Baltic Sea Environment Proceedings No. 126B

Salmon and Sea Trout Populations and Rivers in Russia

HELCOM assessment of salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations and habitats in rivers flowing to the Baltic Sea.

Helsinki Commission

Baltic Marine Environment Protection Commission

Published by:

Helsinki Commission
Katajanokanlaituri 6 B
FI-00160 Helsinki
Finland
http://www.helcom.fi

Authors
Sergey Titov (State Research Institute on Lake and River Fisheries), Sergey Shibaev (Kaliningrad State Technical University (KSTU)) and Konstantin Tylik (KSTU)

Editing and layout of the contents: Miia Mannerla (HELCOM project staff)

For bibliographic purposes this document should be cited as:
HELCOM, 2011
Salmon and Sea Trout Populations and Rivers in Russia – HELCOM assessment of salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations and habitats in rivers flowing to the Baltic Sea. Balt. Sea Environ. Proc. No. 126B.

Layout of the cover: Leena Närhi, Bitdesign, Vantaa, Finland
Cover photo: Konstantin Tylik

Number of pages: 24

ISSN 0357-2994

This report has been funded through a co-financing agreement between the European Union (European Commission, Directorate General for Maritime Affairs and Fisheries) and HELCOM (Overview of the state of salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations in rivers flowing to the Baltic Sea – SI2.546540).

Contents

1. Introduction

This Report gives a description of Russian salmon and sea trout populations and rivers that empty into the Baltic Sea. The Report is based on the HELCOM SALAR Project that focused on the state of salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations in rivers flowing to the Baltic Sea.

The deliveries of the HELCOM SALAR Project include a General Report on Baltic salmon and sea trout populations and rivers (BSEP 126A) as well as reports with individual descriptions of populations and rivers separately for Denmark, Estonia, Finland, Latvia, Lithuania, Poland, Russia and Sweden (BSEP 126B). The project also prepared a GIS map of salmon rivers as well as a database compiling information on salmon and sea trout populations and rivers.

The overall ecological state of the Baltic rivers and their fish populations has deteriorated from their pristine state. This is a consequence of direct anthropogenic impacts caused by many activities in the drainage area, in the rivers and in the Baltic Sea. In the rivers, the most detrimental activities have been damming, dredging and channelizing rivers to serve for hydropower production, log driving and agricultural purposes. Also indirect impacts of human activities such as nutrient and sediment loads from agriculture, forestry and sewage sources have had negative consequences on the ecological state of the Baltic rivers.

The General Report of the HELCOM SALAR Project presents an overview, inventory and classification of Baltic rivers with salmon and/or sea trout populations. In order to improve the status of these populations, the Report recommends measures for the restoration of river habitats and waters, for the opening of passage as well as for fisheries management in rivers. Furthermore, a prioritization of Baltic salmon and sea trout populations in need of urgent actions for their recovery is included. The recommendations and prioritizations form a basis for the development of international and national programs for the planning, funding and systematic realization of these actions.

The HELCOM SALAR Project was funded through a co-financing agreement between the European Commission (DG MARE) and HELCOM. It implements fisheries actions in the strategic HELCOM Baltic Sea Action Plan to radically reduce pollution to the sea and to restore the good ecological status of the marine environment by 2021.

The Reports have been prepared in co-operation with nominated salmonid and river habitat experts of the Baltic Sea countries as mentioned on the second page. The texts concerning salmonid populations and rivers in each country have been produced by the nominated experts and edited by the project staff in the HELCOM secretariat.

The General Report, the Reports with river descriptions and the GIS map are available at www.helcom.fi and the databank as an excel file at the institutions of the nominated experts.

2. Salmon populations and rivers in Russia

The River Luga

The River Luga is a very large wild salmon river flowing to the Gulf of Finland.

Basic hydrological facts

River length: 353 km totally accessible for salmonids
Size of catchment area: 5,000 km^2
Average flow: 2,540 m^3/s
Daily lowest flow: 1,770 m^3/s
Number of migration hindrances: 0

Habitat and water quality in River Luga

River Luga in Novgorod Oblast and Leningrad Oblast is the most important Russian wild Salmon River flowing to the Gulf of Finland. The river starts from near Lake Samino in Novgorod Oblast. There are no large lakes along the main river. The River freezes up in early December and is covered by ice until early April. There are many small and medium-sized tributaries in the river Luga system. The main tributaries are the rivers Oredezh, Lemovzcha and Vruda. The towns of Luga and Kingisepp are situated on the Luga River.

At present there are no natural or man-made migration obstacles in the main river. However, there are some old dams on the tributary Oredezh. The main reproduction areas are located in the lowest and middle part of the river.

The overall water quality is good. However, deforestation and clearing of bushes near the river can increase the sediment and nutrient load into the water. Nutrients may reach the river system from pig and poultry farms situated along the river. There are currently no industrial sites along the river that would pose a risk to the water quality.

The Luga salmon stock

River Luga is the only river located on the Russian part of the Baltic Sea which has natural reproduction of salmon. The salmon stock has been supplemented by stocking of hatchery-reared parr and smolt from the mid-1990s to the present time.

During the second half of the last century the Luga salmon population declined. Until recently the Luga salmon has been the least studied in the Russian part of the Baltic Sea and there is no historical data concerning the abundance of the salmon population.

Comprehensive research was initiated in end of 1990s, which produced direct and accurate data concerning the abundance of the wild salmon population. At present the annual smolt run is from 2,500–8,000 wild smolts (on average 5,000 individuals) per year. Luga salmon reproduce only along the main river and in the lowest part of the tributary Vruda.

The salmon production of the river Luga forms an important part of the salmon production in the Gulf of Finland. However, the reproduction of wild salmon is decreasing and illegal fishing is decimating the Luga salmon stock.

Salmon population facts

Population category: 4
Reproduction area: 72 ha
Production capacity: 70,000 smolts
Recent wild smolt production estimate: 5,200

Specific actions for the development of the salmonid populations

The nutrient and sediment load from agriculture should be decreased by establishing effective protection zones along agricultural lands by the river. It is recommended that the reproduction areas for salmon are restored.

The recommendations in the general report of the HELCOM SALAR project concerning accessibility and river fisheries management are applicable for this river.

The River Narva

The River Narva is a salmon river at the border of Russia and Estonia flowing to the Gulf of Finland.

Basic hydrological facts

River length: 78 km of which 12 km accessible for salmonids
Size of the catchment area: 56,200 km^2
Average flow: 620 m^3/ s
Daily lowest flow: 295 m^3/ s
Number of migration hindrances: 1

Habitat and water quality in River Narva

The river Narva starts in the Lake Pskovsko-Chudskoye. It passes the towns of Narva, Ust-Narva (on the Estonian side) and Ivangorod (on the Russian side) on its way to the Gulf of Finland. Its main tributary is the River Plyussa.

There is a dam of the Narva hydropower plant at about 12 km from the mouth of the river preventing salmon migration. There are no rapids downstream of the power plant.

The water quality is generally good, but it is fair near the big cities. Deforestation and clearing of bushes near the river can increase the sediment and nutrient load into the water.

The Narva salmon stock

There were natural populations of salmon and sea trout in Narva until the 1950s. After the construction of the dam of the Narva hydropower plant in the 1954, salmon continued entering the river for a several years. However, by the beginning of the 1960s the population had almost disappeared.

A salmon hatchery was built in Ivangorod in 1956 for re-establishment of the salmon population in the river Narva. Before the beginning of the 1970s, salmon eggs were delivered to the Narva farm from the rivers Neva, Luga, and some Latvian rivers, for restoring the stock of salmon. Therefore, a

population that has no genetic relations with original Narva population has been established in the river Narva. At present the salmon stock is supplemented only by stocking of hatchery-reared parrs and smolts.

Salmon population facts

Population category: 7
Reproduction area: No information
Production capacity: No information
Recent wild smolt production estimate: No information

Specific actions for the development of the salmonid populations

The recommendations in the general report of the HELCOM SALAR project concerning accessibility and river fisheries management are applicable for this river.

The River Neva

River Neva is a salmon river flowing to the Gulf of Finland.

Basic hydrological facts

River length: 74 km totally accessible for salmonids
Size of the catchment area: 5,000 km^2
Average flow: 2,540 m^3/ s
Daily lowest flow: 1,770 m^3/ s
Number of migration hindrances: 0

Habitat and water quality in River Neva

The River Neva is a link between Lake Ladoga and the Baltic Sea. Although the river is short it has a powerful flow. The river flows past the city of St Petersburg and the towns of Kirovsk and Schlisselburg.

Intensive dredging has been performed during the last decades in the area of salmon spawning grounds in the river Neva.

There are no natural or man-made migration obstacles in the river. The overall water quality is good (the upstream and middle part areas) or fair (the downstream areas near St Petersburg).

The Neva salmon stock

A natural population of salmon existed in river Neva in the past. In 1920–1930 the population declined, and a salmon hatchery was built in the river. By the 1940s the population of the Neva salmon consisted of both natural and farmed fish. At that time, the registered volumes of the catch reached up to 25 tons, and the core of the stock was the fish of natural origin. At the end of the 1950s, farmed salmon made up for 22% of the catch, by mid-1960s this figure was already 55%, and in the 1970s the share of the farmed salmon reached 80–90% of the total number of the population of the Neva salmon. At present the salmon stock is supplemented only by stocking of hatchery-reared parr and smolts.

Salmon population facts

Population category: 7
Reproduction area: No information
Production capacity: No information
Recent wild smolt production estimate: No information

Specific actions for the development of the salmonid populations

Comprehensive research should be conducted in order to define the sections of river Neva that are suitable for salmonid spawning. Conclusions should be made about the possibility for re-establishment of natural spawning grounds at the Neva riverbed on the basis of the results of the research.

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

3. Sea trout populations and rivers in Russia in the St. Petersburg area

The sea trout Rivers of the Gulf of Vyborg

Basic hydrological facts

Name of the river	River length on the territory of RF (of which accessible for salmonids), km	Catchment area, km^2	Mean flow, m^3/sec	Migration hindrances
Serga	14 (14)	186	—	
Peschanaja	23 (23)	197	—	
Velikaja	20 (20)	2,960	—	
Polevaja	21 (21)	—	—	
Seleznevka	23 (3.5)	486	—	1
Gusinaja	18 (18)	—	—	
Malinovka	21 (21)	—	—	
Petrovka	27 (13.5)	190	—	1

Habitat and water quality in the rivers of the Gulf of Vyborg

Totally 8 sea trout populations flow to the Gulf of Vyborg and only one of them is a tributary to a larger river. All of these rivers start from Finnish territory and flow about 20 km from the Finnish-Russian boarder to the Gulf of Vyborg.

The overall water quality in these rivers is good. However, deforestation and clearing of bushes near the river can increase the sediment and nutrient load into the water. There are currently no large industrial sites along the tributaries that would pose a risk to the water quality. But there are some big ports in the area (Vyborg and Vysotsk) which can significantly influence on the water quality in the Gulf of Vyborg.

At present there are old dams on the Seleznevka and Petrovka rivers. There is a sea trout population in the lowest part of Seleznevka River but its upstream is blocked for sea trout migration. Beaver dams are common and serious barriers to fish migration in some rivers and tributaries.

The sea trout stocks of the rivers of Gulf of Vyborg

All of the sea trout populations in the rivers of Gulf of Vyborg are classified as wild, category 1 populations. No enhancement releases have been carried out in these rivers.

The main parts of the rivers are small and each of them has a reproduction area of not more than a few hectares.

On the main part of the rapids and riffles the parr densities are not more than 5–10 individuals per 100 m^2.The smolt run has not been monitored in these rivers, but not more than some hundreds of smolts are estimated to run to the sea from each river.

Sea trout population facts

Name of the river	Population category	Reproduction area, ha	Production capacity, smolts	Recent wild smolt production estimate
Serga	1	2,2	—	—
Peschanaja	1	0,3	—	—
Velikaja	1	1,1	—	—
Polevaja	1	—	—	—
Seleznevka	1	0,8	—	—
Gusinaja	1	—	—	—
Malinovka	1	—	—	—
Petrovka	1	0,1	—	—

Specific actions for the development of the salmonid populations

Efficient protection zones along agricultural lands by the river should be established. The spawning areas and the nursing grounds for sea trout should be restored.

TBeaver dams should on a yearly basis be removed from the small rivers and tributaries to allow for the migration of salmonids.

The recommendations in the general report of the HELCOM SALAR project concerning accessibility and river fisheries management are applicable for these rivers.

The sea trout Rivers of the North Coast of the Gulf of Finland

Habitat and water quality in the rivers of the north coast of the Gulf of Finland

There are totally around 20 sea trout rivers flowing to the Gulf of Finland on its north coast and only some of them are tributaries to larger rivers. Mainly they are small streams and brooks from 2 to 10 km long. Only 4 rivers are more then 17 km long.

The overall water quality in these rivers is good. There are currently no industrial sites along the coast that would pose a risk to the water quality, but the city Zelenogorsk can significantly influence

the water quality in some brooks flowing to the Gulf of Finland. Also deforestation and clearing of bushes near the river can increase the sediment and nutrient load into the water.

Beaver dams are common and serious barriers to fish migration on small rivers and brooks. There is only one man-made migration obstacle in these rivers. The River Sestra is totally blocked for sea trout migration.

The sea trout stocks of the rivers of the north coast of the Gulf of Finland

All of the sea trout populations in the rivers of the north coast of the Gulf of Finland are classified as wild, category 1 populations. No enhancement releases have been carried out in these rivers.

Totally the reproduction area in these streams is not large (not more then 0.1–1 ha in each of them). At present the main part of the local populations are poor. Only in 5–6 of the rivers the parr densities on the rapids and riffles reach more then 20–30 individuals per 100 m^2.

The smolt run has not been monitored in these rivers, but only some hundreds of smolts are estimated to run to the sea from each river.

Specific actions for the development of the salmonid populations

Efficient protection zones along agricultural lands by the river should be established. The spawning areas and the nursing grounds for wild salmon should be restored.

Beaver dams should on an annual basis be removed from the small rivers and brooks to provide the migration of sea trout.

The recommendations in the general report of the HELCOM SALAR project concerning accessibility and river fisheries management are applicable for these rivers.

The sea trout Rivers in the River Luga Basin

The River Luga is the largest sea trout river flowing to the Gulf of Finland from Russia.

Basic hydrological facts

Name of the tributary	River length (of which accessible for salmonids), km	Catchment area, km^2	Mean flow, m^3/sec	Migration hindrances
Solka	33.5 (21.5)	206	—	1
Azika	17 (17)	—	—	
Vruda	54 (54)	—	—	
Lemovza	46 (46)	526	—	
Lubenka	16 (16)	839	—	
Khrevitsa	32 (3)	—	—	1
Oredezh	192 (54)	—	—	6
Vidon	7 (7)	—	—	

Habitat and water quality in River Luga Basin

River Luga is the most important Russian wild Sea Trout and salmon River flowing to the Gulf of Finland. The river starts from near Lake Samino in Novgorod Oblast. There are no large lakes along the main river. There are many small and medium-sized tributaries in the river Luga system.

The main tributaries are the rivers Oredezh, Lemovzcha and Vruda. Sea trout reproduces only in the tributaries of the Luga River but not along the main river.

The overall water quality in the Luga tributaries is good. However, deforestation and clearing of bushes near the river can increase the sediment and nutrient load into the water. Nutrients may reach the river system from pig and poultry farms situated along the river. There are currently no large industrial sites along the tributaries that would pose a risk to the water quality.

At present there is one old dam in the middle part of Solka River. There is a sea trout population in the lowest and middle parts of the River and a landlocked trout population in the upstream of the River. There are some old dams on the tributary Oredezh and the lowest of them is located about 50 km from the mouth of River. The sea trout stock was lost due to these activities, but there is a landlocked trout population in this River.

Beaver dams are common and serious barriers to fish migration on some small tributaries of the Luga River.

The Luga sea trout stock

During the second half of the last century the Luga sea trout stock declined. Until recently the Luga sea trout has not been studied in the Russian part of the Baltic Sea and there is no historical data concerning the abundance of the sea trout population.

Comprehensive research was initiated in the end of the 1990s, which produced direct and accurate data concerning the biology and abundance of the wild sea trout population. It is estimated that there are around 8 local sea trout populations inhabiting the tributaries of River Luga. There are altogether approximately 35-40 ha of rapids and riffles in the tributaries of Luga. They are mainly located in the Vruda River and Lemovzha River.

All but one (Vruda) sea trout population is classified as a wild, category 1 population. In the Vruda River the sea trout stock has been supplemented by stocking of hatchery-reared parr from the end-1990s.

The smolt run has not been monitored in each of the tributaries, only in the mouth of the Luga River. At present the annual sea trout smolt run in the river Luga is from 2,000–8,000 wild smolts (on average 5,000 individuals) per year.

The sea trout production of the river Luga forms an important part of the sea trout production in the Gulf of Finland. However, the reproduction of wild sea trout is decreasing and illegal fishing is decimating the Luga stock.

Sea trout population facts

Name of the tributary	Population category	Reproduction area, ha	Production capacity, smolts	Recent wild smolt production estimate, smolts
Solka	1	1,9	—	—
Azika	1	0,3	—	—
Vruda	3	17,8	—	—
Lemovza	1	14,7	—	—
Lubenka	1	—	—	—
Khrevitsa	1	—	—	—
Oredezh	1	—	—	—
Vidon	1	0,8	—	—
Total			**50 000**	**5 000**

Specific actions for the development of the salmonid populations

Efficient protection zones along agricultural lands by the river should be established. The spawning areas and the nursing grounds for sea trout should be restored.

Beaver dams should annually be removed from the tributaries to allow for migration of salmonids.

The recommendations in the general report of the HELCOM SALAR project concerning accessibility and river fisheries management are applicable for these rivers.

4. Sea trout populations and rivers in Russia in the Kaliningrad area

The River Aleika

The River Aleika is a small sea trout river flowing to the Baltic Sea.

Basic hydrological facts

River length: 12 km totally accessible for salmonids
Size of the catchment area: 115 km^2
Average flow: 0,2 m^3/ s
Daily lowest flow: 0,1 m^3/ s
Number of migration hindrances: 0

Habitat and water quality in River Aleika

The river Aleika starts from the Sambia peninsula. There are no lakes in the catchment area of the river. The tributaries of the main river are very small. The catchment area consists of agricultural fields and small forests. The river flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow.

Agriculture is the main source of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Aleika sea trout stock

River Aleika has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the production has somewhat decreased and is currently nearly 300 smolts (in 2009).

Aleika sea trout reproduces only along the main river. The spawning success per spawner in the Aleika is on an average level among the wild sea trout stocks of the Kaliningrad Region. This may indicate average river conditions for sea trout reproduction. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: 2 ha
Production capacity:2500 smolts
Recent wild smolt production estimate: 300 (in 2009)

Fishing regulations in the River Aleika

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Angrapa

The River Angrapa is a sea trout river flowing to the River Pregola.

Basic hydrological facts

River length: 169 km (in Kaliningrad Region 97 km) of which 80 km accessible for salmonids
Size of the catchment area: 740 km^2 (in Kaliningrad Region)
Average flow: 14,4 m^3/ s (in Kaliningrad Region)
Daily lowest flow: 4,1 m^3/ s (in Kaliningrad Region)
Number of migration hindrances: 1

Habitat and water quality in River Angrapa

The river Angrapa flows from the uplands in the south-east of the Kaliningrad Region. It is a left tributary of the river Pregola. There are no lakes in the catchment area of the river. The tributaries of the main river are small. The catchment area consists of agricultural fields and forests. River flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer.

There is one power plant dam in Ozersk at a distance of 86 km from the river mouth. The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main source of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Angrapa sea trout stock

The river Angrapa has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the production has somewhat decreased.

Angrapa sea trout reproduces only along the main river. The spawning success per spawner in the Angrapa is on an average level among the wild sea trout stocks of the Kaliningrad Region. This may indicate average river conditions for s sea trout reproduction. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: no information
Production capacity: no information
Recent wild smolt production estimate: no information

Fishing regulations in the River Angrapa

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning accessibility and river fisheries management are applicable for this river.

The River Kornevka

The River Kornevka is a sea trout river flowing to the River Prokhladnaja.

Basic hydrological facts

River length: 42 km (in Kaliningrad Region 29 km totally accessible for salmonids)
Size of the catchment area: 200 km^2 (in Kaliningrad Region)
Average flow: 1,9 m^3/ s (in Kaliningrad Region)
Daily lowest flow: 0,5 m^3/ s (in Kaliningrad Region)
Number of migration hindrances: 0

Habitat and water quality in River Kornevka

The river Kornevka starts from the uplands in the south-west of the Kaliningrad Region. It is a left tributary of the river Prokhladnaja. There are no lakes in the catchment area of the river. The tributaries of the main river are small. The catchment area consists of forests and agricultural fields. River flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main source of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Kornevka sea trout stock

The River Kornevka has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the abundance has somewhat decreased and is currently nearly 600 smolts (in 2009).

Kornevka sea trout reproduces only along the main river. The spawning success in the river Kornevka is high compared to the other wild sea trout stocks in the Kaliningrad Region. This may indicate good river conditions for sea trout reproduction. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: 5 ha
Production capacity: 6000-7000 smolts
Recent wild smolt production estimate: 580 (in 2009)

Fishing regulations in the River Kornevka

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Maiskaja

The River Maiskaja is a sea trout river flowing to the River Prokhladnaja.

Basic hydrological facts

River length: 29 km totally accessible for salmonids
Size of the catchment area: 200 km^2
Average flow: 1,2 m^3/ s
Daily lowest flow: 0,4 m^3/ s
Number of migration hindrances: 0

Habitat and water quality in River Maiskaja

The river Maiskaja starts from the uplands in the south-west of the Kaliningrad Region. It is a left tributary of the river Prokhladnaja. There are no lakes in the catchment area of the river. The tributaries of the main river are small. The catchment area consists of forests and agricultural fields. The river flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main source of nutrient and sediment load. The nutrient load which may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Maiskaja sea trout stock

The River Maiskaja has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the abundance has somewhat decreased and is currently nearly 480 smolts (in 2009).

Maiskaja sea trout reproduce only in the main river. The spawning success in the Maiskaja is on an average level compared to the other wild sea trout stocks in the Kaliningrad Region. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: 3,5 ha
Production capacity: 3000 smolts
Recent wild smolt production estimate: 480 (in 2009).

Fishing regulations in the River Maiskaja

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Nelma

The River Nelma is a sea trout river flowing to the Vistula Lagoon.

Basic hydrological facts

River length: 30 km totally accessible for salmonids
Size of the catchment area: 310 km^2
Average flow: 3.2 m^3/ s
Daily lowest flow: 0.3 m^3/ s
Number of migration hindrances: 0

Habitat and water quality in River Nelma

The river Nelma starts from the Sambia peninsula. The river flows into the Vistula lagoon in the Gulf of Gdansk. There are no lakes in the catchment area of the river. The tributaries of the main river are small. The catchment area consists of agricultural fields and forests. River flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main source of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Nelma sea trout stock

The River Nelma has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the abundance has somewhat decreased and is currently nearly 900 smolts (in 2009).

Nelma sea trout reproduce only in the main river. The spawning success in the Nelma is average compared to the wild sea trout stocks in the Kaliningrad Region. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: 4 ha
Production capacity: 5000 smolts
Recent wild smolt production estimate: 860 (in 2009).

Fishing regulations in the River Nelma

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Pissa

The River Pissa is a sea trout river flowing to the River Angrapa.

Basic hydrological facts

River length: 98 km of which 36 km accessible for salmonids
Size of the catchment area: 1,050 km^2
Average flow: 8,7 m^3/ s
Daily lowest flow: 1,6 m^3/ s
Number of migration hindrances: 1

Habitat and water quality in River Pissa

The River Pissa starts from the Lake Vishtytis located in the uplands in the south-eastern part of the Kaliningrad Region. It is a right tributary of the river Angrapa. There are no lakes in the catchment area of the river. The most tributaries of the main river are small. There is only one major left tributary - river Krasnaja, which flows into the Pissa near Gusev. The catchment area

consists of forests, swamps and agricultural fields. River flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good on the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main sources of nutrient and sediment load. Agriculture increase the nutrient load which may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Pissa sea trout stock

The River Pissa has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the abundance has somewhat decreased.

Pissa sea trout reproduce only in the main river. Spawning in the Pissa is low compared to the other wild sea trout stocks in the Kaliningrad Region. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: no information
Production capacity: no information
Recent wild smolt production estimate: no information

Fishing regulations in the River Pissa

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Pregola

The River Pregola is a sea trout river flowing to the Baltic Sea.

Basic hydrological facts

River length: 123 km
Size of the catchment area: 1,582 km^2
Average flow: 83.9 m^3/ s
Daily lowest flow: no information
Number of migration hindrances: 0

Habitat and water quality in River Pregola

The River Pregola starts in the middle of the Kaliningrad Region at the conjunction of the rivers Angrapa and Instruch near Cherniachovsk. The river flows into the Vistula lagoon. There are several lakes in the catchment area of the river. The largest tributaries are rivers Angrapa, Instruch and Lava. The catchment area consists of agricultural fields and small forests. River flow varies a lot seasonally and depending on the changes in precipitation. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main source of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Pregola sea trout stock

The River Pregola has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the production has somewhat decreased and is currently nearly 900 smolts per year.

Pregola sea trout reproduces only in tributaries. The spawning success per spawner in the Pregola is on an average level among the wild sea trout stocks of the Kaliningrad Region.

Sea trout population facts

Population category: 1
Reproduction area: 0 ha
Production capacity: No information
Recent wild smolt production estimate: No information.

Fishing regulations in the River Pregola

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of

extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Prokhladnaja

The River Prokhladnaja is a sea trout river flowing to the Vistula Lagoon.

Basic hydrological facts

River length: 77 km
Size of the catchment area: 1,027 km^2
Average flow: 1.7 m^3/ s
Daily lowest flow: no information
Number of migration hindrances: 0

Habitat and water quality in River Prokhladnaja

The river Prokhladnaja starts from the uplands in the south-western part of the Kaliningrad Region. The river flows into the Vistula lagoon. The tributaries of the main river are small. Rivers Kornevka and Maiskaja are the main tributaries of the River Prokhladnaja. There are no lakes in the catchment area of the river. The catchment area consists of swamps, forests and agricultural fields. The river flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main sources of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Prokhladnaja sea trout stock

The River Prokhladnaja has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the abundance has somewhat decreased and is currently approximately 1,300 smolts per year.

Prokhladnaja sea trout reproduce only in the tributaries. The spawning success per spawner in the Prokhladnaja is on an average level compared to the other wild sea trout stocks in the Kaliningrad Region. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: 0 ha
Production capacity: No information
Recent wild smolt production estimate: No information.

Fishing regulations in the River Prokhladnaja

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

The River Velikopalnij

The River Velikopalnij is a sea trout river flowing to the River Maiskaja.

Basic hydrological facts

River length: 13 km totally accessible for salmonids
Size of the catchment area: 120 km^2
Average flow: 0.3 m^3/ s
Daily lowest flow: no information
Number of migration hindrances: 0

Habitat and water quality in River Velikopalnij

The river Velikopalnij starts from the uplands in the south-western Kaliningrad Region. The river is a left tributary of the river Maiskaja. There are no lakes in the catchment area of the river. The tributaries of the main river are small. The catchment area consists of forests and agricultural fields. River flow varies a lot seasonally and depending on the changes in precipitation. Typically the annually lowest flow season is late winter but sometimes it is also late summer. There are no natural or man-made migration obstacles in the river.

The water quality is good in the upper section of the river, but deteriorates downstream and may potentially negatively affect sea trout reproduction, especially during the seasons of low flow. Agriculture is the main sources of nutrient and sediment load. The nutrient load may negatively affect mid- and late summer conditions for parr and spawners and increase macro vegetation growth.

River Velikopalnij sea trout stock

The River Velikopalnij has an original wild sea trout stock. The abundance of wild smolts was on its highest level in the early 2000s, after which the abundance has somewhat decreased and is currently nearly 260 smolts (in 2009).

Velikopalnij sea trout reproduce only in the main river. The spawning success per spawner in the Velikopalnij is high among the wild sea trout stocks of the Kaliningrad Region. Improving the river habitat for sea trout reproduction may increase the productivity through increased survival of eggs and juveniles.

Sea trout population facts

Population category: 1
Reproduction area: 4 ha
Production capacity: 3000-3500 smolts
Recent wild smolt production estimate: 260 (in 2009)

Fishing regulations in the River Velikopalnij

Fishing of sea trout in the rivers of the Kaliningrad Region is prohibited during the whole year according to the fishing rules.

Specific actions for the development of the salmonid populations

The water quality should be improved by decreasing nutrient and sediment load from agriculture by establishing an effective protection zone along agricultural lands by the river. The occurrence of extreme low flow conditions should be prevented by decreasing possibilities for fast surface runoff throughout the catchment. This could be done by filling old, unnecessary ditches and by strict permission policy for any digging of new ditches (draining for agriculture).

The recommendations in the general report of the HELCOM SALAR project concerning river fisheries management are applicable for this river.

5. Acknowledgements

HELCOM wishes to express its most sincere thanks to the nominated experts of Russia: Sergey Titov (State Research Institute on Lake and River Fisheries), Sergey Shibaev (Kaliningrad State Technical University (KSTU)) and Konstantin Tylik (KSTU), who have prepared the texts and coordinated the HELCOM SALAR Project work in Russia.

HELCOM expresses its gratitude to all the experts that have participated in the HELCOM SALAR project. The report would not have been produced without their collective effort.

HELCOM is grateful to Leena Närhi, Bitdesign, for designing layout for the cover of the report.

This report has been funded through a co-financing agreement between the European Union (European Commission, Directorate General for Maritime Affairs and Fisheries) and HELCOM (Overview of the state of salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations in rivers flowing to the Baltic Sea – SI2.546540).

HELCOM has the sole responsibility for this report and the European Commission is not responsible for any use that may be made of the information contained therein.

www.helcom.fi