

# ICPDR IKSD

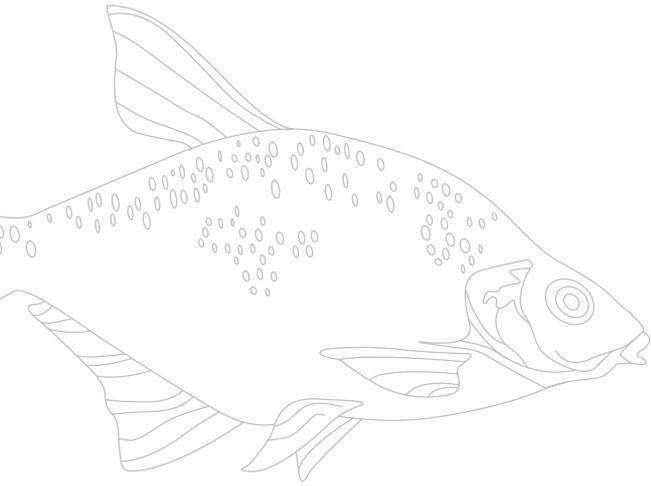
International Commission  
for the Protection  
of the Danube River

Internationale Kommission  
zum Schutz der Donau

## A Shared River

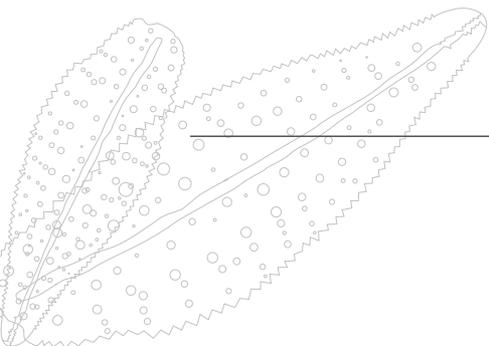
MANAGING THE DANUBE RIVER BASIN





# Contents

	Foreword	Pg 03
	Executive Summary	Pg 04
	The Role of the ICPDR	Pg 08
	Working Together for the Danube	Pg 12
	Balancing Water Uses	Pg 14
	Adapting to Climate Change	Pg 16
	Solidarity for Safety	Pg 18
	Shared River Science	Pg 20
	The People's River	Pg 24
	A World Leader	Pg 26
	ICPDR Vision and Mission	Pg 27



# Foreword

One of the main benefits provided by the International Commission for the Protection of the Danube River (ICPDR) is the ability to help national decision-makers balance the competing needs and uses of the Danube River such as water supply, hydropower, navigation, agriculture, the management of climate risks and the environment.

In its work to implement the EU's Water Framework Directive (WFD) the ICPDR and its partners have developed a truly integrated approach to the management of the river basin and its resources. Today the ICPDR serves its member countries as a highly successful platform for consultation, coordination and the integrated management of the Danube River Basin. National delegates, ministers, technical experts, civil society, the scientific community and the wider public all now cooperate with the ICPDR to ensure the sustainable and equitable use of water resources in the Danube River Basin.

The ICPDR has improved data collection and analysis, generated cross-sector dialogue, increased investments, promoted public participation and created greater awareness of the need to protect, conserve and manage the Danube River Basin in a sustainable way. In the field of water management, the work of the ICPDR has supported the accession process of Danube countries to the European Union. The cooperation and technical support provided by the ICPDR has helped to strengthen the environment, economy and security of the entire Danube River Basin.

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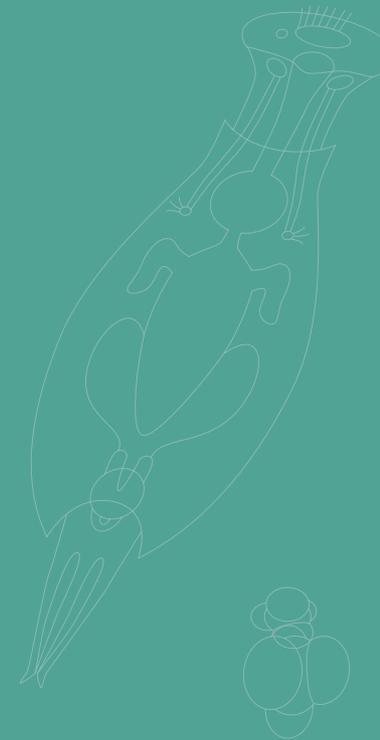
The ICPDR provides a platform for consultation, coordination and the integrated management of the Danube River Basin.

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In 2016 the Danube Ministerial Conference acknowledged the impressive progress in ongoing reduction of organic emissions from point and diffuse sources. Hundreds of fish migration aids have been constructed, opening up migration routes and improving the connectivity between habitats. In addition, more than 50,000 hectares of wetlands and floodplains have been partially or totally reconnected, restoring ecosystem functioning and flood attenuation services. The Danube Declaration adopted at the Ministerial Conference outlines the path towards a cleaner, healthier and safer Danube River by 2021.

It is with great pleasure that I invite you to read this publication to learn more about how the ICPDR in helping all of its stakeholders to work together to improve the management of our shared river.

**Dr. Helge Wendenburg,**  
**ICPDR President, 2018**



# Executive Summary



*This publication is designed to highlight the key benefits that Danube countries receive from their membership in the International Commission for the Protection of the Danube River (ICPDR).*

The main benefit provided by the ICPDR is the platform it provides for all Danube countries to work together on the integrated management of the river basin so that 80 million people can enjoy a cleaner, healthier and safer river.

These three key elements of the ICPDR's management plans also provide the three pillars of action that are needed for the Danube to achieve: **cleaner** water, a **healthier** home for aquatic animals and plants, and a **safer** environment for people to live without the fear of floods.



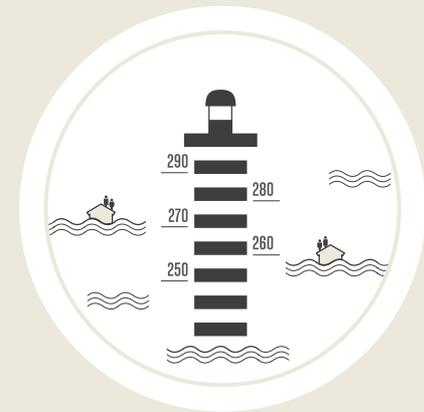
## Cleaner

cleaner water



## Healthier

a healthier home for aquatic animals and plants



## Safer

a safer environment for people to live without the fear of floods

## Cont.

In this publication you will read about many of the people, such as Vasyl Gubal (pictured below), who both contribute to and benefit from, the work of the ICPDR. Mr. Gubal is the mayor of Kvasovo, a small village of 900 people located on the border of Ukraine and Hungary. In 2001 his village was devastated by a catastrophic flood and, ever since this traumatic event, the entire village has been motivated to improve the management of the local Borzhava River, which ultimately feeds into the Danube.

When the ICPDR was first established in 1998 it provided the platform that was needed for countries to assess the health of the river and develop basin-wide plans to address priority issues such as climate change, flooding and the generation of hydropower. In just 20 years the ICPDR has become a global model for the transboundary management of shared river basins around the world.

The ICPDR has now supported three Joint Danube Surveys in 2001, 2007 and 2013 to collect the scientific information that is needed to help decision-makers to select the right measures for the Danube River Basin Management Plan. These collaborative surveys have shown that water quality is progressively becoming healthier and safer, in large part thanks to the collaborative management efforts supported by the ICPDR.

One of the main benefits provided by the ICPDR is the ability to help national decision-makers balance the competing needs and uses of the Danube River. This work has been keenly demonstrated by the development of the 2013 “Guiding Principles” for sustainable hydropower in the Danube Basin. These principles are now helping Danube countries to balance the need for energy while supporting efforts to reconnect fish species to their natural spawning grounds.

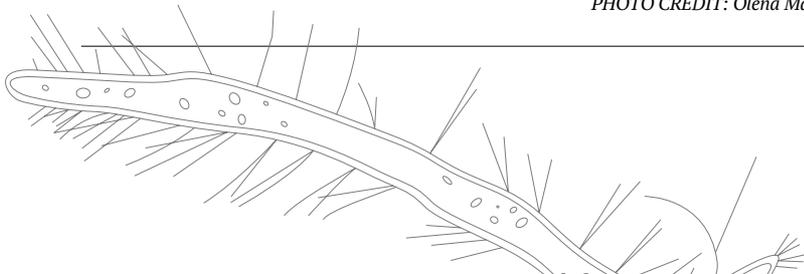
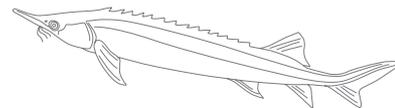


PHOTO CREDIT: Olena Marushevska

## ICPDR adopts Sturgeon Strategy

The ICPDR formally adopted its Sturgeon Strategy at the ICPDR Ordinary Meeting in December, 2017 as part of its efforts to ensure the survival and recovery of this ancient species in the Danube River Basin. The new strategy provides a comprehensive overview of actions and measures considered necessary for securing the survival of sturgeons by fostering cooperation between all national and international players dedicated to sturgeon conservation activities.

The ICPDR’s Sturgeon Strategy will help to catalyze much needed cross-sectoral actions to secure the survival of Danube sturgeons. This includes an array of actions such as removing barriers blocking their migration, stopping the loss and deterioration of habitats and halting or mitigating other negative impacts such as pollution, over-exploitation and trafficking. Making the Iron Gates and Gabčíkovo dams passable for sturgeons as is envisaged by the ICPDR Strategy will reopen precious sturgeon habitat upstream.



The ICPDR's 2017 Sturgeon Strategy will help to catalyze the cross-sectoral actions needed to secure the survival of Danube sturgeons, which are an integral part of the natural heritage of the Danube River Basin. This ancient migratory fish can grow up to seven meters in length and can live to be a hundred years old, but they are now considered to be one of the most endangered species groups on the planet.

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One of the main benefits provided by the ICPDR is the ability to help national decision-makers balance the competing needs and uses of the Danube River.

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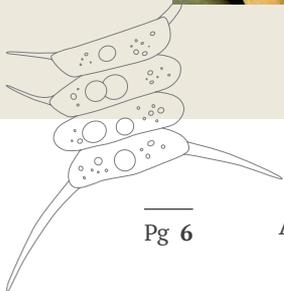
PHOTO CREDIT: KOLLER

In this publication you will also learn how the ICPDR is helping countries to understand how climate change is impacting the health and management of the river at a basin-wide level. The droughts of 2015 have stimulated the development of new adaptation measures such as improved irrigation and drought-resistant crop varieties.

However, it is the shared management of flood risks that perhaps best demonstrates the application of the “solidarity principle”, whereby Danube countries are now working closely together to avoid simply exporting flood problems to their downstream neighbours. The ICPDR's 2015 Flood Risk Management Plan is now helping all Danube countries to find cost-effective ways to reduce the impacts of the major flood events that regularly affect many Danube communities.

The ICPDR supports the active involvement of the public and civil society on all levels of its work such as the development of the Danube River Basin Management Plan and the Flood Risk Management Plan. The ICPDR's public participation approach allows all of the Danube Basin's residents to make their voices heard and get involved to help restore the water resources of the basin and safeguard them for the benefit of their communities.

We welcome you on this journey through “A Shared River” and ask you to reflect on the many thousands of people across the Danube River Basin who are working together every day to ensure that the Danube is kept cleaner, healthier and safer for generations to come.



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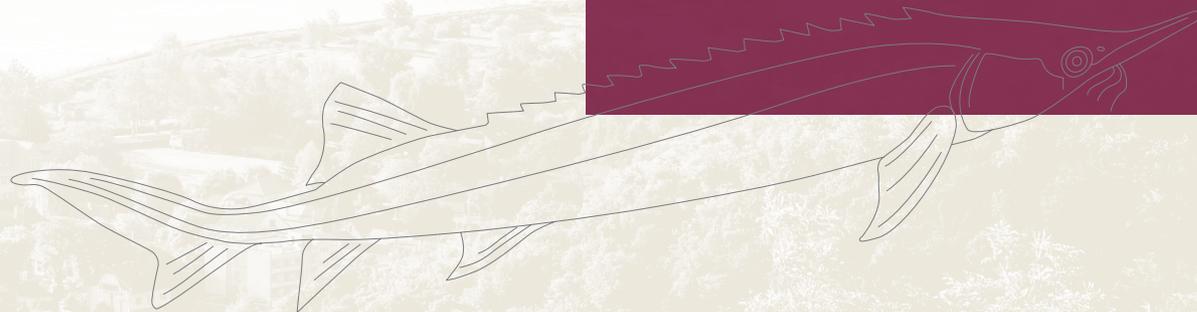
The largest stock of the sturgeon population in the European Union still living in the wild can be found in the lower Danube Catchment; all surviving stocks share the status of critically endangered species and their survival depends on immediate action.

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## Sturgeons ~ A species on the brink of extinction

Sturgeons are an integral part of the natural heritage of the Danube River Basin. For over 200 million years sturgeons have outlasted the dinosaurs but, according to the International Union for Conservation of Nature, they are now the most endangered species group on the planet.

Once present in large, viable populations in many rivers and adjacent coastal areas of the European Union, sturgeons have now either completely disappeared or declined very dramatically over the past century. The largest stock of the sturgeon population in the European Union still living in the wild can be found in the lower Danube Catchment; all surviving stocks share the status of critically endangered species and their survival depends on immediate action.



# The Role of the ICPDR

“The ICPDR is the principal international body for the promotion of a sustainable and balanced use of water resources in the Danube River Basin.”

- **Boško Kenjić**, Bosnia & Herzegovina's Head of Delegation to the ICPDR

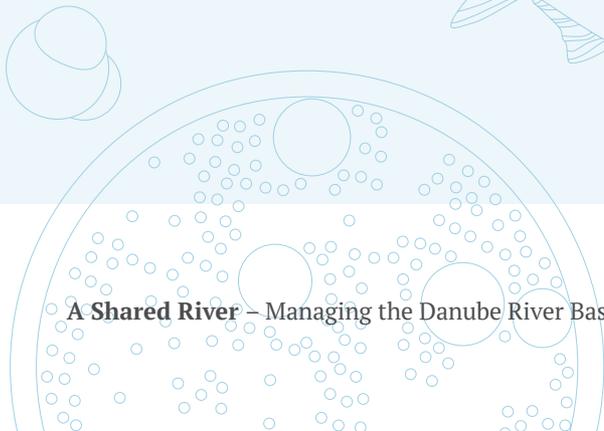
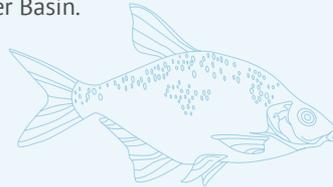
The International Commission for the Protection of the Danube River (ICPDR) is a transboundary river basin organization that works to ensure the sustainable and equitable use of freshwater resources in the Danube River Basin for the benefit of over 80 million people.

Since the ICPDR was established in 1998 it has provided a platform for countries to assess the health of the river and develop basin-wide plans to address priority issues such as pollution, hydropower, navigation and adaptation to climate change. By bringing together representatives from the highest ministerial levels, technical experts, members of civil society and the scientific community, the ICPDR has contributed significantly towards improvements in the state of water bodies in the Danube River Basin.

## The Challenge

Nineteen countries share the Danube River Basin, making it the world's most international river basin. Because of a requirement for at least 2,000 km<sup>2</sup> of national territory to be located within the Danube River Basin, only fourteen of these countries – and the European Union - are full contracting parties to the ICPDR. The river basin covers 817,000 square kilometers and 83 million people live in its catchment area.

Some 20 million people rely on the Danube for drinking water. The Danube passes through numerous large cities – including four national capitals, Vienna, Bratislava, Budapest and Belgrade. By the 1980s water quality was a serious issue due to the pollution originating from millions of individuals, agriculture and industry. The river is also critical for the generation of hydropower, navigation, agriculture, recreation and the natural environment. Currently just 24.7% of the Danube's water bodies are considered to have good ecological status.



## The Danube River Protection Convention

The Convention was signed on 29 June, 1994, and signatories to the Convention have agreed to cooperate on fundamental water management issues, including the conservation, improvement and rational use of surface and groundwater; preventive measures to control hazards originating from accidents, floods, ice or hazardous substances; and measures to reduce the pollution loads entering the Black Sea from sources in the Danube River Basin.

## Towards a Cleaner, Healthier, Safer Danube by 2021

The ongoing goal of the ICPDR is to implement the Danube River Protection Convention and make it a living tool to coordinate sustainable and equitable water management, including conservation, improvement and rational use of water resources for the benefit of the Danube River Basin countries and their people. The 2016 Danube Ministerial Declaration outlines the ICPDR's three key goals for a cleaner, healthier and safer Danube River by 2021:

1. **“Cleaner” water;**
2. **A “Healthier” home for aquatic animals and plants and;**
3. **A “Safer” environment for people to live without the fear of floods.**



*PHOTO CREDIT: Malta Oberstufe © VERBUND*

# UNECE Water Convention

The 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes has served as a model for transboundary cooperation arrangements. Many river basin agreements, such as the Danube River Protection Convention, are based on the Convention's basic principles.

The aim of the UNECE Water Convention is to strengthen transboundary water cooperation in order to protect and ensure the quantity, quality and sustainable use of transboundary water resources – both surface and groundwater. The Convention – now a global instrument - takes a holistic approach, based on the understanding that water resources play an integral part in ecosystems as well as in human societies and economies.

**Achievements:**

*In 2017 Danube Day mobilized*

**33,000** people

in **230** events

across **14** countries

*Reconnected*

**50,000**

hectares of wetlands and  
floodplains

*Coordinated*

**3**

international surveys of the  
Danube River Basin  
(Joint Danube Surveys)

*Since 2004*

*Danube Day has been*

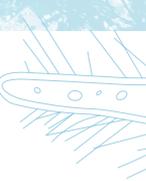
**celebrated**

every year

*Constructed or upgraded*

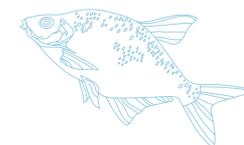
**900**

Urban Waste Water  
Treatment Plants



## The ICPDR - Facts & Figures

<b>Members</b>	Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Slovakia, Slovenia, Serbia, Ukraine, and the European Union.
<b>Annual Budget</b>	€1.2 m
<b>Function</b>	The ICPDR assesses and synthesizes information on the state of surface and groundwater in the Danube basin and acts as a forum for countries to coordinate and implement basin related EU Directives (Water Framework Floods Directives) and individual projects.
<b>Objectives</b>	A primary objective of the Danube River Basin Management Plan 2015 update is to improve water status and coordination of management planning including areas such as navigation, hydropower, flood management, ecosystems and the economy.
<b>Key challenges</b>	<ul style="list-style-type: none"><li>- Organic substance pollution</li><li>- Nutrient pollution</li><li>- Hazardous substance pollution</li><li>- Hydromorphological alterations</li><li>- Flood risk management</li></ul>
<b>How does it work?</b>	The ICPDR consists of delegations from contracting parties. Delegates make decisions by consensus, twice yearly, in the Heads of Delegation (Standing Working Group) and the Commission's plenary meetings (Ordinary Meeting). These meetings are chaired by the ICPDR President. The ICPDR working structure further includes Expert Groups and Task Groups. Twenty-three observer organisations are involved in the work of the ICPDR.
<b>Expert Groups</b>	ICPDR Expert Groups focus on the following key areas: <ul style="list-style-type: none"><li>- River Basin Management</li><li>- Flood Risk Management</li><li>- Accident Prevention and Control</li><li>- Monitoring and Assessment</li><li>- Pressures and Measures</li><li>- Public Participation</li><li>- Information Management and GIS.</li></ul>
<b>Secretariat</b>	The Commission is supported by a permanent secretariat of nine staff based in the Vienna International Centre (VIC).



# Working Together for the Danube



**THE ICPDR IS HELPING COUNTRIES TO WORK TOGETHER TO CREATE A CLEANER, HEALTHIER AND SAFER DANUBE RIVER BASIN.**

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“The ICPDR is an exemplary international organisation that, by its very nature, requires multilateral solutions to transboundary issues.”

~ **Adriana Petcu**, Romania’s Head of Delegation to the ICPDR

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The ICPDR addresses the entire Danube River basin, including more than 300 tributaries and connected ground water resources, making the ICPDR one of the largest and most active international river basin management commissions in the world.

Austria’s Wolfgang Stalzer, the first ICPDR President (Austria) and now an ICPDR Ambassador, says the ICPDR should receive greater recognition for its work to improve environmental management of the Danube River Basin.

“Since 1998, the ICPDR has provided an essential platform for developing the joint measures and activities that were needed to improve the transboundary management of the Danube. We have only been able to take these shared actions because we now have a technically and institutionally strong body like the ICPDR,” he says.



*PHOTO CREDIT: Magnus Lundgren/Rewilding Europe*

## European Union a Driving Force for Cooperation

Since 1991 the European Union has been one of the main drivers for river basin management planning in the Danube. After the collapse of the former Soviet Union the driving force for environmental change in the Danube Basin was provided by the promise of accession to the European Union and the subsequent need to meet its stringent environmental directives.

The goals of the ICPDR include safeguarding and conserving water, protecting water quality, ensuring healthy river systems, and reducing damage caused by floods and ice hazards.

Given the complexity of the Danube River Basin, including many countries with widely differing economic and environmental management needs, one overall framework was required to sustainably manage the basin. In 2000, the ICPDR contracting parties nominated the ICPDR as the platform for the implementation of all transboundary aspects of the EU Water Framework Directive (WFD). The WFD is a holistic legal and policy framework, based on transboundary cooperation in basins, seen by many as the strongest water protection legislation in the world.

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Despite its many achievements, the ICPDR has much work to do, particularly in relation to supporting more water-friendly measures in the agricultural sector.

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In its work to implement the EU's Water Framework Directive (WFD) ICPDR and its partners have developed a truly integrated approach to the management of the river basin and its resources. This work has turned the Danube into a classic example of Integrated River Basin Management while also helping to reinforce the political stability of the whole Danube region.

Despite its many achievements, the ICPDR has much work to do, particularly in relation to supporting more water-friendly measures in the agricultural sector. The ICPDR has already indicated its commitment to support the development of more sustainable agricultural practices that will help to improve water management and reduce nutrient pollution. Achieving these goals will require greater cooperation between the environmental and agricultural sectors to try and decouple economic growth from the pollution of surface and groundwater.



PHOTO CREDIT: Istock Photo

# Balancing Water Uses



## MANAGING THE DANUBE RIVER BASIN INVOLVES A COMPLEX MYRIAD OF DIFFERENT FACTORS, WITH DIFFERENCES IN ECONOMIC PERFORMANCE, BIOLOGICAL ASSETS, AND THREATS.

It was clear from the establishment of the ICPDR, in 1998, that one overall framework was required to sustainably manage the basin environment. Today the ICPDR continues to use Integrated River Basin Management (IRBM) as the main mechanism for understanding how to balance different water uses, such as hydropower and navigation.

### Sustainable Hydropower

The ICPDR is helping Danube countries to ensure that the growing demand for hydropower is balanced with the need to protect the environment and endangered fish species.

Hydropower is an important renewable and clean source of energy for Danube countries such as Austria, Romania, Croatia, Slovenia, and Serbia. While hydropower helps to reduce greenhouse gases, the interruption of river continuity places significant pressure on river ecology and now threatens the survival of key fish species such as sturgeons.

A third of the Danube and a number of its tributaries are already impounded by 8557 hydropower stations, many of

which are located in the upper catchment. A number of new hydropower projects are now at different stages of planning and development throughout the Danube River Basin.

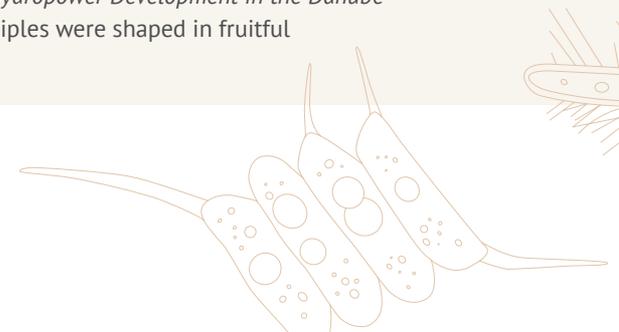
Over 100 species of fish are found in the Danube, including many migratory species such as Danube salmon, nase and sturgeons. Both large and small hydropower facilities can prevent migratory fish species from reaching their spawning grounds.

The Iron Gate I and II hydropower plants, which are jointly operated by Romania and Serbia, represent the largest hydropower dam and reservoir system along the entire Danube. Installing fish passes here would open up an additional 800 kilometres all the way upstream to the Gabčíkovo Dam in Slovakia and the Szigetköz region in Hungary. With the support of the ICPDR, the governments of Serbia and Romania are now working closely to develop effective solutions to overcome the significant engineering challenge posed by a drop in the river level of 20-28m.

### Consultation Leads to Improved Decision-Making

In 2010 Ministers from the Danube countries mandated the ICPDR to trigger a broad discussion process with the hydropower sector and all relevant stakeholders with the aim of integrating environmental considerations into the management of new and existing hydropower plants.

In 2011 Austria, Romania and Slovenia volunteered to steer an innovative and participative process to develop *Guiding Principles on Sustainable Hydropower Development in the Danube Basin*. These Guiding Principles were shaped in fruitful



discussions between the hydropower sector and stakeholders such as environmental NGOs, ministries and the scientific community. They were adopted by the ICPDR in 2013.

Since 2013, these Guiding Principles have helped to create a common vision and practical recommendations for countries to improve the efficiency and environmental management of all existing and planned hydropower plants. They have also enabled all Danube countries to develop a more predictable and transparent decision-making process, thereby reducing potential conflicts between the goals of energy production and environmental protection.

The process of developing the Guiding Principles has also helped to share a range of best practices across the region, such as the integration of fish migration aids into the upgrades of existing facilities. They are also helping to ensure that any new sites for hydropower plants are selected to minimize environmental impacts on ecology, sediment flows and groundwater quality.

The Guiding Principles are also supported by a number of inspiring case studies from countries such as Austria, Slovenia and Germany that show where the quality of water and the wider natural environment does not have to be substantially degraded as a result of hydropower generation.



PHOTO CREDIT: HE DJERDAP

## Navigating Shared Challenges

The Danube is an important shipping route and centuries of navigation have radically changed the physical and ecological characteristics of the river and its tributaries. In order to facilitate the cross-sectoral discussion needed to address the conflicting interests between navigation and ecology, the ICPDR used the “Integrated River Basin Management” approach to support the launch of a “Joint Statement on Inland Navigation and Environmental Sustainability in the Danube River Basin” in 2007.

This Joint Statement was developed in collaboration with the International Sava River Basin Commission (ISRBC) and the Danube Commission, which is responsible for the maintenance and improvement of navigation conditions of the Danube River. The statement summarizes the principles and criteria for environmentally sustainable inland navigation, including the maintenance of existing waterways and the development of future waterway infrastructure. It also provides a guiding document for the development of measures, requested by the EU Water Framework Directive, for the planning and the investments in future infrastructure and environmental protection projects.

# Adapting to Climate Change



## THE ICPDR HAS DEVELOPED A BASIN-WIDE CLIMATE CHANGE STRATEGY TO HELP DANUBE COUNTRIES DEVELOP MORE EFFECTIVE WATER MANAGEMENT APPROACHES IN THE FACE OF INCREASING DROUGHTS.

In 2012 the ICPDR was the first river basin commission in the world to develop a climate adaptation strategy. At the 2010 Danube Ministerial Conference, Ministers asked ICPDR to develop a Climate Change Adaptation Strategy for the Danube River Basin and Germany was nominated as Lead Country for this activity.

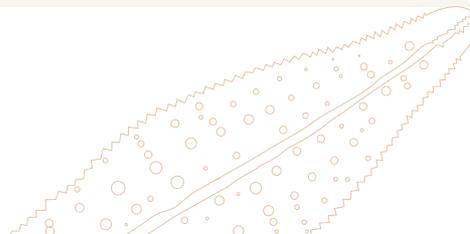
As the basis for this adaptation strategy, Germany supported a study to develop a greater understanding of the impacts of climate change on water resources across the basin.

This study found that, in some parts of the Danube River Basin, drought risk is expected to increase drastically, leading to possible economic losses, potential for water conflicts and water use restrictions. Water quality is also expected to be impacted by a decreasing oxygen concentration in rivers, aquifers and lakes, while higher water temperatures may lead to increased algal blooms.

ICPDR's climate adaptation strategy says that drought, low flow events and water scarcity situations are likely to become more intense, longer and more frequent. The Carpathian Area, particularly the southern parts of Hungary and Romania, as well as the Republic of Serbia, Bulgaria and the region of the Danube Delta, are likely to face severe droughts and water stress resulting in water shortages.

An intensification of extreme events, such as droughts, leads to high impacts for sectors such as agriculture and industry. The ICPDR's basin-wide approach to climate change is now helping to provide water management information at the catchment scale so that countries can determine the most likely impacts and cooperate on suitable adaptation measures. The Climate Change Adaptation Strategy stresses that any potential conflicts need to be addressed at the earliest possible stage in the planning process together with the involvement of all key stakeholders and interest groups.

In 2015 significant parts of the Danube River Basin were affected by drought. In July, 2015, absolute maximum temperatures were well above 40°C in several areas of Germany, Austria, Hungary and the Czech Republic, which all recorded their highest maximum daily temperatures since 1975. For those Danube countries which experienced a significant drought phenomena during 2015, agriculture was by far the most impacted sector. The most significant impact was on corn production but some countries also observed lower yields with later harvested plants like soya, sugar beet and rape seed.



Agriculture will also have to adapt to more frequent, longer and more intensive periods of drought in summer. As a result, many Danube countries are already adapting to the impact of droughts. However, many countries acknowledged the need for better monitoring data especially concerning the withdrawal of water for farming. In order to avoid or reduce the damage caused by droughts the ICPDR is working to support greater preparedness concerning the effective use of water across the entire agricultural sector.

Climate change impacts upstream can have implications downstream and vice versa. This is why international cooperation on the issue of climate change and water management will be one of the key issues regarding the implementation of the EU Water Framework Directive and its River Basin Management Plans, as well as the EU Floods Directive and its Flood Risk Management Plans.

At a basin-wide level Danube countries are continuing to support the development of green infrastructure, such as the extension of natural areas and the re-connection of wetlands and floodplains, which helps to support the protection and maintenance of the natural ecosystem. Further positive adaptation measures can also include the improved linkage between surface and groundwater which also leads to increased robustness of water resources during potential periods of water scarcity and droughts.

The ICPDR Climate Change Adaptation Strategy, and the study it is based on, are currently being updated to incorporate new developments in recent years. A new study and strategy will be available in 2018.

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“The ICPDR is providing global leadership as one of the first river basin commissions to have developed a climate change adaptation strategy.”

~ Heide Jekel, Germany's Head of Delegation to the ICPDR

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*During the 2015 drought one of the most significant impacts was on corn production*



# Solidarity for Safety

**THE ICPDR IS WORKING TO INCREASE THE SAFETY OF DANUBE COMMUNITIES BY ENABLING COUNTRIES TO WORK TOGETHER TO REDUCE A RANGE OF RISKS FROM FLOODING, POLLUTION AND INDUSTRIAL HAZARDS.**

## **The Danube's First Flood Risk Management Plan**

The increasing frequency of major flood events in the Danube River Basin has raised serious concerns about the role of climate change on increasing flood risks. In this new millennium major flood events have already occurred in 2002, 2005, 2006, 2009, 2010 and 2013. The floods in June, 2013 alone, resulted in economic costs of €2.4 billion.

The ICPDR's 2015 *Danube Flood Risk Management Plan*, which is based on the EU Floods Directive, focuses on the strategic management of flood risks across the entire river basin. This regional plan complements the national flood risk management plans, which provide more detailed information on measures such as flood maps.

A core foundation of the Danube Flood Risk Management Plan is the practical application of the Solidarity Principle which is

designed to prevent countries from simply exporting their flood problems to downstream neighbours. The application of the Solidarity Principle is essential, because structural flood protection such as dykes and demountable barriers may also lead to transferring more water downstream during extreme flood events.

The Danube Flood Risk Management Plan supports every effort to retain rainfall and store excess water locally, before releasing it downstream. Natural water retention measures include wetlands, restoration of flood plains and land-use changes such as the increased planting of grasses and forest areas.

Changes in land use in rural and urban areas can also worsen flood effects. The key lessons from the 2010 floods have shown that the risk of flood damage could be dramatically reduced by creating dry polders, revitalizing floodplains and providing regular maintenance of river channels to ensure unhindered flow during extreme flooding events.

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**“95% of our water in Hungary comes from abroad so it is clear that water safety issues cannot be solved alone.”**

~ **Peter Kovacs**, Hungary's Head of Delegation to the ICPDR.

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## Accident Prevention and Emergency Warning System

The ICPDR provides Danube countries with a critical platform for supporting accident prevention and crisis management across the river basin. Over the past two decades, surface water bodies in the Danube River Basin have been damaged by several major accident events, including a cyanide spill at Baia Mare in Romania in 2000 and a red mud spill at Kolontár in Hungary on 04 October, 2010.

Although the fight against accidental pollution has a long history in the basin, there are still a substantial number of high risk installations in the basin where appropriate safety conditions need to be established and maintained. There are more than 2,000 large facilities operating in the Danube River Basin and over half of these involve waste and wastewater management (29%) or metal processing (22%). However, the most hazardous sectors include mining sites and the storage facilities for chemicals and oil products. A basin-wide analysis of potential sources of accidental pollution has identified more than 250 high risk hazards with installations that store more than six million tons of hazardous substances.

A total of 40 contaminated sites (25 industrial sites and 15 waste deposits) have also been found to pose a high risk to water bodies in relation to flood events and their washout impacts. These sites represent a total surface area of about nine million m<sup>2</sup> and a total deposit volume of about seven million m<sup>3</sup>. The most hazardous sites need to be further examined in detail and prevention measures set up to prevent flood washout, along with the establishment of remediation activities.

## Jointly Breaking the Ice

Early in 2017 about 170 km of the Danube froze, bringing Hungary's river shipping to a complete standstill. When Hungary's ice breakers were called out to clear the waterway the ensuing cross-border cooperation with Serbia and Croatia was an immediate reminder of the regional solidarity that lies at the very heart of the ICPDR. Between these three countries there has been a long history of cross-border ice control. When the river froze two Hungarian ice-breakers broke through the ice jam in Dalj while two more moved to the Serbian section of the Danube between Novi Sad and Belgrade. Because of the emergency situation, Natasa Milic, Serbia's Head of Delegation to the ICPDR, says it was agreed for the ice-breakers to be deployed beyond the common interest section and Hungary's ships were sent to destroy the ice threatening its neighbours. "When the freezing temperatures caused a dangerous ice formation that threatened to cause damaging floods, we were able to achieve a fast response, because of cooperation that is built on our transboundary partnership," she says.

Together with partners, such as the United Nations Economic Commission for Europe (UNECE), the ICPDR also focuses on the provision of practical workshops and training events to promote guidelines, checklists and catalogues of safety measures for priority industrial sectors. Because past experiences show that tailing ponds related to mining activities and waste deposits are one of the highest hazard sectors the ICPDR plans to undertake a basin-wide risk assessment, specifically on tailings management facilities, by recommending checklists and measures to improve safety conditions and by organising training events for facility operators and authority inspectors.

# Shared River Science



**THE ICPDR HAS DEVELOPED A REGIONAL PLATFORM FOR INNOVATIVE SCIENCE THAT IS HELPING TO PROTECT THE LIVES OF OVER 80 MILLION PEOPLE ACROSS THE DANUBE RIVER BASIN.**

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“The ICPDR shows the true value of transboundary cooperation on the Danube River Basin. Because water knows no administrative boundaries the science, planning and decision making can and must be done together.”

~ **Elizabeta Kos**, Croatia's Head of Delegation to the ICPDR

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## Joint Danube Survey 3

Every six years the ICPDR coordinates a Joint Danube Survey, as a core component of the monitoring strategy for the Danube River Basin. The 2013 Joint Danube Survey 3 (JDS3) was the world's biggest river research expedition of its kind and provided a unique opportunity to assess the water quality of the entire Danube.

The JDS3 expedition provided the largest volume of knowledge about the Danube River Basin ever collected through a single scientific exercise. Its results showed that the health of the Danube is progressively improving. Additionally, new species were also discovered, such as the floating fern *Azolla*.

These joint, cooperative surveys are critical in helping decision-makers to select the right measures for the Danube River Basin Management Plan updates. They are also critical for measuring progress and identifying problems and the specific measures that are needed to address them.

For six weeks in August and September 2013, the survey ships travelled 2,375 km downstream, through 10 countries, to the Danube Delta. A core team of 20 scientists was responsible for all survey activities including sample processing and on-board analyses. The expedition vessels included Serbia's *Argus*, the *Istros* from Romania and two Austrian vessels, the *Wien* and *Meßschiff IV*.

The survey found that nutrient (i.e. nitrogen and phosphorus) concentrations have declined and this may indicate that recent improvements to municipal wastewater treatment are having a positive impact on water quality in the Danube. While most hazardous chemicals were found to be below levels of concern, concentrations of perfluorooctanesulfonic acid (PFOS) in water and fish were generally higher and the concentration of mercury in all fish samples significantly exceeded desired levels.

While JDS3 reconfirmed the Danube's high degree of biodiversity, pressures from fishing, invasive species and hydropower means that up to 90% of the sites did not meet the ecological requirements of the WFD for fish. The hydromorphological assessment found no "natural" stretches of the river, with about 60% of the entire Danube having now been modified in some way. The remaining 40% is classified as extensively or severely modified and about 75% of the Upper Danube is considered to be intensively altered. The Lower Danube is generally good and includes the river's longest free-flowing stretch of 860 km.

Dense urbanization and hydropower plants, such as Gabčíkovo and Iron Gates dams, mean that long stretches of the Danube are engineered. Very few stretches provide good conditions for floodplains and much of the 30-35% of remaining natural floodplains are impacted by disconnection from the main river.

The JDS3 report identified the need for further measures to restore floodplains, manage the sediment balance and to reinforce bank revetments. There is also a need to develop and upgrade wastewater treatment plants, especially in the middle and lower Danube areas. Work is already underway to investigate the occurrence of mercury in fish, implement policies to reduce the emission of hazardous substances, and to protect bank-filtered water wells used for drinking water.

## Joint Danube Survey 4

The results from the planned Joint Danube Survey 4 (JDS4) in 2019 will be used for the 2021 update of the Danube River Basin Management Plan. The JDS4 will also test new analytical methods which are also likely to prove highly useful for other river basins. The next survey will focus on the use of new approaches to screen pollutants and it will also explore the potential for using environmental DNA to assess changes in biological quality. JDS4 will also help to provide a detailed analysis of microplastics in the Danube.

In past surveys a core team of leading experts carried out all the sampling and analysis activities. In JDS4 most tasks will be undertaken directly by national experts while the Core Team will play more of a coordination and advisory role. It is hoped that this shift in responsibility will encourage greater country autonomy and ownership of the results, while also supporting a higher level of technical cooperation and harmonization across the region.



PHOTO CREDIT: UFZ/Künzelmann

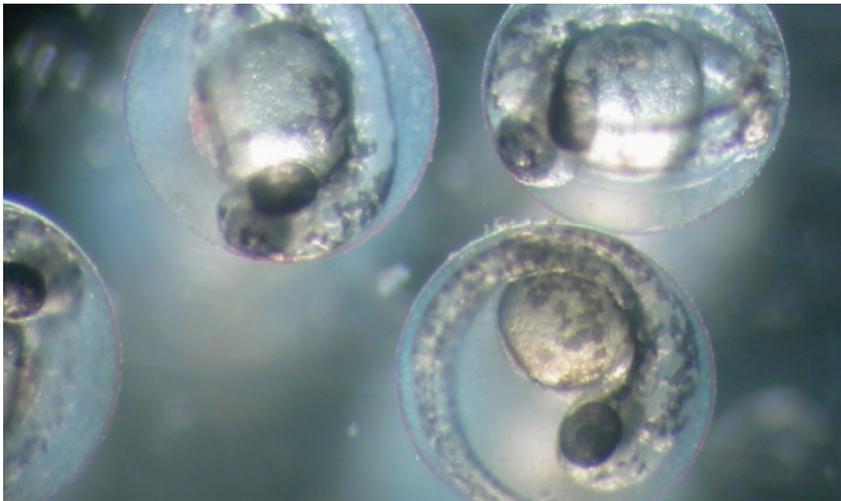


# Solutions for Emerging Pollutants

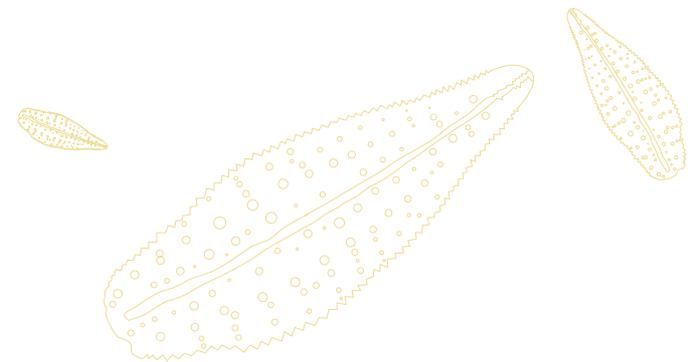
The ICPDR is a project partner of the EU FP7 SOLUTIONS project. A major objective of this project is to develop the evidence-base for water policies and consistent guidance for the early detection, identification and abatement of chemicals in the water cycle. The SOLUTIONS project provided a substantial contribution to JDS3 by analyzing samples for a wide range of hazardous substances and this analysis was used to identify Danube river basin specific pollutants that were included in the 2015 update of the Danube River Basin Management Plan. In August 2017, a total of 12 wastewater treatment plants were also sampled in nine Danube countries for further analysis of emerging chemicals and heavy metals. The SOLUTIONS modelling results and the final list of the Danube River Specific Substances produced by JDS3 will be available in 2018.

## Modelling Nutrient Emissions in River Systems

The Modelling Nutrient Emissions in River Systems (MONERIS) model is a critical tool in efforts to mitigate nutrient pollution. It calculates the emissions into and transport of nitrogen and phosphorus in surface waters. As a regionalized model for nutrient loads entering the Danube Basin from point and diffuse sources, MONERIS allows for the development and assessment of effective measures at sub-catchment scale to reduce the nitrogen and phosphorus content within the water bodies. About half of the nitrogen discharged into the river is from agricultural sources such as chemical fertilisers and manure from intensive farming operations. Other sources include industrial and municipal wastewater, and runoff from urban areas.



*SOLUTIONS has found that Zebrafish embryos are an excellent tool to study the effects of aquatic toxicants.*



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“Our work with ICPDR has now inspired countries to collaborate on similar freshwater surveys in shared river basins across the globe.”

~ **Vladimír Šucha**, Director-General of the Joint Research Centre for the European Commission

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# The People's River



**PUBLIC PARTICIPATION IN ENVIRONMENTAL DECISION-MAKING IS CRITICAL TO THE SUCCESSFUL MANAGEMENT OF THE DANUBE RIVER BASIN.**

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“We need to reach out to motivated people in our relevant stakeholder groups or organizations who are willing to take part in a fair and transparent process.”

~ **Susanne Brandstetter**, Chair of ICPDR's Public Participation Expert Group

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## Encouraging Public Participation

The ICPDR supports the active involvement of the public and civil society on all levels of its work, such as the development of the Danube River Basin Management Plan and the Flood Risk Management Plan. The ICPDR's public participation approach allows for all of the Danube Basin's residents to have their voices heard and get involved to help restore the water resources of the basin, safeguarding them for future generations.

In its commitment to directly involve stakeholders the ICPDR goes far beyond its legal requirements. In order to ensure that civil society and the wider public can be more meaningfully involved in its work, the ICPDR places a strong emphasis on public information, education and outreach activities. This is because of a firmly held belief that active public participation supports greater understanding, facilitates broader support for policies and leads to greater efficiency in the implementation of management measures.

The ICPDR actively engages in public participation through the direct involvement of 23 observer organisations such as the Danube Environmental Forum (DEF), the Danube Tourist Commission (DIE DONAU) and World Wide Fund for Nature – Danube-Carpathian Programme (WWF-DCP). It also supports a number of activities that ensure a high level of public consultation in the development of the ICPDR management plans such as stakeholder workshops, online surveys and public calls for the submission of comments on draft documents.

### ***Voice of the Danube***

In recent years one of the best illustrations of stakeholder involvement was the stakeholder consultation workshop Voice of the Danube on the draft DRBMP Update 2015 and the DFRMP, which was held in Zagreb, on 2-3 July 2015. The workshop targeted specialists with expertise in water management, and was implemented by the ICPDR together with the Global Water Partnership. In total, over 80 participants represented a broad range of backgrounds, from academia, to the national and international public sector, to non-government organisations and corporate entities.

### ***Danube Day***

Every year on 29 June, Danube Day commemorates the anniversary of the signing of the Danube River Protection Convention in Sofia, Bulgaria, in 1994. Danube Day has become the largest river festival in the world, with huge festivals on the riverbanks and public meetings as well as educational events.

Danube Day is also a basin-wide celebration reflecting the diversity of the region. The celebration pays tribute to the vital role the Danube and its tributaries play in people's lives: providing water, food, power, recreation and livelihoods. Maria M. Galambos, Chief Adviser Department of International Relations at Hungary's Ministry of Agriculture, believes that Danube Day allows all Danube countries to celebrate the diversity of its communities and share their appreciation for the river and its biodiversity.

"Danube Day provides a great opportunity to organize joint events between countries that directly demonstrate the need for international cooperation to protect our shared river," she says.

In 2017 the ICPDR asked everyone in the basin to, "Get Active for a Cleaner Danube", inspired by the 2016 Danube Declaration which has made it a priority for all Danube Basin countries to make the Danube River Basin cleaner, healthier and safer for everyone to enjoy.

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**“If we want to achieve significant results in river conservation we need to unite decision-makers and local communities.”**

~ **Mr. Vasyl Gubal**, Mayor of Kvasovo village

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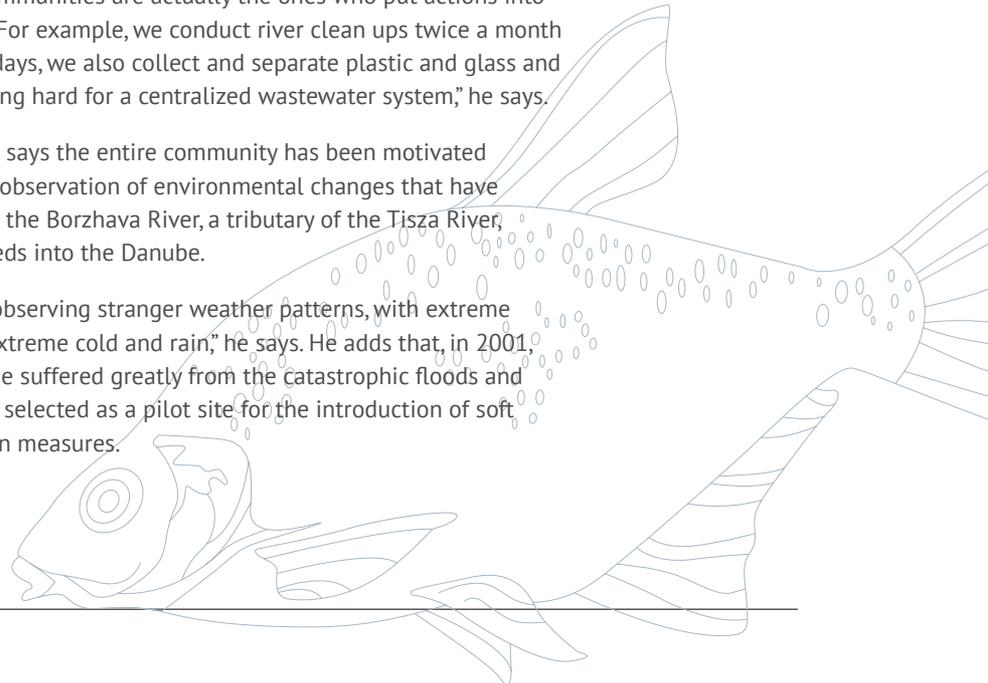
### **Faces of the River**

Mr. Vasyl Gubal is mayor of Kvasovo, a small Ukrainian village of 900 inhabitants, located in the Tisza Basin, not far from the Hungarian border. Since 2009 Kvasovo has been actively participating in Danube Day and Mr Gubal believes that it is really the local communities that are the key to protecting the Danube.

“Local communities are actually the ones who put actions into practice. For example, we conduct river clean ups twice a month on Saturdays, we also collect and separate plastic and glass and are pushing hard for a centralized wastewater system,” he says.

Mr. Gubal says the entire community has been motivated by direct observation of environmental changes that have impacted the Borzhava River, a tributary of the Tisza River, which feeds into the Danube.

“We are observing stranger weather patterns, with extreme heat or extreme cold and rain,” he says. He adds that, in 2001, the village suffered greatly from the catastrophic floods and was then selected as a pilot site for the introduction of soft mitigation measures.



# A World Leader



“All Danube countries now benefit from a strong ICPDR, solid environmental regulation and growing levels of national investment into the cross-sector management of their water resources.”

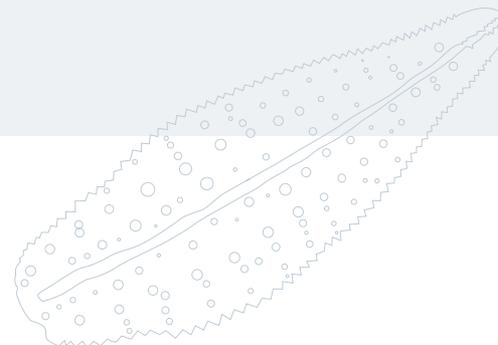
~ **Dr. Naoko Ishii**, the CEO & Chairperson of the Global Environment Facility (GEF).

Around the world the ICPDR is seen as a world leader in river basin management, providing valuable lessons for the managers of other transboundary water systems from the Orange River to the Amazon. The ICPDR is also actively cooperating with global organisations such as the GEF, the World Bank, UNDP, UN Environment and OECD, to ensure that other programmes can learn from the experiences of managing the Danube River Basin.

The ICPDR now operates as a self-sustaining and financially autonomous institution providing the legal, institutional and technical framework for cooperation and management of a river basin shared by nineteen countries. With the support provided by this technically and institutionally strong river basin commission, the Danube countries are backed by solid environmental regulation and investments needed meet their own environmental needs. National delegates, ministers, technical experts, civil society, the scientific community and the wider public all now cooperate in the ICPDR to ensure the sustainable and equitable use of water resources in the Danube River Basin.

Since 1991 one of the main drivers of regional efforts to strengthen the environmental management of the Danube River Basin has been the expansion of the European Union. When the ICPDR was established in 1998 it provided the platform that was needed for countries to assess the health of the river and develop basin-wide plans to address priority issues such as climate change, flooding and the generation of hydropower.

The work of the ICPDR and its Expert Groups and Task Groups has also significantly strengthened the capacity of the Danube countries to continuously meet the EU's accession and Acquis Communautaire challenges. Moreover, political and economic incentives for environmental compliance resulting from the EU accession process has facilitated a speedier implementation of the Danube River Protection Convention's objectives. As more Danube countries move closer to the EU the Danube becomes safer, cleaner and healthier because the countries' expertise is growing and more lessons are being learned.



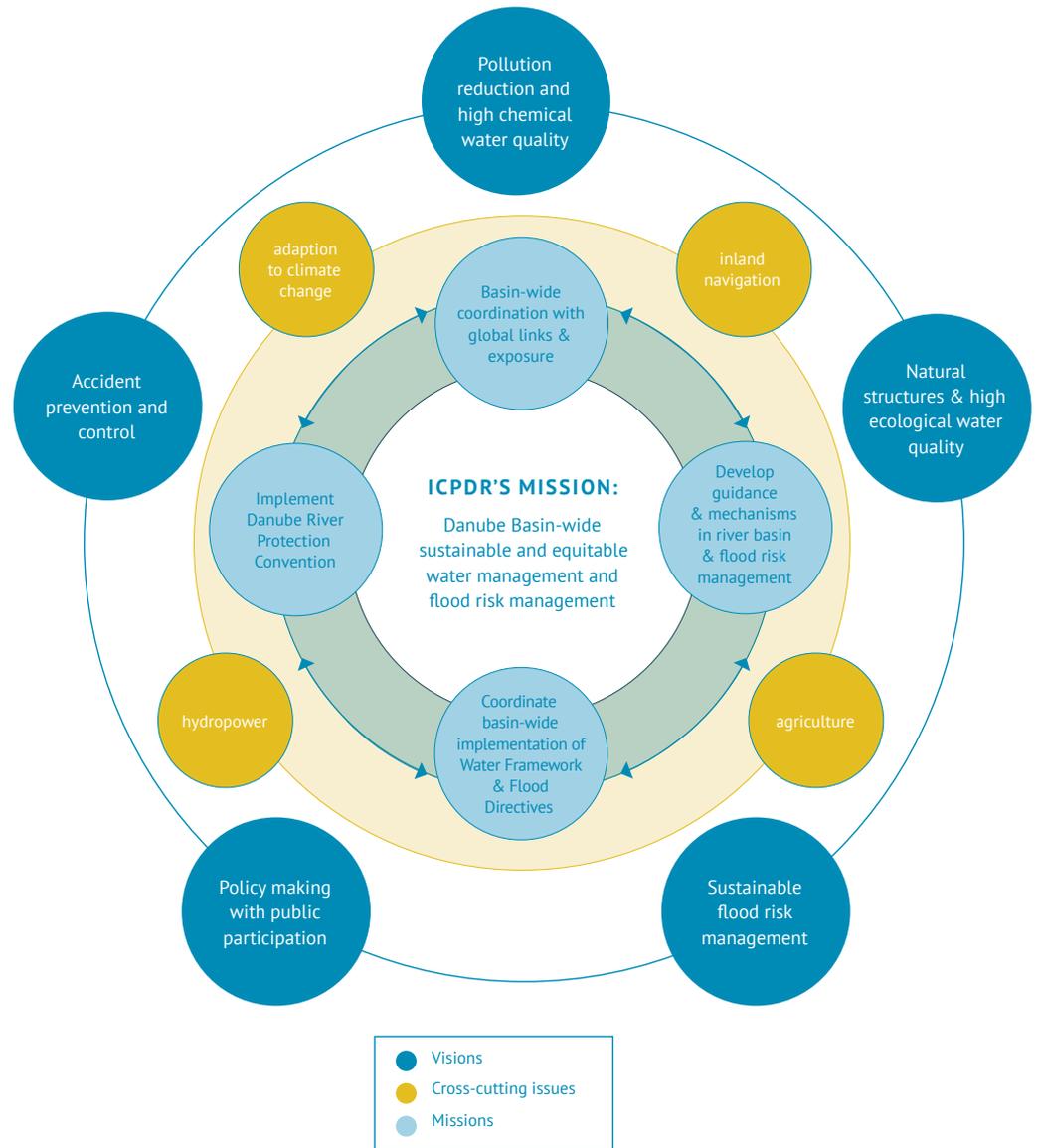
The ICPDR continues to serve as a vital learning hub and platform for the exchange of experiences and innovation between countries facing vastly different economic and environmental challenges. It also continues to pioneer inter-sectoral cooperation and structured dialogue across the different users of the Danube's water resources from navigation and water supply to hydropower and sanitation.

While this publication celebrates the many achievements and successes of the ICPDR, it also clearly outlines the many challenges that remain to be addressed in efforts to manage the shared Danube River Basin. In the coming years these challenges will undoubtedly require even greater cooperation, innovation and determination from all of the countries, organizations and individuals that continue to make the ICPDR a world leader in river basin management.



PHOTO CREDIT: ICPDR/Zoran Major

# ICPDR Vision & Mission



# ICPDR



International Commission  
for the Protection  
of the Danube River

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