 2007.

Quotas for recreational fisheries were allocated in 2007 to the Murmansk and Arkhangelsk regions, Republic of Karelia and Nenets Autonomous Region.

In the Murmansk region the fishery operated on the basis of catch-and-release (fly rod) and catch-and-retain (spinning) from May to October. The catches have been increasing in the past

10 years (Fig. 1), which reflects both an increased fishing effort (number of fishing days) and healthy state of the stocks in those rivers, where mainly catch-and-release is exercised. In 2007 the catch by this fishing method was 44 300 salmon, 57% more than the average catch in the previous five years and double of the average catch in the previous 10 years (Section 4.1 of the Implementation Plan). On the Barents Sea rivers the catch per unit effort varied from 0.8 to 1.4 salmon per angler per day, on the White Sea rivers (Ponoi river) it was 6.0 salmon per angler per day. The catch in catch-and-retain was 5 500 fish, which was 15% less then the average catch in the last five years, but 14% more than the average in the last 10 years. Quota for recreational fishery shows an increasing trend. It was 46.03 t in 2006, 47.08 t in 2007, and 55.00 t was allocated for 2008 (Section 4.1 of the Implementation Plan).

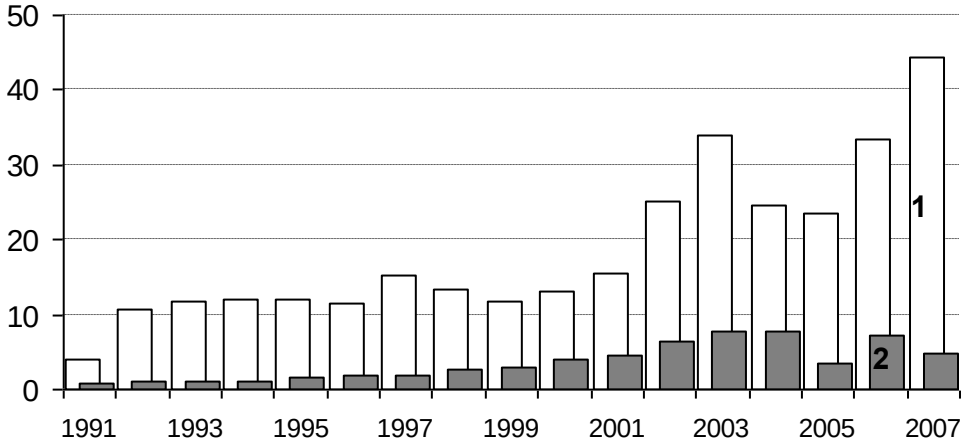

Fig. 1 Catches of Atlantic salmon (No of salmon X 1000) in catch-and-release (1) and catch-and-retain (2) fisheries in the Murmansk region in 1991-2007.

In the Archangelsk, Nenets Autonomous Region, Republics of Komi and Karelia recreational fishing by rod is not well developed. In 2007 the fishery in the Archangel region operated from early June to early November. Fishing gear – spinning. Catch in catch-and-retain was 230 kg against the allocated quota of 2.47 t. Catch-and-release fishing was conducted only in the periods from 23 to 30 June and from 23 to 30 September on small rivers flowing into the Barents Sea. Fishing gear – fly rod. The catch was 17 salmon. Mean catch per unit effort was 0.2 salmon per angler per day.

Although quotas had been allocated, there was no recreational fishery in the Republic of Karelia and Nenets Autonomous Region in 2007 (Table 2).

Table 2. Catches of Atlantic salmon in the Republic of Karelia and Nenets Autonomous Region according to quota types in 2007, tonnes.

Quota type	**Republic of Karelia**		**Nenets Autonomous Region**	
	quota	catch	quota	catch
To indigenous small nations of the North	-	-	-	-
Scientific research fishing	0.01	-	5.00	2.54
For enhancement purposes	1.11	0.83	-	-
Recreational fisheries	0.80	-	0.06	-
Commercial fisheries	-	-	-	-
Total	1.92	0.84	*5.06*	*2.54*

Quotas for scientific research fishing were allocated to all regions in 2007.

In the Mumrnask region only 13% of the allocated quota (Table 1) was fished out due to late installation of fishing gear and other technical problems linked to unusually high water level during summer months, which made it impossible to collect representative data on biological characteristics of adult salmon on some index rivers (Varzuga river). Regular electro-fishing studies were carried out on most monitored rivers and representative data on juvenile densities and their biological characteristics were collected.

In the Arkhangelsk region studies were carried out on rivers Severnaya Dvina, Onega, Megra. The catch of adult salmon was 1.8 t against the quota of 4.2 t (Table 1).

In the Arkhangelsk region scientific fishing for adult salmon was conducted at three sites in the downstream of the Pechora river in the period from 20 July to 22 September. The allocated scientific quota was 5.0 t (Table 2). Drift nets with the length of 350 m and the mesh size of 70 mm (one net per site) were used. Overall, the quota uptake for three sites was 51%.

Scientific quota allocated to Karelia was not fished.

Quotas for enhancement purposes were allocated to the Murmansk and Arkhangelsk regions and Republic of Karelia.

Presently, there are three salmon hatcheries left in the Murmansk region. There was one more, which was closed in 2006. Fish for brood stock were taken from two rivers: Kola and Umba, where enhancement activities were carried out. The catch was 2.34 t. There are two hatcheries in the Arkhangelsk region. The catch from fishing to provide brood stock to the hatchery was 0.74 t (Table 1). Brood stock was fished in the Onega and Solza rivers, where enhancement activities were carried out. In Republic of Karelia the catch of salmon for enhancement purposes was 0.83 t. Salmon for brood stock was also fished in the Keret river, where a project is being carried out to rebuild the stock.

2. Identification of exploited stocks and the reference points (conservation limit and/or management target) or alternative measures used to define adequate abundance of the stock.

In the Murmansk region 79 salmon stocks were exploited by in-river fisheries in 2007 and a number of stocks from the White sea rivers were exploited by a mixed stock fishery in coastal waters of the White Sea. Besides, salmon originating from Russian rivers migrate from feeding areas in the ocean back to homewaters along the Norwegian coast, where there is still a coastal fishery operating. At the same time tagging data available suggest that Norwegian fishermen harvest salmon from Russian rivers – (Danilchenko, 1938; Novikov, 1953; Bakshtansky, Nesterov, 1973; Bakshtansky et al., 1976; Zubchenko et al., 1995).

Conservation limits were set for all known stocks of salmon in rivers of the Murmansk region. Management targets are applied as reference points for managing the fisheries. Estimates of abundance of adult salmon stock in rivers were derived by direct counting at barrier fences (3 stocks) and by mark-recapture method using data from tagging in recreational fishery (6 stocks). For assessing the natural production of salmon and status of stocks during the freshwater phase of the life cycle estimates of parr densities derived from electrofishing in spawning and nursery habitat in monitored rivers are used (24 rivers).

Returning stock abundance and spawning escapement in rivers of the Murmansk region were estimated using the methods recommended by the ICES Working Group on North Atlantic

Salmon, where the Pre-Fishery Abundance Model is applied and on the basis of information on declared catches and estimates of exploitation rates and unreported catches (Potter *et al*., 2004). Adult returns, conservation limits and exploitation on selected rivers in the Murmansk region in 2007 are given in Table 3.

Table 3. Adult returns, conservation limits, quotas and catches in the rivers of Murmansk region in 2007.

River	Conservation limit, No of salmon	Adult returns, No of salmon	Total quota, tonnes	Total catch	
				Retained, tonnes	Released, No of fish
Tuloma	3,380	4,726[1]	2.82	0.90	5
Kola	4,250	4,246[1]	5.59	2.25	977
Kharlovka	1,390	3,434[2]	0.78	0.19	1,267
Rynda	2,760	5,572[2]	0.50	0.10	1,132
Zolotaya	150	857[2]	0.20	0.08	198
E. Litsa	810	4,264[2]	0.45	0.17	1,054
Varzina	720	2,174[2]	0.45	-	667
Ponoi	7,280	39,200[2]	20.64	6.81	15,057
Varzuga	19,980	n/a	7,19	3,33	14,838
Kitsa	2,395	1,829[1]	0.78	0.75	1,435

[1] – Barrier fence
[2] – Mark-recapture

In the Arkhangelsk region exploited by in-river and mixed stock fisheries were the stocks of the River Severnaya Dvina, River Onega, River Solza and the stocks from some other rivers. Reference points for managing are conservation limits.

In the Nenets Autonomous Region exploited are the stocks in the River Pechora and three small rivers of the Barents Sea basin (Rivers Volonga, Velikaya, Indiga). Refernce points for management – conservation limits.

In the Republic of Karelia exploited is the stock in the River Keret. Reference points for management are historic data on catch statistic and adult counts at a barrier fence.

3. The status of the stock relative to the abundance criteria specified.

In the Murmansk region the dynamics of stock complex of the Barents Sea rivers showed quite strong variation and the spawning escapement to the rivers of this complex was often close to or even below the conservation limit (Fig.2). Despite the total adult returns in recent years being above the conservation limit, this stock complex is suffering reduced reproductive capacity after homewater fisheries have taken place. It should also be taken into account that the status of individual river stocks varies considerably. For example, in 2007 the adult returns to the monitored river Tuloma were half the abundance in 2006, which was mostly due to increased illegal fishing activity, largely because of the blockage of returning salmon below the barrage of the Lower Tuloma power station last year, however the spawning stock was still above its conservation limit. At the same time in the monitored rivers located in less populated areas, but with well developed angling tourism based on catch-and-release the spawning escapements were notably higher than the conservation limits.

In the White Sea rivers of the Murmansk region the dynamics of adult salmon abundance showed increasing trend from 1990s with the peak value in 2001-2002, which was due to cessation of commercial fishery in a number of large rivers (Fig.3). Over the whole period retuning salmon stock was well above the conservation limit. Although adult returns in recent years were declining the stock complex is currently at full reproductive capacity after homewater fisheries have taken place. However, similarly to the Barents Sea stock complex the status of individual river stocks of the White Sea complex varies considerably. And if in most of the rivers this is linked only to natural abundance fluctuations, in the river Umba the state of natural salmon production has been assessed as critical for high level of illegal fishing, which takes about 70% of the adult returns to the river (Alexeev et al., 2006; Alexeev, 2007). Enhancement activities on this river have not so far given any noticeable results, and the proportion of salmon of hatchery origin is, on the average, about 6%.

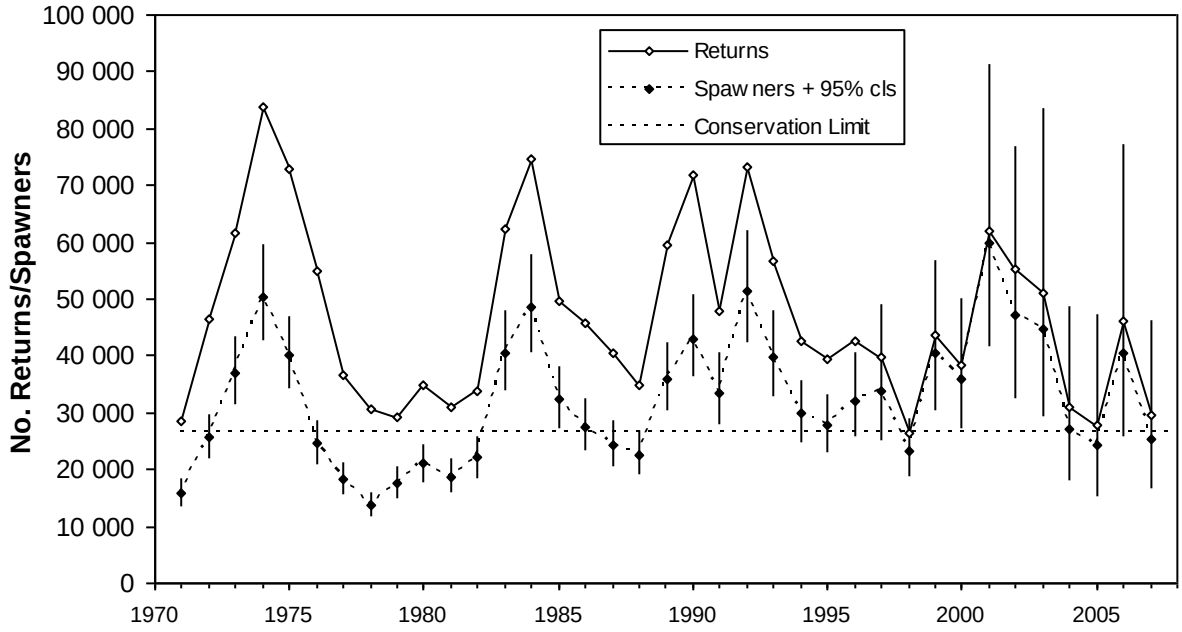

Fig. 2. Estimated Returns, Spawners and Conservation limit for the salmon stocks complex of the Barents Sea rivers, Murmansk region.

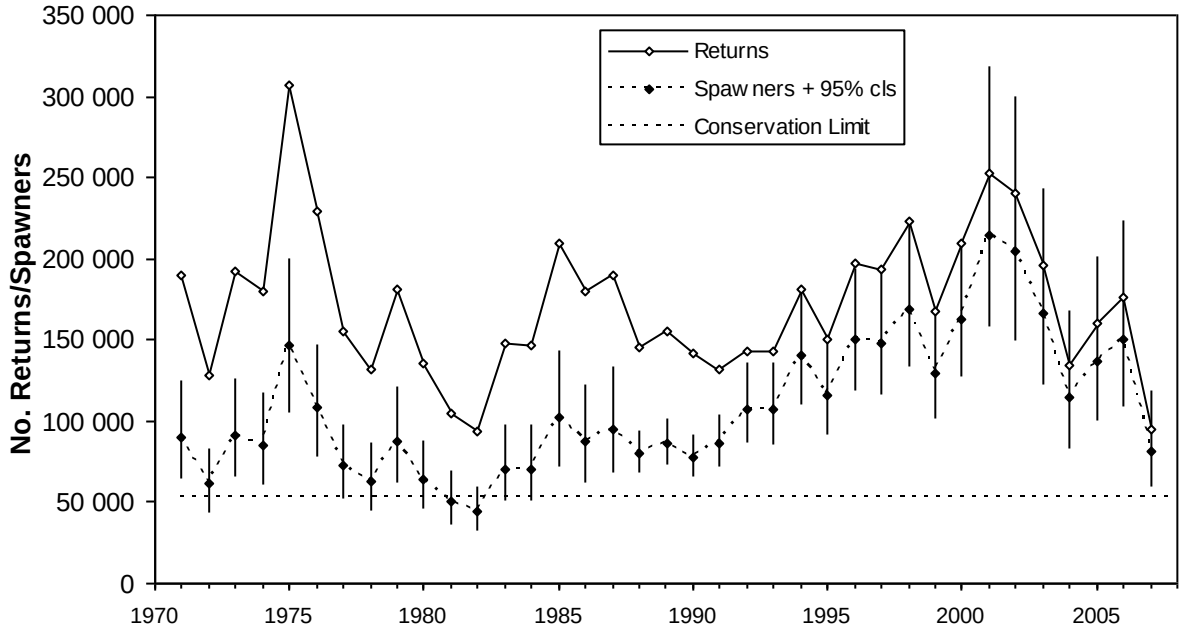

Fig. 3. Estimated Returns, Spawners and Conservation limit for the salmon stocks complex of the White Sea rivers, Murmansk region.

In rivers of the Arkhangelsk region and small rivers of the Nenets Autonomous Region the adult stock abundance was estimated on the basis of smolt counts on monitored rivers. The abundance of returning salmon stock to rivers of the White Sea basin within the limits of the Arkhangelsk region has in recent years varied between 35 000 and 45 000 salmon (conservation limit 12 300 salmon), in other words it is within safe biological limits. However the status of individual stocks is varying, the fisheries are managed on a river-by-river basis.

The adult salmon abundance in the river Pechora was assessed on the basis of data from scientific research fishing. The returning salmon stock was on the average 52 000 fish. According to expert evaluation maintaining the adequate natural production in the river requires a stock of, at least, 40 000 spawners. Because of the low stock abundance it was recommended to close all the fisheries.

In rivers of the Republic of Karelia no assessment of adult returns has been undertaken and no data are available on the status of stocks. Expert evaluation based on catch statistics has shown that all stocks in this region continue to be below their conservation limits.

According to genetic studies salmon stocks in rivers Varzuga and Pechora have a complex population structure. However, no conservation limits have been developed for individual tributary populations in these rivers.

4. The extent to which the stock is meeting other diversity criteria (e.g. age groups, size groups, populations), if such information is available.

In the Murmansk region data were collected on the age structure, spawning run dynamics, size and weight composition, sex composition of adult salmon of 7 stocks in 2007. Compared to the previous year the proportion of females in monitored rivers of the Barents Sea stock complex (Tuloma, Kharlovka, East Litsa) increased from approximately 35% to 50%. The proportion of grilse declined (from 70% to 40%) and the number of 2SW salmon increased from 35% to 55%. As in the previous years 4SW salmon were quite rare. Prevailing smolt age was 4+.

The proportion of grilse also declined in Ponoi, one of the White Sea rivers, (74% to 58%) and the number of 2SW salmon increased (26% to 43%). It is difficult to assess the situation on other rivers for lack of representative data. Likewise, unavailable are data that would allow the assessment of biodiversity of the mixed stock in the river Varzuga.

Data on the age structure, size and weight composition and sex composition of juvenile population gathered on monitored rivers showed no changes compared to previous years, and parr densities indicated good natural production in the rivers.

For the Arkhangelsk region, Nenets Autonomous Region and Komi Republic there are data available on the age structure, spawning run dynamics, size and age composition, sex composition of adult salmon from 4 stock complexes. In the river Severnaya Dvina most of the spawning stock in 2007 was composed of salmon at age 5+, according to the total age (48%), or 2SW according to the sea age. The proportion of summer run salmon, mostly 1SW, was 40%. The average length and weight were 71.4 cm and 4.6 kg, which was less than the long-term means (76.0 cm and 5.2 kg). Ratio between females and males was 1.08:1.

In the river Onega salmon at age 5+, total age, predominated in the spawning stock. According to sea age 2SW fish prevailed. Mean length and weight were 91.4 cm and 8.2 kg. Sex ratio was 1:2.00.

In the river Pechora changes were observed in both the dynamics of spawning run (timing shifted to later period in the autumn) and its structure – age composition, growth rate, which may, probably, be linked to the global climate warming. Most numerous in the returning stock are 1SW and 2SW fish, while the number of 3SW salmon is declining rapidly. The length (AC) varied from 50.7 to 114.0 cm, with average of 77.3 cm, the weight varied from 1.5 to 19.7 kg, average 5.8 kg. According to the total age the stock is composed of three age groups – 5+, 6+ and 7+. Dominating groups are 5+ (38.4%) and 6+ (55.0%). The proportion of salmon at age 7+ was small 6.6%. The ratio between females and males in the spawning stock was 2.2:1. There are no data available to describe the principal biological parameters of individual populations in the river complex.

5. **For mixed stock fisheries, the information in numbers 3 and 4 above should be presented for each contributing stock.**

The mixed stock salmon fisheries operate in coastal waters of the White Sea. It is known, that these fisheries harvest almost one third (32.4%) of salmon returning to the river Varzuga (Salmov, 1982). There is no other data available to characterize this mixed stock.

6. **The management actions that will be employed to control harvest, including measures that will be used to address any failure or trend in abundance or diversity.**

Powers for regulating fishing activity and/or harvest

- **Basic management procedures**

<u>Determining a TAC</u>

Based on the analysis of stock status, forecasts of salmon returns and scientific advice on the level of TAC are developed. On a yearly basis under the adopted TAC catch quotas are set for

different types of fisheries. Fishing activities are carried out in accordance with established fisheries regulations. In case a declining trend has been identified for a stock and/or a part of the stock causes of the decline are analyzed, when the forecast of returns is being developed, advice may be given to reduce the harvest (quotas) to a certain level or other recommendations concerning the exploitation of the stock (e.g. closure of the fishery, more protective exploitation pattern).

Applying the management targets

A TAC for Atlantic salmon is determined by using the management targets, which are set at a level higher than the conservation limits to take account of uncertainties in the stock assessment and exploitation of individual stocks.

Taking into account post-release mortality in catch-and-release fishing

In determining the level of TAC post-release mortality of salmon in catch-and-release fishing, which is a prioritized fishing method on the majority of rivers, is taken into account.

Determining the TAC on a stock-by-stock basis

To implement the conservation-oriented management of salmon stocks quotas for the fisheries are established on the basis of TACs determined on a river-by-river basis (rivers of the first order).

Developing scientific recommendations for the users of aquatic biological resources at fishing sites – salmon rivers

Scientific recommendations are developed for users on a yearly basis. The following information is included: description of the status of stocks of aquatic biological resources; recommendations concerning the stock exploitation; recommendations on how to improve the stock status. Following such recommendations allows the users to effectively use the allocated quotas, take measures to protect and restore the stocks.

Developing regimes of fishing in recreational fisheries

Regimes of fishing were implemented in 2007. Those were adopted by regional administrations. The regimes established requirements to fishing, times and sites of fishing, main requirements to orgarnisers and participants in recreational fisheries (Section 4.1 of the Implementation Plan).

Additional powers for management (from 2008 on)

Territorial Directorates of the State Committee of the Russian Federation on Fisheries

At the end of 2007 – beginning of 2008 formation of territorial directorates of the State Committee on Fisheries was finalized. These are plenipotentiaries of the Committee in areas within their jurisdiction across the fisheries basins. Presently, the territorial directorates of the Committee are entrusted with the task of protecting the stocks of anadromous fish, controlling and enforcing the fisheries legislation of the Russian Federation and other tasks pertinent to the fisheries management. Territorial directorates of the Committee are responsible for issuing licences for all fisheries, they also compile catch statistics, which is required to be sent by users every second week.

Commission on regulation of the harvest (catch) of anadromous fish

Following the adoption of amendments to the Federal Law "On fisheries and conservation of aquatic biological resources", concerning the harvesting of anadromous fish a Commission on regulation of harvest of anadromous fish shall be established at a regional level (in subjects of the Federation) in 2008. The membership of the Commission shall include representatives of the federal and regional bodies of executive power, fisheries associations and unions, scientific and non-government organizations. The Commission shall determine the volumes that can be fished, times and sites of fishing and other conditions of harvesting the anadromous fish, which shall then be approved by a territorial directorate of the State Committee on Fisheries. Creation of such Commission would allow operative management to regulate the fisheries.

A Protocol for harvesting the anadromous fish

In 2008 following the adoption of a number of amendments to the Federal Law "On fisheries and conservation of aquatic biological resources", concerning the harvest of anadromous fish, a Protocol for harvesting the anadromous fish was enacted:

a. legal entities and entrepreneurs shall harvest anadromous fish on the basis of a contract allocating a fishing site;
b. for harvesting the anadromous fish such species and water bodies, where they live, are allocated following a decision of the Commission on regulation of the harvesting the anadromous fish, which shall further be approved by the territorial directorate of the State Committee on Fisheries;
c. for providing favourable conditions for fishing and conservation of aquatic biological resources in water bodies allocated for harvesting the anadromous fish a contract can be concluded with the purpose of allocating to a user the right to fish anadromous fish in a respective water body for the period of 10 to 20 years provided that the user fulfils all obligations on rational exploitation and conservation of aquatic biological resources.

7. The extent to which the following issues are taken into account:

a. uncertainty in the assessments

This is taken into account when recommendations for a TAC are developed by applying the management targets, which are set at a level above conservation limits to take account of uncertainties in the assessment of individual stocks (valid for the stocks on the Kola Peninsula, not valid for Archangelsk region, Republic of Karelia, partly valid for the River Pechora).

b. abundance of the stock/diversity of the stock

This is taken into account, when advice on the level of TAC is developed on the basis of assessment of status of individual stocks.

c. selectivity of the fisheries

This is taken into account in respect of fisheries in coastal waters of the White Sea, which are supported mainly by the strong autumn run.
This is also taken into account for recreational fisheries. A user can, following the scientific advice, adjust the fishing effort applied to different biological groups of salmon

(summer and autumn run) or to male and female salmon fished at a fishing site (for instance, catch-and-retain fishing can be forbidden at the beginning of the run, when mostly large fish are exploited by the fishery; a ban can be introduced on the retention of females larger than 90 cm and others).

d. any non-fishery factors affecting the stock

In 2007 there was a non-fishery event that affected the stock of salmon in the river Tuloma (the Barents Sea basin). Due to abnormally high water levels in the Tuloma river reservoirs (there are two hydro power stations on the river), releases of water at the Lower Tuloma power station took place over an extended period of time, that discouraged the fish from entering the fish ladder. For 2008 it was recommended to open the fish pass earlier in the season so that to allow the first arriving fish to run into the fish pass rather then gather below the barrage misguided by the water flow from the spillway.

e. other fisheries exploiting the stock.

Potential by-catch of salmon in other fisheries such as herring fishery in the White Sea. No data were obtained in 2007 that would allow assessment of the level of by-catch.

8. The expected extent and timescale of effects.

Applying the basic management procedures allows operative (within one calendar year) and longer-term (two years before the fisheries take place) management of fishing activities to ensure rational exploitation of the stocks.

9. An explanation of how socio-economic factors are applied in the development of fisheries management actions and how this affects the attainment of NASCO's goals

Socio-economic factors are taken into account, when measures to regulate the fishery are being developed. From 2004 quotas are allocated annually to indigenous small nations of the North. This type of quota stands first, in the order of priority, amongst other quotas allocated for different purposes (scientific research fishing, enhancement purposes, recreational fisheries, commercial fisheries). Small-scale commercial fisheries are maintained as traditional activity of coastal communities. The fisheries are regulated by quotas set annually with risks associated with exploitation of mixed stock taken into account. In recent years the commercial quotas continue to show a decreasing trend.

10. Programs that will be used to monitor the effect of the management measures and identify information deficiencies and timeframe for resolution.

The effect of management actions is monitored by:

- Territorial Directorates of the State Committee on Fisheries and Basin Directorates (Rybvods) with responsibilities to gather catch statistics from all fisheries; information on composition of catches (size and weight, sex and age composition), carry out enhancement activities and monitor the conditions in salmon habitat;
- Fisheries Research Institute (PINRO) with responsibilities to study and assess the salmon stocks. For monitoring their status biological data on monitored rivers are collected, adult returns assessed, run dynamics studied, data on size, weight and sex composition of adult

stock gathered, parr densities at standard stations estimated, tagging undertaken and smolt counts obtained.

This array of information is used to develop a scientific advice on the level of TAC, monitor the status of individual stocks and their habitat and to develop and adopt the necessary management measures.