



# FISH COME FIRST

by Matthew Pehrson

A behind-the-scenes look at present-day fish culturists and their humble beginnings

*Spring is in the air, and anglers eagerly await the rumble of the stocking truck and the splash of trout being stocked. You might be surprised to learn just how much work it takes to make sure those silvery fish are ready to land in a stream near you.*

Modern-day fish culturists rely on new innovations in fish biology, physiology, genetics, behavior and nutrition. They must be “Jacks of all trades,” proficient at basic electrical work, plumbing, carpentry, welding, mechanics, computer operation, programing and chemical and water quality monitoring. They have become a passionate breed, known for critical thinking, physical work, and commitment to making “fish come first.”

## HATCHERY CYCLE

Hatchery work is not always glamorous. Fish and Game’s fish culture facilities

remain relatively low-tech and labor intensive. Much like those who worked in the old-time hatcheries (*see sidebar*), our current culturists must overcome unforeseen issues on a daily basis.

The fish culturist’s work commences in early fall, when brood stock fish are ready to spawn. Female trout are checked once a week for what is referred to as “ripeness.” Light pressure is applied to the female’s sides and belly. If the eggs flow freely from her vent, she is ready; if not, she is gently placed back into the tank. This procedure is laborious, but is conducted because our

state hatcheries do not use hormones or any chemical exposure to induce spawning.

Each ripe female’s allotment of eggs is spawned or “stripped” into individual buckets, where milt from a male is added to fertilize the eggs. A single teaspoon of eggs (10 to 15 eggs) is taken from each paired mating for raising future brood stock. This sub-sample of eggs, called an aliquot, maintains genetic variability for future generations.

Fertilized eggs are then brought into the hatchery, where the fish culturists disinfect the eggs of any external pathogens. The eggs are then inventoried and moved into an incubation system to develop. This spawning procedure continues every week until the end of November. Some of the eggs are provided to Fish and Game’s Trout in the Classroom Program, which allows students to learn about aquatic habitats by raising and releasing trout. The brood stock fish, which average four to six pounds, are then stocked into designated waterbodies

to give our avid New Hampshire anglers an increased opportunity to catch trophy-sized trout.

During incubation, some eggs die each day and must be meticulously removed. This simple act is time consuming for culturists, especially since over a million eggs must be checked daily! In addition to tending the eggs, culturists continue to take care of the other fish on station, monitor water quality, and maintain the facility.

Newly hatched fish (called “sac fry” or “alevin”) utilize the egg yolk for nutrients. Culturists monitor sac fry development daily, so fry can be moved to nursery tanks just before they use up all of their yolk storage. When their yolk is completely absorbed, the young fry swim to the surface and begin the search for food. In this phase, they are called “swim-up fry.” From the time fry start feeding until they are stocked at 19 months of age (“yearling fish”), culturists tend them with care. At each stage of development, a specific feed formula is calculated for each pool at the hatchery, using high quality commercial feed.

Then, at last, it is show-time. Each day during the stocking season, from late March into July, hundreds of pounds of fish are carefully loaded into the stocking trucks. Off they go to be distributed by culturists and Conservation Officers to waterbodies designated for stocking by fisheries biologists. Areas with easy access are stocked with nets and buckets; remote areas are reached with backpacks full of fish; and some of the most isolated ponds are stocked by helicopter. For New Hampshire’s anglers, the fun begins!

## KEEPING FISH HEALTHY

Things have improved a lot since the days when hatcheries saw lower fish

survival, less efficient operations, and water nutrient levels that would not meet today’s higher standards. Today, fish health is top priority in New Hampshire state hatcheries. Hatchery workers consistently monitor fish physiology and the overall quality of the environment. This vigilance has prevented the need for any vaccinations or antibiotic treatments at our state fish hatcheries for more than a decade.

Common pathogens we’re on the lookout for include external parasites that are naturally present in New Hampshire waterbodies. These can be brought in by mink, blue herons and feral fish. To keep out these unwanted guests, culturists

employ non-lethal deterrents such as nets, fences and cracker shells. New greenhouse hoops at Berlin Hatchery provide such non-lethal protection from predators, saving an estimated \$33,000 in loss annually.

If a parasite does infect the fish, culturists treat with a calculated dosage of 35% hydrogen peroxide. We prefer this method, because hydrogen peroxide decomposes into oxygen and water. This prevents exposing our fish, and aquatic organisms downstream, to harmful pesticides.

## BRIGHT FUTURE

The state’s hatcheries also are being retrofitted to meet new energy standards.



*Clockwise from top left: A hatchery fish culturist demonstrates egg-stripping for young students; a newly hatched trout sac fry; a brood stock brown trout from the New Hampton fish hatchery; Matt Pehrson releases trout fingerlings into Lonesome Lake during the annual helicopter stocking of remote ponds.*

We want to lower facility operational costs, but most importantly, to reduce our environmental footprint. Over the past three years, federal and private grants have allowed us to make needed renovations. A variable frequency drive installed on the well pump at Milford Hatchery has improved efficiency and water conservation. At the New Hampton Hatchery, all rearing station lights have been replaced with efficient LED

lighting, along with the photo-manipulation hut, which allows brown trout to be spawned in mid-summer – leading to improved propagation, better use of facilities, and increased opportunities for anglers.

Through changing times and technological advances, our fish culturists will continue to work behind the scenes to provide New Hampshire's anglers with a quality fishery. Like their humble

predecessors, these men and women don't do the job for awards and fame, but to practice environmental stewardship, promote conservation, and ensure that diverse angling opportunities are there for future generations.



*Matthew Pehrson is the Hatchery Biological Technician for the New Hampshire Fish and Game Department.*

## HUMBLE BEGINNINGS

New Hampshire has some of the oldest accounts of fish culturing in the country, dating back to private “hatch houses” and ponds where fish were raised commercially. In the late 1800s, a dedicated group of state officials and residents interested in restoring runs of anadromous fish to the Merrimack and Connecticut River watersheds generated new interest in fish culture.

Responding to these concerns, in 1877, the Fisheries Commissioners of New Hampshire and Massachusetts cooperatively built the first N.H. State Hatch House at Livermore Falls in Holderness. Its purpose was to restore anadromous fish populations, rear native inland fish species for restoration and raise non-native species for introduction into New Hampshire waters.

The original culturists working at Livermore were volunteers and part-time employees. State hatcheries tried to obtain as many eggs as possible from native brook trout stocks and out-of-state sources; the eggs were hatched and fry stocked indiscriminately. With limited knowledge of fish

culturing, hatchery survival rates were low. Once the fundamentals of rearing eggs to fry began to be better understood, survival rates increased dramatically, along with the daily workload.

Hatchery work in the 1800s was backbreaking manual labor. Feeding the fish was a grueling process. Culturists were tasked with acquiring butchers' offal and spent much of the day grinding up animal parts for fish feed. Workers raised maggots using spoiled leftovers to feed the small fry. Attempts were made to feed fish with mosquito larvae, coagulated animal blood, live minnows, insects and curdled milk. Culturists were responsible for protecting the fish from predators and even poachers.

With the help of these early fish culturists, many native and non-native species were successfully established by 1900. By 1920, the Commission operated five hatcheries, down from eleven in 1900. A decision was made to propagate yearling-size fish to accommodate for the increasing popularity of sport fishing, as well as continuing restoration efforts. Rearing pools

were introduced to raise larger fish that were distributed by efficient new transportation to waterways throughout the state.

With these advances came full-time hatchery personnel and a new chapter that was the start of many improvements to come. The last state fish hatchery to be built opened in Milford in 1973. Today, Fish and Game operates six fish hatcheries that produce nearly a million catchable-sized trout every year.

*“Modern” transportation made it easier to stock hatchery-raised fish. Note the milk cans full of fish loaded on these early stocking trucks of the 1920s.*




© NHFG PHOTO ARCHIVES

*New Hampshire Wildlife Journal is your best source for fishing, hunting, wildlife and conservation information in the state.*

# DID YOU ENJOY READING THIS ARTICLE?

Every issue of N.H. Wildlife Journal includes stunning wildlife photography, in-depth features and "how-to" articles – plus Naturalist's Notebook, Warden's Watch and no advertising.



So what are you  
waiting for?  
Subscribe today!

[www.wildnh.com/pubs/wj-magazine.html](http://www.wildnh.com/pubs/wj-magazine.html)