

# Future IAD: Acting together for the conservation of the Danube River system



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60 years ago, it seemed a 'curiosity that the largest Central European river, the Danube, had so far found relatively little limnological interest'. This statement of IAD-founder Reinhard Liepolt in 1961 came as a consequence of the lack of knowledge about this riverine ecosystem and addresses the challenge of cooperation between the numerous Danube countries at that time (Liepolt 1961). What was the vision of the IAD founding members and, more importantly, is it still relevant?

Their scientific concept was to act together for a joint study of Danube, organizing cruises from the mouth to the source and developing standardised methods to speak in one scientific language about the riverine conditions. This is how the knowledge about Danube developed gradually from describing aquatic habitats and biocoenoses of single stretches, to holistic studies of processes and mechanisms governing the functionality of the whole Danube River and its major tributaries, being considered in national and regional environmental policies, nature conservation and environmental education activities.

All these points follow the statutes of IAD, aiming to:

- encourage and support scientific research in the Danube region in the fields of limnology, ecology and related fields
- act for environmental, natural and water protection in the Danube region, cooperate with related organizations (such as environmental NGOs or intergovernmental bodies)
- increase public awareness on topics of water ecology and water conservation

The aim for integrated research and cooperation among Danube scientists is vivid also today and represents the backbone of IAD activities.

In order to meet the big challenges faced nowadays, we plan to focus on 3 main pillars:

## 1. Fostering joint research along Danube River and the riverine network

While there is general agreement that science is needed to provide a sound basis for future development of the Danube Region, scientific outputs are heterogeneously distributed in the region. To enhance the scientific excellence and foster closer collaboration among scientists, we plan to:

- increase knowledge exchange between scientists studying the Danube system by facilitating student attendance at scientific conferences, short-term exchanges, organization of seminars, summer schools and summer camps, aiming for initiatives to link Master, PhD and post-doc studies, etc.
- establish student volunteering programs in the Danube Region (1-2 weeks up to 1-3 months) and link them with relevant international universities
- encourage transboundary studies and publications among IAD scientists
- create a mentoring program between advanced research teams and their counterparts to build future project partnerships. For example, the CEEPUS network EcoMan-Aqua ([www.ceepus.info](http://www.ceepus.info)) was established by several IAD members in 2017 to provide mobility for teaching and joint supervision of graduate students within the CEEPUS network and with other partners (DN 36).

To achieve these goals, inter-institutional cooperation at transnational level is an essential aspect. Over the years, members of IAD developed numerous transboundary partnerships and research projects (e.g. MEASURES, MARS, AQUACROSS, RESI, RISE, DANUBIUS-RI, DANUBE:FUTURE, DREAM, ESMERALDA, ECOPOTENTIAL, ISOBEL, FITHYDRO, Danube Sediment, Danube Floodplain, STURGEON 2020, ESENIAS – TOOLS, LIFE Sturgeon), and we intend to foster such activities also in the future by:

- creating a network of existing field stations/units along the Danube River and its major tributaries in support of joint research/education activities,
- identifying major knowledge gaps for specific areas of the Danube River Basin
- launching transboundary research projects to complete the knowledge base and foster a more comprehensive understanding
- supporting small projects along the Danube River and its main tributaries for young scientists (regular calls on IAD website).



*Figure 1: Preserving natural riverine systems is essential for biodiversity conservation. Channel in the Danube Delta. Photo: Cristina Sandu*

Recent books of IAD members document the multiple aspects of joint activities in Danube research and project implementation. These books cover various topics such as fish (Kováč 2015), macrophytes (Janauer et al. 2018), invasive species (Trichkova et al. 2017), Danube historical landscape development (Jungwirth et al. 2014), the sustainable management in the Danube River Basin (Schmutz & Sendzimir 2018) and sustainable restoration of former stretches of the main river (Dokulil et al. 2018).

## **2. Increasing public awareness and promoting environmental education**

Environmental education, dissemination of scientific output (publications, conference presentations) and communication of scientific results to stakeholders and experts with different background (navigation, hydropower, fishery) form since the foundation a key part of IAD legacy in support of Danube environment. For this reason, over the past years we have participated in numerous environmental education events (Danube Day, World Fish Migration Day, school events, summer camps), and we plan to continue such activities with key actors in the region also in the future. Furthermore, we extend these activities also to more enhanced exchange with younger generations and the educational system in the Danube region. For example, IAD has cooperated recently with a Slovenian partner to develop e-learning tools for environmental education for primary and secondary schools in the Lower Danube Region (guidebooks and experiments presenting river bio-

diversity and mechanisms enabling self-purification processes) (<https://water-detective.net/>).

As expertise in IAD covers also other topics on aquatic ecosystems, we can transpose scientific output into easily accessible teaching materials highlighting e.g. the impact of current environmental challenges on water resources and aquatic biodiversity, or ecological mechanisms and processes in aquatic ecosystems. Thus, we can offer children, youth and the wider public an easier access to knowledge and information on options to prevent further degradation of the aquatic environment and how they can contribute to its conservation.

## **3. Acting for implementing scientific results by communication at the science – policy interface**

Over the years, IAD scientists cooperated closely with water authorities in the Danube Region, facilitating the consideration of scientific results into decision tools. After the establishment of the International Commission for the Protection of the Danube River in 1998, IAD became an observer to this international governmental organization, providing state-of-the-art scientific knowledge regarding river systems.

Over the past decade, IAD was involved also in transdisciplinary dialogues with navigation, hydropower, flood protection, presenting scientific evidence for river management and biodiversity conservation. IAD has also contributed to the implementation of the EU directives and international conventions devoted to biodiversity conservation and ecosystem health, such as Water Framework Directive, Birds



and Habitats Directives, Bonn Convention, Bern Convention and the Convention on the Biological Diversity.

The activities foreseen in pillars 1 & 2, targeting harmonization of aquatic research activities in the Danube Region and fostering excellence in research, facilitate the provision of sound scientific evidence concerning the status and the evolution of aquatic ecosystems across the Danube Region. Transferring such knowledge at local and regional policy level also in the future is crucial for informed decisions about water management.

To foster this ecosystem knowledge transfer, we plan to:

- enhance IAD's role and contribution to policy level (ICPDR, EUSDR, EC) by developing relevant projects, continuing and extending our work in different expert groups and informing on state-of-the-art scientific results,
- enhance dissemination of scientific results to policy stakeholders and the wide public via books and scientific articles, the IAD Bulletin Danube News, policy notes or other communication materials,
- create specific programs addressing several key groups of stakeholders, as experience exchanges, trainings, participation in joint field trips and scientific projects, aiming to raise awareness on the importance of aquatic biodiversity conservation

To conclude: Many aspects of research on the Danube River Basin were stimulated by IAD scientists over the last decades. In future, IAD will not only continue these studies, but will also dedicate more attempts to assemble individual research outcomes in order to obtain an integrative picture

of the status of this river system and to better contribute to its conservation. Balancing a healthy river system on the one hand, and its sustainable use on the other, is a challenge that we should try to overcome together, so we can preserve the Danube ecosystem also for the generations to come.

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## The challenge of Invasive Alien Species

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Since 2008, I have been an active member of IAD, and in 2017, I became the head of a newly established expert group on Invasive Alien Species (IAS). By creating such an expert group, IAD has reacted to an important threat to biodiversity in the Danube River Basin (DRB).

The introduction and spread of IAS in the DRB have increased recently. As a result, the biodiversity and ecosystems are affected, and adverse socio-economic effects and impact on human health have been reported. However, still there are many gaps related to the IAS distribution, magnitude of impact, pathways of introduction and spread, and other issues. In response to this growing concern and the necessity of cooperation and coordinated actions at regional level, in 2014, the IAD together with the Priority Area 06 of the EU Strategy for the Danube Region and other organisations initiated the establishment of the **Danube Region Invasive Alien Species Network (DIAS)**. Furthermore, to

strengthen the scientific multidisciplinary approach related to IAS, in 2017, IAD established the **Invasive Alien Species Expert Group** as one of the current 12 IAD expert groups. Thus, IAD helps to reach the targets of DIAS, which comprise: 1) sharing of knowledge; 2) formulating a strategy and work plan to efficiently tackle the issue of IAS in the Danube Region; 3) considering and cooperating with existing European and global IAS networks and organisations; 4) developing individual but coordinated projects in the single regions; and 5) promoting the transfer of know-how and expertise to actors on all administrative levels in a transnational context.

Currently, the IAD Invasive Alien Species Expert Group and DIAS collaborate closely in activities such as:

- Implementation and development of joint projects: Danube-IASapp (2016–2017), Danube IAS Corridor (ongoing), Danube IAS Corridor 2 (2019), Alien CSI (2018–2022);
- Organisation and participation in scientific conferences and forums: Joint ESENIAS and DIAS scientific con-