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Trouble signs in the river: Researchers eye missing shiners

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AMHERST - Fish in the Fort River will soon be under constant, high-tech surveillance.

What did the cold-blooded, aquatic vertebrates do to deserve this kind of monitoring?

They've disappeared - and that's a problem.

The absence of shiners in the Fort River this fall may be a result of higher river temperatures. Rising river temperatures are an indicator that water levels are shrinking and cool water from underground sources isn't making it to the rivers.

In short, the water supply is drying up.

With less area to hide in the diminishing river, shiners are more easily gobbled up by predators.

Few people realize the impact of fish on their lives beyond the dinner plate, said Piotr Parasiewicz, director of the newly launched Rushing Rivers Institute, a river restoration research group in Amherst. But fish are the proverbial canary in the coal mine when it comes to water abundance and quality.

'The Fort River is not as warm as other rivers we see,' said Parasiewicz. 'It is a good resource and if the Fort is in trouble, imagine what happened to the others.'

During an August fish count by Rushing Rivers, researchers found 80 percent of the fish stock in an Amherst section of the Fort River were 'shiners,' or small, silver fish. When they went back in October, all the shiners were gone.

'Maybe they migrated to Connecticut or perhaps there are more predator fish there than before. We don't know for sure,' said Parasiewicz. 'Fort River is not getting the attention it deserves.'

'All we know is there were none and that is odd,' added Jeffrey Legros, a fisheries biologist, or 'fish hugger' as Parasiewicz calls him, with the institute.

Along with a host of area environmental organizations and colleges, Rushing Rivers Institute is turning Fort River into a 'living teaching laboratory' in the hope of drawing more attention to the plight of fish and their river habitats.

Next summer, underwater video cameras will be placed along the river's bed. Hydro-microphones will be added alongside the cameras, recording the secret language of the fish and the water's gurgles. In-stream sensors

Courtesy of Piotr Parasiewicz
Dressed in shorts and a button-up shirt, Piotr Parasiewicz, director of Rushing Rivers Institute in Amherst, watches researchers participating in an August Rushing Rivers seminar take an up-close look at the habitat conditions of Fort River fish.
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to monitor conditions such as pH and dissolved oxygen levels, temperature and water flow velocity will also be installed.

Information collected by the equipment will be transported to the institute through a solar-powered wi-fi network and displayed online for all to see.

Fort River is the largest, undammed contributory river to the Connecticut River. It runs through Amherst and Hadley and is home to a variety of endangered aquatic animals, including the dwarf wedgemussel and salmon. Fort River also serves as a source of drinking water for Amherst and Hadley.

'We want people to be able to see the work we're doing,' said Parasiewicz about streaming the fish camera online. 'People need to understand its importance.'

The project is a collaboration between Rushing Rivers, the University of Massachusetts civil and environmental engineering and computer science departments, along with the Mount Holyoke College Geoprocessing Laboratory and the Center for the Environment.

Joining in as well are the Northeast Instream Habitat Program , professors from Amherst and Hampshire colleges, the Hitchcock Center and the Amherst and Hadley conservation commissions.

Through the project, researchers will supply Amherst with an ecological status report of the river's water quantity and quality, provide research opportunities for area school and college students, advance state-of-the-art river research equipment and methods, and provide long-term analysis of river dynamics.

'When you can protect the (river) habitat, then you protect our water resource,' Legros said.

Awareness is key

Parasiewicz said he created Rushing Rivers in January to help bridge the gap between river science and river restoration and construction practices.

The institute seeks to supply engineers with tools that rely on established research to help construct responsible dams, bridges and developments around rivers. Rushing Rivers also seeks to make the public more aware of the problems facing rivers.

'The public doesn't understand the need for this kind of work,' said Parasiewicz from his quiet office on Amity Street. 'All the rivers in New England are drying out.'

While Fort River is yet to be intensely studied by Rushing Rivers, Parasiewicz has noted the rising temperatures and evaporation among the over 10,000 rivers in New England. In some New Hampshire rivers, for example, temperatures have risen over 15 degrees to 84 degrees Fahrenheit.

When river temperatures rise, many cold water or northern fish die, he said. About one-third of freshwater fish species are extinct or on their way out. They are disappearing five times faster than land animal species, Parasiewicz said.

Rising river temperatures are due to a variety of factors, including global warming, people's drain on the water supply (less water is easier to heat

up than more water) and the Industrial Age, which reshaped and widened New England's rivers to make them better transportation routes.

This widening has made the rivers shallower, providing less vegetative habitat for fish and thus easier to warm. Thousands of relics of small dams with shallow ponds leftover from this era work like solar panels heating up rivers.

Land development has also played a role, Parasiewicz said. When buildings are put on land that used to be forest, the Earth loses the forest topsoil that acted as a sponge that filtered and fed water to cool underground river contributors and aquifers. Little of this underground water is making it into rivers as people are tapping wells for their own uses.

'We don't want to try to blame anyone, we just want to advocate for science and science-based approaches to river management,' Parasiewicz said. 'We all want to use water, we just have to do it smarter and with more awareness.'

The lack of applicable environmental management tools is not caused by underdevelopment in science, but by limited access to available state-of-the-art research, Parasiewicz said.

Parasiewicz hopes to change that with his research and by developing river-management tools. With the Northeast Instream Habitat Program, Parasiewicz created a computer river-mapping program that can predict how temperature, construction and other outside factors affect specific rivers.

He plans to create a computer map of Fort River following the summer's information collection.

'We're trying to propose changes that don't cost a lot and, when done right, can save people money in the long run,' Parasiewicz said.

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