An Chomhairle Oidhreachta
The Heritage Council

Monaghan
County Council

FOGHLAIM • FEABHAS • FIONTAR

National Federation of Group Water Schemes

BALLYBAY WETLANDS CENTRE

Module 4: Water and Biodiversity

Unit 2: Assessing Biodiversity

Objectives of this presentation

- To introduce the fundamental concepts of biodiversity.

- To familiarise participants, in general terms, with some of the sampling methods employed in river and stream ecology.

Biodiversity – some concepts

- Biodiversity simply refers to "biological diversity.
- It includes the full of range of ecosystems.
- It is our biological inheritance
- It is fundamental to human existence

Assessing freshwater ecosystems and biodiversity

Why is water quality assessment important?

- It helps us understand the health of ecosystem and biodiversity

Assessment generally comprise three separate elements:

1. Visual assessment
2. Physico-chemical monitoring
3. Biological monitoring.

Physico-chemical monitoring versus biological monitoring

Physico-chemical Monitoring	Biological Monitoring
Provides a snapshot of what is in the water *now*	Indicates the health of a stream *over time*

Biological Monitoring - background

What is a **Biotic index**?

- Scale for showing quality
- Based on sensitivity of life forms to conditions of habitat .

In Ireland, two commonly-used biotic indices used

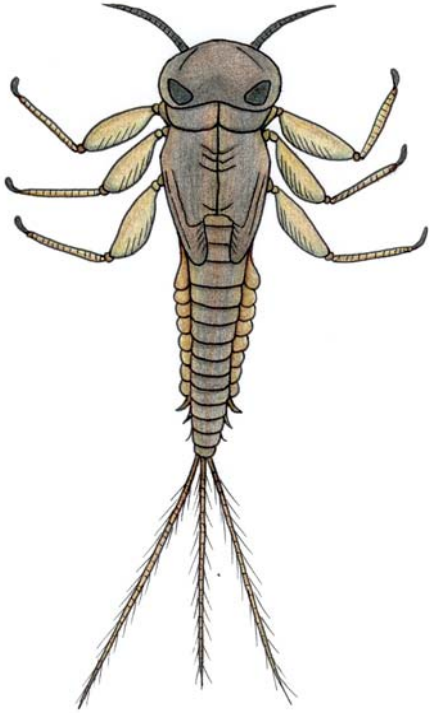
- Q-value system
- Small Streams Risk Score (SSRS).

Use of biological monitoring

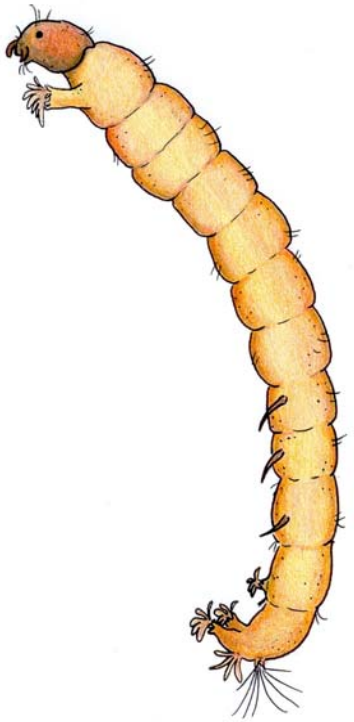
- The Q-value system classifies rivers under four broad categories of ecological status:
  - Unpolluted
  - Slightly polluted
  - Moderately polluted
  - Seriously polluted
- SSRS classifies streams into three broad categories of risk:
  - Probably not at risk
  - Probably at risk
  - At risk

Examples of biotic indicator groups

Mayflies (with a few exceptions) are an indicator of a good water quality.



Blood worms (*Chironmous*) are likely to indicate poor water quality.



Objective and methodology of "kick sampling"

- To obtain a representative sample of macroinvertebrate community
- Is taken over a defined time period,
- Is taken is in the riffle area (or in multiple habitats)
- Is accompanied by a stone wash and/or a weed sweep.

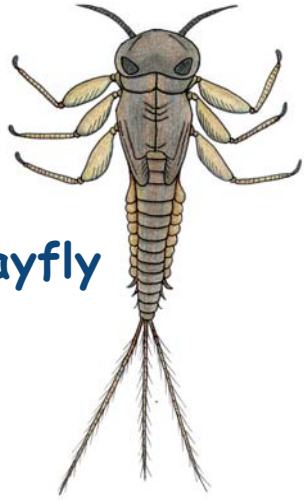
Sampling Method

Kick-sampling (single or multiple habitat)

What to do with a sample

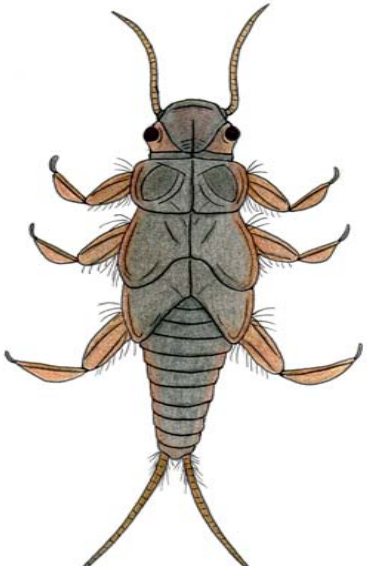
- Transfer to white tray
- Remove larger debris
- Estimate abundance of relevant species
- Fill in field sheet

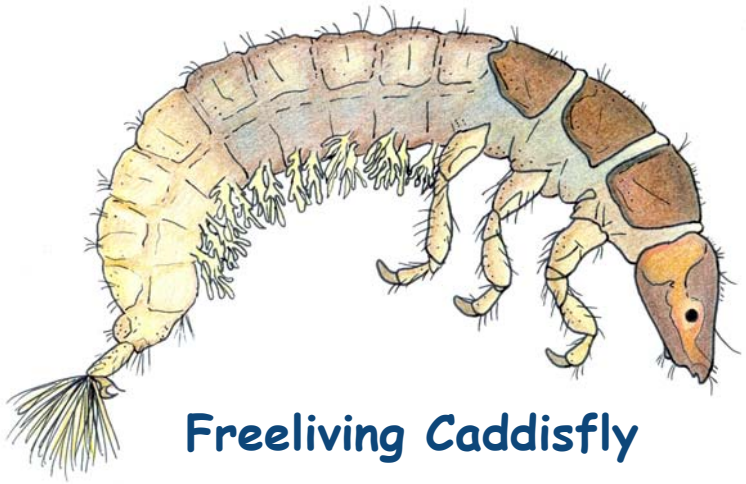
Some species found in unpolluted water



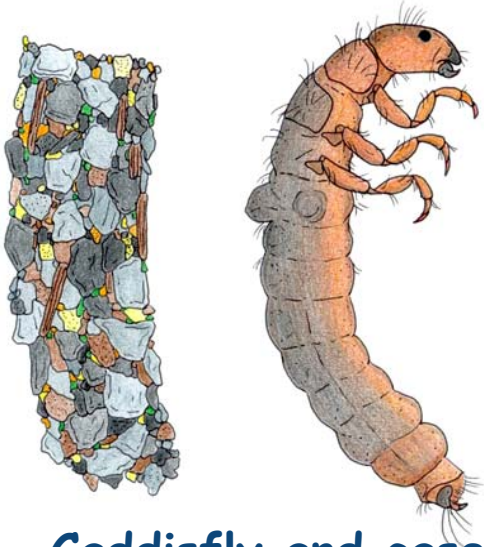
Mayfly

Stonefly



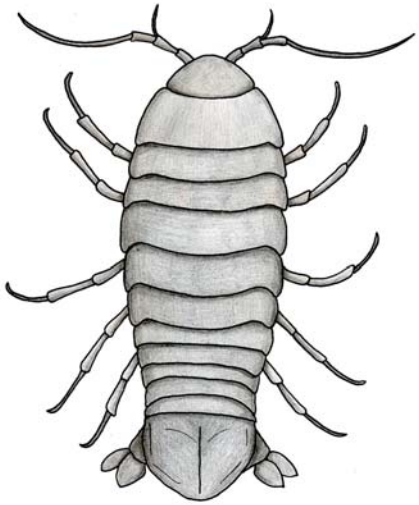


Freeliving Caddisfly

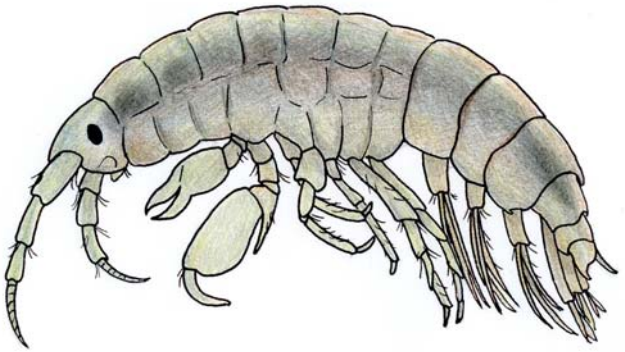


Caddisfly and case

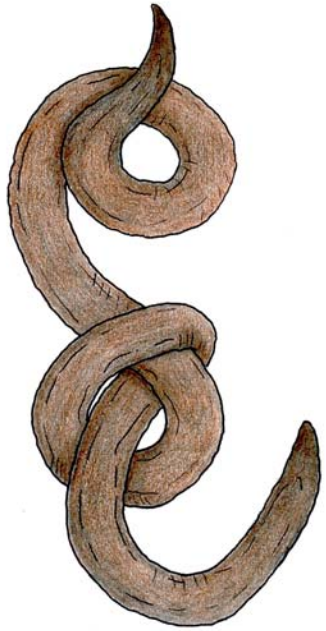
Some species found in badly polluted water



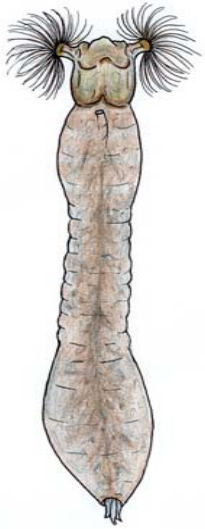
Ascellus



Gammarus



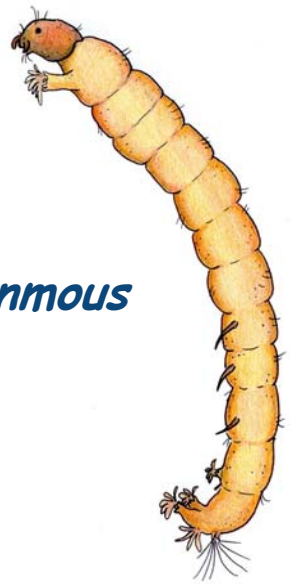
Tubifex Worms



Simuliidae
(Black fly larvae)

Leech

Chironmous



An introduction to macroinvertebrates

As part of an exercise led by a suitably qualified field guide

- Collect sample as described
- Use a field study guide to identify types and abundance of each type of organisms
- Which group is dominant?
- Your field guide will help interpret the results
- This information will provide an indication of your stream quality

Sample sheet

Creatures	0-5	5-20	> 20
Mayfly nymph			
Stonefly nymph			
Caddis fly larvae			
Freshwater shrimp			
Snail			
Worm			
Beetle			
Leech			