BInd14: Relative abundance of invasive alien invertebrate species

Quality element: Benthic fauna

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

Selection rationale: Indicator of 'biopollution'

Indicator type (DPSIR): Pressure, State, Impact

Description: An alien species is defined as a taxon introduced outside its natural past or present distribution. According to the Millennium Ecosystem Assessment, invasive alien species are considered to be the third most important threat to biodiversity of inland waters (after hydromorphological degradation, and point source and diffuse pollution). Main cause for their spread in surface waters is the increasing international ship traffic and the connection of formerly separated river basins by canals (e.g. Rhine-Main-Danube Canal in Germany). Alien species also benefit from climate change effects. They are expected to be established as a prominent part of the communities of European surface water bodies in the near future.

Main impact of alien invasive species is the decrease or extinction of indigenous species populations, with effects on the entire food web, through (1) a change of the habitat quality (mostly resulting from other pressures) for native species, leaving an empty space for tolerant alien species, (2) an invasion of a new species which takes over the niche of a native or preys on them successfully and (3) an exploitation of a 'new', previously unexploited food resource (Orendt et al. 2009). Co-invasion describes the introduction of exotic diseases and parasites brought along with the invasion of aliens.

The relative abundance of invasive alien invertebrate species indicates the level of 'biological contamination' of the water body. It informs about the dominance structure of the community, assuming that impacts from invasive aliens on the native biota are proportional to their abundance in the system. The metric represents an indicator of pressure, state and impact, since alien species may also cause damage to economies, ecosystem services or human health.

The indicator is equal to the Abundance Contamination Index proposed by Arbačiauskas et al. (2008).

Spatio-temporal scale: Sampling site, single survey

Unit: Relative abundance (number of individuals *or* abundance classes *or* biomass)

Standardisation: none

Data requirements: Field data

Other: See Annex 4 for a list of alien invertebrate taxa relevant in German watercourses – the list needs to be adopted for the regional conditions

MARS spatial scale
Experimental*, river-basin and European scale
* all river experiments

References

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