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Request to integrate important recent results and insights of the MEASURES project to the Danube River Basin Management Plan, update 2021

To the DRBMP-Update 2021 working-group and decision makers,

We sincerely acknowledge and appreciate the efforts within the Danube River Basin Management Plan, Update 2021, and the excellent progress already made, to promote the conservation and restoration of habitats, to improve physical and ecological connectivity and to re-establish functioning fish migration routes. We appreciate that chapter 6.7 of the draft DRBMP Update 2021 summarizes key measures needed for effective restoration of sturgeon populations; it shows that the commitment to establish fish migration across the Iron Gate dams continues and that solutions for a fish passage at Gabčíkovo are being explored. Finally, management objectives for 2027 also address well the issues of existing or potential future barriers. We recognize, that the DRBMP Update states explicitly, that transversal structures such as dams and weirs act as barriers for the migration of fish and prevent their access to habitats and spawning grounds.

We also recognize that preliminary results from the MEASURES project have already been considered in the current draft version of the DRBMP as of March 2021. This concerns in particular the inclusion of sturgeon habitats identified and compiled during the MEASURES project. Further, we welcome that the DRBMP highlights the need that Contracting Parties will be obliged to review their own activities and plans in the light of the results of the MEASURES project.

Nevertheless, we would like to strengthen the necessity of preserving and restoring migratory fish populations, their habitats and migration routes in the current DRBMP Update. Human impacts on global freshwater fish biodiversity are severe (Su et al. 2021) and the Danube River basin is no exception, especially with regard to migratory fish (Schiemer et al. 2003, Kováč 2015, JDS4 2021). Of the six long distance migratory fish considered in MEASURES¹, the three sturgeon species are critically endangered. Of the nine

¹ *Acipenser gueldenstaedtii*, *Acipenser stellatus*, *Huso huso*, *Alosa immculata*, *Alosa tanaica*, *Salmo labrax*

potamodromous species investigated, one is extinct² and seven are classified as endangered in at least one Danube country (MEASURES 2021a).

Hydro-morphological alterations and subsequent adverse effects on habitats and river continuity threaten migratory fish species in particular. Both features characterize long sections of the Danube River. It is expected that Future Infrastructure Projects related to hydropower use, navigation and flood protection will worsen the situation.

The MEASURES consortium promotes the idea of fully functional ecological corridors, integrating physical continuity, suitable habitats for all life stages of different migratory fish and viable fish populations. The inherent conservation and restoration of habitats and all migratory fish species and populations as ecological and cultural heritage as well as a future food and genetic resource is of particular importance.

The MEASURES consortium has developed approaches to identify important habitats for migratory fish and identified a core set of important habitats, which are presented in maps as basis for further protection as well as for planning of remediation of obstacles to migration to these habitats. Future efforts are necessary to identify further key habitats.

Based on the project results, the MEASURES consortium invites ICPDR and contracting parties to consider the subsequent lines of action with regard to restoration of river continuity, identification, restoration and protection of habitats and monitoring of migratory fish.

Monitoring, assessment, conservation and restoration of the ecological corridor

Conservation and restoration of ecological corridors³ should be adequately considered in any further planning and management activities. In order to account for the ecological corridor and its elements in pressure evaluation and status assessment as well as in management and planning we suggest to add:

To chapter 2.1.6.4., Future Infrastructure Projects (pag 52)

These projects, if implemented without full consideration to effects on water status, are likely to provoke impacts on water status due to hydromorphological alterations **and impediment to migratory fish and other organisms**. These projects need to be addressed accordingly and since the planning phase, it is needed to integrate **green infrastructure, nature based solutions and** mitigation measures in order to reduce/cancel the potential impacts on water status.⁴

To chapter 4.1., Surface Water, section Ecological status/ecological potential (pag. 67)

Ecological status results from assessment of the biological status of all WFD biological quality elements (fish, benthic invertebrates, phytoplankton, phytobenthos and macrophytes) and the supportive physico- chemical parameters (general and specific pollutants) as well as hydromorphological parameters (hydrological regime, river continuity and morphological

² *Acipenser nudiventris*

³ The concept of a river basin as an ecological corridor encompasses the physical waterbody as a migration route or passageway for aquatic organisms, different categories of habitat, its inherent habitat use and “habitat-using”- fish populations, as well as all processes and exchanges like information (e.g. behavioural, genetic), turnovers (e.g. energy, biomass, bed load) necessary for the ecological functioning of the system to support viable populations of native fish and migratory species.

⁴ Suggested amendments highlighted in blue

conditions, [i.e. of habitats and the ecological corridor](#)), following the principles stipulated in the WFD Annex V.

To chapter 4.1.6., Gaps and Uncertainties of Status Assessment of Surface Water Bodies (pag. 80 – 81, paragraphs three and four):

The way forward presented in the DRBMP Update 2015 necessitated that the missing sampling and assessment methods shall be developed and that the already existing sampling and assessment methods should be transferred between the countries and adapted to the local needs. Special attention was suggested to be given to further development of ecological assessment methods for phytobenthos, phytoplankton, macrophytes and fish. [The Danube Migratory Fish Habitat Manual developed in MEASURES can serve as a valuable basis \(MEASURES 2021b\)](#). Information exchange between the national experts was considered to be an important prerequisite for this process. All these recommendations had been materialised during the JDS4. The new active approach applied in JDS4, which included the training workshops for each biological quality element organized prior to the survey, provided an excellent opportunity for harmonization and training in WFD related monitoring. Some uncertainties concerning fish assessment are remaining though.

In addition, there is a lack of experiences with methods for ecological potential assessment for HMWB stretches of the Danube and its tributaries (including reservoirs). Future activities have to be focused on sharing knowledge [and harmonizing methods](#) among the Danube countries on the assessment methods for the ecological potential for relevant biological communities (especially for benthic invertebrates and fish). This should include experience with MEP setting and selection of relevant BQE and relevant metrics.

To chapter 6.3., River Basin Management and Nature Protection (pag. 93):

Infrastructure projects, which are fully or partly located in protected freshwater habitats and which are likely to have a significant effect must be carefully planned and assessed in order to avoid conflicts. [Promoting Green Infrastructure and nature based solutions should be the basis of any planning](#). EU Habitats Directive Article 6(3) provides for an appropriate assessment of the impacts of such plans or projects.

To chapter 6.4., Inland Navigation and the Environment (pag. 96), add the following bullet point to the existing list

- [Promote as much as possible green infrastructure and nature based solutions](#)

To chapter 8.1.5.3.1, River Morphological Alterations (pag. 146), section Management Objectives, add the following bullet point

- [Ensure that habitats already identified by MEASURES as critical are protected with the set of legislation in place at the national as well as at the international level \(e.g. Natura 2000/FFH Directive; Nature Restoration Laws\)](#)
- [Complete the map produced by MEASURES of habitats for migratory fish species and their protection status](#)
- [Ensure that management plans are in place for these habitats and they consider the needs of migratory fish](#)

- Allocate appropriate resources to continue identification of habitats of key importance for migratory fish and to monitor progress;
- Ensure that location and extent of measures foreseen for implementation by 2027 to improve river morphology by identification, protection or restoration of habitats are specified by each country
- Establish working relations with authorities responsible for nature protection and biodiversity in Contracting parties to implement these measures
- Extend working relations with the Black Sea Commission to successfully address the improvement of (long distance) migratory fish populations
- Support regular monitoring of migratory fish populations and habitat status to detect changes and allow for effective management measures.
- Include monitoring of migratory fish into the scope of ICPDRs Transnational monitoring and devote a separate section of the “TMNM Yearbook” to migratory fish
- Mandate a working group to design a Danube wide network of monitoring sites and a monitoring program tailored to migratory fish (building on monitoring of fish already in place to meet requirements of EU Water Framework Directive and Nature Conservation legislation).

Eliminate or mitigate the effects of migration barriers

In order to further improve longitudinal connectivity, the assessment of barriers and to decrease their impact on the ecological corridor we recommend to add to chapter 8.1.5.2.1, Interruption of River Continuity for Fish Migration (pag. 138), section Management Objectives, the following bullet points:

- Iron Gate dams as key obstacle for migration of fish from Lower Danube to Middle Danube and Gabčíkovo-dam as key obstacle for migration of fish from the Middle Danube to the Upper Danube Remain are top priorities in the Danube River Basin Management Plans for the period 2021 -2027.
- Address other obstacles blocking access to habitats already identified as critical by MEASURES equally in the national (and where appropriate: International) river basin management plans
- Explore opportunities for removal of barriers as a first choice
- Allocate sufficient funds for remediation of these obstacles
- Ensure that appropriate mechanisms are in place (such as periodical reporting in Annual meetings of ICPDR on progress) to avoid further delays in remediation
- Allocate appropriate resources to ensure that ecological corridors in large rivers work well for upstream migration as well as for downstream migration, whereas several open questions still need clarification
- Standardize and harmonize methodologies for assessment, implementation and function control of barrier / dam removal as well as for establishing passing solutions and communicate these methods among experts and cross-sectoral groups.
- Ensure that fish-migration aids at bottlenecks of key importance for the entire Danube Basin (e.g. Iron Gates, Gabčíkovo...) as well as of high importance at the regional level are monitored (including continuous / automatic registration of migrating fish) to prove that fish migration aids work properly, that ecological corridors and measures

taken (such as e.g. supporting stocking efforts) deliver and to get indications of populations of migratory fish in place.

- For ecological prioritization of measures for river continuity restoration the creation of coherent stretches of ecological corridors should be taken into account, i.e. sections, which link important habitats and populations within the Danube as well as towards/within tributaries; linking Black Sea and Danube.

Strengthen inter-sectoral exchange and cooperation on transboundary and basin-wide scale

MEASURES has proven the effectiveness of national cooperation via a series of national workshops, to which stakeholders from different sectors were invited and attended. We think the networks established should be strengthened, in particular as we see also potential for future transboundary and international exchange. Therefore, we propose

To add to chapter 6, Integration Issues (pag. 90), after the first sentence as follows:

The integration with other sector policies is an important issue in the Danube River Basin in order to create synergies and avoid potential conflicts. Activities are ongoing to continuously implement and further intensify the exchange with different sectors such as inland navigation, hydropower, agriculture, and nature protection including sturgeon conservation activities. [The Local Migratory Fish Networks established in several Danube countries in the MEASURES project](#) have proven to be good platforms for stakeholder discussion and debates on a specific target and can be used as a basis for future efforts.

To add to chapter 5.1. Management Objectives (pag. 88-89):

b. help to bridge the gap between measures on the national level and their agreed coordination on the basin-wide level to achieve the overall WFD environmental objective. [This requires the identification of opportunities for basin-wide level exchange of different sectors.](#)

To chapter 6. Integration Issues (pag. 90):

The integration with other sector policies is an important issue in the Danube River Basin in order to create synergies and avoid potential conflicts. Activities are ongoing to continuously implement and further intensify the exchange with different sectors such as inland navigation, hydropower, agriculture, and nature protection including sturgeon conservation activities. [Opportunities for basin-wide level exchange of different sectors have to be identified and agreed upon.](#)

Finally, we would like to emphasize that MEASURES has prepared a manual for genetic conservation for Danube sturgeons. Therefore, we would like to propose adding to the chap. 6.7., Sturgeon Conservation, second box (Ex-Situ Conservation Hatcheries Project Upper Danube), on pag. 104:

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A genetic conservation manual for ex-situ Danube sturgeon live gene stocks to assist the development of supportive restocking (MEASURES 2021c) and guidelines for ex-situ facilities have been developed.

References:

- Bammer V. et al. 2021: Fish. In: Liška I., Wagner F., Sengl M., Deutsch K., Slobodník J., Paunović M. (eds): Joint Danube Survey 4, A Shared Analysis of the Danube River. Scientific Report. ICPDR, Vienna.
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- MEASURES, 2021a: Strategy for Ecological Corridor Conservation and Restoration in the Danube Catchment. Eds. G. Haidvogel, C. Munteanu, R. Reinartz. BOKU, Institute of Hydrobiology and Aquatic Ecosystem Management, Vienna, Austria.
- MEASURES 2021b: Danube Migratory Fish Habitat Manual. Eds. Cokan B., Paraschiv M., Pekarik L. Danube Delta Technological Center Publishing House, Tulcea, Romania.
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- Schiemer, F., Guti, G., Keckeis, H. & Staras M., 2003: Ecological Status and Problems of the Danube River and its Fish Fauna: a review, Proceedings of the Second International Symposium on the Management of large rivers for Fisheries, Sustaining Livelihoods and Biodiversity in the New Millennium 11th - 14th February 2003 in Phnom Penh, Kingdom of Cambodia, Welcomme, R.L. & Petr, T. (eds.), Volume I, pp. 273-299.
- Su, G., Logez, M., Xu, J., Tao, S., Villéger, S. & Brosse, S., 2021: Human impacts on global freshwater fish biodiversity. DOI: 10.1126/science.abd3369 (6531), 835-838.371