

It's All About the Bugs

How we monitor the creek's water quality

The tiny organisms that inhabit Sausal Creek provide the basis for the web of interactions that supply food for bird and beast. These freshwater invertebrates are mostly insect larvae that molt to become adult winged insects, but they also include worms, snails, and relatives of the spiders that make their homes in the creek for some or all of their lives. The number and diversity of these freshwater invertebrates gives us vital information on the health of the creek.

FOSC's aquatic insect monitoring team has performed three bioassessments so far by taking a detailed look at these organisms. We wade into the creek and use special nets to collect the tiny invertebrates that live under the rocks and stones. Using tweezers and pipettes, we separate them from the surrounding debris, categorize and count them, record the data, and then release them back into the creek.



We analyze the data using an industry standard called the EPT ratio. EPT stands for Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)--three families of invertebrates that show various degrees of sensitivity to pollution. Mayflies are very resistant to pollution, stoneflies are somewhat resistant, and caddisflies are not very resistant at all. So if we find a lot of mayfly larvae, not many stonefly larvae, and very few caddisfly larvae, then the ratio of pollution-tolerant larvae is high, indicating the creek has some problems. And indeed, that is what our three assessments to date have shown. In two assessment areas in Dimond Canyon and one in Dimond Park, we have found a complete absence of caddisfly larvae.

The assessment is based on a ratio because the sheer numbers of organisms in the creek will vary greatly with the season, weather, the collection method, and other variables. By comparing one family to another at a given point in time, we can get a more accurate sense of what's affecting these populations. Scientists focus on the insect family, as opposed to genus or species, because identification is easier at that level. A well-trained amateur can spot the mayfly larva's smooth shape and three "tail feathers" or the stonefly larva's three distinct thorax segments.

The team plans to survey several locations in the Sausal Creek watershed on a monthly basis. One location will be in Joaquin Miller Park above Highway 13, another in Dimond Park, and a third on the Dimond Canyon Trail. Sampling multiple locations will give us a new perspective on the workings of the creek from the point of view of these tiny, usually overlooked inhabitants of the biosphere.

Interested in joining the team? FOSC provides equipment and training. The complete bioassessment takes two to three hours, from collecting the samples to keying out the organisms and recording the data. We will make the information available on the FOSC website when we have enough to report. Please contact [Megan](#) or [Kathleen](#) if you would like to join us.

--Kathleen Harris



Mayfly nymph



Stonefly nymph