SOUTH EASTERN EUROPE

BARRIER REMOVAL PROGRESS 2024-2025

WWF

OPEN RIVERS PROGRAMME

DAM REMOVAL EUROPE

Removal works of a barrier at the Plitvice National Park, Croatia in spring 2024
© WWF Adria

Field trip during the national workshop “Towards Free Flowing Rivers in Greece” on April 3, 2025 © MedINA

INTRODUCTION

Across Europe, rivers have been heavily disrupted, with more than 1.2 million in-stream obstacles such as dams, weirs, and culverts recorded (Belletti et al. 2020), and additional barriers are still being constructed. The ecological importance of free-flowing rivers and the role of barrier removal have only recently gained full recognition at the European scale. A major turning point came on August 18, 2024, when the European Union’s Nature Restoration Regulation came into force, establishing legally binding goals for ecosystem recovery, halting biodiversity loss, and strengthening resilience to climate change[1]. One of its most ambitious requirements is the restoration of at least 25000 kilometers of rivers to a natural, free-flowing condition by 2030 (Article 9) (Duque et al. 2025). This commitment is transformative for freshwater ecosystems because it directly targets the widespread fragmentation caused by outdated infrastructure. Taking down redundant barriers is critical for reinstating natural flow dynamics, sediment transport, and nutrient cycling—processes that sustain biodiversity and ecosystem services—while also removing the safety hazards posed by decaying structures (McCaffery et al. 2024). Placing barrier removal at the center of restoration efforts is vital to revive aquatic ecosystems and to secure healthier, more climate-resilient landscapes for people and wildlife alike.

As reported in the latest Dam Removal Europe annual report, countries across Europe are removing barriers, with increasing numbers every year (Mouchlianitis 2025). Several countries are also beginning to adopt this approach, either by removing barriers already or by preparing through surveys and assessments of their river infrastructure. Nevertheless, the practice remains uncommon in southeastern Europe (Figure 1). Only 0.93% of all barrier removals in Europe (84 out of 9003 cases) have occurred in this region (Figure 2). Detailed barrier inventories are also lacking in most southeastern European countries (AMBER Consortium 2020). However, progress is slowly accelerating with increasing number of people engaging in barrier removal activities, as well as number of projects being developed and of barriers being demolished.

In this report, an overview of state of play of barrier removals in southeastern Europe[2] during 2024 and the first half of 2025 is presented. It was prepared under the framework of the project “Scaling up dam removal: implementation plan for Southeastern Europe”, an initiative, with a budget of 1.2 million euros, coordinated by WWF Netherlands in partnership with local and international organizations such as Fauna & Flora, MedINA Greece, WWF Adria, WWF Slovakia, Wetlands International Europe, and the European Rivers Network. The project is financially supported by the European Open Rivers Programme, a charitable foundation incorporated in the Netherlands and funded by Arcadia with a budget of €42.5 million over eight years (2021-29), that grants projects from any of the 51 countries of Greater Europe. The report provides figures on the number of barriers that have been removed, the number of projects that have been/are being implemented to develop a pipeline of future barrier removals through inventorying and prioritisation, and the ways through which enabling conditions have been improved relevant to:

- Expanding the barrier removal movement in southeastern Europe by connecting with new stakeholders, creating a community of practice, and offering technical support.
- Capacity building and knowledge dissemination through training, material production, newsletters, practical guidance for governments, NGOs, and local communities etc.
- Strengthening supportive policies & permitting
- Raising public awareness through events and connecting with press

[1] https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en

[2] Countries considered to be in the southeastern Europe are: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Georgia, Greece, Hungary, Italy, Kosovo, Moldova, Montenegro, North Macedonia, Romania, Serbia, Slovakia, Slovenia, Turkey, Ukraine

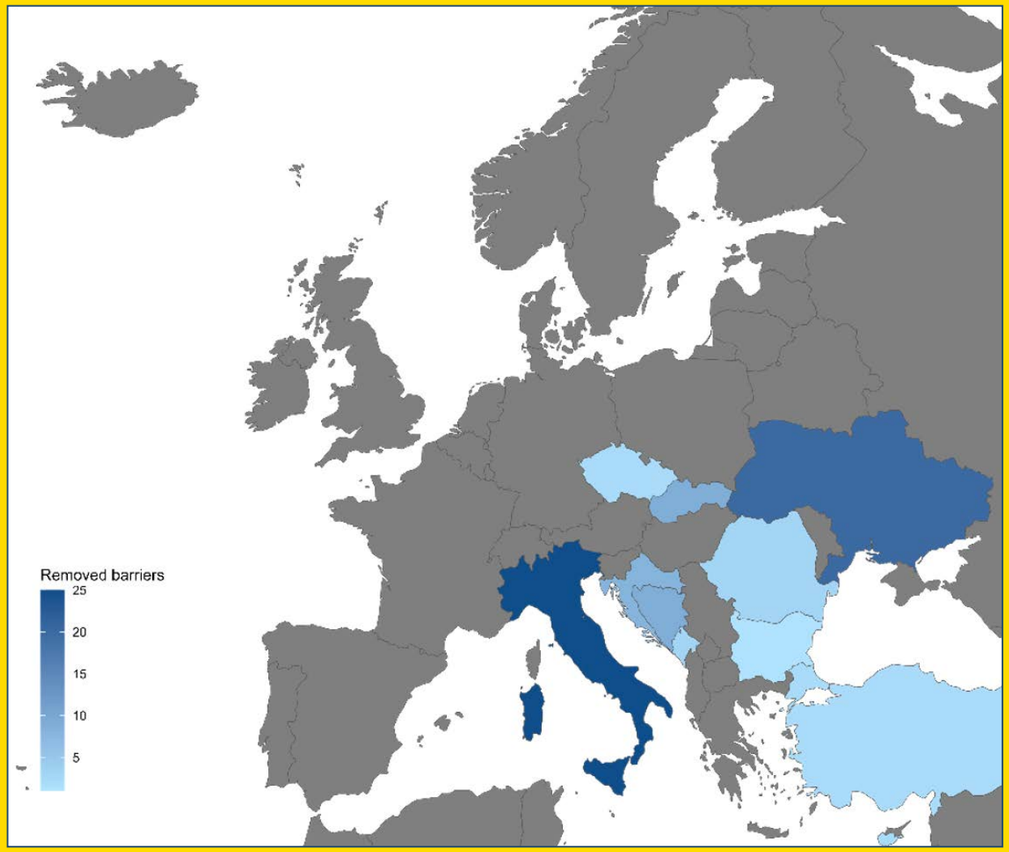

Figure 1. Countries in southeastern Europe where barriers have been removed till June 2025. Color gradient refers to the number of removals per country (source: Dam Removal Europe).

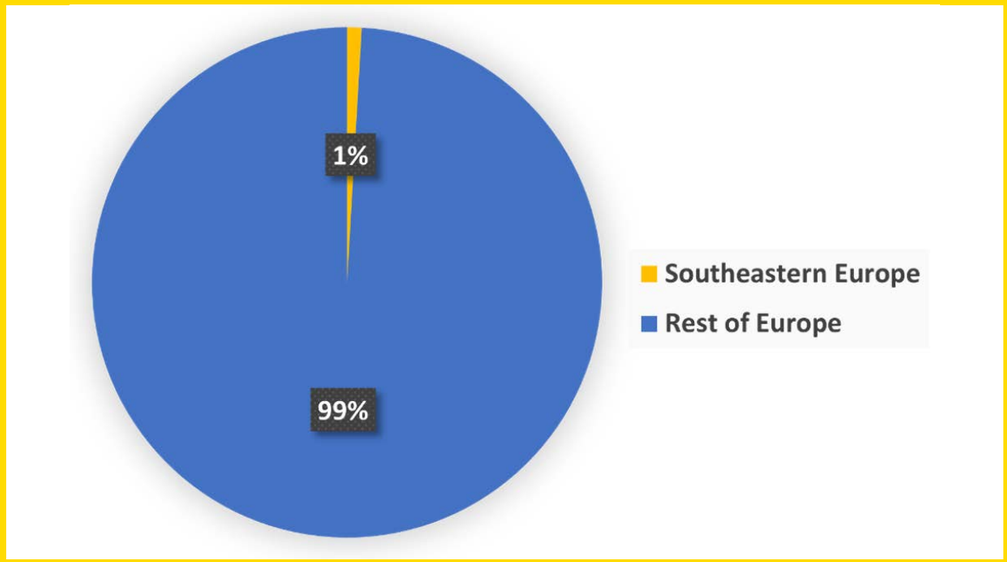

Figure 2. Percentage of barrier removals executed in southeastern Europe compared to the rest of the continent (source: Dam Removal Europe).

DATA COLLECTION & RESULTS

The data presented in this report were provided by public institutions, NGOs, scientists, and river restoration practitioners. Accurate estimations of the total number of actions relevant to barrier removals executed per year in southeastern Europe is a highly complex endeavor as the network of practitioners/organizations involved in such projects in this region is currently under development. In that respect, the final number of actions reported herein should be considered an underestimation. The majority of projects reported were/are funded by the European Open Rivers Programme, while others were financially supported by EU funding mechanisms, like LIFE projects.

The activities presented in this report were classified into three main categories (Figure 3): (1) those contributing to scaling up the implementation of barrier removal as a river restoration tool, (2) the preparatory works in the field that lead to barrier demolitions, and (3) the actual removal works. More specifically, the first category (Table 1) includes all the activities that promote and build the barrier removal movement through seminars, webinars, articles, newsletters, etc. Stakeholder engagement and knowledge dissemination actions, along with capacity building efforts for relevant practitioners (e.g., through training courses) also fit under the umbrella of the first category. Similarly, all efforts to influence policy and legislation to incorporate barrier removal were placed into the first category. The different preparatory actions, including inventorying efforts and assessment/prioritization of existing barriers, and the pre-removal works, meaning all the surveys needed prior to any demolition works (e.g., ichthyological, hydrological, archaeological, etc.) are shown in Table 2, along with the actual barrier removals.

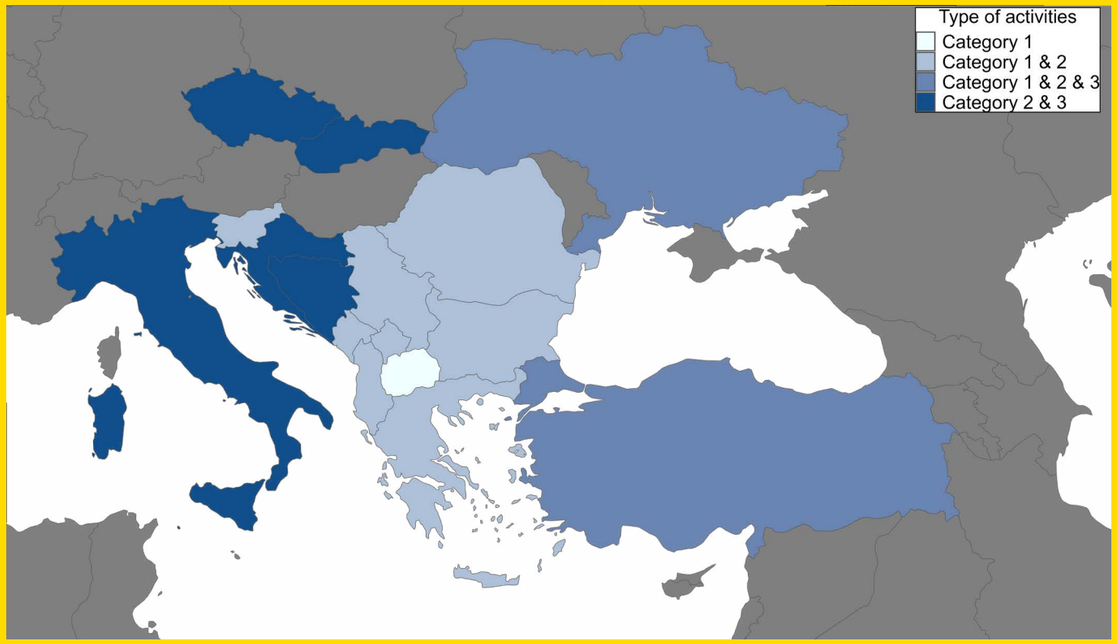

Figure 3. Implementation of barrier removal and/or actions leading to potential future infrastructure demolition in southeastern Europe between 1/2024 and 6/2025. Category 1 = Scaling up barrier removal movement, Category 2 = Preparatory works, Category 3 = Barrier removals

Based on the information gathered, in southeastern Europe during 2024 (January to December) and the first half of 2025 (January to June):

- **Sixteen (16) countries took actions to boost the barrier removal movement (Figure 3, Table 1 & 2).**
- **Activities aiming at scaling up the barrier removal movement (n = 135) outnumbered the pre-demolition works and the barrier removals (n = 79) (Table 1 & 2).**
- **Slovakia was the trailblazer in scaling up the barrier removal movement, followed by Italy, Romania and Croatia (Table 1).**
- **At least thirty-three (33) barriers were removed in seven (7) southeastern European countries (Table 2).**
- **Bosnia and Herzegovina, Croatia, Czech Republic and Türkiye officially removed their first barriers ever.**

Fact-sheet "Removing barriers for the benefit of people and nature: 10 reasons why it's a good idea" translated in Slovak and Greek

Country	Building the movement	Stakeholder engagement/Knowledge dissemination/Capacity building	Policy/Legislation influence	Total
Albania	1	6		7
Bosnia and Herzegovina		2		2
Bulgaria		5	2	7
Croatia	4	9	1	14
Czech Republic	2	2	3	7
Greece	3	2	1	6
Italy	4	15		19
Kosovo	1			1
Montenegro		1		1
North Macedonia	1			1
Romania	1	16		17
Serbia		2		2
Slovakia	13	24	11	48
Slovenia	1	2		3
Total	**31**	**86**	**18**	**135**

Table 1. Activities scaling up the barrier removal movement in southeastern Europe between 1/2024 and 6/2025 (category 1)

Country	Inventorying	Pre-demolition works	Barrier removal	Total
Albania	1			1
Bosnia and Herzegovina	2	3	9	14
Bulgaria	2	1		3
Croatia	4		8	12
Czech Republic	2	1	1	4
Greece	1	2		3
Italy	1	4	5	10
Kosovo	1	1		2
Montenegro	1	1		2
Romania	4	4		8
Serbia	3	3		6
Slovakia		1	5	6
Slovenia		1		1
Türkiye	1		2	3
Ukraine		1	3	4
Total	23	23	33	**79**

Table 2. Preparatory actions and barrier removals in southeastern Europe between 1/2024 and 6/2025 (categories 2 & 3)

BARRIER REMOVAL SHOWCASE: FREEING GIOVENCO RIVER IN THE HEART OF CENTRAL APENNINES IN ITALY

In the summer of 2024, the Giovenco River in Italy's Central Apennines came back to life. Five (5) old barriers that had blocked its flow for decades were finally removed (Figure 5) through the GIOV & GO – A free-flowing Giovenco project[2],led by Rewilding Apennines with strong backing from the Abruzzo, Lazio and Molise National Park, the Municipality of Bisegna, and the European Open Rivers Programme.

For the first time in years, an 11-kilometer stretch of the river now runs free. The change is more than symbolic — it means new opportunities for the valley's people and nature alike. Local residents have been part of the journey, joining educational activities, discovering the value of a healthy river, and exploring new economic opportunities, such as nature tourism and outdoor recreation that celebrate the restored landscape.

The benefits for wildlife are equally powerful. Species like the endangered white-clawed crayfish and the Mediterranean trout can once again move through the water, reclaiming habitats that were cut off for generations. Otters, birds, and countless smaller creatures are already finding new space to thrive as plants return along the riverbanks. The Giovenco is also beginning to behave like a natural river again, carrying sediment, reshaping meanders, and repairing erosion — processes that sustain life and landscapes over the long term.

What happened on the Giovenco is only the beginning. Inspired by this success, work is expanding to other stretches of the river and to neighboring waterways, such as the Liri[3], with the vision of reconnecting entire landscapes and breathing fresh life into the Apennines' rivers.

[2] https://rewildingeurope.com/news/rewilding-apennines-leads-pioneering-removal-of-river-barriers/

[3] https://openrivers.eu/projects/202509697-a-wilder-sound-for-the-liri-river/

Figure 5.
Removal works of barriers on Giovenco River, Italy © Bruno D'Amicis

Croatia

Kick-off meeting of the "Improve River LIFE" project in Dugopolje
© Ministry of Environmental Protection and Green Transition

Slovakia

Field trip and presentation of barrier impacts to students at Green School
© WWF Slovakia

Romenia

Live interview from a barrier site in Romania with Paul Hac from Fauna & Flora

Serbia

Workshop on barrier removal and water sustainable management in Serbia organized by Rzav Ecological Association
© Goran Sekulic

Italy

Stakeholder meeting within the framework of the "Free the Pollina River" project organized by Collettivo Rewild Sicily
© Mathia Coco

Kosovo

"Flowing or Fading? The Fate of Kosovo's Rivers" conference organized by EcoZ and Riverwatch

Albania

1st national conference in Albania on the identification and decommissioning of non-functional dams organized by H2H Foundation
© H2H Foundation

Greece

Dam removal course in Athens, Greece
© MedINA

Bulgaria

Workshop on barrier removal in the Yantra River Basin organized by the BALKANI Wildlife Society
© Ivan Donchev

BARRIER REMOVAL SHOWCASE: HISTORIC RIVER RESTORATION COMPLETED AT PLITVICE LAKES NATIONAL PARK IN CROATIA

Plitvice Lakes National Park has become the site of a groundbreaking ecological achievement: the successful removal of eight outdated barriers along the Bijela Rijeka stream (Figure 6), marking a historic milestone for freshwater restoration in Croatia[4, 5]. The barriers, once built for mills had long disrupted the natural flow of the river, isolating populations of the endangered Danube trout and blocking their access to critical spawning grounds. With their removal, 7.6 kilometers of river have been reconnected, creating a continuous free-flowing stretch feeding Prošćansko Lake. The project was carried out by WWF Adria and the Plitvice Lakes National Park with the financial support of the European Open Rivers Programme.

The ecological benefits of this achievement are significant. The restoration has reopened natural migration routes, allowing trout and other aquatic species to move freely and reproduce in their native habitats. Re-establishing river continuity also enhances biodiversity, strengthens food webs, and improves the resilience of freshwater ecosystems to climate change. The carefully managed restoration ensured that water quality and the river's hydromorphology were maintained, using natural materials to recreate authentic streambeds and prevent any negative environmental impact.

Beyond ecological gains, the project is a landmark for conservation practice in Croatia. It demonstrates how targeted barrier removal can bring rivers back to life, setting an example for similar initiatives across the country. The project has also spurred wider collaboration: a national seminar in 2024, hosted by Plitvice Lakes National Park and WWF Adria, brought together government bodies, scientists, and NGOs to explore future restoration opportunities. This led to the launch of the "Improve River Life" initiative, aimed at mapping and prioritizing further barrier removals nationwide.

The success at Plitvice shows that even small-scale interventions can yield profound results: a healthier river system, revitalized fish populations, and a restored natural heritage that will benefit both wildlife and people for generations to come.

[4] https://openrivers.eu/projects/202304484-eight-barrier-removals-in-plitvice-lakes-national-park-croatia/

[5] https://youtu.be/Hnq0U_GFEAE?si=9s_5V0ujq4PKZjxC

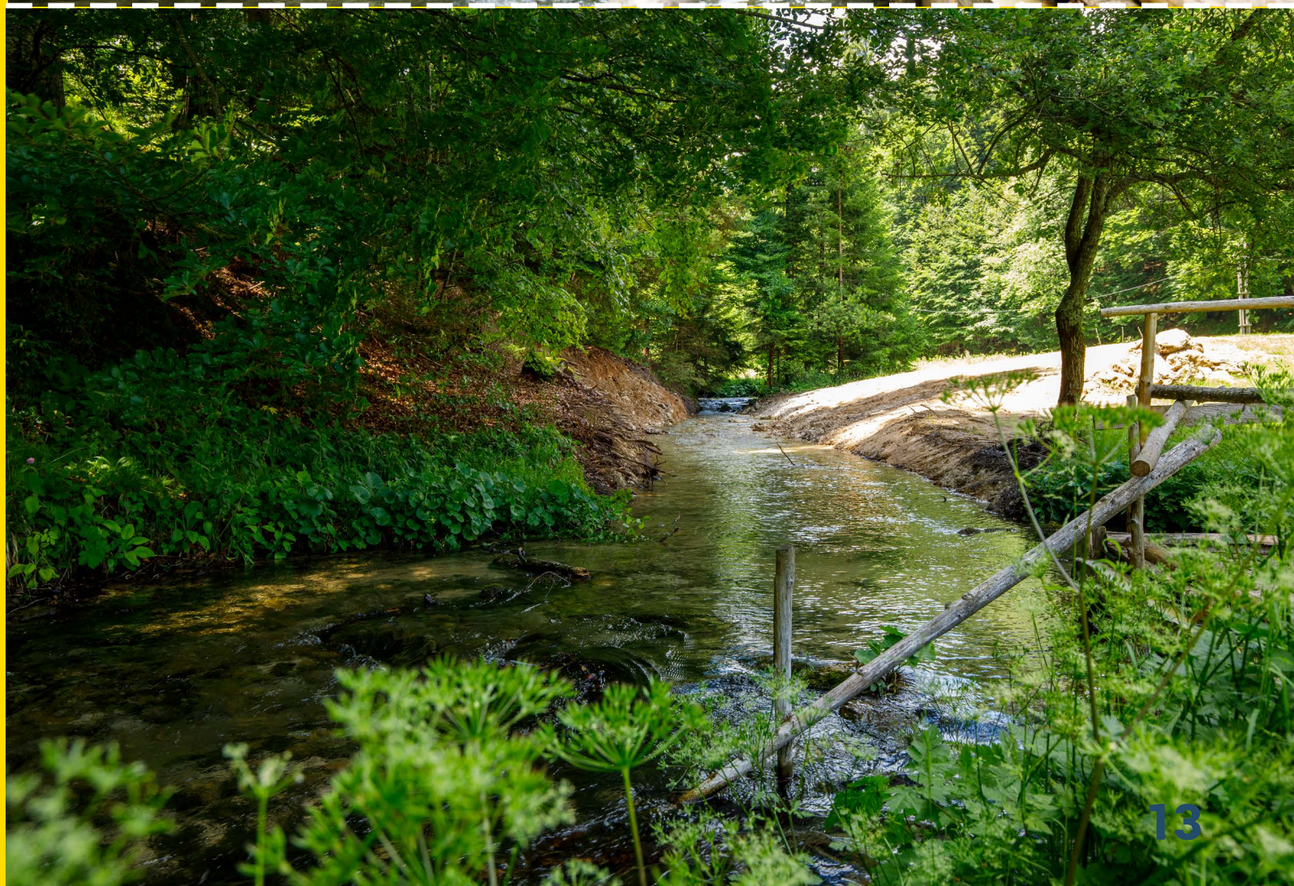

Figure 6.
Barrier at Plitvice Lakes National Park, Croatia: (up) during and (down) after the removal works © WWF Adria

BARRIER REMOVAL SHOWCASE: A MILESTONE FOR BOSNIA AND HERZEGOVINA AT HUTOVO BLATO NATURE PARK

Bosnia and Herzegovina has taken a major step forward for river restoration with the complete removal of nine obsolete barriers on the Jelimska Riječina and Šarčevac streams at the Hutovo Blato Nature Park[6, 7]. Once used as fish-catching structures, these barriers had blocked the movement of iconic and endangered species. Their removal has restored 2.5 kilometers of free-flowing water, reopening critical migration routes and reconnecting fish with their spawning and feeding grounds.

Reestablishing river continuity is expected to boost fish populations, strengthen food webs, and enhance the resilience of the entire Neretva Delta ecosystem. The revival of these waters will also benefit local communities, supporting traditional fishing practices and creating opportunities for eco-tourism in one of the Adriatic's most important wetland areas.

The project was executed by Udruga Dinarica with exceptional care. Specialized amphibious machinery (Figure 7) was used to dismantle the barriers without disturbing fragile riverbanks or aquatic habitats, ensuring that the restoration delivered only positive outcomes. Financial support for the project was provided by the European Open Rivers Programme.

Beyond the ecological gains, the project has inspired a new model for river restoration in Bosnia and Herzegovina. By uniting park managers, scientists, NGOs, and local communities, it shows how collaboration can bring rivers back to life and sets a precedent for further restoration projects across the Neretva basin and beyond. In fact, a new project has recently been launched on the Unac River aiming to systematically identify, evaluate and set priorities for the removal or rehabilitation of obstacles that disrupt the natural dynamics of the river[8].

[6] https://openrivers.eu/projects/202305491-nine-barriers-bosnia-and-herzegovina/
[7] https://dinarica.org/u-parku-prirode-hutovo-blato-uklonjena-prva-od-devet-barijera-u-sklopu-projekta-uklanjanja-barijera-kako-bi-se-obnovila-migracija-riba/
[8] https://dinarica.org/pokrenut-projekt-na-rijeci-unac-mapiranje-barijera-i-ocuvanje-ribljih-vrsta/

Figure 7.
Specialized amphibious machinery used during the barrier removal works executed at the Hutovo Blato Nature Park in Bosnia and Herzegovina between May and July 2024 © Udruga Dinarica

BARRIER REMOVAL SHOWCASE: RECONNECTING A SIDE CHANNEL TO THE MAIN ONE OF THE OLD DANUBE IN SLOVAKIA

In Slovakia, a landmark river restoration project successfully reconnected the degraded upper Foki side arm to the mainstem of the old Danube. This was achieved in two phases: first by removing five artificial barriers, and second, by dredging and reconnecting the side arm to the main riverbed. The first phase, implemented in autumn 2024-(from September to November), involved the removal of three aged groynes and two traverses—structures that had altered the natural water flow. Their dismantling restored essential hydrological connectivity to the area. The second phase was implemented during the next eight months (from November 2024 to July 2025). The project was executed by BROZ - conservation association, with the financial support of the European LIFE Programme, the European Open Rivers Programme and the Ministry of Environment of SR.

Slovak side arm system, within the Old Danube section had suffered significant and extensive ecological degradation due to human interventions in the 19th- and 20th-centuries. These included cutting off all inflows to side arms and river branch systems and the construction of the Gabčíkovo hydropower plant and an artificial navigation channel construction. Over time, these measures drastically altered river dynamics, leading to the loss of up to 50% of Danube habitats in Slovakia and a 70% decline in fish populations.

The heart of the project was the restoration of a 2.24 km stretch of free-flowing water. By removing the barriers and dredging the riverbed, this section of the Foki side arm has regained its natural connection to the Danube, allowing riverine species to access historical spawning and feeding grounds for the first time in decades. The ecological benefits of the restoration go beyond fish migration. The project is expected to improve groundwater levels, enhance flood protection through natural retention, and support the health of alluvial forests and wetland biodiversity. It also contributes to Slovakia's commitments under the Ramsar Convention, EU Water Framework Directive, Slovak Water Strategy, and the EU Biodiversity Strategy for 2030.

This initiative represents the first restoration of its kind within an Old Danube section in Slovakia, showcasing how targeted barrier removal—backed by robust planning—can restore degraded river systems. Long-term hydrological and ichthyological monitoring is now underway to assess ecological recovery and inform future restoration efforts. The implementation of this extensive restoration measure within the upper part of the Foki side arm was supported by projects (1) Dynamic LIFE Lines Danube LIFE18 NAT/AT/000733 and (2) Open Rivers Programme 2023 - 04 – 431 Foki for Fish.

[9] https://broz.sk/en/projekty/foki-for-fish/

[10] https://openrivers.eu/projects/202304431-four-barrier-removals-danube-river-slovakia/

Figure 8.
Re-connection of the degraded Foki side arm to main river (Old Danube) in Slovakia
© BROZ

NEXT STEPS

Over the past ten years the barrier removal movement has advanced significantly, and this practice has become a mainstream river restoration tool in central, western and northern Europe. Thousands of barriers have been removed, reopening thousands of kilometers of rivers. These efforts restore entire ecosystems, boost biodiversity, and reduce the dangers associated with aging infrastructure, which can threaten both people and the environment. Tackling river fragmentation, however, is not only about dismantling dams and weirs; it also requires changing perspectives among decision-makers and local communities so that they understand the wide-ranging benefits of barrier removal, from stronger ecosystems and cleaner water to improved flood protection. Awareness campaigns and training initiatives have shifted the perspective towards river restoration from being a novel concept to becoming an essential strategy for protecting water quality and ecological health in most of Europe.

In the southeastern region of Europe barrier removal is still at an early stage, and extra support is needed to assist the launch of pilot projects, to promote awareness about the benefits of free-flowing rivers, to create networks for practitioners to exchange methods and lessons learned, and to shift existing policies that will enable the implementation of this practice. However, significant progress has already been made, as presented in this report and observed through the "Scaling up dam removal: implementation plan for Southeastern Europe" project in the last couple of years. There have been 34 ORP proposals submitted, and a total of 49 projects are in various stages of development from 15 countries. The network is growing, with more than 1300 people, while thousands of people and key stakeholders have been reached through online and in person events. The national events that have been organized in several countries have been particularly impactful in driving momentum and developing new projects. In Romania, for example, nine new projects commenced and collaborations with stakeholders have evolved soon after the first national seminar.

For Member States, the time to take action is now, as they have to submit their National Restoration Plans (NRPs) by September 2026, meaning that they have to map their barriers and prioritize those for removal in less than a year. Depending on the country, there are several ways to participate in the process, either through citizen science apps or by getting involved in consultation groups for the formulation of the NRPs.

For more information on emerging trends in barrier removal, practical and useful insights as well as technical support for practitioners can be found in the Dam Removal Europe toolbox and at the open-access helpdesk (contact: Foivos Mouchlianitis; falexandrosmouchlianitis@wwf.nl). News on ongoing initiatives, upcoming events, and expert perspectives are also provided on the website (www.damremoval.eu), along with regular updates and the option to subscribe to its newsletter.

Acknowledgements

WWF Netherlands wishes to express its gratitude to everyone who provided valuable information/data/photos for the publication of this report, which was produced with financial support from the European Open Rivers Programme.

References

1. AMBER Consortium (2020). The AMBER Barrier Atlas. A Pan-European database of artificial instream barriers. Version 1.0 June 29th 2020. https://amber.international/european-barrier-atlas/
2. Belletti B., Garcia de Leaniz, C., Jones, J., et al. (2020). More than one million barriers fragment Europe's rivers. Nature 588: 436–441
3. Duque I., Agapakis I., Pravuljac M. (2025). Going with the flow: Barrier removal for healthier rivers – A legal analysis of Article 9 of the Nature Restoration Law
4. McCaffery R., Duda J.J., Soissons L., Roussel J-M. (2024) Editorial: Large-scale dam removal and ecosystem restoration. Front. Ecol. Evol. 12: 1471146
5. Mouchlianitis F.A. (2025). Dam Removal Progress 2024. Dam Removal Europe

The 1st screening of DAMBUSTERS documentary in Greece
© A. Stamopoulou / MedINA

DAM REMOVAL EUROPE

Cite as

Mouchlianitis F.A. (2025). Southeastern Europe Barrier Removal Movement Progress Report 2024-2025. WWF Netherlands

Design

Bas Deelman | www.tackleproblems.nl

Resources and tools

For more information about barrier removal showcases, events, tools and resources, or if you are interested in becoming a donor and help restoring free-flowing rivers in Europe, visit: www.damremoval.eu

Copyright

WWF Wetlands International Fauna & Flora ERN European Rivers Network MedINA Open Rivers Programme