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The eight briefs: What they cover and why each issue matters

The briefs published by Biodiversa+, Water JPI and partners fall into two groups:

- four ecosystem roadmaps that provide phased implementation guidance for specific habitat types,
- four enabling conditions briefs that address the requirements that must be in place for restoration to succeed at scale.

Taken together, the briefs show that nature restoration is not only about reversing biodiversity loss. Restoring healthy, functioning ecosystems can simultaneously support biodiversity, climate resilience, water systems and human health. Delivering these interconnected benefits requires restoration to be planned across sectors and at the appropriate ecological scale, while putting in place the practical conditions needed for restoration to succeed at scale.

The ecosystem roadmaps

Provide practical, phased implementation guidance tied to National Restoration Plan (NRP) timelines covering the 2026–2028 early implementation window, the 2030 targets, and the longer-term 2040–2050 milestones.

1. Forest-Climate-Water nexus

Policy Brief : Integrating the Biodiversity – Climate – Water Nexus into Forest Landscape Restoration
Forest — biodiversity + water + climate resilience:

Restoring forests is not only about biodiversity. Healthy forests support climate resilience, water regulation and freshwater ecosystems, making them a clear example of the biodiversity–climate–water nexus. Effective restoration therefore requires integrated planning that accounts for climate risks, ecological connectivity and the interactions between forest and freshwater systems.
Across Europe, these ecosystems face growing pressures from climate change, intensive management and habitat fragmentation. Research shows why forests, freshwater and climate need to be considered together: restoring river connections may not be enough if the loss of trees along riverbanks causes water temperatures to rise and reduces habitat quality as the climate warms. Research looking at 52 freshwater species under

scenarios extending to 2100 shows the importance of restoring rivers and the forests around them together. Addressing these interconnected pressures requires coordination across sectors and policies. Without this coordination built into NRPs from the start, restoration risks being undermined by conflicting demands across forest, biodiversity, climate, water, energy and bioeconomy policy.

Main solutions listed by the briefings:

- Restore more than forest cover alone, developing forward-looking forest-freshwater assessments that plan forests and freshwater systems together, supporting biodiversity, water systems, and climate resilience.
- Coordinate across competent authorities to align restoration, land-use, freshwater, and climate policy, using targeted incentives tailored to different forest owner groups to drive engagement.
- Select restoration sites and species based on long-term habitat suitability and connectivity, incorporating climate-risk screening for species reintroductions to ensure decisions hold under future conditions.
- Monitor ecological recovery over the long term through catchment-scale riparian restoration approaches and adaptive management, adjusting as conditions change.

2. Marine and coastal restoration

Policy brief: Marine and Coastal Ecosystem Restoration under the Nature Restoration Regulation
Marine — biodiversity + climate resilience:

Restoring marine and coastal ecosystems can support biodiversity while strengthening resilience to a changing climate. However, marine restoration is costly, technically demanding and slow to show results, and remains significantly underfunded and under-planned relative to terrestrial restoration. Climate change adds to existing pressures from diseases, invasive species and competing human activities, increasing the risk that restoration investments fail to deliver over the long term. Research on seagrass, macroalgal and coral ecosystems shows that some areas suitable for restoration today may become less suitable under future climate conditions, making long-term site selection particularly important.

With limited resources and rapidly changing oceans, the priority question for Member States is where to restore. Spatial risk mapping, climate resilience screening, and standardised monitoring should determine where marine restoration will have the greatest and most durable ecological impact.

Main solutions listed by the briefings:

- Restore where nature is most likely to recover, using spatial risk mapping and scientific prioritisation to focus resources where ecological recovery is most achievable.
- Plan by integrating climate resilience screening into restoration design from the outset, rather than planning for current conditions alone.
- Monitor restoration over time through standardised frameworks that enable adaptive management and improve long-term success.
- Coordinate restoration across sectors, authorities, and borders to maximise ecological benefits and avoid conflicting pressures.
- Address biosecurity and disease risk as core components of restoration planning, alongside socio-ecological assessment

3. Resilient urban waters

Policy brief: Resilient Urban Water
Urban Waters — biodiversity + water quality + flood regulation + climate resilience

Urban rivers, ponds and wetlands can simultaneously support biodiversity, improve water quality, regulate flooding and strengthen climate resilience when managed as functioning ecosystems rather than simply as drainage infrastructure. Evidence from assessments of 60 urban aquatic Nature-based Solutions across five European cities shows that design matters: more uniform systems with limited habitat variation tended to support lower ecological quality and species diversity, highlighting the need for diverse aquatic habitats alongside integrated water governance and catchment-scale planning.

Climate change and urbanisation are putting growing pressure on urban freshwater systems, with heavier rainfall, increased runoff, sewer overflows and rising flood risks. The brief shows how cities can target Nature-based Solutions where they are most needed: by identifying areas at greatest risk of runoff and sewer overflows and using measures such as urban wetlands and vegetated drainage systems to help manage excess water. Designed with diverse habitats and combined with conventional infrastructure, these solutions can support biodiversity while strengthening cities' resilience to climate change.

Main solutions listed by the briefings:

- Design urban waterways for biodiversity, not just drainage, creating diverse aquatic habitats that support ecological quality alongside water management functions.
- Plan water management across the whole city, integrating water governance, biodiversity, and urban planning at catchment scale to target priority areas effectively.
- Use Nature-based Solutions where they can make the biggest difference, focusing on flood hotspots and combined sewer overflow areas where co-benefits for biodiversity and resilience are greatest.
- Combine natural and conventional infrastructure to strengthen long-term urban resilience, moving beyond purely engineered approaches to deliver durable ecological recovery.

4. Freshwater restoration

Policy brief : Freshwater Restoration under the Nature Restoration Regulation
Freshwater — connectivity + water systems + resilience to future change

Healthy freshwater ecosystems depend on connected river systems. Restoring rivers, lakes, and wetlands is most effective when planned across the whole catchment rather than at isolated sites. Everything that happens upstream, from water quality and sediment flows to land use and habitat connectivity, shapes what is possible downstream.
Member States that design their National Restoration Plans around individual sites risk locking in an approach that cannot deliver the freshwater and river connectivity targets required under the NRR. Evidence from 226 river restoration projects across Europe shows that water quality, habitat fragmentation, hydrology, and land use all interact at river basin scale, meaning that site-level measures alone may not be sufficient to deliver lasting ecological recovery. Climate change adds another layer of pressure: future climate and land-use conditions can alter habitat suitability and species movements, making connectivity and forward-looking catchment planning increasingly important for long-term restoration success.

Main solutions listed by the briefings:

- Restore rivers as connected systems rather than isolated sites, using catchment-scale prioritisation to focus restoration where ecological connectivity and recovery potential are greatest.
- Plan restoration across whole catchments, addressing habitat, hydrology, and water quality together rather than as separate pressures, to maximise long-term ecological recovery.
- Strengthen ecological connectivity across freshwater systems to support species movement and resilient habitat networks that can withstand future pressures.
- Track restoration over time through standardised monitoring protocols, shared frameworks, and technical guidance, enabling adaptive management and continuous improvement of restoration outcomes.

The enabling conditions

These four briefs address the requirements that must be in place for ecosystem restoration to succeed at the scale required by 2030. Without them, even well-designed NRPs could face avoidable implementation failures.

5. Zoonotic disease risk and One Health

Policy brief: Reducing zoonotic risk through nature restoration
One Health — biodiversity + human health

Nature restoration is also an investment in public health. Restoring healthy, biodiverse ecosystems can reduce the conditions that favour zoonotic disease emergence, since intact, biodiverse ecosystems act as a biological buffer, stabilising pathogen dynamics and reducing the potential of spillover to humans. The One Health approach, which recognises the interdependence of human, animal, and ecosystem health, provides a practical framework for anticipating, reducing, and managing zoonotic risks throughout restoration planning without compromising ecological or health benefits.

More than 75% of emerging infectious diseases originate in animals, and habitat destruction is one of the primary drivers of spillover risk. Yet a systematic appraisal of 30 national and international policies on landscape restoration, zoonoses, and related health frameworks since 2015 found that only 10% address the unintended health or social consequences of restoration**.** Member States should integrate health considerations into their NRPs from the outset, because restoration that is not designed with health in mind can temporarily increase localised disease risk during the transition phase.

Main solutions listed by the briefings:

- Integrate public health into restoration planning through a One Health approach, recognising the interdependence of human, animal, and ecosystem health from the earliest stages of design.
- Reduce disease risks before restoration begins by assessing high-risk situations, identifying potential vectors, reservoir hosts, and human-wildlife interface zones specific to each restoration context.
- Restore diverse and balanced ecosystems that limit the dominance of species most likely to carry and transmit pathogens.

6. Seed supply chains

Policy brief: Need for Seeds: Securing a Safe Supply Chain for Successful Nature Restoration
Seeds — biodiversity + climate resilience

Successful restoration depends on planting the right seeds in the right place — and anticipating the conditions restored ecosystems will face in the future. Scientists use Seed Transfer Zones to help identify suitable plant material based on environmental conditions. Climate change adds another challenge: plant material adapted to today's local conditions may not necessarily be suited to future conditions. Seed sourcing therefore needs to balance local adaptation and genetic diversity with future climate suitability. Securing a reliable native seed supply is not a technical detail but a strategic prerequisite for restoration at scale, requiring supply chains to be planned three to four years in advance to ensure the right species composition, secured provenance and sufficient quantity.
Restoration at the scale required by the NRR will demand billions of native seeds. Yet even in countries such as Germany and France, which have had native plant translocation and propagation certification frameworks for a decade, 90% of the market remains dominated by uncertified material. There is currently no EU-wide standard. Member States that do not address seed supply chains in their NRPs risk investing in restoration that delivers biodiversity homogenisation rather than genuine ecological recovery, with consequences including poor establishment, loss of genetic diversity, biological invasions and wasted public investment.

Main solutions listed by the briefings:

- Start restoration with the right seeds, using locally adapted plant material with secured provenance and a detailed description of species composition.
- Plan seed production years ahead of restoration activity to meet future demand.
- Build reliable and traceable seed supply chains that can operate at the volume required by NRR targets.
- Develop common EU-wide quality standards for restoration material, closing the certification gap that currently leaves most of the market unregulated.

7. Nursery accreditation

Policy brief: Successful Ecosystem Restoration through Biosecure Nursery Production
Nursery accreditation — safeguarding restoration outcomes

Plant health is a prerequisite for successful ecosystem restoration. Millions of plants used for restoration are produced in nurseries that may harbour invasive soilborne pathogens. Surveys of more than 2,500 nurseries and a similar number of restoration and planting sites across Europe detected more than 120 *Phytophthora* species, most of them exotic, highlighting the scale of the biosecurity challenge. These pathogens enter ecosystems primarily through nursery-produced plant material. Without biosecure and pathogen-free planting material, restoration projects could become a pathway for the spread of invasive plant diseases, potentially causing the very ecosystem degradation they are designed to reverse.

Existing European phytosanitary rules cannot reliably detect these infections and the EU currently has no mandatory or harmonised nursery accreditation system for restoration. This regulatory gap threatens restoration investments across Member States, creating a risk that public funding is used to plant material that spreads disease into the ecosystems it is meant to restore. Harmonised nursery accreditation is therefore not an optional quality measure but a core component of restoration policy.

Main solutions listed by the briefings:

- Ensure restoration starts with healthy plants by implementing a harmonised accreditation system.
- Prevent plant diseases from spreading into restored ecosystems by adopting an EU Voluntary Code of Conduct for nurseries supplying restoration projects, closing the current regulatory gap in phytosanitary standards.
- Improve traceability and biosecurity throughout plant production, ensuring nurseries can demonstrate the provenance and health status of all material supplied for restoration.
- Raise restoration standards through certification and training, building the technical capacity needed to maintain biosecurity consistently across the nursery sector.

8. Public-private partnerships

Policy Brief: Enabling Public-Private Partnerships (PPPs) to Finance EU Nature Restoration
Public-private partnerships — financing restoration at scale

Nature restoration requires new sources of investment. The European Commission estimates that Europe faces an annual nature investment gap of €65 billion, while private financing of restoration remains marginal.But the economic case goes beyond closing this funding gap: 72% of EU non-financial corporations and nearly 75% of Euro-area bank loans are linked to sectors with a high or moderate dependency on nature, making ecosystem degradation an economic and financial risk.

Well-designed public-private partnerships can help mobilise private capital while safeguarding ecological integrity and delivering measurable social and economic benefits. To attract investment, governments need to provide long-term policy certainty, credible monitoring and mechanisms for sharing financial risk. Member

States should therefore include clear and investment-ready financing arrangements in their National Restoration Plans.

Main solutions listed by the briefings:

- Create restoration projects that attract investment by providing long-term policy certainty, clear ecological targets, and credible monitoring systems that demonstrate outcomes to private investors.
- Reduce financial risks to encourage private investment.
- Build trust through transparent monitoring and verification of restoration outcomes, ensuring that private finance is tied to measurable and independently validated ecological results.
- Engage landowners, businesses, and local communities in long-term restoration partnerships, recognising that durable private investment depends on broad stakeholder commitment and equitable benefit-sharing.