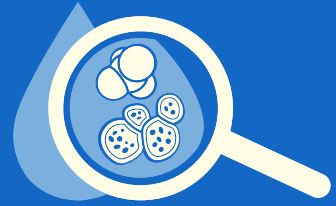




# JOINT DANUBE SURVEY 4



## JDS4: Key Findings

One of the world's most  
comprehensive investigative  
surface-water monitoring efforts  
in the world

**ICPDR** **IKSD**

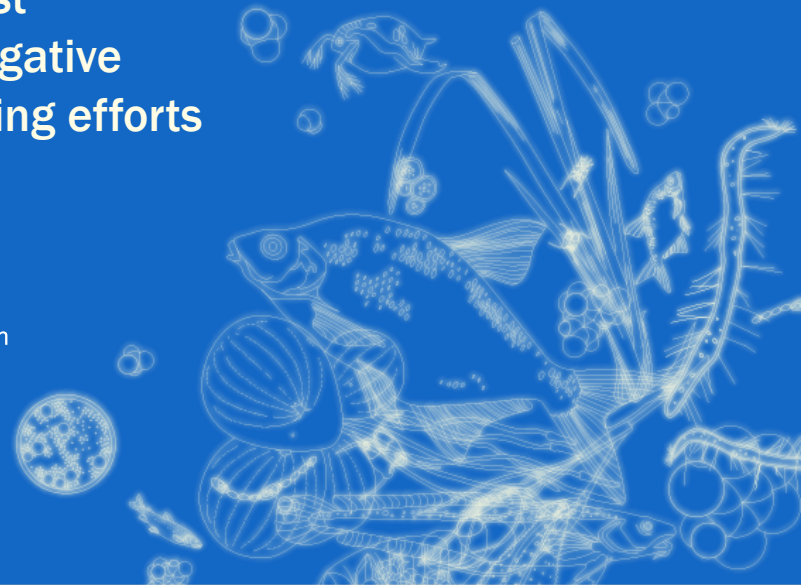
International Commission  
for the Protection  
of the Danube River

Internationale Kommission  
zum Schutz der Donau



This action has  
received funding from  
the European Union

by Igor Liska, ICPDR





## JDS4: KEY FINDINGS

- ✓ BQEs indicating pressure from nutrients and oxygen depletion by biodegradable substances – Phytoplankton, Macrophytes, Phytobenthos, partly Macrozoobenthos – indicated a good status at many sites and pointed at local pressure only;
- ✓ Fish and Macrozoobenthos indicated impacts induced by hydromorphological pressures at most of the sites;
- ✓ Danube was reconfirmed as a key source of fish biodiversity in Europe, but the fish community is threatened along the whole river;
- ✓ Pressure by Invasive Alien Species remains significant.



## JDS4: KEY FINDINGS

- ✓ Parallel application of traditional biological assessment techniques and modern molecular methods demonstrated a big potential of DNA and environmental DNA-based approaches for biodiversity and WFD ecological status class assessments (particularly effective in detecting the hard to capture benthic species);
- ✓ Hydromorphological monitoring showed intensified restoration on the still strongly altered Upper/Middle Danube and only insignificant deteriorations on the Lower Danube, the long reaches of which are still only slightly to moderately altered.



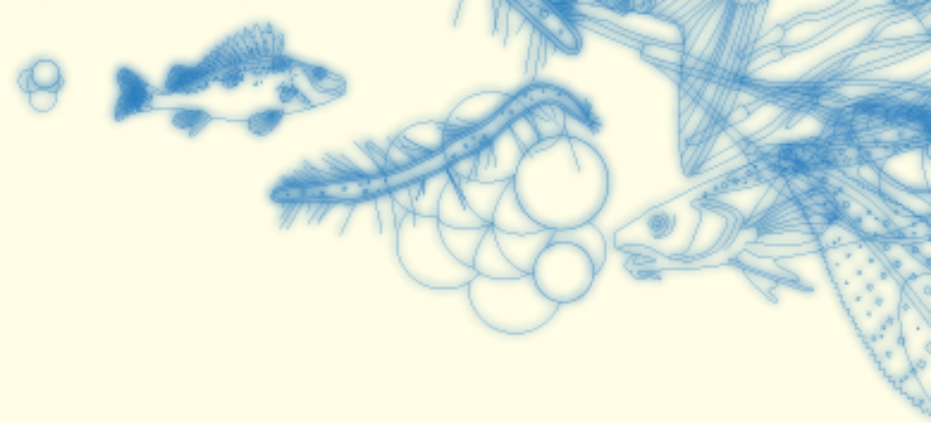
## JDS4: KEY FINDINGS

- ✓ Analysis of antibiotic resistant bacteria showed a significant increase in multi-resistance.
- ✓ Target analysis of WFD PS, EU Watch List and Danube RBSPs in water showed only occasional exceeding of Environmental Quality Standards;
- ✓ Hg and brominated diphenylethers in biota showed concentrations higher than the EQS at all sites;
- ✓ Wide-scope chemical target screening and non-target screening proved to be a promising alternative to target analysis of WFD PS and RBSPs;



## JDS4: KEY FINDINGS

- ✓ Processing screening data (>2,600 substances from wide-scope target screening, >65,000 substances used for suspect/non-target screening) → prioritisation of Danube River Basin Priority Substances in water, biota, sediment, wastewater and groundwater.
- ✓ Analysis of groundwater showed that for some compounds lower concentrations were detected in groundwater than in the Danube, but the opposite situation was also observed;
- ✓ No Groundwater & Drinking Water Environmental Quality Standards exceeded but new compounds may pose a risk;

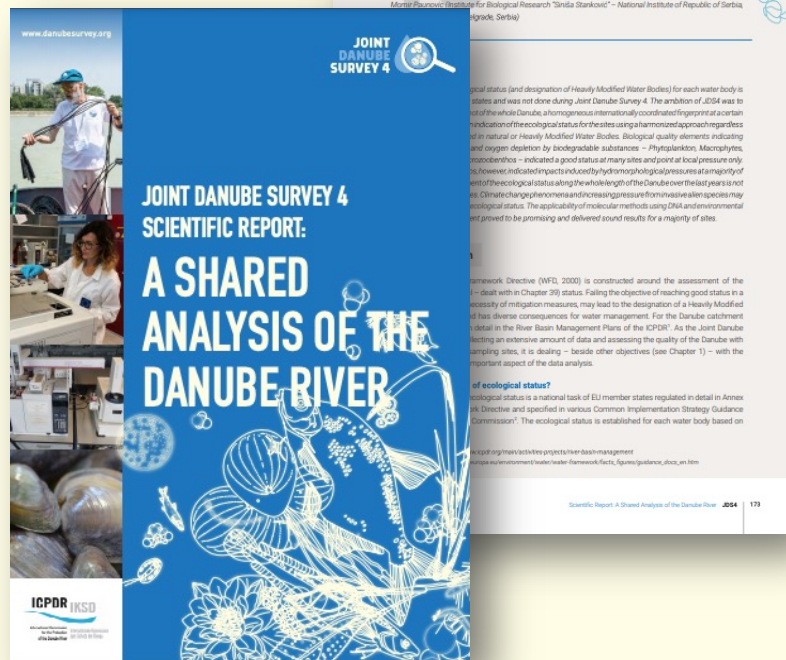


## JDS4: KEY FINDINGS

- ✓ First ever comprehensive screening of microplastics along the Danube established a baseline of pollution by MP;
- ✓ Rare Earth Elements monitored for the first time;
- ✓ Radioactive contamination of the Danube with artificial nuclear fission radionuclides  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  decreased 100x since Chernobyl accident (1986) - no indication of hazardous man-made radioactive contamination.



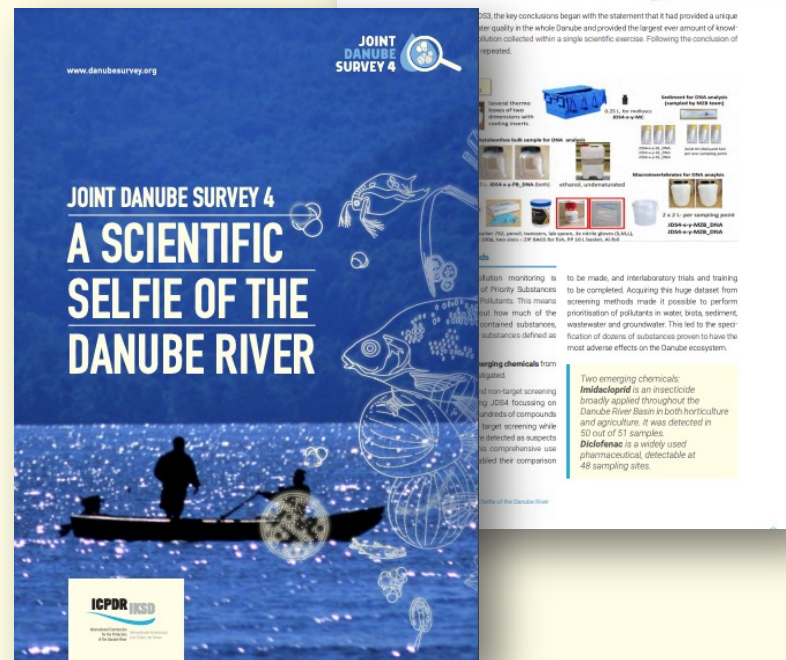
# Public & Scientific Reports



## JDS4 Scientific Report

565-page report (print & PDF): Available at

[www.danubesurvey.org/jds4/publications/scientific-report](http://www.danubesurvey.org/jds4/publications/scientific-report)



## JDS4 Public Report

23-page report (print & PDF): Available at

[www.danubesurvey.org/jds4/publications/public-report](http://www.danubesurvey.org/jds4/publications/public-report)

# Fish Cards

These cards provide information about the characteristics of selected species.

Due to a variety of pressures on aquatic habitats, many of our Danube fish are endangered. On each card, the status of the fish species on the Red List of the International Union for Conservation of Nature (IUCN.org) is given.

Fish are ideal indicators of the ecological quality of the ecosystem. For this reason fish are one of the biological quality elements defined in the Water Framework Directive of the European Union (WFD), together with invertebrates, water plants and plankton.



Available as printed card sets or PDF versions  
in both English & German

Visit: [www.danubesurvey.org/jds4/publications/fish-cards](http://www.danubesurvey.org/jds4/publications/fish-cards)



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DANUBE  
SURVEY 4**



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