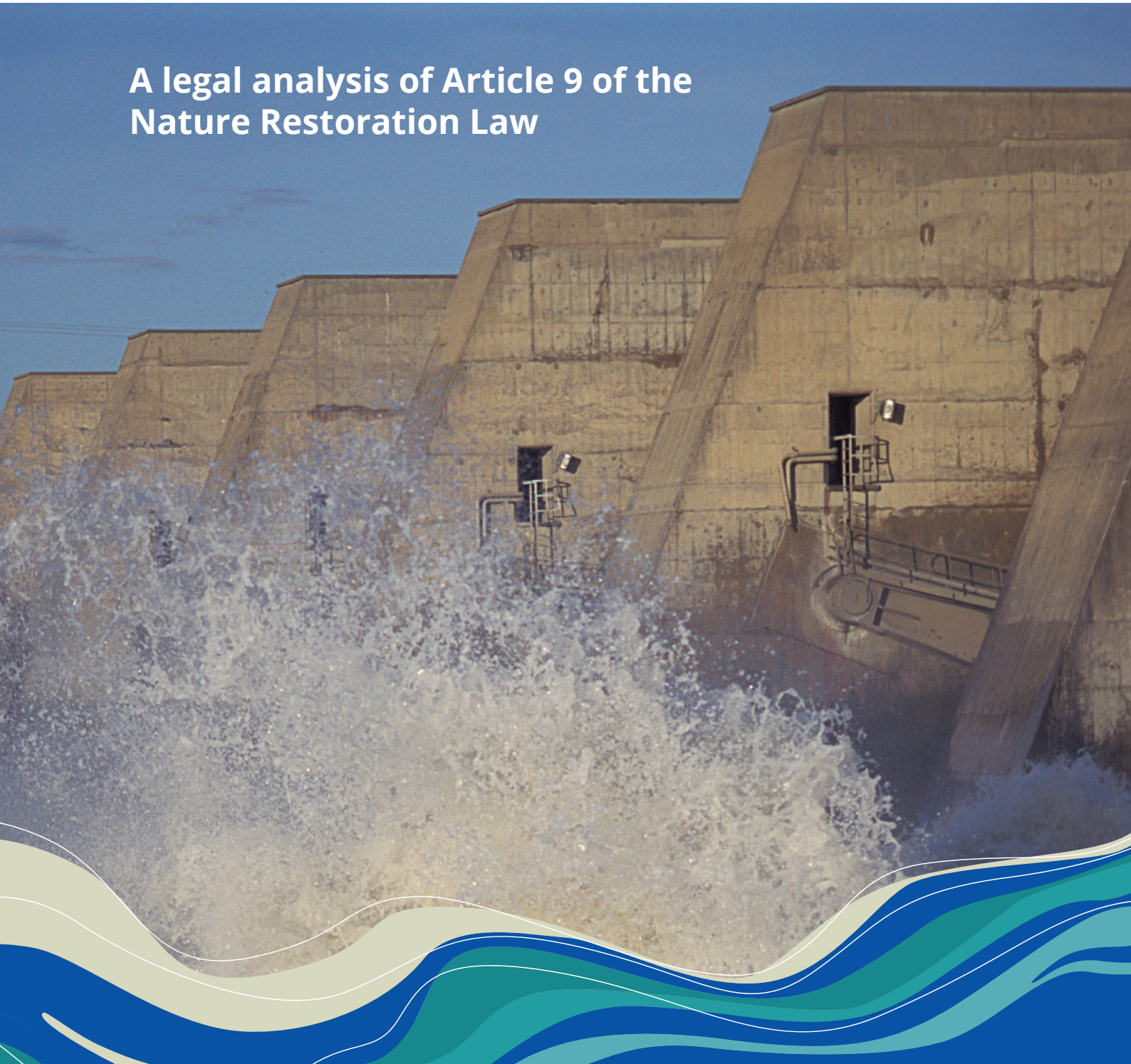
ClientEarth

Living Rivers Europe

Going with the flow: Barrier removal for healthier rivers

A legal analysis of Article 9 of the Nature Restoration Law



Authors:

Produced by Irene Duque (Wetlands International Europe), Ioannis Agapakis and Maja Pravuljac (ClientEarth); in close collaboration with Living Rivers Europe.

Acknowledgments:

Twan Stoffers from the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB).

Editing: Barney Jeffries.
Graphic design: Doug Dawson
Cover image: naturepl.com-Jean E. Roche- WWF

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NRL ARTICLE 9:
LEGAL BRIEFING

INTRODUCTION

The Nature Restoration Law (NRL) is the first EU legislation to establish **binding, time-bound targets for the restoration of ecosystems** across terrestrial, coastal, freshwater, marine, urban, agricultural and forest environments, as well as pollinator populations. As a central pillar of the EU Biodiversity Strategy for 2030,[1] the NRL has immense potential to restore Europe's suffering natural landscapes, shield communities from climate change-induced disasters and extreme weather, and address the interconnected crises of biodiversity loss and climate change.

Among its various restoration obligations, the NRL places a strong emphasis on freshwater ecosystems, which are among the most degraded and fragmented in Europe. To address this, Article 9 sets a landmark legal target:

> **Restore at least 25,000km of rivers into free-flowing condition by 2030**, primarily through the **removal of artificial barriers** that disrupt natural river connectivity.

This target, first proposed in the EU Biodiversity Strategy, is now a binding legal obligation under Article 9(1). It reflects growing scientific and policy consensus that river fragmentation is one of the leading pressures on freshwater biodiversity.

The scale of river fragmentation in Europe is vast: an estimated 1.2 million barriers[2] – including weirs, culverts, sluices, fords, ramps and dams[3] – fragment river systems across the continent, many of them obsolete or undocumented.[4] Originally built for purposes such as streambed stabilisation, energy production, inland navigation, flood protection, water supply and agricultural abstraction, or historical uses like water mills, many of these structures now persist even when they no longer serve a viable function. Their environmental impacts vary depending on type, height, size, permeability and location, but the effects on river systems are often severe.

Barriers alter natural water flow, block fish and aquatic species' migration, and disrupt sediment and nutrient transport, leading to sediment build-up upstream and depletion downstream. These changes degrade water quality, interfere with temperature regulation and oxygenation, and can contribute to eutrophication. The loss of sediment transport also displaces key aquatic habitats and has broader implications for flood protection, groundwater levels, land use and natural water retention. **The cumulative impact of multiple small barriers can significantly impair ecological continuity**, leading to the decline of freshwater biodiversity and collapse of migratory fish populations.[5]

Removing obsolete barriers is increasingly recognised as a cost-effective and ecologically robust restoration measure, helping re-establish river continuity, improve water quality, support fish populations, and increase resilience to floods and droughts. It also enables broader climate and biodiversity benefits, especially when combined with wetland and floodplain restoration 17% (around 200,000) of barriers are obsolete. Compared to large-scale engineering interventions, systematic barrier removal is often more strategic and efficient, particularly when barriers are small, outdated, or no longer serve essential functions.[6] It also delivers multiple co-benefits across policy areas: in addition to restoring river connectivity, it supports the

1. European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2020) *EU Biodiversity Strategy for 2030: Bringing nature back into our lives,* COM/2020/380 final.
2. Baletti, B. et al. (2020). More than one million barriers fragment Europe's rivers. *Nature* **588**: 436–441.
3. European Environment Agency (2024) *Tracking barriers and their impacts on European river ecosystems*. EEA Report Nr 07/2024.
4. Bellmore, J.R. et al. (2019) Conceptualizing ecological responses to dam removal: If you remove it, what's to come? BioScience 69(1): 26-39.
5. EEA (2024).
6. Bellmore et al. (2019).

rewetting of peatlands,[7] enhances natural water retention, and improves conditions for adjacent terrestrial and wetland habitats. These synergies are critical for meeting the wider objectives of the NRL and should be integrated into national restoration planning. Yet despite its growing momentum as a restoration strategy, only **a tiny fraction of barriers in the EU have been removed to date,[8] even though a large number are obsolete**.[9]

Article 9 represents a shift from voluntary restoration to enforceable legal obligations. **To comply with Article 9, Member States must**:

- Identify and map barriers to river connectivity;
- Prioritise obsolete barriers for removal;
- Ensure actions contribute to the NRL's definition of free-flowing rivers, including longitudinal, lateral and vertical connectivity (Article 3(22));
- Complement barrier removal with measures to restore floodplain and wetland functions;
- Ensure restored river connectivity is maintained over time.

This briefing will explore each of the above obligations, following the structure of Article 9. **Part 1 covers the inventory** of barriers to river connectivity and their contribution to the NRL's Member State-level (NRL Article 4) and Union-wide (NRL Art 9(1)) targets, while **Part 2 delves into** the modalities of **Member States' obligation to remove barriers**, including considerations on the required environmental assessments to be conducted prior to each barrier removal.

Implementation will demand **coordinated planning across water, biodiversity, infrastructure and climate sectors**, and respective competent authorities. Article 9 measures must also align with the Water Framework Directive (WFD),[10] Birds Directive, Habitats Directive (HD)[11] and Trans European Network (TEN-T) Regulation,[12] and be embedded in the National Restoration Plans (NRPs) required under Article 15. Member States must prepare NRPs that detail how they will meet restoration targets, including for river connectivity. These plans must be developed through inclusive governance processes, ensuring the active participation of stakeholders such as civil society organisations, scientific institutions and local actors. The transformative impact of the NRL will depend not only on technical design, but on genuine engagement and political will.

This briefing is intended to **support national authorities, river basin managers and policy practitioners in interpreting and implementing Article 9. It provides a practical, legally grounded guide**, structured to:

- Clarify the legal scope of Article 9 and what types of restoration measures count towards the 25,000km target, including how these actions contribute to achieving good ecological status (GES) by 2027 under the WFD;
- Guide prioritisation and planning of barrier removals;
- Ensure legal coherence and sound environmental assessment;
- Offer tools, good practice examples and references to support effective implementation strategies.

7. Another landmark EU target under NRL Article 11.
8. Living Rivers Europe (2021) Driving the restoration of free-flowing rivers to support biodiversity: Briefing paper on setting an EU free-flowing river restoration target in the EU Nature Restoration Law.
9. Dam Removal Europe (2023) *Progress Report*. The percentage of obsolete barriers has been set as high as around 17% (around 200,000). Dam Removal Europe (2020) *Progress Report*.
10. Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.
11. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
12. Regulation (EU) 2024/1679 of the European Parliament and of the Council of 13 June 2024 on Union guidelines for the development of the trans-European transport network, amending Regulations (EU) 2021/1153 and (EU) No 913/2010 and repealing Regulation (EU) No 1315/2013.

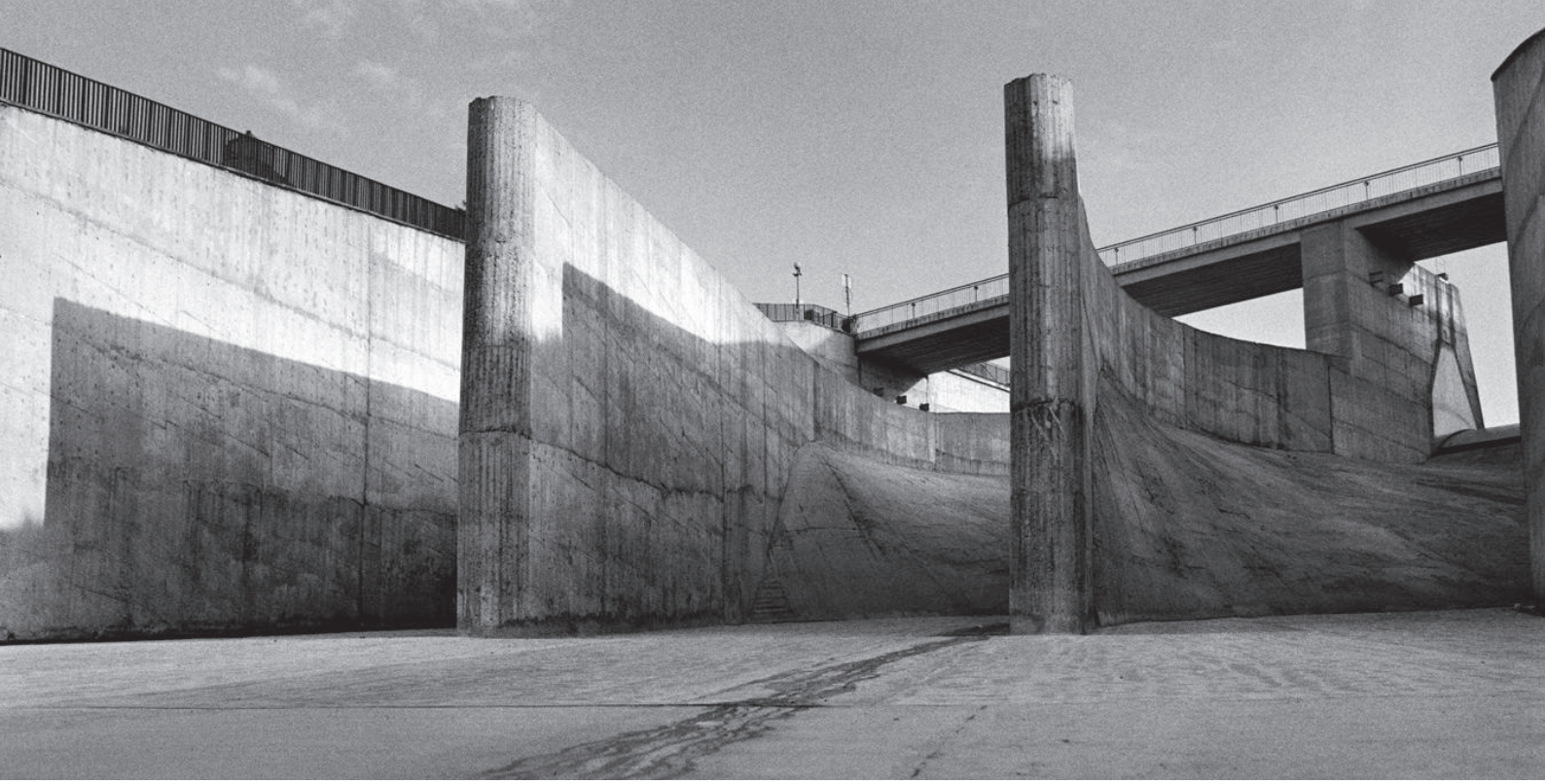
POLICY RECOMMENDATIONS

We encourage the European Commission to:

- Provide **guidance on barrier removal prioritisation**, to help Member States better identify which barrier removals deliver more co-benefits across different pieces of relevant EU legislation (see ***Section 2.1*** for more).
- **Approve the *Criteria for identifying free-flowing river stretches for the EU Biodiversity Strategy for 2030*** at the marine and water directors meeting, formalize it as WFD common implementation strategy guidance and incorporate it formally into the explanatory notes accompanying the Nature Restoration Plans.
- Take **decisive action if**, upon receipt of Member States' draft National Restoration Plans, the total length of rivers with **planned barrier removals does not meet the Union-wide 25,000km target**.

Member States should:

- Assess on a **case-by-case basis** whether barrier removal is the most appropriate measure to meet NRL Article 4's restoration and re-establishment targets for habitats and habitats of species, in line with the ecological requirements of the habitats and species in question.
- **Harmonise barrier inventories**, particularly when employing citizen science data such as the AMBER reporting app, to avoid duplications.
- Develop a **binding administrative procedure** for barrier removal to facilitate implementation, clearly attributing responsibilities on dismantling the artificial infrastructure upon the expiration of its administrative licence, or upon dissolution of its owner.
- Establish **permanent legal protections for rivers restored to free-flowing status** (see *Section 1.3* for more), safeguarding such status in perpetuity.
- Prioritise barrier removal and complementary measures (e.g. floodplain connectivity) on the basis of their contributions to broader biodiversity goals, climate change adaptation and disaster risk resilience.
- Conduct, as necessary and on a case-by-case basis, all relevant **assessments under the Environmental Impact Assessment (EIA) Directive, Habitats Directive and Water Framework** Directive prior to authorising any barrier removals, considering all direct, indirect and cumulative impacts of the removal on biodiversity, including on Natura 2000 sites' conservation objectives and rivers' ecological and chemical status (see Section 2.2 for more).
- Take clear steps to ensure the legal and ecological integrity of river restoration efforts and **coherence in the implementation of the NRL, WFD and TEN-T policies** by:
  - Excluding river stretches for which valid derogations apply from the inventory of river sections considered eligible for restoration or reclassification as free-flowing;
  - Not extending artificially the life of obsolete barriers through retroactive relicensing or speculative repurposing.
- In the development of **Renewables Acceleration Areas (RAAs) under the Renewable Energy Directive (RED)** (see *Section 2.3* for more):
  - Consider excluding hydropower plants from RAAs due to their detrimental effects on river connectivity and their significant ecological and hydromorphological impacts on water quantity and quality, and the ecological status of the river.
  - Coordinate the development of plans designating RAAs and NRPs to ensure they are aligned and avoid the deterioration of prime restoration areas.
  - Ensure that any Strategic Environmental Assessments (SEAs) or Environmental Impact Assessments (EIAs) associated with the planning, designation and permitting processes under the RED include an evaluation of the plans' and projects' effects on the achievement of targets under NRL Articles 4 and 9(2).



PART 1

1.1 Member States shall make an inventory of artificial barriers to the connectivity of surface waters (NRL Article 9(1))

NRL Article 9 sets out two related obligations for Member States. First, they must create a comprehensive **inventory of all artificial barriers** to surface water connectivity. This is a mapping exercise aimed at establishing a baseline of obstacles – such as embankments, sluices and weirs – that hinder natural river flow, regardless of whether these structures are still in use. This inventory[13] must be included in NRPs[14] and is not intended to predetermine which barriers will be removed. Second, based on this inventory, Member States must **identify and remove specific barriers** (explored in Sections 1.2 and 1.3). The inventory lists all barriers; the identification for removal selects those whose removal is ecologically necessary to meet restoration targets under Articles 4 and 9.

In this context, **"artificial barriers"** refers to physical structures created directly by humans that block or reduce the natural flow of surface waters, typically built for purposes like hydropower, flood control, irrigation or navigation. While the term primarily covers human-made constructions, it can also include natural-looking changes that result clearly from human activities, such as sediment build-up caused by land-use changes or river engineering. However, barriers created by wildlife – even species like illegally introduced beavers – are not classified as artificial, since they are not directly made or placed by humans, even if their presence is a result of human actions.

For the purpose of this first obligation, river connectivity will respect the passage of natural flow, sediment and biota. However, it is important to note that the term connectivity can have different meanings. For example, for a river to be considered "free-flowing" (Article 3(22) NRL), connectivity has three dimensions, all of which must be restored: longitudinal, lateral and vertical. The different types of connectivity will be further discussed in *Section 1.3*.

13. Which will include all artificial barriers, the list of artificial barriers to be removed, the total length of free-flowing rivers resulting from the removal and any additional measures aiming at the re-establishment of floodplains.
14. As required under Article 15(3)(i).

NRP planning at a glance

Member States must:

- Involve stakeholders via public and targeted consultations, in accordance with Article 14(4) and in full compliance with Aarhus Convention Article 7.
- Prepare science-based NRPs following the process outlined in Article 14, including (as a minimum) the elements listed in Article 15(3), adopting the uniform NRP format.[15]
- Submit a **draft NRP** to the European Commission by **1 September 2026** (Article 16).
- Finalise and submit their **final NRP** within six months of receiving the Commission's observations (likely by early autumn 2027) (Article 17(6)).
- Choose between a full implementation plan to 2050 or a stepwise approach with interim updates in 2032 and 2042 (Article 15(1)–(2)).
- Ensure the NRP includes a barrier inventory and plan for removal (Article 15(3)(i), (n)).
- Update the inventory and report progress every six years (Article 21).
- Consider existing measures in River Basin Management Plans to avoid duplication and ensure coherence with WFD obligations (Article 14(13)).

For a more detailed analysis of these requirements, please consult the general NRP guidance.

The barrier inventory must be regularly updated to include any newly constructed barriers. Member States must electronically report an updated inventory for the period up to 2030 by July 2031, and every six years thereafter.[16] Member States must also ensure that the inventory is accessible, up to date and integrated into a digital system.[17]

The administrative burden of compiling the inventory is expected to be low. According to a survey by the European Centre for River Restoration, 72% of participating countries already have national databases of artificial barriers. The European Commission's Impact Assessment accompanying the NRL notes that while EU-wide data gaps remain, several national and research-led inventories already exist (including the AMBER project) and can be scaled up. The most notable data gap is around lateral barriers, which will be particularly relevant for ***Section 1.3***. This task also aligns with reporting duties under the WFD, meaning limited additional efforts for Member States.

72%

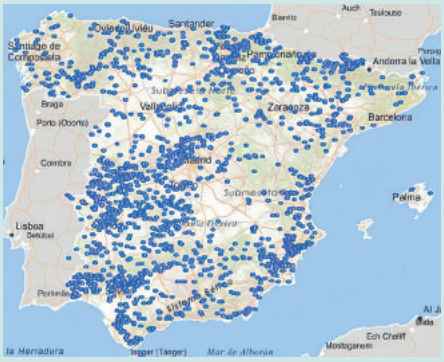
OF PARTICIPATING COUNTRIES ALREADY HAVE NATIONAL DATABASES OF ARTIFICIAL BARRIERS.

15. Annex to the *Commission Implementing Regulation (EU) 2025/912 of 19 May 2025 laying down rules for the application of Regulation (EU) 2024/1991 of the European Parliament and of the Council as regards a uniform format for the national restoration plan* (May 2025).
16. NRL Article 21.
17. NRL Preamble 75.

Good practices

Member States can take advantage of EU-wide barrier mapping efforts:
Notably, the AMBER project has mapped longitudinal barriers.
The INSPIRE Database and Geoportal is another source of useful data.
Both of these are recognised methods of barrier identification per the NRP template.

Some Member States have their own barrier mapping:
Spain has an inventory of barriers linked to the flood risk mapping exercise and a River Restoration Strategy that encompasses barrier removal, and even a regional barrier mapping method and dam removal guidelines.
Czechia has created its own river mapping system and a citizen-science mobile app called HydroMAP so citizens can contribute to barrier mapping efforts.
France has a map and a dictionary of obstacles to water flow.



Austria also has extensive mapping, as part of its obligations under the WFD.
Portugal has identified, evaluated and planned a mapping of obsolete barriers for removal, setting up a taskforce to this end.
Italy has made a digital cartography for large dams.

Other Member States can take advantage of the extensive work done by NGOs:
Free Flow Luxembourg has a very detailed categorisation of barriers, and a Free Flow Strategy.
MedINA's MapStream project has studied 452km of streams in Greece, mapped more than 100 barriers in the Sarantaporos river basin, and identified the top five candidates for removal.

1.2 Identify the barriers that need to be removed to contribute to meeting the restoration targets set out in Article 4 of this Regulation (NRL Article 9(1))

Barriers identified for removal must contribute to national restoration targets of Article 4, **as well as** the Union-wide 25,000km target or Article 9(2), **cumulatively**. Nonetheless, not all barrier removals contributing to the Union-wide 25,000km target will automatically contribute to Article 4 and vice versa; for this reason, **this section will limit itself to detailing barrier removals as restoration measures to contribute to Article 4**, whereas *Section 1.3* will detail those necessary for the 25,000km target.

Not all barrier removals under NRL Article 9(2) will, by default, contribute to the restoration targets of NRL Article 4. For a barrier removal under NRL Article 9(2) to simultaneously contribute to NRL Articles 4(1), (4) and (7), two additional conditions apply:

I. The targeted river type needs to be listed under NRL/HD Annex I (or – in the case of Article 4(7) – to be a habitat of one or more species listed in Annexes II, IV, V of the HD), which is not the case for all rivers, including most urban and/or heavily modified, or otherwise regulated, rivers.

II. Barrier removal needs to constitute a necessary measure for the improvement of the condition of the habitat or habitat of species in question; in other words, barrier removals contribute to the Article 4 restoration targets only when they are deemed necessary in line with the specific ecological requirements of the area to be restored.

Section 1.2 will address each restoration target in Article 4 separately in subsections: Article 4(1) on general restoration targets, Article 4(4) on the re-establishment of habitats to a favourable reference area, and Article 4(7) on the restoration of habitats of protected species. It will also address Member States' obligation to verify the ecological condition of Annex I habitats whose condition is unknown (detailed in ✦ ***Section 1.2.5, On knowledge***).

1.2.1 Annex I habitat types which are not in good condition (NRL Article 4(1))

The link between Article 9(1), (2) and Article 4(1) is straightforward: areas where habitat types listed in Annex I occur that are currently not in good condition must be subject to restoration measures until good status is achieved. Under Article 4(1) of the NRL, Member States must restore **Annex I habitat types that are not in good condition**,[18] progressively achieving the following targets:

- By 2030: at least 30% of the total area of all such habitats
- By 2040: at least 60% of the area of each habitat group
- By 2050: at least 90% of the area of each habitat group.[19]

Until 2030, restoration efforts should prioritise areas located within Natura 2000 sites. These obligations must be reflected in the NRPs, which must quantify the areas to be restored, map potential sites and provide a timeline for implementation.[20] According to estimates from the European Environment Agency (EEA), at least 226,000km^2 of Annex I habitats likely require restoration to reach favourable conservation status.[21] Where multiple habitats could be restored in one location, the rarer or more threatened habitat type or species assemblage should be prioritised (Article 17 Guidelines).

Barrier removal as a targeted measure

Barrier removal is one of several restoration actions that may be needed to reach good condition for affected freshwater, wetland and peatland habitats. However, its relevance depends on the **ecological requirements of each habitat type** and must be assessed **case by case**. Where hydrological connectivity, sediment flow or natural disturbance regimes of Annex I habitats are disrupted by artificial **barriers, barrier removal is likely to play a key role:**

- **Water courses of plain to montane levels with *Ranunculion fluitantis and Callitricho-Batrachion* vegetation (3260)**. This freshwater habitat is severely impacted by river fragmentation and flow regulation, and relies on longitudinal connectivity for natural flow, sediment transport and species migration. Barrier removal restores this, and also improves lateral and vertical connectivity – allowing floodwaters to reach floodplains and maintaining groundwater interactions.

18. As of June, the European Commission is developing further guidance to aid Member States in assessing the condition of Annex I habitats under the Habitats Directive. .
19. Under Article 4(1)(a) of the NRL, the 2030 target requires that at least 30% of the **total area of all Annex I habitat types** that are not in good condition be restored. This means that, in theory, a Member State could achieve the 2030 target by restoring a single habitat type, provided the restored area reaches 30% of the combined degraded area of all habitats. However, this approach risks rendering impossible Member States' compliance with HD Article 6(2), the achievement of the overarching objective of the NRL (Article 1(2)) and the outcome-based obligation of NRL Article 4(17)(a), according to which an increase of the area in good condition is expected for all habitat types. It would also risk the achievement of the 2040 and 2050 targets under Article 4(1)(b) which, by contrast, impose **habitat group-specific obligations**. Therefore, from 2040 onwards, it is not legally sufficient to focus on only one habitat type; Member States must ensure restoration across all habitat groups, unless specific derogations for widespread habitats (Article 4(2), Recital 35) are justified and detailed in the NRP.
20. NRL Article 15(3)(a), (c), and (n). For more, please see #RestoreNature Coalition, *Guidance and Recommendations for Ambitious Nature Restoration Plans* (2024).
21. European Environment Agency (2020) *State of nature in the EU – Results from reporting under the nature directives* 2013–2018, EEA Report No 10/2020, p.106 (Chapter 4.3 Restoration needs of habitats).

- Barrier removal is not only relevant for rivers and floodplains, but also **for a wide range of other Annex I habitats** that rely on natural hydrology and connectivity. These include alpine rivers and the herbaceous vegetation along their banks (3220), transition mires and quaking bogs (7140), bog woodland (91D0), hydrophilous tall herb fringe communities (6430), coastal lagoons (3260), and natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation (3150). The ecological benefits of restoring connectivity in these systems are well documented.[22] Member States should prioritise such co-benefit measures to help meet the NRL's ambitious restoration targets and reinforce ecological resilience across freshwater and wetland landscapes.

Other measures

As mentioned, **barrier removal may be one of the restoration measures required under Article 4(1), but additional measures are likely to also be required**, such as reintroducing species, reducing the primary stressors that cause degradation (e.g., pollution, invasive species, hydrological alteration, riverbed dredging, riparian vegetation removal), re-establishing natural disturbance regimes like flooding or fire[23] or re-meandering a straightened stretch. Restoration must address both abiotic (e.g., soil chemistry, hydrology) and biotic conditions (e.g., species composition, trophic interactions) to be effective and lasting.[24]

How barrier removal fits with River Basin Management Plans (WFD)

Member States can move forward with river barrier removals under the NRL without waiting for the next River Basin Management Plan (RBMP) cycle.

Barrier removal under the NRL must be coordinated with, but not delayed by, RBMPs. Member States are required to consider existing RBMP measures when drafting their NRPs, to avoid duplication and ensure coherence (Article 14(13)). However, there is no obligation to amend existing RBMPs before proceeding with barrier removals.

This legal flexibility is important. RBMPs are updated only once every six years (WFD Article 13(7)), while the timeline for meeting the 25,000km free-flowing river target under the NRL is much shorter. Member States can and should proceed with barrier removals according to their NRP timelines and incorporate these measures into RBMPs during future update cycles.

Barrier removal and hydromorphological improvements are already widely included in RBMPs. Their most recent evaluation found that:

- Measures to improve longitudinal continuity (e.g. installing fish passes or removing obsolete barriers) are planned in 91% of river basin districts.
- Measures to improve other hydromorphological conditions (e.g. river restoration, improvement of riparian areas, removal of hard embankments, reconnecting rivers to floodplains) are planned in 79% of river basin districts.

The pace of implementation is also increasing. According to Dam Removal Europe, in 2024 alone, 542 barriers were removed across 15 European countries, a 50% increase from the previous record year. The leading countries include France, Spain, Sweden, Denmark and Estonia.[25]

(See ✦ ***Section 2.2.2***. for more on coherence with the WFD.)

22. Nilsson, C. et al. (2005) Fragmentation and flow regulation of the world's large river systems. Science 308(5720): 405–408.
23. Society of Ecological Restoration (2004) *Primer on Ecological Restoration*.
24. Stoffers, T. et al. (2021) 30 years of large river restoration: How long do restored floodplain channels remain suitable for targeted rheophilic fishes in the lower river Rhine?. *Science of the Total Environment* 755: 142931.
25. Dam Removal Europe (2024) *Progress Report*; European Commission (2025) *Third river basin management plans Second flood hazard and risk maps and second flood risk management plans*.

To determine which areas must be restored, Article 14(2) requires Member States to **quantify and map the area of Annex I habitats in need of restoration**. In order to **determine the status of a coastal or freshwater ecosystem**, and therefore determine where a restoration measure is necessary, Member States can consult their own reports under HD Article 17, given that both legislative acts use the same habitat codes. Still, it should be noted that under the reporting obligations of HD Article 17, Member States assess the conservation status of **each habitat type by biogeographical region**, using data on habitat structure, function and extent. These assessments are reported every six years, and help identify priority areas where ecological conditions are not favourable. In contrast, under the NRL, Member States will have to monitor condition and trend of habitat types and quality and trend of types of habitats of species at site level (NRL 20(1)(a) and 15(3)(p) "areas subject to restoration measures").[26]

Where habitat types occur across multiple biogeographical regions, each region is evaluated separately, and the conservation status may differ. In transboundary catchments, cooperation is essential and obligatory,[27]as one country's inaction can undermine restoration across the shared ecosystem. Member States must, when needed, jointly plan barrier removal and habitat restoration in a way that reflects ecological interdependencies and ensures coherent implementation of the NRL.

Good practices

The European Commission created a Nature Restoration Regulation Reference Portal to assist in the implementation of this article. Member States can also use the ample evidence from LIFE projects.

The Open Rivers Programme case studies bank showcases examples where barrier removals helped achieve habitat restoration objectives, such as the barrier removal and ecological restoration in Ribeira de Perofilho in Portugal.

WWF-Germany has an ecological prioritisation study for dismantling transverse structures.

As part of its national biodiversity strategy, France has created a prioritization of barriers to be removed or restored, based mostly on the ecological requirements of protected habitats, and identified 5,000 barriers to be removed by 2027.

1.2.2 Favourable reference area (NRL Article 4(4))

In addition to restoring degraded habitats, the NRL also requires Member States to **re-establish** certain habitat types that have disappeared from parts of their natural range. Under Article 4(4), this must be done to reach the **Favourable Reference Area (FRA)**.

What is a Favourable Reference Area?

FRA refers to the minimum area of a habitat type in a given biogeographical region needed to ensure the long-term viability of the habitat and its typical species at national level (NRL Article 3(8)). FRA therefore refers to a geographical area that will depend on the historical distribution of the habitat type, taking into consideration changes in climate projections (Preamble (65)). The NRL states that re-establishment contributes to reaching favourable conservation status under the HD and to good environmental status under the Marine Strategy Framework Directive (MSFD) for marine habitats.

26. While this is apparent from the letter of the law, the Implementing Act adopting the uniform format of the NRPs (section 5.1) does not introduce a similar level of scrutiny: it only renders a "transversal description" obligatory, while classifying article-specific information as "optional", making no explicit reference to the site-level monitoring obligations enshrined in the law (c.f. Implementing Regulation (2025)).
27. Cross-border coordination is required under WFD Articles 13(2)–(3), the HD, the TEU (Article 4(3)) and customary international law.

Member states must set FRA values themselves,[28] based on best available science, historic and current distributions, trends, the precautionary principle, connectivity, and the ecological needs of typical species, among others. Guidance is available in the European Environment Agency's Article 17 Guidelines (pages 72-73).[29]

What is re-establishment?

The NRL does not define "re-establishment", but Article 4(4) clarifies that it applies to Annex I habitats that have disappeared from certain areas. Re-establishment involves reconstructing a habitat so that it closely resembles its original or historical state. It includes restoring the ecosystem's physical structure (hydrology, topography), biodiversity and key ecological processes to pre-disturbance levels.[30] For example, if an FRA of 100km² is required but only 50km² currently exists, restoration measures must be applied to 15km² (beyond the currently existing 50km²) by 2030 (i.e., 30% of the total area that needs to be re-established).

As with the obligation under NRL Article 4(1), this obligation is **measures-based**, meaning Member State's obligation is to put in place necessary measures by the given deadline, rather than secure full ecological outcomes.

Restoration vs. re-establishment: understanding the difference:

It is important to distinguish between the obligations under Article 4(1) and those under Article 4(4).

- **Restoration** refers to assisting the recovery of degraded ecosystems, aiming to improve their structure and functions without necessarily returning them to their original state (NRL Article 3(3).[31] Restoration actions often involve barrier removal to restore natural flow regime, species migration, sediment transport, water quality and nutrient cycling.[32]
- **Re-establishment** requires recreating a habitat type to return it to areas where it has disappeared entirely. Re-establishing degraded wetlands to their FRA frequently requires hydrological reconstruction, such as backfilling drainage ditches or building water control structures, as well as reintroducing native plant communities.[33]

The total area coverage for restoration under Article 4(1) on the one hand and re-establishment under 4(4) on the other varies, as shown in the relevant calculations of Annex VIII of the NRL Impact Assessment.

Choosing the appropriate strategy depends on the severity of degradation, regional context and ecological objectives.[34] Both strategies must be guided by sound science, adaptive management and robust monitoring to ensure that the resulting ecosystems are self-sustaining and resilient in the long run,[35] and also in line with NRL Article 14(16).

BARRIER REMOVAL CAN DIRECTLY RE-ESTABLISH THESE HABITATS BY RESTORING NATURAL FLOW, SEDIMENT AND NUTRIENT TRANSPORT AND AQUATIC SPECIES DYNAMICS.

28. NRL Article 14(2)(a)(iii).
29. European Environment Agency (2023) *Guidelines on Concepts and Definitions Article 17 of Directive 92/43/EEC*.
30. Miller, J.R. and Hobbs, R.J. (2007) Habitat restoration—Do we know what we're doing? *Restoration Ecology* 15(3): 382–390.
31. Hobbs, R.J. and Harris, J.A. (2001) Restoration ecology: Repairing the Earth's ecosystems in the new millennium. *Restoration Ecology* 9(2): 239–246.
32. O'Connor, J.E., Duda, J.J. and Grant, G.E. (2015) 1000 dams down and counting, *Science* 348(6234): 496–497.
33. Rochefort, L. and Lode, E. (2006) Restoration of degraded boreal peatlands. In: R.K. Wieder and D.H. Vitt (eds.), *Boreal Peatland Ecosystems*, pp.381–423.
34. Miller and Hobbs, 2007.
35. Holl, K.D. and Aide, T.M. (2011) When and where to actively restore ecosystems? *Forest Ecology and Management* 261(10): 1558–1563.

Barrier removal as a contribution to re-establishment

Choosing the removal of barriers as a restoration measure can, simultaneously, contribute to the re-establishment of certain habitat types listed in Annex I of the NRL, and the same habitats of the HD; in other words, **fulfilling the obligations under Article 4(1) could contribute to obligations under Article 4(4) as well as the achievement of favourable conservation status under the HD**. However, this must be assessed on a case-by-case basis, in line with the ecological requirements of the habitat in question. For instance:

- **Water courses at plain to montane levels with *Ranunculion fluitantis and Callitricho-Batrachion* vegetation (3260)** rely on longitudinal connectivity to support natural hydrology and ecological processes.[36] Barrier removal can directly re-establish these habitats by restoring natural flow, sediment and nutrient transport and aquatic species dynamics.[37]
- **Raised bogs (7110)** mainly depend on vertical water connectivity. Removing nearby river barriers may indirectly help by stabilising regional groundwater dynamics,[38] but will often need to be combined with additional measures (such as blocking drainage ditches) to fully re-establish the habitat.[39]

While barrier removal is a powerful tool, it must be integrated into broader, habitat-specific restoration planning to fully satisfy the combined obligations under Article 4(1) and 4(4).

1.2.3 Restoration of habitats of species (NRL Article 4(7))

Restoration measures under Article 4(7) are required for habitats of species protected under the annexes of the Habitats Directive or the Birds Directive, going beyond Annex I habitats. Restoration measures are obligatory for habitats of species "*...in addition to the restoration measures referred to in paragraphs 1 and 4 of this Article ...*"; **restoration and re-establishment is applicable to habitats beyond those listed in Annex I** of the HD if they are part of the species' natural range.

The geographical scope of this article extends beyond where the habitat type presently exists (Article 4(1)) or its historical range (Article 4(4)) to the **entire habitats of listed species**, which is defined as the "environment... in which the species lives ***at any stage of its biological cycle***" (HD Article 1 (f)). A species' natural range has in turn been defined by case law as encompassing whatever location the animal presently is (see Case C-88/19 for the HD and C-66/23 for the Birds Directive). For more, see the chapter on species in the Article 17 guidelines.[40]

Member States must implement any measures necessary to improve the quality and quantity of those habitats, including the re-establishment of habitat (see ***Section 1.2.2***), **and to enhance connectivity** (see ***Section 1.2.4***.), **until sufficient quality and quantity of those habitats is achieved to restore the species to a favourable conservation status**. Habitat quality and quantity is, in turn, defined under Article 3(9) and (10) of the NRL and further clarified under the Article 17 guidance cited above, specifically under Chapter 2 for habitats and Section 1.7 for habitats for species.

As above, barrier removal may be deemed a measure necessary to improve the quality and quantity of the habitats of species in question, determined on a case-by-case basis.

THE LIFE LOUTRE PROJECT REMOVED OR MODIFIED 21

21

OBSTACLES TO THE MIGRATION OF FISH UP AND DOWN THE RIVER.

36. European Commission (2013) *Interpretation Manual of European Union Habitats*.
37. Nilsson, C. et al. (2005) Fragmentation and flow regulation of the world's large river systems. *Science* 308(5720): 405–408.
38. Belyea, L.R. and Malmer, N. (2008) Carbon sequestration in peatland: Patterns and mechanisms of response to climate change. *Global Change Biology* 10(6): 1043–1052.
39. Rochefort and Lode (2006).
40. European Environment Agency (2017) *Extracts from 'Explanatory Notes & Guidelines', May 2017 - Favourable Reference Values*.

Good practices

Several LIFE projects have been created to improve protected species habitats. For example, the European otter (protected under HD Annexes II and IV) benefits from barrier removal. The LIFE05 NAT/B/000085 project reconnected seven backwaters and spawning grounds to the main river channel, removed or modified 21 obstacles to the migration of fish up and down the river, and installed nine passageways for otters under road bridges as a measure to restore water quality for the otter and its prey.

Protected species such as the dragonflies *Stylurus flavipes* or *Ophiogomphus cecilia* might require the restoration of floodplains. For this, longitudinal barrier removal might not be sufficient, and lateral barriers must also be addressed.

The Open Rivers Programme has abundant case studies of barrier removal for the restoration of habitats of protected species, such as the removal of the Moulin Bas weir and habitat restoration for salmon in France. Barrier removal can also improve the habitat of less mobile species such as freshwater mussels, and habitat connectivity can be improved by the removal of lateral and vertical barriers as demonstrated by the Kaitarannankoski dam removal in Finland.

Tools from NGOs:

- TNC Europe has created a prioritisation tool for freshwater conservation areas
- WWF-Germany conducted a prioritisation study that takes into account habitats of protected species.

1.2.4 Connectivity (NRL Article 4(10))

Article 4(10), rather than additional obligations, imposes a qualifier to the obligations under Articles 4(1), (4) and (7). For the first two (Articles 4(1) and (4)), restoration measures foreseen to restore and re-establish habitat types must consider additional, complementary restoration measures to improve connectivity between protected habitat types. Connectivity for the purposes of Articles 4(1) and (4) is understood broadly, as permitting the passage of sediments, nutrients, and freshwater flora and fauna.

In this regard, barrier removal is a crucial restoration measure, since its main goal is to restore connectivity between ecosystems. Connectivity is essential for sufficient habitat quality and quantity[41] to be achieved (preamble 29). When habitats and species are connected – rather than fragmented – across landscapes, populations and habitat types are more resilient. For species, this allows movement, gene flow and recolonisation, which supports long-term survival. For habitat types, connectivity enables natural processes like sediment transport, nutrient flow and hydrological cycles to function properly, which helps maintain or restore ecological integrity. In contrast, isolated habitats and populations are more vulnerable to pressures such as climate change, habitat degradation and reduced genetic diversity. Connectivity restoration measures thus offer numerous co-benefits.

Once again, **the phrasing of Article 4(7) expands the scope of this obligation beyond Annex I habitat types, by requiring that "the ecological requirements" of all species concerned be taken into account**. Barrier removal as a restoration measure that focuses on improving or re-establishing connectivity can be instrumental in improving the conservation of species included in the Annexes of the Habitats and Birds Directives. Many freshwater species will benefit directly or indirectly from removing barriers. For example:

41. European Environment Agency (2017).

- The **huchen** (*Hucho hucho*) would directly benefit from barrier removal in the Danube basin.
- The **gold-striped salamander** (*Chioglossa lusitanica*) would benefit *indirectly* from barrier removal that reconnects floodplains with the deciduous forest it calls home.
- The **grey heron** (*Ardea cinerea*) requires pathways between breeding (forests) and feeding (floodplain meadows) areas to complete its life cycle. So obligations under Article 4(7) and (10) will require connectivity between these ecosystems, *even if the habitat connecting them is not a protected habitat type in Annex I*.

Connectivity is also subject to the non-deterioration regime, as can be inferred by the obligation to ensure "*continuous improvement*" (preamble 34), requiring that environmental conditions are maintained, enhanced but not degraded; in this case requiring proactive measures to ensure connectivity is not eroded once targets are met.[42]

Good practices

Mapping by NGOs on connectivity:

- WWF has studied the barriers with highest re-connectivity potential.
- Wetlands International Europe created the Swimways of European Importance inventory, which categorises the most important migratory fish pathways.

France has based its methodology for the 5,000 barriers in need of removal on re-connectivity potential.

Most barriers in Europe are very small (<2m); yet these are the ones that cause most of the fragmentation[43] (whereas other problems, such as habitat loss (e.g. ponding), are caused mostly by a small number of large dams[44]). Member States should target small barriers for removal due to their higher connectivity potential, reduced social opposition, and the fact they are simpler, cheaper and faster projects.

1.2.5 Knowledge (NRL Article 4(8) & (9))

The restoration targets in Article 4 hinge on whether the condition of the habitat type in question is known; if the condition of a habitat type is unknown it will not count towards the 30%, 60% and 90% targets. Currently, 21% of the area of Annex I habitats for rivers and lakes is of unknown status;[45] for coastal and inland water habitats this rises to 48%,[46] significantly reducing the area covered by the restoration target. To prevent this loophole, the NRL requires Member States to know the condition of at least 90% of the area of Annex I habitat types by 2030 and 100% by 2040,[47] by conducting any pertinent scientific investigations.

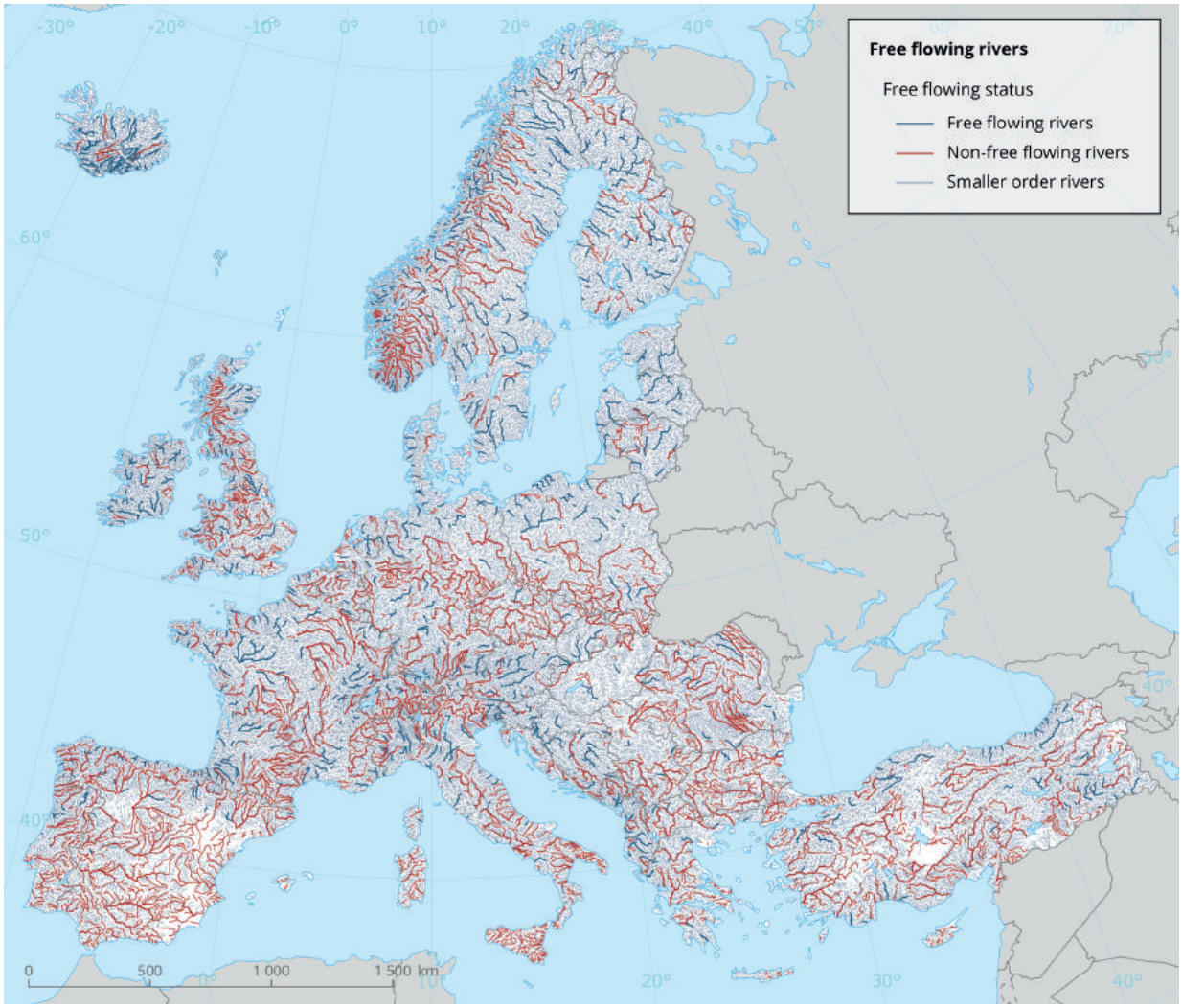
Member States must also conduct preparatory monitoring and research to determine the restoration measures needed to meet the law's targets and obligations.[48] This includes assessing knowledge gaps that could hinder effective restoration and identifying ways to address them. **Member States will have to study how barriers affect the ecological condition of each habitat type and whether habitat types in need of restoration would benefit from barrier removal as an effective restoration measure**.

42. With regards to the free-flowing rivers target, the term "connectivity" has a different meaning that will be explored in the relevant section.
43. Belletti et al. (2020), More than one million barriers fragment Europe's rivers.
44. Parasiewicz, P. et al. (2023) Over 200,000 kilometers of free-flowing river habitat in Europe is altered due to impoundments. *Nature Communications* 14: 6289.
45. European Commission (2022) Commission Staff Working Document Impact Assessment Report Annex VIII-f, p.621.
46. European Commission (2022) Commission Staff Working Document Impact Assessment Report Annex VIII-a.
47. NRL Article 4(9).
48. NRL Article 14(1).

Member States are under the obligation to report environmental status information for protected aquatic habitats under the HD, the Birds Directive, the MSFD, the Bathing Waters Directive and the WFD, among others –with HD Article 17 reports being the most relevant source of information in terms of favourable conservation status of habitat types. Abundant information can be found on the WISE.EU platform, in contextualised reporting documents such as the *EEA's Europe's State of Water 2024* report, synthesised under the Reportnet 3 platform.

1.3 Identify the barriers that need to be removed to contribute to fulfilling the objective of restoring at least 25,000km of rivers into free-flowing rivers in the Union by 2030 (NRL Article 9(1))

The EU's target of restoring at least 25,000km of free-flowing rivers by 2030 is enshrined in the EU Biodiversity Strategy for 2030 and pertains to the EU's contribution to the global Freshwater Challenge's target of 300,000km.



A study of only 3% of Europe's barriers revealed the potential to longitudinally reconnect 50,000km, demonstrating that achieving 25,000km of free-flowing rivers is both realistic and achievable. To help Member States achieve this target, the Commission will provide technical guidance to identify sites and mobilise funding.

Before diving into the details of Article 9, it is important to note that barrier removals contributing to Annex I habitat restoration under Article 4 only count toward the 25,000km target **if** they result in a free-flowing stretch. This requires **longitudinal, lateral and vertical connectivity**.[49] Some technical guidance includes **temporal connectivity**,[50] but this is **not part of the legal definition** and will be treated as supplementary.

As explained in ***Section 1.2*** and evident in the phrasing of Article 9(1), Member States must inventory all barriers and then identify a subset of those barriers for removal: those necessary to meet restoration targets under Article (4) objectives **and** the 25,000km target, **cumulatively**. This inventory will be an annex to the NRPs and will be updated on a regular basis (newly built barriers will be included in the inventory).

When calculating which removals contribute to the achievement of the 25,000km target, it is important to note that ***only*** those stretches where one or more barriers have been removed after 2020 will count toward the target,[51] and any additional barriers constructed between 2020 and 2030 will count against the target.

> **Example:** a 10km river stretch that already qualified as free-flowing in 2020 will not count towards the target. The construction of a new barrier within the stretch will count **against** the 25,000 km target. The removal of a barrier reconnecting an additional 5km to free-flowing status downstream will only contribute 5km towards the 25,000km target (if all the criteria to qualify as a free-flowing river are met).

Finally, the **25,000km target is an EU-wide target, binding the Union in its entirety and not individual Member States**. While the NRL does not specify how efforts will need to be distributed among Member States, some general remarks can still be made. According to the principles of solidarity and sincere cooperation,[52] compliance with obligations binding the Union in its entirety is a shared burden among all Member States.

It is unclear from the wording of the law what exactly each Member State is obliged to contribute, what is each Member State's "fair share" of barrier removal to meet the target, or whether each Member State should contribute proportionally to the total length of its rivers, or based on how fragmented its rivers are. **Since barrier removal does not contribute only toward the Union-wide target of 25,000km but also toward the national targets under Article 4, each Member State's contribution to the Union target should be at least proportional to its national target obligations**. Quantification of the latter will only be available once the NRL Article 14(2) exercise is complete.

The Commission plays a key role in overseeing implementation, assessing each Member State's contribution to the EU's goals.[53] Upon receipt of Member States' draft NRPs, the Commission will be able to assess whether national efforts collectively (in aggregate) meet the Union-wide target. Based on its assessment of NRPs, the Commission can then provide feedback to Member States – such as suggesting additional barriers that should be removed.[54] Additionally, the EEA is expected to publish a first technical report on progress by 2032.[55]

The concept of a free-flowing river[56] stems from one key component: connectivity, which in this case has three dimensions. All three dimensions of connectivity must be fulfilled for a river stretch to be considered free-flowing:

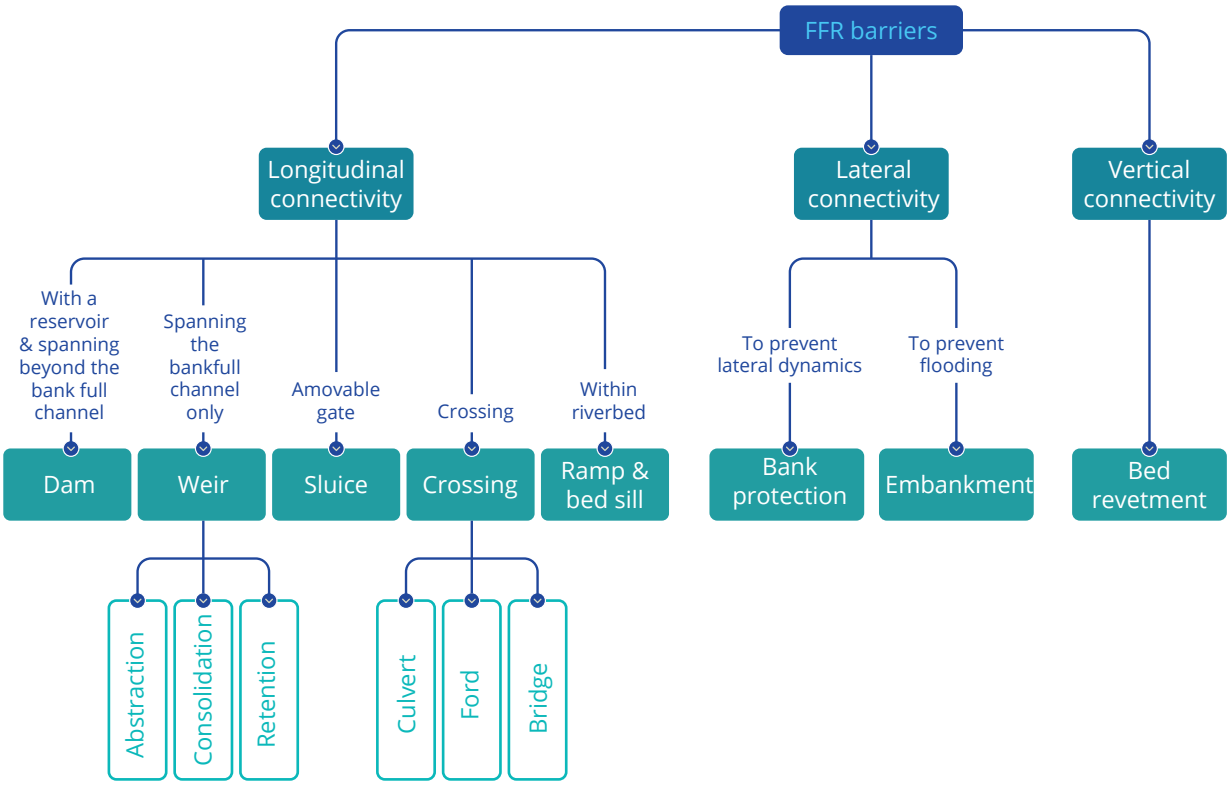
49. NRL Article 3(22).
50. European Commission (2024) *Criteria for identifying free-flowing river stretches for the EU Biodiversity Strategy for 2030*.
51. River stretches that already qualified as a free-flowing river do not count – only stretches that have been reconnected after a barrier removal. Article 15(3) (i)): (i) *"the inventory of barriers and the barriers identified for removal in accordance with Article 9(1), the plan for their removal in accordance with Article 9(2)* ***and the length of free-flowing rivers to be achieved by the removal of those barriers estimated from 2020 to 2030 and by 2050****, and any other measures to re-establish the natural functions of floodplains in accordance with Article 9(3)".*
52. Treaty on the European Union Articles 3(3) and 4(3).
53. Article 17(2)(c).
54. Article 17(4).
55. Article 21(5).
56. A definition of the term "free-flowing river" has been provided at EU level by the Joint Research Centre; however, we will use the binding definition provided by NRL Article 3(22) which excludes temporal connectivity.

- **Lateral connectivity** refers to the adjacent floodplains, as does Article 9(3), and focuses on the connection between a river and the wetlands bordering the river. The importance of lateral connectivity in terms of natural purification of the floodplains, how anaerobic conditions in wetland soils allow for denitrification of surface waters and the crucial aspect of disaster risk reduction ***are addressed in more detail in Section 2.1 below***, so this section will limit itself to pointing out how restoration measures under Article 9(3) will contribute to achieving a free-flowing status for the river stretch in question, contributing to the 25,000km target.

- **Longitudinal connectivity** operates along the length of the river; dams and similar structures act as barriers to longitudinal connectivity by impeding the upstream and downstream flow of migratory species and sediments. Restoration measures under Article 4(7) for species or Article 4(1) or (4) in terms of sediment flow will also contribute to free-flowing status, and the 25,000km target.

- Finally, **vertical connectivity** refers to the connection between the river and sponge ecosystems (such as petlands) and groundwater storage. Removing barriers that impede the infiltration of water, nutrients, matter and organisms between the river and the aquifer via infiltration within the hyporheic zone (the region beneath and alongside a streambed where surface water and groundwater mix) will have a positive effect on water resilience, and on the health of ecosystems and species that depend on the availability of groundwater.

The methodology[57] details the degree to which these criteria must be fulfilled, including minimum lengths for a stretch to qualify as free flowing, and additional conditions at stretch level (e.g., ensuring adequate environmental flows) and larger scale (e.g., ensuring mitigation of impacts on connectivity at upstream and downstream barriers). It concludes with an example of what barriers have to be removed to contribute to which type of connectivity (see infographic), allowing Member States to properly assess which type of barrier removal, as a restoration measure, would contribute to which type of connectivity.



57. European Commission (2024) *Criteria for identifying free-flowing river stretches for the EU Biodiversity Strategy for 2030*.

Good practices

The European Commission provides information for Member States on its Nature Restoration Portal, such as the JRC Criteria for Selection of Free-Flowing Rivers and Guidance on Barrier Removal for River Restoration.

Mapping by NGOs:

- WWF identified key river restoration projects that could achieve the 25,000km free-flowing rivers target while lessening the impact of floods and droughts.
- WWF-Austria created a methodology and identified stretches with high restoration potential to meet the free-flowing rivers target.

Examples of restoration efforts:

- In Ukraine, WWF and the Open Rivers Programme opened 531km of longitudinal connectivity through the removal of seven obsolete barriers.

1.4 Without prejudice to the WFD and the TEN-T Regulation (NRL Article 9(1))

Article 9(1) of the NRL applies "without prejudice" to derogations under the WFD, in particular Articles 4(3), 4(5) and 4(7), as well as to exemptions under the Trans European Transport Network (TEN-T) Regulation (Regulation (EU) No 1315/2013), notably Article 15. This means that Member States are not obliged to remove barriers whose continued existence is lawfully justified under EU law, for example, those serving essential purposes such as renewable energy generation or inland navigation.

However, the presence of such barriers, even if exempted or permitted under the WFD or TEN-T, precludes the affected river stretches from being counted toward the targets set out in Article 9 or Article 4 of the NRL. **A river stretch cannot be considered restored, nor qualify as free-flowing, if its connectivity remains disrupted by an artificial barrier, whether obsolete or not**. For this reason, Member States are still encouraged to evaluate the strategic need for these barriers, despite their removal not being obligatory. Restoration under the NRL must lead to meaningful ecological improvement, including the re-establishment of longitudinal, lateral and vertical connectivity and the removal or mitigation of pressures hindering natural flow regimes. In practice, this means that stretches still impacted by barriers covered by valid WFD derogations or TEN-T exemptions are excluded from the 25,000km target for restored free-flowing rivers under Article 9(1), and from freshwater habitat restoration obligations under Article 4.

Member States should therefore take clear steps to ensure the legal and ecological integrity of river restoration efforts. This includes identifying and transparently disclosing river stretches affected by valid derogations or exemptions. These stretches should be excluded from the inventory of river sections considered eligible for restoration or reclassification as free-flowing. Additionally, Member States must ensure coherence and consistency in the implementation of the NRL, the WFD and TEN-T policies, so that restoration planning remains both legally sound and ecologically meaningful.

IN UKRAINE, WWF AND THE OPEN RIVERS PROGRAMME OPENED

531KM

OF LONGITUDINAL CONNECTIVITY THROUGH THE REMOVAL OF SEVEN OBSOLETE BARRIERS.

PART 2

Having covered the inventory of barriers to river connectivity and their contribution to the NRL's Member State-level (NRL Article 4) and Union-wide (NRL Art 9(1)) targets, Part 2 will delve into the modalities of Member States' obligation to remove the identified barriers, including considerations on the required environmental assessments to be conducted prior to each barrier removal.

2.1 Member States shall remove the artificial barriers to the connectivity of surface waters identified in the inventory. When removing artificial barriers, Member States shall primarily address obsolete barriers. (NRL Article 9(2))

Barrier removal is not barrier replacement, where a barrier is replaced by another structure, for example, to facilitate upstream fish passage. While such a structure may serve ecological functions similar to barrier removal by improving river continuity, it remains an artificial installation. Though mitigation measures may improve connectivity, Member States' obligation (in line with NRL Article 9(3)) consists in **removing** barriers, rather than merely improving connectivity. Replacement of this kind could contribute to Article 4 restoration objectives, following an EIA (*Section 2.2.1*.), but is unlikely to count toward the 25,000km target, as the presence of artificial infrastructure continues to impede some form of connectivity and disqualifies the stretch from being considered free-flowing under the set criteria.

The first qualifier for prioritisation is that the barrier is obsolete.[58] The AMBER project estimates that approximately 20% of transversal barriers in the EU are obsolete, with a significant share identified as readily removable. For the purposes of this article, an obsolete barrier is understood as any artificial structure in a watercourse that no longer serves a legitimate or lawful function, either because its original use has ceased, its permit or licence has expired without renewal, or the infrastructure has fallen into disrepair or abandonment. This includes barriers whose intended uses (such as watermills, weirs for irrigation or industrial diversion channels) are no longer relevant. **Legal obsolescence encompasses not only physical disuse but also**

58. Mentioned in Article 9(2) and in Preamble (50): *"When removing barriers, Member States should primarily address obsolete barriers", which are those that "are no longer needed for renewable energy generation, inland navigation, water supply or other uses."*

regulatory or administrative inactivity: where no valid permit exists or where the infrastructure fails to meet current environmental standards. Given that Member States should *"primarily"* (and not "exclusively) focus on obsolete barriers, they may also opt to remove barriers which are still in use, counting these in their contribution to both NRL Article 4 and NRL Article 9(1) targets, provided that the necessary assessments (EIA and appropriate assessment) have been conducted.

Member States must not artificially extend the life of obsolete barriers through retroactive relicensing or speculative repurposing – for instance, by proposing the conversion of disused watermills into micro-hydropower plants without proper environmental assessment or justification under the RED. Such practices would contravene the NRL's intent and risk undermining the coherence with Article 14(13) and preamble (65), which require that NRPs align with the designation of RAAs, rather than serving as loopholes for retaining harmful infrastructure. Examples from France show that rehabilitating obsolete mills into small hydropower projects has led to net ecological degradation, fragmenting river systems and harming aquatic biodiversity under the guise of "green" development.[59] Guidance to Member States must therefore clearly delineate that obsolete barriers cannot be deemed non-obsolete merely due to hypothetical future use.

The second qualifier is the prioritisation of barriers whose removal would provide co-benefits, including across different legislations (see the following sections on synergies).[60] But a single benefit (such as the restoration of an Annex I habitat type) might be dominant and enough to justify a high priority. Barriers can themselves be a barrier to the achievement of good ecological status, by altering river morphology, disconnecting floodplains, stagnating flow and providing unsatisfactory habitats for species. Similarly, MSFD alignment is critical. Barriers that disrupt source-to-sea connectivity or hinder the Directive's goals should be prioritised for removal to restore natural sediment and nutrient flows.[61]

Considering the close relationship between surface water connectivity and flood risk management, and how they are affected by climate change, these issues should be addressed in a coordinated way,[62] including under the NRL.

- **Example:** Removing an embankment to improve an alluvial forest (91E0) would satisfy restoration obligations (Article 4(1)) and species conservation obligations (Article 4(7)), or even re-establish the habitat where it did not previously exist (Article 4(4)). Restoration would deliver co-benefits under the Habitats Directive. It might also improve the neighbouring **raised bogs (7110)** since peatlands are dependent on water availability,[63] which often comes from rivers or floodplains.[64] This, in turn, might reduce flood risk and rewet organic peatlands in agricultural zones (as would also be required under Article 11(4)).

Beyond legislative obligations, barrier removal plays a vital role in climate change adaptation, disaster risk reduction and resilience. With this in mind, priority should be given to areas where restoring connectivity can mitigate flood risk, enhance drought resilience and help buffer against rising sea levels. By integrating barrier removal with broader climate adaptation strategies, Member States can ensure that restoration efforts contribute to both ecological and societal resilience.

59. European Rivers Network. Small and micro-hydro: A development everywhere in Europe, an alarming boom in France!
60. This is not only an imperative of good governance and prudent use of public funds, but also an obligation, established in NRL Article 14(14).
61. Wang X, et al. (2022) Effect of river damming on nutrient transport and transformation and its countermeasures. *Frontiers in Marine Science* 9:1078216; Kukuła, K. and Bylak, A. (2022) Barrier removal and dynamics of intermittent stream habitat regulate persistence and structure of fish community. Scientific Reports 12:1512.
62. Cf above, European Commission, n.25, p 54.
63. Conselho Nacional da Água and Ministerio do Ambiente (2017).
64. Gatis, N. et al. (2023) Peatland restoration increases water storage and attenuates downstream stormflow but does not guarantee an immediate reversal of long-term ecohydrological degradation. *Scientific Reports* 13: 15865 (2023).

Good practices

Some Member States already have operational definitions for **what barriers are obsolete**:

- Portugal identified, evaluated and planned a mapping of obsolete barriers for removal.[65]
- Spain has a legal requirement to remove obsolete barriers to recover the original condition of the water public domain once the licence to operate runs out. This may be due to time expiration, lack of compliance with permit conditions, non-renewal by the concession holder or forced expropriation by river basin authorities.

Member States can draw on proposals by NGOs. For example WWF-Slovakia has proposed a legal definition of what is obsolete, based on factors such as official cadastral registration, state of dilapidation and accessibility by road.

A growing body of evidence demonstrates the multiple co-benefits of barrier removal. There is abundant literature on barrier removal being an essential restoration measure for species conservation, nutrient and sediment dispersal, habitat conservation and flood risk management.

Barrier removal also acts as a climate mitigation measure by allowing ecosystems to provide carbon sequestration services:

- Barrier removal has been found to reduce methane emissions by up to 10 times.[66]
- Peatland restoration has exceptionally high potential for carbon sequestration.[67] Once a peatland has been rewetted through barrier removal, additional measures for its natural functions (Article 9(3)) and soil integrity (Article 11(4)) are required, which will deliver on obligations under the WFD[68], Floods Directive (FD), and climate obligations.

65. Conselho Nacional da Água and Ministerio do Ambiente (2017).
66. Bisbal Regidor, E. (2024) *Decarbonizing hydrological landscapes through dam removal*, University of Barcelona; CSIC (2025) *A project assesses the climate impact of dams*.
67. Their potential as carbon sequestering ecosystems is also not to be overlooked, since 25% of the EU's agricultural greenhouse gas emissions result from drained peatlands, despite these covering only 3% of agricultural land. After restoration of peatland ecosystems, emissions are reduced by 10 tonnes/C/ha/year with potential reductions up to 20 tonnes/C/ha/year. European Climate Initiative (2025) *Farming (in) peatlands*.
68. Peatland ecosystems are powerful denitrificators, and thus offer priceless ecosystem services as water purifiers. Drained peat soils lose their natural water-holding capacity, which makes them more prone to droughts and require costly irrigation for continued agricultural use (e.g. need for ongoing maintenance of ditches, pumping systems and flood defences). Martinez-Espinosa, C. et al. (2021) Denitrification in wetlands: A review towards a quantification at global scale. Science of The Total Environment 754: 142398; UN Environment Programme (2022) *Global assessment reveals huge potential of peatlands as a climate solution*.

Complementary measures to improve the natural functions of related floodplains (NRL Article 9(3))

Member States must complement the removal of artificial barriers with measures necessary to improve the natural functions of the related floodplains (NRL Article 9(3)). This is an additional obligation for Member States (going beyond barrier removal) and is applicable to all "related" floodplains (those adjacent, connected to or in any way affected by the river stretches where barriers have been removed).

This obligation recognises that restoring river connectivity is not only about removing barriers but also about reviving the floodplain's ecological role in water retention, sediment flow and habitat support. Member States must take active measures to reconnect rivers with their floodplains and enhance their natural dynamics, contributing to both biodiversity goals and disaster risk resilience (e.g. flood and drought mitigation).

Floodplain connectivity provides a cost-effective, nature-based solution for flood control, simultaneously providing more ecosystem services and higher biodiversity outcomes in comparison to grey infrastructure.[69] The most recent evaluation of RBMPs highlighted the importance of nature-based solutions, especially floodplain restoration, to achieve the objectives of the WFD and the Floods Directive[70] and even mentions the co-benefits that this can have for the Habitats Directive and the NRL.[71]

The Floods Directive covers the impacts of climate change on flooding (FD Article 4(2)). It requires these impacts be considered in the preparation of preliminary flood risk assessments, which are elaborated into flood hazard and risk maps (FD Article 6) and flood risk management plans (FD Article 7). The latter need to be taken into account during the preparation of NRPs.[72] Similarly, the link with climate change mitigation, climate change adaptation, land degradation neutrality and disaster prevention must be clearly explained in the NRPs; Member States must identify these synergies and prioritise restoration measures that support them.[73]

Floodplain restoration can lead to conflicts with landowners, particularly when it involves changes in land use, water access or property boundaries. Member States must address these concerns transparently and fairly, ensuring appropriate consultation and compensation, where needed. However, pre-existing property rights should not constitute a deterrent to ambitious restoration efforts, as the cost of inaction – increased flood risk, drought, biodiversity loss and damage to livelihoods – is far greater in the long term (€10 billion in Cohesion funds in 2024). Balancing restoration with property rights is essential, but the urgency and scale of the climate and water crises demand bold, proactive action.

Good practices

Member States can make use of the information put at their disposal by the European Commission, including this report on nature-based solutions for climate change adaptation and disaster risk reduction and the information learned from LIFE projects.
NGOs have also created useful and easily available information:

- WWF has identified key river restoration projects that could lessen the impact of floods and droughts.
- Natuurpunt manages various wetland restoration sites to mitigate the effects of floods (and droughts); its projects include monitoring of these effects and awareness campaigns to publicise the results.

69. Turkelboom, F. et al. (2021) How does a nature-based solution for flood control compare to a technical solution? Case study evidence from Belgium. *Ambio* 50: 1431–1445.
70. Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks.
71. Cf above, European Commission, n. 25, p 46.
72. NRL Article 14(14)(c).
73. NRL Article 14(9).

2.2. Barrier removal and assessment of impact on environment, nature and water

While the primary goal of barrier removal is to restore riverine habitats and connectivity, it can, in certain circumstances, have adverse effects on the environment, including protected species, habitats and water resources.[74] Before barriers are removed, relevant EU legislation such as the EIA Directive, the Habitats and Birds Directives, and the WFD may need to be applied to identify and mitigate any potential significant environmental impacts. The following section outlines the requirements for barrier removal under these key laws.

2.2.1 Environmental Impact Assessment Directive

The EIA Directive requires that projects likely to have significant effects on the environment be assessed before authorisation.[75] This includes public and private projects that, due to their nature, size or location, may degrade the ecological condition of an area[76] or affect the conservation status of a habitat or species.[77] Degradation of the ecological condition of an area (NRL Article 3(4)) or the conservation status of a species or habitat, in line with Habitats Directive Articles 1(e) and 1(i), are all considered "significant effects on the environment".

The EIA must be conducted before the project is authorised and must assess both direct and indirect effects on a broad range of factors:[78] population and human health; **biodiversity (with particular focus on species and habitats protected under the Birds and Habitats Directives)**; land, soil, water, air and climate; material assets, cultural heritage and the landscape; and the interactions between these factors.

Barrier removal projects may fall under the EIA Directive, depending on the type of structure, removal method and expected environmental impacts. The Directive applies to a broad range of projects,[79] from construction and extraction activities, to "other interventions in the natural surroundings and landscape",[80] such as demolition works,[81] or removal of obsolete dams, sluices or other river barriers.

The annexes to the EIA Directive are organised by sector rather than by specific activities. As such, **barrier removal projects may fall under different categories depending on the context, such as dam removal, demolition of water management installations or decommissioning obsolete hydropower plants. Competent authorities must determine the applicable category on a case-by-case basis**.

Projects subject to the EIA Directive are defined in Article 4. Any project category listed in Annex I is automatically considered likely to have significant effects on the environment and must be subject to an EIA in all cases.[82] For projects listed in Annex II, an EIA is only required if, based on their nature, size or location, they are likely to have significant effects. This is determined through a screening procedure,[83] in which competent authorities apply the selection criteria set out in Annex III.[84]

Barrier removal projects may fall under either Annex I or Annex II, depending on their characteristics. For example, the decommissioning of large-scale hydropower plants or dams could fall under Annex I (e.g., water management projects for agriculture or energy production), and thus always require an EIA. Conversely, the removal of smaller obsolete weirs, embankments or sluices might fall under Annex II, and would only require an EIA following screening.

74. See for example Evans, J.E. (2015) Contaminated Sediment and Dam Removals: Problem or Opportunity? Eos, 8 October.
75. EIA Directive, Article 2(1).
76. NRL Article 3(4).
77. HD Articles 1(e) and 1(i) and EIA Directive Article 1(1).
78. EIA Directive, Article 3; see also, case C-50/09, *Commission v Ireland*, paragraph 76.
79. Case C-72/95, Kraaijeveld and others, paragraph 31.
80. EIA Directive, Article 1(2) point (a).
81. Case C-50/09, Commission v Ireland, paragraphs 86-107.
82. EIA Directive, Article 4(1).
83. EIA Directive, Article 4(1) and (2).
84. EIA Directive, Article 4(3).

Additionally, the EIA Directive covers mobile and temporary installations – even though these are not explicitly listed. If such installations (e.g., temporary cofferdams, dredging platforms or machinery used for barrier removal) are likely to cause significant environmental impacts, they must still comply with the EIA requirements.[85]

While the removal of a single small barrier may not trigger an EIA on its own, the cumulative effects of removing multiple barriers within the same catchment or river basin may collectively result in significant impacts. In such cases, the entire project (the group of removals) must be assessed as a whole.[86] This requirement applies both to Annex I and Annex II projects and must be considered during the screening phase.

Whether a barrier removal project requires an EIA procedure must be determined on a case-by-case basis. The decision will depend on the specific project category it falls under, the likelihood of significant environmental effects – either individually or cumulatively with other projects – and key factors such as nature, size and location.

Good practices

WWF-Slovakia has conducted an analysis of the Slovak EIA Act and the SEA/EIA Directive, and issued a series of recommendations. These include the recommendation that, once the administrative concession for an artificial barrier has concluded, the barrier should be removed to restore habitat condition. Under the Slovakian Water Act, permits for special water use can be reassessed when the infrastructure's environmental impact is significantly greater than originally anticipated in the EIA. This provision supports the removal of permitted barriers and cessation of operations as a response to non-compliance with the EIA and binding environmental targets.

2.2.2 Water Framework Directive

The WFD provides the overarching legal framework for the protection of Europe's fresh water, while enhancing the ecological status of aquatic ecosystems and the terrestrial environments that depend on them.[87] Its two core objectives are to prevent deterioration of the status of all surface and groundwater bodies[88] and to achieve good status for all surface waters and groundwater[89] within a set timeframe.

These legally binding obligations[90] apply not only at the planning level, through RBMPs[91] and programmes of measures[92] established by Member States, but also at the level of individual projects.[93]

Member States are obliged to achieve good status[94] at the latest 15 years after the Directive entered into force. The deadline can only be extended under narrowly defined conditions.[95]

85. European Union (2015) *Interpretation of definitions of project categories of annex I and II of the EIA Directive*, pp.9-10.
86. C-560/08, Commission v Spain, paragraphs 98-99.
87. WFD Article 1.
88. WFD Article 4(1)(a)(i) and (b)(i).
89. WFD Article 4(1)(a)(ii) and (b)(ii).
90. C-461/13, *Bund für Umwelt und Naturschutz Deutschland e.V. v Bundesrepublik Deutschland*, para. 43; C-535/18, IL, Others v Land Nordrhein-Westfalen, para. 72; C-559/19, Commission v Spain, para. 43.
91. Established for each river basin district. WFD, Article 13.
92. WFD Article 11.
93. C-461/13, *Bund für Umwelt und Naturschutz Deutschland e.V. v Bundesrepublik Deutschland*, paras. 43 and 47.
94. For surface waters, "good status" encompasses both good ecological and good chemical status, while for groundwater, "good status" refers to the chemical and the quantitative status, both of which must be good. For artificial or heavily modified bodies of surface water, a lower standard applies: they must achieve good ecological potential and good chemical status.
95. Listed under Article 4(4) of the WFD. The CJEU has stressed that Article 4(4) applies only to the enhancement obligation laid down in Article 4(1)(b)(ii), but not to the obligation to prevent deterioration referred to in Article 4(1)(b)(i). Case C-559/19, *Commission v Spain* (Détérioration de l'espace naturel de Doñana), para. 45.

The Court of Justice of the EU (CJEU) has consistently reinforced the strict nature of the WFD's non-deterioration obligation. Any deterioration in the status of a water body is prohibited – even if the deterioration is minor, short term, or affects only a single quality element as defined in Annex V of the WFD.[96] This applies even when the overall classification of the water body remains unchanged.[97] The CJEU has ruled that this obligation applies at all stages of implementation and to all surface water bodies covered by or requiring a RBMP.[98] Accordingly, Member States must refuse authorisation for any project likely to cause deterioration unless a derogation is formally granted under Article 4(6) or 4(7). These derogations are subject to strict legal criteria and granting a permit to a project that causes deterioration, without compliance with these criteria, would constitute a breach of the WFD.[99]

Before authorising a barrier removal project, competent authorities must assess whether the project could cause deterioration or prevent the achievement of good status.[100] This preliminary evaluation is known as an *applicability assessment*.[101] If no deterioration is expected, either thanks to effective mitigation measures or the nature of the project, no further analysis is required and the project can be authorised under the WFD. However, if there is a risk of deterioration, the project must also undergo an Article 4(7) test.

Under WFD Article 4(7), a project may be authorised only if:

1. All practicable steps are taken to minimise harm (Art. 4(7)(a)).
2. The reasons for the modification are clearly explained in the RBMP (Art. 4(7)(b)).
3. It serves an overriding public interest and the benefits outweigh the environmental costs (Art. 4(7)(c)).
4. No better environmental alternative exists that is technically feasible or not disproportionately costly (Art. 4(7)(d)).

Barrier removal projects are generally expected to meet the characteristics of a project serving overriding public interest, as they serve clear environmental and public interest[102] goals such as restoring river continuity, improving biodiversity and climate resilience.[103] Still, Article 4(7) compliance is required unless the impacts are clearly negligible.[104]

While most barrier removals aim to restore or improve ecological status, any temporary, short-term or transitory deterioration still triggers the need for compliance with Article 4(7). Removing a barrier may cause short-term damage before its long-term benefits are seen. This raises the question of whether temporary deterioration caused by barrier removal would be in violation of the WFD. The CJEU has made it clear that even temporary degradation constitutes a breach, **if not properly assessed and justified**. By analogy, such an interpretation seems to apply to temporary deterioration caused by barrier removal under the NRL as well.

96. C-346/14, Commission v Austria, para. 59. The CJEU has clarified that a deterioration in the status of a body of surface water occurs as soon as at least one quality element, as defined in Annex V of the WFD, drops by one class, even if this does not lower the overall classification of the water body. If the affected quality element is already in the lowest class, any further decline is considered a deterioration of status. See also C-525/20, *Association France Nature Environnement v Premier ministre and Ministre de la Transition écologique et solidaire*, para 39.
97. C-664/15, *Protect Natur-, Arten- und Landschaftsschutz Umweltorganisation v Bezirkshauptmannschaft Gmünd*, para. 31.
98. Cf above: C-461/13, n. 91, para. 50; C-346/14 n. 97, para. 64; C-525/20, n. 97 para. 25.
99. Cf above: C-461/13, n. 91 para. 50; n. 98, C-664/15, para. 31 and the case-law cited.
100. C-535/18, IL and *Others v Land Nordrhein-Westfalen*, para. 76.
101. Common Implementation Strategy for the Water Framework Directive and the Floods Directive, *Guidance Document No. 36, Exemptions to the Environmental Objectives according to Article 4(7)*, (December 2017) p.16.
102. Member States have broad discretion in defining what constitutes an overriding public interest, as reaffirmed in Case C-346/14 (cf above, n. 97). Concerns regarding this definition should be addressed at the national level, rather than by weakening EU environmental protection rules. The Critical Raw Materials Act (Regulation (EU) 2024/1252) reinforces this principle by stating that strategic projects identified under the regulation *"shall be considered to be of public interest or serving public health and safety, and may be considered to have an overriding public interest"* in relation to the environmental impacts covered under Article 4(7) WFD, provided that all conditions are met. This confirms that exemptions for such projects are already possible under existing EU law.
103. The CJEU has confirmed that "re-naturalisation" projects will in most cases meet the Article 4(7) test, Case C-525/20, para. 43.
104. Cf above, C-525/20, n. 97, paras. 42 and 45.

Good practices

NGOs have explored coherence between restoration obligations and the WFD, such as in this case in Spain. For more on policy coherence, consult the Lawyers for Rivers handbook.

2.2.3 Habitats Directive

The aim of the Habitats Directive is to conserve biodiversity by protecting natural habitats, wild fauna and flora within the EU. It requires that Member States maintain or restore species and habitats at a favourable conservation status through conservation measures, while considering economic, social and cultural factors, as well as regional and local characteristics.[105]

The HD requires EU Member States to designate protected sites for certain habitats and species listed in annexes I and II. Together with sites under the Birds Directive, these make up the **Natura 2000 network**.[106] Restoration efforts under the NRL will primarily focus on the same types of habitats and species covered under the HD.[107] Article 6 of the HD sets out rules for how these sites must be managed and conserved.[108] This is especially important because NRL Annex I includes the same habitat types listed in HD Annex I – meaning that these habitats are now regulated by both the NRL and the HD and their restoration is now framed by a time-bound obligation.

Any plan or project that could significantly affect a Natura 2000 site, including removing barriers like dams or weirs, must go through an **"appropriate assessment"** under HD Article 6(3). This process ensures that the site's conservation goals, as set out in Articles 6(1) and 6(2), are not undermined. According to the European Commission, this assessment functions like a permit process, deciding if and when such projects can move forward.[109] The assessment consists of two stages:

- **Screening**, where it is determined if a plan or project unrelated to the site's conservation objectives could have a significant impact.
- **Main assessment**, where the potential effects of the project are evaluated and specified in detail.

The term "project" is not defined under the HD. Instead, what matters is whether plans or projects are likely to have a significant effect on a Natura 2000 site.[110]

An effect is considered significant if it cannot be ruled out based on objective evidence.[111] This means that the decision on the likelihood and significance of effects on the site must rely on scientific and measurable criteria rather than subjective judgment. Similar to the EIA Directive, whether an effect is considered significant depends on factors such as the impact magnitude, duration, intensity, probability and cumulative effects, as well as the vulnerability of habitats and species.[112]

As with the EIA Directive, Article 6(3) of the HD requires that the impacts of a barrier removal are assessed **cumulatively**. This applies both at the screening stage and during the appropriate assessment. This process will include not only existing completed projects, but also those that are approved but not yet completed, or proposed.[113]

105. Habitats Directive Articles 1 and 2.
106. Habitats Directive Article 3 (1).
107. For the period up to 2030, the link is even stronger, given that Member States will be prioritising restoration measures in Natura 2000 sites (terrestrial and freshwater habitats), in line with NRL Article 4(1).
108. European Commission (2019) Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Notice 2018/C 7621 final, p.7.
109. Ibid, p.33.
110. Ibid, p.35.
111. C-435/09, *Commission v Belgium*, para. 27; C-127/02, *Landelijke Vereniging tot Behoud van de Waddenzee and Nederlandse Vereniging tot Bescherming van Vogels v Staatssecretaris van Landbouw, Natuurbeheer en Visserij (Waddenzee)*, para. 44 (please note that these cases relate to the application of the EIA Directive and Article 6(3) of the Habitats Directive respectively, but these interpretations are also applicable to the SEA Directive, given both the shared objective and the fact that all three processes emanate from the precautionary principle).
112. European Commission (2019) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*, p. 41.
113. Ibid, p.41.

Assessments must be site-specific, taking into account conservation objectives and baseline conditions, as what is significant for one site may not be for another.[114] **Any project which could undermine a site's conservation objectives must be considered as having a significant effect,[115] regardless of its location**.[116]

Barrier removal under NRL Article 9 must be evaluated on a case-by-case basis to determine whether it could significantly and negatively affect the conservation objectives, habitats and species of a Natura 2000 site. This assessment is required whether the barrier is located inside or outside the site. For example, if removing a barrier could allow the spread of an invasive species that harms a strictly protected species downstream, and significant effects cannot be ruled out beyond reasonable doubt, a full appropriate assessment under Article 6(3) would be necessary.

In general, if a project would affect the integrity of a Natura 2000 site, it should not receive a permit.[117] However, HD Article 6(4) provides an exception: the project may still go ahead if three conditions are met:

- There are no alternative solutions;
- The plan or project is undertaken for *imperative reasons of overriding public interest;*
- Compensatory measures, necessary to ensure that the overall coherence of the Natura 2000 network is protected, are taken.[118]

Similarly to the WFD, barrier removal projects will probably in most cases be able to meet all of the criteria listed under HD Article 6(4).

Good practices

Please refer to Section 1.2.1 on habitat conservation and Section 1.2.3 on species conservation for examples.

114. Ibid, p.41.
115. Cf above, n. 112, C-127/02, paras. 46–48.
116. C-142/16, *European Commission v Federal Republic of Germany*, para. 29.
117. Cf above, n. 109, *European Commission*, pp.33 onwards.
118. For a full analysis of the above conditions, please see European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. For more comprehensive guidance, see European Commission (2019) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*.

2.3 Connection to the Renewable Energy Directive[119]

Although the NRL and the RED share the common objectives of mitigating climate change by reducing greenhouse gas emissions, implementing the RED may entail trade-offs for biodiversity. In the case of barrier removal and river restoration, the conflict is evident: the RED promotes the upscaling of hydropower plants, whereas the NRL requires the removal of barriers.

Furthermore, the flexibilities introduced by the RED, such as overriding public interest and EIA exemptions under Articles 16(a)-(d) and 16(f), may lead to the prioritisation of renewable energy infrastructure over restoration efforts. This risks further degrading areas targeted for restoration, hampering their potential to sequester carbon and strengthen climate change-related disaster risk resilience, going against the very climate goals that the RED also seeks to achieve.[120]

In order to minimise conflicts and maximise co-benefits, synergies in the implementation of the NRL and RED must be maintained[121] through effective coordination of competent authorities at all stages: from identifying areas needed to meet national contributions toward the EU's 2030 renewable energy targets, to the designation of renewables acceleration areas (RAAs), and the permitting of the individual projects.

Mapping and designation

Member States must carry out mapping of available land, sea and inland waters for renewable energy deployment,[122] identifying areas needed for renewable plants, grids and storage infrastructure, in order to meet their national targets under the EU's 2030 renewable energy target.[123] Based on this mapping, they must then designate specific areas as RAAs.[124] It is crucial to note that **the RED allows Member States to exclude biomass combustion and hydropower plants from these RAAs.**

Already at the mapping stage, Member States must ensure that renewable energy projects align with how the area is already being used.[125] While a significant portion of restoration under the NRL will normally not fall under such "pre-existing use" (given that the NRL was adopted after the RED and most implementation measures will be put in place after the mapping exercise under the RED is complete), it is still important to ensure that energy projects in the mapped areas are not in conflict with existing conservation and restoration uses. Such a consideration is especially relevant in the early phases of putting both laws into action. **To avoid delays or unnecessary administrative burden at the RAA designation stage, Member States should already consider future restoration areas during the mapping, using information from the preparatory NRL's ecosystem condition assessment**.[126]

When designating RAAs, the RED obliges Member States to exclude certain areas based on ecological or normative characteristics (e.g., Natura 2000 sites, nationally protected areas, major migratory routes for birds and marine mammals) or their sensitivity, as identified through environmental sensitivity mapping indicating potential significant environmental impacts.[127] In practice, this means that beyond excluding protected areas, like Natura 2000 sites, nationally protected nature zones or migratory corridors, Member States must also, following a case-by-case assessment, exclude areas identified as sensitive using environmental mapping tools.[128]

119. For a significantly more detailed analysis on the relationship between the RED and EU environmental legislation (NRL, Birds and Habitats Directives, EIA Directive, SEA Directive and the Aarhus Convention), see ClientEarth, *Renewable Energy for Nature and People – A Practical Guide to the revised Renewable Energy Directive* (2025).
120. Cf above, n. 20, *Guidance and Recommendations for Ambitious Nature Restoration Plans*, p.28.
121. NRL Articles 14(9) and 14(13) oblige Member States to consider such synergies at the earliest stage of its implementation, namely during the preparation of NRPs.
122. RED Article 15b.
123. RED Article 3(1).
124. Certain conditions need to be followed for RAAs (RED Article 15c): RAAs must be in areas where the specific type of renewable energy is not expected to have significant environmental impacts (Art. 15c(1)(a)); Member States must prioritise artificial and built surfaces (Art. 15c(1)(a)(i)); **Natura 2000 sites**, nationally protected areas, major bird and marine mammal migratory routes, and other environmentally sensitive areas **must be excluded** (Art. 15c(1)(a)(i) and (iii)).
125. RED Article 15b(3).
126. RED Articles Art 14(2) and (6).
127. Cf above, n. 119, *Renewable Energy for Nature and People*, p.22.
128. RED Article 15c(1)(a)(ii).

Since the RED was adopted before the NRL (and its mapping process precedes the preparation of NRPs),[129] restoration areas are not automatically excluded from becoming renewable energy zones or RAAs. Still, on the basis of a case-by-case assessment, these areas would likely be excluded either due to their nature as Natura 2000 sites and ecological characteristics[130] or on the basis of their ecological sensitivity.[131]

Member States are required to coordinate the development of their NRPs, both when **mapping** areas needed to meet the 2030 renewable energy targets and when **designating RAAs**. The authorities responsible for the preparation of the NRPs must ensure that restoration efforts do not obstruct the implementation of the RED.[132] In other words, the two planning processes, both of which contain strong spatial planning elements, must occur jointly, not only for the sake of the efficient use of public resources (funding and staff capacity), but also in order to ensure compliance with both laws. Through proper coordination, Member States will minimise unavoidable overlaps between restoration and renewable energy deployment areas; and, when overlaps do occur, identify the most appropriate restoration measures and renewable technology types to decrease risks of conflict and/or the undermining the objectives of the respective legislation.[133]

Finally, authorities must continuously monitor the impact of renewable projects. If such projects damage restoration areas, inside or outside RAAs, Member States will be required to restore even more land or water to compensate, adding to their overall obligations under the NRL.[134]

Permitting of individual projects

Member States will designate RAAs in areas particularly suited for renewable energy projects, where deployment is not expected to have significant environmental impacts. Natura 2000 sites, nationally protected areas, major bird and marine mammal migratory routes, and other environmentally sensitive areas must be excluded from RAAs.

Renewable energy plants and energy storage projects, as well as their connectivity to the grid, located inside RAAs are exempt from the requirement to carry out an EIA under Article 2(1) of the EIA Directive (see Section 2.2.1.), as well as the requirement to carry out the appropriate assessment under Article 6(3) of the Habitats Directive (***Section 2.2.3***.), provided that Member States develop a "mitigation rulebook" as part of their plans for RAAs. This should outline clear guidelines for effectively mitigating environmental impacts related to specific renewable energy technologies within each RAA. These measures need to be targeted to the specificities of the area, the renewable energy technology and the identified environmental impacts.[135]

Outside a Natura 2000 site, "the planning, construction and operation of plants for the production of energy from renewable sources, their connection to the grid and the related grid itself, and storage assets shall be presumed to be in the overriding public interest"[136]. This provision grants Member States the option to exempt such plans or projects even *"from the requirement that no less damaging alternative solutions are available under [NRL] Article 4(14) and (15) and Article 5(11) and (12)"* provided that an SEA or an EIA have been carried out.[137] This means that the RED allows projects within RAAs to bypass an EIA and appropriate assessment at the permitting stage, while introducing the obligation to undertake instead a modified, significantly more detailed SEA for the RAA's plans that anticipates the necessary mitigation measures.[138]

This exception only covers non-deterioration duties under NRL Articles 4 and 5. It does not apply to restoration work or removing barriers under Article 9(2), even if a project is in the public interest.[139]

129. RED Article 15b mapping is required by 21 May 2025; preparation of NRPs is required by 1 September 2026 (NRL Article 16).
130. RED Article 15c(1)(a)(ii).
131. RED Article 15c(1)(a)(iii).
132. NRL Article 14(13).
133. Cf above, n. 119, *Renewable Energy for Nature and People*, p.19.
134. Cf above, n. 20, *Guidance and Recommendations for Ambitious Nature Restoration Plans*, p.29.
135. RED Article 16a(3). They also need to comply with Article 6(2) of the Habitats Directive, Article 5 of the Birds Directive and Article 4(1)(a) of the WFD. Both RAA plans and mitigation rulebooks need to be subject to the SEA procedure (and appropriate assessment if applicable).
136. NRL Article 6.
137. Cf above, n. 119, *Renewable Energy for Nature and People*, p.73.
138. RED Article 15c(2).
139. Cf above, n. 119, *Renewable Energy for Nature and People*, p.73.

It is uncertain how the requirement for a prior SEA or EIA can be met for renewable energy projects in RAAs, since these projects are usually exempt from the EIA Directive. The only viable way to meet this requirement is for the SEA procedure for the RAA's plans to maintain a wider scope and level of detail and to assess the impacts of specific projects, as required by Article 15c(2) of the RED. **To ensure legal certainty of plans designating RAAs and NRPs, these assessments must also evaluate the effects of the projects on restoration obligations under Article 4 of the NRL, and specifically quantify the impact of hydropower installations on the free-flowing rivers target of NRL Article 9(2)**.

Good practices

For more on policy coherence, consult the Lawyers for Rivers handbook.

2.4 Member States shall ensure that the natural connectivity of rivers and natural functions of the related floodplains are maintained (NRL Article 9(4)

Despite its different formulation to other NRL articles,[140] NRL Article 9(4) also introduces a non-deterioration obligation, as a corollary to the "substantive" restoration obligation of barrier removal. Non-deterioration, which relates to measures separate to the initial restoration measures, consists in maintaining over time a certain environmental quality once the desired restoration outcomes have been achieved. NRL Article 9(4) is more closely linked to other non-deterioration obligations, most notably those under the WFD[141] and those foreseen in HD Article 6(2). Unlike NRL Articles 4 and 5, the HD Article 6(2) **non-deterioration obligations are all outcome-based**.[142]

For the sake of completeness, according to HD Article 6(2), Member States must take all the appropriate actions to ensure that no deterioration or significant disturbance occurs in Natura 2000 sites.[143] The scope of this article is broader than that of Articles 6(3) and 6(4), which apply only to plans and projects. It applies to all ongoing activities, including those that may not fall within the scope of Article 6(3), along with plans and projects which have been previously authorised and subsequently prove likely to give rise to deterioration or disturbances.[144] Importantly, this article applies to the Natura 2000 site at all times: it may concern past, present or future activities or events, and if an existing activity in a Natura 2000 site is likely to cause deterioration of natural habitats or disturbance of species for which the area has been designated, it must be covered by the appropriate measures foreseen in HD Article 6(2).[145]

In the case of the NRL, non-deterioration means maintaining "good condition" of the restored areas in the long term. The non-deterioration principle derives directly from the Treaty on the Functioning of the European Union, which mandates a high level of environmental protection and continuous improvement in environmental quality.[146]

140. A full analysis of these provisions falls outside the scope of this briefing. For more information on non-deterioration under the NRL, please consult ClientEarth's relevant Legal Analysis (June 2025, pending publication).
141. Articles 4(1)(a) and 4(1)(b).
142. The outcome-based nature of these obligations has been confirmed by the CJEU for both HD Article 6(2) and WFD Article 4(1) in numerous cases. For HD Article 6(2), cf C-241/08 *Commission v France*, para 32 or C-559/19, n. 96, para 155; for WFD Article 4(1): cf above , n.91, C-461/13paras 41 and 43.
143. European Commission (2019) *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*.
144. Ibid, p.25.
145. Articles 4(11) and (12) and 5(9) and (10). For more: Ibid, p. 25.
146. Consolidated Version of the Treaty on the Functioning of the European Union (TFEU) (Article 3(3)). This principle is fundamental and non-derogable, based on the doctrine of *acquis communautaire*, which ensures that established EU legal obligations are maintained and cannot be weakened.

Particularly with regards to NRL Article 9, non-deterioration will consist in the long-term, sustained and continuous maintenance of both the natural connectivity of rivers and the natural functions of the related floodplains. Such measures will need to be included in NRPs, falling under NRL Articles 15(3)(c) and 15(3)(q).

Given the coinciding application of the various non-deterioration obligations on the same stretches of rivers and related floodplains, it is expected that the derogation systems introduced under WFD Articles 4(6) and (7) and HD Articles 6(3) and (4) (see relevant sections above) will also apply here. Member States will be able to invoke different derogations depending on whether the habitat type is situated within or outside a Natura 2000 site.

While a more detailed analysis of the non-deterioration obligations falls outside the scope of the present briefing, an essential caveat relates to deterioration caused due to force majeure.[147] **Most flood or drought events caused by climate change can no longer meet the criteria of "force majeure", as they are not understood as "unforeseeable" due to the scientific information and evidence on their risk and likelihood of occurrence.[148] This necessitates the integration of climate change predictions in sectoral management plans.[149] Force majeure, as an exception to the general rule of non-deterioration, must be interpreted and applied restrictively**.[150] A similar argument will necessitate the restriction of the scope of the NRL's exception to the non-deterioration obligations under Articles 4 and 5 due to "unavoidable habitat changes due to climate change", which Member States will be unable to invoke unless they prove that they have exercised "all due care"[151] in the form of climate change mitigation.

Good practices

Codifying the non-deterioration obligation:

- Spain created a catalogue of fluvial reserves, granting protection against deterioration to pristine river stretches.
- France has categorised watercourses on which any new obstacle to ecological continuity will be prohibited.

NGOs are heavily involved in implementing the non-deterioration principle, such as the Save the Blue Heart of Europe campaign.

Non-deterioration must work across sectors, so that funding and policy contradictions are minimised (such as the iconic example of the TMNHSA hydropower project on the Danube, which contradicts many EU-funded restoration efforts on the Danube). Similarly, river restoration through barrier removal must not deteriorate the conservation status of protected species, such as the white claw crayfish, which could be affected by barrier removal without proper mitigation measures.

MOST FLOOD OR DROUGHT EVENTS CAUSED BY CLIMATE CHANGE CAN NO LONGER MEET THE CRITERIA OF "FORCE MAJEURE", AS THEY ARE NOT UNDERSTOOD AS "UNFORESEEABLE" DUE TO THE SCIENTIFIC INFORMATION AND EVIDENCE ON THEIR RISK AND LIKELIHOOD OF OCCURRENCE.

147. Relevant both under WFD Article 4(7) and NRL Articles 4(14)(a)&(b), 4(15)(a)&(b), 4(16)(a)&(b) and 15(11)(a)&(b), 15(12)(a)&(b), 15(13)(a)& (b).
148. Case C-640/15, *Minister for Justice and Equality v Tomas Vilkas*, para 53. For more, see 'Section 3.2.3. Legal effect of the application of force majeure' in European Commission (2024) Communication from the Commission to the Council on force majeure and exceptional circumstances in Regulation (EU) 2021/2116 of the European Parliament and of the Council on the financing, management and monitoring of the common agricultural policy.
149. E.g. European Commission (2024) *River basin management in a changing climate. Guidance document No 24*.
150. Cf above, n. 148, *European Commission*, "Section 4: Conclusions".
151. Cf above, n.148, C-640-15.

List of abbreviations

AMBER	Adaptive Management of Barriers in European Rivers
CJEU	Court of Justice of the EU
EC	European Commission
EEA	European Environment Agency
EIA	Environmental impact assessment
EU	European Union
FD	Floods Directive
FRA	Favourable reference area
HD	Habitats Directive
INSPIRE	Infrastructure for Spatial Information in Europe
JRC	Joint Research Centre
MSFD	Marine Strategy Framework Directive
NGO	Non-governmental organisation
NRL	Nature Restoration Law
NRP	National restoration plan
RAA	Renewables acceleration area
RBMP	River basin management plan
RED	Renewable Energy Directive
SEA	Strategic environmental assessment
TEN-T	Trans-European Transport Network
WFD	Water Framework Directive

In collaboration with ClientEarth

Living Rivers Europe is a coalition of six environmental and angling organisations: WWF's European network, the European Anglers Alliance, European Environmental Bureau, European Rivers Network, Wetlands International Europe and The Nature Conservancy. Living Rivers Europe puts forward a strong vision of healthy river ecosystems flourishing with wildlife to the benefit of society at large, the economy and sustainable development in Europe. To make this vision a reality and give our water ecosystems a real future we stress the importance of an ambitious implementation of the EU Water Framework Directive and related policies. Together with our members and supporters, representing a dedicated movement of over 40 million people across Europe, we aim to ensure that the loss of aquatic wildlife is halted and reversed and that European waters are managed more sustainably.