MERLIN

Deliverable D5.5:

MERLIN Policy Briefs

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MERLIN

Imprint

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Lead contractor: University of Duisburg-Essen

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MERLIN Key messages

1. MERLIN produced ten policy briefs translating research and implementation experience into actionable guidance for decision-makers.
2. Freshwater restoration is framed as a systemic policy challenge requiring coherence across EU regulatory and sectoral frameworks.
3. Upscaling demands institutional embedding, long-term governance support, and structured pathways beyond isolated projects.
4. Diversified and blended financing mechanisms are essential for durable restoration at scale.
5. Robust monitoring strengthens the credibility, legitimacy, and investment readiness of Nature-based Solutions.
6. Stakeholder engagement and cross-sector collaboration are critical conditions for effective National Restoration Plans and mainstreaming.
7. Joint policy briefs with other EU-funded projects reflect a coordinated science-policy engagement at European level.

MERLIN Executive Summary

Deliverable D5.5 compiles the complete set of policy briefs produced by the EU Horizon 2020 research and innovation project MERLIN during its implementation period.

The objective of these briefs was to translate scientific knowledge, implementation experience, and cross-case synthesis into targeted, actionable recommendations for European and national policymakers, public authorities, funding bodies, and practitioners engaged in ecosystem restoration.

In total, ten policy-oriented outputs are included in this collection. These cover key thematic areas central to the European restoration agenda, including:

- diversified financing mechanisms for nature restoration,
- structured pathways for upscaling freshwater ecosystem restoration,
- systemic monitoring of Nature-based Solutions,
- coherence between the EU Nature Restoration Regulation and the Water Framework Directive,
- agricultural policy reform and water-resilient farming practices,
- biodiversity protection under Natura 2000,
- stakeholder engagement in National Restoration Plans,
- water resilience strategies and sponge landscape approaches, and
- cross-sectoral mainstreaming of freshwater restoration.

Several briefs were developed jointly with other EU-funded research and innovation projects (REST-COAST, SUPERB, WaterLANDS, SpongeWorks, SpongeBoost, SpongeScapes, and FutureLakes), reflecting MERLIN's contribution to a coordinated European restoration community and its role in strengthening science-policy interfaces across projects.

This deliverable provides a consolidated reference document that preserves the original format and content of each brief. By compiling these outputs, D5.5 documents MERLIN's policy engagement activities and supports continued dissemination and uptake beyond the project lifetime.

Content

1 Introduction

Throughout its implementation, the EU Horizon 2020 research and innovation project MERLIN has developed a series of policy briefs aimed at translating scientific insights and implementation experience into actionable recommendations for policymakers, public authorities, funding bodies, and practitioners.

These briefs address key thematic areas relevant to freshwater ecosystem restoration in Europe, including:

- diversified funding strategies,
- structured pathways for upscaling,
- systemic monitoring of Nature-based Solutions,
- legal coherence between major EU policy frameworks,
- agricultural policy reform,
- biodiversity protection under Natura 2000,
- stakeholder engagement in National Restoration Plans,
- water resilience and sponge landscape strategies, and
- cross-sectoral mainstreaming of restoration efforts.

Several briefs were developed jointly with other EU-funded research and innovation projects (e.g. REST-COAST, SUPERB, WaterLANDS, SpongeWorks, SpongeBoost, SpongeScapes, and FutureLakes), reflecting MERLIN's active role within a broader European restoration community and its contribution to coordinated science–policy engagement.

This deliverable compiles all policy briefs formally issued during the project period. In total, ten policy-oriented outputs are included:

- Eight policy briefs issued under the MERLIN project,
- Two joint policy briefs developed in collaboration with other EU projects,
- One policy-oriented contribution published via The Freshwater Blog.

All formal briefs are referenced with persistent identifiers (DOIs) where available. The original content and layout of each brief are preserved in the following sections.

2 Policy brief references

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3 Compiled policy briefs

Strengthening Freshwater Biodiversity Protection and Restoration under Natura 2000

Authors: Annette Baattrup-Pedersen[1], Astrid Schmidt-Kloiber[2], Ellis Penning[3], Rob St. John, Marta Baumane[1], Daniel Hering[4], Sebastian Birk[4]

([1]Aarhus University, Denmark; [2]BOKU University, Austria; [3]Deltares, The Netherlands; [4]University of Duisburg-Essen, Germany)

Key messages

- **Freshwater biodiversity is declining despite existing EU legislation.** Current implementation of the Habitats Directive and the Water Framework Directive is not sufficient to halt degradation. Structural gaps in the Natura 2000 network must be addressed.
- **Natura 2000 does not adequately cover freshwater habitats in Europe.** Evidence shows that the coverage of freshwater habitats is low compared to terrestrial and coastal habitats. This limits the network's ecological effectiveness and resilience.
- **A targeted expansion of freshwater designations in Natura 2000 is needed.** EU Member States should assess whether additional sites are required and expand existing ones where necessary to ensure adequate coverage and ecological coherence.
- **Representation gaps weaken EU-level biodiversity outcomes.** Not all freshwater habitats – including those identified in the European Red List of Habitats – are covered across their natural range. This must be corrected.
- **Action is critical for delivering the Nature Restoration Regulation and the European Green Deal.** Without improved spatial coverage, restoration targets, water security and climate adaptation objectives will be harder and more costly to achieve.
- **The Commission should act now.** A coordinated EU-level review coupled with clear guidance and support for Member States is required to strengthen freshwater protection and restoration in Europe.

The MERLIN project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036337.

Purpose and policy context

Freshwater ecosystems across the European Union remain under significant pressure from habitat alteration, pollution, water abstraction and climate change. Despite long-standing legal protections, their biodiversity continues to decline. This undermines the objectives of the EU Biodiversity Strategy, the European Green Deal and core legislation, including the Habitats Directive, the Water Framework Directive, and the Nature Restoration Regulation.

The Natura 2000 network is the EU's primary instrument for biodiversity conservation. However, its effectiveness for freshwater ecosystems remains limited. Evidence from the EU MERLIN project (project-merlin.eu) indicates that freshwater habitats are insufficiently covered, unevenly distributed and often fragmented within the network. These structural limitations constrain both protection and restoration outcomes.

A coordinated EU-level effort is therefore required to strengthen freshwater planning within the Natura 2000 network. EU Member States should assess whether the current designation of freshwater habitats is sufficient and take steps to strengthen coverage, coherence and restoration potential.

Strengthening spatial coverage of freshwater habitats

A priority for improving freshwater conservation under Natura 2000 is to ensure that the spatial extent of designated freshwater habitats is sufficient to support ecological functioning, species persistence and long-term resilience. Current evidence indicates that freshwater habitats are underrepresented in the network, both in total area, and in relation to their actual distribution across Europe. This is particularly evident for running waters, which comprise only 0.4% of the Natura 2000 network, despite hosting 71% of Europe's threatened freshwater species. While rivers and streams are linear systems, their limited inclusion in Natura 2000 cannot be explained by this characteristic alone.

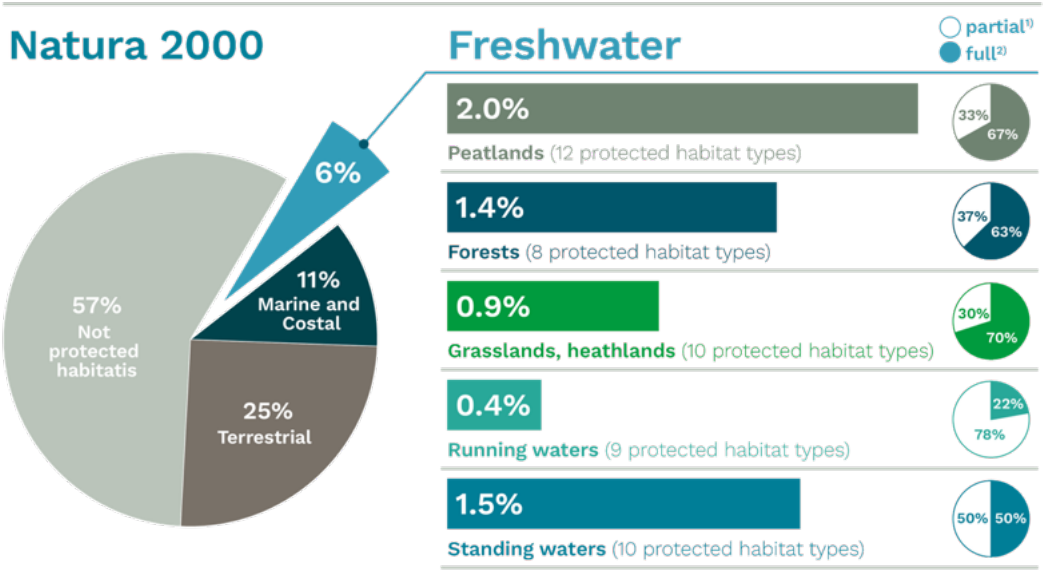

Figure 1: Overview of Natura 2000 freshwater sites

Member States should undertake a structured assessment of whether existing designations provide adequate coverage of all freshwater habitat types listed in Annex I of the Habitats Directive. The assessment should consider not only total area but also ecological functioning. Designated areas must be large and coherent enough to maintain key processes, ensure connectivity and support viable populations of characteristic species.

Where gaps in overall coverage are identified, Member States should expand existing site boundaries or designate additional sites. This should be done strategically, with particular attention to river catchments and hydrological coherence, rather than through isolated or incremental additions. A catchment-based approach will improve ecological integrity and increase the effectiveness of both protection and restoration measures.

Addressing representation gaps across biogeographical regions

In parallel, Member States should address gaps in the biogeographical representation of freshwater habitats. Several freshwater habitat types – particularly streams and small rivers – recognised in the European Red List of Habitats are not protected across their full natural range. In some regions they are absent from the Natura 2000 network altogether. This uneven coverage weakens ecological resilience and adaptive capacity under climate change.

A systematic review of Natura 2000 should verify whether each relevant freshwater habitat type is represented in all biogeographical regions in which it naturally occurs. Where representation gaps are identified, targeted designation of new sites, or adjustment of existing sites, will be required. This is particularly urgent for habitats already classified as threatened or declining.

Full biogeographical representation is necessary to secure long-term viability of freshwater biodiversity habitats at the EU scale. Without it, conservation efforts remain fragmented and less effective, and opportunities for species recovery and habitat restoration are reduced.

Linking designation with restoration priorities

Effective freshwater protection and restoration within Natura 2000 will not be achieved unless these spatial limitations are addressed. Insufficient coverage and fragmented distribution constrain restoration impact. They limit connectivity, reduce ecological recovery potential and undermine cost-effectiveness.

This has direct implications for implementation of the Nature Restoration Regulation, which requires measurable and sustained ecosystem recovery over the coming decades. It also affects delivery of the Water Framework Directive, which depends on functioning and connected river basin systems.

Member States should thus align the recommended review of Natura 2000 freshwater designations with restoration planning. Expanding and optimising the network should go hand in hand with identifying where restoration can be delivered most effectively. Priority should be given to areas where ecological condition can be improved with feasible measures, where connectivity gains are high, and where co-benefits for biodiversity, climate adaptation and water management can be maximised.

Supporting implementation: the MERLIN web app

The MERLIN web app (waterwebtools.com/merlin) provides practical support for this process. It enables Member States to assess current habitat coverage, identify spatial and representation gaps, and identify restoration potential across both running and standing waters.

The tool supports evidence-based decision-making. It allows authorities to identify where Natura 2000 designation should be expanded, and where restoration actions are most feasible. Used alongside national datasets and River Basin Management Plans, it can strengthen the preparation of National Restoration Plans under the Nature Restoration Regulation.

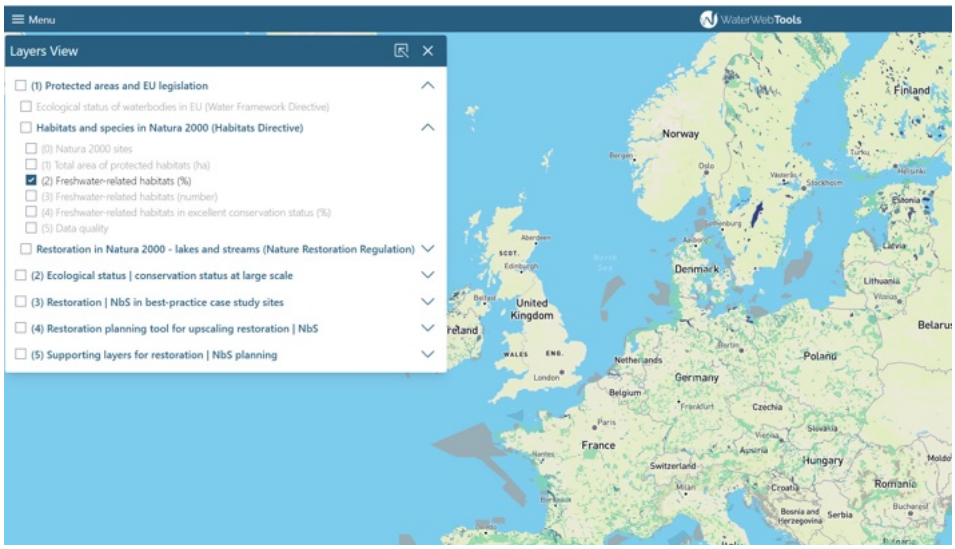

Figure 2: MERLIN web app

Policy recommendations

The European Commission should invite Member States to undertake a coordinated review of freshwater habitat designation within the Natura 2000 network. This review should assess the adequacy of spatial coverage and biogeographical representation across the network, and identify where expansion or adjustment of sites is necessary. This review should ensure that all European Red List freshwater habitats and species are protected across their full natural range.

The Commission should provide guidance to support this process. This should include methodological recommendations, the use of EU-level tools such as those provided by MERLIN, and alignment with existing policy frameworks, in particular river basin planning under the Water Framework Directive and implementation of the Nature Restoration Regulation.

Taking action now will improve ecological outcomes, enhance climate resilience and increase the efficiency of EU investment in biodiversity. It will also reduce long-term implementation risks and support coherent delivery of EU environmental objectives

Acknowledgements

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Further reading

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A Structured Pathway for Upscaling Freshwater Ecosystem Restoration

From isolated efforts to coordinated, large-scale action

Authors: Tom Buijse[1], Ellis Penning[1], Maria Ojanen[2], Sebastian Birk[3]

[1]Deltares, Delft, The Netherlands; [2]Finnish Environment Institute, Helsinki, Finland; [3]University of Duisburg-Essen, Essen, Germany

Healthy freshwater and wetland ecosystems are vital for people and nature, yet many need restoration. Progress in current restoration efforts remains too slow, small-scale, and fragmented. This brief calls for bold, coordinated action that aligns with EU policy goals and delivers lasting benefits for nature, climate, and society. The time to upscale is now.

This policy brief introduces a method developed under the EU Horizon 2020 Research and Innovation project MERLIN for creating Regional Upscaling Plans that help freshwater restoration to move from isolated efforts to coordinated, large-scale action. The approach supports alignment with the EU Green Deal goals and shows how local and regional actors can drive systemic transformation. Scaling up restoration is not only essential for ecological recovery—it is a strategic investment in Europe's long-term resilience, competitiveness, and leadership in nature-based innovation.

1. The Challenge: Fragmented Restoration with Limited Impact

Freshwater ecosystems across Europe are in serious decline. Despite their vital role in providing clean water, flood protection, biodiversity, and climate resilience, restoration efforts remain small, localised, and disconnected from broader policy and societal objectives. They often lack integration with sectors such as agriculture, energy, and transport, and are constrained by fragmented governance and limited funding.

As a result, the cumulative impact of ongoing restoration initiatives remains marginal. Slow progress towards achieving good ecological status under the Water Framework Directive underscores the need for a transformative approach. To reverse degradation and deliver co-benefits for nature, climate, and society, restoration must evolve from isolated projects to coordinated, long-term strategies.

The MERLIN project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036337.

2. What Is Upscaing?

Upscaling refers to the strategic expansion and integration of restoration efforts across five dimensions:

- Geographic scope: from local actions to landscape-scale interventions
- Multiple goals: integrating nature restoration with climate, agricultural, flood risk, and rural development policies
- Stakeholder engagement: ensuring early and broad co-creation across sectors and communities
- Funding: combining public and private sources to secure long-term investment
- Long-term vision: planning beyond typical project cycles, with time horizons extending to 2050 and beyond

Upscaling is not simply about doing more—it is about doing restoration more effectively, connecting actions across systems to create durable, transformative change.

Upscaling requires amongst others a larger landscape perspective

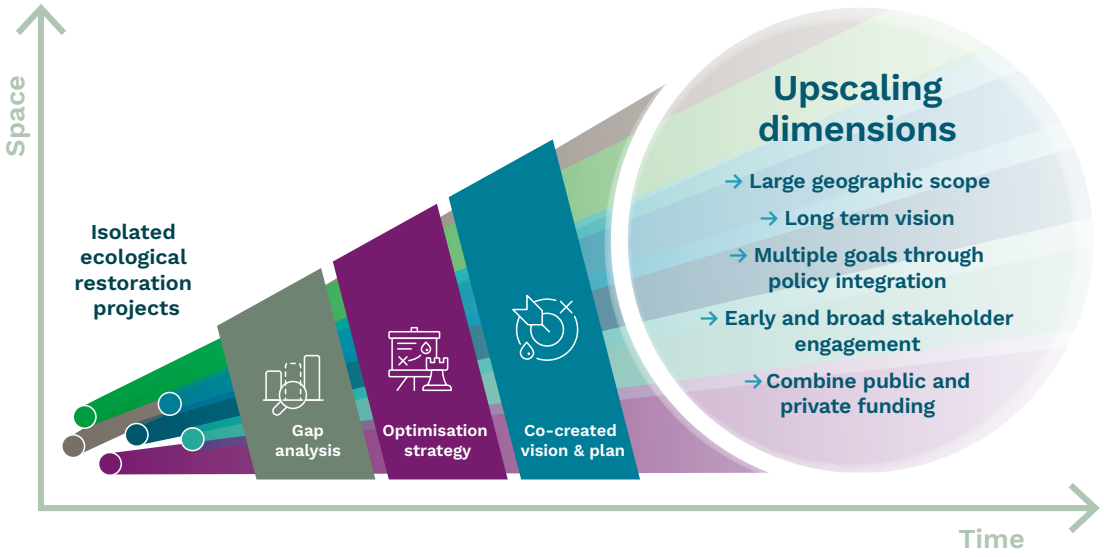
3. The MERLIN Method for Regional Upscaling

MERLIN developed a structured three-step method to guide the creation of Regional Upscaling Plans and move regions from fragmented projects to coherent, long-term strategies

- **Step 1: Gap Analysis**
  Evaluate existing restoration efforts to identify strengths, weaknesses, opportunities, and threats.
- **Step 2: Optimisation Strategy**
  Design tailored approaches that reflect regional context and stakeholder priorities, serving multiple goals with a broader range of (nature-based) solutions.
- **Step 3: Co-created Vision and Plan**
  Bring stakeholders together to define a shared long-term vision and actionable plan.

The method promotes integrated, multi-objective planning aligned with EU Green Deal ambitions, while facilitating access to broader funding and policy support.

A structured pathway for upscaling freshwater ecosystem restoration



4. Enabling Conditions for Regional Upscaling

Align with EU Policy Goals

The European Green Deal and related EU strategies —on biodiversity, climate adaptation, water resilience, and zero pollution—call for ecosystem-based approaches. The Nature Restoration Regulation sets binding targets, reinforcing the need for regional planning.

Scaling up freshwater restoration meets these goals while strengthening Europe's competitiveness. Healthy water systems sustain agriculture, clean energy, resilient infrastructure, and innovation in nature-based solutions. Aligning restoration EU priorities creates synergies that enhance economic resilience and global leadership in green technologies.

Mobilising Diverse Actors and Funding

Effective upscaling depends on collaboration among communities, businesses, landowners, and public authorities at all levels. Co-creation and policy integration foster ownership and unlock long-term investment. Lasting commitment grows from inclusive engagement and shared design of restoration measures.

Bridge Strategy and Implementation

Regional Upscaling Plans bridge the gap between high-level policy and on-the-ground results. They turn EU and national ambitions into coordinated local action, backed by Communities of Practice and practical tools.

MERLIN events with external stakeholder interaction: (top left: Danube floodplain restoration Austria, right Tzipori basin restoration Israel, bottom right Room for the Rhine Netherlands, left Tisza floodplain rewetting Hungary)

5. Learning from Lighthouse Examples

MERLIN highlights several exemplary models of restoration at scale:

Room for the Rhine (Netherlands): Over 30 projects (2006–2018) improved flood safety and spatial quality for nature and people by giving rivers more space through dike relocation, floodplain lowering, side channels, and bypasses.

Emscher River Basin (Germany): A 30-year, €5 billion transformation of an industrial waste-water system into a near-natural river landscape, improving biodiversity, climate resilience, and regional quality of life.

Green Denmark Agreement: The 2024 Tripartite Agreement commits €5.76 billion to a fair green transition—rewetting 140,000 ha of farmland, planting 250,000 ha of forest, and introducing the world's first agricultural CO_2 tax, with key milestones for 2030 and 2035.

Tisza River (Hungary): WWF Hungary's roadmap toward 2050 combines rewetting, invasive-species control, native vegetation recovery, sustainable grazing, and biomass production to restore floodplains and livelihoods.

These cases demonstrate that long-term commitment, local leadership, and inclusive dialogue are key to success. Field exchanges, storytelling, and peer learning can effectively inspire and accelerate restoration across Europe.

Mobilising Diverse Funding for Nature Restoration in Europe

Authors: Viviane Cavalcanti (Deltares, Netherlands, MERLIN); Sien Kok (WUR/Deltares, Netherlands, MERLIN); Esther Carmen (James Hutton Institute, United Kingdom, MERLIN); Kerry Waylen (James Hutton Institute, United Kingdom, MERLIN); Josselin Rouillard (Ecologic Institute, Germany, MERLIN); Gerardo Anzaldua (Ecologic Institute, Germany, MERLIN); Marie-Isabell Lenz (Federal Institute of Hydrology, Germany, MERLIN); Emma Hart (University College Dublin, WaterLANDS); Shane Mc Guiness (University College Dublin, WaterLANDS), Craig Bullock (University College Dublin, WaterLANDS); Wesley van Veggel (Deltares, REST-COAST); Ase Johannessen (Deltares, REST-COAST); Lieke Husken (Deltares, REST-COAST); Jo O'Hara (Future Ark, SUPERB); Thomas Lundhede (University of Copenhagen, SUPERB); Elisabeth Schatzdorfer (European Forest Institute, SUPERB).

This briefing presents three EU-wide actions to unlock diversified funding for nature restoration: build skills, mobilise resources responsibly, and reinforce governance to drive collaboration and funding at scale.

1. Introduction

Europe's new Nature Restoration Regulation[1] marks a turning point in efforts to restore degraded ecosystems. Achieving its goals will require not only ambitious plans but also diversified and reliable sources of funding. Relying solely on public budgets will not be sufficient to meet restoration needs at the required scale. Public and private investment must work hand in hand, with public funds to create the enabling conditions, and private finance to provide scale, and long-term commitment.

This policy brief offers recommendations for EU and national policymakers to enable diversified funding for nature restoration. It draws on lessons from four Horizon 2020 projects – MERLIN, REST-COAST, SUPERB, and WaterLANDS – that together worked across Europe to test how restoration projects can attract broader support and financing[2]. The brief identifies three key priorities:

- ➔ Strengthen the capacity of restoration teams to access diverse funding sources.
- ➔ Create enabling conditions for responsible and inclusive mobilisation of public and private finance.
- ➔ Improve enforcement of existing policies to unlock new funding streams.

[1] Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration, and amending Regulation (EU) 2022/869.

[2] In this brief, the term ‚funding' refers to how restoration projects are ultimately paid, and ‚finance' to the provision of up-front resources for implementation, usually requiring a financial return

2. Key messages

2.1 Strengthen the Capacity of Restoration Teams

Diversifying funding requires restoration teams to understand and engage a broader range of funders – from public authorities and foundations to private investors. These actors have different expectations, risk appetites, and criteria for support. However, restoration managers often come from backgrounds rooted in ecology, civil engineering or public administration, and are primarily trained to prioritise and deliver outcomes for nature. Restoration managers therefore need new skills that go beyond ecology or engineering: **financial literacy, strategic stakeholder engagement, communication skills, and entrepreneurial thinking**.

Upskilling should include a shift in how to present restoration projects in economic and social terms – for example, by putting more emphasis on how they generate benefits and opportunities for local communities and businesses, or how they reduce climate risks and hazards to critical infrastructure and build areas. **To embed restoration in this thinking, guidance on nature restoration, climate adaptation and disaster risk reduction can put particular emphasis on approaching restoration from a Nature-based Solutions (NbS) perspective**. An NbS perspective reframes initiatives around their full suite of social, economic, and ecological benefits, rather than solely their biodiversity outcomes.

Understanding how to express environmental and social benefits in measurable ways can make projects more attractive to funders. **Training for restoration managers should thus cover how to better quantify ecosystem services delivered by restoration projects**. Furthermore, restoration teams must strengthen their capacity to engage with foundations, companies and investors. This includes becoming familiar with the expectations and requirements of potential funders and financiers, including their preferences regarding project outputs, size, return timelines and attitudes to financial risks, as well as how to quantify returns and manage risks. Training is needed to prepare basic economic assessments and financial documents, such as cost-benefit analyses, natural capital accounting, cash flow projections and financial risk assessments to increase confidence in the financial soundness in investments associated with the restoration project. This will enable them to better design attractive restoration projects and formulate effective communication about them.

EU and Member States can set up dedicated support programmes. For example, investment readiness programmes have been established by national environmental policy actors in the UK, providing restoration teams with the financial knowledge and skills to explore new funding opportunities[3]. In addition, EU-level actions should continue to support the consolidation and demonstration of methodologies and approaches for large scale restoration that can act as 'lighthouses', while Member States should work to embed NbS within spatial planning and permitting processes to reduce regulatory risks and uncertainties.

2.2. Create Enabling Conditions for Responsible Investment at Scale

As funding and financing sources widen, clear and fair rules are needed for how investment is mobilised and used, and, ultimately, how restoration benefits are shared. **Policymakers can play a central role by setting up governance models and standards that encourage collaboration and joint investments at scales that ensure true environmental, social and economic impact**. Diverse governance models exist for restoration projects, from formalised partnerships such as Landscape Enterprise Networks (LENs) now implemented in several European countries, to devolved models where new legal entities – such as Special Purpose Vehicles take responsibility under the joint governance of authorities, investors and stakeholders.

Benefits and costs of restoration are unevenly distributed across stakeholders. Much focus must therefore be on ensuring equitable and differentiated outcomes whereby that those who bear costs are compensated or supported, and each stakeholder contributes and benefits to their fair share. **Trusted intermediaries that can act as an independent facilitator for collaboration may be necessary to align interests and enable cross-sector investment**.

Diversifying funding and financing across public and private sources requires giving attention to the best ways in which they can be combined or "blended" in order to leverage the comparative advantages of each sector. In particular, public-private partnerships can offer risk-sharing benefits: public or philanthropic funds can provide stability and guarantees that lower perceived

[3] Ecosystems Knowledge Network. (n.d.). Natural Environment Investment Readiness Fund (NEIRF). Retrieved August 7, 2025, from https://ecosystemsknowledge.net/neirf/

risk for private investors, while private finance can provide scale by bringing additional resources. Examples like the Dutch NL2120 programme illustrate how public-private partnerships can generate long-term investment in nature-based solutions.

A series of supportive actions could include:

- **Launching EU and national-level restoration funds** that explicitly channel public sector resources to attract private capital in a blended funding approach.
- **Supporting the development of endowment funds, dedicated trust mechanisms or Special Purpose Vehicles (SPVs)** by restoration actors to better pool public-private resources, and manage long-term revenues.
- **Setting standards and creating safeguards** for emerging ecosystem service markets (e.g. water, carbon, biodiversity), ensuring verification, accountability, and inclusion
- **Creating the conditions to drive demand** by establishing and regulating markets for ecosystem services and subsidising early entrants

To ensure responsibility and transparency, new initiatives should align with EU sustainability frameworks such as the Corporate Sustainability Reporting Directive and the EU Taxonomy.

2.3. Enforce Existing Policies to Unlock Capital

Beyond designing new instruments and mechanisms to capture restoration benefits, **there is a strong potential to unlock more funding for ecosystem restoration by better enforcing existing laws and national policies**. A large share of potential restoration funding already exists within current EU and national frameworks but remains untapped due to weak implementation. Strengthening enforcement of existing laws can unlock substantial resources.

For example, full application of the cost-recovery principle in the Water Framework Directive could generate new revenue streams for ecosystem restoration. Similarly, perverse incentives acting against restoration from existing policies, such as agricultural subsidies under the Common Agricultural Policy, could be redirected to support more actively restoration efforts (e.g. through agri-environmental payments, training, cooperative approaches) and provide the co-funding needed to enable private investments.

3. Summary

Europe's restoration ambitions depend on building a broad coalition of funders and practitioners. Policymakers can catalyse this process by:

- **Providing training and advisory support to restoration teams** to help them navigate funding landscapes, and design and present projects that attract diverse funding.
- **Creating enabling conditions for the responsible mobilisation of both public and private resources**, including standards and partnership models high quality restoration outcomes to strengthen accountability.
- **Strengthening enforcement of existing policy instruments and national policies** to unlock funding and revenue streams, and incentivise sustainable land and water use practices.
- **Creating the conditions to drive demand** by establishing and regulating markets for ecosystem services and subsidising early entrants

By implementing these measures, the EU and its Member States can mobilise sustainable finance for restoration, creating benefits for nature, communities, and the wider economy.

4. Further Reading

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Ecosystem restoration and nature-based solutions: how do they differ and why does it matter?

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tags: Briefing, Catchment, Climate Change, Freshwater, IUCN, James Hutton Institute, MERLIN, Nature-based solutions, Restoration, River

by freshwaterblog

Freshwater catchments across the world are increasingly being restored using nature-based solutions. Image: Alexander Cahlenstein | Flickr Creative Commons

Awareness of the need to restore Earth's ecosystems has become increasingly mainstreamed in recent years. The **UN Decade on Ecosystem Restoration (https://www.decadeonrestoration.org/)** began in 2021, marking the start of increased efforts to

halt the degradation of global ecosystems, and restore them to mitigate the effects of climate change and stop the collapse of biodiversity.

More recently still, the concept of **nature-based solutions (https://freshwaterblog.net/2022/01/20/what-are-nature-based-solutions-and-why-do-they-matter/)** has entered the global environmental conversation. Nature-based solutions aim to manage natural processes to bring benefits to both people and ecosystems. For example, planting native forests in watersheds can help naturally filter water supplies, and reintroducing beavers can create the floodplain environments which buffer flooding.

As a result, the terms ecosystem restoration and nature-based solutions are often used interchangeably. And, of course, there is significant overlap between them: nature-based solutions are an increasingly central part of many restoration projects globally. But given the rapid growth of both approaches, it is useful to ask: how do they differ, and why does it matter?

Defining ecosystem restoration and nature-based solutions

As a starting point, it's helpful to look at globally-agreed definitions of each approach. According to the **International Standard for Ecological Restoration (https://www.ser.org/page/SERStandards/International-Standards-for-the-Practice-of-Ecological-Restoration.htm)**, restoration means, "assisting in the recovery of ecosystems that have been degraded or destroyed, as well as conserving the ecosystems that are still intact."

On the other hand, the **International Union for Conservation (IUCN) defines nature-based solutions as (https://www.iucn.org/theme/nature-based-solutions)**, "actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature."

As these definitions suggest, the two concepts are similar and mutually supportive. However, the starting point of restoration is nature itself, whereas the starting point of nature-based solutions is societal needs and goals. Restoration's focus on healthy ecosystems can, and often does, have benefits for society, but traditionally such benefits have not been the primary aim. This can make it harder to communicate the relevance of restoration actions to individuals and institutions who are not engaged in biodiversity conservation.

As a result, nature-based solutions represents a paradigm shift to a focus on how restoring ecosystems creates benefits for human well-being, economies and societies, particularly in terms of building resilience to environmental and climatic changes. It is often suggested that this focus on the human benefits of restoration projects can motivate more sectors of society, including economic bodies that affect, or are affected by, ecosystem degradation.

Restoration and nature-based solutions in a freshwater catchment

An hypothetical catchment helps imagine the impacts of restoration activities on freshwater ecosystems. Image: MERLIN

The **MERLIN project (https://project-merlin.eu/)** supports the **use of nature-based solutions (https://project-merlin.eu/files/merlin/downloads/deliverables/MERLIN_D4.1_Briefing_EUsector_perceptions_Dec2022.pdf)** in ambitious freshwater restoration projects across Europe. The diagram above shows a hypothetical freshwater catchment with many of the characteristics of the project's real-life sites. These include rivers, streams and wetlands impacted by agriculture, hydropower and urban development. The hypothetical catchment helps us outline the subtle differences between ecosystem restoration and nature-based solutions approaches to management.

A restoration project in this catchment might aim to improve the extent and quality of wetland habitats by focusing on ecological connectivity through **a range of activities (https://portals.iucn.org/library/node/46347)** to improve water quality, biology, morphology and hydrology. Actions that slow the flow of water through the landscape – such as upland rewetting – may also reduce downstream flood risks and provide some cultural ecosystem services such as increased landscape amenity. However, these are unlikely to be the main aims

of the intervention. Restoration work in the catchment would not entirely ignore human activities in the landscape, but would seek to reduce the human impacts and pressures, as a means of restoring healthy, functional ecosystems.

On the other hand, a nature-based solutions approach in this catchment would start with a societally defined problem, such as flood risk management, and tailor its environmental management accordingly. For example, the use of **Natural Water Retention Measures (http://nwrm.eu/)** to protect communities and settlements would also consider other ecosystem services delivered by the catchment system, such as improving recreational access, or drinking water quality. Regulating extreme flooding events would likely benefit other economic sectors in the catchment, including agriculture, hydropower, navigation and water supply. Improvements to hydrological connectivity would benefit wetland habitats, but there is likely to be less attention paid to conservation issues such as tackling non-native invasive species.

Restoration and nature-based solutions in practice: planning, implementing and monitoring

These differences can often be seen in the way that projects are planned, implemented and monitored. Ecosystem restoration typically aims to restore ecosystem functioning, often through removing or mitigating significant human impacts. Interventions often aim to restore functional ecosystem units: in freshwater projects this can mean entire catchments, but in practice is often confined to smaller rural sub-catchments. Restoration is often planned, funded and carried out through public sector partners, and monitoring often prioritises ecological, biophysical and hydrological parameters.

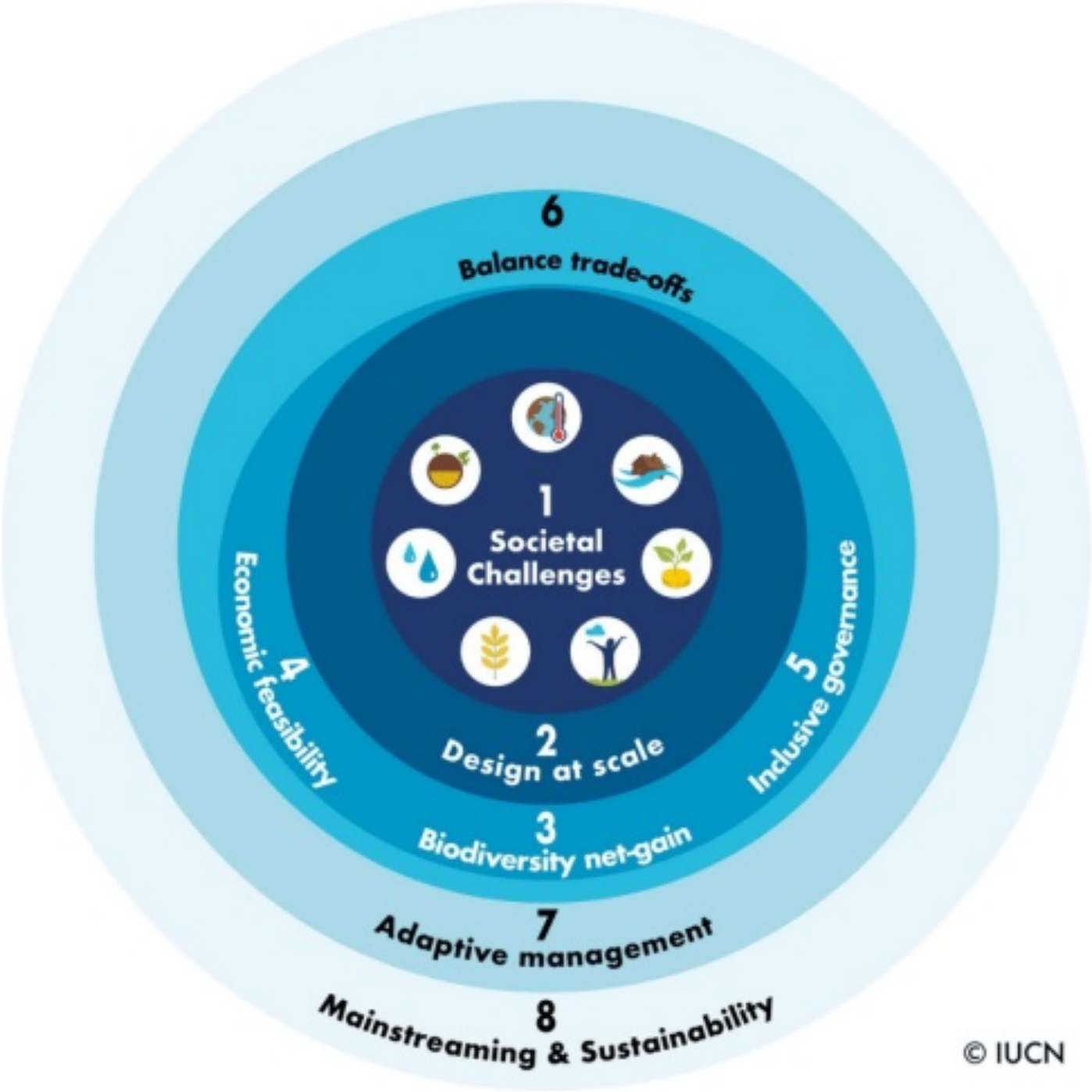
Nature-based solutions, on the other hand, aim to support sustainable development by responding to societal challenges such as climate change mitigation, food security and flood risk. Each intervention is planned based on the scale of the challenge and the benefits required, and involves the collaboration of groups from across public and provide sectors. In this way, nature-based solutions have the potential to unlock more diverse sources of funding than traditional restoration approaches, such as through corporate investment and crowdfunding. Project monitoring often focuses on how well societal goals have been achieved through the use of nature-based solutions.

Balancing social and environmental needs in times of crisis

Nature-based solutions offer valuable tools to address the urgent need to achieve sustainable development and societal needs in the face of the climate and biodiversity crises. By responding to pressing social and economic needs they can potentially provide stronger

arguments for environmental interventions than those based solely on the need for ecosystem restoration.

However, this utilitarian and human-centred framing brings **inherent risks (https://oppla.eu/sites/default/files/uploads/networknature-nbs-knowledgebrief-2.pdf)**. Echoing previous debates over ecosystem services, nature-based solutions may focus attention largely on aspects of nature that are obviously useful, predictable and commodifiable. However, nature is inherently complex and dynamic: there are tradeoffs in what services it generates and for whom, and many of these services are irreplaceable even if they are not understood to be immediately responding to societal challenges. More broadly, nature has significant intrinsic value, and is worthy of conservation and restoration in its own right.



The eight criteria in the IUCN global standard for nature-based solutions. Image: IUCN

The **IUCN global standard for nature-based solutions (https://portals.iucn.org/library/sites/library/files/documents/2020-020-En.pdf)** holds the potential to help mitigate these risks. Its eight criteria and associated indicators reflect insights from conservation practice and restoration ecology. Each criteria is equally important for guiding and evaluating action. For example, the standard requires all nature-based solutions to maintain and enhance biodiversity. It also highlights the likelihood of tradeoffs, and specifies the need for adaptive management in response to unpredictable changes in complex socio-ecological systems.

Whilst ecosystem restoration and nature-based solutions are sometimes used interchangeably, it is important to consider the different goals and scopes of the two approaches. The IUCN global standard for nature-based solutions offers a framework to help navigate the challenges of working with a wide range of societal actors – such as businesses – who may not be traditionally involved in environmental management. What matters is finding ways of living and working with nature that benefits both ecosystems and people.

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Adapted from:

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Synergies and Tensions between the EU Nature Restoration Regulation and the Water Framework Directive

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Europe's freshwaters remain under severe pressure, with most water bodies failing to achieve good ecological status despite two decades of effort under the Water Framework Directive (WFD). The newly adopted Nature Restoration Regulation (NRR) offers an unprecedented legislative push to reverse ecosystem degradation, including binding targets for river connectivity, floodplain reconnection and wetland recovery. As both instruments converge on similar pressures and shared landscapes, their alignment will be decisive for Europe's water resilience in the face of climate change. This Policy Brief explores how joint implementation of the WFD and NRR can transform restoration outcomes across Europe.

Key messages

- **Align WFD and NRR planning cycles to maximise restoration impact. National Restoration Plans should be closely coordinated with River Basin Management Plans to ensure that NRR measures directly support WFD status improvements and vice versa, avoiding parallel, disconnected planning streams.**
- **Develop shared guidance and methodologies to connect NRR targets on how much should be restored with WFD ecological quality outcomes (the status of surface and ground waters). .**
- **Recognise and harness synergies between the NRR Article 9 targets (free-flowing river, barrier removal, reconnecting floodplains) and WFD hydromorphology status. The NRR's focus on reconnecting river processes can raise restoration ambition, complement WFD assessments, and stimulate barrier removal to deliver improvements in WFD ecological status where traditional WFD measures alone have proven insufficient.**

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- **Ensure spatial coherence across ecosystem types. While the WFD operates at river basin scale and the NRR at ecosystem scale, coordination is essential so that measures in agricultural, urban and forest ecosystems under the NRR support WFD freshwater objectives and vice versa without introducing local conflicts.**
- **Integrate agricultural policy to avoid persistent pressures. Misalignment with the CAP risks undermining restoration efforts, particularly in peatlands, floodplains and freshwaters within or downstream of intensively farmed catchments where land-use decisions strongly affect water bodies.**
- **Strengthen funding coherence and administrative capacity. Restoration ambitions under the NRR will only enhance WFD outcomes if funding streams, technical expertise and monitoring systems are harmonised rather than developed separately.**
- **Promote restoration as a multi-benefit strategy. Framing NRR-WFD synergies around climate resilience, biodiversity recovery, water quality, and flood risk reduction can build broader societal and political support.**

Introduction

Europe's waters flow through landscapes burdened by decades of alteration: straightened channels, dams and weirs, drained peatlands, disconnected floodplains, and intensively managed agricultural areas. The health of rivers, lakes and groundwater is inseparable from the condition of their catchments. It is in this context that two major European policy instruments converge: the longstanding Water Framework Directive (WFD) and, more recently, the Nature Restoration Regulation (Regulation (EU) 2024/1991; NRR) that enshrines Europe's first continent-wide legally binding and directly applicable nature restoration requirements.

Under the WFD, Member States are obligated to secure good ecological status or potential for all surface and groundwater bodies, with deadlines stretching to 2027 and beyond. The WFD has been the driver of river and lake restoration over the past two decades. A multitude of restoration projects have been put into practice, but the overarching goal of achieving good status for all water bodies in Europe is far from being achieved. With the Nature Restoration Regulation (NRR), a new player has entered the field with partly overlapping ambitions. The NRR, which entered into force 18 August 2024, commits the Union to ensuring "the long-term and sustained recovery of biodiverse and resilient ecosystems…" and sets out obligations for Member States to adopt national restoration plans, restore significant proportions of land (including inland waters) and sea, and address degraded ecosystems across terrestrial, freshwater, coastal and marine domains.

A prominent freshwater-related goal under the NRR (and the broader EU Biodiversity Strategy) is the restoration of at least 25 000 km of rivers by 2030 to a "free-flowing" condition, achieved through the removal (or adaptation) of primarily obsolete barriers and the reconnection of floodplains and wetlands (NRR Article 9.1).

Because many of the same pressures — barrier fragmentation, hydromorphological change, land-use intensification — degrade water bodies under WFD and impact biodiversity, there is great potential for synergies between the WFD and NRR. Equally, important risks of misalignment and unintended conflict may exist, requiring careful implementation to ensure policy cohesion.

This brief narrates the relationship between the two instruments, highlights where they reinforce each other, explores where tensions may arise, and concludes with recommendations to ensure the two frameworks become mutually reinforcing rather than operating in parallel or at odds.

How the Instruments Link: Reinforcing the Same Landscape

The WFD and NRR share a common story: the quality of freshwater and coastal waterbodies depends on the wider landscape, and restoration of nature broadly is part of achieving healthy water bodies. While under the WFD, a large number of river and lake restoration projects were implemented and successful, the overall share of water bodies in good ecological status has not increased. Most success has been seen in improving waterbodies from bad or poor to

moderate status, or for individual parameters. Restoration of freshwater ecosystems is mainly delegated to water management that is instrumental in improving in-stream structures and enforcing wastewater purification. But water management cannot change catchment land use, and can thus not directly influence stressors resulting from catchment agricultural activities and urbanisation. For example, the establishment of woody riparian vegetation has been identified as a key measure to improve ecological status particularly of smaller streams, but it has rarely been put into practice, as water management usually has little control on riparian land use.

With this in mind, the NRR may strengthen the WFD in several ways.

Firstly, the NRR introduces binding restoration targets for degraded ecosystems and Member States must identify ecosystems in need of restoration, establish national restoration plans, and implement area-based measures. In freshwater contexts this means that long-standing hydromorphological pressures (river fragmentation, disconnected floodplains, drained wetlands) that pose difficulties under WFD implementation may now gain a more structured restoration impetus.

Secondly, by explicitly addressing connectivity (in its many dimensions) and setting the 25 000 km free-flowing rivers objective, the NRR acknowledges that river health is about restoring flows, sediments, floodplains, and catchment processes. The European Commission's document on the criteria for free-flowing stretches (van de Bund et al. 2024) emphasises longitudinal, lateral and vertical connectivity including groundwater abstraction, which aligns well with WFD hydromorphology quality elements, which are essential for achieving good ecological status.

Thirdly, the NRR's requirement for cross-ecosystem restoration (terrestrial, wetland, coastal, urban), taking a more landscape approach, gives added impetus to measures in riparian areas and the wider catchment as a continuum. This means that many of the land-based pressures on waters bodies can now explicitly be addressed under the NRR. The WFD has always recognised that pressures originate outside of the water body, but implementation has often been constrained by sectoral divides. The NRR helps bridge that by offering a more integrated restoration lens (Blackstock et al. 2025).

Fourthly, the NRR article 11 (2) c demands for an increasing trend at national level of agricultural land with high-diversity landscape features. Strategically planned, this target could also benefit the WFD, if for example riparian buffer strips will be prioritised.

In short: the NRR can give the WFD a "catchment-scale boost" by making restoration of nature a core regulatory obligation, rather than something peripheral to water policy.

Where Tensions and Risks Could Emerge

Yet, even in this promising convergence, several critical tensions appear.

Timing and metrics misalignment: The WFD has established deadlines (2027, with some extensions) for achieving good status, and uses habitat or community quality, such as ecological status, as well as individual biological, chemical and hydromorphological parameters to measure success. The NRR operates on a different timescale (2030, 2040, 2050) and often uses restoration metrics of quantity, such as area restored or km of barrier removed. Linking quantitative NRR measures with qualitative ecological outcomes under the WFD will be challenging. Crucially, the gap is bidirectional: the NRR community is not required to translate restoration quantities into expected improvements in water-body status, while the WFD community often cannot specify how much and what type of restoration is required in a given basin to reach good status. This mutual ambiguity means that both policy communities have a shared responsibility to develop guidance and methodologies that connect restoration efforts with status objectives.

Spatial planning and institutional alignment: The WFD is organised around river basin districts and requires measures to achieve good status across all water bodies. Yet the NRR allows ecosystem-specific restoration planning (peatlands, forests, agricultural land, urban nature) and national restoration plans may adopt different spatial units. This could lead to restoration efforts that are less well aligned with basin management needs or water body obligations under the WFD. Added to this, the 25 000 km free-flowing rivers target is EU-wide and not broken down in the NRR into national quotas, leaving open the question of how Member States prioritise action within their basins. Given the very strict definition of free-flowing rivers, which have to be high status, they will most likely be restricted to remote and less populated areas in Europe.

Definition and measurement of "free-flowing": The EC's guidance emphasises that the concept of free-flowing rivers is not yet uniformly defined in EU law, and that operational criteria are being developed. The water community under the WFD may question how the free-flowing metric overlaps with hydromorphological quality elements. There is a risk of two parallel metrics that do not fully coalesce. At the same time, the free-flowing concept will help to shift attention toward full reconnection of river processes. While the metric differs from hydromorphological quality elements under the WFD, the two can be complementary: removing barriers enhances connectivity, sediment continuity and habitat quality, i.e. factors that underpin ecological status. The NRR can also be viewed as the long-awaited restoration complement to Natura 2000, filling gaps where the WFD has struggled to trigger large-scale hydromorphological improvement. However, these synergies need to be acknowledged to ensure that the emerging free-flowing metric becomes a driver rather than a parallel track.

Land-use and sectoral conflict (especially agriculture): Many restoration actions (e.g., peatland rewetting, river-floodplain reconnection) impinge on agricultural land, drainage infrastructure, or forestry systems[1]. The NRR allows Member States an "emergency brake" with regards to the restoration of agricultural ecosystems under specific conditions. This creates potential for weaker implementation of restoration measures affecting water bodies. Unless agricultural policy (especially the Common Agricultural Policy) is fully aligned (Blackstock et al. 2025, Meier et al. 2025), the same pressures that cause WFD failures may persist even as restoration plans are drafted.

Implementation capacity and funding divergence: Water authorities implementing the WFD often cite limited budgets, staffing and long lag-times for ecological response. The NRR places additional demands on Member States and especially on local/regional bodies (engagement of stakeholders, drafting national plans, monitoring results). If restoration efforts become another "parallel stream", there is risk of duplication, administrative overload, or mismatch in financing.

A Coherent Path Forward: What This Means for Policy and Practice

To ensure that the NRR strengthens, rather than complicates, WFD implementation, a number of actions are critical.

First, integrated planning must become the default. National restoration plans should be developed in concert with river basin management plans (RBMPs). Restoration measures for waters (e.g., barrier removal, floodplain reconnection and measures listed in NRR Annex VII. e.g. points 1, 2, 5, 6, 7, 8, 9) should be placed within the basin-scale context of the WFD, not treated as stand-alone ecosystem fixes. Freshwater-related habitats depend on the wider hydrological regime, and coordination with RBMPs can ensure that local terrestrial and wetland measures support, rather than inadvertently constrain, water-body objectives. Articulating these cross-scale synergies will help link NRR habitat restoration with WFD pressures and status improvements while respecting the ecological scales relevant for different habitat types.

Second, prioritisation of measures should favour those that deliver dual benefits, restoring nature and improving water status for both policy contexts. For example, removing obsolete dams achieves biodiversity benefits, restores sediment and nutrient flow, and also lifts hydromorphological pressures defined under the WFD. By choosing restoration sites based on both biodiversity and water-status gains, Member States can optimise use of resources and deliver compelling wins.

Third, monitoring and indicators must be harmonised. Restoration metrics (length of river restored, area of floodplain reconnected) should feed into water-status indicators and vice versa. The scientific and policy communities should work to ensure that metrics developed for "free-flowing" rivers under the NRR align with hydromorphological quality elements under the WFD, so that restoring connectivity actually results in measurable improvements in ecological status.

Fourth, funding and capacity must be aligned, ideally even beyond WFD and NRR and including funds to mitigate floods, droughts and increase water resilience. Agricultural funding (CAP) and structural/cohesion funds should be fully leveraged. By cooperation between water, nature,

[1] On cross-sectoral conflicts and support please compare https://project-merlin.eu/files/merlin/downloads/deliverables/MERLIN_D4.7_Routemap_and_Annex_Nov2025.pdf

agricultural and other authorities, spatial planning, costs and administrative burdens can be reduced.

Framing restoration actions as win-win for multiple existing environmental and climate targets, such as water quality, flood risk reduction, biodiversity and climate resilience, will help build broad support across sectors (farmers, municipalities, utilities, NGOs). The convergence of the WFD and the NRR represents a unique policy moment for Europe's freshwater systems. It offers a second chance of giving way to a watershed-scale perspective that the WFD implementation has not fully achieved.

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Policy and practice brief
October 2025

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Stakeholder engagement for the development and implementation of National Restoration Plans

Key recommendations across ecosystem types

Background and objectives

The European Union (EU) Nature Restoration Regulation (NRR) mandates each Member State (MS) to develop a draft National Restoration Plan (NRP) by September 2026, outlining how it will meet restoration targets. A critical component of this process is **broad-based stakeholder engagement throughout all preparation phases**.

Research conducted by four large Horizon 2020 Green Deal restoration projects across various European ecosystems offers guidance on how to activate stakeholder engagement for the successful delivery of NRR targets and provides concrete examples and tools to support this process (see links at the end of the document for resources covering the approaches and methods discussed in the brief).

Research recommendations

Stakeholder mapping and understanding stakeholder perspectives and needs

Effective design and implementation of restoration actions begin with the identification of all relevant stakeholders, i.e. of all those that can affect, contribute to, or be positively or negatively affected by restoration actions. It is also crucial to gain an in-depth understanding of the needs, values and socioeconomic contexts of all stakeholders, among them local communities and the often 'silent' broader public. This includes identifying the power dynamics and any (potential) conflicts among them.

Stakeholder mapping across individuals, groups, organisations, and sectors is a powerful tool to ensure an inclusive approach that captures vulnerable actors and those who may otherwise remain overlooked or uninformed.

Mapping of social media engagement around restoration plans and initiatives is particularly useful for identifying unexpected and overlooked groups, social views and citizen involvement.

Gaining an understanding of how community and stakeholder needs can be met by the environmental, socioeconomic and cultural benefits of restoration is a key starting point for ensuring buy-in. If community and public concerns are not recognised and tackled from the start, resistance by local residents and politically active citizens can potentially hinder future NRP actions.

Conversations with key informants – individuals with detailed knowledge on local land use – is a good first step in understanding attitudes towards restoration actions in directly affected communities.

Targeted surveys of public perceptions on restoration can bring helpful insights on where citizens stand on restoration and why.

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From consultation to collaboration: ensuring meaningful engagement

Stakeholder engagement goes beyond information provision and consultation. It involves meaningful participation in decision-making. This is less about finding consensus than ensuring that all views are considered, valuable input is taken on board, and expectations are managed. Stakeholder engagement also offers the opportunity to create new partnerships and collaborations, which in turn can unlock new pathways for restoration efforts and funding.

Trust and a sense of ownership are crucial for long-term stakeholder support. True listening, open discussions, and transparency about how input will be incorporated are vital for establishing trust and ownership. This requires the building of relations over time and continuously updating all stakeholders about the restoration activities. At the same time, to avoid stakeholder fatigue and to enable people to make real contributions, engagement activities need to have a clear purpose and to be concise and tailored to those involved.

Effective approaches for deep and ongoing engagement include holding regular workshops, developing local implementation boards, using citizen science, implementing site visits, and forming inclusive and interdisciplinary communities of practice for regular interactions and learning. Involving stakeholders in decision-making by using Participatory Multi-Criteria Analysis (PMCA) can bolster the practical relevance of decisions by directly incorporating the values and preferences of those affected. Using a justice framework can help address social inequality issues and work towards a fair distribution of the costs and benefits of restoration initiatives.

Monitoring stakeholder engagement supports ensuring that no one is disenfranchised and identifies ways of improving the process.

Interactive Pilot session during a governance workshop at the REST-COAST annual meeting in Gdansk (Poland), September 2023. Photo © REST-COAST.

SUPERB stakeholder engagement workshop in Thy (Denmark), March 2024. Photo © Gesche Schifferdecker, European Forest Institute.

Field trip with students from Ballinamore Community School in Cuilcagh-Anierin Uplands SAC (Ireland). Photo © WaterLANDS.

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Building capacity in stakeholder engagement

It is important to build stakeholder engagement capacities at all levels, and particularly for those leading the implementation as the importance of stakeholder engagement is often not well understood and appreciated at local levels, where NRR actions need to be realised.

Involving social scientists and stakeholder engagement experts in the design, implementation and monitoring of the NRPs and working in multidisciplinary teams can facilitate constructive societal participation in decision-making. Their support is likely to be much needed, as bringing stakeholders together and effectively designing strategies tailored to specific groups requires professional expertise.

It is equally important to ensure adequate time, funding, and staffing, as stakeholder engagement requires sustained resourcing to be meaningful and inclusive.

Sharing REST-COAST policy briefs with local authorities at Ebro Delta (Spain). Photo © IUCN/Jorge Astorquia for REST-COAST.

High-level policy event 'Supporting National Restoration Plan Development', 10 March 2025 in Brussels (Belgium), organised by the four EU Horizon 2020 Green Deal 'Restoration Cluster' projects. Photo ©Rina Tsubaki, European Forest Institute.

Building support through positive messaging and targeted communication

Opposition to restoration often stems from limited understanding of the synergies that can arise between restoration and long-term economic development, business opportunities, and ecosystem services such as water management and wildfire control.

Communication campaigns and engagement activities with clear, positive messages on the economic and social benefits of the ecosystem, while also being transparent about potential trade-offs are essential for fostering stakeholder and public support for NRP actions and maintaining trust.

Highlighting concrete cases of win-win examples as a starting point for outreach and discussion is recommended. Involving scientists in engagement and communication activities can help strengthen the positive narrative and the overall dialogue. In addition, it is important that the language of these activities is tailored to specific stakeholder groups.

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Effective conflict resolution and stakeholder empowerment

Conflicts around restoration are not uncommon. They need to be tackled early and openly and may only be effectively addressed if stakeholders feel they have a real say in decision-making. This may include compromising on or adapting some measures considered desirable from a restoration perspective, at least until such stakeholders are reassured.

Professional facilitation of engagement by neutral, trained moderators is crucial especially when tensions are expected. In this way stakeholders may feel heard, and trust is built.

Approaches such as Collaborative Learning workshops – geared at conflict resolution – where a mutual understanding of different positions is developed, can help alleviate tensions and be a first step towards reaching a solution.

Addressing existing power dynamics and empowering stakeholders who have previously been marginalised in decision-making is also key for achieving social justice in restoration efforts, creating broad-based social benefits, and gaining the societal support that is fundamental for the long-term success of the NRPs.

This policy and practice brief was written by the 'Restoration Cluster', a collaborative initiative of four major EU Horizon 2020 research and innovation project funded under the Green Deal and focusing on ecosystem restoration: MERLIN (restoration of freshwater-related ecosystems in a landscape context), REST-COAST (restoration of coastal ecosystems), SUPERB (forest and forest landscape restoration) and WaterLANDS (restoration of wetlands), with particular support by Prospex Institute and European Forest Institute.

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List of examples and tools

Stakeholder mapping / engagement / conflict resolution guidance and tools

Assessment of socioeconomic options (WaterLANDS). This resource contains the **Participatory Multi-Criteria Analysis** (PMCA) method, which involves engaging stakeholders in a structured decision-making process, ensuring that their preferences and values are considered when evaluating the alternatives.

Engagement monitoring and tracking tool (MERLIN). Template for **tracking stakeholder participation** over time using anonymous identifiers. Helps maintain consistent records of workshops, meetings, and direct contacts for monitoring and reporting.

Forest Knowledge Gateway (SUPERB). An online, easily searchable knowledge repository hosting many resources developed by SUPERB and topically related projects and initiatives. It includes tools and advice on **stakeholder mapping, engagement, and conflict resolution,** and approachable research conclusions on societal attitudes towards restoration.

Forest Storytelling and Engagement for Change – A toolkit for effective stakeholder engagement and communication (SUPERB). Hands-on advice on the topic, including tools for **stakeholder mapping, social media mapping,** and developing stories for transformative engagement.

Guidelines for Conducting Surveys (SUPERB). Provides practical advice for **designing household and online surveys** on public views of forests and restoration. Includes links to ready-to-use multilingual questionnaires and key insights to generate high-quality data for evidence-based decision-making and public engagement.

Guidelines for Stakeholder Mapping and Establishing Stakeholder Board in Mainstreaming Restoration in MERLIN (MERLIN). Step-by-step guidance on how to **map stakeholders** and **form stakeholder boards**. Explains methods for identifying roles, interests, and influence. Supported by ready-to-use templates.

Pilot Site Governance Briefs (REST-COAST). Offer a detailed evaluation of the governance frameworks across the project's Pilot Sites. Assess the status and progress toward transformative governance using standardized metrics and visual tools, including **stakeholder mapping** to identify key actors and their roles in the restoration process.

Report on Deliberative Processes and Stakeholder Values (WaterLANDS). Explains the process of **deliberation** and how it is being applied in the project Action Sites. Deliberation is a discussion with stakeholders of issues such as the environmental and social context, use and knowledge of a location and the values that people attach to certain attributes/activities. It allows for the participants to better understand the location and of one another's awareness, positions, needs and values.

Stakeholder mapping tool (MERLIN). Template for **recording and analysing stakeholders** across scales, interests, and influence.

The Collaborative Learning Approach - Guidelines for Conflict Management in Forest Restoration (SUPERB). Provides practical guidelines for organising a **Collaborative Learning** workshop with diverse **stakeholders** to address **conflicts** related to forest restoration.

Strategies for stakeholder engagement and inclusive governance

Roadmap for governance transformation strategy and criteria for effective restoration programmes at the Pilots (REST-COAST). Outlines a strategic framework and site-specific roadmaps to guide project Pilot Sites toward transformative governance for large-scale coastal restoration, integrating socio-economic, policy, and **stakeholder dimensions** in alignment with EU environmental goals.

Strategy for community engagement at the Action Sites (WaterLANDS). Provides an overview of the context and strategies for **stakeholder engagement** at the six WaterLANDS Action Sites, with additional context and support from the WaterLANDS Knowledge Sites.

Transformative stakeholder engagement: a strategy for the SUPERB demonstration areas (SUPERB). Outlines the project's **transformative stakeholder engagement** vision and **strategy** in its demo areas. Presents practical engagement formats and a framework for analysing and addressing engagement **enablers** and **challenges**.

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Analysis of sectoral perspectives and governance challenges/solutions

Focus Sectoral Strategies for mainstreaming freshwater restoration (MERLIN). Strategies for **six economic sectors** (agriculture, hydropower, insurance, navigation, peat extraction, and water supply & sanitation) for mainstreaming nature-based solutions. Useful for **understanding the underlying rationale**, methodology, and strategic framework to support sectoral actors in advancing restoration.

Mainstreaming aquatic restoration using Nature-based Solutions (MERLIN). Summarises experiences of **engaging six economic sectors** – agriculture, hydropower, insurance, navigation, peat extraction, and water supply & sanitation. Highlights sectoral perceptions, barriers, and opportunities for freshwater restoration. Useful for **anticipating conflicts** and **aligning sector interests**.

Report mapping the governance status quo in pilot sites (REST-COAST). Provides an overview of the governance status quo across the nine Pilot Sites at the start of the project. Serves as a baseline to support future planning, **facilitate dialogue**, and guide the development of each Pilot Site throughout the project's implementation.

Recommendations from Core and Fellow Pilots as a key management element for present/future restoration actions (REST-COAST). Provides advice on strengthening the governance criteria for the successful implementation of restoration programmes at each project Pilot Site. Provides guidance on effective natural resource management and assesses the possible outcomes of **different governance approaches**.

Just transformation

Just Transformation – Embedding stakeholder engagement to mainstream nature-based solutions in freshwater ecosystems (MERLIN). Presents lessons from 19 freshwater restoration sites, focusing on how **justice principles of representation, procedure, and distribution** play out in practice. Offers practical insights for local implementers on challenges and opportunities when engaging communities, landowners, and other local stakeholders.

Just Transformations: Sectoral Stakeholder Engagement, Processes and Perceptions of Mainstreaming Nature-based Solutions (MERLIN). Summarises engagement with six **key economic sectors** and how **justice principles** of representation, procedure and distribution were manifested. Helps understand sector-specific priorities, navigate trade-offs, and encourage engagement to ensure that restoration initiatives are just. Describes the project's experience with building **Communities of Practice (CoPs)**.

Restoring healthy rivers and wetlands: How can agricultural policies support the uptake of water resilient farming practices?

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The Common Agricultural Policy (CAP) plays a pivotal role not only in shaping Europe's agricultural landscape but also in safeguarding broader environmental quality and societal well-being. At the same time, food production and rural economies depend fundamentally on healthy water systems. This Policy Working Paper illustrates how water restoration can be embedded in future agricultural policies to enhance water resilience.

Key messages

- Freshwater protection and restoration should be at the heart of EU agricultural funding, regulation, and land-use decisions.
- CAP payments must remain tied to high environmental standards to protect vital freshwater ecosystems, consistent with societal expectations and ensuring a level playing field for all land managers across the EU.
- Agricultural payments should be tightly linked to outcomes that benefit rivers, wetlands, and aquatic ecosystems. A performance-based framework is essential to ensure payments are well-targeted and impacts on freshwater are measurable.
- CAP should move beyond uniform compensatory schemes and recognize that different restoration measures affect farms in very different ways. A more strategic payment framework is needed to enable diverse farm transitions and secure lasting ecosystem benefits.
- Farmers need training and environmental services to adopt water-resilient farming, and collaborative approaches to deliver catchment and landscape scale outcomes.
- Funding to projects that degrade freshwater must be avoided, such as drainage schemes, new irrigation in over-exploited areas, or reservoirs in already water-stressed landscapes.

The MERLIN project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036337.

Introduction

The current CAP, running until 2027, is being implemented against the backdrop of the 'Strategic Dialogue on the Future of EU Agriculture' (SDFA, 2024) and the 'Vision for Agriculture and Food' (EC, 2025a) which set out priorities for the coming years. While there has been an emphasis on environmental considerations in the last two rounds of CAP reforms (ECA, 2024), more recent discussions emphasize the competitiveness of the agricultural sector, focusing on farmers' income and position in the food value chain, regulatory simplification, greater subsidiarity and flexibility for Member States (MS), and a shift from compliance-based regulation to incentive-driven approaches (EC, 2025c). The recent proposals for the next Multi-Annual Financing Framework (MFF) closely align with new priorities (Hart & Baldock, 2025).

At the same time, in the context of the EU's water policy, the upcoming 2027 deadline for achieving the objectives of the Water Framework Directive (WFD) (EC, 2000) is fast approaching. Yet, most surface waters still fall short of reaching good ecological status, with less than 40% meeting the criteria and little improvement over the past decade (EEA, 2024). Meanwhile, the recently adopted Nature Restoration Regulation (NRR) (EC, 2024a) places emphasis on ecosystem restoration and water resilience – issues that are increasingly important in the context of climate change. The Water Resilience Strategy (EC, 2025b) further underlines the importance of water for Europe's environmental, economic, and social well-being.

This Policy Working Paper aims to reflect on the performance of the current CAP in supporting freshwater ecosystems and explore how future agriculture policy design can better integrate their restoration and maintenance. Healthy freshwater ecosystems are not only fundamental for food production but also for drinking water supply, recreational use, economic development, biodiversity, and climate adaptation. Strengthening the synergy between agricultural practices and freshwater protection is therefore essential to ensure long-term resilience and sustainability across sectors.

Why should freshwater ecosystems be restored and maintained in agricultural landscapes?

Healthy freshwater ecosystems deliver essential benefits for society at large. Functional rivers, wetlands, and floodplains play a vital role in reducing flood risks, protecting drinking water, supporting biodiversity, and offering recreational and nature-based tourism opportunities (EEA, 2020). The agricultural sector is both a major driver of freshwater degradation and highly dependent on water-related ecosystem services, making it a key stakeholder and beneficiary of restoration. Around 60% of European floodplains are under agricultural use (Entwistle et al., 2019), and agricultural activities largely contribute to habitat loss, pollution, and hydrological disruption (EEA, 2024a; Schürings et al., 2024). At the same time, farmers depend on healthy soils, stable water cycles, and a functioning landscape to maintain long-term productivity and adapt to increasing climate variability. Farmers increasingly recognise the threat from climate change and are willing to invest in nature-based solutions (Bednár et al., 2025).

Notably, even modest restoration efforts can have a substantial impact. For instance, evidence suggests that restoring less than 2% of Europe's cropland in floodplains as retention areas could reduce economic flood damage by up to 83%, and lower population exposure by 84% under a 3°C warming scenario (Dottori et al., 2023). On-farm practices such as cover cropping, reduced tillage, and diverse crop rotations enhance soil health and water retention, directly supporting yields while reducing input costs (Tamburini et al., 2020; Jones et al., 2023).

A water-resilient agricultural landscape integrates these practices at multiple spatial levels – i.e., at plot and farm, micro- and sub-catchment, and floodplain level – as described by the MERLIN Agriculture Sector Strategy (le Clech et al., 2025). These levels are important as they introduce different types of intervention. At plot and farm levels, interventions can enhance ecosystem services, such as reducing surface water runoff, or increasing soil water retention. At sub-catchment level, interventions can restore surface waterflows and freshwater ecosystems. At floodplain level, they can restore the functioning of larger rivers' floodplains, e.g. through barrier removal (le Clech et al., 2025). These different measures and their benefits are illustrated in the below MERLIN infographic (Figure 1) showing a vision for a restored rivers in their broader landscape.

A restored wetland in an agricultural landscape
(©Josselin Rouillard)

Protecting a drainage ditch with riparian buffers
(©UDE/Midjourney)

River in a peatland landscape
(©Kirsty Blackstock)

Controlling water levels in a drainage agricultural floodplain
(©Josselin Rouillard)

Low intensity agricultural grassland
(©Randolf Manderbach - www.deutschlands-natur.de)

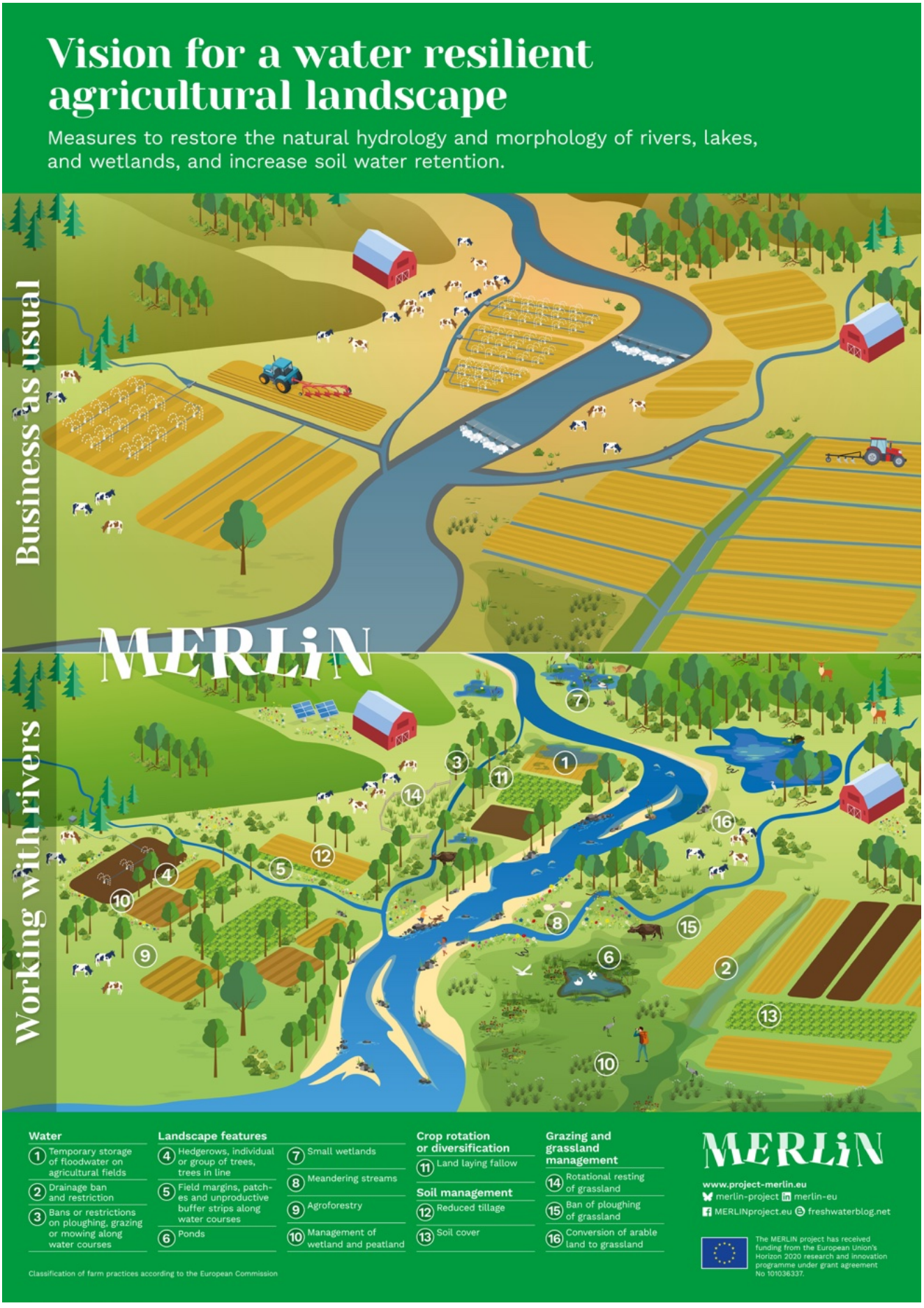

Figure 1: Vision for restored rivers in their broader landscape.

Table 1 below presents farm practices that can contribute to restoring the natural hydrology and morphology of rivers, lakes, and wetlands, and to increasing water retention in the wider agricultural landscape. These practices can be differentiated regarding their impact on farm businesses:

- Land 'sharing' measures maintain agricultural land in production whilst supporting natural processes
- Land 'sparing' measures manage land for nature without agricultural production

Differentiating these can help understand economic implications and inform appropriate responses through CAP instruments, as discussed later.

Table 1: *Farm practices that can contribute to preserve and restore rivers and wetlands*

Group of measures	Farm practice*	Impact on farming activity	Benefits for river and wetland restoration
Water	Temporary storage of floodwater on agricultural fields	Land sharing	Retention and percolation of flood water into the alluvial aquifer
	Drainage ban/restriction	Land sharing or sparing depending on whether maintain production despite restrictions	Reduction of water runoff and increase of water retention on agricultural land
	Bans or restrictions on ploughing, grazing or mowing along water courses	Land sharing or sparing depending on whether maintain production despite restrictions	Preservation of riverbanks from animal trampling and damage from nearby cultivation; Preservation of rivers from sediment erosion input from nearby fields
Landscape features	Hedgerows/individual or group of trees/trees in line	Land sparing	Reduction of water runoff and soil erosion on agricultural land and increase of water retention (and pollutants) in the agricultural landscape, thereby indirectly contributing to a more natural flow of water
	Field margins, patches and unproductive buffer strips along water courses	Land sparing	
	Ponds	Land sparing	
	Small wetlands	Land sparing	
	Streams	Land sparing	
	Agroforestry	Land sharing	
	Management of wetland/peatland	Land sparing	
Crop rotation or diversification	Land laying fallow	Land sharing or sparing depending on rotation	
Soil management	Reduced/no tillage	Land sharing	Increase of surface roughness and soil organic carbon, thereby reducing rainfall runoff and favouring landscape water retention
	Soil cover	Land sharing	
Grazing and grassland management	Rotational resting of grassland	Land sparing	Reduction of overland run off and storage of water (as compared to arable land) with most benefit arising from permanent grassland
	Ban of ploughing of grassland	Land sharing	
	Conversion of arable land to grassland	Land sharing or sparing depending on whether grassland still used for production	

*As defined by Angileri et al. (2024)

How does the current CAP support the restoration and maintenance of freshwater ecosystems?

Since its introduction in the early 1960s, the CAP has evolved to increasingly integrate environmental and climate considerations, including the protection and restoration of rivers and wetlands. The latest step in that direction was the introduction of the so-called 'Green Architecture' in the latest programming period (2023-2027). MS CAP Strategic Plans (CSPs) must outline the Green Architecture to show how they will use CAP funding to achieve environmental, climate, economic, and social objectives through tailored instruments. The CSPs therefore include detailed descriptions of the instruments' objectives, supported farming practices, eligibility and selection criteria, and relevant indicators to monitor progress in implementation, including MS-specific targets for result indicators that quantify uptake of interventions towards addressing specific environmental outcomes.

The current CAP is structured around four key instruments, each serving a different purpose and supporting different types of farming practices, as presented in Table 2. The differences in duration, coverage, and funding mechanism have implications for achieving freshwater restoration and water resilience.

Table 2: *Overview of key CAP instruments for freshwater restoration (not exhaustive)*

CAP instrument	Main purpose	Duration/coverage	Funding
Good Agricultural and Environmental Conditions (GAEC)	Ensure common minimum environmental standards that famers must comply with to receive several types of CAP support	Always applicable; mandatory for all recipients of direct payments	GAEC puts conditions on receipt of farm support payments, which are funded under European Agriculture Guarantee Fund (EAGF); fully EU-funded
Eco-schemes	Encourage short-term voluntary adoption of sustainable practices beyond mandatory requirements	Annual payments (farmers can opt in each year); compulsory for MS to offer, voluntary for farmers to participate in	European Agriculture Guarantee Fund (EAGF); fully EU-funded
Agri – Environment - Climate (ENVCLIM) interventions	Support long-term environmental improvements that require sustained efforts	Multi-year commitments (typically 5-7 years); compulsory for MS to offer, voluntary for famers to participate in	European Agriculture Fund for Rural Development (EAFRD); co-funded by national/regional authorities
Investment (INVEST) interventions	Fund structural changes and improvements in farming infrastructure (both productive and non-productive)	One-time funding for long-term projects; voluntary	EAFRD; co-funded by national/ regional authorities

In the latest round of reform, the ‚enhanced' conditionality, including Good Agricultural and Environmental Conditions (GAEC), replaced the former Cross Compliance and Greening rules, introducing stricter mandatory environmental standards that farmers must meet to receive direct payments. Conditionality represents a key instrument in the CAP as it leverages direct income support – which has the largest financial allocation – to support broad environmental care in farming practices (EC, 2019). Provisions such as the long-standing requirement to establish buffer strips along watercourses (GAEC 4) and the new requirement to protect wetlands and peatlands (GAEC 2) are particularly important for maintaining water quality and hydrological integrity.

The Polish eco-scheme "Water retention on permanent grassland" (i.e. I 4.5) promotes water retention on farmland affected by flooding. Farmers are compensated for making their land available for water storage, helping reduce carbon dioxide emissions and improve water management.

Eco-schemes are voluntary payment schemes that reward farmers who adopt practices that go beyond the mandatory requirements of conditionality. They were introduced in the last reform to significantly raise the environmental ambition of the CAP by leveraging direct payments as an incentive to farmers to adopt practices beneficial for the environment and the climate (EC, 2019). Eco-schemes are characterized by their one-year commitment period and generally simpler requirements compared to Agri-Environment-Climate Commitments (AECCs), as described below, aiming to facilitate broader participation among farmers and greater area coverage. This approach, however, entails a trade-off, as these simpler requirements tend to encourage uptake but offer limited transformative impact and environmental benefits.

In Sweden, the ENVCLIM intervention "Compensation for the management of wetlands and ponds" (i.e. VÅTMARK) supports the maintenance of constructed and rewetted wetlands. Farmers receive compensation for managing water levels, removing invasive vegetation, and preserving biodiversity, thereby improving nutrient retention capacity, natural hydrological cycles, and biodiversity.

ENVCLIM interventions combine longer existing commitments including AECCs, organic farming, and animal welfare. Compared to eco-schemes, they provide longer-term support for generally more ambitious and targeted practices, though there is considerable variation in the level of environmental ambition across interventions. While the previous CAP capped payment levels, the 2023–2027 CAP allows MS more flexibility.Although premia must still be formally based on the principle of costs incurred and income forgone, they can now be set to meet targets, allowing them to be based on the cost of the most expensive hectares rather than average costs. However, this opportunity remains underutilised by many MS (Chartier et al., 2023).

Figure 2 illustrates the number of CSPs that include at least one intervention – either via eco-schemes or ENVCLIM interventions – promoting selected farm practices beneficial for freshwater ecosystem health. Most popular are interventions aimed at improving soil health, followed by initiatives to protect riparian zones through buffer strips along watercourses, and more broadly, those safeguarding grasslands from ploughing. These are mainly 'land sharing' measures, that allow farm production to continue, with farmers benefiting from investment in their own natural capital. In contrast, few countries provide financial support to measures reducing agricultural drainage, removing embankments to allow flooding, and restoring or creating wetlands (see also Rouillard et al., forthcoming). These latter measures may require 'land sparing', and whilst there are benefits (such as replenished soils and groundwater levels) to the farmer, the benefits are often for wider society through reducing risks of floods or droughts. Regarding differences per intervention type, eco-schemes predominantly support land sharing measures, while ENVCLIM interventions include both land sharing and land sparing approaches.

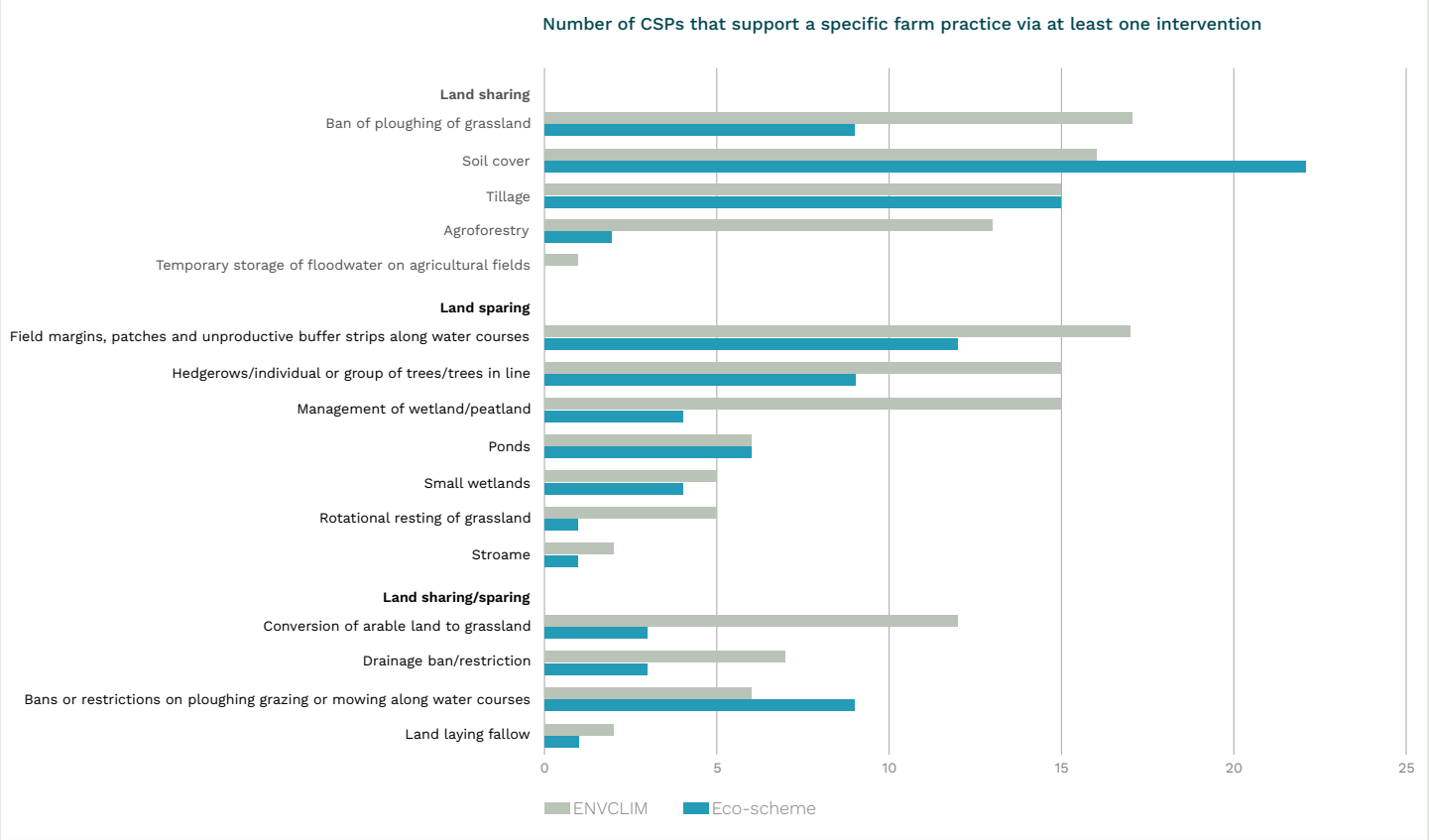

***Figure 2:** Number of CSPs that support a specific farm practice via at least one eco-scheme or ENVCLIM Intervention.*
***Note:** For land sharing/sparing, the categorisation depends on the subsequent use of land.*

The German investment intervention "Non-productive water investments" (i.e. EL-0401) aims to improve water retention in the landscape, enhance hydromorphology, and reduce surface water pollution.

INVEST interventions support capital investments in environmental and climate infrastructure. The new CAP allows up to 100% public funding for non-productive investments, such as the establishment of restoration of landscape features, peatland rewetting and habitat restoration. Investment may therefore be of use when agricultural land is brought out of production or when restoration involves significant one-off costs.

MS are free to programme other interventions, such as compensatory payments for reaching specific environmental objectives linked to the implementation of Natura 2000 protection or the WFD. Sectoral support may be relevant to support uptake of environmental measures in specific agricultural sectors like fruit and vegetables or wine. Moreover, support is available for training and skills enhancement, and for measures encouraging cooperation between farmers, food actors, and other rural stakeholders. This includes e.g., support for the European Innovation Partnership for agricultural productivity and sustainability (EIP-AGRI), which promotes innovation and knowledge exchange through operational group projects and research initiatives, many of which address water-related challenges. There are also examples of cooperation-focused interventions, such as in Ireland as described in Textbox 2 below. While such examples exist, an analysis of their design also shows their limited use by MS or their lack of tailoring to freshwater needs (Rouillard et al., forthcoming).

Overall, the current CAP is a step forward in terms of environmental and climate ambition, including support for freshwater ecosystems. However, this progress has been largely incremental and insufficient to achieve water policy objectives (ECA, 2024), especially amid increasing pressures from climate change and loss of biodiversity, habitats, and species (IPBES, 2024). In the next sections, we propose six areas of improvements, based on our observations of MS choices in the current programming period and taking into account policy discussions on the future of agricultural and food policy.

Matching ambitions with funding

With an average of EUR 55 billion per year, the overall budget of the CAP accounts for 31% of the overall Commission budget of the 2021-2027 period (Giuliani & Baron, 2025) and is significantly larger than EU funding available for nature protection and restoration (e.g., LIFE funding for 2021-2027 with EUR 5.4 billion per year). Therefore, it is critical to ensure that the budget allocation is effectively implemented to meet the full range of CAP objectives, including the green objectives relevant to freshwater restoration. Based on our calculations[1], the current share of national CAP budgets allocated to green CAP interventions[2] varies widely across MS. The EU average stands at 29.9%, with 13 MS falling below this threshold – Hungary recording the lowest allocation at 19% – while 15 MS exceed it, with Czechia reaching nearly 50%. A detailed analysis of funding options shows also that several countries stayed at or near the minimum required under the CAP Regulations[3].

Regarding freshwater restoration, existing EU tools and public data do not enable a direct assessment of MS' financial allocations to **freshwater-related objectives**. Nevertheless, available figures allow for a general estimation of priorities: approximately 35% of the eco-scheme budget and 66% of the ENVCLIM budget support area-based payments aimed at protecting water quality (i.e., linked to R21). Significantly less funding is directed at sustainable water use (i.e., linked to R23), with only 14% of the eco-scheme and 8% of the ENVCLIM budget targeting these issues (Chartier et al., 2023)[4]. This may also indicate that MS plan to address water stress through infrastructure investments, rather than changes in farm practices.

[1] Calculation of the share of green CAP instruments is based on the aggregation of national allocations to eco-schemes (2024–2028), and environmentally focused EAFRD interventions (2023–2029) including agri-environment-climate commitments (AECCs) and other green rural development actions. Combined allocations are expressed as a proportion of each MS's total CAP budget, defined as the sum of national envelopes for direct payments and EAFRD funding over the respective programming periods.

[2] The definition follows the Commission's assessment of green interventions: eco-schemes, ENVCLIM, green investments, areas with specific disadvantages (ASD), and 50% of areas with natural constraints (ANC). It could be argued that this is an overestimation, as ANC payments are not clearly linked to environmental requirements and may support agricultural practices in areas where it may be better to reduce agricultural pressure particularly on water resources.

[3] The CAP Regulation 2021/2115 requires that MS allocate at least 25% of direct payments under EAGF for eco-schemes and at least 35% of EAFRD for green interventions.

[4] Note that the Result Indicator related calculations only include eco-schemes and ENVCLIM interventions and do not track e.g., investment support, which may also deliver benefits for freshwater ecosystems.

However, infrastructure investments may help address water demand and supply issues in some cases but will not necessarily address the wider issues of stopping biodiversity decline and taking climate action (Martin et al., 2021).

Against this background, the 'Strategic Dialogue has recently concluded to the need to significantly **increase financial support to environmental and climate actions** throughout the following two CAP periods to meet the EU's environmental objectives (SDFA, 2024). It also called for an additional funding instrument in the form of an Agri-Food Transition Fund outside the CAP, dedicated to enabling a large-scale transformation of the European agricultural sector. These proposals do not appear in the recent proposals on the next MFF presented by the EU Commission (EC, 2025c). Instead, the EU may move toward a more integrated funding landscape post-2027, in which environmental and climate action is mainstreamed with sectoral, regional, and cohesion funds – with a significant risk of diluting environmental spending (Hart & Baldock, 2025). In such landscape, the establishment of **strong ringfencing mechanisms** for green spending within agricultural policies will be crucial to safeguard environmental outcomes and prevent the dilution of ecological objectives amid competing priorities.

Other avenues highlighted in the Strategic Dialogue (SDFA, 2024) as well as in the Vision (EC, 2025a) and the recent proposals of the Commission on the next MFF included attracting additional private capital to realise environmental and climate objectives. Whilst these avenues may leverage additional funding for restoration, several barriers must be overcome as explored in the MERLIN work on the role of private finance in freshwater restoration (Rouillard et al., 2025b).

Avoiding conflicting incentives

A review of MS choices in the CSPs suggests a lack of a strategic approach to restore and protect freshwater ecosystems (Chartier et al., 2023; Rouillard et al., forthcoming). Instead of leveraging synergies across instruments and interventions, the current approach often results in fragmented measures and overlapping schemes, creating complexity for farmers and reducing the overall impact[5]. At best, this leads to inefficiency, at worst, it creates conflicts between the green and non-green instruments.

Several transitional and flexibility provisions were introduced during the legislative process. For instance, MS were allowed to postpone implementation of GAEC 2 on the protection of wetlands and peatlands, and many have taken advantage of this option (Nemcová & Caiati, 2022). With increased subsidiarity, MS had greater flexibility to tailor policies to their specific regional conditions. This approach has, in practice, led to significant disparities in environmental obligations and incentives across the EU, and overall, did not lead to significant increases in environmental ambition (ECA, 2024).

This trend was further reinforced by Russia's invasion of Ukraine, which shifted political priorities toward food security, and by widespread farmer protests across several MS. In response, GAECs have now been weakened with the two rounds of simplification packages, effectively rolling back key environmental provisions of the CAP. These included the relaxation of several GAEC standards. Most notably, the obligation to maintain a minimum share of unproductive areas and features under GAEC 8 was removed and replaced by the requirement for MS to offer a corresponding eco-scheme (EP, 2024). More recently, elements of GAEC 2 from the baseline for eco-schemes and AECCs were removed, allowing MS to compensate farmers for maintaining wetlands and peatlands. Additionally, GAEC 4 was modified to allow greater flexibility in defining watercourses (EC, 2025d).

The erosion of the GAEC framework – possibly further implemented in the next MFF (Hart & Baldock, 2025) – is a major challenge. Maintaining ambitious conditionality requirements is crucial, as they provide a mandatory baseline for protecting wetland, peatlands, and freshwater ecosystems which voluntary interventions cannot replace but should build upon. This calls therefore for **more ambitious implementation of conditionality** instead of their removal. For instance, GAEC 2 would benefit from integrating strict protection requirements (e.g., no drainage, ploughing or conversion of wetlands, restrictions on ploughing and machinery use on peatlands), while GAEC 4 could be strengthened through wider buffer strips, preventing ploughing or tilling

[5] See results from the Thematic Group on Green Architecture: Designing Green Strategies | EU CAP Network

to fully recreate woody riparian vegetation, and importantly preventing exemptions or a restricted definition of watercourses on which the GAEC applies.

In addition, certain investment subsidies and sectoral aid can inadvertently undermine water protection objectives. To avoid conflicting incentives, non-green interventions should include **ambitious environmental performance standards**. Current CSPs provide limited funds to promote low water demanding cropping systems and while there is considerable support for soil health, related measures are seldomly targeted at strategically enhancing natural water retention to increase landscape water resilience. In CSPs, water stress is mostly addressed through productive irrigation investments that may perpetuate abstraction pressure and water-intensive cropping systems in water-stressed areas. The requirement to save water when investing in irrigation[6] is an indispensable mechanism, however, it currently applies only to improvements of existing installations and infrastructure in areas where water bodies are under stress. Expanding this obligation to also cover water bodies at risk of future stress and tightening water-saving requirements would strengthen the regulation. Moreover, particular care should be given to the expansion of irrigation, the construction of reservoirs, and to drainage schemes and operations – especially in regions where water bodies are already under stress or are projected to face increasing pressure as a result of reduced water availability due to climate change.

The proposed redesign of EU budget aims to increase national discretion over spending (EC, 2025c). This may increase flexibility but also risks blurring accountability and leading to uneven implementation across MS. To prevent environmental backsliding, it is critical to maintain common minimum standards and a coherent intervention framework.

Textbox 1. Design of the French eco-scheme

France has one holistic eco-scheme (31.01) that supports farmers in their transition to more sustainable practices and rewards them through market-based mechanisms. The scheme provides a flat-rate payment per eligible hectare and farmers can choose from three non-cumulative access routes:

- The Environmental Certification route allows farms with an organic certification or high-level environmental certification under the renovated High Environmental Value scheme to obtain automatic eco-scheme payment. The organic and High Environmental Value certification include many dimensions that will be beneficial for water management, regarding use of synthetic fertilisers, chemical pesticides, as well as criteria on efficient irrigation, monitoring, and reduced abstraction.
- The Practices route requires agro-ecological practices across the entire farm, including permanent grassland maintenance, crop diversification in arable settings, and inter-row vegetation cover in orchards and permanent crops. These practices are not specifically water-focused but offer co-benefits such as improved infiltration, reduced runoff, and erosion control.
- The Biodiversity Elements route rewards the presence of agro-ecological features such as hedgerows, ponds, and buffer strips, some of which help protect water quality and regulate flows through temporary water retention and runoff filtration.

Yet, concerns remain about the low environmental ambition of these routes, as many criteria can be met without meaningful changes in practice. Furthermore, protection of freshwater ecosystems is a co-benefit, yet not the central focus of the scheme. This illustrates that while the equivalence mechanism has potential for freshwater restoration, careful attention to the how the specific requirements can meet the ambition is needed.

Rewarding better the adoption of measures at farm level

CAP funding still focuses on compensating for the uptake of farm practices, rather than recognising and actively rewarding existing positive contributions to ecosystem services (Baldock & Bradley, 2023; SDFA, 2024). The Strategic Dialogue has underscored the need for the CAP to take on a **stronger role in delivering public goods**, particularly through better incentives and rewards for farmers who contribute to biodiversity conservation and water protection (SDFA, 2024). However, not all freshwater restoration measures require the same type of financial support.

Some restoration measures, such as those that optimise the use of synthetic fertilizers and pesticides or encourage more efficient water use, do not require any changes in land use (land sharing). Others, such as creating small scale features along fields (e.g., buffer strips, hedgerows) are land sparing. These can result in minor production losses in the short term but can increase productivity in the long run by improving water retention, soil health, and agro-ecosystem resilience (Moret-Bailly & Muro, 2024; OIEAU, 2024).

[6] Article 74 of CAP regulation 2021/2115 requires that investments in irrigation result in effective water savings and are subject to prior assessment to ensure compliance with the WFD and avoid negative impacts on water bodies.

Given both land sharing and some land sparing practices can improve productivity overall, instead of maintaining compensatory payments indefinitely, adoption of such **agroecological measures should be better supported through loans and/or through market-based mechanisms**, such as environmental certifications[7] or protected geographical indications that require restorative agriculture[8]. Certification schemes would improve farmers access to more favourable market conditions, especially if actively supported by cooperatives and food value chain actors.

To encourage this transition, agricultural policy funding could establish an 'equivalence' mechanism ensuring automatic compliance of certified farms with conditionality or the lower tiers of environmental payments to reduce bureaucracy for the farm business (Pekdemir, 2018). Some countries, such as France, have opted for an access route to eco-scheme payments, which includes various criteria relevant to water management (see Textbox 1). Compensatory payments would therefore be of transitionary nature and more effectively integrated with the range of market mechanisms that better reward agroecological farm production.Better market conditions for production systems adopting 'win-win' measures could free CAP resources for some of the most ambitious freshwater restoration measures, such as large-scale wetland restoration or the rewetting of peatlands. These involve fundamental changes to land use and can result in reductions in agricultural production, therefore requiring compensation for delivering societal benefits.

To support farmers in undertaking major changes in land use, it is essential to adopt longer term CAP support schemes. These should combine investment in the (re)creation and management of non-productive features – such as wetland and other unproductive landscape features – and area payments, bringing security of funding for farmers during transition of their farm practices.

CAP investment support and area payments could be designed to support the transition in floodplain, wetland, and peatland areas. For instance, some MS, such as Germany and Latvia, have started to support the adoption of paludiculture (e.g., horticulture, biofuels or pharmaceuticals/health products) to help with peatland restoration.

To secure long term funding, alternative revenue streams are necessary to compensate for lost income. Currently, result-based schemes can be designed in the CAP, although few MS have yet opted for that route, especially regarding payments for freshwater restoration (EC, 2024b). Moreover, even these schemes are typically based on costs incurred or income foregone, rather than offering genuine performance incentives. To date, only one MS, namely Ireland, included a criterion relevant to water management in its reward based ENVCLIM intervention (see Textbox 2). While CAP result-based schemes are relevant, they are dependent on the short funding cycle of the CAP, which mismatches the long-term impact of major land use change associated with some freshwater restoration measures, such as rewetting wetlands and peatlands.

Textbox 2. Irish ENVCLIM intervention

Ireland's ENVCLIM intervention (AECMCP70) stands out as one of the few genuinely reward-based schemes targeting freshwater restoration. It is designed to deliver environmental outcomes at landscape and catchment scale, with a strong emphasis on water quality improvement. Participating farmers receive payments that are partially results-based, using scorecards to assess progress toward environmental goals, including reduced nutrient runoff and improved ecological status of water bodies. The measure is implemented in high-priority geographic areas, such as those identified in Ireland's River Basin Management Plans, and is aligned with the objectives of the Water Framework Directive. By rewarding measurable improvements rather than just measuring management actions, Ireland's AECM sets a precedent for how the CAP can more effectively support ecosystem service delivery, especially in the context of freshwater protection and restoration.

Moreover, the intervention cooperation option amplifies its impact by fostering collective action among farmers and land managers within the high-priority areas. Rather than approaching farms as isolated units, it facilitates coordinated efforts to address environmental challenges at landscape scale. This collective model is supported by locally based project teams who play a key role in planning and implementation by helping to identify regional priorities related to biodiversity, water, and climate, and work with farmers to set objectives and develop strategies to address them. As part of the process, farmers are required to submit a Farm Sustainability Plan aligned with the overarching action plan of the Cooperation Project. By anchoring the intervention in locally defined priorities, the cooperation option enhances both the relevance and the impact of the measure.

[7] For example, Unilever Sustainable Agricultural Code requires efficient water use, irrigation planning, drainage management to protect water quality or various organic certification processes; or the EU Organic Regulation (2081/848) that also requires regenerative practices that support freshwater ecosystems.

[8] For example, the BioLand ecolabel, see Chen et al. (2024).

These land sparing practices require ongoing maintenance, which are often not well covered by the capital INVEST instruments. Payments offered by water utilities (e.g., Thomson et al., 2014; Vuletić et al., 2020), carbon farming arrangements under Regulation 2024/3012, or biodiversity crediting systems (BCA, 2023) may provide long-term financial incentives for land managers who contribute to freshwater restoration beyond individual CAP programming periods. However, such Payment for Ecosystems Services and ecosystem markets have drawbacks and potential high transaction costs (Reed et al., 2017) – these must be addressed before upscaling. A more streamlined approach would also be needed to facilitate a switch from CAP payments to long term non-CAP sources of funding and payment schemes.

Maximising benefits at the landscape level

Encouraging stronger and longer cooperative efforts – such as landscape-scale management initiatives (e.g., whole floodplains, catchments) – can help achieve measurable improvements in biodiversity, water quality, and climate resilience (Pe'er et al., 2022; Hering et al., 2023). They are essential for water preservation efforts as impacts mostly arise from the cumulative pressure of farms across river catchments (OECD, 2017). However, current CAP incentives are mostly designed as individual farm-level measures (ECA, 2024), and cooperation is underdeveloped in the plans (Chartier et al., 2023). As a result, they often fail to deliver cumulative benefits at a meaningful scale, for instance by incentivising a diversity of uncoordinated and weakly targeted changes in land use management amongst several farmers active in the same catchment (Pe'er et al., 2022).

MS can propose cooperation interventions in their CSPs. However, they are currently mostly underdeveloped and not designed for landscape-wide freshwater restoration (Chartier et al., 2023). They fail to be attractive, poorly reward the collective effort, and often face operational constraints in implementation (ENRD, 2018).

One approach to incentivise landscape scale approaches is to include appropriate selection criteria that prioritise coordinated applications of farmers to rural development funds. Generally, such targeting of CAP funds would be beneficial for freshwater restoration, especially if informed by river basin and flood management planning under WFD and the Floods Directive, and other water and nature protection policies (e.g., Nature Directives, Nitrates Directive, Nature Restoration Regulation). The Irish example in Textbox 2 shows one way to integrate cooperation with agri-environment measures.

Textbox 3. The Dutch landscape scale collaborative approach

Under its ENVCLIM interventions, the Dutch Strategic Plan supports collective approaches, where certified farmer collectives act as legal entities that coordinate and implement landscape-scale management across multiple holdings. These collectives submit area-based habitat proposals, receive results-based payments per hectare, and distribute funds to their member land managers. The scheme aims to conserve biodiversity – particularly habitat for endangered species – while also addressing water and climate objectives. Specific measures contribute directly to the goals of the Water Framework and Nitrates Directives by enhancing water quality and retention through environmentally friendly management of ditches, banks, and other hydrological features across entire catchments. (Source: Reichenspurner et al., 2024)

Another approach is to support local landscape partnerships or groups who collaborate and develop schemes across multiple farm holdings. This may exist under ENVCLIM interventions (see Textbox 3), LEADER or the European Innovation Partnerships. More generally, major opportunities lie in joint projects between farmers, land managers, and municipalities – more closely linking rural and urban areas for the benefits of restoration to trickle down whole catchments and river basins. Hence, CAP synergies with other European funds, such as LIFE, Cohesion Policies, and Regional Funds, must be enhanced to leverage public funding for landscape wide ('territories') transitions. The MERLIN Agricultural Sector Strategy outlines more specific examples and recommendations (le Clech et al., 2025).

Adopting a performance-based monitoring framework

To ensure that future CAP interventions effectively support freshwater protection and restoration, better alignment between policy objectives, implementation tools, and measurable outcomes is essential. A **robust monitoring and evaluation system** that goes beyond administrative oversight to assess real-world impacts plays a critical role in identifying what works, where, and why. This is especially important for water-related measures, where ecological responses are often cumulative and spatially diffuse, and where success depends on actions across multiple farms and landscapes. At present, CAP monitoring systems provide only limited insight into the actual ecological outcomes of agricultural practices, especially regarding water quality, hydrological function, and ecosystem health. Current metrics overlook key drivers of ecological degradation and fail to capture landscape scale interactions.

To improve the CAP's environmental performance, its evaluation framework must incorporate more comprehensive indicators that reflect pressures on water and soil systems at landscape and catchment scales (ECA, 2024). Existing WFD indicators (e.g., agricultural pressures at the water body level) and EU datasets, such as the Farm Sustainability Data Network (FSDN) with a regional granularity (at best NUTS3), offer a foundation for better metrics as combined they can quantify both pressures and impacts. Yet, challenges remain with the lack of physical rather than financial quantification of metrics in FSDN (Matthews et al., 2021) and need to include more business to allow basin specific analysis (and managing issues of disclosure). Moreover, enhanced soil monitoring – via European sample archives, high-throughput indicators, and precision agriculture – would also support integrated land and water management.

Importantly, monitoring should not be designed solely for compliance. It should also support learning, transparency, and peer exchange among farmers, advisors, and administrations. For example, locally relevant monitoring, such as the results-based scorecards used in Ireland's AECM intervention (see Textbox 2), can build trust and engagement while enabling flexible, place-based responses. Similarly, landscape partnerships like those in the Netherlands (Textbox 3) require shared monitoring frameworks to coordinate efforts and reward joint outcomes.

Ultimately, improved performance tracking will help justify funding, demonstrate the added value of nature-based solutions, and direct support towards those interventions and actors that most effectively contribute to restoring healthy rivers, wetlands, and catchments.

Final remarks

The future CAP must actively strengthen the resilience of the European farming system by promoting sustainable agricultural practices and by preserving and restoring freshwater ecosystems. There is an urgent need to reduce environmental pressures and to restore ecological functions within agricultural waterscapes. This paper shows how the future CAP can do more to embed water protection across its instruments. Where water is currently addressed in the CAP, it tends to relate to water as a resource, with little recognition of the importance of freshwater ecosystems. Yet, without safeguarding ecosystem health, the services and benefits on which European agriculture relies cannot be guaranteed. Achieving true resilience and sustainability requires the CAP to adopt a more systemic understanding – one that includes water, landscape, and agroecosystem functions across spatial and temporal scales. It also calls for better integration of EU agricultural policies with the broader agri-food interface to better internalize environmental costs and align market demand with the imperative of freshwater and environmental restoration, so that consumers appreciate and reward water-friendly farming.

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Further reading

- MERLIN Agriculture Sectoral Strategy
- Rouillard, J., Meier, J., Blackstock, K. L., Matthews, K. B., & Birk, S. (Forthcoming). Does the Common Agricultural Policy 2023–2027 support the restoration of freshwater ecosystems? Nature Conservation.

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Advancing the Water Resilience Strategy through Sponge Landscapes and Nature-Based Solutions for a Climate Resilient Europe

Core Message

The European Water Resilience Strategy (EWRS) sets out an ambitious vision: climate-resilient landscapes that are adapted to both floods and droughts. Integral to this is the restoration and protection of the natural water cycle (pillar 1 of the EWRS). Delivering this vision requires a shift in how Europe manages its water and soil systems. Scaling up Nature-based Solutions (NbS), ecosystem restoration, sustainable land management and urban greening are central to this transformation.

Sponge landscapes — ecosystems that capture, store, and slowly release water (Figure 1) — are a cornerstone of this approach. By restoring sponge functioning, Europe can reduce flood peaks, replenish groundwater, and strengthen resilience during droughts. The proposed **European Sponge Facility** can play a pivotal role by consolidating evidence, supporting a community of practice, and guiding Member States (MS) and regions on funding and implementation pathways.

This policy brief outlines concrete policy recommendations for operationalizing the EWRS by addressing key gaps in the interplay between EU-level policy-making, Member State (MS) policy implementation and local action based on lessons learned from EU research projects. It brings together our current understanding of how sponge landscapes can contribute to hydrological functioning and climate resilience, and outlines pathways for EU-level, MS-level, and local actors to deliver sponge strategies at scale and to restore the water cycle and strengthen climate resilience. It draws on evidence and practical experience from EU-funded projects and demonstrates how governance, policy integration, innovative research, stakeholder engagement and finance can enable large-scale implementation, putting the EWRS into practice.

Why Sponge Landscapes Matter

Across Europe, decades of drainage, water abstraction, soil degradation, and intensive land use have weakened natural sponge functioning. Restoring it helps capture rainfall where it falls, slow runoff, reduce flood peaks, and store water in soils, floodplains, and aquifers. These functions support the EWRS's Green and Blue Corridors initiative and complement the objectives of the Nature Restoration Regulation.

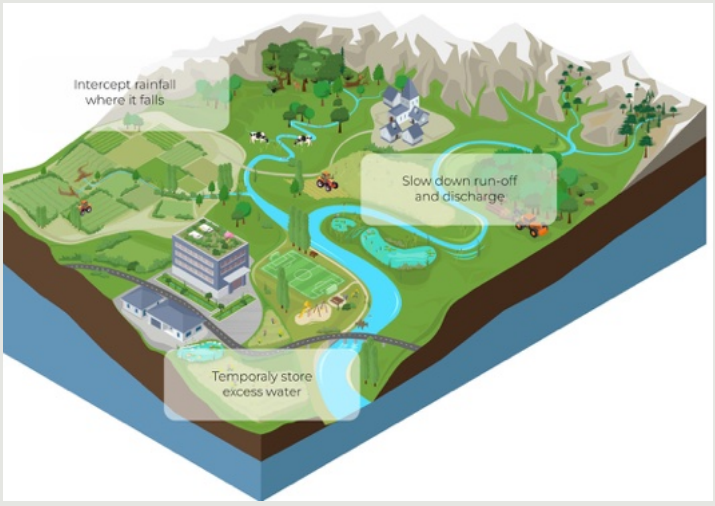


***Figure 1:** Sponge landscapes intercept rainfall where it falls, slow down run-off and discharge and temporally store excess water*
(source SpongeScapes policybrief 1)

Effective implementation of EWRS goals related to enhancing sponge landscapes depends on stronger connections between EU-level policy design, MS-level planning, and local implementation. Knowledge must flow in both directions: EU institutions need access to local realities and tested practices, while local actors require clear guidance, comparable data, and coherent policy frameworks (Figure 2).

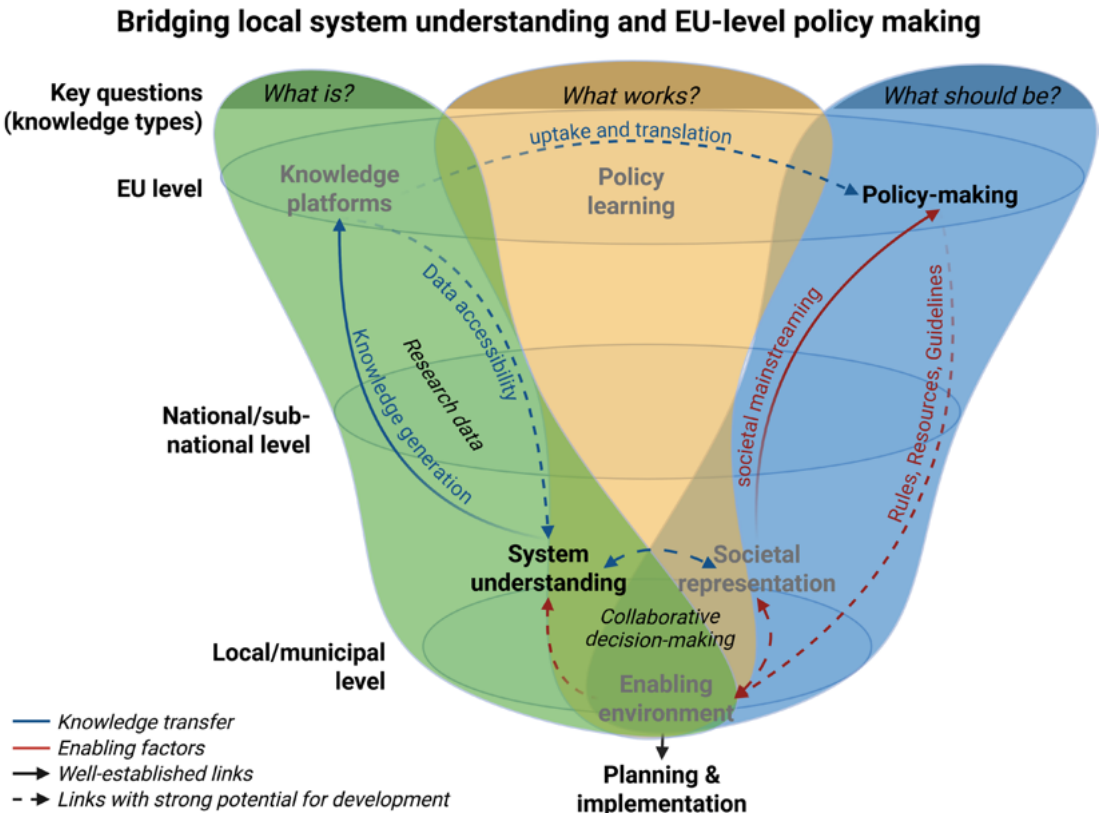


Figure 2: Conceptual diagram on the integration between the local (implementation) and EU (policy) levels.

Many EU-funded project outputs are currently expanding the evidence base on sponge functioning. However, **governance and upscaling** are key bottlenecks in utilizing this knowledge for the delivery of impact at scale.

Upscaling NbS depends on a functioning **enabling environment** – a coherent set of policies, regulations, participatory norms and financing mechanisms that support the long-term implementation of NbS (Figure 2). It requires accurate knowledge about current systems, tested insights into effectiveness and socio-economic realities, and forward-looking understanding of desired futures. This in turn requires strengthening the feedback loops between **local system understanding** and **EU-level policy making**.

Three types of knowledge underpin effective policy (Figure 2): understanding what is (system conditions and data), **what works** (tested practices and policy learning), and **what should be** (visions and regulatory direction).

At the **local level**, the three knowledge types are addressed by an interplay of local system understanding and societal representation. **Societal representation** relates to what works and what should be by harnessing perspectives, knowledge and past experiences of local stakeholders and involving them in a collaborative decision-making process. On one hand, it fosters acceptance by embedding visions, values, and priorities from stakeholders and communities into planning and decision-making through co-creation. On the other hand, stakeholder knowledge can be incorporated into research to enhance **system understanding**. It relates to understanding what is (local biophysical and socio-economic realities) and what works (tested practices, experiential knowledge, and biophysical limits).

Research processes then translate this combined knowledge into accessible outputs. Locally, this provides practitioners with robust data and lessons from other regions. At higher governance levels, it **enables policy learning** by making local insights discoverable and transferable. Policies informed by diverse local realities and strong evidence are more targeted, effective, and implementable.

Despite the substantial evidence generated by EU projects, knowledge remains fragmented across platforms and difficult to access. Improving the **findability, accessibility, interoperability, and reusability of data** would significantly strengthen policy learning and support implementation.

Actions for achieving sponge landscapes

To enhance water-resilient sponge landscapes it is necessary to adopt a '**green where you can, grey where you must**' approach. This approach emphasizes the importance of prioritizing nature-based (green) solutions to address societal challenges while acknowledging that complementary technical (grey) solutions may be required to ensure risk reduction potentials in high-risk areas and during more extreme events, providing additional benefits to those provided by green solutions.

This approach needs to be underpinned with a governance and policy environment that supports mainstreaming NbS. EU- and MS-level institutions can shape the enabling environment by providing actions on **1. Aligning policies and regulations, 2. Strengthening comparability and accessibility of local system understanding, 3. Facilitating stakeholder engagement and co-design** and **4. Enabling flexible financing instruments**, which are outlined below.

1. Aligning Policies

Improved alignment across policy domains ensures that sponge strategies are consistently supported by water, climate, nature, agriculture, and land-use policies. The EWRS offers important opportunities to break down silos across policy domains and place cross-sectoral governance and NbS high on the agenda of the current policy planning processes. The proposed Sponge Facility and the ongoing water dialogues with Member States can serve as platforms to integrate actions needed for the implementation of flood risk management, Water Framework Directive's (WFD) river basin planning, policy frameworks of soil health and land use change and Nature Restoration Regulation (NRR) restoration targets planning (e.g. the National Restoration Plans). Other existing policies to be aligned include the Common Agricultural Policy (CAP) and CAP Strategic Plans (CSP), Climate Adaptation Strategies and, National Energy and Climate Plans (NECP).

Aligning these processes will help ensure that measures are coherent across scales and sectors, and that agricultural (including forestry) and urban policies support rather than undermine water resilience.

Water dialogues and regular exchanges with regions, cities and water authorities, to promote exchange of best practices on “sponge landscapes”, are flagship actions of the EWRS governance and implementation enabling areas. Cross-sectoral collaboration is essential, and the EWRS provides the political momentum to convene the right actors at the same table. MERLIN’s routemap on cross-sectoral action offers concrete recommendations and examples of measures that deliver multiple benefits across policy domains, such as floodplain restoration, regenerative agriculture, wetland rewetting, and river remeandering.

Recent feedback to the Commission’s 2025 open call on climate resilience and risk management shows strong support for resilience by design, harmonised climate risk assessments, NbS as a first line of defense, long-term adaptation funding, and attention to climate-related health impacts. Building on this momentum, the EU should consider requiring Member States to adopt sponge targets under forthcoming climate resilience legislation. This approach is already in place in Belgium, where the Flanders Blue Deal includes water retention / sponge targets for priority catchments.

2. Strengthening local system understanding

The EWRS places strong emphasis on NbS and sponge measures and their effectiveness is now well demonstrated. A substantial evidence base has emerged from EU-funded initiatives: MERLIN’s 18 demonstration sites, the 140 examples catalogued at NWRM.eu, the 31 overall cases from SpongeScapes, SpongeWorks and SpongeBoost, and the FutureLakes portfolio of six sites and three associated regions are amongst the +100 projects in the EU on Nature-based Solutions. Together with recent scientific reports — including SpongeScapes Critical review, FutureLakes Innovation Review and the recent publications (e.g. Almasi et al. 2025; Zhu et al. 2024), these projects show that sponge measures can improve hydrological functioning, reduce flood impacts, enhance drought resilience, deliver multiple ecosystem services, and support biodiversity.

Strengthening the evidence base - example *SpongeWorks’ strip-tilling test in the Pinios basin (Greece) reduced fuel and irrigation costs, improved infiltration, avoided ponding, and supported a successful harvest.*

To translate these results into impact at scale, lessons from pilot sites must be learnt and adapted across catchments and regions. This requires embedding evidence into policy and planning frameworks, strengthening organisational capacity for implementation and monitoring, and building long-term support through stakeholder engagement and shared narratives. EU projects are already developing tools to support this transition; MERLIN’s Regional Scalability Plans, for example, provide guidance for adapting sponge measures to regional contexts.

Despite a strong knowledge base, gaps remain in the understanding of Europe’s freshwater and marine systems, water resource availability, and the water-energy-food-ecosystem nexus. Integrated assessments that combine flood, drought, and biodiversity dimensions are still needed, as are harmonised guidelines for model selection, monitoring approaches, and performance indicators. Tools such as the SpongeScapes model selection map and MERLIN’s monitoring and modelling guidance offer a starting point.

Finally, knowledge must be easier to access. Centralised platforms or crosscutting workflows that draw from multiple sources would help ensure that evidence reaches practitioners and policymakers. Existing platforms -including the Copernicus Emergency Management Service, community-based monitoring initiatives and the Global Biodiversity Information Facility (GBIF) can complement EU efforts to strengthen collective resilience.

3. Enhancing stakeholder engagement and co-creation

To make the EWRS work in practice, policies must be underpinned by strong and trusted relationships with the people and sectors that depend on water. Evidence from MERLIN shows that early and continuous stakeholder involvement is essential: listening to local needs, communicating benefits and tradeoffs clearly, and ensuring fair representation all help build acceptance of NbS and reduce conflict. These approaches support the codesign of regional strategies and the coordinated implementation of catchment-wide measures, enabling sectors such as agriculture, hydropower, and conservation to align behind shared water resilience goals.

Longterm resilience also depends on sustained cooperation between sectors and on strengthening local capacity. Providing authorities with training, participatory methods, and social science expertise equips practitioners to engage communities effectively and increases the likelihood that restoration measures can be scaled across Europe. Regularly monitoring who participates and how decisions are made helps ensure that engagement remains inclusive and effective. When paired with well-designed and well-resourced stakeholder processes, the EWRS can foster the trust, shared ownership, and practical momentum needed to secure Europe's freshwater systems.

Innovative tools can further enhance dialogue. SpongeScapes' GeoDesign approach, tested in the Aadal Noord (NL) and Leze (FR) catchments, enables stakeholders to explore future scenarios and codevelop shared visions. Complementary resources – including SpongeScapes' and SpongeBoost cartoon series and games, MERLIN's infographics and SpongeWorks' solution cards, and advanced digital spatial mapping tools - help translate complex concepts into accessible formats. Consolidating these materials within the Sponge Facility would provide practitioners with practical guidance and examples. Crucially, all engagement efforts must be tailored to local contexts, using storytelling and communication approaches that reflect cultural differences across stakeholder groups and Member States.

4. Driving Financing and Investment

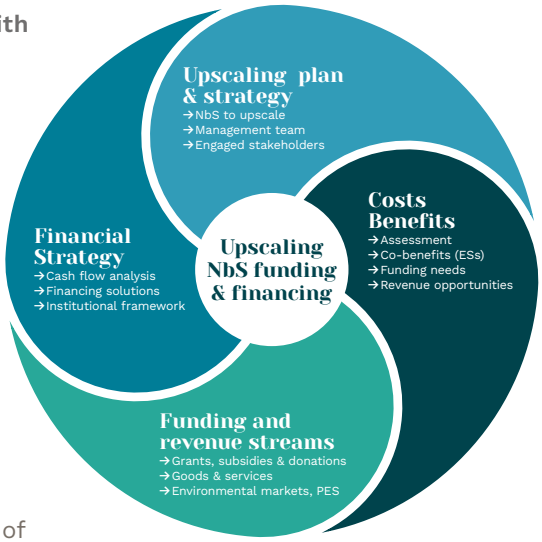
Finance remains a decisive factor for scaling NbS and meeting the EWRS targets. **Diversifying funding sources and expanding blended-finance models will be essential** to upscaling NbS implementation. In such models, public actors reduce investment risks through regulation, cofunding, or guarantees, enabling private capital to enter, while private investors provide scale. The Wyre Catchment Natural Flood Management project in England illustrates how such models can mobilise investment, though uptake in the EU remains limited.

Unlocking private finance requires implementing authorities to adopt new financial competencies and to develop NbS projects at a scale that matches investor expectations. This remains a challenge: despite the European Investment Bank's EUR 15 billion commitment for 2025–2027, many NbS initiatives are too small to access such opportunities. MERLIN's financial planning workflow helps NbS managers design more investable upscaling initiatives and strengthen private sector involvement.

Clear evidence on the costs and benefits of NbS is also critical. Economic assessments such as Cost-Effectiveness and Cost-Benefit Analyses must capture the full range of benefits, co-benefits and trade-offs. MERLIN's Cost-Benefit Analysis of floodplain restoration in the "Room for the Rhine" case (Kok et al., 2025) demonstrates how such assessments can support decision-making and strengthen the case for investment.

Public and philanthropic funding will continue to play a central role, particularly through agri-environmental schemes that incentivise landowners to adopt NbS.

Aligning the Common Agricultural Policy with EWRS objectives will be important to unlock this potential. Climate-induced disruptions are already strengthening the case for water investments, and the promotion of co-benefits can attract diverse private funding sources, ranging from the commercialisation of conventional goods and services, credits in environmental markets, to payments for ecosystem services. However, perceived risks, uncertainties, and the small size of many NbS projects still limit private sector engagement.



To ensure sustainable public-private collaboration, **robust governance frameworks** must address market failure, ensuring polluters bear the full cost of their activities, strict compliance with and enforcement of existing regulations. Strong and predictable policy signals will create the regulatory certainty required for responsible private investment and help ensure that NbS financing delivers genuine additionality and integrity.

Recommendations to realize the EWRS aims on sponge landscapes

To fully realize the EWRS vision on restored hydrological functioning at landscape-scale, several priorities emerge. These recommendations can be clustered for different governance levels: EU-level, MS-level and Local level or combinations thereof:

1. **EU: Make sponge targets mandatory for MSs**, providing a clearer regulatory framework, technical standards and legal certainty to stimulate a 'green where you can, grey where you must' approach.
2. **EU: Make the systemic consideration of sponge measures mandatory in climate risk assessments and climate- and water resiliency planning**, by requiring institutional support and the consideration of short- and long-term co-benefits and trade-offs of proposed measures in cost-benefit assessments and decision-making.
3. **EU: Align the EWRS's proposed enhancement of climate resilient landscapes** with existing policies and planning frameworks of the Climate law, WFD, CAP and NRR to ensure coherence across EU water related policies.
4. **EU/MS: Provide resources and infrastructure to systematically collect, organize, and disseminate lessons and recommendations from EU projects** to make the evidence base more accessible, context-relevant and practically usable for a wide diversity of stakeholders.
5. **EU/MS: Develop clear financing pathways** with guidance on cost-benefit analysis, blended finance, and ecosystem service payments. Improvement of co-funding (private/public) frameworks (see MDB Common Nature Finance Taxonomy), streamlining payments for ecosystem services through policies (CAP etc.).
6. **MS/local: Make early and balanced stakeholder engagement mandatory** to facilitate co-design of climate resilient landscapes with a just and inclusive stakeholder group and enhance acceptance through ownership.
7. **MS/local: Upscale successful nature-based practices** by embedding them in co-created regional scalability plans and ensuring early and just stakeholder engagement to enable true transformation at landscape scale. Create platforms to facilitate communities of practice and cross-sector learning.
8. **All: Support inclusive multi-level governance innovation** to bridge EU-level strategies with local implementation, using communities of practice, translation of EU policies into easily digestible information. This should include transboundary and catchment level partnerships such as the ICPDR, ICPR etc.
9. **All: Frame resilience as a multi-benefit opportunity in future policy documents** that address cross-cutting issues such as climate adaptation, biodiversity recovery, water quality, socio-economic gains, and public health and wellbeing. Include the consideration of trade-offs and ongoing monitoring and maintenance to minimise unintended negative consequences and foster positive synergies.

Resources

This resources list provides a selection of relevant deliverables coming from the MERLIN, SpongeScapes, SpongeWorks, SpongeBoost and FutureLakes projects.

Further resources can be found on the respective websites of these projects.

On technical aspects of enhancing landscape resilience and the evidence base:

- SpongeScapes Critical Review of Existing Knowledge on sponge functioning
- SpongeScapes Modelling Approach Map for Quantifying the impact of sponge strategies
- SpongeScapes Scientific Article on benefits, co-benefits and trade-offs in natural water retention measures: a review of classifications and indicator - Almasi et al. (2025)
- FutureLakes Innovation review
- MERLIN Review on Monitoring and impact evaluation
- MERLIN Deliverable on the MERLIN modelling workflow to assess the bio-physical and economic impact of freshwater ecosystems restoration at catchment scale

On multi-level governance and role of policies in upscaling and mainstreaming

- MERLIN Deliverable on policy opportunities for mainstreaming freshwater nature-based solutions
- MERLIN Deliverable on focus Sectoral Strategies for mainstreaming freshwater restoration
- MERLIN Deliverable of a Cross Sectoral Routemap for Mainstreaming Freshwater Nature-based Solutions in Europe
- MERLIN Regional Scalability Plans

On economic and financial aspects

- MERLIN Deliverable on diversifying Funding for Freshwater Restoration using Nature-Based Solutions
- MERLIN Deliverable on cost-Benefit-Analysis in freshwater ecosystem restoration
- MERLIN Scientific Article on trade-offs in ecosystem services under various river management strategies of the Rhine Branches - Kok et al. (2025)

On stakeholder engagement

- MERLIN Deliverable on sectoral stakeholder engagement

Further reading – Policy briefs

- SpongeScapes Policy brief From Drainage to Water Retention - Advancing a Paradigm Shift Towards Sponge Landscapes for Enhanced Climate Resilience
- MERLIN Policy brief on restoring healthy rivers and wetlands through agricultural policies and water resilient farming practices
- MERLIN Policy briefs

Colofon

This policy brief was written by the SpongeScapes, SpongeWorks, SpongeBoost, MERLIN, and FutureLakes EU projects, that jointly contribute to the EU 'Mission on Adaptation to Climate Change', 'Restore our Oceans and Water' and 'A Soil Deal for Europe'.

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The Benefits of Nature-based Solutions: evidence using a systemic monitoring approach

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Scaling up Nature-based Solutions (NbS) is central to the societal transformation required to tackle interconnected challenges such as climate impacts, water risks, and biodiversity loss. Yet implementation remains constrained by limited, robust evidence on how NbS deliver the societal benefits they promise—especially improvements in climate resilience to floods and droughts, and measurable gains in biodiversity.

This Policy Brief presents a systemic monitoring approach for NbS that captures their environmental and socio-economic performance across broad sustainable-development objectives and major economic sectors. Applying this framework to 18 freshwater restoration case studies across Europe—each guided by the IUCN Global Standard for NbS—we demonstrate how diverse and heterogeneous data can be synthesised into coherent, actionable evidence. The results show how consistent monitoring strengthens confidence in the effectiveness, co-benefits, and upscaling potential of NbS.

Key messages

- Monitoring of freshwater and wetland restoration projects should cover environmental, economic and social criteria in a balanced way.
- An objective monitoring approach should provide with consistence in the assessment of the indicators, data confidence and a comprehensible visual synthesis.
- Well-designed freshwater and wetland restoration integrated into NbS can provide significant environmental and social benefits, support economic development, and contribute to the EGD objectives.
- The presented systemic monitoring approach provides decision-makers with the evidence needed to adjust interventions, allocate resources strategically, and ensure long-term effectiveness.

The MERLIN project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036337.

1 Introduction

Implementing Nature-based Solutions (NbS) is central to EU and global policy goals, as they address both the biodiversity crisis and wider societal challenges such as climate adaptation and mitigation. Yet a key barrier remains: limited confidence in how effectively NbS deliver their primary objectives and wider co-benefits. Monitoring is often narrow in scope, focusing mainly on primary outcomes (e.g. flood resilience), while social and economic indicators are rarely included. Existing NbS data are frequently diverse, heterogeneous, and hard to compare.

To address this, MERLIN developed a consistent, systemic monitoring approach that captures the environmental, economic, and social impacts of NbS. This briefing introduces the approach, tested across 18 freshwater and wetland restoration case studies guided by the IUCN Global Standard for NbS, and provides recommendations for strengthening its application.

2 How to cover all relevant aspects affected by NbS?

NbS are intended to address societal challenges such as climate resilience and biodiversity loss, while also contributing to wider sustainable-development goals, including public health and a greener economy. Within MERLIN, a systemic monitoring framework was developed covering 13 environmental, social, and economic policy criteria aligned with the European Green Deal (EGD) (Carvalho et al., 2022).

To collect structured information, specific indicators were defined for each criterion. For example, changes in water-storage capacity or areas of rewetted wetlands serve as indicators for Flood Resilience, with several indicators further subdivided where appropriate. Standardised guidance and reporting templates (MERLIN Deliverable D1.6) ensured consistency. Indicator selection will, however, vary across restoration programmes depending on regional contexts and policy priorities. A Theory of Change (ToC) was used in all 18 case studies to identify primary and secondary NbS goals (Pott et al., 2025).

The standardised indicators were applied by the 18 freshwater and wetland case studies over two years. Case-study diversity meant that not all criteria were equally relevant to all projects. Although a Before-After-Control-Intervention (BACI) design is recommended, control sites were rarely available, so impact assessment mostly relied on before–after comparisons.

Appropriate spatial and temporal scales are indicator-specific. Some impacts occur at the habitat scale (e.g. carbon fluxes), others at the catchment scale (e.g. migratory fish). Social and economic outcomes, such as downstream flood or drought resilience, often materialise far from the intervention site. Indicators also respond over different timeframes—ranging from immediate pollution reductions to ecological changes that may take years or decades—requiring modelling approaches to estimate long-term effects where direct measurement is not yet feasible.

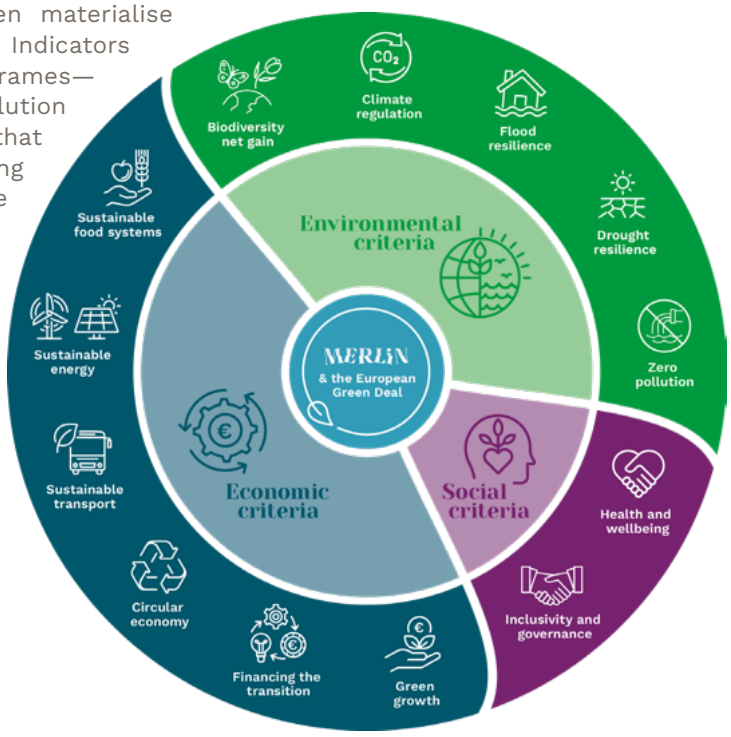

Figure 1 - Systemic monitoring framework developed within MERLIN to assess the impacts of freshwater restoration measures in alignment with the European Green Deal.

3 How to objectively assess NbS impacts?

Within the MERLIN Horizon 2020 project, a scoring approach for interpreting monitoring results was developed (Schwerk et al., 2025). The method followed two steps: first, individual indicators were scored within each policy criterion; second, these were aggregated into a single score for each of the 13 European Green Deal criteria. The analysis assessed both the direction of impact (positive, negative, or no change) and the strength of the supporting evidence. A clear visual synthesis was produced to support rapid decision-making and performance tracking (Box 1). The scoring system was peer-reviewed by experts from all 18 case studies, who provided revisions and accompanying justification.

Box 1: "Traffic light system" for assessing the impact of restoration measures

Negative impact:

Clear evidence of deterioration.

Indications of deterioration, but data are ambiguous (e.g. fluctuating trends).

No impact/irrelevant impact:

No detectable change, with stable data or narratives confirming the absence of change.

No significant change, but less precise evidence.

Positive impact:

Clear evidence of improvement, supported by consistent data or positive narratives.

Indications of improvement, but data are ambiguous (e.g. fluctuating trends)

The aggregated score for each of the 13 Green Deal policy criteria was calculated as follows: when all indicators within a criterion showed the same result, the criterion score matched that shared assessment. When indicators differed, a numerical scoring system was applied to compute an average value (see Schwerk et al., 2025, for details). The resulting aggregated scores were then reviewed by case-study experts, who provided feedback and validation.

4. Example application

Interactions inferred from the monitoring results of the Tisza Floodplain Rewetting Project in Hungary (MERLIN case study 9) demonstrate the practical value of the monitoring approach. The analysis shows that stable funding is crucial for sustaining multiple benefits (interaction 1); that combined measures can generate simultaneous co-benefits (interaction 2); that bringing people closer to nature enhances inclusivity and strengthens restoration outcomes (interaction 3); that flood, drought, and climate-regulation impacts interact (interaction 4); and that land-use change may create risks of stakeholder dissatisfaction (interaction 5) (Figure 2).

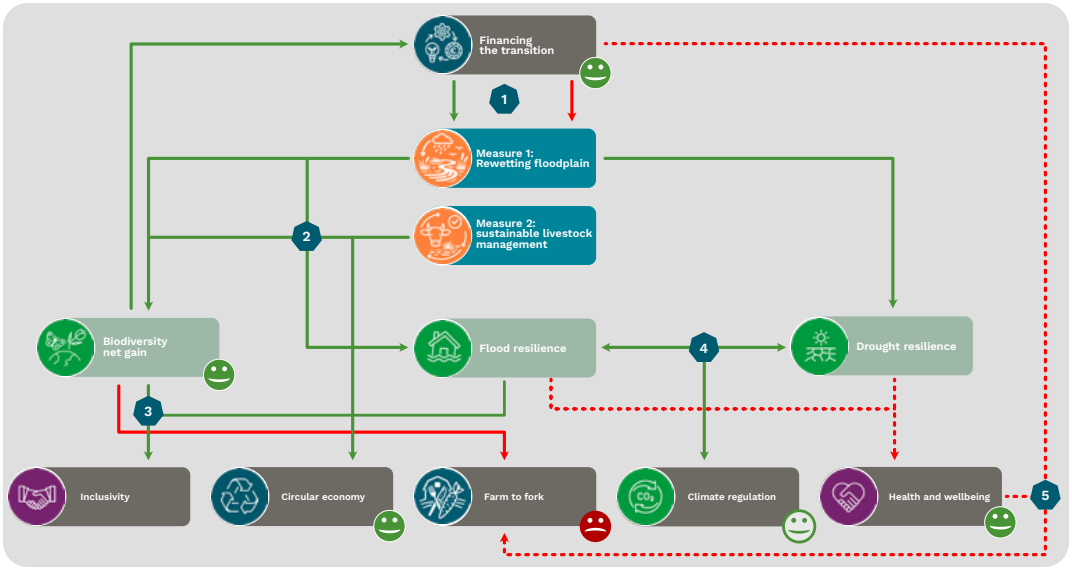

Figure 2 - Schematic diagram of the interactions inferred from available evidence for the Tisza Floodplain Rewetting Project, Hungary. The diagram displays the two main measures implemented and their links to the primary Green Deal policy criteria associated with the restoration objective (green boxes), alongside secondary Green Deal criteria (grey boxes). Arrows indicate positive (green) or negative (red) interactions, with dashed arrows marking interactions of low confidence. Numbered heptagons correspond to the interactions referenced in the text.

5. Key conclusions

Environmental results strongest; socio-economic gaps remain

Environmental outcomes were the most robustly reported across the case studies, particularly for Biodiversity Net Gain and Climate Regulation. In contrast, socio-economic criteria were less consistently assessed, highlighting the need to integrate these dimensions more strongly into monitoring and planning. Indicators relating to economic sectors were often not relevant to project goals, which were primarily environmental.

Confidence varies across criteria

High-confidence results were achieved for Biodiversity Net Gain, supported by quantitative data. Lower confidence for Zero Pollution and economic-sector indicators points to priorities for improved data collection and methodological refinement. In several case studies, narrative insights complemented quantitative data, adding depth in complex contexts and supporting more tailored adaptation.

Recognising trade-offs is essential

Some disbenefits were also reported, including temporary increases in water pollution and loss of agricultural land. Transparent identification of such trade-offs is essential for managing conflicts and aligning ecological restoration with socio-economic needs, including approaches for compensation where relevant.

Systemic monitoring adds explanatory power

The systemic monitoring approach enabled MERLIN case studies to assess the multiple benefits of freshwater and wetland restoration in a consistent and practical way. This helped determine not only whether ecological improvements occurred, but also whether they translated into enhanced ecosystem services. To fully understand why change does or does not occur, benchmark information (e.g., cost, effort) and contextual data (e.g., land use, governance) are needed alongside impact monitoring.

NbS deliver value – but scaling requires stronger monitoring

In conclusion, the MERLIN monitoring results show that well-designed NbS can deliver substantial environmental and social benefits, support local economic development, and contribute directly to European Green Deal objectives. Strengthening and further standardising the systemic monitoring approach will be crucial for scaling up NbS and maximising their contribution to sustainability goals—particularly climate and biodiversity targets. The MERLIN approach provides decision-makers with the evidence required to adjust interventions, allocate resources strategically, and enhance long-term effectiveness.

Acknowledgements

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Mainstreaming freshwater restoration requires supporting multiple economic sectors to collaborate

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Achieving the restoration of freshwater ecosystems at pace and scale depends on the active involvement of many societal groups including a range of economic sectors. We thus need to 'mainstream' working with nature across all sectors of society. This brief explores opportunities and challenges to achieve mainstreaming. It highlights a need to strengthen coordination and collaboration between economic sectors and shows how to enable this through existing institutions and approaches.

Target audience

- This briefing is relevant to those encouraging nature restoration at pace and scale across Europe, including (but not limited to) nature conservation charities, voluntary groups working for nature, plus policy-makers and public sector agencies focused on water, nature, climate and the environmen

Key messages

- We share insights from four years of work with six economic sectors to 'mainstream' restoring and working with nature.
- These sectors show appetite to work with nature but also share concerns about their role: these concerns impede action.
- Multi-faceted approaches are needed, supporting immediate and longer-term change.
- Supporting collaboration within and between sectors is vital, with attention to risks and responsibility-sharing.
- Groups already working with and for nature still have a key role, using and adapting existing approaches.

The MERLIN project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036337.

1. Why did we write this briefing?

European ecosystems urgently require restoration to ensure they can underpin healthy societies and resilient economies. In response, the recent Nature Restoration Regulation (NRR) sets binding targets to restore degraded ecosystems. Such policy targets are important, but restoration cannot be achieved by the conservation sector working alone. Instead, to achieve nature restoration at pace and scale, it is crucial to achieve 'mainstreaming', so that working with nature becomes normal for all sectors who depend on natural systems and who influence their quality and quantity.

Many have written about the need to work with a range of economic sectors but there is not much experience reported of actually having done so. In MERLIN we have experience of working with economic sectors on freshwater restoration, so our learnings and practices can inform how others can encourage mainstreaming.

2. What is the basis of this briefing?

2.1. What is the MERLIN project?

The MERLIN project is an Horizon2020 funded Innovation Action (from October 2021 to March 2026) working to enable mainstreamed and transformative restoration of freshwater-related ecosystems across Europe to develop solutions for both nature and society – i.e. Nature-Based Solutions (see box below).

Society includes many economic sectors that use natural resources for economic development. Degraded or depleted ecosystems create risks for society and business, especially when further threatened by climate change. It is therefore important to 'mainstream' – to involve more economic sectors in working for and managing nature. MERLIN therefore aimed to understand and support how different organisations from multiple economic sectors can work together, drawing together insights from discussions with European-level institutions, 18 case studies of landscape scale restoration; and different economic sectors.

Nature-Based Solutions (NbS)

- NbS are "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits." (UN, 2022)
- We recommend using NbS as a framing to encourage mainstreaming. By focusing on economic and societal benefits it can help motivate new sectors' involvement in working with nature (Waylen et al 2024).

2.2 How did MERLIN work with economic sectors?

In MERLIN we focused on six economic sectors: Agriculture, Hydropower, Insurance, Navigation, Peat Extraction, and Water Supply and Sanitation. Each economic sector contains many different types of organisations, but all have a shared focus on producing a good or service, in ways that depend on and/or impact freshwater ecosystems.

For each sector we established pan-European Communities of Practice (CoP), who then collaborated with us and each other – e.g. using workshops, document sharing and interviews – to develop Sectoral Strategies. Those involved in the CoPs include businesses, policymakers, financial institutions and sectoral associations. These organisations came from across Europe.

The resultant strategies provide visions and action plans for integrating NbS into these six sectors' practices, including what types of measures to prioritise, who should be involved, how and when.

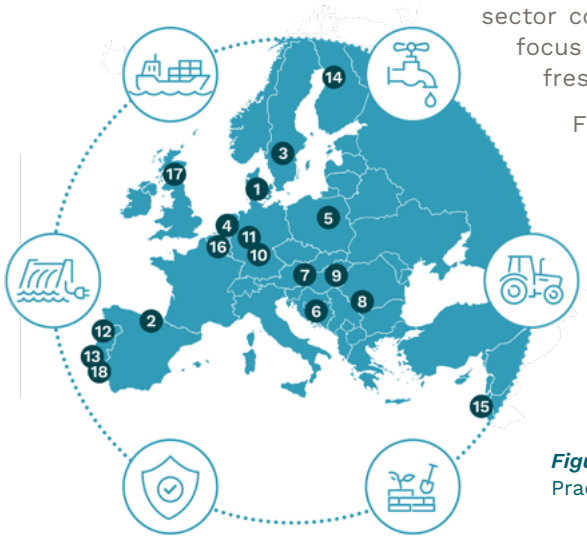

Figure 1: Visual summary of the 6 sectoral Communities of Practice and 18 case studies involved in the MERLIN project

3. What did we find out about mainstreaming?

This briefing highlights key cross-cutting issues that span all six sectors, as explained in our summary of the Strategies (Bérczi-Siket et al, 2025) and our cross-sectoral Routemap (Blackstock et al, 2025).

3.1. Many sectors are relevant to mainstreaming NbS

Whilst working with our six sectors, we identified a total of nineteen sectors as having roles to play in mainstreaming freshwater NbS. Efforts for mainstreaming must encompass a wide variety of sectors, to ensure responsibilities and risks are seen to be fairly shared.

Figure 2: Visual summary of a range of NbS measures in a landscape and the benefits for society and economies. For more information about the 19 sectors that we identified as having roles to play in this andscape please see https://storymaps.arcgis.com/stories/a21460ac063c495698693dbfdd80dd2e

3.2. Many are interested to do more to support restoration and work with nature

Across our six CoPs we found organisations, activities and ideas that already represented good practice in working with nature. For example, some peat extraction companies in Finland have managed post-extraction sites by creating wetland habitats[1]. Across the CoPs we also found widespread recognition of the challenges of climate change. For example, prolonged droughts threaten goals ranging from food production to the navigability of waterways: thus, a failure to respond is a threat both to organisations and livelihoods of individuals. However, each sector is diverse and may contain only a few pioneers working differently: more are needed. For example, the navigation sector has launched pilot projects[2] to reduce environmental harms whilst safeguarding navigability but they cover only a small fraction of Europe's waterways. Sharing positive and pioneer examples could help encourage learning and wider adoption, to complement regulatory or other drivers.

[1] For more information see the peat extraction strategy at https://project-merlin.eu/files/merlin/downloads/sectoral_strategies/MERLIN_sectoral_strategy_Peat_Extraction_sector.pdf

[2] See the Navigation sector strategy at https://project-merlin.eu/files/merlin/downloads/sectoral_strategies/MERLIN_sectoral%20strategy_Navigation_sector.pdf

Restoration supporting potential commercial opportunities in the Romanian Danube (MERLIN case study 08)

- In the lower Danube, between 'Iron Gates II' to Hârşova, there is low connectivity between the river and its floodplains, used for agriculture and forestry. Amongst the planned interventions, dried-up fish ponds have been identified as offering potential to support aquaculture whilst also supporting flood risk mitigation and nature conservation in Natura2000 sites. This is expected to provide a new revenue from eco-tourism and support land-managers' income diversification.
- For more information about this case, visit its case study portal https://project-merlin.eu/cs-portal/case-study-08.html; and for other examples of businesses benefiting from ecosystem restoration see Table 1 in MERLIN_D4.7_Routemap_and_Annex_Nov2025.pdf

3.3 A variety of concerns and challenges can impede change

There were concerns that changing sectoral practices to invest more in nature, might lead many organisations to be at a competitive disadvantage versus their peers. This could be due to higher operational costs, by providing benefits that are free to others, or by exposure to new liabilities e.g. if alterations are deemed to exacerbate risks e.g. of downstream flooding. It is important to recognise these concerns. There are also underlying concerns about justice and fairness in what different sectors are asked to do, who benefits and who bears the costs. In short, mainstreaming NbS uptake is often a 'collective action' challenge.

3.4 Mainstreaming needs even more collaborative working

Managing water and nature is already often associated with collaborative teamwork. Expanding and strengthening these approaches can address many challenges. Coordinating sectoral-wide approaches can help. For example, in Sweden, central coordination has led to hydropower companies planning together and providing jointly-held funds for removal of obsolete barriers[3]. In other cases, policies may need adjustment, e.g. to ensure land-managers are eligible for subsidies[4], to adjust approaches to evaluating investments[5], or to underwrite risk-sharing[6]. It is also important to acknowledge and ideally coordinate the roles of different sectors in managing nature.

Existing organisations such as catchment and landscape partnerships may be able to support collaboration and coordination, if they have appropriate competences and are endorsed to act in the interests of all involved. Formal transboundary mechanisms such as the Joint statement "Development of Inland Navigation and Environmental Protection in the Danube River Basin" support essential coordination across borders.

Enabling cross-sectoral working with new partners in the Forth Basin, UK (MERLIN case study 17)

- The Forth Rivers Trust has taken a long-term approach to building relationships, whilst also exploring new frameworks and guidance for connecting with local business partners in the landscape.
- Over the 4 years of MERLIN they repeatedly met with a wide range of potential partners, ranging from individual land-managers, to energy and transport infrastructure companies. As a result, the Trust has started to unlock new sources of funding and support for nature restoration that come from beyond the public sector.
- For more information on this case see https://project-merlin.eu/cs-portal/case-study-17.html or section 4.1 in MERLIN_D4.7_Routemap_and_Annex_Nov2025.pdf.

[3] For more information see the Hydropower sectoral strategy https://project-merlin.eu/files/merlin/downloads/sectoral_strategies/MERLIN_sectoral_strategy_Hydropower_sector.pdf

[4] For more information see the Agriculture sectoral strategy https://project-merlin.eu/files/merlin/downloads/sectoral_strategies/MERLIN_sectoral_strategy_Agriculture_sector.pdf

[5] For more information see the Water Supply and Sanitation sectoral strategy https://project-merlin.eu/files/merlin/downloads/sectoral_strategies/MERLIN_sectoral_strategy_Water_Supply_and_Sanitation_sector.pdf

[6] For more information see the Insurance sectoral strategy https://project-merlin.eu/files/merlin/downloads/sectoral_strategies/MERLIN_sectoral_strategy_Insurance_sector.pdf

3.5 Mainstreaming needs multiple approaches

Promoting the involvement of multiple sectors needs multiple approaches. Our 'RouteMap for Mainstreaming' (Blackstock et al. 2025) identifies five interconnecting areas that need attention: law & regulation, values and attitudes, knowledge and innovation, funding and financing, and collective action. We identify where existing actions and approaches are helpful and should be maintained, as well as where new approaches would be beneficial or where actions should be adjusted or removed. For example, agri-environment schemes under the Common Agricultural Policy should be adjusted to pay for sectoral priorities that produce public benefits. Some of these changes would produce quick visible results – e.g. changing conditions on permits for peat extraction, whilst others – such as promoting cultural change – would have effects that are slower but are just as important to enable widespread and long-lasting change.

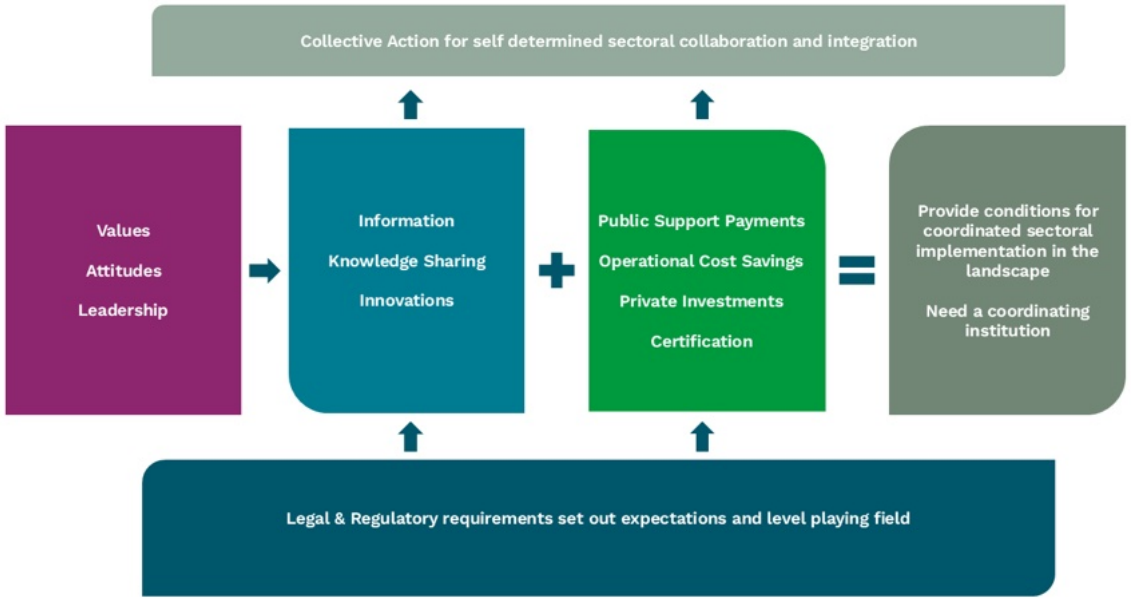

Figure 3: Approaches needed to foster mainstreaming, from the MERLIN Cross-Sectoral Strategy

3.6 Mainstreaming still needs existing actors and approaches

To date, much nature restoration has been led by not-for-profit and governmental organisations focused on environmental issues. The continued commitment of these actors is needed, targeted to unlock involvement from more economic actors. This is especially important where policy goals for nature are not accompanied by high levels of public sector funding, as for the NRR. European, National and local government actors – whose resources and rules have shaped much action for nature in past decades – can continue to drive change. Its leadership can encourage sectors to transition to work with nature differently and give confidence that collective action will be achieved. Stability in rules and regulations, and enforcement by regulators can also help organisations commit to mainstreaming NbS. Strengthening support also reinforces the need for policy coordination, e.g. between those working to implement the NRR with other policy areas that influence water, inland navigation, nature and landscapes. For example, there are opportunities to clarify how conflicts between transport and water quality goals should be resolved.

4. Conclusions and next steps

Restoring and managing nature for people cannot happen without cross-sectoral support and involvement. In MERLIN, our experiences of working with economic sectors produce useful insights about achieving this.

Safeguarding nature must be framed as a necessity, not a burden, since all sectors ultimately depend on it. However, efforts to upscale nature restoration must also respond to the potential constraints and concerns of organisations and sectors that are not already involved. For example, pioneer organisations who adopt an NbS approach may not be widely copied by peers in their sector, if doing so is not seen as strengthening their own business cases. It is therefore important to discuss how risks, responsibilities and benefits will be fairly shared within and between sectors.

Mainstreaming NbS should be planned as a process depending on competences, partnerships and collaborations that go far beyond individual organisations or sectors. Addressing many concerns requires multi-faceted approaches to support cross-sectoral sharing and landscape-based collective action, capitalising on existing institutions and initiatives already working for nature. MERLIN's Cross-Sectoral Routemap sets out more specific implications for European, national and regional-to-local actors, e.g.

- For recommendations regarding legal and regulatory actions related to the Water Resilience Strategy see section 6.2.2, for Nature Restoration Regulation see 6.2.3, and for CAP strategic plans see 6.2.4.
- For recommendations regarding influencing values and attitudes, see section 6.3; knowledge and innovation (section 6.4), funding and financing (section 6.5), and collective action (section 6.6).

These insights are relevant beyond MERLIN, beyond the cases and sectors that we directly worked with. We invite all organisations involved in nature restoration to consider how they can work differently, to broaden and deepen the range of sectors involved.

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Further reading

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