

Proposals for a Luga River Salmon management plan

- Russian Implementation of the HELCOM Baltic Sea Action Plan and Actions Connected to Biodiversity and Wild Baltic Salmon

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 *Coalition Clean Baltic*

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1. Proposals for a Luga River salmon management plan

From HELCOM Baltic Sea Action Plan: "To reach the target and objectives associated with the favorable conservation status of the Baltic Sea biodiversity

- *the development of restoration plans (including restoration of spawning sites and migration routes) in suitable rivers to reinstate migratory fish species, by 2010;*
- *the active conservation of at least ten endangered/threatened wild salmon river populations in the Baltic Sea region as well as the reintroduction of native Baltic Sea salmon in at least four potential salmon rivers, by 2009", page 23 of the Action Plan*

Introduction

The river Luga River in Leningrad and Novgorod Oblast is crucial for the Russian implementation of the HELCOM Baltic Sea Action Plan regarding biodiversity and wild Baltic salmon. The Luga River has great potential to become a healthy and qualitative strong river for wild salmon, and the Luga is by far the most important wild salmon river in the Gulf of Finland in this respect. A more comprehensive description of the Luga made by Russian scientists is available in a separate CCB Report.¹ There are several positive facts about the river system. The water quality is still overall good, there are no major dams in the main river and there are today no industrial sites that potentially threaten the river system.

However there are severe problems, especially for the wild salmon. In the Luga the reproduction of the wild salmon is decreasing and illegal fishing is quickly decimating the Luga salmon stocks. Estimates show an alarming low rate of returning wild spawners to the system, maybe as low as 500 salmon per year. Today the Luzhskiy production-experimental salmon factory (hereafter Luga fish farm) is active in the Luga River breed and release salmon to keep the salmon stocks up. Unfortunately this activity mainly supplies poachers with more fish and the local communities and regional government lose money as the salmon resource does not support the development of the local economy. Given the size of the Luga River, the potential population of returning salmon spawners is 20-30 000 salmon. If one large spawning area that only partly holds spawning salmon today is restored to full reproductive capacity that number grow even more.

Today estimations show that the wild production of salmon smolts in the entire Gulf of Finland is down to about 27 000 per year, and the releasing of reared salmon is around 770 000 mainly from Finland.² Farming salmon is never a sustainable solution and the numbers should be reversed.

¹ See attached report "Atlantic Salmon in the Russian part of the Baltic Sea Basin" Dr Sergey Titov, Dr Dmitry Sendek, a Coalition Clean Baltic report, 2008. A summary of the Luga salmon situation in Russian is attached in annex 2 of this document

² ICES and Baltic Salmon and Trout Working Group (WGBAST) data from 2008

Farming salmon also cost large sums of money. That money could be spent on actions to restore the possibilities for the wild salmon could reproduce themselves.

The local municipality wastewater treatment standards are mainly poor in the Luga River catchment area. The facilities are old and are not functioning very well. This can become an increasing problem as the treatment plants get even older, and problems can increase if new housing is constructed. There are potential problems with agriculture activities, nutrient run-off and deforestation along the river. Manure handling with sub standard practices may cause an increased load of nutrients to the Luga River.

The salmon require optimal conditions when it comes to spawning and it is only under the right conditions that spawning will be successful. It is important to underline that action to create a better environment for salmon gives a greater benefit the whole Luga River ecosystem.

2. Important Components in a Salmon Management Plan for the Luga River

The NGO network Coalition Clean Baltic (CCB) together with Russian organizations Green World and Baltic Fund for Nature hosted a seminar in Kingisepp about the Luga salmon in December 2009. At the seminar several important actors and stakeholders connected to the Luga River was present, including scientists, local authorities from Kingisepp and Luga Municipalities, regional authorities from Neva-Ladoga Basin Water Directorate of Federal Agency for Water Resources, SEVZAPRYBVOD/North - West department of fishery regulation, Committee on agriculture and fish industry complex of Leningrad region, representatives of NGOs from Russia, Latvia and Belarussia and personal from the Luga and Narva fish farms.

The seminar concluded that there is a need for a plan that includes all the regional authorities connected to water and fisheries management of the Leningrad oblast. All parties at the seminar supported the idea to develop a Luga River salmon management plan and agreed that actions to prevent illegal fishing are important. Continued progress relies on the regional authorities, to start the process and to be involved. Unfortunately the N-W Territorial Administration of Federal Agency of Fishery/ROSRBYBOLOVSTVO was not present at the seminar and their involvement is of course imperative. The presentations and all documents from the seminar are available at <http://ccb.se/Salmonseminar09.htm>

All actions listed in this plan are selected in close collaboration with scientists with long experience of the Luga River. The actions listed here are the most prioritized and some needs urgent attention, some should be developed in a longer perspective. The stakeholders at the seminar support the proposed actions of this document.

2.1 Luga Salmon Management Goals

Background: Clear and realistic goals for the development of the wild salmon stock in Luga River are important components for a successful management, and should be established as soon as possible.

The numbers of returning wild salmon spawners are today estimated to be approx. 500, but the potential can be 40-50 times higher. The potential population of spawners, based on calculations of the available spawning areas, can be 20-30 000 salmon and if one spawning area is restored to full reproductive capacity this number increase substantially. See more on specific actions in following sections. The success of the wild spawners and the salmon smolts this produces compared with farmed salmon is visible in the available statistics on out migrating salmon from the Luga River to the Gulf of Finland. Of the 100 000 farmed salmon, only (last three year average) 15 500 make the trip out to sea, whereas the wild production give 4600 salmon smolts from only about 500 spawners. This means that if a 1000 more wild salmon would return to the river for spawning (total of 1500 salmon), they would produce the same amount of out migrating smolts as the whole fish farm produce today.

Proposed targets:

- Set a goal of minimum 500 wild returning spawners (non fin-clipped) at the spawning areas in 2010 to sustain the current level of wild spawners.
- The goal for 2015 (as a three year average) should be minimum 1500 returning wild spawners, achievable mainly through reducing poaching
- Set at goal for out migrating smolts to reach before 2021. The target should be 25000-50000 smolts in 2021 (based on 2500-5000 wild salmon spawners)
- Establish a long term salmon smolts production goal for Luga River – Production of naturally spawning Luga salmon shall gradually increase to attain a production of wild salmon smolts of 75 % of the estimated potential.

2.2 Fisheries Management and Illegal fishing

a) State Control of illegal fishing activities in the Luga

Background:

A scheme of State control in sphere of protection, reproduction and use of fauna objects and its environment is not agreed upon, although it is provided for in asset 16 of the Federal Law of 24 April 1995 №52-FL “About fauna”. Everlasting reorganization of the state nature protection structures in Russia, cutting down of financing on nature protection activities, reduction of inspector’s staff has practically brought a full loss of the state control of the use of water and biological recourses.

At the same time the poaching along the river is extensive and sometimes clearly visible, but there is no effective way to stop it. Therefore, effective guarding of the salmon rivers have to be the first step to safeguard the existing wild salmon population, its migration and spawning.

Potential actions:

1. Improve legislation and pass amendments that regulate a precise scheme for imposing fines for illegal fishing
2. Strengthen the inspector’s role: increase the staff and provide necessity resources for transport, navigation and communication systems to secure efficient response

3. Increase the fines for illegal fishing and poaching, especially for catching protected and valuable species of fish. Collected fines should be used for nature protection activities in the same area where damage took place

Responsible actor: State Duma of RF, ROSRYBOLOVSTVO

B) Public control of illegal fishing activities in the Luga

Development of a system of voluntary fishing inspectors in Latvia has proven to be very successful with combating poaching.³ Experience in Latvia has shown that effective actions against poaching have increased the fish stocks 3 to 10 times. This type of system could be successfully used for the Luga. Such experiences from foreign colleagues in salmon management planning and salmon protection activities are important.

Potential actions:

1. Create a public control system and develop a framework to train voluntary inspectors with a mandate to remove illegal fishing gear from the river in 2010-2011 (cooperation is possible with Latvian Anglers Association)
2. Empower public inspectors with the same rights as state inspectors (except the right to impose a fine)
3. Coordinate the efforts with voluntary inspectors, police, state inspection and coastal guard for inspectorial spot-checks especially in migration and spawning periods.
4. Give a clear mandate to local police to take actions against poaching in cooperation with voluntary inspectors
5. ROSRYBOLOVSTVO together with local municipality administration should organize a first meeting to find voluntary inspectors and support the establishment of a group of inspectors

Responsible actor: ROSRYBOLOVSTVO, Local authorities in Kingisepp and Luga Municipalities, SEVZAPRYBVOD, NGO activists.

Costs and timeframe: These actions have the highest priority of all. If the stocks continue to be fished down at the rate of today, the wild salmon may be extinct in a few years! Farmed fish can never replace the wild and genetically unique Luga salmon. If actions are taken already this and next year both in the river and in the areas close to the river mouth the amount of returning spawners could increase considerably.

Costs for training voluntary inspectors 1-2000 Euro, equipment needed, such as clothing and chest-waders, approx 1000 Euro. Funding from private /NGOs for the equipment for voluntary inspectors may be possible.

³ Project created and promoted by the Latvian Anglers Association, presented in a CCB report 2008

Costs are potentially high since this is a labor intensive work. However there is a great chance to get people to volunteer to protect the river and personal at the Luga fish farm could be given the mandate to confiscate illegal fishing gear in the river.

c) Fisheries management in Luga River estuary and Luga Bay

Background: The local fishing in the Luga bay has the potential to heavily influence the salmon stocks. Poaching is a problem outside the river as well. Studies of Luga Salmon indicate that out-migrating salmon smolts stay in the Luga Bay up to one year. Fishing can certainly exist but fishing efforts must be carefully controlled and planned to avoid catch of returning salmon spawners and by-catch of young salmon and smolts. Fisheries closures during times of in -and out migration of fish are most likely needed, such as protected areas near the river mouth as well as temporal closures. Constructions in the bay area should try to minimize the negative effects on the water quality and negative impact on migrating spawners and smolts.

Potential actions:

1. Develop the regulation needed in coastal and open-sea fisheries to prevent by-catch of post-smolts in 2010
2. Set up area closures and temporal closures, especially in times of migration in 2010-2011
3. Fishing should only be allowed on reared salmon. Establish rules that require that all wild salmon (non-fin clipped) should be released alive to the water
4. Boost the control of both illegal and legal fishing (see previous section on actions against poaching)

Responsible actor: ROSRYBOLOVSTVO, GosNIORh

Costs and timeframe: Actions should be planned for and implemented 2010-2011 and this must have the highest priority.

2.3 Monitoring and Research

Background: The base for a proper management of Luga salmon is knowledge about stock size, migrations patterns, habitats etc. A lot of important work has been done for several years by scientists at the research institute GosNIORh, but the knowledge about the river system is still inconclusive. All existing and potential spawning areas are not recognized and mapped. Inventory work and mapping of all existing and potential spawning grounds and nursing grounds are essential to be able to develop a long term plan for the river. There is also insufficient data about the actual amount of salmons and about out migrating patterns and time spent in the river mouth and Luga bay area. This is important knowledge to avoid negative impact on the salmon when constructing new harbor areas in Luga bay.

To create better data collection of the salmon stocks a regular monitoring program must be set up. There is a need of monitoring with both electro-fishing and smolt-traps to establish parr densities and the amount of out migrating smolts to the sea. Monitoring of returning spawners is needed for both spring and autumn migration.

Furthermore, the genetics of wild Luga salmon need complementary studies where material from returning adult wild salmon spawners caught for breeding in the Luga fish farm should be used.

Potential actions:

Monitoring programme for Luga salmon

1. Develop a program for inventorying and mapping of all areas of interest for salmon spawning and breeding in Luga River (main stream and potential tributaries of interest for salmon), in 2010-2012. The river stretches for inventories in 2010 and 2011 should be identified and prioritized.
2. Development of a strategy and suitable methods for counting of returning adult salmon spawners to Luga River (identify suitable sites and methods) Monitoring of returning spawners from both early migration (Apr – Jun) and late migration (Aug – Oct)
3. Set up electro-fishing studies of parr densities in Luga River, and implement such monitoring on a yearly basis
4. Develop regular monitoring of out-migrating salmon smolts (site and methods, smolt-wheels or fishing nets)
5. Develop regular monitoring of Luga salmon in Luga estuary and Luga Bay, to raise knowledge of salmon seasonal behavior, and to develop proper control of construction/shipping activities and fisheries
6. Genetic monitoring – develop complementary genetic research of wild Luga salmon (e.g. as a cooperation project between GosNIORh, Luga fish farm and possibly the Finnish Game and Fish Research Institute

Responsible actor: GosNIORh, Luga fish farm, Central ichthyological laboratory

Costs and timeframe: Priorities for the salmon monitoring activities must be set up, which include studies of returning spawners, out-migrating smolts and parr-densities. Increased financing is needed. It is extremely important to find state financing for a proper monitoring. Salmon monitoring, the base for Luga salmon management, would be the most important component for the Russian state authorities to support financially. Complementary genetic studies may be financed via NGO-funds.

Cost estimates:

Activities 1, 3, 4: 1 200 000 rubles

Activity 2: system to count returning spawners 2 500 000 rubles

Activity 5. monitoring work in estuary part of Luga 1 700 000 rubles (10 stations of observations)

Activity 6. the sampling can be done at very low cost, and the price of genetic analysis is 30 Euros per sample at the Finnish Game and Fish Research Institute

Budget for regular salmon monitoring of Luga salmon in Luga estuary and Luga Bay should be sponsored by the Ust-Luga Harbour and the harbour area north of Vistino, as expenses for environmental impact of industrial activities.

2.4 Protection of the Luga River as a Natural and Free-flowing River

Background: There are good experiences and knowledge in Russia on salmon management. Russia has reported on far reaching monitoring and research in the northern areas of the White Sea and the Kola peninsula to North Atlantic Salmon Conservation Organization (NASCO). These experiences, goals and targets should also be implemented in the Luga River.

The legal instruments are already in place and under the Federal Law No. 166-FZ on fisheries and conservation of aquatic biological resources from 2004 a number of actions can be taken.

Potential actions:

1. To appoint the Luga River system as a river of regional Russian interest for migrating salmon and sea-trout and proclaim it to be a “Fishery Protected area” under the law on fisheries and conservation of aquatic biological resources
2. Introduce restrictions for construction work in Luga River, and prohibit all *new* construction, e.g. dams, that may stop or prevent migrating salmon and sea-trout to reach the whole river-system.

Potential actor: Russian Ministry of Natural Resources and Environment, Leningrad Oblast administration, ROSRYBOLOVSTVO and Neva-Ladoga Basin Water Directorate.

2.5 Habitat Restoration and Protection

Background:

There are today several areas that need urgent attention. Some of which are fairly simple and cheap and other that demand a more work and research to perform and manage. Restoring and protecting the existing stretches of the river that are known spawning sites is essential for a long term sustainable reproduction of fish. For example the scientists at GosNIORh has investigated the three major spawning sites in the main riverbed, Sabskije, Storonskije and Kingiseppskije rapids, and some of them needs to be cleaned by simply removing rubbish and trash from the river.

Priority should be given make sure that the corridor function of the river is re-established i.e. clear the path for migrating fish for them to reach the spawning areas. This action is an effort needed once and then maintained. There is a good chance of engaging local communities and NGO for voluntary work.

Public awareness is important and necessary to encourage more involvement in keeping the river clean. Active local and regional NGOs have been working with River Watch programs in other rivers. This can be applied in the Luga and can be an important part of education children about the environment and the river. Local municipalities should take pride in the fact that their river is the most important salmon river in the entire region and in the Gulf of Finland.

Potential actions:

1. Appoint important salmon and spawning and breeding areas in Luga River as nature conservation protected areas, with restrictions for constructions work. To be used for spatial planning in local municipality and Leningrad oblast. Timeframe: 2010-2011 (Responsible actor: Leningrad oblast Administration, Kingisepp and Luga Municipalities)
2. Activities to raise the Public awareness on salmon values and a clean Luga River
 - A) Publish a Folder (2 A 4-pages) in Russian describing the values and threats for the Luga River salmon for distribution to local citizens (Timeframe: 2010 Local actor: Local NGO or/and Kingisepp municipality. Potential funding: financial support via NGO-funds).
 - B) Organization of Clean-Up days, for voluntary citizens, of the of river-bed in the three major spawning sites in the main riverbed, Sabskije, Storonskije and Kingiseppskije rapids, to be cleaned by simply removing rubbish and trash from the river. Start with Kingiseppskii rapids. (Timeframe: 2010; Local actor: Possibly Kingisepp/Luga Municipality in cooperation with local NGOs. Potential funding: Labour work support from municipality and financial support via NGO-funds).
 - C) Organize River Watch programs in Luga River for school-children and youngsters as an important component for education of children about the environment and the river. (Timeframe: 2010-2011; Potential actor: Kingisepp Station of Youth Naturalists and other schools/NGOs. Potential funding: Financial support via municipality and NGO-funds).
3. Restoration of salmon spawning and breeding areas to improve conditions for a higher salmon productivity in Luga River. Prioritize identified important salmon areas for restoration. Development of a plan for restoration work should be made together with salmon/hydrology experts and voluntary workers. (Timeframe: 2010 if possible, or 2011; Responsible actor: GosNIORh, Kingisepp Municipality in cooperation with a local NGO).
4. There is a need to clear the main river from obstacles that interrupt or even stop migrations of fish. An inventory of potential obstacles for salmon migration in Luga River should be implemented in 2010-2011. (Responsible actor: Leningrad oblast Administration and Kingisepp/Luga municipality)

2.6 Safeguarding of the Genetic Variability of Luga salmon⁴

Helcom Baltic Sea Action Plan (BSAP) requires Contracting Parties to take immediate actions for:

“the further development and application in all cases of appropriate breeding and restocking practices for salmon and sea-trout to safeguard the genetic variability of native wild stocks by 2012” (BSAP, page 22).

⁴ See details about the Luzhskiy production-experimental salmon factory and its working procedures in Annex 1 to this document

Background: The management must safeguard the genetic variability of the Luga salmon stocks. Great efforts must be taken not to undermine the genetic composition of the fish stocks. Research has shown that fish migrating at different periods of the year are genetically different. Today spring spawners are not used at all in the breeding process because of past problems of keeping the fish alive at the fish farm. This represents a big problem because this, most likely genetically different, larger and stronger salmon is not part of the breeding process at all. There is a need to study how other fish farms keep and disinfect the brood stock over the summer. The goal should be 50-500 rule, meaning that on a short term 50 wild spawners should be used for breeding, and the long term goal must be 500.

Potential actions:

1. Only use naturally returning salmon spawners to Luga River (non fin-clipped) as material for the breeding of salmon in the Luga fish factory to safeguard genetic variability of Luga salmon.
2. Widen the base for the fish breeding by catching fish during the entire migration period. Especially important is to increase efforts to catch returning spawners from the spring migration to reach approx. fifty-fifty proportion between spring and autumn breeders.
3. Short term target for catch of wild spawners should be 25 from spring migration and 25 from autumn migration.
4. Increase the total catch of Luga salmon spawners for breeding to reach the long term goal of 250-500 salmon per generation (10 % of the target 2500- 5000 for returning spawners in 2021).

Responsible actor: SEVZAPRYBVOD and the personal at the Luga fish factory together with GosNIORh.

Costs and timeframe: The expenses for widening the base for salmon breeding should be a part of the budget for the Luga fish farm. Work to increase the catch of spawners and include fish from the spring migration should start 2010-2011.

2.7 Luga Fish Farm Management⁵

Background: hatching and breeding of fish is costly and should be considered as temporary solution to keep a genetic stock of fish under times of when natural reproduction is poor. In the long run, investments in and around the river to increase the natural spawning is certainly more cost effective and the naturally produced salmon have much better survival rates and are usually healthier. Unfortunately today, the released salmon smolts from the farm is mainly feeding the poachers in Luga River with more fish, thus sustaining this illegal activity!

The effectiveness of salmon hatcheries operation in the Luga today can be optimized for better results. One of the options available without any increasing cost is to carefully evaluate the timing

⁵ See details about the Luga fish farm and its working procedures in Annex 1 to this document

and places for releasing of reared smolts. The selection of fish to release and the criteria for this selection is very important. The salmon must smoltify before release and not be released on a size or age basis.

It is important to understand that most of the techniques and equipment today are adapted to produce fast growing fish for the food market, rather than to breed a fish as natural as possible. Experiments with slow growing fish in more nature like conditions are an important option. The problems with post-smolt survival observed in the entire Baltic Sea are most likely connected to the conditions at fish farms, the amount of time spent there and the fodder.

Potential actions:

Smolt releasing practices

1. Introduction of practices where releasing of reared salmon (parrs and smolts) to the natural nursing areas are made during the night, which is more often the natural migration period for smolts.
2. Develop a specific action plan to protect the released salmon from poachers with constant inspection at the releasing sites up to 36 hours after smolt release.
3. Introduce practices for proper timing of the release of “ready” smolts and proper selection of smolts that are ready to be released. It is important to improve the survival of the smolts and their ability to migrate out and start finding food.

Smolt production

4. Evaluate different fodder to increase the survival of smolts. Evidence from other farms in the Baltic show that this may be a key factor to better post smolt survival. Less fat and more protein in the fodder are most likely better.
5. Try as far as possible to simulate natural conditions at the fish farm (temperature, fodder, light, fish densities etc) to increase the survival rate of the released smolt and to increase the chances of survival.

Responsible actor: GosNIORh, Luga fish farm (SEVZAPRYBVOD).

Costs and timeframe: Proposed smolt releasing practices can be implemented without delay already this coming season 2010-2011. Issues of timing of released fish and the location of the releasing sites is a priority. Changing the breeding pattern and fodder issues must be evaluated. Fodder for more natural growth of smolts should be tested already in 2010.

The costs can be potentially high but there is also a good chance to save money in this operation, especially if fish survival rates are increased and more fish can return to spawn on their own.

2.8 Water Management Along the Luga River

Background: Generally the water quality of Luga River is sufficient to host a salmon population. But some problems connected to water quality have been noted. Activities around and near the river can

have substantial impact. Deforestation and clearing of bushes etc near the river can increase the flow of water, with sediments and nutrients. Trees give shelter and help to keep water temperature down during summer. Trees also keep the banks of the river intact and decrease the risk of erosion and minimize increased drainage of water. If trees must be cut down, make sure to leave the trees on the south side to create maximum shade. At periods and season with heavy rainfall the turbidity of the river water tends to rise substantially

Animal farms in Luga catchment. A number animal farms for pigs and poultry are situated in Luga River basin, polluting the river system with nutrients (nitrogen and phosphorus) because of improper handling of organic manure. Around 20-25 animal farms, mainly small farms can be identified. One big poultry farm, with a production of 50-250 tons/year, is identified in the north-east part of Luga catchment. ⁶

Potential actions:

1. Control and minimize the nutrient run-off from handling of organic manure at animal farms, with help of regular inspections.
2. Actions to prevent deforestation along the riverbanks.
3. Develop buffer strip of approx. 20-100 meters along the river, depending of the local situation. Buffer strip should be protected and excluded from tree-cutting.

Timeframe: 2010-2012

Responsible actor: Neva-Ladoga Basin Water Directorate, Leningrad oblast Administration and State Forestry Administration, Rosprirodnadzor.

⁶ Data from a presentation at HELCOM Land meeting 25 January 2010, by Vladislav B. Minin, *North-West Research Institute of Agricultural Engineering and Electrification*

Annex 1 - Description of the activities at the Luga Fish farm

Luzhskiy production-experimental salmon factory (LPESF) – production and release activities in the Luga river

(Information about the Luzhskiy production-experimental salmon factory received at the visit of factory on December 10, 2009. The farm is located in tributary Khrivitsa River)

LPESF was projected and built as at the expense of compensatory means from damage to nature from construction of Leningrad Nuclear Power Plant (Sosnovy Bor). The factory was put in commission in December 1989.

At present factory is under reconstruction, which includes three stages. The first two stages already finished:

- A water chute 3 km in length from Ivanovskoe water storage basin to state in village Porechje is constructed.
- Reconstruction of house for long time keeping of spawners (LKS) is done.

In 2008 the LPESF was included in Federal Aim Program “Program for increasing the effectiveness of using and development of a potential fish industry resort complex in 2009-2013”. In accordance to this program the further reconstruction of factory will be continued as the third and final stage.

All houses will be re-equipped, work technologies will be changed, output will be increased, staff will be increased. At present 38 people are employed at the fish-farm (41 persons should be in accordance of staff time-table). Director is Marina Ivanova.

LPESF has facilities at two sites:

- **In village Porechje** where houses and constructions of the basic and auxiliary process are located. House for long time keeping of spawners, where brood stocks of salmon and sea trout are kept was put in commission in 2000. Large containers for keeping caught spawners in the river are located in the same place.
- Incubatory-growing house is located in **village Ivanovskoe** in the building of old hydropower dam. Artificial insemination of spawn from wild spawners, its incubation and growing fry and parr of salmon and sea trout occur here.

The water supply source for LPESF is Ivanovskoe water storage basin on the Khrivitse river

In accordance with Program of ecological control, examinations of water quality in 25th indexes are realized monthly by Centre of hygiene and epidemiology. Sampling of fresh water and waste water is realized in 8 points. Waste water goes back to Khrivitsa river from incubatory-growing house and to Luga river from LKS house.

The collecting of spawners is done by fixed nets in the Luga river near Struppovo village which is located in 12 km up streams from the Luga river mouth. Stream net is placed into position from 1 August until 15 November in accordance with getting permission on catching of water bio resources.*

The closing of the river with nets takes place in accordance with a time-table. Generally they have 5 days when river dammed fully and the next 5 days the river is closed to 2/3 with nets.

In 2009 the catch for breeding purposes were:

- 32 spawners of salmon, of planned 90 salmon
- 26 spawners of sea trout of the planned 76 trout

The average weight of spawners is about 5 kg.

Caught spawners are kept temporary in container at the place of capture. Then spawners are transported to the fish- factory and put into the stream containers in Khrivitsa river mouth which is located in 90 km from trap-nets. Spawners are kept here up to 3 months in natural conditions. During this time the place is under strong security and control. When the temperature of water draws to spawning all fish is brought up and placed in tanks of Ivanovskoe incubator -growing house. Time of spawning approaches when the temperature of water is 7,0 – 8,0 °C. In this time females and males are set separately and their conditions are tested individually every 4-5 days.

After getting the reproductive products, all wild spawners and old generations of brood stock are sold.

** Fish factory catch no early returning spawners in May –June for reproduction, although this time is the most favourable for catching spawners because the biggest and strongest spawners come at this time. They have had unsuccessful experiences with spring migrating fish. It has proven very difficult to keep them alive at the farm. As much as 80% die before the right spawning conditions of the fish occur.*

Incubation and young growing

Time of incubation depends of water temperature (the lower temperature, the longer incubation). When young reach weight of 1 gr. the second phase starts – rearing of young of the current year. Then fish is sorted, counted and moved to a tank where there is circulating water. An experimental circulating incubator (ICE) is used on a trial basis where the water is heated up to 7,0-9,0°C. In ICE fish grows 2,5-3 times faster. But there is a problem when young have to be re-placed to regular tanks. They are stressed because of difference in temperature. This can cause health problems.

The releases of smolts take place in August and yearlings in April. Number of released young is set in accordance of plan task, which is:

- Two-year salmon young– 500
- Yearlings of salmon and sea trout smolt– 100 000
- Young of current year (parr)of salmon and sea trout – 32 500
- Lamprey larvae “ammocoete larva” – 15 000 000.

Releases take place when the temperature grows up to 3-5 °C (proximally 2-3 weeks before beginning of natural migration of smolts).

Releases of young in different age give them possibility to occupy more forage reserves in Luga river and its tributaries. GosNIORH (State Research Institute of Lake and River Fisheries) investigates all places for releases and gives recommendations based on of food reserves and another conditions in those places.

In accordance of such recommendations LPESF release smolts:

- Salmon smolts - on Kingiseppskije and Sabskije rapids
- Sea trout smolts - to Vruda river
- Two-year salmon young and salmon young, which was grow in ICE - in Luga river mouth.

Fish clipping methods

Annually all young is clipped to define of returning fish. They use two type of fish clipping:

- cutting of adipose fin, which is made in autumn.
- Pelvic fin clipping of 1500 young. This methods is used more seldom because of high price and because those fins tangle very often.

Wild salmon is not fin-clipped.

Down-stream migration

Migration of smolts and monitoring of returning reared spawners are controlled by specialists of GosNIORH in area of Struppovo village in 12 km from the Luga river mouth. The most important work is monitoring down-stream migration of smolts of salmon and sea trout in the Luga river. Results of the monitoring allow appraising annual and detailing valuation of state of wild and reared populations in the biggest river in Leningrad region. At present information for estimation of returning reared spawners is collected. Determination of total data of returning reared spawners is not possible, because of big uncontrolled catch of spawners in Gulf of Finland and areas outside the river. However, according to monitoring of returning spawners, 80 % of them are reared salmon and 20% are wild.

The trend is to use more materials (released smolts) from wild Luga salmon.

	2007	2008	2009
Smolts, from wild spawners (not fin-clipped)	20 %	33%	64%
Smolts, from fin-clipped spawners	80 %	67 %	36 %

Annex 2 - Summary of the CCB report "Atlantic salmon in the Russian part of the Baltic sea" by Dr. Sergey Titov and Dr. Dmitry Sendek

The purpose of the report is to list and describe the three salmon carrying rivers in the Russian Baltic sea basin, the Narva, Neva and Luga river. The specific findings about the Luga river are the following.

The situation

Basic facts: The Luga is the largest salmon river in the area with the total length of 359 km. There are three major spawning and hatching areas located in the main riverbed. The estimated size of just these three areas are 700 000 m².

The Salmon population: It has been confirmed that there are true wild Salmon still present in the Luga, but the population is weak. The population is supported with stocked fish from the local fish farm. However the salmon being reared there is not native to the Luga but actually Neva salmon. Today, the amount of spawning Salmon are estimated to about 1500-1700 individuals but only 500 of those are wild Salmon. The rest stem from the reared salmon released from the local fish farm. Main spawning areas are identified to be Sabskije, Storonskije and Kingisepskije.

The threats and problems:

- Illegal fishing-poaching
- Wastedumping and pollution
- Insufficient spawning sites
- Increasing activity in the Luga bay and river mouth area

The possibilities:

- No major disruptive dams or aquaculture activities in the river
- The river can hold about 20-30 000 spawning fish, more than ten times the amount that exist today
- Large spawning and hatching areas can be established
- Much of the work needed can be cheap and focused on a few key areas

The recommendations

- The spawning and nursing grounds for wild salmon in the Luga must be restored and possibly strengthened with artificial redds to increase spawning effectiveness
- The local community needs to be involved and understand the importance of a clean and healthy river system that will benefit all living things in it, including the salmon
- The local community must also be engaged in protecting the river and the spawning areas as well as the spawning fish
- Young salmon and smolts migrating out from the river must be protected to ensure more returning spawners
- Illegal fishing must be controlled and reduced and better protection of the released salmon must be established