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Flathead Lake Biological Station

What's in the water? Researchers wrap up sampling season on Flathead Lake

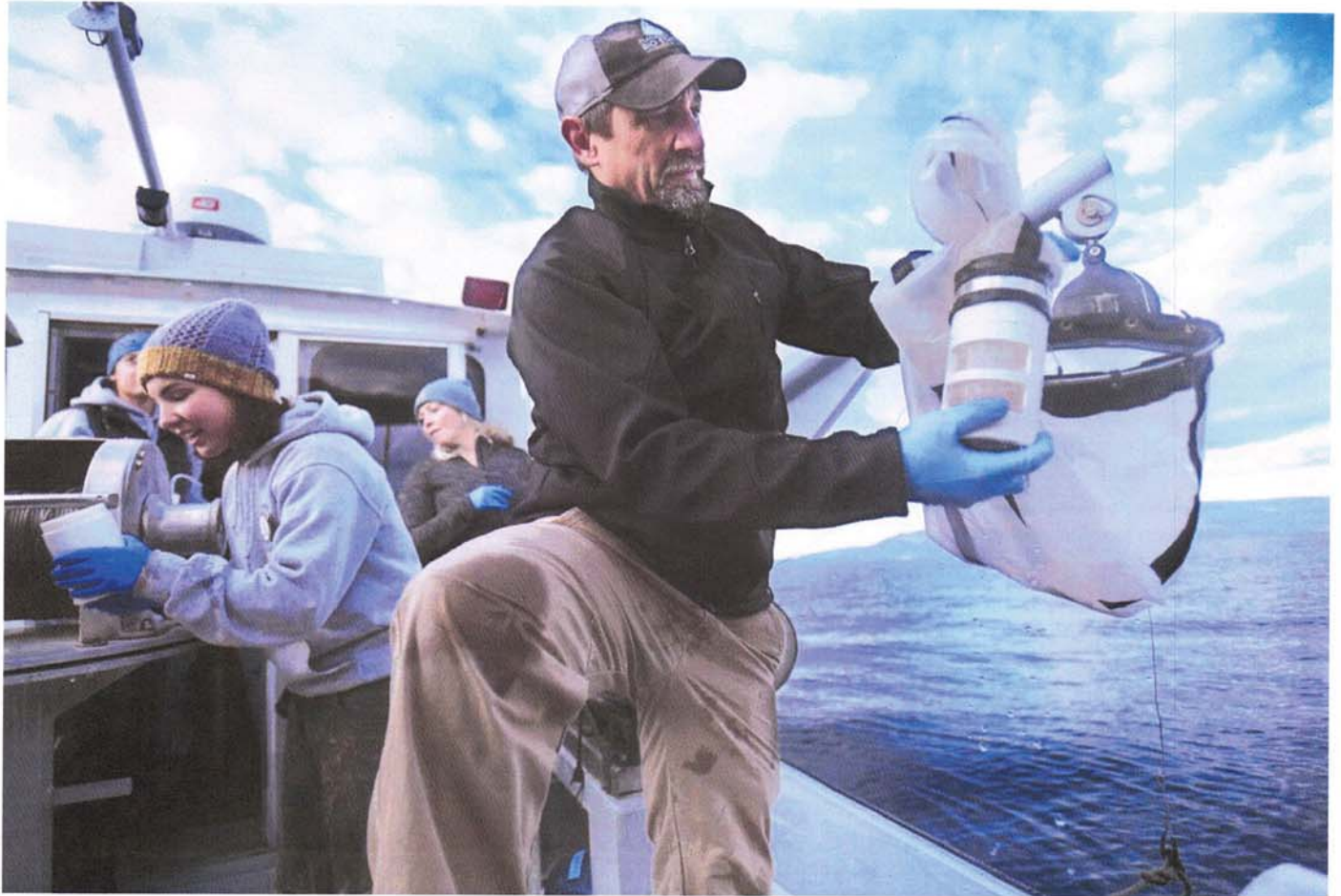
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Phil Matson, a research specialist with the Flathead Lake Biological Station, taps the water from a sample collected from Flathead Lake on Wednesday morning. Matson and his team are in the third round of sampling for the year as part of the effort to keep the lake and Montana's waterways free of zebra and quagga mussels.



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FLATHEAD LAKE — Once the research vessel Jessie B. came to a stop Wednesday morning, Phil Matson got to work.

The Flathead Lake Biological Station's research coordinator lowered a sensor-equipped plastic tube called a “hydrolab” into the water as the boat gently rocked, then slowly unspooled a cable to let it sink deeper. As it dropped, Matson kept his eye on the water temperature readings.

“We're looking for the thermocline,” a boundary layer between warmer and colder levels of Flathead Lake, he explained. The water there is “a little dense,” and more likely to trap what Matson was looking for: the larvae and DNA of invasive mussels.

He may have been searching for zebra and quagga mussels, but everyone aboard the boat hoped he wouldn't find them. If boaters carry these hitchhiking mussels into Flathead Lake, the mussels could crash its food chain and clog nearby infrastructure — and spread downstream to cause similar problems throughout the Columbia River Basin. To keep that from happening, Montana has launched an expensive, multi-pronged prevention effort — and relies on regular water sampling to see if it's working.

“We sample around 250 water bodies, over 2,000 samples a year, with a multitude of partners,” said Zach Crete, aquatic invasive species coordinator with Montana Fish, Wildlife and Parks. On Flathead Lake, “this is our third round of sampling this year,” Matson said. “We want one in the spring, summer, and the fall.” He and his colleagues test water samples from 31 sites around Flathead Lake. Nineteen of those are along the shoreline, but 12 are only reachable by boat.

Traffic on Flathead Lake is thin now, as the snow piles up on surrounding peaks and the wind gets cold enough to scour exposed skin. But more than a dozen people, including Upper Columbia Conservation Commission chair Lori Curtis and state Rep. Neil Durham, R-Eureka, squeezed onto the 30-foot Jessie B. for the penultimate sampling day of the season. The first site was a short, but windy ride north from the University of Montana-run Biological Station.

The lake bottom here was more than 60 feet down, but Matson couldn't find the thermocline; the hydrolab gave a constant temperature reading all the way down. That's typical this time of year, he explained. Without that water layer, mussel larvae are likely to either float to the top or settle on the bottom, so the samplers collected water from both.

Matson winched one long net, affixed to a small plastic jar, down into the depths. Meanwhile, Big Sky Watershed Corps member Natalie Poremba ran another one across the surface. Each filtered 2,000 gallons of lakewater, condensing their suspended contents into one 50-milliliter sample. With the boat still rocking, they donned latex gloves and carefully divided the scummy water into vials for different testers, brown specs swirling in each one.

"Occasionally I'll get a note that says, 'It looks like diarrhea, heads up,'" said one of those testers, Caroline Maughan.

As the eDNA coordinator for UM's Montana Conservation Genetics Lab, Maughan and her colleague test water samples from around North America for free-floating environmental DNA, or "eDNA" that can be linked to specific species. "I first extract the DNA from the sample that they provide from the boats and such," then puts samples into a plate of small plastic wells and runs them through tests for mussel DNA.

"The plates are 24 samples, and they'll send me about 100 or so," Maughan said, "It takes about 2 to 3 weeks, because I have to do it and it is time consuming. It takes about three days of extraction."

Other samples collected Wednesday will go to Montana Fish, Wildlife and Parks' Helena laboratory, which will test for the mussel larvae, or "veligers."

"Thus far this year we've collected 2,200 samples" statewide; 1,865 have been analyzed already," said Crete. Last year, he said Flathead Lake had the most samples collected of any water body in the state. The two runners-up were Tiber and Canyon Ferry Reservoir — where signs of mussels were detected in fall 2016, prompting Montana to overhaul its aquatic invasive species policy.

The samples that tested positive had been collected in July 2016, but only tested positive that October. "Prior to the detections in '16, they did have some changes in how we decide samples, how they come first, the prioritization of it, and yes, it's a much quicker turnaround" now, he said.

No further signs of mussels have been found in either Tiber or Canyon Ferry for three years — and they've never been found on Flathead Lake.

"We would love to sample more," Matson said after the boat had returned to its dock. "However, budget constraints don't allow that right now." They funded their first year of sampling entirely with philanthropic grants, and for the past two years with grants from the Montana Department of Natural Resources and Conservation. "It's a competitive program, and we'll see how it goes" with funding, he said.

It's also too early to tell how the samples the Jessie B. collected Wednesday morning will test. But Matson and his colleagues aren't sitting tight as they wait. After dropping the guests off at the dock, they planned to visit five more sites Wednesday, the other six testing sites later. Before they put their boats in for the season, they're planning to gauge Flathead Lake's health one last time.