



Macroinvertebrates



A healthy stream contains a variety of animals including aquatic insects, fish, crayfish and salamanders. The most common and diverse group of animals are known as **macroinvertebrates**. Macroinvertebrates are animals that lack a backbone but are typically visible to the unaided eye. These are primarily aquatic insects, but also include worms, mussels, snails, and crayfish.

Macroinvertebrates are excellent indicators of water quality because:

They are unique

Each species has specific requirements for survival. Some need highly oxygenated water, have low tolerance to toxic pollutants, or have specific food or habitat needs.

They are easily collectible

Most macroinvertebrates attach on to rocks, logs or roots in the stream bottom and do not move great distances making them easy to collect.

They reflect past conditions

While chemical tests indicate water quality at the moment of sample collection, changes in water quality may go undetected between samplings. Because these organisms live in the same area for most of their lives (several weeks to several years), macroinvertebrate communities can reflect water quality conditions over a period of time.



Certain macroinvertebrates are sensitive to pollution while others are more tolerant of pollution. The diversity of macroinvertebrates, especially the number and diversity of pollution sensitive animals, can be used to monitor the water quality of streams and rivers.

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Macroinvertebrate Water Quality Indicators

Stoneflies (Order Plecoptera)

ID: Nymphs have a roach-like body, two tails, and two hooks at the end of each leg. The nymphs can reach up to 1 inch in length.

Water quality rating: EXCELLENT



Mayflies (Order Ephemeroptera)

ID: Nymphs have a roach-like body, two or three tails, and one claw at the end of each leg. Rows of gills can often be seen along the sides of the abdomen.

Water quality rating: GOOD.



Mayfly Nymph

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Caddisflies (Order Trichoptera)

ID: Caddisfly larvae have a caterpillar-like body, six distinct legs, and two hooks at the end of the body. Many camouflage themselves in cases made from pebbles, leaves or twigs.

Water quality rating: GOOD



Caddisfly larva & case (up to 1" in length)

True Flies (Order Diptera)

ID: True flies have a worm-like body and lack distinct legs.

Water quality rating: FAIR - POOR



Black Fly larvae (up to 1" in length)