

Appendix 1

Incubation Box Procedure 2021

Stream Side Incubation

Stream side incubation procedure is as follows. Collect the stream side incubation equipment inside the red shipping container at the top of hill near the NB power dam. First set up the blue tarp on wall of power dam to keep water splashing off the building. Next install main supply water tank (large white tank with couplings on the bottom) onto the large metal rack with a 2"x4" under it to help support the tank. Be careful not to hit outlet couplings under tank as it is fragile.

Place wooded rack to support the parabolic filter, then hoist the parabolic filter onto the main water supply tank. Then slide the filter onto its wooden base.

Install degasser cylinder, which is the large clear cylinder pipe, to the building with the drain outlet facing forward. Install main water supply hose with water valve to the top of degasser.

Make sure to place the 4" white PVC fittings from the parabolic filter to the main water supply tank.

Set up all of the tanks on top of 4"x4" pieces of wood located beside the power dam at the incubation site. Ensure that all tanks are placed level as to eliminate potential water spills from the sides. Fry will be lost if the water spills out from the top if not level.

Connect all hoses under main water tank couplings and attach to each appropriate incubation box. Install circular holding tank and put 12 mats in each small incubation box. Once all hoses are installed open the main valve to begin water flow through the system. To disinfect the incubation system start by pouring 1 liter GERMAC disinfectant as it is aquatic life friendly for the environment in the main water tank (through hole in the plywood lid) and let the solution flow in each box. Once the water has flowed through the system, shut main water line and let the disinfectant solution sit 30 minutes. Once the time has run out open the main valve and let flow for 24 hours to flush system.



Photo 1: Stream side incubation system set up at the power dam

It is important to adjust the water flow through the system so that the speed of the water is not too slow or too fast. To adjust the water flow to optimum conditions, take a 5 gallon pail and place under the outlet pipe of the small incubation tanks to capture the outflow water. The ideal water flow is one full 5 gallon pail to be filled in 30-35 seconds for every tank (maintain this water flow throughout the entire incubation period, especially when warm weather approaches).

Adjustments can be made at either the main water valve (pipe that goes to the large cylindrical tank) or each individual tank to match the required water flow. The main water tanks also need to be kept at a safe operating level, this is adjusted with the large main valve. Once the entire system is flowing at acceptable speed and that the main water tank is at above the low water mark, it would be deemed ready for the salmon eggs.

Once the fertilized eggs are transported to the power dam begin with recording the water temperature of the incubation tanks and compare the temperature results in one jar that

contains the eggs. If the water temperature results are greater than 2°C, acclimatization is needed in order to eliminate potential temperature shock. To acclimatize the eggs simply take the egg containers and let float inside the circular tank, containing the incubation water, until both temperature results are less than 2°C apart.

When the eggs are acclimatized, place a carpet at the bottom of the tank and then place 5 to 6 rocks to help keep the carpet on the bottom. Leave the first carpet void of eggs. Add the second carpet over the rocks and add 5 or 6 rocks placed above in another location compared to the first layer of rocks. The thinking behind this is to create pockets of habitat and routes for later migration of the fry. Place approximately 5000 eggs for this second carpet. Then repeat the procedure (carpet, rocks, eggs) until a total of 50 000 eggs are placed per tank. Use the hands to push the water in a gentle sweeping motion over the eggs to help spread the eggs onto the carpet. During the procedure remove any white eggs, with the special egg tongs as these are dead, to eliminate potential contamination. Record the egg mortality during the procedure for future data analysis and track the count per specific tank.

Place ABS pipes from outlet tanks to the circular tank, when the fry begin to swim up to the surface of the tank, Ensure to tape the joints on the newly installed ABS pipes between the small tanks to the circular tank (if this is accidentally pulled apart the fry will fall out of the tank to the river below). Ensure to direct the water flow inside the circular tank in such a way to not have water currents. The outlet pipes must be directed vertically to the water surface so there is less circular motion as possible. Once this is done remove the metal filters inside the small box so that swim up fry can make their way to the large circular tank.

To improve fry migration to the large circular tank, carpets need to be removed. Slowly remove the first few carpets while ensuring fry are kept free from the carpet. Sometimes tapping the back of the carpet can help remove the fry as well as submerging the carpet upside down. Once the carpet is free of swim up fry, discard out of the incubation box and place out of way as to not create a tripping hazard. All tanks need to be inspected during swim up fry stage to help the migration. Count the number of the dead eggs found on the carpets per tank for future data analysis. Dead fry can also be counted to help calculate the fry stage survival. Scooping of the fry in dip nets can also be used to speed up the process but it is important to support the bottom of the net with the free hand to avoid crushing injuries to the fry.

It is also important to place the swim up fry into the river system as quickly as possible due to yolk sac absorption. Once yolk sacs are totally absorbed it is time to move the fry from the incubation tank to the river system (usually no more than 3-5 days).

It is important to take a temperature of the water used for transportation before dumping the fry into it as to eliminate potential temperature shock. Incubation water can be dumped into the transport tank to equilibrate the two temperatures. Once the temperature is within 2°C, fry can be dumped into the holding tank while external oxygen is given. Keep the external oxygen operational until the last fry has been stocked into the river.

Stocking locations are chosen ahead of time and trail inspections are needed prior to fry migration. Ensure to strap the fry holding tank lid securely during transportation to avoid losing

cargo. Suggestions are made to stock fry in several areas high upstream into the Nepisiguit River as to avoid densification, reduce food competition while improving fry survivability.



Photo 2: Placing eggs onto carpets at incubation site

It has been exercise in place a practical fish counting mythology before transportation to sites, using simple average fish weight example: $0.184\text{gr}/\text{fish fry} \times \text{weight} = \text{number of fish}$. This way we can be more precise for fish distribution accuracy.

Example; 1000 gr. of fish @ 0.184gr./ fish would give you 5435 fish