

- Postel S, Carpenter S (1997): Freshwater ecosystem services. In: Daily GC (ed.) *Nature's Services: Societal Dependence on Natural Ecosystems*. Island Press, Washington, DC, 195–214
- Pusch M, Fiebig D, Brettar I, Eisenmann H, Ellis BK, Kaplan LA, Lock MA, Naegele MW, Traunspurger W (1998): The role of micro-organisms in the ecological connectivity of running waters. *Freshwater Biology* 40, 453–494.
- Pusch M, Hoffmann A (2000): Conservation concept for a river ecosystem (River Spree, Germany) impacted by flow abstraction in a large post-mining area. *Landscape and Urban Planning* 51 (2–4), 165–176.
- Schindler S, Sebesvari Z, Damm C, Euller K, Mauerhofer V, Hermann A, Biró M, Essl F, Kanka R, Laawars SG, Schulz-Zunkel C, van der Sluis T, Kropik M, Gasso V, Krug A, Pusch M, Zulka KP, Lazowski W, Hainz-Renetzeder C, Henle K, Wrba T (2014): Multifunctionality of floodplain landscapes: relating management options to ecosystem services. *Landscape Ecology* 29, 229–244.
- Schindler S, O'Neill FH, Biró M, Damm C, Gasso V, Kanka R, Laawars S, Sebesvari Z, van der Sluis T, Krug A, Pusch M, Baranovsky B, Ehlert T, Neukirchen B, Martin JR, Euller K, Mauerhofer V, Wrba T (2016): Multi-functional floodplain management in temperate Europe and evidence for biodiversity effects: an expert consultation. *Biodiversity and Conservation* 25, 1349–1382.
- Stammel B, Amtmann M, Gelhaus M, Cyffka B (2018): Change of regulating ecosystem services in the Danube floodplain over the past 150 years induced by land use change and human infrastructure. *Die Erde* 149, 2–3, 145–156.
- Tockner K, Pusch M, Borchardt D, Lorang MS (2010): Multiple stressors in coupled river-floodplain ecosystems. *Freshwater Biology* 55 (Suppl. 1), 135–151.
- Tockner K, Pusch M, Gessner J, Wolter C (2011): Domesticated Ecosystems and Novel Biotic Communities: Challenges for Water Management. *Ecology and Hydrobiology* 11, 167–174.
- Wilczek S, Fischer H, Brunke M, Pusch MT (2004): Microbial activity within a subaqueous dune in a large lowland river (River Elbe, Germany). *Aquatic Microbial Ecology* 36, 83–97.

Nine countries unite for a common purpose: the protection of migratory fish in the Danube River Basin

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This year nine countries along the Danube (Germany, Austria, Slovakia,

Slovenia, Hungary, Croatia, Serbia, Romania and Bulgaria) join forces in an international project to conserve endangered migratory fish species in the Danube river basin by identifying and improving access to habitats and promoting the establishment of ecological corridors. Ukraine experts support the project to enlarge the spatial scope to the northern part of the Danube Delta.

The project under which these states will work over the next three years to achieve the objectives is called MEASURES (Managing and restoring aquatic ecological corridors for migratory fish species in the Danube river basin) and officially started in October 2018. Financial support is provided by the Interreg Danube Transnational Program.



Figure 1. Between 17 and 22 September 2018, the Danube Delta National Institute organized a training workshop to discuss and harmonize sampling methods (© D. Trauner)

The Danube is home to some of the most important sturgeon and other migratory fish populations (e.g. shads, barbel, nase etc.). Bulgaria and Romania hold the only – still – viable populations of wild sturgeon species in the European Union. The remaining populations have faced a dramatic decline in the past decades due to man-made barriers that prevent their migration and their ability to spawn, such as dams or hydropower plants. These barriers fragment the natural habitats of migratory fish, making it impossible for fish to move up or downstream to spawn or reach feeding grounds. In the long term, these barriers, along with other anthropogenic human activities such as overfishing, pollution and habitat destruction, will lead to the extinction of the species unless action is taken now.

In order to address the problem of migratory fish reaching their habitats, MEASURES will lay the foundation to establish ecological corridors by identifying key habitats and by initiating transboundary protection measures along the Danube and its main tributaries. The main actions through which the project aims to achieve all the objectives are:

- developing and testing a methodology for mapping and identifying habitats for migratory fish species;
- design a harmonized strategy for restoring ecological corridors and supporting implementation in future management plans;
- restocking of two native species to conserve their genetic pool in Hungary (*Acipenser ruthenus*) and Romania (*Acipenser gueldenstaedtii*), in order to establish a network for concerted repopulation of the target species and to compose a manual for the operation of broodstock facilities that will provide the offspring needed for future re-population efforts;
- implementation of the MEASURES Information System will facilitate the access of relevant information to experts, decision-makers and the general public. Concrete input into future drafts of policy- and man-

agement plans will secure the consideration of our project outcomes into sustainable measures aimed to restore the function of ecological corridors.

The Danube and its tributaries are key migration routes for sturgeons and other migratory fish, such as barbel and nase. These species are excellent bio-indicators of the effectiveness of ecological corridors due to their specific needs during their long lifecycles. This is especially true of sturgeons, which typically migrate long distances and are an important part of the natural heritage of the entire Danube Region. Their dramatic decline in the last few decades has become an issue of basin-wide importance, documented by the Danube countries and the European Commission.

Training workshop on assessment of migratory fish habitat and behavior

The MEASURES project began with two important activities. The first one dedicated to the NGO environment and for specialists of academic and relevant institutions in the partner countries was the training workshop on assessment of migratory fish habitat and behavior.

Experts from seven Central and Eastern European countries gathered in Tulcea from 17 to 22 September, in the framework of a course supported by specialists from the Danube Delta National Institute for Research and Development. The purpose of the six days was to exchange experience(s) and share good practices along the Danube and its tributaries, in order to better study and understand sturgeons, the emblem species of this river. Discussions were focused on the identification of sturgeon species' habitats, ways to identify breeding, wintering or resting areas, behaviors of sturgeon species, and good practices and examples from all participating countries.



2. The participants of the Kick-Off Conference in Vienna (© R. Becsi)

The Kick-off Conference took place this autumn in Vienna

On the first two days of October the Kick off Conference organized in Vienna officially launched the MEASURES project. Together with the project partners, also representatives from the relevant institutions for the conservation of sturgeons in Europe were present. Among them were: Gusztáv Csomor, Project Officer, Joint Secretariat – Danube Transnational Programme, Karl Schwaiger, Austrian Ministry for Sustainability and Tourism, Ivan Zavadsky, Executive Secretary, International Commission for the Protection of the Danube River and Jörn Gessner, Leibniz Institute of Freshwater Ecology and Inland Fisheries.

Important topics have been reached to achieve the project's objectives, a series of opinions have been set out to support work on the conservation of migratory fish in the Danube River Basin. And the solution is the synergy of all projects of the partner institutions and their work, the exchange of experience and expertise, the cooperation to maximize work for migratory fish of the Danube.

MEASURES is a project co-funded by the European Union (ERDF, IPA), www.interreg-danube.eu/measures

Strategies for restoration and conservation of aquatic biodiversity in the Danube River Basin – Findings from the H2020 AQUACROSS project

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The AQUACROSS project in a nutshell

Knowledge, Assessment, and Management for AQUatic Biodiversity and Ecosystem Services aCROSS EU policies (AQUACROSS, <https://aquacross.eu>) is a Horizon 2020 project (June 2015 – November 2018) aiming to support EU efforts to protect aquatic biodiversity and ensure the provision of aquat-

ic ecosystem services. Besides water quality problems, hydro-morphological alterations, such as disconnection of floodplains, threaten riverine ecosystems and their biodiversity, and are a particular challenge along the Danube. Multiple human activities, including the construction of hydropower plants, expansion of agriculture, and large-scale river regulation measures related to navigation and flood protection are resulting in an ongoing loss of habitat and biodiversity. In the Danube River Basin case study, the AQUACROSS Assessment Framework (Gómez et al. 2016) thus was applied to identify how management of river-floodplain systems along the Danube can