



Steve Fiske: Studying Benthic Wildlife to Assess Ecosystem Health

Steve Fiske, an aquatic biologist and benthologist, studies streams and aquatic organisms in the state of Vermont. Fiske works primarily with benthic macro invertebrates. By studying these creatures and noting their presence or absence, their population numbers and species types, and by comparing these metrics over time, Fiske is able to estimate the overall health of an aquatic ecosystem.

His career with the ANR spans 35 years. He has seen much change over that time. Unlike other aquatic environments like lakes, bays or oceans, a stream's quick moving water means that it by nature is a rapidly changing or dynamic environment. "Streams are different than lakes in that their response time to pollutants is also quick," explains Fiske. "They can degrade rapidly and they recover rapidly when the pollutant source is removed. The most recent recovery that I have documented is in the West Branch Ompompanoosuc River following the cleanup of the Elizabeth Copper Mine."

In recent years, Fiske has been busy establishing what he terms, "a climate change sentinel stream network." These are a set of streams where we have the longest record of biomonitoring and a long-term baseline has been established. Climate-related temperature and flow data will be added to the data collection to be monitored over time. "There are two primary stressors we are looking at when we are looking at climate change impacts to stream ecology," says Fiske. "The first, altered hydrology has to do with the structure of the stream itself and can show up in two ways. We know that models are predicting more frequent flood events like the flooding that occurred after Irene. We call these high flow events. The second way that stream hydrology may be affected is by an increase in the occurrence of extended droughts. "With low water flows, low dissolved oxygen can cause problems for fish and macro invertebrates. Drought is also going to exasperate the warming of water."

Warming of water is the other predicted major stressor of climate change. "We will begin to see fewer cold-water obligate species in many of our streams. These species will migrate toward colder water, most likely upstream and higher elevation, changing the baselines for what we expect to see in Vermont streams."

Although climate change is worrisome for Fiske, the good news is that his monitoring points have not yet demonstrated significant changes to the biology. "To-date there has been no documented changes, with the exception of a significant decrease in abundance immediately after Irene, we never saw a loss of species and we're already seeing recovery from this event so that's good news," says Fiske.

After thirty five years in the field, I ask Fiske what he loves most about the work that he does. He replies easily, "the best part of my job has been seeing Vermont. I have visited thousands of miles of streams, some of them very remote and beautiful. I have a collection of some beautiful spots that I bet most people don't know exist. On the other hand during the winter months back in the lab the discovery of a new species for Vermont can really make your day."

I want the benefit of Fiske's experience. I ask him for advice – what can we do that will support the work that you are doing? What can we do in our own homes and lives and communities? "Get involved on the local scale," he says. "Join your watershed association, conservation or planning commission. Get to know the streams in your own backyard first. There are so many ways to get involved and it is crucial that we do. With climate change, it is very complicated and we do not yet understand how or how rapidly our aquatic environment is going to change. As stewards of our aquatic environment we will need to monitor the response of our stream communities in order to understand the effects of the altered environment on the biological integrity of these communities."

I ask Steve what's next for him. "I think when I'm retired I may become a stream walker possibly offering my services as a stream guide. I don't plan to retire yet though. You know when it's time to retire when you don't love your job anymore, and that hasn't happened yet."