

October 18, 2022

Visit to the Lagunnoye Lake Salmon Hatchery

The Lagunnoye Lake Salmon Hatchery is a fish hatchery where fish eggs are planted and incubated, as well as keeping prelarval fish, their feeding and then releasing juvenile Chum Salmon. At the first stage, the following facilities were built: river and ground water supply systems, an incubation workshop with "Box" type machines, a nursery workshop with plastic pools and Japanese NYS 800 flotation devices, as well as a nursery on the Yaponskiy stream with a pebble bottom. At the time of the visit to the hatchery, a second fish nursery workshop (identical to the first one) was built, in which the installation of fish breeding equipment began (Fig. 1 and 2).

In 2022, 12.5 million juvenile Chum Salmon were released from the Lagunnoye Lake Salmon Hatchery (Table 1).

Table 1. Release of juvenile Chum from the Lagunnoye Lake Salmon Hatchery

Year of release	The number of released juvenile Chum Salmon, million fish	Release dates	Average weight, grams
2018	1.5	June 15-16	2.6
2019	3.4	May 27 to June 20	0.8
2020	10.4	May 25 to July 01	1.1
2021	18.5	June 10 to July 2	1.2
2022	12.5	May 24 to June 30	1.0



Fig. 1. Workshops and fish ladder, through which fish from the Pervukhina stream rises into the fishway. Hatchery workers clean the bars on the fish pass windows and watch the entrance of the Chum Salmon into the fish ladder.

Rice. 2. Construction of the second fish breeding workshop. Installation of fish-breeding equipment

A number of Chum Salmon were observed returning up the channel and then along the fish ladder to the fishway located next to the nursery workshop (Fig. 3). Fish farmers use these Chum Salmon for planting eggs in incubation machines of the "Box" type (Fig. 4).

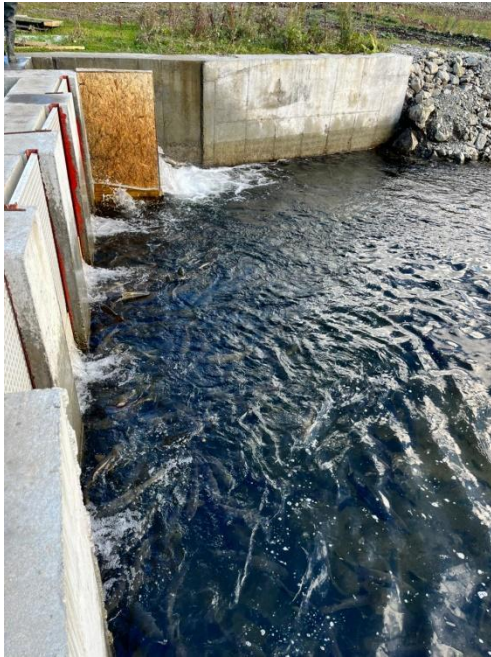


Fig. 3. Aggregation of Chum Salmon in front of the fish ladder (entrance to the fishway).

Fig. 4. Chief fish breeder Dmitry Pastukhov demonstrates the placement of the first batch of Chum Salmon eggs in the incubation apparatus, which they collected from local spawners.

The egg collection point is located upstream of Pervukhina stream, about 800 m from the confluence of the stream into Lagunnoye Lake. The collection and fertilization of eggs is carried out in specialized areas inside the building of the nursery workshop (Fig. 5). Thus, item 1.2 of the Plan of activities for the Lagunnoye Lake Salmon Hatchery, adopted to achieve Action #7 of the FIP Workplan, was fulfilled.



Fig. 5. Chief fish breeder demonstrates a new egg collection point from hatchery spawners.

Interview with Dmitry Pastukhov, chief fish breeder of the Lagunnoye Lake Salmon Hatchery

Lyudmila: When was the first egg collection from your hatchery fish carried out?

Dmitry: The planting of eggs for incubation from our local fish began on October 14. We sort all entering fish and keep them separately, so we know almost all of our spawners "by name". The ratio of females to males was 1:10. Then, from October 14 to October 17, the ratio changed towards an increase of females 1:5. Today, as you can see, we are carrying out work on trapping and keeping spawners, and the ratio of females to males has already reached 1:3.

Lyudmila: How many hatchery fish eggs were you planning to collect? Can you say today how much you will eventually collect?

Dmitry: For this season we planned to collect about 6 million eggs from returning hatchery fish. While it is difficult to say how many eggs we will collect, it will depend on various factors, including fecundity and the quality of fish eggs. But for these purposes, we make maximum use of all the fish that enters the fishway. After the end of the planting of local fish, a decision will be made on the number of additional purchases of fish eggs.

Lyudmila: With what intensity does the fish enter the channel of Lake Lagunnoye and the mouth of Pervukhina stream?

Dmitry: The dynamics are various. There is no such thing as a tendency to increase or decrease. It happens that there are no fish at all, and the next day small schools of fish actively enter. Such observations on the daily registration of fish entry, we have been conducting for the first year. Therefore, there is nothing to compare the data with yet.

Lyudmila: How many fish eggs did you plan to buy from other salmon hatcheries and how many did you buy in the end? (implementation of item 1.2 of the Plan of activities for the Lagunnoye Lake Salmon Hatchery, adopted to achieve Action #7 of the FIP Workplan).

Dmitry: In the spring of this year, we have developed an egg planting strategy for ourselves, according to which we intend to completely abandon the import of eggs from other fish hatcheries by 2024-2025. In 2022, we planned to deliver 20 million fish eggs. To date, 13.5 million newly collected eggs have been purchased, which is incubated at the Taranaisky Fish Hatchery (Sakhalin) and there is an agreement to purchase another 5 million eggs (if such a need arises). Taking into account the production and transportation output, it turns out that we will deliver approximately 17 million Chum Salmon eggs. We have already purchased fish eggs from the Okhotskoye Hatchery (10 million fish eggs), from the Olkhovatka Hatchery (3 million fish eggs) and from the Gastello Hatchery (0.6 million fish eggs). Currently, negotiations are underway to purchase another 5 million fish eggs from the Kalininsky and Sokolnikovskiy hatcheries. If there are more of our local fish to ensure the planting of 6 million eggs, then we will collect it as much as possible. Production facilities of the Lagunnoye Lake Salmon Hatchery currently allows accepting 35 million fish eggs, but we are not aiming for such a maximum this year. We would like to plant 25 million eggs of Chum.

Lyudmila: Please tell us about the otolith marking program carried out in the last fish breeding cycle (implementation of item 2.2 of the Plan of activities for the Lagunnoye Lake Salmon Hatchery, adopted to achieve Action #7 of the FIP Workplan).

Dmitry: In 2022, we released 2.227 million marked juveniles. The marking work was carried out by the "dry" method at the stage of incubation of fish eggs. This marking was experimental. The average weight of the released juveniles was 1,043 grams, the age was 1087 degrees days. Marked juveniles were kept and reared in the workshop in plastic pools. The release of these juveniles was carried out on June 30. So

far we have not received the results and recommendations from SakhNIRO. Perhaps this was due to the fact that at the time of marking, a lot of snow fell on Kunashir and the water temperature dropped sharply by almost 2 degrees. Perhaps this affected the quality of the marks, "erased" (or "changed") them.

Lyudmila: Please tell us more about the dynamics of the entrance of Chum Salmon into Lake Lagunnoye and Pervukhina stream (implementation of item 1.1 of the Plan of activities for the Lagunnoye Lake Salmon Hatchery, adopted to achieve Action #7 of the FIP Workplan).

Dmitry: The timing of the Chum Salmon run: the first males began to enter from the sea into the channel of Lake Lagunnoye in the first days of September. Since September 6, there has been a weak run - 3 to 5 fish entering there. Chum Salmon began to enter Pervukhina stream about October 5, that is, a month later. We observed an interesting behavior of the fish: the fish reached the stream, turned back and left. We observed this behavior for a month. And last year we observed the same behavior - Chum was "walking" in the lake.

Further, the number of entering fish significantly increased from October 10 to October 14. Moreover, it coincided that these days the fish began to enter more actively both into the channel from the sea and into the stream. The mechanism is still difficult to explain, it may just be a coincidence. There are few observations so far.

Two guards are engaged in observations of the running of the fish, who record visual observations in the log 2 times a day. They go to watch from 7 to 9 AM in the morning and from 7 to 9 PM in the evening. The fish enters the watercourses in the evening better, at dusk.

Lyudmila: Are Chum Salmon spawners evenly distributed across the lake?

Dmitry: No, there is no even distribution. And last year it was the same. All the fish that entered the lake since the beginning of September entered the Pervukhina stream. Only the fish that started entering the channel in mid-October began to remain in the locations of lake spawning grounds.

Lyudmila: Are biological analyses carried out of those Chum Salmon, that are then used to collect and plant eggs for incubation? (implementation of item 2.1 of the Plan of activities for the Lagunnoye Lake Salmon Hatchery, adopted to achieve Action #7 of the FIP Workplan).

Dmitry: Yes, biological data is being monitored. On October 14, the first biological analysis of fish was made, which were used to plant fish eggs for incubation. 88 fish were used for the analysis. The age composition was as follows: 12 fish aged 3+ (13.6%) and 76 fish aged 2+ (86.4%). There were no fish of other age groups in this bioanalysis. On October 20, 2022, a second analysis was conducted, the results of which are currently being processed. One or two additional analyses are planned in the future.

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