SEARCH PARTY

In Maine, partners find common ground in cold water

by BRIDGET MACDONALD

"If you were a salmon, where would you want to be in the summertime?" Service fisheries biologist Scott Craig asks about a dozen people at Moosehorn National Wildlife Refuge in Maine.

They aren't there to hear the answers. They are there to help find them. A few hours later, most are knee-deep in Popple Flowage learning how to install data loggers underwater to find sites that offer prime habitat for salmon—or could if restored.

Once the loggers are installed, they can be left alone to record water temperatures for up to three years. But up front, it requires a lot of time in the field, toting a lot of equipment—tape, epoxy, a wire brush and a camera to document the site well enough to find it again. Preferably a waterproof camera.

"I already fell in this morning when I was out scouting the site," says Service biologist Kirstin Underwood, who was co-leading the training with Craig.

It's worth the trouble. For young Atlantic salmon—called parr—summer is the time to forage, mature and grow, which they can only do in water 44 to 72 degrees Fahrenheit. For reference: That's cold. The low end of the temperature range for an Olympic swimming pool is 77 degrees.

When water temperatures pass that threshold, salmon suffer. "They still eat, but they don't gain weight because their metabolisms are running so high," says Craig. When water temperatures stay high for several days, salmon will relocate in search of cold water. When they're traveling, they're not growing, and the likelihood that they will live long enough to reproduce begins to diminish.

That's not just a problem for fish; it's a problem for Maine.

"Cold water is our natural heritage," explains Merry Gallagher of the Maine Department of Inland Fisheries and Wildlife. As a native fish conservation biologist, Gallagher's primary focus is Eastern brook trout — a species of special concern in Maine — and as with salmon, temperature is everything. Brook trout do best in water between 54 and 68 degrees.

The challenge, Gallagher says, is that "Maine is a big state, with a lot of water." More than 44,000 miles of rivers and streams in 10 major watershed regions, encompassing more than 35,000 square miles. Just 1,000 square miles shy of the total area of the five other New England states combined.

That's why partners from Native American tribes, universities, watershed councils, land trusts, nonprofit organizations, and several state and federal agencies in the United States and Canada formed the Maine Stream Temperature Working Group. They all share a stake in Maine's cold water heritage, and now they are sharing resources that can help them preserve it.

"There were a lot of organizations keyed into streams and stream temperature in Maine, and many people were collecting data in different places at different times across the state," says Service biologist Serena Doose, former coordinator of the working group. "We knew that all of that data would be of greater value if it was collected and shared." That's because when all of the information is one place, it's easier to see where the gaps are.

Ecologist Ben Letcher of the U.S. Geological Survey's Conte Anadromous Fish Research Center was thinking the same thing on an even bigger scale. With support from the Service and a regional conservation collaborative, his research group had been developing the Spatial Hydro-Ecological Decision System (SHEDS) — a regional stream temperature database and more — designed to support better management of aquatic resources across the Northeast.

The goal was to build a model that could predict daily stream temperature at most locations in the region — except sites with unusual groundwater inputs or water management practice — based on weather conditions, characteristics of the surrounding watershed and actual measurements taken by people in the field. The perfect tool to find sweet spots for species such as salmon and brook trout.

Just as the coordinators of the Maine partnership were looking for a central repository for partners to store their data, Letcher approached them about piloting the SHEDS database.

They dove right in.

"I was surprised to see how many different organizations were involved," says Jeff Walker, an environmental and water resources engineer who helped design the SHEDS database.

But for participants, it seemed natural. "As soon as I got wind of the group, I thought: 'Yes! We want to be involved,'" says Jeff Stern of the Androscoggin River Watershed Council. Stern focuses on habitat restoration projects for brook trout and says he has noticed that the main stem of the river has been getting increasingly warmer in the summer.

"In the long run, the tributaries are going to be the saving grace for brook trout." Stern says. The streams "are smaller, more shaded and will stay cooler as the climate changes," he explains. "SHEDS will help us focus in on exactly where we need to be concentrating our efforts."

And the focus gets sharper as more partners contribute. Courtney Nickerson, a board member of the Merrymeeting Bay Chapter of Trout Unlimited and of Fly Fishing in Maine, was looking for a way to channel his local knowledge of aquatic systems into a project that aligned with the missions of his organizations when he heard about the working group. He attended a training in November 2016 and went home with 10 data loggers to deploy.

"As someone who is out on the water a lot, I understand how important cold water is to an entire river system," says Nickerson. "Trout Unlimited can use the information we collect to keep track of streams and be better stewards at the local level, but anyone who goes into SHEDS can use that data to help make better management decisions now, and hopefully 10 years and 50 years into the future."

According to Underwood, who is now the coordinator for the working group, SHEDS has temperature data from 1,773 sites in Maine — that includes data from 194 active sites where data loggers have been installed, as well as historic data.

There are now almost 100 million stream temperature measurements in SHEDS for the entire Northeast, and nearly half of them are in Maine.

While there is still more ground to cover, the picture is coming into focus.

"There are some areas where, until recently, we didn't have any data at all," says Gallagher. "We are continually getting new information, and every iteration of the model is an improvement."

They are getting warmer in their search for cold water. □

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