

## **Blnd13: Abundance ratios of invertebrate functional feeding groups**

**Quality element:** Benthic fauna

**Water category and water body types:** Rivers, lakes, transitional waters; all types

**Selection rationale:** Trait-based indicator of functional relevance linked to food web structure

**Indicator type (DPSIR):** State

**Description:** The benthic invertebrate community is often the taxonomically and functionally most diverse organism group in aquatic ecosystems. Abundance ratios of invertebrate functional feeding groups represent trait-based and process-related indicators, based on taxon-specific morphological-behavioural adaptations for food acquisition.

The indicator distinguishes between five feeding groups: (1) Shredders feeding on large particulate organic matter such as dead leaves, (2) Gatherers and Collectors feeding on sedimented fine particulate organic matter, (3) Grazers and Scrapers feeding on biofilms, (4) active and passive Filter Feeders acquiring suspended fine particulate organic matter, and (5) Predators feeding on prey organisms. Feeding group assignments are available from <http://www.freshwaterecology.info>.

The indicator is sensitive to detect functional changes in the biological community related to the nutritional resource base. Various ratios can be calculated, e.g.

- Grazers and Scrapers /to/ Shredders, Gatherers and Collectors  
→ Dominant food source (autochthonous *versus* allochthonous)
- Shredders /to/ Gatherers, Collectors and Filter Feeders  
→ Dominant food source (coarse particulate organic matter *versus* fine particulate organic matter)
- Predators /to/ Total of all other functional feeding groups  
→ Top-down control of predators on prey

Shifts in these ratios allow for indicating the effects of multiple stressors (e.g. nutrient pollution, impoundment, siltation, riparian integrity) impacting on food availability.

**Spatio-temporal scale:** Sampling site, single survey

**Unit:** Dimensionless (abundances given as number of individuals; abundance classes; biomass)

**Standardisation:** To be standardised against rule-of-thumb values (e.g. Merritt et al. 2002)

**Data requirements:** Field data

**Other:** Calculated by the ASTERICS software (<http://www.fliessgewaesserbewertung.de/download/berechnung/>)

**MARS spatial scale**

Experimental\*, river-basin and European scale

\* all river experiments

## **References**

- Merritt, R., Cummins, K., Berg, M., Novak, J., Higgins, M., Wessell, K., & Lessard, J. (2002). Development and application of a macroinvertebrate functional-group approach in the bioassessment of remnant river oxbows in southwest Florida. *Journal of the North American Benthological Society*, 21(2), 290–310.
- Wooster, D. E., Miller, S. W., & DeBano, S. J. (2012). An examination of the impact of multiple disturbances on a river system: taxonomic metrics versus biological traits. *River Research and Applications*, 28, 1630–1643.