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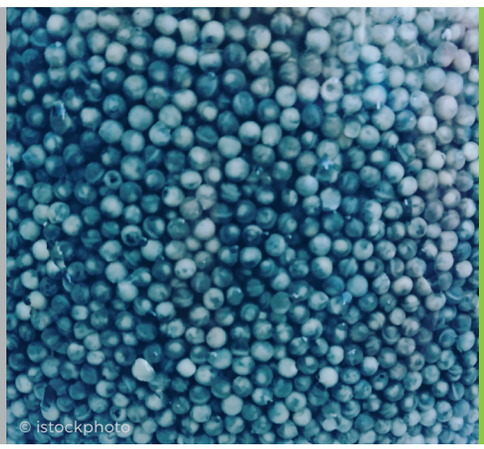
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Strengthen migratory fish


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Strengthening endangered migratory fish populations targets sturgeon populations. In this step, we will develop a strategy to conserve the genetic pool of two Danube sturgeon species (Sterlet in HU, Russian sturgeon in RO) including restocking pilot actions.

The strategy represents an urgently needed and novel guidance for broodstock holding of Danube sturgeons in artificial conditions, gathering and generating knowledge on the status and requirements of migratory fish species in the Danube basin. The objective of strengthening migratory fish populations is further enriched by science-based conservation restocking events.

Who we are addressing to:

- **regional public authority**
- **national public authority**
- **interest groups including NGOs**
- **higher education and research institutes**
- **enterprises**

Genetic integrity is the key to success

To ensure success and sustainability, such activities need to be distinguished clearly from ordinary aquaculture operations. Therefore, ex-situ live gene stocks have to be maintained long-term without loss of genetic diversity to ensure the success of genetic conservation. The conservation management by individual identification and genetic analysis of the captive broodstock is the keystone in protecting the genetic integrity of native populations.

Also, findings of genetic analysis will provide information about genetic connectivity and thus indirectly about habitat connectivity (i.e. penetrability of bio-corridors) along the sampled Danube section. This is also referred to as a keystone of ex-situ sturgeon conservation by the Sturgeon 2020 initiative of ICPDR (International Commission for the Protection of the Danube River) and DSTF (Danube Sturgeon Task Force) and can be seen as a key contribution to foster genetic connectivity in the Danube River Basin.

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Work package lead partner:
National Agricultural Research and Innovation Centre, Research Institute for Fisheries and Aquaculture (NAIK-HAKI)

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Responsible Project Partner:

National Agricultural Research and Innovation Centre, Research Institute for Fisheries and Aquaculture (NAIK-HAKI)

The NAIK-HAKI, the BOKU and IBER-BAS will conduct a comprehensive literature study. Based on this, the NAIK-HAKI and the BOKU will develop a conservation manual for Danube sturgeon species.

The eDNA study will be done under the lead of BOKU, with IMSI and NAIK-HAKI contritbuting to the study design. The sampling will take place through a cooperation between MEASURES partners and the Joint Danube Survey. The NAIK-HAKI will contract an external expert on eDNA techniques, who will lead the study and conduct the laboratory work and method-development..

The restocking activities of sterlet and Russian sturgeon individuals will be managed through the cooperation of NAIK-HAKI, University of Belgrade - Institute for Multidisciplinary Research, Danube Delta National Institute for Research and Development and Institute of Biodiversity and Ecosystem Research at the Bulgarian Academy of Sciences, while the broodstock holding facility design will be conducted by experts from NAIK-HAKI and BOKU.

Furthermore, a genetic conservation manual for Danube sturgeon species will be developed as a second objective, providing the basis for ex-situ conservation actions for the remaining Danube sturgeon species, as well as potentially other aquatic organisms.

What we will do

» ***Ex-situ gene stocks of Danube sturgeons***

To initiate and maintain ex-situ gene stocks it is essential to collect wild specimens or descendants of wild individuals (min. 10 per species for further reproduction) in locations of the PP due to imminent danger of extinction in the wild. The ex-situ stocks of two species in this project (A. gueldenstaedtii and Aruthenus) can be managed in specialized facilities designed and used for maintaining gene banks.

» ***Method for presence of rare Danube Sturgeons***

Traditional catch-based sampling techniques cannot provide reliable information about the presence and distribution patterns of dramatically declined sturgeon species. This information would be a prerequisite to implement appropriate restoration or reintroduction actions in line with the IUCN guidelines. Novel molecular techniques (environmental DNA) will be adapted to the characteristics of Danube sturgeons. A methodological guide of this technique will be provided.

» ***Pilot restocking of Russian sturgeon and Sterlet***

Pilot restocking activities are directly contributing to revive and strengthen Danube sturgeon populations/ the biodiversity of the river's ecosystem. Furthermore, evaluation of survival and distribution patterns of released sturgeons by in-situ surveys gives valuable insight for larger restocking plans in the future. For this purpose, mapping the bio-corridor is essential, covering the Middle and Lower Danube Region parts.

» ***Design of ex-situ preservation in sites***

In this step, we will develop a facility design with cost estimates for pilot sites to allow the establishment of living gene stocks within follow-up projects. Safety, accessibility, access to clean Danube water, operation by several states and further criteria identified during the project work will influence the selection of sites.

The MEASURES academic partners are responsible for providing scientific experience and background in laboratory and experimental studies and the preparation process of manuals. Some specific findings/ output (e.g. eDNA, genetic profile of sturgeons) potentially have a high impact on fundamental research and will be presented on scientific events.

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