

Macroinvertebrates

Benthic Macroinvertebrates: What are they?

Benthic Macroinvertebrates are aquatic animals that lack an internal skeleton, are large enough to be seen by the unaided eye, and live on or among the substrate. In other words, benthic macroinvertebrates are bugs that live on the bottom of a stream. These organisms fill an important niche in a healthy ecosystem and can be used as an indicator of overall stream health.

What role do macroinvertebrates play in monitoring stream health?

Monitoring the health and abundance of macroinvertebrates provides a more inclusive assessment of stream health than physical indicators alone. Water quality is measured by physical parameters such as water temperature, chemistry and habitat diversity. It is possible for these parameters to indicate high water quality and diverse habitat but the actual aquatic life is not healthy and thriving. Sampling of macroinvertebrates can provide a more inclusive depiction of stream health by indicating the stream's ability to support aquatic species. Macroinvertebrates play a critical role in a stream's food web which makes them a strong indicator of the overall health of aquatic species.

Why sample macroinvertebrates instead of other organisms (fish and algae)?

Macroinvertebrates are desirable for biological sampling due to a number of reasons. From a sampling standpoint these organisms are abundant, readily collectable and easy to identify. Also macroinvertebrates are not highly mobile. This makes them desirable because they cannot easily escape pollutants or human disturbances, where as fish can quickly leave a compromised area. A high sensitivity to pollution and varying life spans allow macroinvertebrates to indicate both the short and long term effects of pollution.

The health of algae and fish also indicate the health of a stream but these organisms are not as desirable for sampling as macroinvertebrates. There are relatively few fish species in the Northwest, and many fish populations are threatened by human activity. Intensive study of fish has the potential to irreversibly impact already compromised populations. Algae are plentiful and representative of stream health but there are few people who can identify samples.

How are macroinvertebrates sampled?

The presence and relative abundance of macroinvertebrate species in undisturbed and natural stream conditions may be compared with organisms in disturbed conditions. Samples are designed to include a representative sample of the habitat types of interest, such as pools and riffles. The actual sampling is carried out by technicians wading in the stream and using nets to collect organisms from the stream bottom.

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EPA, 1997, Volunteer Stream Monitoring: A Methods Manual, EPA