

DANUBE WATCH

THE MAGAZINE FOR THE DANUBE RIVER · WWW.ICPDR.ORG 1/2019

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Conservation Action



ICPDR **IKSD**

International Commission
for the Protection
of the Danube River

Internationale Kommission
zum Schutz der Donau

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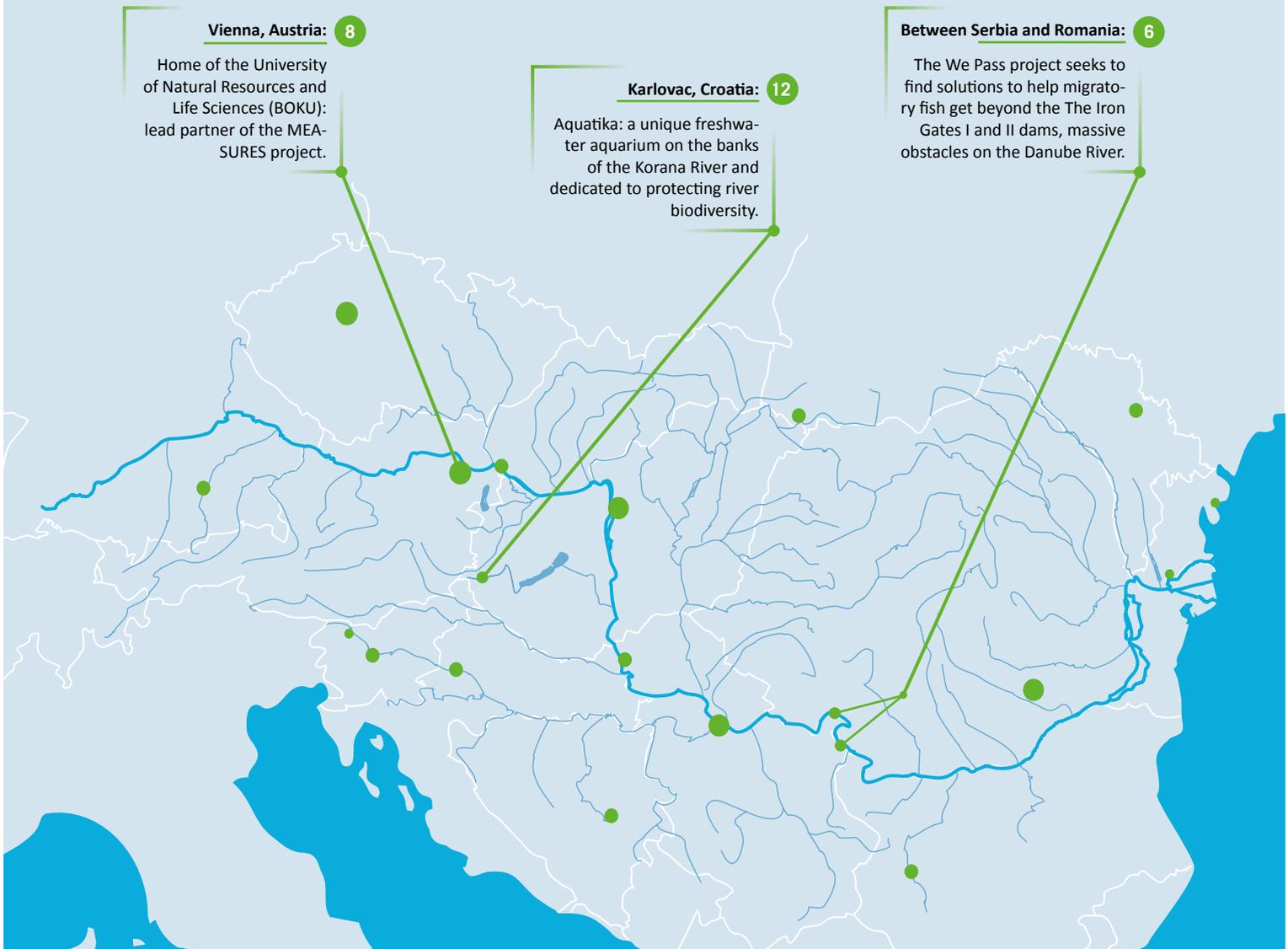
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The We Pass project seeks to find solutions to help migratory fish get beyond the The Iron Gates I and II dams, massive obstacles on the Danube River.





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Dear readers,

Conservation can serve two objectives:

to protect/conservate a current state with respect to ongoing changes or to return to conditions as they were in the past (a restoration).

In the case of nature and of aquatic environments in particular, conservation may comprise both these elements, but it should be associated with a rational approach that allows for the application of effective measures. Some of the changes underway, such as global climate related alterations, are the results of long-term changes and, as such, cannot be reverted immediately given their political, economic, and social impact. The same is true for many other anthropogenic activities that modify habitats, such as the construction of hydroelectric power plants to satisfy energy needs and the alteration of river hydrology for navigation and flood protection. To these impacts, poaching and over-fishing must also be ascribed. These are of particular relevance in the case of sturgeons due to the value of their caviar. As such, man has the obligation to mediate the effects of their activities and diminish or compensate for their consequences.

In the case of sturgeons, as with other fish species, their conservation does not intend to stop progress or oppose the legitimate interests of the inhabitants of the regions in which the species thrive, but requires a compromise to adapt the needs of development to the needs of the long-term welfare of these species and their communi-

ty structures. In cases where this intervention is occurring too late, the loss of species is a detrimental result. In these cases, we are obliged to think about their re-introduction, after ensuring that the conditions of the habitats are suitable and by adopting all the measures that have been described and standardised based upon previous experiences. This framework is now available and validated in documents such as the European Action Plan for Sturgeons, adopted by the Bern Convention, and endorsed for implementation under the EU Habitats Directive on international Biodiversity Day. This work, produced by the WSCS and WWF, represents the first official action plan under this Directive for a fish species. It covers 8 sturgeon species, 7 of which are listed as critically endangered by the IUCN, and aims to conserve the last functional populations, restore habitats, stop poaching, and reintroduce sturgeon to many rivers. Another key document is the Vienna Declaration, which lists the key recommendations regarding the effectiveness of conservation management when planning or implementing activities to protect and preserve sturgeons. The Danube watershed and the Black Sea, with five native sturgeon species urgently in need of conservation measures, are model areas; offering a harmonised infrastructure which provides the opportunity for the implementation of the guiding documents to not only save the treasures of the Danube, but also to increase the wealth of nature and help protect biodiversity in the region as a whole. As such, the Danube could become a laboratory for a much needed global approach.

Paolo Bronzi, President of the World Sturgeon Conservation Society (WCS)

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International Commission
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of the Danube River

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Danube Watch is the official magazine of the ICPDR, the International Commission for the Protection of the Danube River. Danube Watch enhances regional cooperation and information sharing on sustainable water management and environmental protection in the Danube River Basin. It reports on current issues affecting the Danube Basin, and on action taken to deal with challenges in the river basin. Striving for scientific accuracy while remaining concise, clear and readable, it is produced for the wide range of people who are actively involved in the Danube River Basin and are working to improve its environment.

The ICPDR accepts no responsibility or liability whatsoever with regard to information or opinions of the authors of the articles in this issue.

News & Events

ICPDR Publishes Position Paper on the Post-2020 Common Agricultural Policy and Water Management in the Danube River Basin

Discussions have begun on how the EC's post-2020 Common Agricultural Policy (CAP) will detail a framework for "future-proof" policy while responding to international commitments, EU environmental challenges, and changing societal expectations. In response to proposals, the ICPDR has published a Position Paper, outlining our positive response and suggesting a way forward for the Danube River Basin.

Besides ensuring the profitability of agriculture, food security and public, animal, and plant health, a chief concern of CAP is to boost efforts related to environmental protection and management of detrimental effects on natural and public waters. The updated post-2020 CAP would set a baseline for more sustainable agricultural commitments through good farming practices and standards.

This would bring potentially positive impacts on water quality. Member States are also required to prepare a 'CAP Strategic Plan', designing measures better suited to their national needs and the needs of local farmers. The proposal would link a part of farmers' income support to the use of eco-friendly practices and schemes, and would require that at least 30% of national allocations for rural development be dedicated to environmental measures.



But how closely does this affect the waters of the Danube River Basin? For one thing, the nutrient losses from agricultural areas could potentially increase and extend adverse effects in the Danube region if agriculture is not managed sustainably. With climate change rapidly set to increase and the threat of droughts real, water scarcity combined with inappropriate agricultural management could have disastrous consequences.

World Water Day 2019 – Putting the Spotlight on Water Availability



Vienna, 22 March 2019 - World Water Day 2019 focuses on the UN's Sustainable Development Goal 6 (SDG 6): "Water for all by 2030".

Some 20 million people rely on the Danube River for drinking water, yet currently only 25% of its waters meet environmental objectives in terms of water status and providing a good hab-

itat. The prime objective of SDG 6 is to "ensure availability and sustainable management of water and sanitation for all", and is therefore at the heart of the ICPDR's activities.

In addition to the Danube's surface waters, its groundwater is also a key resource for the region. However, this vital resource is under threat from over-abstraction and from agricultural and other forms of pollution. Some solutions are already being successfully deployed across the region. These include the implementation of the Drinking Water Resource Protection Programme in Hungary and efforts by the Bavarian Ministry of Food, Agriculture, and Forestry to help farmers implement optimal groundwater protection measures.

Climate change is also a major problem, with the threat of water scarcity and drought throughout Europe rising over recent decades. The widespread droughts in 2003, for example, impacted the lives of over 100 million people, affected one third of European Union territory, and cost the European economy approximately € 8.7 billion in damages. Similar events occurred in 2007, 2011, and 2012. These trends highlight the significance of growing imbalances in water supply and availability in Europe, specifically in the context of climate change.

World Wetlands Day 2019 in the Sava River Basin



World Wetlands Day is celebrated every year on 2 February and marks the date of the adoption of the Ramsar Convention on Wetlands in 1971.

The main objective of the initiative is the conservation and wise use of all wetlands through local and national actions and international cooperation. This year's slogan, "We are not powerless against climate change", emphasised the important role that these ecosystems, like wetlands, play and the need for us to protect them.

Two countries in the Sava River Basin celebrated World Wetlands Day this year by presenting the Sava TIES project at awareness raising events. The first event, on 1 February in Šabac, Serbia, focused on how the spread of invasive alien species (IAS) can lead to serious consequences for the wetlands and is one of the main challenges facing biodiversity conservation. The second event, on 2 February in the village of Stružec in Croatia, showcased the objectives and main activities of the Sava TIES project.

Sava TIES is an Interreg project that will run until the end of May 2021 and is being implemented in all four countries of the Sava River basin: Slovenia, Croatia, Bosnia and Herzegovina, and Serbia. It aims to find solutions for the permanent eradication of invasive alien plants, to reduce habitat fragmentation, and improve the connectivity of the transnational ecological corridor.

Invasive alien species are plants, animals, and other organisms that are non-native to an ecosystem, but are primarily human-introduced. They are spreading uncontrollably in the Sava River Basin, having a negative effect on native species, destroying soil fertility, reducing the area of arable land, causing major problems in flood control, and much, much more.

Sterlet Fishing Ban Campaign Awarded "Best Non-profit Campaign 2018"

Belgrade, Serbia, 20 February 2019

***"Lobbying for legal changes to achieve successes in protecting wildlife cannot be achieved without the support of people. To get their support, we need to have open conversations with them, to educate them, and to find solutions to the modern challenges together, acting as a responsible community."* Milena Dragović, Communications Officer at WWF-Adria.**

The WWF Sterlet Fishing Ban Campaign in Serbia was one of the three winners for the "Best Non-Profit Campaigns in 2018". The prize is awarded by the Brodoto Agency to NGOs with the most innovative and impactful campaigns in Serbia and Croatia. The campaign was developed and implemented in collaboration with the United Anglers of Serbia, fishing communities, and law enforcement agencies.

The initiative to save the sterlet was launched last year within the framework of the Living European Rivers Initiative and WWF Adria. This was followed by a media campaign requesting that the Ministry of Environmental Protection impose a sterlet fishing ban in Serbia.

The sterlet is a relatively small species of sturgeon that migrates between fresh and salt water. Due to overfishing, pollution, and



migration routes blocked by dams, the sterlet population has declined dramatically and is now considered to be vulnerable by the International Union for Conservation of Nature (IUCN).

Following a successful, six-month campaign, the sterlet fishing ban was adopted and came into effect in Serbia on 1 January 2019.

We Pass:

Facilitating Fish Migration And Conservation At The Iron Gates

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ICPDR is seeking solutions to man-made dams that hinder and prevent the migration of sturgeon and other migratory fish species in the Danube River with the project We Pass focusing on the Iron Gates dams.

Sturgeon are migratory fish. This means that in order to reproduce they must travel further upstream in the Danube to their ancient spawning grounds. However, this important aspect of their life-cycle has been hindered by dams constructed along the river. Sturgeon are by no means the only fish species to be impacted but, combined with recent dramatic habitat loss and historic overexploitation, these species of sturgeon are considered to be among the most endangered groups globally according to the IUCN Red List of Threatened Species. However, with concerted study and efforts, these iconic fish can not only be saved from completely disappearing, but can have their numbers brought back up to healthy levels all along the Danube.

The project, We Pass – Facilitating Fish Migration And Conservation At The Iron Gates, aims to aid fish migration in the Danube River Basin, and has been set up with EU funding (DG REGIO) by the ICPDR,

CDM Smith, Jaroslav Černi Institute (JCI), and the Danube Delta National Institute for Research and Development (DDNI). Its focus is on the preservation and re-establishment of endangered fish species' migration routes in the Danube River, its tributaries, and specifically at the Iron Gates hydropower plants.

The hydroelectric power plants Iron Gates I and II (aka Porțile de Fier / Đerdap) are the largest dams on the Danube River and are



jointly managed by Romania and Serbia. The dams provide vast amounts of sustainable hydropower for the region and also make navigation for people both easier and safer on the Danube. However, the disruption they cause to the river's continuity constitutes a serious obstacle for migratory fish like sturgeon. The heights of Iron Gates I and II (60m and 35m, respectively) and

the depth of the reservoir, necessitate the implementation of a massive fish-passage. Unfortunately, no pre-existing solutions are up to this daunting task.

According to the Danube River Basin Management Plan (updated in 2015), a restoration in river continuity at the Iron Gate I and II dams would open up more than 800 km of upstream river to the sturgeon coming from downstream. This would include access to numerous spawning grounds along the Danube and major tributaries. Additionally, it would help to meet EU goals, including increasing the ecological status of rivers within the EU, protecting biodiversity and threatened species, as well as making the Danube less vulnerable to the effects of climate change. Therefore, working out a solution is extremely important.

A chief aspect of We Pass is the running of a feasibility study exploring alternatives and seeking solutions to blocked routes that may be having adverse effects on sturgeon and other fish species. To determine the possibility of creating a path for migratory fish past the Iron Gate dams, the ICPDR adopted the Terms of Reference for the Feasibility Study analysing options for fish migration at Iron Gate I and II in late 2016. This con-

cluded that a technical solution would indeed be possible but that specifics would need to be determined through further investigative studies.

The current Feasibility Study aims to analyse the strengths and weaknesses of a proposed project, the opportunities and threats present, the resources required to carry out the project, and ultimately the success of the project. Many factors need to be taken into consideration to determine whether a project is technically feasible, economically viable, and profitable (costs versus ecological benefits). Supported by the European Commission, the first phase of the study ran from 2011 to 2016 and created a dialogue between the ICPDR and relevant stakeholders. Running until 2020, the second leg of the Feasibility Study will lead into planned third and fourth phases to consolidate technical designs between 2012 and 2023, with implementation expected from 2024 onward.

In 2017, the ICPDR Sturgeon Strategy was approved with the goal of better understanding and highlighting the challenges faced by the Danube's sturgeon in order to add to conservation efforts. In conjunction with the We Pass-supported feasibility study for restoring continuity at the Iron Gates, this acts as an important aspect of the EU Strategy for the Danube Region to improve the situation of the river's sturgeon. Efforts to restore continuity will be accompanied by several other conservation measures as laid out in the Danube Sturgeon Action Plan, including protection and restoration of habitats, strict enforcement of existing fishing bans, and the continued fight against the illegal caviar trade.

Concerns specific to sturgeon species and the dams themselves make the future of extended migration quite tricky. Sturgeon, unlike other migratory fish, grow much larger and generally swim along the riverbed. Sturgeon also spawn several times throughout their lives, thus the fish-passage would also need to be designed to allow the downstream migration of large adult sturgeon. All of this makes facilitating sturgeon migration more complex and more difficult than would be the case for other fish.



Making this complex and difficult task easier is the aspiration of We Pass; This can be achieved by bringing together a multitude of international projects in the region, exploiting the opportunity to share knowledge and stakeholder contacts using common messaging, and combining efforts to maximise the impact of all communications, thus strengthening conservation efforts. Working to synergise efforts with groups and projects such as the EU Strategy for the Danube Region, the Danube Strategy Task Force, Sturgeon 2020, LIFE Sterlet, and MEASURES will also aid in raising awareness of the issues concerning Danube sturgeon, another important aspect of the We Pass project.

Efforts to raise awareness were highlighted at the We Pass kick-off event held on 9 April 2019. In attendance were project partners, stakeholders, representatives of the Đerdap Hydroelectric Power Station, and members of the public. Mr. Ivan Zavadsky, ICPDR Executive Secretary, and Ms Edith Hödl, ICPDR We Pass Project Manager, officially opened a session seeking to explore the project in greater detail and kick off the public discourse on We Pass' aims while highlighting its expected results. After detailed presentations on various aspects of the project, round table discussions were hosted directly with the public as an opportunity to ask ques-

tions and find out more about new opportunities offered by We Pass.

With similar and complementary programmes already in place across the region with which We Pass can combine efforts, there is hope that the project will become fully realised as a solid piece of the overall conservation puzzle that is the Danube River Basin's sturgeon and ecosystem on a whole. Getting the sturgeon over this single set of obstacles will truly help them to reoccupy their former home upriver and to again become an expected and iconic sight all along the Danube.



Explore further:

www.we-pass.org

www.facebook.com/we.pass.danube

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MEASURES:

Managing and Restoring Aquatic Ecological Corridors for Migratory Fish in the Danube River Basin



MEASURES seeks to identify and protect key habitats of the Danube Basin necessary for the conservation of migratory fish species. Through the partnership of governments, organisations, and institutions, the project will provide important information for the future of the area and its fish.

Migratory fish populations within the Danube River Basin have dwindled dramatically over the past half-century. The largest and possibly most iconic among these species is the sturgeon, a key element of life within the river basin. A main cause of this loss are man-made obstructions, such as dams, along the Danube which prevent or hinder the movement of these fish species and have led to fragmentation and loss of habitats on local and basin wide scales. Coordinated action is the only way to prevent further decline or the complete disappearance of these species, whose importance cannot be underestimated. In fact, the health of these sturgeon populations reflect the overall health and well-being of the entire Danube ecosystem itself. Note: sturgeon migrate via several countries, action requires a joint approach between those countries.

Working from, and adding to, the achievements of previous multilateral projects, seeking to address and promote the health of the river basin, MEASURES brings together 10 countries along the Danube (Germany, Austria, Slovakia, Slovenia, Hungary, Croatia, Serbia, Romania, Bulgaria, and Ukraine), along with 12 partner institutions. The project will work to create safe corridors all along the Danube and its major tributaries for the native fish, which migrate along the river as an essential part of their reproductive life-cycles. By working to protect and increase their numbers, MEASURES will be contributing a key piece of the complex puzzle to restore and assure river vitality and sustainability. This is particularly important in regards to the development of future infrastructure projects, which would put additional pressure on the last remaining habitats of the endangered species.

Over the 3 years of the project (set to run until the end of May 2021), the impressive list of partner universities, institutes, organisations, and ministries have been and will continue working together to create safe ecological corridors by:

- ◆ Mapping and identifying key habitats by developing and testing a methodology for migratory fish habitat mapping.
- ◆ Developing a harmonised strategy for restoring green corridors and supporting implementation in future management plans.
- ◆ Restocking of two native species to conserve their genetic pool in Hungary and Romania, establishing a network for concerted re-population of the target species, and elaborating a manual for the operation of brood-stock facilities that will provide the offspring needed for re-population.
- ◆ Implementing the MEASURES Information System, an online platform tool, that will facilitate the access of experts, decision-makers, and the general public to the relevant information available.

Mapping and identifying key habitats can be achieved in many ways with a variety of tools. Because sturgeon make extensive use of riverbeds, specialised technologies are required. Multi-beam sonar, which help develop 3D bathymetric surveys of the areas concerned, are one important example. By bringing together scientists and researchers in planned joint pilot activities, further methods can be more readily constructed and put into place. Furthermore, a standardised manual of mapping approaches will be created and will allow

various stakeholders to map crucial habitats in a comparable way.

Once habitats and migratory corridors are identified, a basin-wide map will allow the development of a basin-wide strategy. Actions and their implementation plans, necessary for the preservation of these ecological corridors, can be devised and act to guide management plans concerning ecological conservation, water management, as well as diminishing the effects of infrastructure projects and navigation in the Danube Basin. This will allow a push for more collaborative effort among the many key stakeholders within the Danube River Basin, rather than the fragmented approach seen up to now which has rendered efforts moot.

Another vital approach to saving the sturgeon and other endangered migratory fish species within the Danube consists of manually replenishing their numbers by restocking the remaining species through state-of-the-art conservation methods. As a preliminary part of this endeavor, 3,000 juvenile sterlet were released in Hungary and more than 1,000 Russian sturgeon in Romania. The fish were tagged prior to release in order to identify them if they are caught during later in-river surveys, providing valuable insight into their survival rates for the larger future restocking plans.

◆ **Authors Paul Meulenbroek and Daniel Trauner** are both part of Project Management for MEASURES at the University of Natural Resources and Life Sciences (BOKU) in Vienna.



In order to share the knowledge and methods developed, an online information platform (MEASURES Information System, MIS) has been created. This platform will allow everyone from scientists, to politicians, to the general public to access shared information regarding ecological corridors and migratory fish habitats, as well as other areas relevant to the MEASURES project. With collaboration and a harmonised strategy being important aspects of MEASURES and future derivative projects, this centralised information-sharing system may prove to be as valuable to achieving the desired outcomes as the collected and assessed data itself.

© (all photos) Thomas Friedrich



Flagship Species of the Danube – Will There be Sturgeons in the Future?

An Article by Jörn Gessner, Thomas Hein, Thomas Friedrich

Russian Sturgeon © WWF-Lubomir-Hlasek

Sturgeons are living fossils. Documented to have existed for over 200 million years, they developed a unique set of traits; living up to 200 years, maturing late, and growing to impressive sizes of up to 7 metres. Spending most of their lives in marine waters while reproducing in freshwater allowed them to establish large populations that could not be sustained in freshwater alone. This anadromous migration of up to 2,500km in the rivers to spawn re-occurs throughout their long lives in intervals of 2-5 years.

The Danube hosted six species in the past and as such had the largest diversity of sturgeons of any river worldwide. This diversity, in conjunction with the population sizes, also reflects the past ability of the Danube to provide a healthy and varied habitat.

Historically, sturgeons were an important resource for the inhabitants along the Danube. When no dams hindered the migration of the species, they ranged from the Delta of the Danube to the headwaters Bavaria. Since these times, sturgeons have been caught in the river. But, even the first intensification of their harvest in

the 16th century through the use of fences and traps already resulted in the decline of long-distance migrants. The next stage of decline started when flood protection measures restricted the once braided and meandering river to a single channel. These alterations, in combination with dykes and the subsequent navigation development associated with bed fixation and trough-like channel design, reduced habitat diversity even further. Damming mainly for hydropower also transformed the once living river into a regulated water supply system. These interventions have resulted in fatal consequences for the ecosystems and their inhabitants. In the Danube, the past wealth of sturgeon species and their huge populations have been diminished to a few survivors that suffer continuous decline through poaching.

This development is exemplified by the fate of the ship sturgeon (*A. nudiventris*), a potamodromous freshwater fish in the Danube, with only three known sightings during the first decade of this century it is now considered functionally extinct. The anadromous European Sturgeon (*Acipenser sturio*), once present in the Lower Danube, has also gone extinct in the Danube River Basin. Of the most abundant

long distance migrants, the Russian Sturgeon (*A. gueldenstaedtii*), is considered to be on the verge of extinction, with nearly all recent catches stemming from restocking actions and no known natural reproduction having been documented in the Lower Danube for several years. In contrast, Beluga Sturgeon (*Huso huso*) and Stellate Sturgeon (*A. stellatus*) still reproduce in the Lower Danube in small numbers. However, these small remnant stocks are under constant pressure from poaching in the Danube and Black Sea while at the same time suffering from continued habitat loss due to recent navigation development. The potamodromous Sterlet (*A. ruthenus*) is still present in most of the main stem of the Danube. However, the populations are fragmented by dams, and show low reproductive success while removal by angling and fisheries continues in large areas of its range.

In a summary, characteristics of their biology, with the resulting need for proactive support and management over extended periods of time, render them ambassadors for a living and lively Danube. Whatever measures support the sturgeons will also benefit the other river fish communities of the Danube.



Persisting threats

Although fishing bans are in place in the Lower Danube countries, their implementation remains a problem as poaching still persists and enforcement is insufficient. More alarming are recent attempts to lift the existing fishing bans, despite the critical state of the populations.

Perspective

The future of Europe's last functional sturgeon populations is at stake! Compared to historic levels, today's catches of a few fish are a mere fraction of the past abundance and clearly show how far the species have declined. This decline bears two major risks: First, the loss of genetic diversity and thus the adaptability of the remaining populations, including the loss of the various sub-populations that utilise different spawning sites varying distances from the river mouth by migrating at different times and utilising different nutrient resources. The more narrow the genetic bandwidth, the higher the risk that future catastrophes, such as increased water temperatures, changes in the food chain or changes in discharge, could eradicate the populations, simply because its flexibility will be insufficient to adapt in time. Secondly, with declining population sizes, the risk that the fish will not find a suitable mating partner can lead to catastrophic failures in reproduction.

If the recovery of the populations becomes truly successful, the long term target could be a defined harvest at sustainable levels. For the populations to become self-sustaining in numbers that allow such harvests, time and effort have to be invested. Model calculations show that recovery of long-living species like sturgeons can easily take half a century even under optimal conditions. The smaller the initial population and the more habitat destruction has taken place, the higher the effort to counteract the mistakes of the past. Until such a time, effective protection, both *in situ* and *ex situ*, in conjunction with support of the populations will be the only means to guarantee their survival. Looking at the disastrous loss of biodiversity on a global scale, it is our responsibility to let the giants of the Danube fulfill their biological fate and recover their populations, not to become corpses on a table but to serve their role in the ecosystem and as ambassadors for a living and interconnected Danube! Joint action and collaboration are urgently needed to reach this goal!

Efforts

Although recovery plans have been in place for a long time, they were never fully implemented on a transnational level.

Instead, efforts have been limited in scope- though productive and adding important information for future projects. What has been shown is that protecting the future of these species requires utilising multifaceted, multidisciplinary approaches on multinational and multiregional levels to cope with the complexity of both the problem at hand and the potential solutions. The steady, incremental progress so far has included fishing bans, genetic population assessments and monitoring, as well as the improved understanding of the situation. The most important prerequisite for success has been and remains multilateral cooperation, whether political, scientific, or economic.

The development of the "Pan-European Action Plan for Sturgeons" under the Bern Convention acts as an example of a multinational approach, taking into account the similarities of the challenges sturgeon recovery faces throughout Europe. This plan serves as a framework to harmonise national and regional activities. It envisages collaboration and exchange between macro-regions in their efforts to save these charismatic species.



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Karlovac Freshwater Aquarium AQUATIKA:

a Unique Freshwater Aquarium on the Banks of the Korana River in Karlovac, Croatia



Aquatika - a protector of biodiversity

The Public Institution AQUATIKA – KARLOVAC FRESHWATER AQUARIUM was established as part of an EU project entitled “FRESHWATER AQUARIUM AND RIVER MUSEUM – KAQUARIUM”, and was co-financed by the European Union from the European Regional Development Fund.

Aquatika is intended for everyone, from children and young people, to scientists, aquarium enthusiasts, nature lovers, and the local population, and aims to raise awareness of the exceptional biodiversity of our freshwater ecosystems. Its primary purpose is to educate visitors as to how the exceptional natural wealth of Croatia can be used in the function of sustainable tourism. The aquarium displays Croatian freshwater fish fauna and plants and their habitats, with more than 80 species of fish, including 30 endemic species, which are plants or animal species that are only found in one specific geographic area. If the area is very small (a cave, lake, river or mountain), this species is then classified as stenoendemic. It is important to note that among the 150 fish species found in Croatia’s rivers and lakes, 52 are endemic. This wealth of species is the consequence of Croatia’s geographical position, which includes both the Danube (Black Sea) and Adriatic Basin.

The aquarium has been designed as a two-story building with a ground floor and underground level and includes three buildings with an open area between them. Thanks to the green garden roof concept,

the aquarium has a minimal impact on the landscape, and the green vistas of the surrounding areas have been preserved.

River continuity

The aquarium complex is designed to display the course of a karst river and its various habitats, such as the Korana where the aquarium is situated. The design is based on the idea of dividing the river course into its upper, middle, and lower sections.

The upper course flows at higher elevations which are nearer to the source and where the water is fast, cold, and high in oxygen. These reaches are inhabited by fish species that have adapted to such environmental conditions, such as the brown trout *Salmo trutta*, and the minnow *Phoxinus phoxinus*. Underwater plants that can tolerate the physical and chemical conditions in these upper reaches are mosses and diatoms. Invertebrates from the caddisflies genus, *Trichoptera*, live on the riverbed and build shelters of stones and twigs to increase their mass and prevent the water from washing them away.

The middle course of the river is characterised by a higher average temperature and

lower flow speed with a somewhat lower oxygen content. The riverbed is gravelly and sandy, and invertebrates present here include the larvae of insects *Insecta*, snails *Gastropoda*, and crustaceans *Crustacea*. The aquatic vegetation includes mosses and diatoms, as well as green algae, filamentous bacteria, and fungi. Due to the better living conditions, there is a higher diversity of life, and this is where the most fish species are to be found, including the barbel *Barbus barbus*, chub *Squalius cephalus*, asp *Leuciscus aspius*, nase *Chondrostoma nasus*, bleak *Alburnus alburnus*, Danubian roach *Rutilus virgo*, and Balkan loach *Cobitis elongata*.

In the lower course, the riverbed is wide and deep, the water flows slowly, and average temperatures are higher than upstream in the middle course. This zone has rich aquatic vegetation, including water lilies. The bottom is sandy and silty, enabling the development of special communities of invertebrates, such as the molluscs *Bivalvia* and *oligochaetes Oligochaeta*. The fish species that are characteristic to the lower course are bream *Abramis brama*, carp *Cyprinus carpio*, catfish *Silurus glanis*, and zander *Sander lucioperca*.



© (All photos) AQUATIKA

Fish endemic to Croatia

The cave system habitat shows the endemic species of fish that are predominantly found in the karst landscapes and underground habitats. Endemics found in underground habitats are highly sensitive and are at risk of extinction. Their survival depends directly on human activities, specifically on the active protection and conservation of surface and underground waters. Some of the endemic fish, such as the Croatian dace *Telestes polylepis*, karst dace *Telestes karsticus*, Krbava minnow *Delminichthys krbavensis*, Jadova loach *Cobitis jadovaensis*, and Zrmanja chub *Squalius zrmanjae* are found only in Croatia and nowhere else in the world.

A home for sturgeons

The largest habitat in the aquarium includes the migratory fish species from the sturgeon family that migrate from the sea into the river to spawn. The majority of these species: the stellate sturgeon *Acipenser stellatus*, Russian sturgeon *Acipenser gueldenstaedtii*, ship sturgeon *Acipenser nudiiventris*, Atlantic sturgeon *Acipenser sturio*, and beluga sturgeon *Huso huso* are considered to be regionally extinct in Croatia due to regulatory measures, the damming of watercourses and overfishing. It is interesting that these fish species date back to the time of the dinosaurs and that the beluga sturgeon is one of the largest fish ever to exist (a specimen eight metres long and weighing 3,200 kilograms was caught in the Volga River in 1884). Unlike the sturgeons, other species such as the European eel *Anguilla anguilla* migrate from the river into the Atlantic Ocean to spawn.

Standing waters

The standing waters are represented by the ponds and wetlands and abound with

diverse plant and animal life. These areas serve as a natural filter and retain water during flooding. These waterbodies have a series of positive effects on the environment and are considered to be the protectors of biological diversity. The fish inhabiting the standing waters, such as tench *Tinca tinca*, Crucian carp *Carassius carassius*, and weatherloach *Misgurnus fossilis*, are all capable of adapting to the great changes that occur in the physical and chemical parameters of the water.

Alien fish species

The next habitat contains alien fish species that are not native to Croatia. Most of these are invasive and pose a threat to the native fauna. Alien species are those which do not naturally inhabit an area but were instead intentionally or unintentionally brought to that habitat through human activity. When an alien species creates changes in a given area and threatens the native biodiversity it becomes 'invasive'. These invasive species compete with the native species both for space and food, with some crossbreeding with native species. They can also introduce new diseases and pests into the environment. Invasive fish species, such as rainbow trout *Oncorhynchus mykiss*, Prussian carp *Carassius gibelio*, and the grass carp *Ctenopharyngodon idella*, are among the most significant reasons for the extinction of native species, along with pollution, watercourse regulation, the construction of dams, and amelioration works.

Travertine

The final habitat shows the karst phenomenon of the creation of travertine waterfalls, and the importance of conserving them. In favourable conditions, carbon dioxide is liberated from the water and

mineral calcite is separated out. Travertine building plants, such as algae, secrete sugars that the calcite sticks to, and cad-disflies form netting that the calcite attaches itself to. Calcite crystals settle out of the water with the help of these travertine builders, and at certain places in the river's course, travertine begins to form as a porous and soft sedimentary rock. Fish and crustaceans can find places to shelter within its hollows and channels. Stunning examples of travertine waterfalls can be seen at the Plitvice Lakes, on the Sljunčica River in Rastoke, and on the Mrežnica and Korana Rivers.

The natural water cycle & aquarium technology

Due to the natural water cycle and its geographical position, Karlovac is rich in underground waters. Near to the aquarium is a deep well that supplies the aquarium tanks with chlorine-free water. This natural water is pumped into the aquarium's system, with particles such as algae and sand being removed from the water through a mechanical filter. Harmful compounds such as ammoniac are removed with a biological filter. The water then enters into a cooling chamber where the temperature is regulated. Oxygen is added to the water, which is then sterilised to remove viruses and bacteria. As it passes through the aquarium system, 5%, or 14 m3, of the water evaporates, and the same amount is returned to the Korana River via the surface runoff drainage system. As in nature, this hydrological cycle is repeated ad infinitum.

Aquatika is a unique freshwater aquarium in Europe and provides visitors with the unique experience of the underwater world that we seem to know well, but still have so much more to learn.

2018 INTERIM REPORT ON THE IMPLEMENTATION OF THE JOINT PROGRAMME OF MEASURES IN THE DRB

The ICPDR has released a 23-page Interim Report on the implementation of its ‘Joint Program of Measures in the Danube River Basin’. The brochure is both a snapshot of the progress being made, and a look at the future of the ICPDR’s three main aims: to make Danube waters “cleaner”, “healthier”, and “safer”.

It’s also the first such publication by the ICPDR to take on a new design-focused look, deploying more images and a clearer language in a public-friendly format.

CLEANER



Reduced pollution from settlements, industry and agriculture

HEALTHIER



habitats and ecosystems for aquatic plants and animals

SAFER



waters free from harmful substances and accidents

The ICPDR’s Interim Report summarises many of the achievements that have been made throughout the Danube River Basin in recent years. These include:

- The establishment of a number of projects dedicated to reviving and protecting Danube sturgeon species and their habitats
- The successful implementation of measures to simplify and improve groundwater management in Germany and Hungary
- The hosting of public-facing consultations such as “Voice of the Danube” in Croatia in 2015
- The “Integrated Nutrients Pollution Control” project, which started back in 2008 in Romania, and has since successfully implemented infrastructure measures to reduce nutrient pollution into the Danube. The latter project has been twice extended, and will continue to receive World Bank funding until 2022.

These are just a handful of the success stories covered by this Interim Report – but it nonetheless remains frank about the ongoing challenges and difficulties that lie ahead. For example, while the vast majority of wastewater in the region is now correctly handled, many large industrial facilities remain in the Danube River Basin, releasing significant pollutant emissions into surface waters. Despite some notable improvements, many Danube sturgeon species remain on the brink of extinction. The report also goes into detail regarding the activities being undertaken addressing financing for the JPM, the targeting of EU funding, and closing of financing gaps throughout the project.

Download the document here.



In essence, the goal of this interim report is to disseminate current information and news from a broad Danube-wide perspective. In line with requirements of the European Union’s Water Framework Directive (WFD), we aim to make as much ICPDR content as possible broadly accessible to the general public. The publication of this interim report is a requirement of article 15.3 of the WFD. The new and updated form, look, and feel of the report and 10 key messages were agreed upon with the intention of providing a concise document which is more appealing and informative for the public. The ICPDR is the only such river basin commission with its own Public Participation Expert Group (PP EG – who worked closely on this publication), and is going one step further with this communication requirement, aiming to assure a good balance between technical content and other messaging while assuring maximum comprehensibility and availability to the general public.

INTERIM REPORT

ON THE IMPLEMENTATION OF THE JOINT PROGRAM OF MEASURES IN THE DANUBE RIVER BASIN

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ICPDR **IKSD**

International Commission
for the Protection
of the Danube River

Internationale Kommission
zum Schutz der Donau



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After passing on the presidency of DANUBEPARKS in December 2018 to Vladko Ražac, Carl Manzano handed over the reins of the Donau-Auen National Park to Edith Klauser in February 2019, ending two decades steering the future and development of the Park.

In his 22 years of service, Mr. Manzano has guided the development and direction of the Donau-Auen National Park as Director. This first began long before the national park even existed, with passionate organisation against the building of a nuclear power plant in the area in the early 1980s. Years of working to preserve the river and the natural landscape here would eventually lead to efforts to establish a national park. Mr. Manzano strove tirelessly to convince the many stakeholders, especially the local public, of the worthwhile nature of such an endeavour, with the park coming into existence in 1996 and he being named as the first Director in 1997. Additionally, as president of the organisation DANUBEPARKS, he helped to create a Europe-wide, cross-border brand for nature conservation and oversaw the investment of over 10 million euros in Danube-wide initiatives toward the protection of ecosystems and the cultivation of nature tourism.

He was awarded the Golden Medal of Honour for Services to the Republic of Austria, a fitting tribute to his years of dedicated commitment. On the occasion of this change of leadership, Mr. Manzano reflected, “I am very proud that I was able to participate in the planning and founding of the Donau-Auen National Park and that I was able to lead it until the end of 2018. This was the right task for me, which always gave me great pleasure. I would like to thank my team, which has worked excellently and supported me in this function, and all my companions.”

Over the years, the ICPDR and the Donau-Auen National Park have often collaborated and, in working toward the same goals, have acted to complement one another. Discussing the work of the National Park under Mr. Manzano, ICPDR Executive Secretary, Ivan Zavadsky said, “Both the ICPDR and the Donau-Auen National Park, with their long history of advocating higher en-

vironmental standards for the nature along and in the Danube, have given the world's most international river an exemplary framework for governance.”

Mr. Manzano's successor, Edith Klauser, is the first female to hold the position of Director of a national park in Austria and will continue the positive trajectory of the park along with setting its course in new and productive directions. “I am already looking forward to working together to preserve and protect our precious nature and biodiversity,” commented Elisabeth Köstinger, Federal Minister for Sustainability and Tourism, at the handover ceremony in February.

She went on to say that the immediate future will focus on international cooperation with neighbouring protected areas, giving DANUBEPARKS as a prominent and successful example of such a project initiated by the Donau-Auen National Park. Ivan Zavadsky made it clear that the continued focus on such cooperation is very much welcomed, stating that “for the ICPDR, the National Park and its close associate, DANUBEPARKS, are not only friends but also major contributors to the work of our organisation.”

The Donau-Auen National Park, extending 36 kilometres from Vienna to Bratislava along the Danube river and encompassing 9,600 hectares, is home to a wide range of plant and animal species. It is also very special to the people of the Vienna area. Stephen Pernkopf, of the Lower Austria LH-StV, explained that “the Donau-Auen National Park is a natural retreat and recreational area for thousands of Lower Austrians and Viennese at the same time and, therefore, a heart of our Green Ring around Vienna.”

Having studied botany, zoology, and hydrobiology, as well as having an established understanding of environmental management and business, Edith Klauser is well qualified to continue the work of the Donau-Auen National Park. Director Klauser herself reiterated the future development of the National Park, stating that “the aim is to preserve its treasures in the future together with its proven partners and in accordance with the National Park motto 'Precious Nature for Generations!'”

Fifty Organisations, Ten Countries, Two Wheels, One River Ecosystem.

What better way to experience the natural beauty that the Danube has to offer than by bicycle?

Hoping to highlight the Danube's many national parks, protected areas, and their years of dedicated work, DANUBEPARKS has organised "Cycling the Danube", a Danube-wide bicycle tour from April to June 2019.

© (all photos) Danube Park

Covering 17 protected areas, 120 DANUBEPARKS conservation areas, spanning 10 countries and 3,000 kilometres, the cycle tour will truly show off the fruits of concerted, dedicated, and multilateral conservation efforts: a wonderful natural river area for all to enjoy, including the many species that call the river home. For the conservationist participants, their journey will also culminate in a more thorough understanding of the Danube River Basin as an interconnected ecosystem, the protection of which requires equally interconnected efforts from the various government and nongovernment stakeholders across the region.

To help facilitate this understanding and future steps forward, the participants will meet with over 50 partner organisations and receive presentations on more than 120 pilot projects concerned with the well-being of the Danube River Basin. What

experience, information, and discussion. DANUBEPARKS General Secretary Georg Frank underlined this in his opening statements for the day: "This leg (of the cycle tour) between Vienna and the Schloss Orth National Park Centre allows what important functions this protected area fulfils for a large city to be wonderfully experienced." Indeed, by highlighting the benefits that a large city, like Vienna, gains from having protected natural areas within such a close proximity, people can better see that the natural world and its ecosystems don't end at the city-limits and they themselves don't need to travel out into the wilderness or the countryside to enjoy nature.

How to further stitch together the many rural and urban protected areas along the Danube is a question best addressed through collaborative efforts and idea-sharing. The exchange of ideas and information at the Schloss Orth National Park

The key element stressed by these experts was the possibility for further and continued cooperation among the wide array of stakeholders within the Danube region, a goal being well served on this particular day and well reflected in the projects presented. Ivan Zavadsky, Executive Secretary of the ICPDR, happily observed during his welcom-

At the Annual General Assembly on 11 December in Vienna, Carl Manzano, outgoing Director of the Donau-Auen National Park, also bid farewell as President of DANUBEPARKS. His successor is Vlatko Rožac from the Croatian nature park Kopački rit.

ing statements in Vienna that "the initiative of DANUBEPARKS across all borders brings many people and interest groups together." An important driver of ICPDR work is the active involvement of the public and civil society in all activities throughout the Danube River Basin. A project such as DANUBEPARKS which successfully engages the public



better way to exhibit recent and proposed projects that affect the Danube and the surrounding nature than to a captive audience spending their days cycling through the very same habitats?

One highlight was the tour organised between Vienna and Orth downriver on 25 April 2019 which offered plenty of expe-

Centre at the end of the day's cycling was made possible through the participation of experts from 11 EU-funded projects. Among these projects were LIFE Sterlet and MEASURES, both seeking to better understand the current situation of and to better protect the Danube River Basin's remaining sturgeon populations in cooperation with the ICPDR.

is truly inspiring and complements the work of the ICPDR very well. The Danube Protected Areas are an excellent catalyst for getting the public fascinated in our shared natural heritage on the Danube, and projects of this kind deserve our constant and unreserved support.

Read further: www.danubeparks.org

Presidency 2019: Exploring Strengthening Water Security and



Hungary has taken over the ICPDR Presidency for 2019, the 25th anniversary of the signing of the Danube River Protection Convention (DRPC), the major legal instrument for cooperation and transboundary water management in the Danube River Basin, and taken up the challenge of forging new partnerships, strengthening water security, and paving the way for the next generation of management plans, sustainable cross-sectoral cooperation, and knowledge transfer.

Peter Kovács has had an illustrious career as Water Director at the Ministry of Interior in Budapest and Head of Delegation for Hungary to the ICPDR. He has more than 20 years of experience in water issues and river commissions, and is also a former Chairperson of the UNECE Water Convention. Now he brings his wealth of experience and expertise to the ICPDR as its President for 2019. Mr. Kovács also brings his light-heartedness and sense of good-natured fun, reflected in the array of comic-character ties that he is well known for wearing by all his colleagues.

“ Danube Watch: *You have steered water policy in Hungary for many years. How does it feel to be taking responsibility for the entire Danube River Basin now? What differences in approach do you envisage?*

It is a great honour to take over this kind of extended responsibility. Fortunately, I have gained a lot of experience on regional and sub-regional levels since my junior years. I have always been involved in trans-boundary water management in every position, which will give me a level of confidence. At the Danube Basin level, we are faced with the same problems as on a national level (climate change adaptation, water scarcity, flood challenges), so the approach to coordinating measures should be very similar. We have to move in the direction of digital (precision) water management, using all available technological tools for future planning. But beyond technical issues, trust building and political agreement are also key factors in our work.

Danube Watch: *You have a reputation of being highly committed with a high level of expertise. How do you intend to utilise these attributes in your work with us?*

As a civil engineer, later specialising in surface water quality protection, but also having gained a general overview in other fields, I would also like to actively contribute to expert group level activities in an advisory role. I have a personal interest in some topics, e.g. tailings management and water allocation, where I still act as an expert.

Danube Watch: *One of your main priorities is to further improve the financial framework and sponsoring system, and to explore possibilities of involving new partners from the basin to support the activities of the ICPDR. What actions do you foresee as necessary to achieve this?*

We have to realise that a thorough review is needed relating to the sustainability of the current financing system. A country's contribution has basically remained at the same level, but the responsibilities and new tasks have been growing exponentially at the same time. I am fully aware that some countries suffering financial crises would have difficulties if we were to significantly raise the level of contributions. However, I feel that the use of the business sector in finding additional funds would be an option. We should look for big internationally recognised companies which have a close relationship or are situated close to the water and have a presence in many countries of the Danube Basin. As president, I would like to start negotiations with such companies in the hope that they would support our work.

Danube Watch: *You are also concerned about the possibility of water scarcity caused by climate change in the Danube region. What do you think are the main strengths of the ICPDR's Adaptation Strategy to Climate Change and what other measures can be taken to reduce and mitigate its effects?*

In my opinion, climate change adaptation is one of the biggest challenges of this century. Whether one believes in it or not, the

Forging New Partnerships Securing the Future



fact is that we are facing extreme floods, record low water levels in our rivers, as well as more frequent and longer droughts. The ICPDR's CC Adaptation Strategy provides guidance for all the countries in the basin. Only coordinated actions can lead to a solution.

We are concerned that more frequent or prolonged droughts could increase competition between water uses, which could lead to water scarcity in the long-term. We need to start thinking about this on a transboundary level and ensure that all means are used to identify robust measures and promote the mitigation of the effects of drought.

Irrigation development is one of the answers to the high pressure on both surface and groundwater resources. We have to build up a real partnership with the agricultural sector, pointing out the use of water saving irrigation schemes as good agricultural practice; natural water retention can save the productivity of the farmlands and, at the same time, allow for the sustainability of water resources.

Danube Watch: *The further implementation of the existing plans and preparation of their updates in 2021 is also of great importance to you. What challenges do you expect to encounter and what are the opportunities?*

The 3rd RBMP (River Basin Management Plan) and the 2nd (Flood Risk Management Plan) FRMP will be a challenge, even though we are not doing them for the first time. Data collection is a huge task, which will start this year. The 4th Joint Danube Survey (JDS4) will be a

key activity, as it will provide additional information for the updates. I would highlight the importance of bilateral cooperation between the countries on their national parts of the RBMP, especially on the Program of Measure. We should also provide help to non-EU Member States who have no legal obligation to develop those plans, but have a politically approved commitment to do such.

Danube Watch: *Finally, what do you hope to have achieved by the end of your Presidency?*

I wish to establish a sound financial framework and a sponsoring system for the extended activities of the ICPDR, to classify drought as a significant water management issue, to increase the visibility of the ICPDR, partly by reaching out to an even broader public by using social media, and to extend partnerships with stakeholders (e.g. Danube Strategy, UNECE, etc.).

My wish is also to explore possibilities of involving new partners from the basin who can actively support ICPDR-related activities. I see the engagement of the private sector in individual partnerships with the ICPDR as an opportunity to harmonise efforts towards joint concerns and objectives.

I also hope that we will assure the availability of a sufficient quantity of clean water for all water users, assuring the sustainability of those water resources at the same time. We hope that our joint efforts in 2019 will result in reaching a cleaner, healthier, and safer Danube River Basin. ”

Danube Sturgeon Task Force



© Ralf Reinartz

Since its establishment in 2012, the Danube Sturgeon Task Force (DSTF) has been a frequent guest at ICPDR meetings, informing members about sturgeon conservation initiatives and threats. Although it has proven its value as a cooperative platform for sturgeon experts and actors from the scientific, governmental, and non-governmental realms, its members felt that agreeing on a set of principles and a clear governance mechanism would increase its effectiveness. Therefore, the DSTF was re-organised and streamlined under a new set of Rules of Procedure. They clarify the objectives of the work of the DSTF, the way DSTF members cooperate and communicate, and establish a permanent Executive Committee elected every three years.

The main objective of the DSTF is to raise awareness of the threats facing sturgeon species among decision-makers and the public. In addition, DSTF aims to build stakeholder capacity on sturgeon conservation by organising symposia, workshops, and conferences related to Danube sturgeon protection and the sustainable management of aquatic resources in the Danube and Black Sea Regions. It also seeks to provide expertise on, and advocate for, stur-

geon conservation. The Sturgeon2020 Programme remains the guiding star of DSTF's work. Since Sturgeon2020 was also endorsed by the 2016 ICPDR Ministerial Declaration, the cooperation between the ICPDR and the DSTF continues to be of mutual benefit.

To mark the beginning of the relaunched DSTF, a General Assembly made up of its

edges that the DSTF was established under PA6 as a coordination and support mechanism, and still features as one of several Task Forces under the EUSDR.

The General Assembly elected a DSTF Executive Committee of six members with a balanced mix of expertise and background. Well known former Head of Unit for Water at DG Environment and ICPDR President in 2017, Peter Gammeltoft became the new DSTF Chair. "The Executive Committee is responsible for managing DSTF processes, taking operational decisions, and managing relations with external organisations," explained Mr. Gammeltoft. He is supported in his function as spokesperson for the network by Gheorghe Constantin, who has been the Romanian Water Director for many years. The other members of the Executive Committee include the researchers Thomas Friedrich from Austria and Mirjana Lenhardt from Serbia,

WWF representative Natalia Gozak from Ukraine, and Florian Ballnus as EUSDR PA6 Coordinator and representative of the Bavarian State Ministry for Environment and Consumer Protection.

DSTF and ICPDR have proven to be excellent partners and complement the work

What will the DSTF's main areas of work be in the near future?

Peter Gammeltoft sheds some light on the matter, stating that "DSTF will focus on sturgeon habitat conservation, securing a diverse sturgeon gene pool through *ex-situ* conservation measures such as well-controlled hatcheries, promoting the continuation of fishing bans in Danube countries, and advocating for effective enforcement of laws protecting sturgeon." The DSTF has already set up working groups and focal points to coordinate these different efforts.



members met in April 2019 in Vienna at BOKU University, itself a well-known player in the sturgeon expert world. The ICPDR joined the meeting under observer status. Florian Ballnus, one of the two Coordinators of Priority Area (PA) 6 Biodiversity of the EU Strategy for the Danube Region (EUSDR), opened the session by acknowl-

Strengthened and Relunched

of each other well. Since the ICPDR's mandate is limited to water management objectives, other types of sturgeon conservation measures, such as strengthening enforcement efforts against poaching, can be addressed by the DSTF. Moreover, the DSTF can provide a degree of scientific expertise which the ICPDR cannot. It can connect with nature conservation stakeholders outside of the scope of the ICPDR's focus. From the other side of things, the DSTF can greatly benefit from the ICPDR's network of water managers. This beneficial cooperation is why the DSTF has applied for ICPDR observer status.

Sturgeon conservation, and thus DSTF's work, just received a fresh boost on 22 May, the international Day of Biodiversity. Under the EU Habitats Directive, the European Commission and experts from EU Member States endorsed the implementation of a continent-wide action plan to save all eight European sturgeon species from extinction. The plan aims to conserve the last surviving sturgeon populations in Europe by tackling poaching and the illegal trade in wild sturgeon

products, restoring habitats, and reintroducing sturgeon to many rivers. Indeed, it is high time for Europe to act. Today, natural reproduction is confined to only two European rivers – the Rioni in Georgia and the Danube! Although small native populations are found in the Gironde River system in France and the Po in Italy, they are most likely not reproducing.

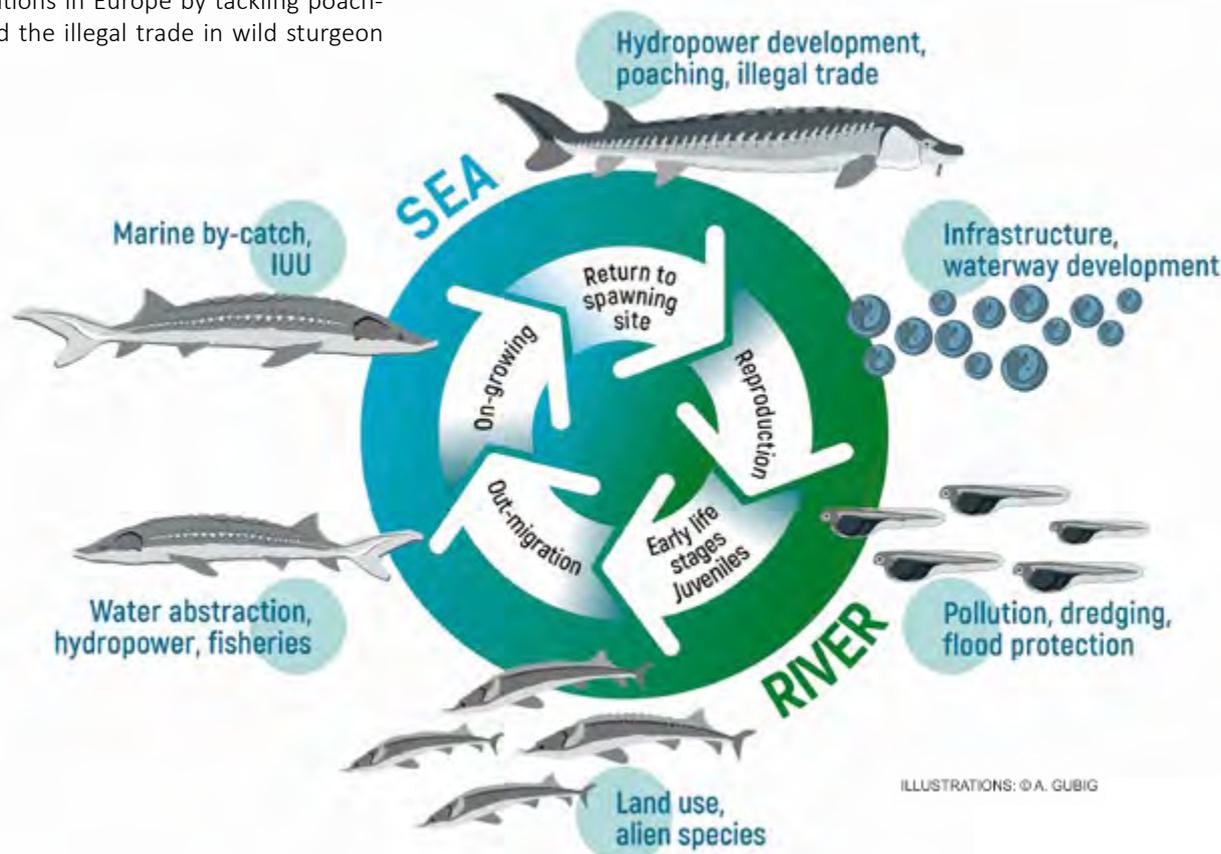
The same conservation action plan was adopted last November in Strasbourg by the Standing Committee of the Bern Convention on the Conservation of European Wildlife and Natural Habitats – a legally binding treaty covering most of Europe's natural heritage. The EU is party to the Bern Convention. The renewed endorsement of the same plan under the EU Habitats Directive is an encouraging sign that the seriousness of the situation has been acknowledged and member states will step up implementation efforts. DSTF is committed to contributing to the implementation of this Action Plan in the Danube River Basin.



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Are you involved in sturgeon conservation and want to become a DSTF member? Then apply by stating the reason you would like to join and sending it to info@dstf.eu.

More information can be found on the DSTF website. www.dstf.eu



ILLUSTRATIONS: © A. GUBIG

An Interview with Dr. Mirjana Lenhardt

Mirjana Lenhardt is Principle Research Fellow in the Department of Hydroecology and Water Protection at the University of Belgrade in Belgrade, Serbia. She is a leading expert on sturgeon in the Danube region.

PEOPLE
OF THE DANUBE

In the interview series "People of the Danube", Danube Watch presents personal portraits of individuals who are passionate about the Danube Basin and its waters.

Danube Watch: *You've led and participated in many multilateral projects focused on the health of regional river ecology, "MEASURES" and "Sturgeon 2020" being recent examples, what do you see as the major benefits of such collaborative efforts? What do you see as some of the main difficulties and/or obstacles of these efforts and potential solutions?*

Sturgeons and other migratory fish species represent a natural and cultural resource of the Danube River and, due to their geographical dispersion, collaboration among teams from different countries is the only way for proper investigation and protection. Collaboration is also important for the standardisation of procedure and building of common a database. Investigation in fish biology requires transforming research practice and organising collaboration in field and laboratory settings. It is important to include new technologies and to organise databases and communication strategies. Cooperation in field biology does not only include scientists, and due to that, it is important to set up a network of all stakeholders with the involvement of local communities and relevant companies. This network could help with the more efficient use of new technologies and in building a valuable database. The other network could be organised for laboratory work which can include different teams with the aim to gather, collate, and analyse data. Results of such work could help in our understanding of various processes and could lead to better management. The economic situation is different in countries along the Danube River and each country encounters their own difficulties in

performing research in the field and laboratory. One of the main problems is the building of an experienced team in each country which could estimate the current status of migratory fish species and important habitats. There is lot of work which could be performed by experienced teams equipped with the latest technology.

Danube Watch: *With more than 30 years of experience in the field, what changes have you seen in the attitudes of key stakeholders regarding the status of the Danube's sturgeon and the health of the river in general?*

My work investigating fish populations in the Danube River started with my PhD thesis in 1980, while my work on sturgeons started in 2001 when I headed the Serbian part of the project "Endangered Species: Oocyte maturation of the beluga sturgeon (*Huso huso*) – Evolutionary significance of egg yolk proteins", financed by the Norwegian Research Council. At that time, catching sturgeons was allowed and fishermen mainly caught beluga sturgeon in the Serbian part of the Danube River downstream of the Iron Gate II dam. It was surprising then that lot of money was earned by selling beluga sturgeon caviar as there were no investigations or data relating to sturgeons, especially relating to beluga sturgeon. Nowadays, there have been some steps forward in the investigation of sturgeon behaviour by telemetry and DNA analysis of different sturgeon species. However, all bigger investigations depend mainly on international projects which last one, two, or a maximum of four years, after which all activities are ceased. There is a real need for continual in-



vestigation and investment in new technologies as only in that way can valuable and reliable data be acquired.

Danube Watch: *You are researching the effects of the Iron Gate II Dam on the Danube's sturgeon and their behaviour, what drew you to this project? What are some special challenges or considerations that come with it?*

Unfortunately, it was only a one year project. The Romanian team trained Serbian and Bulgarian teams in sturgeon telemetry. We worked with fishermen downstream of Iron Gate II for one month in the spring and one month during autumn, but



there were no sturgeons caught. Regardless, it was a great experience monitoring the behaviour of other fish species (catfish, barbell, carp, nase, asp) in the vicinity of the dam. This project showed the importance of collaboration with fishermen and the local community. During this project, one transmitter was implanted in a big catfish (*Silurus glanis*) and now we have almost two years' worth of data relating to catfish depth and temperature, as well as concerning spawning migration. When the project was finished, there were problems with replacing batteries on receivers and damage to cables, so some of the receivers were no longer active. Fortunately, as the WePass project started repairing all receivers, we have gotten new data from the catfish.

Danube Watch: *What do you think and/or hope the future holds for cooperation and collaboration between researchers,*

governments, and organisations like the ICPDR regarding the Danube and its fish species?

It would be really nice if one day a network of observational buoys would exist on the Danube River which would contain receivers and sensors for remote sensing field data and automated data collection. This network would also include many fish with transmitters. It is only possible to achieve if, in each country, good collaboration could be developed among different stakeholders (government, international organisations, navigation companies, HE plants, local communities, fishermen etc.). Only large, multinational, and interdisciplinary research could bring results which can improve fish management.

Danube Watch: *What is your personal relationship to the Danube River? What led you to focus on the fish species in the area?*

As I mentioned, my investigation of fish in the Danube River started at locations near Belgrade during my work on PhD thesis. At that time, I worked on pike (*Esox lucius* L.) and I looked into seasonal changes in blood biochemical parameters. I collected pike specimens for samples in the Danube River each month over two years. I had great help from fishermen and they taught me which locations to find pike in different seasons. After that, I worked on other fish species. I was a mentor for one master and one PhD thesis which related to sterlet (*Acipenser ruthenus*) as well as for one which dealt with Pontic shad (*Alosa immaculata*). Investigations of allochthonous species involved analyses of the pipefish (*Syngnathus abaster*) population downstream of Iron Gate II, as well as of gobiids which were investigated in bilateral projects with Slovakia. ”



Fold out to learn more about restoration measures for river and habitat continuity. Further information on this as well as on river continuity disruptions can be found in the ICPDR's "Danube River Basin District Management Plan Update 2015".

Ecological Prioritisation Regarding Restoration Measures for Rivers



The ecological prioritisation approach (Part A) is not meant to substitute the similar national approaches, but to outline the basin-wide perspective. Low restoration priority indicated on the national level, as all fish species need open river continuity. On the other hand, ecological prioritisation is only one of the many aspects in deciding which measures to adopt at the national level.

This ICPDR product is based on national information provided by the Contracting Parties to the ICPDR (AT, BA, BG, CZ, DE, HR, HU, ME, MD, RO, RS, SI, SK, UA) and CH. EuroGlobalMap data, ESRI World Countries was used; Shuttle Radar Topography Mission (SRTM) from USGS Seamless Data Distribution System was used as elevation data layer; data from the European Commission, Vienna, December 2015



on the basin-wide level does not imply that no measures should be undertaken and implement. Final decision will be taken at the national level.

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from EuroGeographics was used for all national borders except for AL, BA, ME where the data from the Commission (Joint Research Center) was used for the outer border of the DRBD of AL, IT, ME and PL.





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