

What are Benthic macroinvertebrates?



Benthic macroinvertebrates (BMI's) or "stream bugs" are insects that are visible to the naked eye. The term "benthic" derives from the Greek word *benthos* meaning below or beneath. "Macro" refers to macroscopic, meaning what we can see, feel, and touch. Invertebrates are animals that lack a backbone. BMI's live in and on the bottom of the streambed, as well as other substrates such as logs and plants in the stream channel. Through scientific efforts we have been able to monitor stream health by collecting samples of BMI's from selected streams in Napa County. The stream health is determined by scientific scorecard method to rank the health of the streams

The scores are based on what types of bugs are living in the stream and the number of different kinds of stream bugs that are present. By using this scoring system, we can compare very different streams to each other and rank their ecological health. Benthic macro-invertebrates are wonderful indicators of stream health. For one, they are relatively easy and inexpensive to collect. Secondly, macro invertebrates play a crucial role in the nutrient cycle. If stream bugs are suffering, the entire eco-system will be affected. Some insects are tolerant to pollution, whereas others are not. The present or absence of tolerant and intolerant types can further indicate the condition of the stream

For instance, the order *Plecoptera* or [Stoneflies](#) are very sensitive to pollution, so their absence in a stream can signal a problem. In understanding benthic macro-invertebrates it should be important to know where they live. The majority of macro invertebrates lives are spent in the larval stages in the water. Usually when aquatic insects reach adulthood, they leave to bigger and better things. The insects now have wings to carry them away from the stream but not always flying very far from the streams so that when the time comes, they will return and deposit their eggs in the same stream where they were once hatched. [Caddisflies](#), Mayflies & Mosquitoes are all excellent examples of macro invertebrates that carry these traits.

The life cycle of many bugs are very short, sometimes only one season in length. Therefore, we can detect population fluctuations over a short period of time. Population fluctuations might indicate that a change, either positive or negative, has occurred in the stream. Streams are composed of many different habitats such as riffles, runs, glides and pools. Different bugs are adapted to the different microhabitats each of these habitats represents. Some bugs need the clear, cold, fast water found in the headwaters of streams like the [Mayfly](#), who has a very flat profile and is able to cling tightly to rocks. They live in riffles that are fast and turbulent. Other bugs are more commonly found in deep, slow, warmer reaches lower down in the system.

Aquatic worms are often found in the bottom of pools where fine sediments accumulate and dissolved oxygen levels are lower.