

## What are aquatic invertebrates?

Aquatic invertebrates are small animals that lack a backbone and live under water. In our rivers they can be found attached to, and amongst, stones and gravel, logs, leaf material and vegetation, or burrowed into the bottom sand and mud. They include juvenile (larvae) and adult insects, crustaceans, mites, snails, mussels, leeches, and worms.

Aquatic invertebrates inhabit all rivers from small mountain streams to large systems entering the sea. They are food for fish and aquatic birds and are vital for healthy rivers. Most invertebrates are present in rivers all year round and are easy to collect and they are used as 'indicators' of pollution in rivers and lakes around the world.



## How do we survey aquatic invertebrates in rivers?

Aquatic invertebrates are collected by the Environmental Protection Agency (EPA) from rivers across the country each year in summer when flows are likely to be relatively low and the impact of pollution is likely to be at its worst. The sampler places a pond net downstream of where they are standing and then agitates stones and gravel on the riverbed with their foot for a minimum of two minutes in a method known as 'kick-sampling'. The process loosens the invertebrates from the riverbed and allows them to be collected in the net as they drift downstream in the river flow. Samples are preferably collected from the shallower, faster flowing habitats called 'riffles'.



EPA ecologist kick-sampling for aquatic invertebrates

Sample put in large tray and searched

Invertebrates identified

## Aquatic invertebrates and river water quality

Aquatic invertebrates are good at showing if the quality of the river water is good or bad. Once a kick sample is complete the live sample is searched in a large tray on the riverbank. All invertebrates are recorded and counted in the sample. Once this process is complete the water quality of the stretch of river examined can be determined.

A biological index, known as the Q-value system, is used in Irish rivers. It gives a measure of the ecological health of each river stretch based on the known sensitivities and tolerances of each aquatic invertebrate to water pollution. This allows us to classify our rivers into five quality classes based on the Q-value result. 'High' river water quality is when the water is not polluted at all, and 'bad' river water quality is when the water is most polluted.

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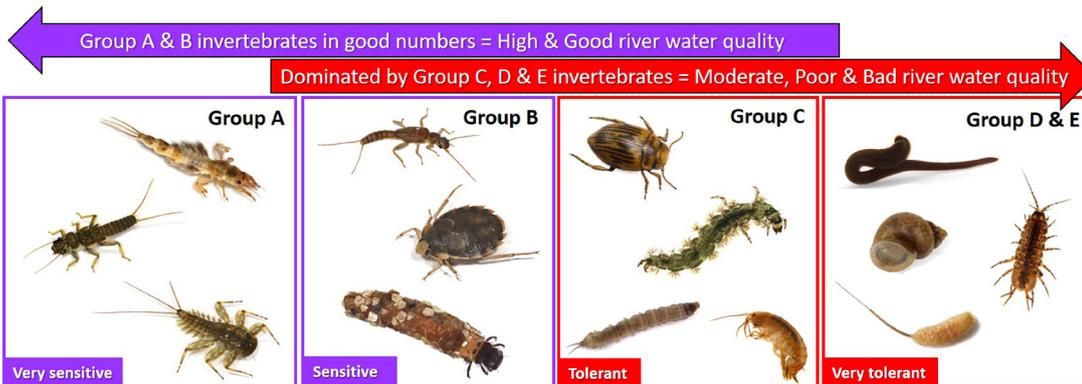


|                |                |                    |                |               |
|----------------|----------------|--------------------|----------------|---------------|
| <b>1. High</b> | <b>2. Good</b> | <b>3. Moderate</b> | <b>4. Poor</b> | <b>5. Bad</b> |
| Q5, Q4-5       | Q4             | Q3-4               | Q3, Q2-3       | Q2, Q1-2, Q1  |

## The Q-Value index - did you know?

- Work to develop the Q-value system started in Ireland in 1971 making it one of the oldest systems for monitoring rivers using aquatic invertebrates in Europe.
- Aquatic invertebrates are divided into 5 'Indicator Groups' based on their sensitivity to pollution:

|                                  |                             |                            |                                 |                                 |
|----------------------------------|-----------------------------|----------------------------|---------------------------------|---------------------------------|
| <b>Group A</b><br>Very Sensitive | <b>Group B</b><br>Sensitive | <b>Group C</b><br>Tolerant | <b>Group D</b><br>Very Tolerant | <b>Group E</b><br>Most Tolerant |
|----------------------------------|-----------------------------|----------------------------|---------------------------------|---------------------------------|



The Q-value calculation is based on the relative number of Group A & B invertebrates to Group C, D & E invertebrates

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- The most recent and historic Q-value results for rivers are freely available at <http://www.epa.ie/QValue/webusers/> and mapped at <https://gis.epa.ie/EPAMaps/>

Additional information about river water quality in Ireland and the environmental pressures on our rivers can be found at [www.rivers.ie](http://www.rivers.ie) and [www.catchments.ie](http://www.catchments.ie) and the river monitoring programme fact sheet at <http://www.epa.ie/irelandsenvironment/getinformed/infographics/>