



Union City State Fish Hatchery Building Up **Mussels**

by Scott Ray
Union City State Fish Hatchery

and Nevin Welte
Natural Diversity Section

Over 100 years after the Pennsylvania Fish and Boat Commission (PFBC) first dipped its toes into freshwater mussel conservation, it is now diving into efforts to culture and restore North America's most imperiled group of animals. Nearly 75% of Pennsylvania's mussels are considered Species of Greatest Conservation Need, threatened, or endangered. Conservation actions are urgently needed to prevent species extinctions, further declines, and recover historically impaired streams and rivers. A dedicated staff and facility, combined with determination, a little ingenuity, and new technology are what is required to culture this at-risk group of animals. The PFBC's mussel culture program at the Union City State Fish Hatchery (UCSFH), Erie County, is the agency's response to this challenge.

A brief history

Despite UCSFH's unique location in the French Creek watershed—one of just a few remaining hotspots of freshwater mussel diversity in North America—the UCSFH was not PFBC's first foray into mussel culture. That distinction belongs to the agency's obscure Spruce Creek Hatchery, established in Huntingdon County in 1905. The agency and this particular



Photos: PFBC archives

Newly imported Round Hickorynut mussels

hatchery had ambitious commercial mussel production aspirations that aligned with the times—noted conservationists such as Theodore Roosevelt and Gifford Pinchot were promoting conservation, or the “wise use” of natural resources, for the “lasting good” of humankind. Starting in 1908 and 1909, the agency had sought to restore the collapsed—but lucrative—freshwater pearl fishery and to develop a market for Pennsylvania mussels for use in the commercial button industry. These early ambitions died quickly with the closure of the Spruce Creek Hatchery in 1913, following devastating floods and the advent of cultured pearl technology and plastics.

The UCSFH—also constructed in 1905—was originally built as a warmwater/coolwater hatchery with a focus on black bass. Fish culture has endured at the UCSFH, and until recently, the hatchery was focused primarily on the



Pictured is an adult Pistolgrip Mussel from the Shenango River.

cost savings permitted the purchase of high-tech equipment such as a medical-grade cell counter (used for counting algal cells for feeding mussels) and a stereo microscope (used for counting baby mussels). This technology will save staff hundreds of hours of labor and allow them to focus their efforts on improving culture systems and take advantage of training opportunities in order to keep up with the latest developments in culture techniques. Mussel culture technology and complex hatchery systems are constantly being modified as the science of mussel propagation for restoration improves. The UCSFH is actively engaged in learning more

production of Northern Pike, *Esox lucius*; Muskellunge, *Esox masquinongy*; and tiger muskellunge, *Esox masquinongy x Esox lucius*. Even though the UCSFH is now embracing a decidedly new mission of mussel culture for the purpose of species conservation and stream restoration, Northern Pike and tiger muskellunge spawning will continue in the spring with eggs being shipped to other PFBC hatcheries. The hatchery will also raise various pond-cultured fishes for stocking and assisting in mussel culture operations.

about these mussel culture innovations and has received advice and training from its federal partners at the United States Fish and Wildlife Service (USFWS) and fellow state agencies such as North Carolina Wildlife Resource Commission.

Changing the culture

Culturing mussels is not for the faint of heart and not too many people do it. The UCSFH will be one of just over 20 North American resource agencies, universities, or zoos dedicating resources to culture mussels. Mussels have a complex life cycle in which mussel larvae (called glochidia) must first attach to a specific host fish before starting life as a baby mussel. The catch is that there is still a lot that scientists don't know about mussels, and culturists may not always know what host fish to use. The challenge is not limited to identifying the correct host fish, which may be rare minnows or darters, but culturists must also carefully raise or care for the fishes until baby mussels drop off the fish. Thankfully, the PFBC culturists are, by nature, a nimble bunch of conservationists who face daily challenges that demand creative and quick thinking. The UCSFH staff have unique backgrounds that range from tropical fish culture, recirculating aquaculture, and medical microscopy lab experience, which makes them well-suited for mussel culture. Collectively, these skills benefit the PFBC as the facility transitions from traditional fish culture systems to more complex mussel culture systems.

Jump start

In August 2019, the UCSFH received nearly 2,500 juvenile mussels from the USFWS White Sulphur Springs National Fish Hatchery. These mussels were being propagated by the USFWS in partnership with the Pennsylvania Department of Environmental Protection to support Dunkard Creek restoration efforts and endangered species recovery. The UCSFH received Plain Pocketbooks, *Lampsilis cardium*; Black Sandshells, *Ligumia recta*; and state endangered Round Hickorynuts, *Obovaria subrotunda*. These mussels will allow the UCSFH to test grow-out systems and act as a training aid on culture techniques, basic biology, and life history of mussels. Mussels will be stocked during the summer of 2020 when the mussels are large enough to be tagged.

The evolution of the UCSFH

Physically, the UCSFH has undergone significant changes in the last 12 months as it evolved into a mussel hatchery. Thousands of dollars were saved due to staff ingenuity in constructing mussel hatchery and rearing systems. These

A sense of purpose

The UCSFH's initial focus will be to raise mussels to restore the formerly diverse Dunkard Creek mussel population. The Dunkard Creek mussel population was destroyed by a toxic event in 2009. Additionally, the UCSFH will work to culture mussels to help restore the Clarion River mussel fauna, a stream that once ran "black like ink" and was declared "the worst in the state" due to historical pollution. Dunkard Creek restoration and settlement monies along with State Wildlife Grants and other funding sources and opportunities will sustain the hatchery.

This latest endeavor by the PFBC has echoes of the agency's earliest mussel culture ambitions but with a decidedly more optimistic outlook. Working and collaborating within (Hatcheries and Environmental Services) and with our state and federal partners, the PFBC is once again putting muscle behind its "Resource First" mission as the agency races the clock to prevent further extinction of North America's most endangered faunal group. □