

Workshop Report on Lateral River Continuity Restoration

30 June, 2025 – Lyon, France

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1. Introduction

The workshop on Lateral River Continuity Restoration was organised on 30 June 2025 as part of the I.S. Rivers 2025 Conference as a pre-event. Organisers were the Office for Biodiversity OFB / Centre de Resource Cours d'Eau in France and the European Centre for River Restoration.

Lateral connectivity has become a significant focus in European policies, particularly in the context of the EU Biodiversity Strategy and the Nature Restoration Law. These policies emphasize the importance of restoring and maintaining ecological networks to support biodiversity and ecosystem services.

The EU Biodiversity Strategy for 2030 aims to halt and reverse biodiversity loss by the end of the decade. It includes ambitious targets such as protecting 30% of the EU's land and sea areas and restoring degraded ecosystems, including 25,000 km of Free-flowing Rivers. The strategy highlights the need for connectivity between natural habitats to ensure the survival of species and the resilience of ecosystems 1.

The Nature Restoration Law, which came into force in 2024, sets binding targets for restoring degraded ecosystems across Europe. The law aims to restore at least 20% of the EU's land and sea areas by 2030 and all ecosystems in need of restoration by 2050. It includes specific measures for various habitats, such as forests, wetlands, rivers, and marine ecosystems. The law also emphasizes

the importance of urban green spaces and the restoration of free-flowing rivers and lateral river connectivity, in article 4 and 9.

By focusing on lateral connectivity, these policies aim to create a network of healthy ecosystems that can support biodiversity, mitigate climate change, and enhance the resilience of natural and human systems. This approach is crucial for achieving the EU's long-term environmental and sustainability goals

The workshop with more than 40 participants and three parallel break out 'speed dating' sessions, was introduced by three presentations. The workshop was chaired by **Martin Janes, Chair of the ECRR and Managing Director with the UK River Restoration Centre**. And he was also a facilitator, together with **Benoît Terrier, Project Leader and Expert Hydromorphological and Ecological River Restoration, Water Agency Rhone, Mediterranean and Corsica, France** and **Anders Iversen River restoration expert, as a volunteer**.



2. Restoration Plan & Lateral Connectivity Restoration in Sweden

This presentation by **Katarina Vartia, Senior Analyst Water Management, Swedish Agency for Marine and Water Management** dives into how we can bring rivers and floodplains back to life under the Nature Restoration Law (NRL). This means finding and getting rid of barriers that aren't needed anymore for things like renewable energy, navigation, water supply, or flood protection. The aim is to make floodplains work naturally again and keep them connected.

National Implementation in Sweden In Sweden, the Swedish Environmental Protection Agency is in charge of coming up with a national nature restoration plan, working with other agencies like the Swedish Agency for Marine and Water Management and the Swedish Forest Agency. The plan needs input from the 21 county administrative boards and shouldn't go beyond the NRL's minimum requirements. Sweden's approach is to keep things simple and only work on projects that are already well-planned.

Challenges and Ownership One big challenge mentioned in the talk is the huge number of barriers and the lack of detailed info about them. Plus, many water bodies are owned by landowners, not the state, which makes things more complicated. Funding and the need for a good digital method for national assessments are also key issues.

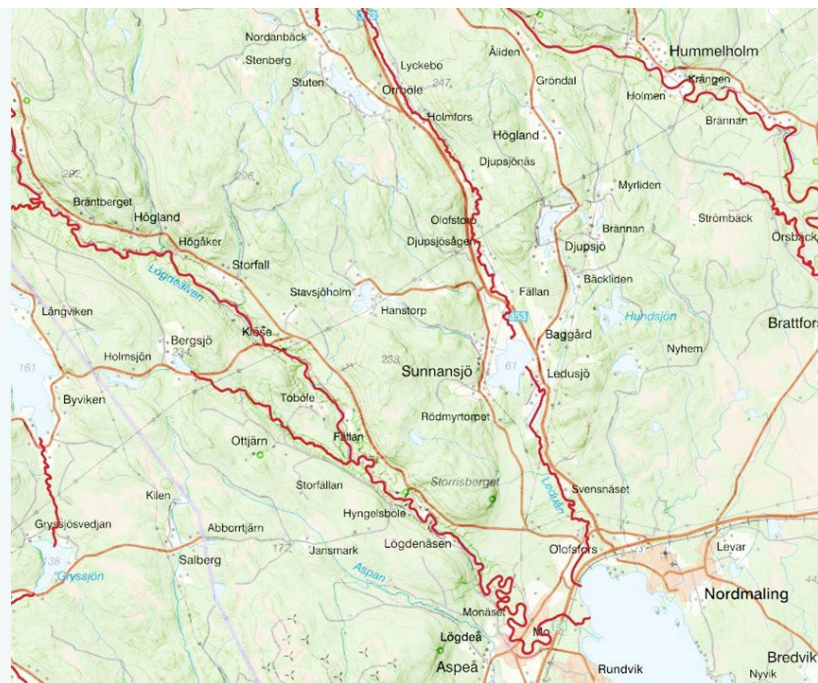
Historical Context: Timber Floating The talk also covers the history of timber floating, where rivers were changed to move timber from forests to downstream locations. This meant narrowing and deepening streams, removing boulders and large woody debris, and cutting off secondary channels. These changes led to fast-flowing channels with low habitat diversity, which really affected aquatic systems. The negative effects on lateral connectivity are still around today, even though timber floating has stopped.

Timber floating

- » Removal of boulders and large woody debris have multiple impacts on stream dwelling species such as salmonids.
- » The transfer of boulders and blocks from the main stream to the stream shore lines, and construction of concrete deflectors, deepened the stream, and also disconnected the stream water from the flood plain, which resulted in negative effects of the lateral connectivity..
- » The effects are still present today, despite that the rivers are not used for timber floating any more.



Restoration Efforts Restoration efforts in Sweden could start with rivers affected by old barriers from timber floating. The talk highlights the importance of fixing hydromorphological changes to improve the ecological status of rivers and floodplains. This includes restoring natural river dynamics, reconnecting rivers with their floodplains, and boosting habitat diversity.



Policy and Collaboration Making the NRL work requires teamwork among various agencies, sticking to regulatory requirements, and tackling the challenges of ownership, funding, and knowledge gaps. The talk stresses the need for a coordinated approach to river restoration, considering both hydromorphological and policy aspects.

Conclusion In short, Katarina Vartia's talk highlights the crucial need to restore lateral connectivity and the natural functions of floodplains under the NRL. By addressing historical changes, ownership challenges, and the need for collaboration, Sweden can make big strides in river restoration and help achieve the broader goals of the NRL.

3. Restoration of riverine habitats along the Mura River in Slovenia within the Natura Mura project

This presentation of **Alexander Koren, Institute of the Republic of Slovenia for Nature Conservation**, about an area of significant natural and cultural value, that is part of the Mura Biosphere Reserve and the 5-country Transboundary Biosphere Reserve (TBR) Mura-Drava-Danube. The river faces several threats, including altered hydrological conditions, inappropriate management practices, and the intensification of agricultural, forestry, and fisheries activities. These threats have led to the drying out of wetlands, flood forests, and agricultural areas, as well as the reduction of flood retention functions.

Project Goals and Activities The Natura Mura project, part of the Operational Programme for the Implementation of the EU Cohesion Policy 2014-2020, aims to restore various habitats and infrastructure in the Natura 2000 Mura area. The project involves multiple partners, including the Institute of the Republic of Slovenia for Nature Conservation (IRSNC), Slovenian Water Agency (SWA), Slovenian forest company (SiDG), Municipality Velika Polana, Slovenia Forest Service (SFS), and the Murska Sobota Development Centre (RCMS).

Restoration Efforts The restoration of river dynamics and aquatic habitats is a central part of the project, involving the restoration of the Mura river bed, side channels, oxbow lakes, and small ponds. Specific restoration sites include Petanjci, Mota II, Konjišče, Dokležovje, and Alter graba for the river bed, and Dokležovje II, Lukačeva struga, Besnica II, Dokležovje I, Srednja Bistrica, and Alter graba for the side channels. The restoration of oxbow lakes and ponds includes the Podkova and Zaton oxbow lakes and the excavation of 20 amphibian ponds.

Lateral Connectivity Lateral connectivity is a key focus of the project, as it aims to reconnect the river with its floodplain and restore natural hydromorphological processes. This includes addressing issues such as gravel riverbed deepening, siltation of sidearms and oxbows, and the overgrowth of gravel banks. By restoring lateral connectivity, the project aims to enhance flood retention functions, improve habitat quality, and support biodiversity.

Land Management Land purchases and exchanges are also part of the project, with 28.5 hectares of forest and water land purchased and 3.3 hectares of private land exchanged. The maintenance and restoration of wet grasslands involve the restoration of 10 hectares of abandoned wet meadows, including land purchase, clearance of scrubs, trees, and invasive species, sowing seeds from neighboring meadows, and sustainable grazing and mowing. The maintenance and restoration of floodplain forests include raising seedlings of indigenous tree species, removing invasive and non-native species, planting seedlings, and promoting natural rejuvenation by forest grazing.



Visitor Infrastructure Visitor infrastructure improvements include the development of infocenters, interpretation polygons, learning paths, and the production of a promotional film.

Achievements and Relevance to Nature Restoration Laws The project has successfully restored 111 hectares of habitats, making it the largest river restoration project in Slovenia. Despite many obstacles and challenges, the project emphasizes the importance of strategic planning and the continuation of restoration work. The Natura Mura project aligns with the EU's nature restoration laws and regulations, particularly those aimed at preserving and restoring biodiversity and ecosystem services in Natura 2000 sites.



4. 20 Years of hydromorphological restoration in the Aude River

This was presented by **Mathieu Dupuis, Syndicat Mixte des Milieux Aquatiques et des Rivières Aude**. The Aude with its Mediterranean climate, had some big river management challenges. Back in 2003, we started by buying land and trying out large-scale dike destruction. These early moves led to the first small floods, deposits, and sedimentation.

Hydromorphological Changes

From 2003 to 2018, we saw three major morphogenic floods. Over 15 years, the riverbed changed from a fixed and incised minor bed to a mobile, meandering one with continuous sediment deposition. Studying pebbles in active river channels showed us the importance of keeping a wide riverbed to handle sediment

Les solutions fondées sur la nature : Une temporalité non maîtrisée, des résultats sur le long terme.

L'importance des crues morphogènes qui parfois se font attendre...

Le retour long mais continu de la biodiversité



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Data Acquisition and Analysis Partnering with Paris Cité UMR 8586 PRODIG – CNRS was key to understanding the long-term mechanisms of river functioning. Gathering raw data over a long period was crucial to mastering how rivers work.

Strategic Development and Education A big part of our strategy was creating a story and sharing it with everyone

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Policy Implementation and Future Plans We rolled out the hydromorphological restoration policy across the entire territory, with a strong commitment to speed up efforts despite constraints. By 2026, the same policy was launched for the Aude River, with 209 hectares acquired and 30 km restored. Future plans include acquiring 220 hectares and restoring another 23 km.

Les actions de suivi : après le transport solide,

Innovative Techniques and Climate Adaptation To achieve more comprehensive river regeneration, we experimented with low-tech beaver techniques to manage inter-flood periods and address reduced flow due to climate change. We conducted training on these techniques with experts from California and set up a complex of seven structures at the Sou experimental site.

5. 'Speed dating' Breakout Sessions

Three facilitated groups had to answer and discuss in three rounds the following three questions:

1. How can local stakeholders be encouraged to accept the flooding of their land and/or the loss of infrastructure along their rivers?
2. How can lateral river connectivity be restored in agriculture land and forestain areas?
3. How can lateral river connectivity be restored in urban ares?

After finishing a round a group started with the results of another group in the previous round. So, we had a bunch of statements from different groups answering the three specific questions about river management. But, as we dug deeper, we realized that these statements were more than just answers to those questions. They actually formed a solid foundation for a broader strategy on how to restore lateral river continuity.

Instead of sticking strictly to the questions, we combined the insights and ideas from the groups to create a comprehensive overview. This way, we can see the bigger picture and develop a more effective and cohesive strategy. So, let's dive into the details and explore the various approaches and solutions that emerged from these discussions!



6. Result: Strategy Lateral River Continuity Restoration

This is a comprehensive overview of approaches discussed by the groups to address the restoration of lateral river continuity. The focus is on encouraging local stakeholders to accept changes, promoting sustainable practices, and ensuring the long-term health of river ecosystems.

Historical Data and Win-Win Solutions Understanding historical data is crucial for making informed decisions. By analyzing past events, stakeholders can develop win-win solutions that benefit all parties involved. Specific strategies include:

- **Working on historical data** to understand past events.
- **Finding solutions that benefit both parties.**
- **Providing incentives and tax deductions for farmers.**

- **Establishing a dedicated fund for flood management.**
- **Promoting higher quality products without intensive farming.**

Agreements and Adaptation Making agreements with farmers instead of buying land can foster cooperation. Adapting to flood dynamics and creating land bank exchanges are essential for long-term sustainability. Key approaches include:

- **Making agreements with farmers** instead of buying land.
- **Adapting to flood dynamics** and creating land bank exchanges.
- **Discussing and sharing long-term strategies and visions.**

Education and Engagement Educating and engaging stakeholders through excursions, presentations, and public relations efforts is vital. Promoting good practices and addressing issues like drought and drainage problems can build trust and cooperation. Specific actions include:

- **Educating and engaging stakeholders and farmers** through excursions and presentations.
- **Promoting good practices** and addressing issues like drought and drainage problems.
- **Implementing regulations and enforcement measures.**

Case Studies and Integrated Policy Providing case studies to show benefits for farmers can serve as powerful examples. Having integrated policy and land planning at the watershed level ensures a holistic approach. Collaboration with science, farmers, and different project leaders fosters innovation and shared responsibility. Key strategies include:

- **Providing case studies** to show benefits for farmers.
- **Having integrated policy and land planning** at the watershed level.
- **Collaborating with science, farmers, and different project leaders.**

Learning and Awareness Raising awareness, diagnosing risks, and using natural elements like beavers and dead wood can enhance ecosystem resilience. Emphasizing the need for space for lateral connectivity and creating a culture of ecosystem services are key to sustainable river management. Specific actions include:

- **Raising awareness, diagnosing risks,** and using natural elements like beavers and dead wood.
- **Emphasizing the need for space for lateral connectivity.**
- **Creating a culture of ecosystem services.**

Planning Zones and Public Relations Planning zones for mobility and preparing arguments for flood response are essential. Using public relations and financial levers can influence public opinion and garner support. Including upstream-downstream solidarity in legislation ensures a fair distribution of responsibilities and benefits. Key strategies include:

- **Planning zones for mobility** and preparing arguments for flood response.
- **Using public relations and financial levers.**
- **Including upstream-downstream solidarity in legislation.**

Restoration and Adaptive Management Making restoration attractive with beaches and parks can enhance community support. Developing a culture of adaptive management allows for flexibility and responsiveness to changing conditions. Connecting people to their rivers and offering trade-offs can foster a sense of ownership and stewardship. Specific actions include:

- **Making restoration attractive with beaches and parks.**
- **Developing a culture of adaptive management.**
- **Connecting people to their rivers** and offering trade-offs.

Sediment Management and Insurance Managing sediment and upstream dynamics is crucial for maintaining river health. Highlighting the role of insurance and national laws can provide financial security and legal backing. Setting time limits on buildings in development zones ensures that infrastructure remains adaptable to changing conditions. Key strategies include:

- **Managing sediment and upstream dynamics.**
- **Highlighting the role of insurance and national laws.**
- **Setting time limits on buildings in development zones.**

International Experiences and Stakeholders

Learning from international experiences with sediment management can provide valuable insights. Identifying stakeholders such as landowners, farmers, inhabitants, authorities, and industries ensures that all voices are heard and considered. Specific actions include:

- **Learning from international experiences** with sediment management.
- **Identifying stakeholders** such as landowners, farmers, inhabitants, authorities, and industries.

Common Good and Economic Incentives Emphasizing the common good, including biodiversity, flood risk reduction, and pollution control, can build a shared vision. Offering economic incentives like land compensation can motivate stakeholders to participate in sustainable practices. Key strategies include:

- **Emphasizing the common good**, including biodiversity, flood risk reduction, and pollution control.
- **Offering economic incentives** like land compensation.

Climate Change and Fishing Associations Addressing the effects of climate change is essential for long-term resilience. Engaging fishing associations and promoting increased tourist activity can provide economic benefits and community support. Specific actions include:

- **Addressing the effects of climate change.**
- **Engaging fishing associations** and promoting increased tourist activity.

Green Image and Scientific Proof Encouraging companies to support projects for their green image can attract investment and public approval. Providing scientific proof and long-term monitoring data ensures that decisions are based on evidence and best practices. Key strategies include:

- **Encouraging companies to support projects** for their green image.
- **Providing scientific proof and long-term monitoring data.**

Emotional Connection and Ambassadors Reconnecting people with rivers through media and education can build emotional connections. Creating ambassadors from target groups can amplify the message and influence others. Specific actions include:

- **Reconnecting people with rivers through media and education.**
- **Creating ambassadors from target groups.**

Infographics and Site Visits Using infographics to explain the common good can make complex information accessible. Organizing site visits to show successful projects can inspire and motivate stakeholders. Key strategies include:

- **Using infographics to explain the common good.**
- **Organizing site visits to show successful projects.**

Listening and Collaboration Listening to people's concerns and needs is fundamental for building trust and cooperation. Collaboration with various stakeholders ensures that solutions are comprehensive and inclusive. Specific actions include:

- **Listening to people's concerns and needs.**
- **Collaborating with various stakeholders.**

7. Conclusion

In conclusion, the workshop has implicitly led to the conclusion that there are no direct measures or approaches to facilitate lateral river restoration. There are several factors that influence this. But there are elements for a strategy and insights gathered from the various groups supporting a comprehensive approach to restoring lateral river continuity. These results are not only significant on their own but are also enriched by the learnings from the three presentations that introduced the topic. Moreover the collaborative discussions and interactions among participants during the IS Rivers 2025 Conference workshop have been very valuable for the participants and organisers.

A heartfelt thank you to the presenters, participants, facilitators, and organizers for their dedication and contributions. Together, we have laid the groundwork for a sustainable and resilient future for the lateral connectivity restoration for our rivers.



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August 2025

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