An aerial photograph of a vast wetland area, likely a salt flat or lagoon, teeming with a massive flock of flamingos. The birds are scattered across the landscape, some standing on the light-colored ground and others in the shallow water. Patches of green vegetation are visible, interspersed with the open areas. The overall scene conveys a sense of a thriving, natural ecosystem.

Supporting ecosystem services provided by rivers: experiences and current policy trends

Claire Baffert, WWF EPO,

INTERREG workshop “Living rivers: a driver for sustainable regional development”,
27 May 2021

Rivers are the pumping hearts of our landscapes

The gifts we receive from healthy rivers, lakes & wetlands

...are key to delivering the 4 main pillars of the European Green Deal

1 EU Biodiversity Strategy 2030

■ Thriving biodiversity

There are **500+** freshwater fish species in Europe, **80%** of which are endemic*

2 Climate resilient Europe

■ Reduced flood and drought risks

Healthy rivers give us healthy floodplains which are resilient to floods and droughts. They also carry sediments, protecting deltas from rising sea levels

3 Climate neutral Europe

■ Carbon sinks

Peatlands - one of Europe's most endangered freshwater ecosystems - are the largest carbon sinks of any ecosystem. They absorb and store carbon, making them invaluable in the fight against climate change*

4 Farm to fork strategy

■ Sustainable agriculture

Sustainable agriculture and aquaculture need a decent supply of good quality water. Healthy rivers provide nutrients, sediments and water

Bonus!

■ Economic prosperity

6% of the EU's added value is generated by economic sectors that are highly dependent on a decent supply of good quality water. These same sectors provide **44 million jobs**†

But Europe's freshwater ecosystems are at risk

...because the EU water law is not implemented



60% of EU rivers, lakes, wetlands and streams are not healthy*

83% decline in freshwater species has been observed globally since 1970 - equivalent to 4% per year. This is double the decline in terrestrial and marine species*

There are **25,000+** hydropower plants in Europe. Hydropower dams destroy rivers, resulting in the loss of freshwater biodiversity*

1 in 3 European freshwater fish species are threatened with extinction†

The costs of not implementing the EU Water Framework Directive and achieving its objectives would result in annual costs in the range of **5-20 billion €**‡

53% of EU water bodies are under at least one exemption to the EU Water Framework Directive*

*European Environment Agency, 2018, European waters: Assessment of status and pressures 2018

†WWF, 2018, Living Planet Report 2018

‡European Environment Agency, 2019, 'Hydrology of natural and sustainable water management', <https://www.eea.europa.eu/en/topics/2019/hydrology-of-natural-and-sustainable-water-management>

§European Commission, 2011, European Map List of Freshwater Fishes

¶European Commission, 2014, 'The costs of not implementing the environmental acquis', Final report, ENV-D-15784-00004/2014

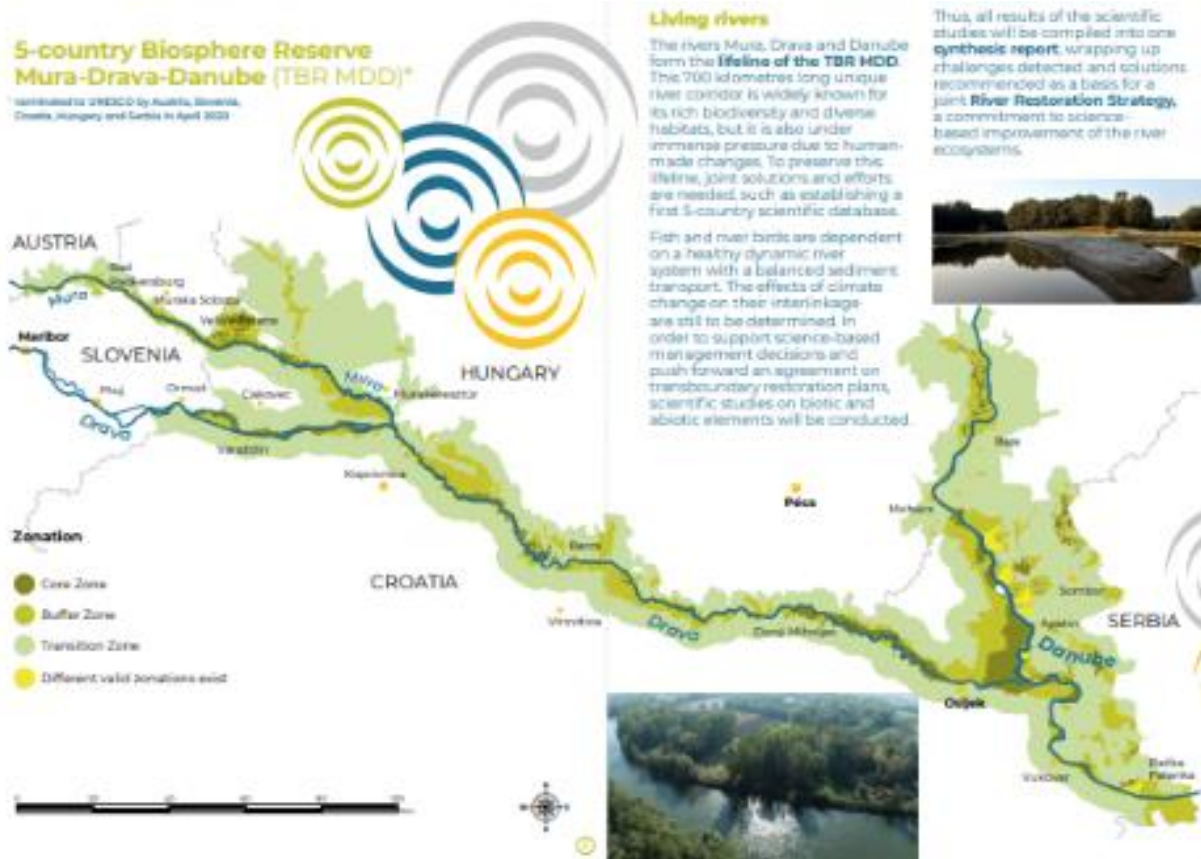
‡EEA 1932, 2018 (WFD) reporting European Commission, 2018



Freshwater ecosystems must be protected and restored

Coop MDD
INTERREG
project (2017-
2019)

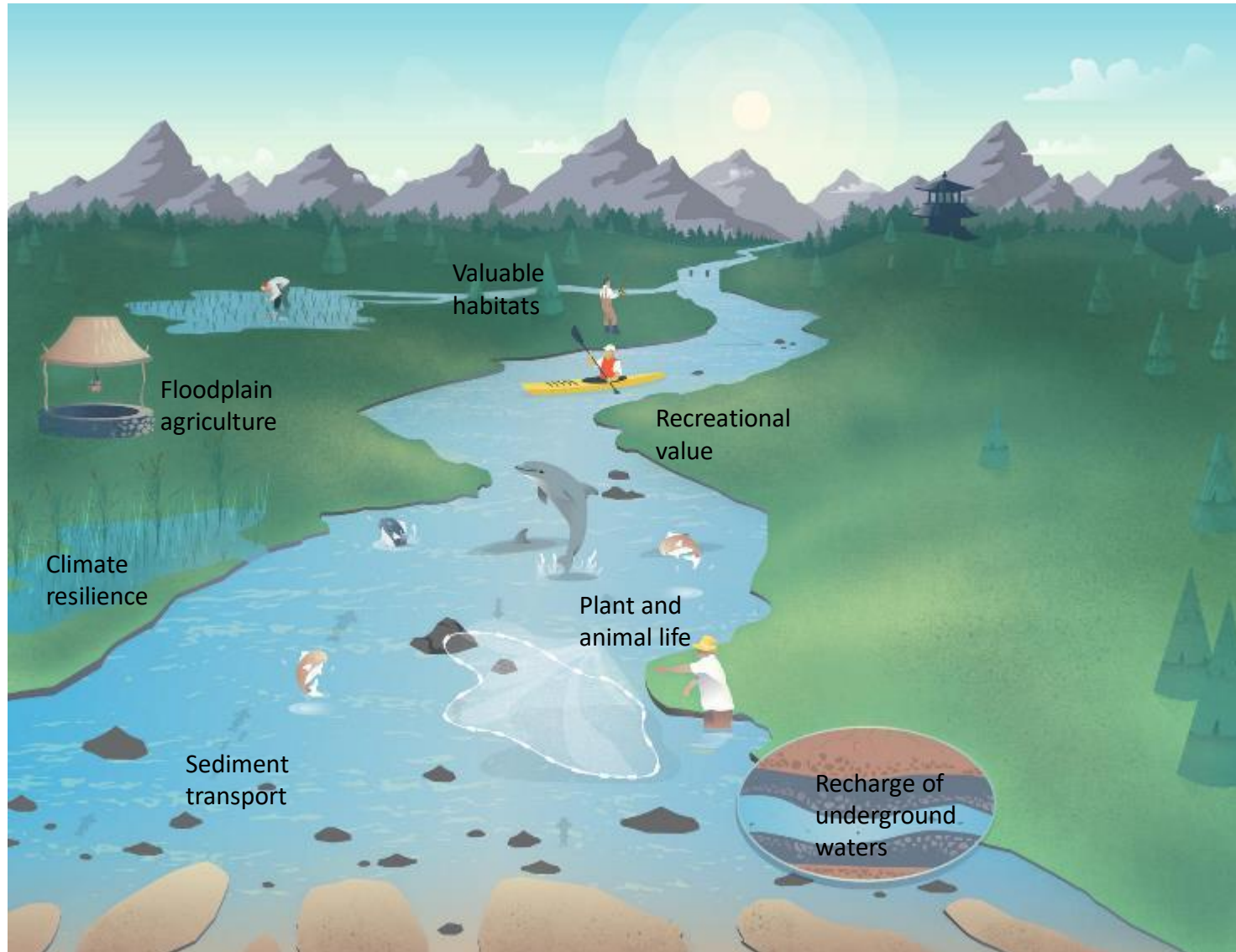
Harmonization of Protected Areas management, development of a joint Management Programme for the future 5-country UNESCO Biosphere Reserve "Mura-Drava-Danube", and development of a living cooperation between Protected Area managers.



LIFELINEM
DD
INTERREG
project
(2020-
2022)
Development
of an
integrated
river
restoration
strategy and
implementati
on of three
pilot
restoration
projects .

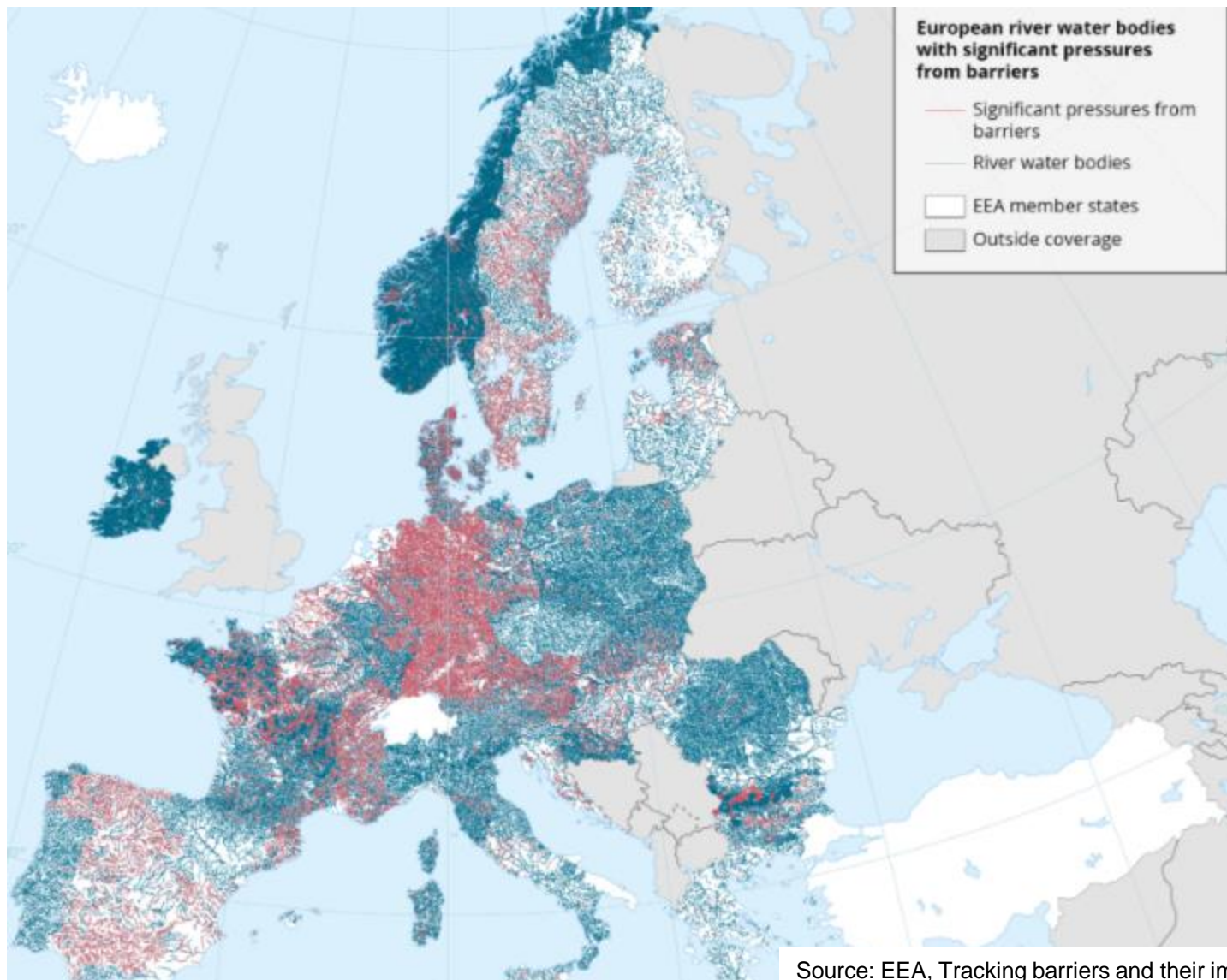


Free-flowing rivers provide multiple benefits, but are threatened





River barriers are a strong cause of failure in WFD targets



Map 1. European river water bodies under significant pressure from barriers

Source: EEA, Tracking barriers and their impacts on European river ecosystems, 2021



Migratory freshwater fish populations have dramatically collapsed in Europe





Learnings from river barrier removal across the globe



Dam removals : 60% less expensive than repair and maintenance over 30 years. Baker, C. et al (2015) [Economic & Community Benefits from Stream Barrier Removal Projects in Massachusetts](#).



Free-flowing river sections have more recreational value than dammed sections. Getzner, M. (2015). [Importance of Free-Flowing Rivers for Recreation: Case Study of the River Mur in Styria, Austria](#)



Dam removal on the Sélune River would generate a threefold increase in suitable habitat for salmon juveniles.

<https://academic.oup.com/i>

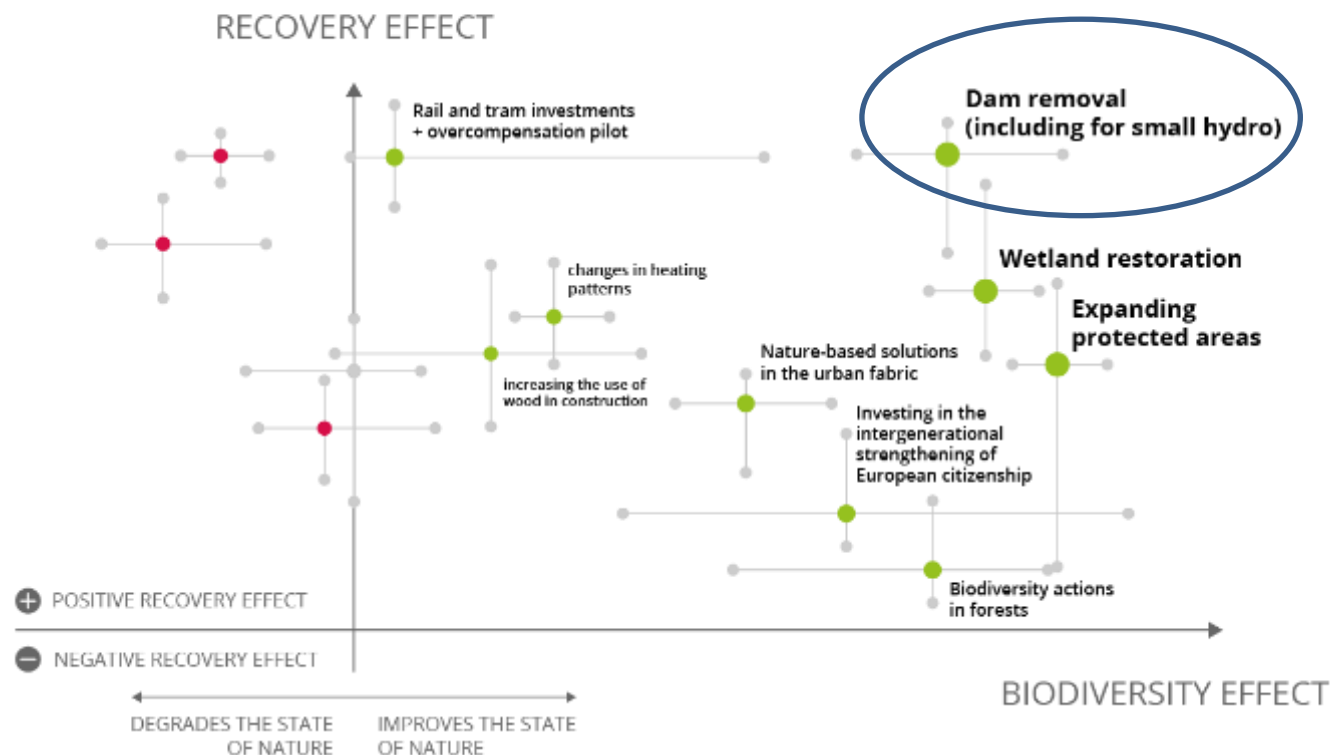


Dike relocation on the Elbe river reduced the flood stage by 0,5m upstream and up to 10 cm at a town 20 km upstream.

WWF, [Working with Nature to reduce Climate risks](#), 2019, pps 26-27.

Barrier removal is the “green” measure with the highest impact on biodiversity and recovery

Recovery and habitats effects of different measures



Recovery and habitat effects of different measures. The higher up in the figure the measure is located, the greater its employment impact, and the further to the right the measure is located, the more positive its impact on biodiversity. The measures with the highest employment and nature effects are in the top right-hand corner of the graph, while the measures with the lowest employment and nature effects are in the bottom left-hand corner. The measures are numbered in order of the highest nature impact. The whiskers represent the estimated ranges of impacts. The position of a measure between the extremes of the range depends on how the measure is implemented.

Source: Suomen Luontopaneeli. 2021. Luonnon monimuotoisuus ja vihreä elvytys. Suomen Luontopaneelin julkaisuja 1/2021.



The need to foster barrier removal is acknowledged at EU level

EU Biodiversity Strategy



“Greater efforts are needed to restore freshwater ecosystems and the natural functions of rivers in order to achieve the objectives of the Water Framework Directive. This can be done by removing or adjusting barriers that prevent the passage of migrating fish and improving the flow of water and sediments. To help make this a reality, **at least 25,000 km of rivers will be restored into free-flowing rivers by 2030 through the removal of primarily obsolete barriers and the restoration of floodplains and wetlands.**”



European Parliament resolution on the implementation of the water legislation

“Welcomes the Commission’s commitment in the context of its Biodiversity Strategy for 2030 to restore 25 000 km of free-flowing rivers in the EU through the removal of barriers and the restoration of flood-plains;”

“Calls on the Member States and the Commission to take all necessary action to minimise pressures on bodies of surface water in order to restore natural functions of rivers and protect ecosystems;”

Is the current EU target for barrier removal enough?

25,000 km = only 2% of EU rivers



- 1,2 million barriers in Europe
- 100,000 are obsolete
- By removing 2,5% (2,500), the 25,000 km target could be achieved



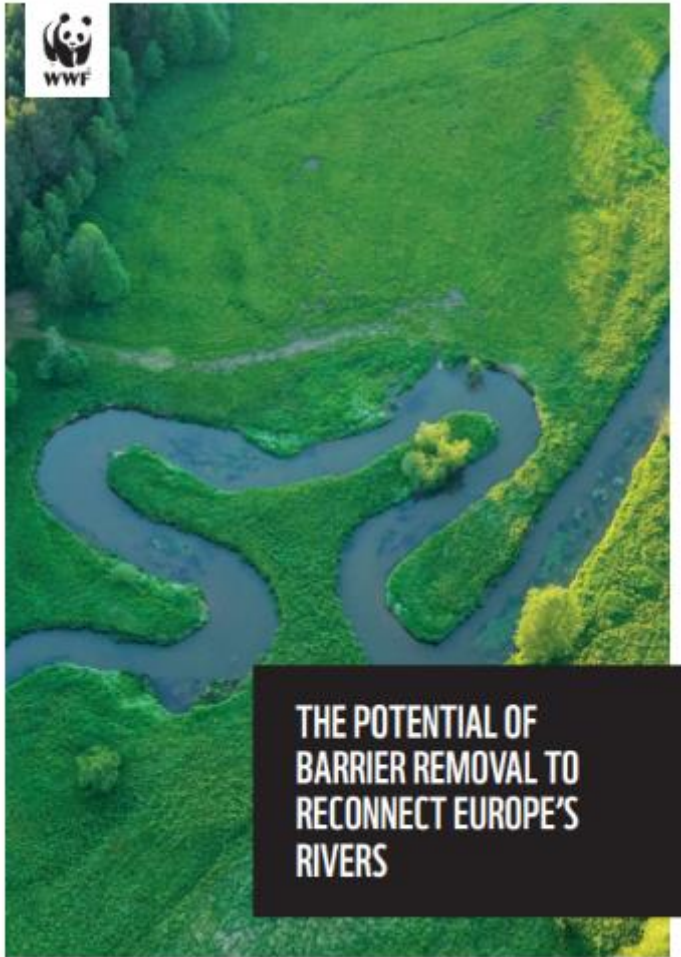
- National Biodiversity Plan sets the objective of restoring 50,000 km of free-flowing rivers by 2030



- WWF and NGOs recommend raising the EU target to 15% of rivers (178,000 km) restored to a free flowing state by 2030, and **making it legally-binding under the EU Nature Restoration Law (proposal expected by the end of 2021)**

See [advocacy paper](#)

WWF analysis on barrier removal: scope



Sample: 30,000 barriers analysed in large and medium-size rivers in Europe

Table 1: Type of barriers included in the analysis

THE STUDY INCLUDES	THE STUDY DOES NOT INCLUDE
<ul style="list-style-type: none"> Longitudinal barriers, built for various purposes, namely ramps, weirs and dams Barriers > 0,5 meters in height ¹⁰ Some barriers equipped with fish passes 	<ul style="list-style-type: none"> Hydropower plants above 10MW Drinking water reservoirs Culverts and fords (mostly bridges and road crossings) Lateral barriers such as flood dykes Barriers < 0,5 meters height

Read the report [here](#)

WWF analysis on barrier removal: criteria for prioritisation

Table 1: Main criteria used for the prioritisation of barriers in this study

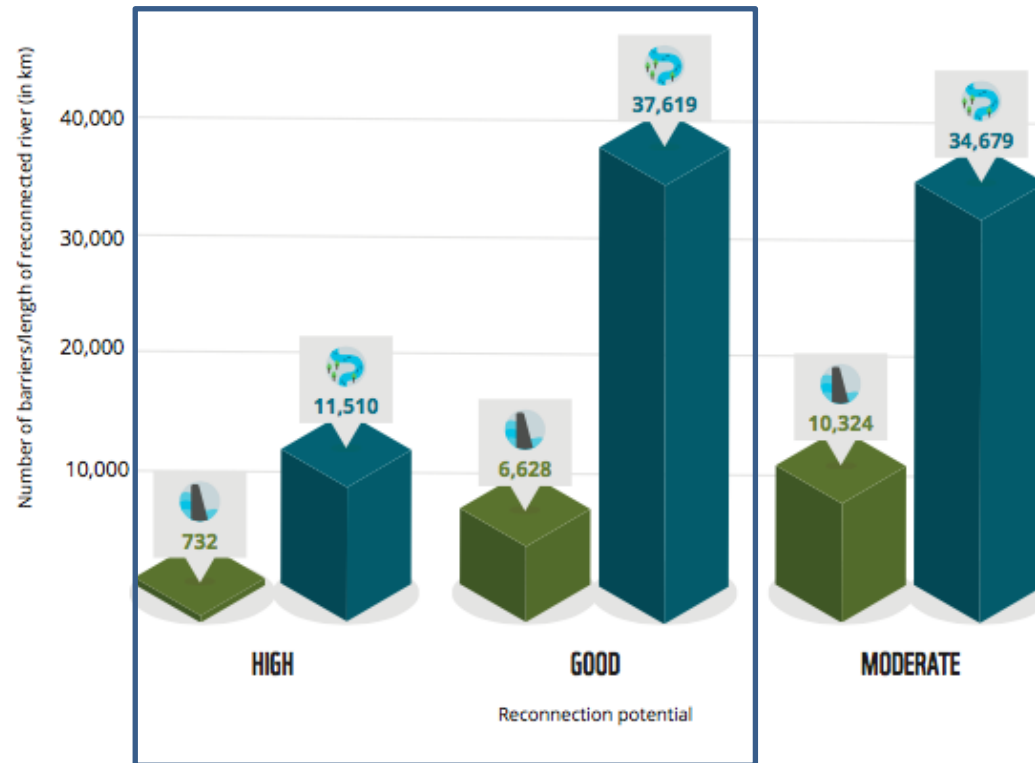
PRIORITISATION CRITERIA	DESCRIPTION AND REASONS FOR SELECTION
Length of reconnected river	Gives the measured length of continuously free flowing river stretch upstream ⁶ , important for fish migration and sediment transport.
Share of natural habitat coverage in the reconnected river stretch	Measured within a buffer around the reconnected river stretch, provides an indicator for hydromorphology or in general the intactness of the river.
Share of riparian zone (floodplain ⁷) in the reconnected river stretch	Additional indicator for the importance of upstream river stretch regarding floodplain reconnection (which is vital for fish spawning, habitat restoration, and sediment retention/remobilisation). Also measured within a buffer around the reconnected river stretch.
Share of the reconnected stretch included in a protected area	Another indicator for the intactness and ecological importance of the upstream river stretch to be reconnected, also measured within a buffer around the reconnected river stretch.
Position of the barrier in a protected area	Prioritises barrier removal within a protected area.

⁶ Considering only the length of the river section upstream of the removed barrier seemed to provide the most accurate estimate of the effects of barrier removal, especially in the case of removal of several successive barriers.

⁷ Floodplain and riparian zones are used here as synonymous.

WWF analysis on barrier removal: results

Figure 4: Distribution of barriers with removal potential in the EU27.



Nearly 50,000 km of rivers have a high and good potential to be made free-flowing again, in the sample studied alone (requiring the removal of 7360 barriers)



Fostering barrier removal across the EU : challenges for policy makers

Different approaches across Member States to prioritise barriers for removal...

But a necessity to uphold common principles:

- Definitions of free-flowing rivers: include longitudinal, but also vertical and lateral barriers
- Removal of barriers vs. adaptation of barriers
- Inclusion in River Basin Management Plans
- Collaboration with multiple stakeholders

Thank you for your attention

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