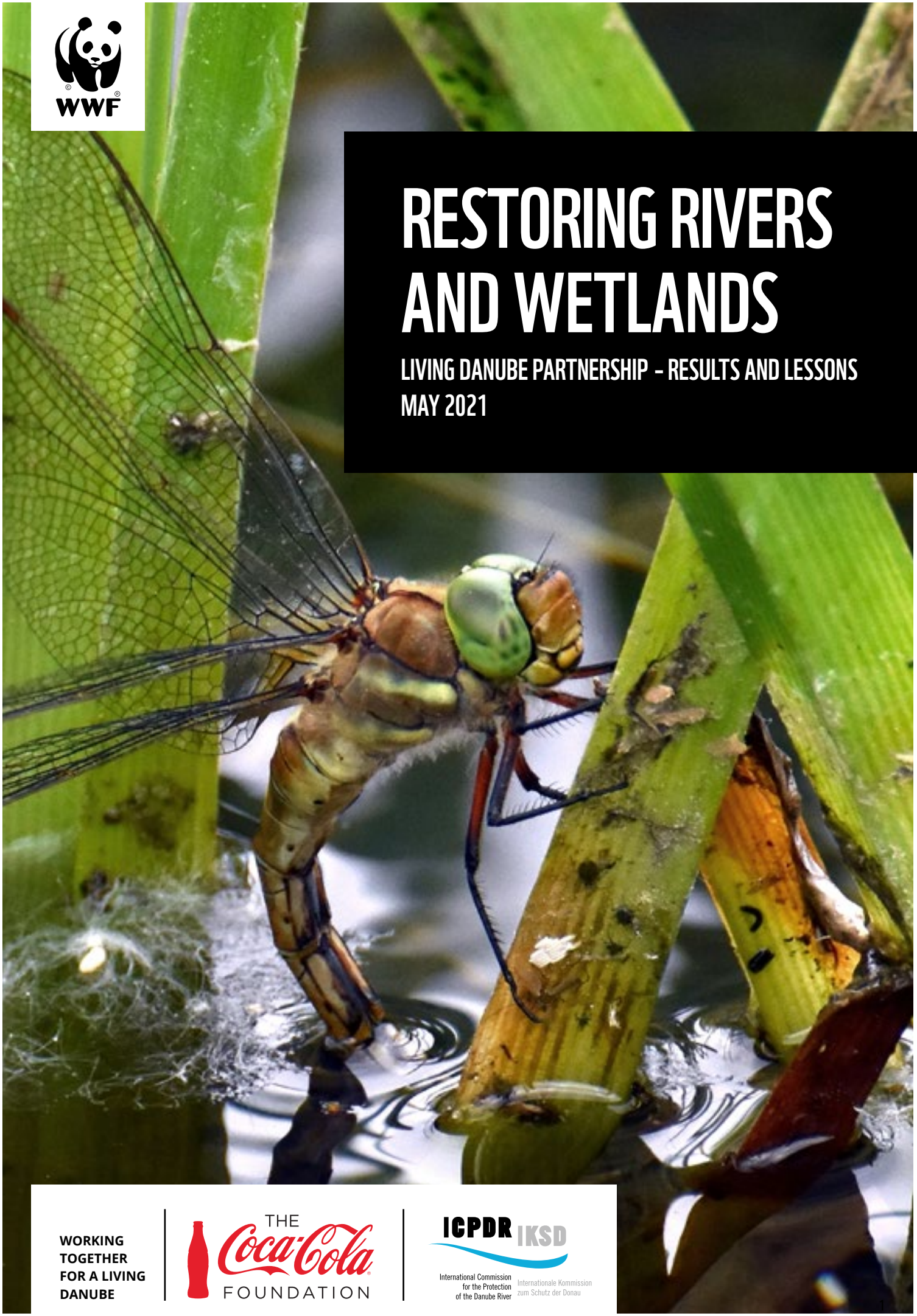

RESTORING RIVERS AND WETLANDS

LIVING DANUBE PARTNERSHIP – RESULTS AND LESSONS

MAY 2021

WORKING TOGETHER FOR A LIVING DANUBE

THE Coca-Cola FOUNDATION

ICPDR IKSD

International Commission for the Protection of the Danube River

Internationale Kommission zum Schutz der Donau

WWF is an independent conservation organisation, with over 30 million followers and a global network active through local leadership in nearly 100 countries. Our mission is to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature, by cons Gârla Mare erving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. See wwf.panda.org

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THE LIVING DANUBE PARTNERSHIP

The Living Danube Partnership is a unique, cross-sectoral partnership that has brought together WWF-CEE, the Coca-Cola Foundation and the Coca-Cola system as well as the International Commission for the Protection of the Danube River (ICPDR) to promote the conservation and restoration of wetlands in the Danube basin. Supported by a $4.4 million (€3.73 million) grant from The Coca-Cola Foundation, the eight-year partnership has sought to restore vital wetlands, rivers and floodplains along the River Danube and its tributaries, aiming to increase the river capacity by the equivalent of 4,800 Olympic sized swimming pools (12 million m^3) and to restore over 7,422 football pitches worth of wetland habitat (53 km^2) by 2021.

THE DANUBE RIVER BASIN

The Danube River Basin is the most international river basin in the world and a very significant lifeline for Europe. On its 2,800 km journey from the Black Forest to the Black Sea, the river passes through 10 countries and drains all or part of 19 countries. Approximately 83 million people live in the Danube River Basin and more than 20 million people depend directly on the Danube for their drinking water. The basin not only unifies and sustains a wealth of diverse cultures and traditions, but also supports unique wetland habitats like the Danube Delta and the Mura-Drava-Danube Biosphere Reserve.

However, over the past 150 years, the Danube basin and its wetlands have been much abused. Dikes, dams, cuts, bank fixation and dredging have modified large parts of the river system. More than 80% of wetlands have been lost, and with them the ecosystem goods and services they provide. The effects have been wide-ranging and include plummeting fish and wildlife populations, decreases in water quality and damage to wetlands, which are no longer able to provide much needed biodiversity hotspots or to act as buffers to floodwaters – services that are becoming all the more valuable in the face of climate change.

80%

PERCENTAGE OF DANUBE BASIN FLOODPLAINS LOST

LESSONS LEARNED FROM 8 YEARS OF PARTNERSHIP

Although water quality in the Danube has improved in recent years, over 80% of the floodplains along the river and its main tributaries have been lost, and with them significant populations of fish and other valuable ecosystem goods and services – services that are especially important to strengthen the resilience of people and nature in the face of climate change.

LIVING DANUBE PARTNERSHIP – RESULTS IN TERMS OF VOLUME AND AREA

	FRESHWATER REPLENISHED	RIVERS RESTORED	
	million m³	hectares	river km
NEUSIEDLER SEE (AT)	0.800	400	
CROATIAN DRAVA SIDE-ARMS (HR)*	tbd	1,000	14.5
LANKÓC FLOODPLAIN FOREST (HU)	tbd	513	
BARCS-OLD-DRAVA (HU)	0.088	176	
ŠIROKI RIT (FRS)	0.145	53	
GÂRLA MARE AND VRATA (RO)	5.190	620	
PERSINA & KALIMOK (BG)	7.400	3,700	
FREE-FISH (BG)	n.a.		120.0
CUMULATIVE FORECAST 2021	13.45	5,462	134.5
ORIGINAL TARGET – BY PROJECT END IN 2021	12.00	5,327	

* to be completed in 2023

RESULTS

While Danube countries have made strong commitments to conserving and restoring freshwater habitats and ecosystems, achieving this in practice has proven to be challenging, requiring overcoming technical challenges as well as painstaking alignment of local landowners and interests. That is where the Living Danube Partnership comes in. The cross-sectoral partnership has harnessed the mandate of the International Commission for the Protection of the Danube River, the capacity and resources of Coca-Cola and The Coca-Cola Foundation, and the facilitation and expertise of WWF-CEE to promote river and wetland restoration in the Danube basin for people and nature.

Coming to the end of the current phase of the Living Danube Partnership, we are proud of what we have achieved over the past eight years (see summary of results). With this publication, which is intended particularly for experts and practitioners of river and wetland restoration, we would like to summarize key challenges, solutions and lessons learned from implementing nine restoration projects across six countries. Some but not all of the recommendations developed from the individual projects are also highlighted by guidance documents.

A more extensive publication also includes our experience, recommendations and lessons learned from developing our broader cross-sectoral partnership across the Danube River Basin.

The aim of the Living Danube Partnership is to promote river and wetland restoration across the Danube basin – not only through the partnership's own actions but also and especially beyond. In this spirit, we hope that the lessons and recommendations we have gathered can benefit further efforts to restore rivers and wetlands, for the benefit of people and nature.

PARTNERS

Restoring rivers and wetlands depends on cooperation between a broad range of different stakeholders, from local land owners and users, to relevant authorities, government officials and interest groups. Indeed, the Living Danube Partnership has been above all about partnership – both across the Danube river basin and within the individual projects and initiatives implemented across six countries. It has involved not only our own cooperation, but also close work with a myriad of local stakeholders and authorities. Partners from a range of backgrounds and perspectives, from water management to nature and forest management, municipalities and county governments, land owners and land users, local anglers and hunters as well as entrepreneurs, have come and worked together to restore rivers and wetlands for the benefit of people and nature. Their cooperation promoted knowledge and awareness, built trust and gave inspiration that will be carried forward in future initiatives.

PARTNERSHIP

If there is one key lesson that we have learned over the past eight years, at basin level and through individual projects, it is the power of partnership – that by working together we can achieve more than working alone. Together possible.

SOFIA KILIFI
SUSTAINABILITY & COMMUNITY MANAGER EUROPE, THE COCA-COLA COMPANY EUROPE

IVAN ZAVADSKÝ
EXECUTIVE SECRETARY, INTERNATIONAL COMMISSION FOR THE PROTECTION OF THE DANUBE RIVER

ANDREAS BECKMANN
REGIONAL CEO, WWF CENTRAL & EASTERN EUROPE

IN 2020, COCA-COLA EUROPE RECEIVED THE PARTNERSHIP OF THE YEAR AWARD FOR ITS PARTNERSHIP WITH WWF-CEE AND THE ICPDR. PRESENTED AT THE REUTERS RESPONSIBLE BUSINESS AWARDS 2020, THE AWARD WAS GIVEN FOR THE LIVING DANUBE PARTNERSHIP'S UNIQUE MODEL OF CROSS-SECTORAL COOPERATION. THE JUDGES PARTICULARLY NOTED THE PARTNERSHIP'S LONG-TERM COMMITMENT AND COMPLEX APPROACH.

70.7 million

REACHED VIA SOCIAL AND MASS MEDIA

LESSONS AND RECOMMENDATIONS FROM PROJECT DEVELOPMENT AND IMPLEMENTATION

River and wetland restoration is often painstaking and complex, not only technically but also requiring cooperation with a range of authorities and stakeholders.

GENERAL RECOMMENDATION

Allocate sufficient time and capacity for preparation, including for building up a collaborative team with a shared basis of knowledge and understanding as well as team spirit.

Careful preparation at the beginning of the project can avoid difficulties later. During the project initiation, carefully map all relevant stakeholders, including land-owners and -users, relevant interest groups (e.g. hunters, anglers, environmentalists) as well as all relevant authorities and decision-makers, including those needed to provide permits (e.g. water, environment, infrastructure) or political or other support (e.g. ministries of environment, water, local development). Do not forget to check the legal rights of the land and the cadastral maps and clarify land-ownership and any liens or rights to use.

Plan for the unexpected. River and wetland restoration projects are by their nature complex, and it is difficult if not impossible to predict and plan for all eventualities – as we experienced for example with inaccuracies in the land register in connection with the Gârla Mare floodplain restoration in Romania (see page 35). Where possible, include buffers in planning budgets and timelines, and design the intervention and financing to permit flexibility and adaptive management. Staff changes may occur at any time, and with each partner as well as relevant authorities. This may require more time and further negotiations.

Assess risks during the planning phase of the project. The impacts of climate change have to be taken into consideration even at the level of feasibility studies.

Keep in mind that small restoration works with good results can pave the way to larger-scale projects – plan small steps toward larger change.

WORKING WITH PARTNERS

Experience from all projects underlines the importance of building good relationships and a common understanding with all partners. Clearly stated shared goals, restoration vision and project outcomes are important to put cooperation on a firm footing and avoid later misunderstandings. Personal meetings with partners are important for getting to know each other and building close and trustful relations.

Where there are significant differences in perspective among partners, neutral experts that are respected by both sides can help mediate relations and facilitate cooperation – as the REVITAL company has done in the project to restore Drava side-arms (see page 17).

It is important to build and maintain the motivation and ownership of the project by all partners. For this, it is important to stick to deadlines and maintain a smooth flow of information among project partners.

Good cooperation and positive feedback from partners and stakeholders is the best advocacy and promotion for river and wetland restoration. A successfully implemented restoration pilot can motivate project partners to initiate and implement further initiatives.

A trustful group of experts are the guarantee of the effective results and smooth progress.

STAKEHOLDER INVOLVEMENT

Experience from most if not all river and wetland restoration projects emphasizes the importance of stakeholders and their careful consultation and involvement in project development. Stakeholders who are initially skeptical and hostile can be won over through careful consultation and involvement, building their trust, awareness and understanding. Local hunters and water managers whose opposition had frustrated earlier attempts to restore soda lakes in the Seewinkel area of Austria (see page 13) were won over through involvement and results – and have now gone on to become active proponents for further restoration.

Experience and expertise in stakeholder involvement can be invaluable for ensuring smooth stakeholder engagement and project implementation. Ensure that one of the project partners has this experience and expertise; alternatively, this can be secured from a third-party, e.g. working on a consultancy contract. Time and resources spent on effective stakeholder engagement is usually well worth the investment.

For efficient cooperation with stakeholders, start their involvement as early as possible and maintain regular contact. Joint discussions about the project idea, the design of the technical solutions and asking for their acceptance avoid misunderstandings and conflicts.

Simple and illustrative model projects can build awareness, trust and support among stakeholders and the public, and thus help overcome resistance to large-scale restoration of natural habitats.

Scientists from universities and institutes can make a valuable contribution especially in project preparation, monitoring and evaluation.

PERMITTING PROCEDURES

Official processes like securing relevant environmental and water permits can take a long time. Involving relevant authorities, planning offices and ministries in project development can help avoid later delays and complications.

There are likely to be delays in permitting, so include buffers of time and resources in the planning.

CROSS-BORDER COOPERATION

In cross-border cooperation, potential language barriers can lead to complications and delays. In some cases, a third language may have to be used to facilitate communication with and between partners and stakeholders. This can significantly slow interaction and require further resources as well as patience. This needs to be taken into account in planning, e.g. by including capacity and resources for translation and longer meetings and interaction.

Legal and administrative procedures, including environmental and water permits, can vary significantly between countries and may be difficult to harmonize, potentially leading to significant delays. Anticipate such cases by including significant buffers of time into the implementation plan.

COMMUNICATION

Communicate the proposed actions and implementation of field measures to local communities and key stakeholders. Select simple and easy-to-understand results for use in communication materials.

Communication tools are changing very quickly compared with the duration of some projects, so it is important to keep as much flexibility as possible in plans and budgets for communication actions – in one case, project planning and budgeting foresaw the purchase of CD's for communications purpose; by the time of implementation, CD's had been replaced by USB sticks and cloud computing, but the inflexibility of contractual obligations required their purchase nonetheless.


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RIVER AND WETLAND RESTORATION PROJECTS

One focus of the Living Danube Partnership is on demonstrating the feasibility and benefits of river and wetland restoration. River and wetland restoration projects are by their nature complex and need time to sort out technical challenges and align interests of land owners, land users and relevant authorities. The Partnership has supported nine restoration projects across six countries (Austria, Hungary, Croatia, Serbia, Romania and Bulgaria) and identified further sites for future restoration. The projects are concentrated in and thus contribute to realising the Lower Danube Green Corridor (shared by Romania, Bulgaria, Moldova and Ukraine); and the Mura-Drava-Danube Transboundary Biosphere Reserve (shared by Austria, Slovenia, Hungary, Croatia and Serbia).

PROJECT 1:
SEEWINKEL, AUSTRIA (NEUSIEDLER SEE NATIONAL PARK)

RESTORING SODA LAKES

Hundreds of rare soda lakes in the Pannonian basin from eastern Austria across Hungary to Serbia have lost their unique character due to man-made interventions, including drainage. By installing a system of sluices, the Living Danube Partnership has raised the level of groundwater, preventing some of the soda lakes from drying out. The successful project has inspired local stakeholders to undertake additional interventions to save other soda lakes in the area.

400 ha

OF SODA LAKES, SALT STEPPES AND SALT MARSHES RESTORED

PROJECT FACTS

Project title Restoration of Pannonian Soda lakes, salt steppes and salt marshes

Location Neusiedler See, Austria

Project duration 2013–2014

Lead and key partners WWF Austria, Austrian Water Management Authority

Funding Total project budget: €260,000 – 50% from The Coca-Cola Foundation, 50% from the Austrian Water Management Authority.

PROBLEM

In Europe, soda lakes are a rare type of wetland that supports unusual biodiversity, including seabirds many kilometers from the sea and salt-loving plants from Central Asian steppes and semi-deserts. In Central Europe, they only exist in the Pannonian Basin, stretching from eastern Austria across Hungary to Serbia. The soda lakes generally have shallow water levels and are strongly alkaline. Out of the 140 soda lakes originally found in the Seewinkel area in eastern Austria, almost 100 have been entirely destroyed, while the remaining 40 have suffered from human interventions, especially drainage and the resulting lowering of groundwater levels. Soda lakes need high levels of groundwater to ensure the periodic replenishment of salts in the upper layers of the soil. This replenishment occurs when the lakes fall dry in summer and salt is transported to the soil surface by evaporating subsurface-groundwater. When groundwater is permanently low, the salt transport ceases and salt-loving habitats gradually deteriorate until all salt-loving organisms are gone.

OBJECTIVES

The main objective of the project was to raise the level of groundwater beneath and around four soda lakes in the Seewinkel area of eastern Austria, covering a total area of 400 hectares, in order to restore the natural water and salt dynamics of both the lakes and the adjacent salt steppes. This was done through water retention measures, closing of drainage channels and by reducing the artificial outflow of water and salts from the lakes.

IMPLEMENTATION

The project could build on significant preparation. A series of research projects had been conducted by universities, local nature conservation authorities and environmental organizations to gather information on the precise mechanisms behind the observed process of degradation of the soda lakes. Based on this research, a number of restoration measures were identified and developed. The first attempts to implement restoration measures failed, partly due to the fact that local stakeholders (landowners, farmers and local municipalities) were very skeptical of the proposed measures, and partly due to the lack of support from the water management authorities. Stakeholder involvement and support from The Coca-Cola Foundation through the Living Danube Partnership finally convinced the water management authorities to support the measures.

RESULTS

The water retention facilities and new prescriptions for the operation of weirs were mostly in place by 2015–2016. 2015 was a year with sufficient precipitation and high water levels throughout the region, resulting in spectacular flooding of lakes and alkaline steppes behind the weirs. So the planned retention effects were very obvious and even exceeded expectations in that year. Unfortunately, from 2017 onwards, the Seewinkel region has been hit by a long period of drought, when the positive effects have been less visible.

The successful project has inspired local stakeholders to undertake additional interventions to save other soda lakes in the area. Among them have been local hunters, municipalities, farmers associations, the Neusiedler See National Park directorate as well as civil society organizations like WWF. The project has contributed to a shift in public awareness and opinion and has paved the way for more ambitious restoration measures, including the development of at least two follow-up restoration projects.

MONITORING

Targeted monitoring focused on water levels, vegetation and salt transport in alkaline soils at the restoration sites.


© Bernhard Kohler / WWF-Austria


© Bernhard Kohler / WWF-Austria

STAKEHOLDER INVOLVEMENT

The main actors and partners were local landowners associations, local farmers, provincial water management authorities, local municipality and national park administration. Regular contacts between WWF and most of these actors had been already in place before the project was launched, but support through the Living Danube Partnership enabled a more systematic and targeted approach, resulting in the gradual building of awareness, trust and eventually acceptance of stakeholders for the proposed restoration measures. Stakeholder involvement, information and education were important to the success of the project and follow-up activities.


© Bernhard Kohler / WWF-Austria

THE RESTORATION OF SODA LAKES THROUGH THE LIVING DANUBE PARTNERSHIP HAS CATALYZED FURTHER, LARGER-SCALE EFFORTS TO RESTORE THESE UNIQUE AND EXCEPTIONALLY VALUABLE HABITATS IN THE SEEWINKEL AREA IN EASTERN AUSTRIA.

LESSONS LEARNED AND RECOMMENDATIONS

Awareness raising, education and involvement of stakeholders and the broad public were important elements of the project. They were key to the successful implementation of the restoration activities, which otherwise were technically simple and rather straightforward.

Building good relationships and mutual agreement on clearly stated joint goals and project outcomes with all partners is a fundamental element of the preparation.

The different working protocols and speed of the cooperating institutions and organizations have to be taken into account when preparing the timeline for project realization. Official processes take longer and cooperation with official bodies is necessary from the beginning.

Smaller restoration projects can help build trust, awareness and support among stakeholders for larger-scale follow-up projects.

Simple and illustrative model projects can help overcome public resistance to the much needed large-scale restoration of natural habitats.

Involving the private sector required additional efforts to ensure acceptance among local stakeholders. The strong focus on outcomes and monitoring of the field results that was required by the Coca-Cola system proved the company's real commitment to the restoration efforts.

MULTIPLIER EFFECTS

The initial skepticism and opposition from some local groups of people changed as a result of the project. The association of local hunters – which had opposed all previous restoration initiatives – proposed to replicate the project in another, smaller part of the area. The results of this follow-up project were presented to local stakeholders at a public meeting in spring 2020. The result was public support for much more ambitious restoration projects. A contributing factor to the change in opinion among local stakeholders was the obvious effects of drought on the region, with impacts on both agriculture and tourism. The change in public opinion has facilitated the development of a large-scale project for funding through the EU LIFE program. If selected, implementation of the new project will begin in September 2021.

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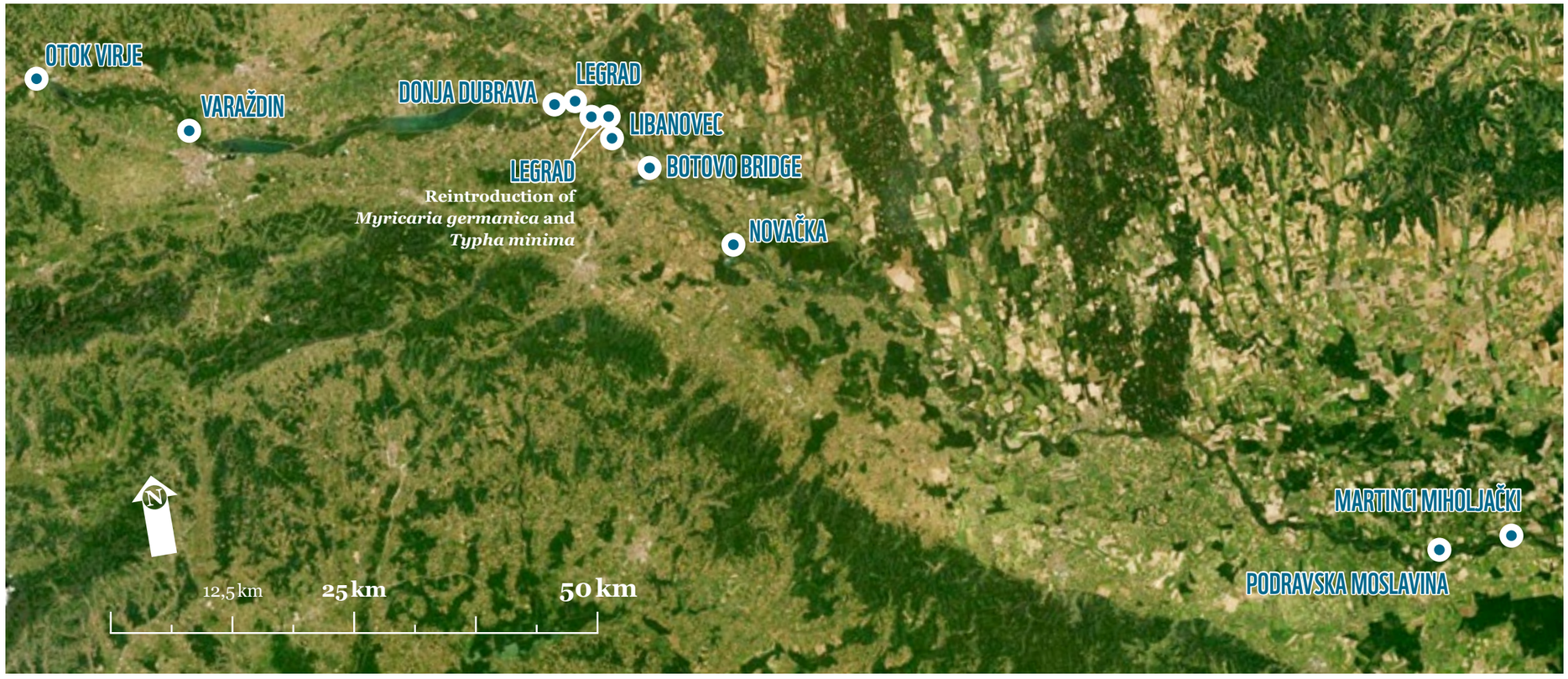
PROJECT 2:
CROATIA (MURA-DRAVA-DANUBE TRANSBOUNDARY BIOSPHERE RESERVE)

RESTORING DRAVA RIVER SIDE-ARMS

Co-financing from the Living Danube Partnership leveraged EU support to restore seven side-arms of the Drava River in Croatia. The project, which is led by the Croatian Water Authority, is designed to give the Authority experience in 'natural' river management while helping Croatia comply with the EU Water Framework Directive and the requirements of the EU Habitats and Birds Directives.

14.5 rkm

RIVER KILOMETRES OF SIDE-ARMS RECONNECTED



PROJECT FACTS

Project title Restoration of Drava River side-arms – official name of EU co-financed project: Drava LIFE Integrated River Management (LIFE14 NAT/HR/000115)

Location Drava side arms, Croatia (Mura-Drava-Danube Transboundary Biosphere Reserve)

Project duration 2015–2024

Lead and key partners Croatian Waters (lead), Public institution for management of protected natural areas and ecological network in Virovitica Podravina County, Public institution for management of protected natural values in Varaždin County, Public Institution for the management of protected natural values in Koprivnica-Križevci County, WWF Austria, Association for nature and environment protection Green Osijek

Funding Total project budget of €4,593,000, financed by the EU LIFE Nature program; The Coca-Cola Foundation; Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, as well as the Croatian Office for Associations.

PROBLEM

Regulation of the Drava River with rockfill dams and other training structures has disconnected many natural side-arms from the main river channel. The negative impacts of these measures have been significant. They have changed the natural hydrodynamics of the river, causing continuous siltation in the side-arms, changes of the bottom substrate as well as ecological deterioration. There has also been loss of the effective floodplain and increased riverbed incision of the main river channel.

OBJECTIVES

The project is focused on a wide range of measures, including development of a joint management plan, conservation measures for the rare little tern (*Sternula albifrons*), the reintroduction of riverine plants, visitor guidance as well as stakeholder involvement. However, the main objective of the project is to preserve and create new functioning floodplains and to improve water levels by restoring seven Drava side-arms in Croatia. Concrete restoration measures include the removal of embankments; the opening of side-arms by removing rockfill dams and other transversal barriers that block the sidearm entrances; the creation of completely new side-arms and smaller ponds (for amphibians); as well as the preservation and creation of new steep banks.

THE PROJECT IS AN IMPORTANT SHOWCASE FOR CROATIA AND THE WESTERN BALKANS, MARKING A SHIFT FROM RIVER REGULATION TO RIVER RESTORATION.


© Branka Španiček / WWF-Adria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IMPLEMENTATION

Preparation of the project by WWF Austria took almost two years (2013–2014). A working group was established consisting of experts from Croatian Waters, the Croatian Nature Protection authorities, local environmental organisations, WWF Austria and the Austrian company REVITAL. Numerous field meetings and study trips were organized with intense planning. REVITAL, one of the leading technical and ecological planning companies for river restoration in Austria, facilitated preparation of the project and prepared a “restoration study” as a joint restoration vision of the partners with concrete measures. Their professional expertise and participation were essential during the preparation phase of the project.

RESULTS

The project was approved in 2015 as the first EU LIFE Nature river restoration project in Croatia of this scale and the first example of inter-sectoral cooperation and integrated management of Croatian rivers. The consortium is led by the Croatian Water Authority, with active roles for numerous partners including local environmental organizations, municipalities and WWF Austria. The project has had a number of additional benefits beyond the river and habitat restoration. The Croatian authorities have developed experience in nature-based solutions for river management. The project has also pioneered cross-sectoral collaboration as well as integrated approaches to addressing contemporary problems of river ecosystems and implementing EU and national legislation, including the EU Water Framework, Floods as well as Habitat & Birds Directives. The project is an important showcase for Croatia and the Western Balkans, marking a shift from river regulation to river restoration.


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MONITORING

During and after project implementation, monitoring has taken place of biotic, abiotic as well as socio-economic parameters. The main emphasis of the monitoring has been on:

— biotic monitoring: surveying fish stocks, birds, reptiles and amphibians, invertebrate and mammals, monitoring of plants and habitats;
— abiotic monitoring: surveying of the water flow dynamics, river continuity, variations of the river width and depth, structure of the river bed, sediment transport and structure of the river bank area;
— socio-economic: monitoring and evaluation of quantitative changes and influence of the project on project communities, community perceptions on implemented measures, overview of the socio-economic impacts by the implementation of nature conservation measures on policy makers, stakeholders, the business sector, tourism, environmental organisations and society in general.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement was coordinated by Green Osijek, a local environmental organization. Local stakeholders, particularly fishermen, contributed to project implementation, especially conservation of the little tern and reintroduction of riverine plants.


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LESSONS LEARNED AND RECOMMENDATIONS

Project development was very much expedited by river restoration experts of the ecological and technical planning office REVITAL, whose expertise was respected by both authorities and civil society. Experts played an important role in facilitating the cooperation and negotiations between water management and nature conservation.

Agreeing on a joint restoration approach and harmonizing the different views and perspectives takes time. It requires thorough discussion, which is essential to avoid misunderstandings later in the project implementation.

Allowing enough time for preparation is worth the investment! Much time is needed to build a collaborative team with a shared understanding and team spirit, and also to exchange experience and expertise between partners and the authorities who are in charge of project implementation.

Project success depends not least on the active and passive support of local stakeholders. It is worth involving a partner who is experienced in best practice stakeholder involvement. Cooperation with local stakeholders, including fishermen, landowners and municipalities, has contributed to realizing project aims and remains positive and supportive.

The greatest challenge in project implementation was the very long procedures for permits and unexpected errors. As the first LIFE Nature restoration project in Croatia, the project is a learning process for both the project partners and authorities. During project preparation, an environmental impact assessment (EIA) was not required; however, during implementation this position was reversed and an EIA was required after all. This additional and unplanned process and difficulties it caused led to four years of delay and prolongation of the project implementation.

In order to avoid such long permitting processes, it is very important to actively involve the national planning offices and relevant ministries who are responsible for the permits already during project initiation.


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THE NATURE-BASED SOLUTIONS DEVELOPED IN THIS PROJECT HAVE BEEN INCORPORATED IN THE DRAVA NATURA 2000 STRATEGY.


© Branka Španiček / WWF-Adria

MULTIPLIER EFFECTS

Croatian Waters submitted another river and floodplain restoration project with a recreational focus and based on the cross-sectoral cooperation pioneered in the Drava LIFE project. Unfortunately, the project proposal was not successful.

Planning documents elaborated through the Drava LIFE project, including the Drava Natura 2000 Strategy, have and will become part of binding instruments (documents). Thus, the nature-based solutions developed in this project will be compulsory in future.


© Goran Šafarek

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Further Reading
Project website: drava-life.hr/en

PROJECT 3:
HUNGARY (MURA-DRAVA-DANUBE TRANSBOUNDARY BIOSPHERE RESERVE)

RESTORING THE LANKÓC FLOODPLAIN FOREST

The overall goal of the project is to reduce riverbed degradation of the Drava River through changes to the existing river regulation structures and management. This will improve the status of riverine and floodplain habitats and, among other benefits, improve the water supply of the Lankóc Floodplain Forest.

531 ha

OF FLOODPLAIN FORESTS RESTORED

PROJECT FACTS

Project title Lankóc Floodplain Forest Restoration. This field pilot is part of a larger project, *WiseDrava: Wise water management for the conservation of riverine and floodplain habitats along the Drava River* (LIFE17NAT/HU/000577).

Location Lankóc Floodplain Forest on the Drava River in Hungary and Croatia (Mura-Drava-Danube Transboundary Biosphere Reserve).

Project duration 2018–2023 (total project duration for the WiseDrava project).

Lead and key partners WWF Hungary (lead), Danube-Drava National Park Directorate, South-Transdanubian Water Management Directorate, Hrvatske Vode (Croatian Waters), SEFAG Forest Management and Wood Industry Share Company.

Funding Total budget for WiseDrava: €1,785,000. The WiseDrava project is co-financed by the EU LIFE Nature programme. Restoration of the Lankoc floodplain forest as one of the field pilots within WiseDrava is co-financed by The Coca-Cola Foundation and the Hungarian Ministry of Agriculture.

PROBLEM

In the 18th and 19th centuries, river training structures including groynes and fixed river banks were built to regulate the Drava River. These interventions, together with hydropower dams that were later built on the upper sections of the river, have significantly impacted the river's dynamics. The originally meandering river became regulated and even channelized on some stretches. Previously unplanned negative impacts have included riverbed incision and degradation of the ecological condition of riverine and floodplain habitats and species, including those in the Lankóc floodplain forest that were the focus of restoration supported through the Living Danube Partnership.

The 2,500 ha Lankóc forest is located in the former floodplain of the Drava River that is no longer directly connected to the river. With a habitat complex of alder and oak woodlands mixed with alluvial meadows, the Lankóc forest is a unique natural area, part of the EU's Natura 2000 network of specially protected sites. It is also managed for the production of wood and timber. The area, which is drained by a channel which flows into the Drava River, is gradually drying out due to more frequent semi-arid conditions and decreasing levels of groundwater. The periodically low groundwater levels have many causes, including possibly the incision of the Drava riverbed – a problem addressed in other activities of the WiseDrava project.

OBJECTIVE

The overall objective of the WiseDrava project is to improve the water regime, ecological conditions and biodiversity of riverine and floodplain habitats through concrete restoration measures (reconnection of side-arms, elimination of river training structures and water retention measures) and identification of the impacts of the riverbed degradation. The purpose of the project is to establish new approaches for improving the hydromorphological conditions of the river. Another objective is to identify measures to mitigate the negative effects on the river while also improving the conditions of the Natura 2000 site and contributing to human use of the river and adjacent areas.

IMPLEMENTATION

The idea for the project came from the Danube-Drava National Park Directorate and WWF Hungary. WWF began discussions with the forest company that owns and manages the forest in Lankóc. Following identification of potential sites for water retention measures controlled by the protected area administration and the forest company, the two authorities were invited to become partners in the larger WiseDrava LIFE project. During the preparatory work for the Lankóc floodplain forest field project, terrain modelling, a geodetic survey and inundation map of the area were prepared. This was accompanied by consultations and involvement of local stakeholders.

RESULTS

Restoration measures undertaken at the Lankóc forest with the support of the Living Danube Partnership include six bottom weirs with adjustable sluices. Installed in 2020, the weirs will improve the water balance and conditions of priority habitats over an area of approximately 300–500 hectares over a five-year period. In addition, black locust (*Robinia pseudoacacia*), an aggressive invasive species, has been removed from an area of 0.4 hectares and replaced by a mixture of 3,000 saplings of common oak, 500 saplings of common ash and 1,000 saplings of black alder. A fence has been constructed around the plot to prevent game from harming the young plantation. A total of 43 hectares, including 34 hectares of meadows and 9 hectares of forest, were purchased for management by the Danube-Drava National Park Directorate.


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The expected result of the WiseDrava project overall is improved hydromorphological conditions of the Drava at sites where three river training structures on the left bank of the river will be removed. The selection of the river training structures to be removed and the side-branch to be reconnected was based on a sediment survey, analysis of land use in the surrounding area as well as hydraulic modelling. These were key assessments to better understand the actual hydromorphological processes of the Drava, the effects of the regulations and the riverbed incision, and to help the project partners to identify potential sites and design new restoration projects. The Heresznye side-arm was selected for reconnection to the main channel of the Drava, which will improve the water supply of adjacent natural habitats as well as increase the river's conveyance capacity to mitigate risk of flooding. These activities are still ongoing at time of writing (2021) – most of the field implementation is still under preparation, complicated by the process of securing permits in the cross-border area.


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SIX BOTTOM WEIRS WITH ADJUSTABLE SLUICES HAVE BEEN INSTALLED TO RAISE WATER LEVELS.

MONITORING

The effects of water regime condition improvements and facilitating the reproduction of keystone species are monitored in Lankóc Forest. The baseline survey included biomonitoring of alder, meadow vegetation, birds, reptiles, amphibians, and maculinea and cristacea species. After putting into operation the six water retention artifacts in the forest in the winter of 2020–2021, all groups are monitored annually during the project implementation. The monitoring of three artificial black stork nests and 51 bat boxes began in 2020 and will continue annually.

Devices for measuring water levels have been installed at six sites in the Lankóc forest to monitor the change in water level.

The effects of side-branch reconnection and improvement of the water regime is monitored along the main channel of the Drava as well as in the side-arm at the village of Heresznye. A baseline survey of vegetation and fish was undertaken in 2020 and continues on an annual basis during and after field implementation work.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement has been an important element from the beginning of the project given that the site is surrounded by private landowners. started from the beginning of the project. A forum was organized for all local stakeholders after the inundation map was developed and the proposed sites for water retention selected. Input of private landowners and other stakeholders regarding potential solutions for problems of water supply and risks were taken into account during the finalization of the technical plans for the water retention artefacts.

Stakeholder involvement included also a study of ecosystem services and a socio-economic assessment based on a series of interviews with stakeholders. One more stakeholder forum will be organized by the end of the project implementation.

LESSONS LEARNED AND RECOMMENDATIONS

In order to maintain the motivation of the partners to implement such project activities on top of their official duties, their interests need to be identified and actions taken.

The protected area manager sought to limit the risk of landowners opposing water retention. For this reason, a minimum scenario of water retention was implemented on the project sites.

In the case of cross-border cooperation, language barriers slow down processes. Overcoming this challenge requires special attention and more time to plan for all steps, for all partners and stakeholders.

The support of The Coca-Cola Foundation had significant value during the preparatory phase of the project, when the partnership and project content were developed. It also supported preparation of a very detailed aerial survey of the project territory, which helped to develop a thorough terrain model and inundation map. This may support development of new, follow-up projects after the WiseDrava project is completed.

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Further Reading
Project website: wwf.hu/wisedrava/?/en

RESTORING THE BARCS OLD DRAVA OXBOW

The Barcs Old Drava, the longest side-branch of the Drava River in Hungary, has suffered from declining water levels that have hurt the ecology of the area as well as fishing. This project, co-financed by EU funds, focused on restoring water levels in the oxbow and surrounding floodplain forest habitats as well as improving infrastructure for anglers.

176 ha

OF WETLANDS RESTORED ON THE DRAVA RIVER

PROJECT FACTS

Project title Transboundary cooperation for revitalization of riverine habitat complex in Drava region within Natura 2000 sites.

Location Old Drava oxbow near Barcs on the Hungarian-Croatian border (Mura-Drava-Danube Transboundary Biosphere Reserve).

Project duration 2014–2018.

Lead and key partners Danube Drava National Park Directorate (lead), WWF Hungary, Anglers Association of Somogy County, Pitomaca Municipality, Regional Development Agency of Virovitica Podravina County, National Conservancy of Virovitica Podravina.

Funding €834,000, from EU LIFE Nature program and The Coca-Cola Foundation.

PROBLEM

The Barcs Old Drava is a 15 kilometer-long oxbow which is the longest side-branch of the Drava River. It was shaped by both natural processes and human interventions. The well-developed meander was cut off at the end of the 18th century, separating the river from its meander and forming an oxbow lake. In recent decades, more water flowed out of the oxbow than flowed in due to the difference in elevation between the main channel of the Drava River and the floodplain as a result of incision of the Drava riverbed and siltation of the oxbow. The oxbow has suffered from declining water levels especially during dry periods that have deteriorated the ecology of the area, with impacts on the ecosystem goods and services it provides.

OBJECTIVE

The main objective of the project was to improve the water supply and restore the open water surface of the Old Drava oxbow in order to maintain the status of the water body and surrounding floodplain forests.

PREPARATION

The site was identified during an assessment undertaken by WWF Hungary and the Danube-Drava National Park Directorate (DDNPD). When the LIFE Nature program was opened in Croatia, the site was selected as a good candidate for a cross-border LIFE project. The joint initiative of DDNPD and WWF Hungary for the restoration of the oxbow was approved by the Croatian side. The Danube-Drava National Park Directorate became the lead partner for the project.

RESULTS

A number of potential solutions were assessed during the technical planning, including improving the water supply through a cross-cut of the meander, dredging, and installing bottom-weirs at different places. Due to the significant difference in elevation between the main channel of the Drava and the oxbow on the floodplain, it was finally decided that a bottom weir with fish-pass at the outflow and limited dredging of the oxbow bed was the most appropriate solution. Additionally, native tree species were planted in order to improve the forest biodiversity around the oxbow. Thirty angling platforms were renovated and more than 40 abandoned, dilapidated platforms removed.

MONITORING

After the LIFE project finished in 2018, biological monitoring (fish, birds, amphibians and reptiles, dragonfly, damselfly and vegetation) of the oxbow was undertaken by WWF Hungary for a three-year period (2018–2021).

STAKEHOLDER INVOLVEMENT

Stakeholder involvement was part of the assessment of ecosystem services. Focus group meetings were organized especially for local people, landowners, managers and municipalities in both Hungary and neighboring Croatia. This was the first ecosystem service assessment of the Old Drava. The most significant use of the oxbow is for angling, but local stakeholders also mentioned the area in terms of recreation, its unique habitat, water purification, and home for freshwater species. Those interviewed are proud of the oxbow, aware of the risks that the habitat faces, and support all the measures to improve the water supply to the Old Drava.


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© Tibor Párrag

INSTALLATION OF A BOTTOM-WEIR WITH FISH PASS AND LIMITED DREDGING HELP TO RETAIN MORE WATER IN THE OXBOW.


© Mátyás Farkas

LESSONS LEARNED AND RECOMMENDATIONS

Personal meetings among partners are essential to get to know each other and to harmonize the project activities even during the preparation phase. Ownership of the project by project partners is fundamental to the successful and timely development and implementation of the project.

Legal and administrative procedures can vary significantly across national borders, and this is something to take into account in planning and implementing cross-border projects. It is difficult to harmonize the obligatory processes (e.g. environmental, water permits) and to secure all of the necessary permits from both countries in a timely manner. Thus, in cross-border cooperation, the planning for the permitting procedures has to include sufficient time buffer.

Language barriers can be a challenge in cross-border projects. A third language may have to be used to exchange views with and between local stakeholders, and this can make the meetings and workshops longer and more challenging to organize. This has to be calculated into the project preparation and implementation.

For efficient cooperation with stakeholders, start their involvement as early as possible and keep contact with them regularly. One round of discussions may not be enough. Take care to clarify the specific role/s of stakeholders among all of the project partners.

Communication actions and related budgets should be as flexible as possible in order to respond to and take advantage of rapid developments in communication tools and approaches.

Communicate the proposed actions and implementation of field measures to local communities and key stakeholders. Select simple and easy-to understand results during the implementation and use them in the communication materials.

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Further Reading
Project website: olddrava.com/en

PROJECT 5:
SERBIA (MURA-DRAVA-DANUBE TRANSBOUNDARY BIOSPHERE RESERVE)

OXBOW RESTORATION AT ŠIROKI RIT

In the second half of the 20th century, efforts to regulate the Danube prevented regular flooding of the oxbow at Široki Rit and led to gradual drying and siltation of the area. Widening and deepening the existing supply channel and slightly dredging the lake has given the area the possibility to fulfill its primary ecological function as a breeding and spawning area for waterfowl, fish and amphibians and a stopover for migrating birds.

53 ha

OF WETLAND AT ŠIROKI RIT RESTORED

PROJECT FACTS

Project title Oxbow lake restoration at Široki Rit in the Mura-Drava-Danube Biosphere Reserve

Location SRP Gornje Podunavlje, northern Serbia (Mura-Drava-Danube Transboundary Biosphere Reserve)

Project duration 2015–2017

Lead and key partners WWF Adria (Serbia), Management authorities: site manager: Zapadna Bačka Public Water Management Enterprise; conservation manager: Public Enterprise Vojvodinašume, Sombor Forest Estate

Funding €213,000 from The Coca-Cola Foundation (100%)

PROBLEM

The Široki Rit is a 53 hectare former oxbow lake in the Danube floodplain in northern Serbia which was free of forest vegetation due to regular flooding. This changed in the second half of the 20th century when regulation of the Danube prevented periodic flooding and led to the gradual drying and siltation of the area. The site also had excessive overgrowth of vegetation and the natural ecological functions became limited.

OBJECTIVE

The main objective of the project was to restore and maintain water levels in the oxbow lake by widening and deepening the existing water supply channel and slightly dredging the oxbow lake. The purpose of these measures was to restore the area's primary ecological function as a breeding and spawning area for waterfowl, fish and amphibians as well as a stopover for migrating birds.

IMPLEMENTATION

During project preparation, the restoration location was identified by WWF Adria in cooperation with the Institute for Nature Conservation of Vojvodina Province. The next step was the clarification of land ownership and management and permits required, which determined the key stakeholders to be involved. A pre-feasibility study was prepared on a pro bono basis by the Water Management Company "Zapadna Bačka" before the planning phase. The feasibility study was finalized during the project.

RESULTS

The measures implemented have resulted in the planned condition to restore and maintain a higher average water level in the lake and the surrounding wetlands. The restoration works improved biodiversity on the restored site, although the water level varies according to season and yearly conditions.

MONITORING

Biological monitoring was done for selected groups. Monitoring of nest occupancy and the breeding success of the white-tailed eagle (*Haliaeetus albicilla*) in the Special Nature Reserve „Gornje Podunavlje“ and monitoring of ornithological values of Semenjača and Šarkanj ponds and Široki rit area were carried out until 2019. Analysis of algae was undertaken in five ponds in the SNR Gornje Podunavlje, including three ponds where wetland restoration measures were implemented (Semenjača, Šarkanj and Široki rit) as well as one natural pond and one fish pond.

STAKEHOLDER INVOLVEMENT

The key stakeholders – the Public Enterprise (PE) “Vojvodinašume” (manager of the Special Nature Reserve “Gornje Podunavlje”), the Secretariat for Urban Planning, Construction and Environmental Protection of Vojvodina Province, and the Water Management Company “Zapadna Bačka” – were involved in the project from the very beginning. All key decisions were made consensually, which facilitated project implementation.


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THE PROJECT HAS IMPROVED THE AREA’S PRIMARY ECOLOGICAL FUNCTION AS A BREEDING AND SPAWNING AREA FOR WATERFOWL AND FISH.

LESSONS LEARNED AND RECOMMENDATIONS

The good cooperation and satisfaction of partners serves as the basis for future advocacy and promotion of restoration. A successfully implemented restoration pilot gives project partners the incentive to initiate and implement new projects.

Public awareness and understanding are crucial for natural resource management. However, there is no strategic approach to raise public awareness regarding the need for nature protection. Schools, civil society organizations, academe, and state institutions could support these kinds of projects in various ways. Find a way to involve them.

Involvement of authorities and physical planners as stakeholders and consensual cooperation with them is crucial for successful and timely completion of the project. The scientific community, including universities and institutes, has an added value particularly for project preparation and monitoring activities.

Ensure that there are sufficient resources for communication and stakeholder involvement. Do not give up! Find a common interest with the key stakeholders and engage them from the very beginning.

An important lesson learned is that impacts of climate change have to be taken into account during the project preparation and feasibility assessments, because the long dry periods with low water levels cause serious risks.

4+1

PARTNERS + WWF IN THE PROJECT

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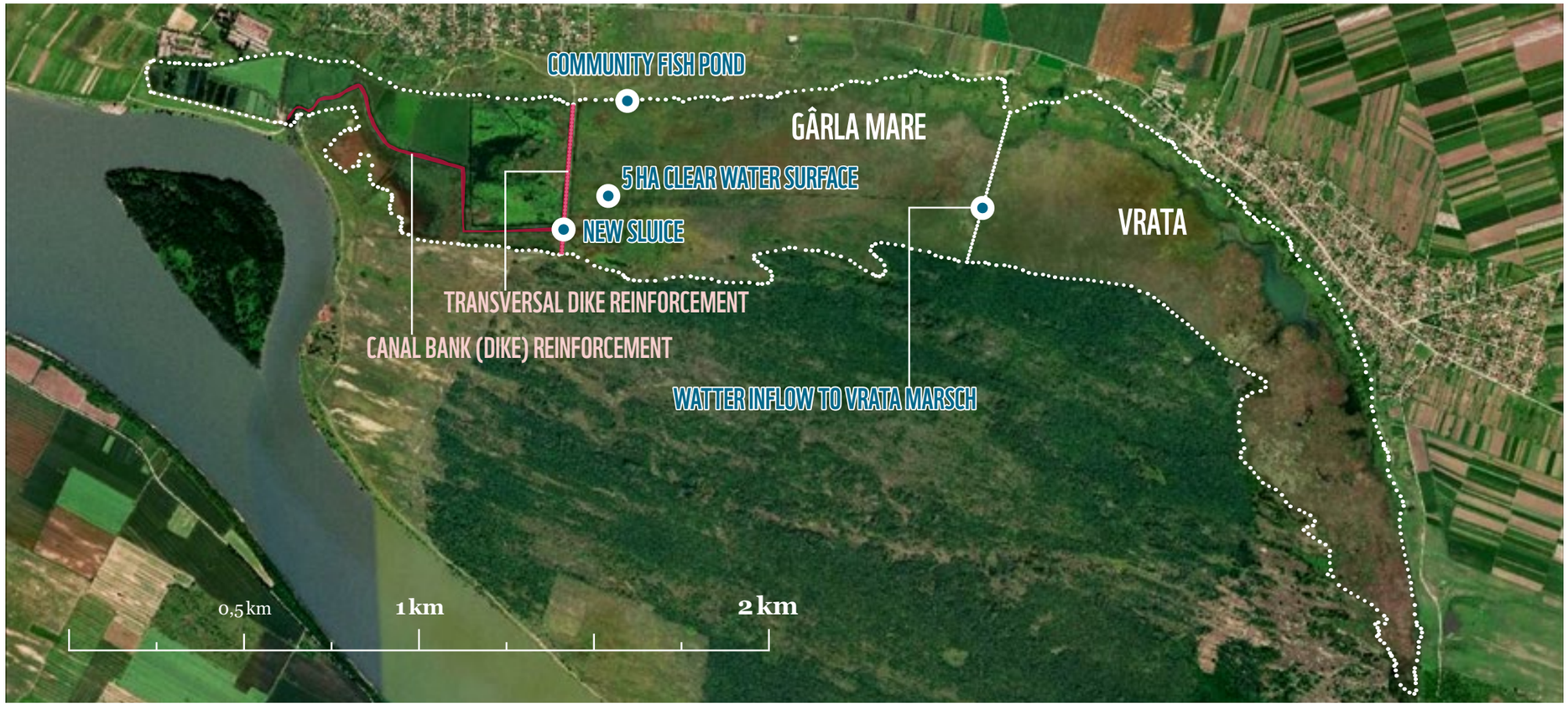
PROJECTS 6-7:
ROMANIA (LOWER DANUBE GREEN CORRIDOR)

RESTORING THE GÂRLA MARE/VRATA WETLANDS

Inundation of the massive wetlands at Gârla Mare and Vrata in southern Romania will be improved through modification of a water supply channel, sluice, dredging, increasing flood storage capacity by 5.2 million m³ (projected). Dykes have been reinforced in order to protect active fish ponds against flooding.

620 ha

OF MARSHLANDS IN THE DANUBE FLOODPLAIN RESTORED



PROJECT FACTS

Project title Restoration of the Gârla Mare and Vrata Wetlands

Location Gârla Mare and Vrata sites, Romania (Lower Danube Green Corridor)

Project duration 2014–2021

Lead and key partners WWF Romania (lead), local landowner and land users

Funding Total budget €1,366,000 from The Coca-Cola Foundation (100%)

PROBLEM

The Gârla Mare and Vrata sites are two adjacent marshlands in a former side branch of the Danube River. Both belong to the Dunărea la Gârla Mare-Maglavit Natura 2000 site (ROSCI0299), designated under EU and Romanian law to protect a number of species of flora and fauna of European interest, including the Eurasian otter (*Lutra lutra*) and fire-bellied toad (*Bombina bombina*). Historically, the area was modified for fish farming, including a fish breeding nursery and ponds. The natural marsh was isolated from the river and divided by dykes. This has caused succession, transforming the marsh into a reed bed. Without intervention, the reed bed would develop into a terrestrial ecosystem in the future. The water supply of the fish ponds is from both springs and from the Danube. The marsh area received water only from the springs and through a small water supply channel from the Danube.

OBJECTIVE

The main objective of the project was to improve the water inundation of the Gârla Mare and Vrata marshlands in the Danube floodplain and to diversify the habitat. The directly affected area is 600 hectares; the entire Natura 2000 site has a total area of 2,380 hectares.

IMPLEMENTATION

WWF Romania initiated the project after a preliminary assessment together with the land users regarding land management and nature conservation. The technical design was developed by water engineers, including hydrological modelling and topo-bathymetric field measurements (terrain elevation, the impact of flooding on neighboring land and the potential solutions for their protection). The preparatory work included investigation of the legal and land cadastral issues, a task that took significantly more time than anticipated.

The whole project took considerably longer than originally envisaged. This was first due to changes in opinion of land owners and users, requiring changes to the technical approach and design of the restoration measures that were finally clarified by 2018. However, a second, unexpected challenge appeared during the subsequent permitting process, thanks to inconsistencies of the Romanian land cadastral system.

RESULTS

An area of five hectares of open water was dredged in the reed-bed to diversify the habitat. The dikes were reinforced and a new sluice installed to increase the water inflow to the Gârla Mare marshland. Another, smaller area of open water was also created in the reed-bed for local inhabitants to fish. Increasing the capacity of the water supply channel ensures that more water can reach the inner area of the floodplain when water levels in the Danube are higher. Smaller dykes were reinforced to protect active fish ponds against flooding. The increased water level in Gârla Mare can flow into the Vrata site as well. The flood storage capacity of both wetlands will also improve, benefitting nearby settlements.

As part of the project, a large-scale analysis of restoration potential was prepared for the Lower Danube floodplain in Romania. Parallel to the work at Gârla Mare and Vrata and based on multi-criteria analysis and prioritization of sites, several floodplain areas along the Lower Danube are being prepared for future restoration.

Flood protection will be improved by re-establishing flood storage capacity for a volume of water up to 5,197,000 m^3.

MONITORING

A baseline study was undertaken of water quality, including physico-chemical parameters (nitrogen, phosphorus, etc.), and biological parameters (aquatic birds, vegetation). Follow-up monitoring is ongoing.

STAKEHOLDER INVOLVEMENT

The main stakeholders of the project were the landowners from the vicinity of the project and local authorities. From the beginning of the project, they were consulted by the project team to identify and design the technical solutions. Due to their interests, which sometimes diverged, the potential technical solutions varied during the process of project preparation and implementation.

WITHOUT INTERVENTION, THE MASSIVE WETLANDS WOULD EVENTUALLY BE LOST.

LESSONS LEARNED AND RECOMMENDATIONS

During the project initiation phase it is important to allocate enough time to engage the relevant stakeholders and analyze the area from multiple perspectives (protected species and habitats, hydrology, legal rights of the land and resources, economic development potential, etc.). Stakeholder opinions and interests will shape the original restoration idea and their continuous involvement from the beginning through the design of the technical solutions will help to avoid or solve misunderstandings and conflicts, increase acceptance and find satisfactory solutions for all sides.

Joint discussion with local, regional and even national authorities regarding the project idea is necessary. Keeping regular contacts and cooperation with them support the permission procedure. In the case of Romania, the County Council is an important stakeholder to consult with, especially the Department of Urban Planning, since they are responsible for issuing urban permits and also have a responsibility to clarify land ownership and the roles of other authorities (water, environmental protection) in releasing the construction permit.

Finally, not all challenges can be anticipated. This project faced unexpected inconsistencies of the Romanian land cadastral system that led to lengthy legal procedures, uncertainty and significant delays. The duration and flexibility of the Living Danube Partnership – guided by longer-term objectives and indicators and regular decision-making by the steering group of partners – was essential for pulling the project to a successful conclusion. This would not have been possible in a more prescriptive framework not allowing for adaptive management.

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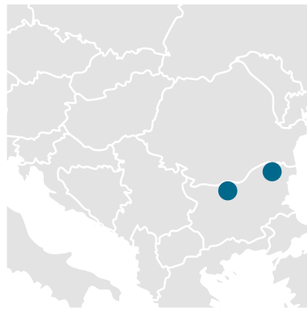
PROJECT 8:
BULGARIA (LOWER DANUBE GREEN CORRIDOR)

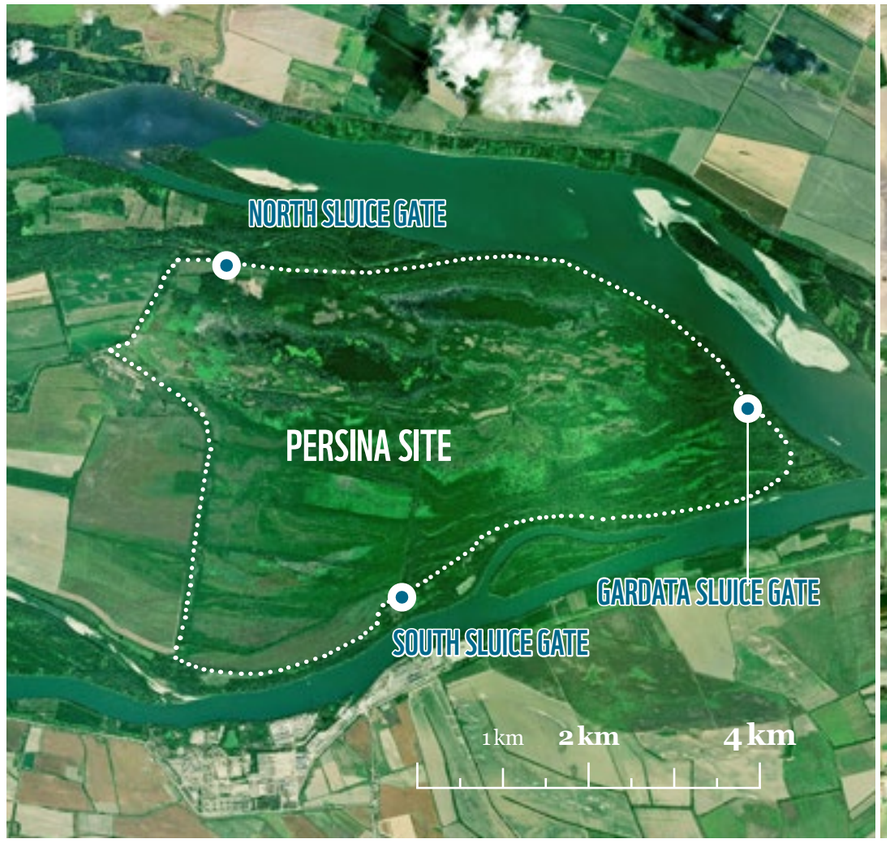
RESTORING THE PERSINA AND KALIMOK WETLANDS

The 3,700 hectares of marshlands on Persina Island in the Danube and nearby at Kalimok on the mainland have benefitted from improvements to the sluice system, permitting better water regulation at the two sites. The measures are already yielding benefits in terms of increased fish production as well as improved habitat for rare species including Dalmatian pelicans.

3 700 ha

OF DANUBE FLOODPLAIN MARSHLAND WITH BETTER WATER SUPPLY





PROJECT FACTS

Project title Restoration of the Persina and Kalimok Wetlands

Location Persina and Kalimok wetlands, Bulgaria (Lower Danube Green Corridor)

Project duration 2017–2020

Lead and key partners WWF Bulgaria (lead), Persina Nature Park Directorate, Rusenski Lom Nature Park Directorate

Funding Total project budget €318,000 from The Coca-Cola Foundation (100%).

PROBLEM

The Persina and Kalimok wetlands are located in the floodplain of the Lower Danube in northern Bulgaria, all together covering an area of 3,700 hectares. Persina is the largest of the Belene islands in the Danube River, characterized by freshwater marshes, seasonally-flooded riverine forests and agricultural land as well as a prison. The area is exceptionally rich in biological diversity, host to rare plants and globally threatened birds such as the Dalmatian pelican (*Palecanus crispus*). The Persina wetland is cut off from the Danube River by dykes that surround the island. The water supply is ensured through sluices. For centuries, Kalimok marsh near the town of Tutrakan was one of the most important sites for commercial fishing. This changed after the marsh was drained and separated from the Danube in the 1950s, leading to a steep decline in fish production.

OBJECTIVE

The objective for both sites was to improve the water supply of the marshlands from the Danube by modernizing sluice gates and enabling one of them to be controlled remotely. A real-time water level monitoring system was also installed and a new operation manual prepared for both sites.

IMPLEMENTATION

A pre-feasibility study was prepared for fourteen sites along the Bulgarian side of the Lower Danube in order to find the most appropriate site for intervention. This study assessed the natural conditions, land ownership, actual land-use and opportunities for changing the land use as well as potential economic and social benefits. The two sites at Persina and Kalimok were selected based on the results of this analysis. WWF Bulgaria already had a working relationship with the Persina Nature Park Directorate and a familiarity with the Persina wetlands due to previous restoration efforts supported by the World Bank.

RESULTS

Electric propulsion mechanisms were installed for the selected sluices in order to replace the difficult manual labor that was previously required for their operation. At one of the sluices a remote control was also installed. A real-time water level monitoring system was also installed and operating manual developed with recommendations for the optimal management of the wetlands. Now, opening and closing the sluice gates is much easier and better adjusted to the habitat needs and the hydrological conditions of the Danube. Following initial tests, the system was put into operation and is functioning well. Bird nesting platforms were also constructed in the Persina marsh that have already been taken over by colonies of Dalmatian pelicans.

A monetary valuation of the ecosystem goods and services that the Persina wetlands provide indicates that the greatest benefits are for fishing with the enhancement of carp nursery habitats, supporting more than 82,000 additional adult carp landings for local fishermen.

MONITORING

Biological monitoring of fish, birds and amphibians has been carried out in both the Persina and Kalimok wetlands. The hydrological conditions are measured by a newly installed, real-time water level monitoring system at both sites. Data from the monitoring systems has been used in the design of the automatic sluice gates as well as in elaborating a new manual for managing the water regime in both wetlands.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STAKEHOLDER INVOLVEMENT

The key partners were the nature conservation managers of the sites, the Persina Nature Park Directorate and Rusenski Lom Nature Park Directorate, who have taken ownership of the assets and will continue to manage the project sites in future. Other stakeholders involved in the project were the Executive Agency on Forestry, Tutrakan Municipality, Belene Municipality, Ministry of Environment and Water, Biological Faculty of Sofia University.

LESSONS LEARNED AND RECOMMENDATIONS

Previously established good relationships with the local experts of the nature park directorates made the planning and implementation of the project smooth and efficient.

Detailed analysis was completed concerning the water regime management both on Persina Island and in the Kalimok Protected Area with a focus on analyzing the constraints and opportunities for realizing the full potential of the wetlands. The analysis was the basis for the subsequent work.


© Persina Nature Park Directorate, Bulgaria

BY MODERNIZING THE SLUICE GATES AND INSTALLING REAL TIME MONITORING SYSTEMS, THE WATER SUPPLY CAN BE BETTER ADJUSTED TO THE HABITAT NEEDS AND THE HYDROLOGICAL CONDITIONS OF THE DANUBE


© Philip Penchev / WWF-Bulgaria

MULTIPLIER EFFECTS

Fourteen potential wetland restoration sites were assessed in the framework of the project. Further expert support and motivation from WWF Bulgaria has led to the development of new project proposals for additional sites.

A project proposal for restoration of Srebarna Lake, was developed and submitted for funding from the EU LIFE Nature program, but was unsuccessful. The nature park administration later extended the proposal and applied for funding from the National Operational Program Environment. The project was approved in late 2019 and is currently under implementation.

The successful installation of propulsion mechanisms to operate the northern sluice at Persina convinced the Persina Nature Park Directorate to apply to the National Operational Program Environment for funds to equip two other sluices at Persina with the same technology.

A third successful project proposal was also prepared within the Persina Nature Park to improve the water regime of the Kaikusha Marsh.

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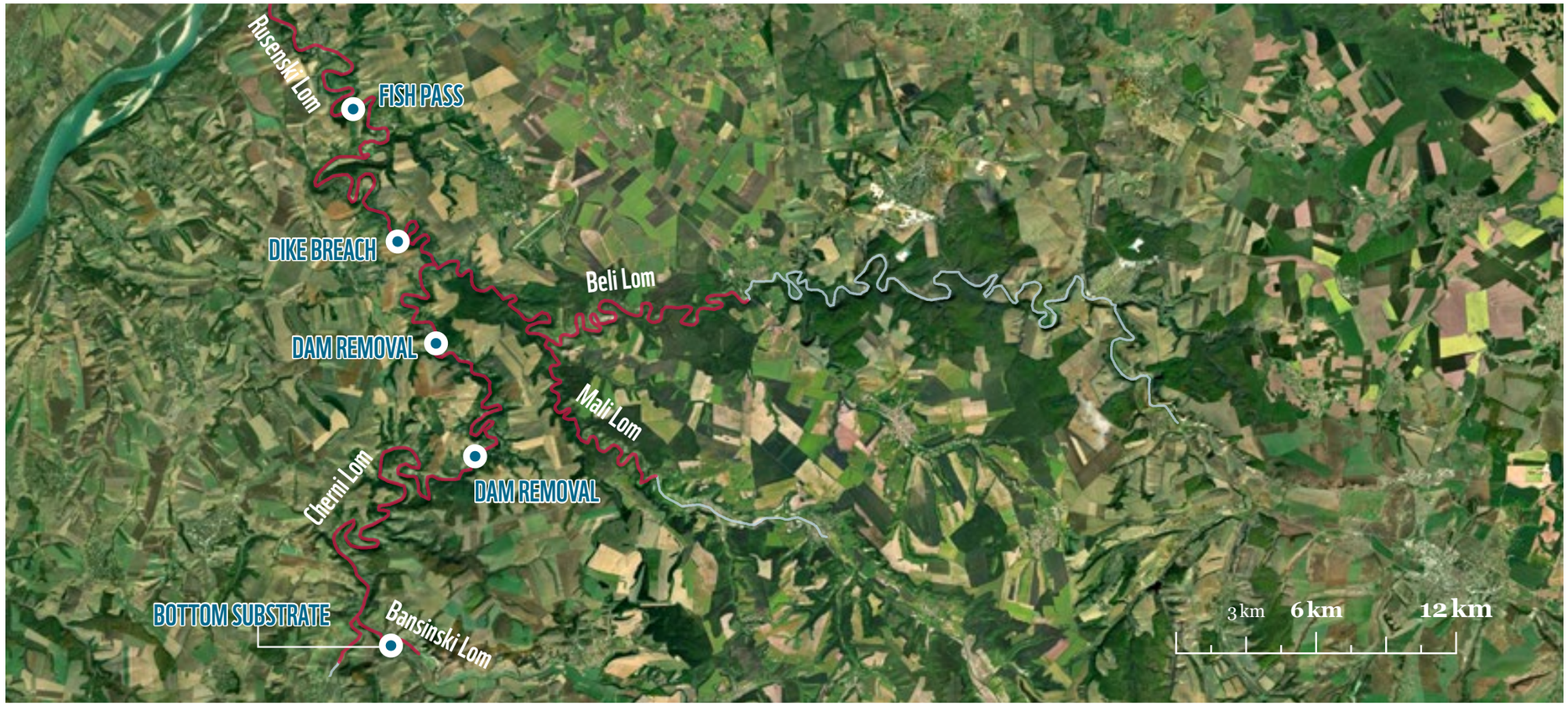
PROJECT 9:
BULGARIA (LOWER DANUBE GREEN CORRIDOR)

FISH PASSAGE ON THE RUSENSKI LOM

Many dams and other man-made barrages in Bulgaria do not have any or only inadequate fish passes, restricting the natural free movement of fish. This pioneering project removed barriers and constructed a new fish pass on the Rusenski Lom River to pilot and promote good practice in design and construction of fish passes in Bulgaria.

120 rkm

RECONNECTED BY REMOVING BARRIERS AND CONSTRUCTING FISH PASS



PROJECT FACTS

Project title Rusenski Lom River and its tributaries – contribution to the EU co-financed project: *Free-Fish – Conservation and restoration of Natura 2000 rheophilic fish species and their migratory routes in key SCIs in Bulgaria* (LIFE12 NAT/BG/001011)

Location Rusenski Lom River and its tributaries, Bulgaria

Project duration 2013–2017

Lead, key partners WWF Bulgaria (lead), Directorate of Rusenski Lom Nature Park

Funding Total project budget €411,000 from the EU LIFE Nature program, The Coca-Cola Foundation and the Michael Otto Foundation

PROBLEM

Man-made barrages hinder or even stop the natural movement and migration of fish on Bulgarian rivers. Over 90% of Bulgarian rivers are obstructed by more than 15,000 structures, including 4,000 dams as well as weirs, bottom sills, etc. Most of these barriers do not have any or only inadequate fish passes. Improving the longitudinal connectivity of Bulgarian rivers is an important step toward restoring and stabilising of endangered fish populations in Bulgaria.

OBJECTIVE

The main objectives of the project were to construct a model fish pass, remove two barriers and restore the bottom substrate (habitat) at four different sites along the Rusenski Lom River and some of its tributaries. The fish pass was planned to be a model for further restoration works. Guidelines for installing fish passes were also developed to help restore longitudinal connectivity of Bulgarian rivers. Project activities included re-stocking fish populations as well as public education and awareness raising.

IMPLEMENTATION

The Rusenski Lom River is one of the most picturesque rivers in Bulgaria, but it is heavily modified. Some of the structures on the river have been abandoned. The project was initiated by WWF Bulgaria during discussions with the Rusenski Lom Nature Park Directorate and the River Basin Directorate to identify potential restorable sections and propose measures. A number of environmental organizations, including Green Balkans, BirdLife, and the Association of Parks in Bulgaria, were also involved. Before this project, no significant restoration measures had been carried out on the Rusenski Lom River or its tributaries.

RESULTS

A model fish pass was built at an existing barrier. Two other barriers were removed based on feasibility assessments undertaken during the planning phase.

The pioneering fish pass and guidance document developed in the framework of the project are used to pilot and promote good practice in design and construction of fish passes in Bulgaria. Based on the guidance, a Regulation for Fish Passes was drafted. The regulation is still to be officially adopted, but is already being used for construction of some fish passes in Bulgaria.

Overall, the results of the project have been satisfactory. Fish can travel freely on a total of 120 km of river. Monitoring data have confirmed that the populations of six threatened and endangered small fish species have improved.

MONITORING

The passability of a relatively low barrage with a fish pass was also tested by tracing the movement of fish. Before the restoration works, a baseline study was carried out of fish species, amphibians and birds, followed by annual fish monitoring.

STAKEHOLDER INVOLVEMENT

Anglers were a key stakeholder group involved in the project. A study visit to small hydropower plants was organized in cooperation with the Balkanka Anglers Society and the Biological Faculty of Sofia University. Information on the barrier removal and fish restocking was shared in anglers' forums. The draft guidance for fish passes was consulted with members of the angler society. Many volunteers participated in the field work as well as awareness raising activities, which included a mobile exhibit of live aquariums that visited seven towns, a swimming challenge in Sofia, and drawing competition involving over 800 children.

FISH CAN NOW TRAVEL FREELY ON A TOTAL OF 120 KM OF RIVER. AS A RESULT, POPULATIONS OF SIX THREATENED AND ENDANGERED FISH SPECIES HAVE IMPROVED.

LESSONS LEARNED AND RECOMMENDATIONS

One of the main challenges in the project was the lack of officially adopted fish pass guidelines, which first caused difficulties to obtain permits for such structures. Therefore, the available recommendations from the UN Food and Agriculture Organisation (FAO) and best practices in Europe were used to overcome this problem.

The left side of the dam, to which the fish pass was connected, started collapsing in 2020 after a flood event, which eventually allowed the river to flow both through the fish pass and through the collapsed part of the dam. Both the measure and the event contributed to restoring the river connectivity of the Rusenski Lom River, and thus, fish migration is ensured. If in the future the dam will be rehabilitated, the fish pass will have a full function again as it is properly designed and stable. This once again proved the importance of dam removal and its overall significant impact on the ecological status of a river compared to a fish pass, which may be regarded as a compensatory measure.

Assessment of the necessary administrative documents to remove hydraulic structures in a river requires significant time for which internal or contracted external expertise should be available.

Good cooperation with the relevant water management authority is essential. They should be involved from the beginning of the project since the project initiation phase is crucial in determining further development. A shared understanding of the problem and solutions helps to obtain the necessary permits in due time and to avoid project delays.

The EU LIFE program has especially strict rules in the national context, which can complicate procedures such as tendering and subcontracting. This needs to be taken into account in work plans and capacity planning for the project.

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Further Reading
Project website: wwf.bg/what_we_do/rivers/free_fish/life_free_fish/

PARTNERSHIP

River and wetland restoration is as much about people as about nature. The Living Danube Partnership has brought together hundreds of people, organisations and authorities around local projects and across the river basin to support, promote and advocate nature-based solutions for the benefit of people and nature.

2 000

PEOPLE HAVE BEEN DIRECTLY INVOLVED IN LOCAL PROJECTS

80 000

HAVE ATTENDED EVENTS

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