

BUILDING RIVER PARTNERSHIPS FROM THE GROUND UP:

The Bratislava Danube Park as a case study of collaborative urban river restoration

Vladimir Misik^{*,}, Vladimir Kovac^{**} & Martin Misik^{**}**

^{*} Municipality of Bratislava, Bratislava, Slovakia

^{**} Bratislava Danube Park NGO (OZ Bratislavsky dunajsky park), Bratislava, Slovakia

Corresponding author <vladimir.misik@bratislava.sk>

1. Introduction

Urban rivers are increasingly recognised as important natural systems that provide many benefits in addition to their traditional functions such as flood protection, navigation and water supply. Healthy rivers support biodiversity, improve climate resilience, provide opportunities for recreation and contribute to the quality of urban life (Hobbs et al., 2009) (Gann et al., 2026). Consequently, many European cities are investing in river restoration programmes that combine ecological improvements with public use of river corridors (Palmer et al., 2005) (European Commission, 2020) (European Parliament and Council of the EU, 2024). Experience shows that the main challenges of large urban river restoration programmes are often organisational as much as technical (Armitage et al., 2009) (Emerson & Nabatchi, 2015).

The Bratislava Danube Park (BDP) provides an example of this process. From the beginning, the initiative was built around three complementary objectives: restoration of degraded river and floodplain ecosystems, reconnecting the city with the Danube through improved recreation and public access, and improving flood protection by restoring selected river-floodplain processes. The long-term vision was not to restore the entire floodplain, large parts of which retained its high ecological value, but to integrate conservation of existing natural habitats with restoration of selected degraded sections of the river-floodplain system as well as management of the urban floodplain landscape as a whole.

A series of studies progressively developed the concept, beginning with the Introductory Study (Misik et al., 2019), followed by the Urban and Landscape Study (Derner et al., 2021), the Danube Case Study prepared for the Slovak Water Policy (Ministry of the Environment of the Slovak Republic, 2021), and the Expert Study prepared under the Slovak Recovery and Resilience Plan (Misik et al., 2023). In this paper, we describe how the Bratislava Danube Park evolved from an independent initiative into a broad partnership for urban river restoration. Rather than focusing on the proposed restoration measures themselves, we examine how cooperation among various organisations gradually developed around a programme that delivers ecological, recreational and flood protection benefits simultaneously. Finally, we discuss how this collaborative and adaptive approach may be useful for other cities planning long-term urban river restoration programmes.

2. The Bratislava Danube Park: An Urban River System Requiring Collaboration

The Danube is Europe's second longest river and one of its most important ecological corridors. In Bratislava, it flows through one of the largest remaining floodplain areas associated with a European capital city. The floodplain includes valuable forests, wetlands, islands and side arms that form part of the Natura 2000 network and provide habitat for numerous protected plant and animal species (European parliament and Council of the EU, 2000) (Ministry of the Environment of the Slovak Republic, 2021).

The Bratislava Danube Park includes restoration measures along more than 20 km stretch of the Danube (Figure 1). With an envisioned floodplain landscape of approximately 4,900 ha, BDP is comparable in scale with several European river and floodplain restoration programmes. While direct comparisons should be interpreted with caution because the programmes differ in objectives, governance structures and

implementation approaches, these examples provide useful benchmarks for assessing the scale and integrated character of BDP (Table 1).

Although large parts of the Danube floodplain system in and around Bratislava remain of high ecological value, much of the original river-floodplain system has been significantly modified. River regulation, reinforcement of riverbanks with rip-rap and the disconnection of former side arms have reduced ecological connectivity and degraded important river habitats, including natural gravel bank habitats. The challenge today is therefore not to recreate the historical river but to restore selected ecological functions while maintaining the river's important societal functions (Palmer et al., 2005) (Muhar et al., 2016) (Misik et al., 2023).

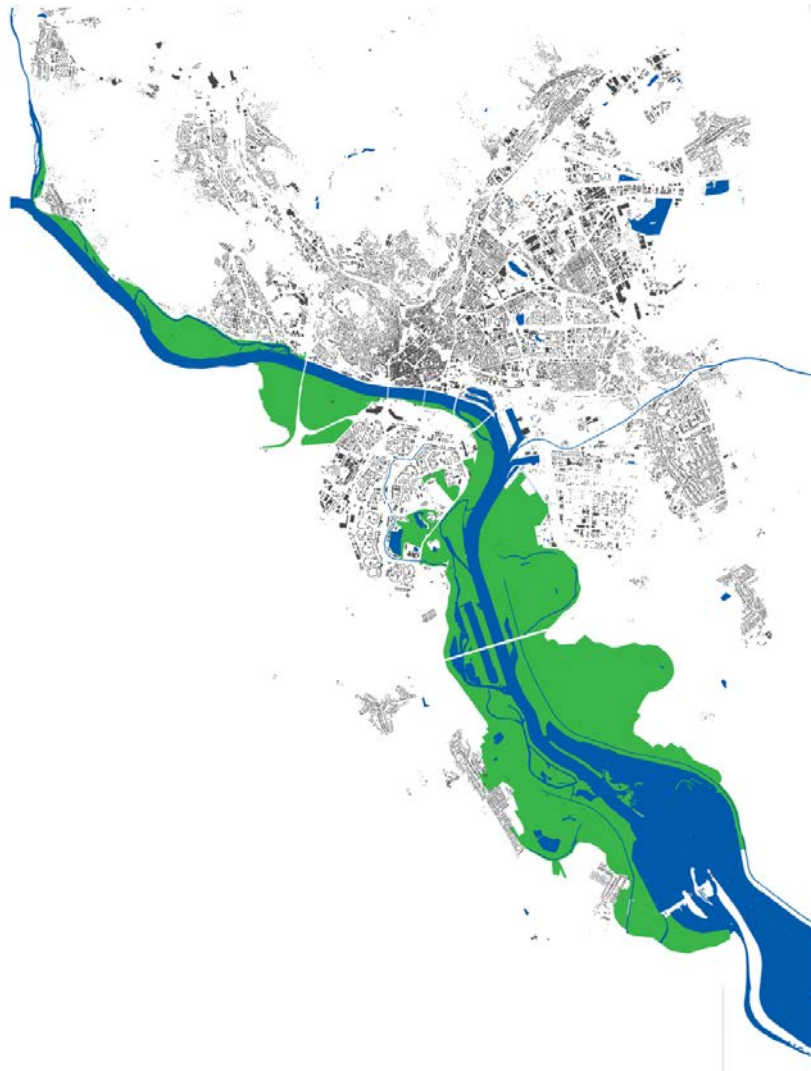


Figure 1: Bratislava Danube Park - green areas around Danube in Bratislava represent the proposed area in which floodplain restoration measures are proposed (Source: Derner et al., 2021).

Table 1. Selected European river and floodplain restoration programmes relevant for benchmarking the Bratislava Danube Park.

Programme	Country	Reported landscape or programme area	Area/length actively restored	Main restoration measures	Urban / peri-urban context	Ecosystem restoration	Recreation / public access	Reference
Bratislava Danube Park (proposed)	Slovakia	≈4,900 ha floodplain landscape*	>20 km river corridor; 3 side arms; ≈3 km rip-rap removal	>20 km restoration corridor; restoration of 3 side arms; ≈3 km riverbank restoration	Urban (Bratislava)	✓	✓	(Derner et al., 2021; Misik et al., 2019, 2023)
Donau-Auen National Park – LIFE Riverbank Restoration	Austria	≈9,300 ha National Park	≈3 km Danube riverbanks restored	Rip-rap removal, gravel-bank restoration, side-arm reconnection	Peri-urban (Vienna–Bratislava corridor)	✓	Limited	(European Commission LIFE Public Database, 2007; Klasz et al., 2008)
March–Thaya Floodplain Restoration (LIFE)	Austria / Czech Republic	≈13,000 ha floodplain system*	39 river engineering measures; side channels restored	Meander restoration, side-arm reconnection, floodplain hydrology	Rural / peri-urban	✓	Limited	(European Commission, 2004)
Szigetköz–Danakiliti Danube Restoration	Hungary	Szigetköz floodplain (area to be verified)	Multiple side-arm systems reconnected	Environmental flows, side-arm restoration, floodplain rehabilitation	Rural / peri-urban	✓	Limited	(Ficsor et al., 2010)
Lower Isar Floodplain Restoration (LIFE)	Germany	Lower Isar valley (programme area)	Large sections of river and floodplain restored	Floodplain restoration, riverbank restoration, alluvial forest rehabilitation	Regional	✓	Limited	(European Commission, 2023)
Middle Elbe Floodplain Restoration (LIFE)	Germany	Natura 2000 floodplain	≈210 ha floodplain reactivated	Dyke relocation/opening, oxbow restoration, wetlands	Regional	✓	Limited	(European Commission, 2019)
Lower Ems Restoration (LIFE)	Germany	91 km river corridor	Multiple tributaries and floodplain reaches	Meander restoration, floodplain reconnection	Regional	✓	Limited	(European Commission, 2009)
Living Rhine Floodplain (Karlsruhe)	Germany	Rhine floodplain	Former Rhine side arm restored	Side-arm restoration, sediment removal, habitat restoration	Peri-urban	✓	✓	(European Commission, 2010)
Loire Valley Restoration Programme	France	>14,000 ha managed landscape	1,404 ha protected/restored; oxbows reconnected	Floodplain restoration, grasslands, wetlands	Regional	✓	✓	(European Commission, 1999)
LIFE Danube Floodplains	Slovakia, Hungary, Romania, Bulgaria	Multi-country programme	≈1,800 ha restored	Floodplain hydrology restoration, side channels, wetlands	Mixed	✓	Limited	(European Commission, 2024)
*Landscape extent refers to the wider floodplain system rather than the actively restored area.								

The scale of the proposed programme also creates significant organisational challenges. The area is owned or managed by several public organisations with different statutory responsibilities, including the Ministry of the Environment of the Slovak Republic (Ministerstvo životného prostredia Slovenskej republiky, MZP SR), the Slovak Water Management Enterprise (Slovenský vodohospodársky podnik, State Enterprise, SVP sp), the Water Management Construction Enterprise (Vodohospodarska vystavba, State Enterprise, VV sp), the Forests of the Slovak Republic State Enterprise (LESY SR sp), the Municipality of Bratislava (Hlavné mesto Slovenskej republiky Bratislava, HMB), Bratislava City Forests (Mestské lesy v Bratislave, MLB), and the Bratislava Water Utility Company (Bratislavská vodárenská spoločnosť, BVS), which manages the city's principal drinking water resources located in the Danube alluvium. As no single organisation has currently responsibility for the entire area, implementation depends on long-term cooperation among these organisations and many other stakeholders. Therefore, the programme is designed in a modular fashion: the technical documentation provides a portfolio of restoration measures that can be implemented over a period of many years through individual projects. These projects may be led by different organisations while contributing to the same long-term landscape programme. The following section describes how this collaborative process gradually developed.

3. Building River Partnerships from the Ground Up

The BDP process did not begin with a formal government programme or an institutional mandate. It started as an independent multidisciplinary initiative bringing together architects, river engineers, ecologists, planners, scientists and civic activists with a long-term interest in the future of the Danube in Bratislava. Although participants came from different professional backgrounds, they shared the view that the city should make better use of one of its greatest natural assets while improving the ecological condition of the river and its floodplain. An important feature of the BDP process was that it was built around complementary objectives rather than a single sectoral priority. River ecologists and environmental organisations were primarily interested in restoring degraded ecosystems and improving ecological connectivity. The Municipality of Bratislava early on recognised the opportunity to improve public access to the Danube and support its vision of a more liveable and swimmable city. Water management organisations focused on flood protection and river management, while the Bratislava Water Utility Company (BVS) recognised the importance of protecting the city's strategic drinking water resources. Although these organisations approached the initiative from different perspectives, the proposed restoration measures increasingly demonstrated that these objectives could be achieved together.

The preparation of successive studies played a central role in this process. The studies provided a common evidence base that allowed engineers, ecologists, planners and decision-makers to discuss the same proposals using shared technical information rather than institutional positions. As the technical documentation became more detailed, confidence also increased that ecological restoration, recreation and flood protection could be combined within a single programme (Derner et al., 2021; Misik et al., 2019, 2023).

The Municipality of Bratislava became a key player in integrating the BDP concept into urban planning and public space development. National authorities and state enterprises responsible for water management, flood protection, forestry and environmental protection became involved as the proposed restoration measures developed. Lessons learned from river restoration projects along the Danube by environmental NGOs, particularly BROZ and WWF Slovakia, helped strengthen the ecological dimension of the programme. Recreational users, including canoe and kayaking organisations (particularly ABVK), voiced strong support for improved public access to the river and restoration of natural river landscapes. An important outcome of this process was that the partnership never depended on complete agreement about a single priority. Instead, organisations remained engaged because the programme contributed to several public objectives that were directly relevant to their own responsibilities. Today, the BDP process has reached a new stage. Much of the technical documentation required for implementation has been prepared, while the partnership continues to evolve and expand. Rather than being implemented as one large project, the landscape programme is expected to be implemented progressively through a portfolio of individual restoration projects. At the same time, discussions continue on the future governance of the Bratislava Danube Park and on how cooperation among the growing number of partners can best be maintained during implementation.

4. From Ideation to Implementation: Lessons for Urban River Restoration

The BDP process is now gradually moving from planning towards implementation. Table 2 describes the major programme milestones. An important lesson from the BDP process is that large urban river restoration programmes benefit from combining several complementary public objectives within a single programme. In Bratislava, the proposed restoration measures simultaneously contribute to restoration of river ecosystems, improved recreational use of the Danube and increased flood conveyance through the city. Additional benefits include protection of drinking water resources, climate adaptation and improved quality of urban public space. Because different organisations are responsible for different aspects of these public benefits, the programme has been able to attract partners with diverse responsibilities and priorities while maintaining a common direction. The same characteristic also creates opportunities for implementation. Rather than depending on a single large investment project, the BDP process has produced a portfolio of technically prepared restoration measures that can be implemented progressively, under a common landscape vision. The overall landscape programme remains constant, while individual restoration projects may be implemented by different organisations according to their statutory responsibilities, technical expertise and

implementation opportunities. This approach provides flexibility and reduces dependence on a single implementing organisation or funding source.

Table 2. Main phases in the development of the Bratislava Danube Park partnership

Phase and approximate period	Main activity	Organisations and groups involved	Main output	Importance for the BDP process
1. Independent multidisciplinary initiative (2018–2019)	Formulation of the initial BDP vision by experts from river engineering, ecology, urban planning, architecture and recreation	Independent experts, scientists river specialists, architects planners and representatives of water-sport organisations	Introductory Study defining the BDP concept, its main objective and initial restoration measures (Mišik et al., 2019)	Established a common long-term vision before a formal institutional structure or implementation programme existed
2. Initial stakeholder consultation and coalition building (2019–2020)	Consultation of the concept with organisations responsible for the river, floodplain, nature conservation, drinking water and recreation	Municipality of Bratislava, Slovak Water Management Enterprise SVP), Bratislava Water Utility Company (BVS), State Nature Conservancy (ŠOP SR), environmental NGOs, canoe and kayak organisations and other stakeholders.	First broader discussion of the proposed measures and incorporation of stakeholder comments into the developing concept	Increased the credibility of the initiative and showed that the ecological, recreational and water-management objectives could be discussed together
3. Integration into municipal planning (2020–2021)	Development of the concept into a comprehensive urban and landscape framework	Municipality of Bratislava, Metropolitan Institute of Bratislava, BDP experts and consulted public organisations	Urban and Landscape Study defining the approximately 4,900 ha BDP floodplain landscape, its spatial structure, restoration priorities, public access and visitor management (MIB, 2021)	Transformed the initial expert proposal into a recognised municipal planning concept
4. Alignment with national water and environmental policy (2021–2022)	Positioning BDP within the wider objectives of sustainable Danube management, water policy, biodiversity protection and flood-risk management	Ministry of the Environment of the Slovak Republic, water-management experts, nature-conservation specialists and members of the national Danube expert group	Danube Case Study prepared for the Slovak Water Policy (Ministry of the Environment of the Slovak Republic, 2022)	Connected the BDP vision with national and European policy objectives and broadened institutional ownership beyond the municipal level
5. Technical preparation and feasibility assessment (2022–2023)	Detailed hydromorphological assessment, hydraulic modelling and preparation of technically feasible restoration measures	Ministry of the Environment, river engineers, hydrologists, ecologists, modellers, water-management organisations and BDP experts	Expert Study for the Slovak Recovery and Resilience Plan including restoration of three side arms, approximately 3 km of rip-rap removal and additional measures along more than 20 km of the Danube corridor (Mišik et al., 2023)	Reduced technical uncertainty and created a portfolio of restoration measures suitable for phased implementation
6. Institutional consolidation and implementation preparation (2024–2025)	Strengthening municipal support, incorporating key BDP measures into planning decisions and developing cooperation with landowners and public managers	Municipality of Bratislava, Metropolitan Institute of Bratislava (MIB), Ministry of the Environment, state water-management enterprises SVP sp and VV sp, forestry organisations and BDP experts.	Stronger formal recognition of BDP in municipal planning and preparation of selected measures for implementation	Produced an implementation-ready portfolio of technically mature restoration measures
7. First implementation milestones (2024–2026)	Transition from planning to implementation through several complementary projects	Ministry of the Environment; SVF sp, Municipality of Bratislava MIB; State Nature Conservancy (ŠOP SR); BDP NGO	1) Completion of detailed technical project documentation funded through the Slovak Recovery and Resilience Plan; 2) Completion and public opening of the first BDP segment (Nábřežný park Staré Lido, area of approx. 1 ha, on 9 July 2026; 3) Initial restoration of approximately 400 m of Danube riverbank through removal of rip-rap and restoration of natural gravel bank habitats funded through the Recovery and Resilience Plan	Demonstrated that the BDP programme had entered practical implementation
8. Progressive implementation and partnership expansion (2026 onwards)	Preparation and implementation of additional restoration projects and expansion of national and international partnerships	Municipality of Bratislava, Ministry of the Environment; SVF sp; VV sp, BVS; LESY SR; BDF NGO, BROZ; WWF Slovakia international partners (e.g. National Park Donau-Auen), scientific institutions and other partners	Modular implementation of restoration measures by different organisations according to their statutory responsibilities and implementation opportunities	Demonstrates the adaptive implementation model through projects led by different organisations while maintaining a common long-term vision.
9. Governance and long-term stewardship	Development of the governance model for the approximately 4,900 ha Bratislava Danube Park landscape	Principal landowners and managers, Municipality of Bratislava, Ministry of the Environment, state water management enterprises SVP sp, VV sp, Bratislava City Forests, BVS, NGOs, scientific institutions and potentially private-sector partners	Governance structure to coordinate long-term conservation, restoration recreation and flood protection.	Represents the long-term objective of transforming the partnership into a sustainable governance framework for the BDP landscape

*Note. The phases partly overlap and should not be understood as a strictly linear sequence. The BDP process developed gradually, with scientific preparation, stakeholder involvement and institutional cooperation progressing in parallel.

The collaborative process itself also continues to evolve. While many of the technical aspects of the proposed restoration measures are now well developed, long-term governance of the park remains under discussion. Future implementation will require continued cooperation among public authorities, state enterprises,

NGOs, scientific institutions and, potentially, private sector partners interested in supporting large-scale urban nature restoration.

5. Conclusions

The Bratislava Danube Park demonstrates that large urban river restoration programmes require long-term cooperation among organisations with different responsibilities, priorities and expertise. A key feature of the BDP process has been its ability to combine three complementary objectives within a single long-term programme: restoration of degraded river ecosystems, improved public access and recreation, and improved flood protection through restoration of selected river-floodplain processes. Another important lesson is that landscape-scale restoration programmes do not need to be implemented through a single project. Preparing a portfolio of technically mature restoration measures allows implementation to progress gradually while maintaining a common long-term vision. This provides flexibility, enables different organisations to lead individual projects according to their responsibilities, and creates a practical pathway towards implementation of complex restoration programmes. Although the Bratislava Danube Park continues to evolve, the experience gained during its development may be relevant to other cities facing similar challenges. We believe that combining a shared long-term vision, evidence-based planning, broad stakeholder cooperation and adaptive implementation provides a practical approach for developing large urban river restoration programmes that deliver ecological, recreational and flood protection benefits simultaneously.

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