

Preparing FAIRway 2 works in the Rhine-Danube corridor

MINUTES (final)

Stakeholders' Forum Meeting 14 (SHFM14)

Date	25.03.2025
Time	10:00 – 12:00
Place	Online meeting (<i>Google Meet</i>): https://meet.google.com/biq-mybk-wgb
Participants	See List of Participants (LoP)
For the minutes	Katarina Marinković, Predrag Živadinović

The presentations are available for download on the [Stakeholders' Forum website](#).

Welcome note

Mr. Ljubiša Mihajlović welcomed all to the 14th Stakeholder Forum meeting for the Project "Preparing FAIRway 2 Works in the Rhine-Danube Corridor," where the focus will be on critical aspects of hydraulic modelling and Multi-Criteria Analysis (MCA). He introduced himself as a representative of the Directorate for Inland Waterways. The Serbian Ministry (MGSI) is a project partner responsible for organising and coordinating the Stakeholder Forum in the project emphasizing its role in supporting joint sector activities on the Danube between Serbia and Croatia, within the FAIRway 2 project under the CEF framework.

Ms. Marina Ilić, the chairperson of the forum meeting, provided an overview of the agenda and the presentations scheduled for the meeting.

Modelling & Multi-Criteria Analysis of the common Danube section

Hydraulic and morphological modelling of the SRB-CRO common stretch of the Danube River - 2D Modelling Progress (*Romeo Soare, Hidrozavod DTD, 2025-03-25_PPT_PFW2_SHFM14_Update_Modelling_Activities_Hidrozavod_R.Soare.pdf*)

Mr. Soare, responsible for management activities, gave an overview of project activities and current status.

He presented progress made on Tasks 1 to 4, as detailed in the presentation. Ongoing efforts focus on scenario development and 2D numerical simulations for hydrodynamics and morphological changes, alongside a multi-criteria analysis.

The "do-nothing" scenario was highlighted as the reference case, incorporating only natural morphological processes such as erosion and sedimentation. This scenario served as the baseline for calibration and validation of the hydrodynamic model.

The main scenario types were analysed, do-nothing, structural measures and revitalization.

Each scenario was designed to evaluate potential improvements in navigability and reduction of riverbed degradation. Specific solutions such as fairway realignment, sediment transport management, and optimized flow distribution were included.

Detailed scenario applications were discussed for critical areas including Apatin, the Drava confluence, Čivutski Rukavac, Staklar, and Aljmaš.

Preliminary simulation results showed sediment dynamics and hydrodynamic changes under different structural interventions (*note: simulation results themselves were not shown in the presentation*). Emphasis was placed on minimizing environmental impact compared to traditional groins, particularly by using chevrons and bottom sills.

An inventory of existing river training structures along both banks of the Danube was presented to assess cumulative impacts when combined with new measures and to propose removal of some structures based on the condition assessment of existing structures done by monitoring team.

Preliminary results of morphological change simulations were introduced (*note: simulation results were not included in the presentation slides*). These are still being refined and will be presented in the final project report. It was clarified during the forum that no finalized simulation results were yet available for public dissemination.

The presentation concluded with a note that further analysis and reporting activities will continue, integrating the 2D modelling results and the multi-criteria evaluation.

Questions & Answers:

Q (Mr. Tibor Mikuška, Croatian Society for Bird and Nature Protection): A broader concern was expressed regarding the overall status of the project. Despite being in the 14th Stakeholder Forum Meeting and nearing the project's conclusion, key outputs from the consultants, such as modelled scenarios, are still missing or unclear. The only substantive document received pertains to the definition of bottleneck variations. This lack of transparency hampers effective participation in the Stakeholder forum and complicates time management for involved parties. It was emphasized that the rationale behind selecting specific structural measures, must be transparently explained, based on scientific grounds rather than solely on expert judgment. The Stakeholders requested a clear and justified methodology showing how different alternatives were considered and why certain options were selected over others from a navigational improvement perspective.

A (Mr. Romeo Soare, Hidrozavod DTD): The process began by identifying navigation problems in each critical section. Based on this, theoretical scenarios were developed involving various structural and non-structural measures. For each critical area, the most appropriate structure or combination thereof was selected to simulate and compare results, with the ultimate goal of identifying the most effective solution. This process was reported to rely on hydrodynamic and morphological parameters and on existing sedimentation, erosion, and transport dynamics. Scenario 1, the "do nothing" or reference scenario, was used as a baseline for model calibration and validation. Further scenarios included various structural interventions and were compared based on their impact on navigability.

Q (Ms. Kerstin Bock, WWF Austria): A request for clarification was raised in relation to the selection of scenarios. It was noted that, according to the participant's understanding, four scenarios and the corresponding bottlenecks had already been defined. It was expected that each bottleneck would be modelled under all four scenarios, allowing for a multi-criteria analysis to determine which alternative would be most appropriate. This was assumed to be carried out in an integrative manner, involving the Stakeholder Forum.

However, it was observed that the selection of scenarios appeared to be based on expert judgement or considerations such as those presented earlier in the meeting. This was perceived as a deviation from the initially anticipated modelling approach. Further clarification on the overall methodology was requested, as some confusion regarding the applied approach was expressed.

A (Mr. Romeo Soare, Hidrozavod DTD): The general approach for scenario simulation began with the establishment of a "do nothing" scenario, serving as the reference situation. This reference was used to calibrate and validate the numerical models. Subsequently, various intervention approaches were applied, such as structural measures, revitalization, and fairway realignment, with the aim of producing results that would allow for the estimation of hydrodynamic and morphological parameter evolution.

This approach formed the basis of the 2D numerical modelling activities and was used to assess the processes influencing navigation, in correlation with existing structures. It was emphasized that no scenario was excluded from consideration. Scenario 1 was established first as the basis for comparison with the results of all other scenarios. This initial scenario reflected the evolution of the river section without any structural measures or interventions. Scenarios 2, 3, and 4 were subsequently developed to assess the effects of different intervention approaches.

Q (Mr. Arno Mohl, WWF Austria): A comment was made regarding the Apatin section, where two chevrons had been proposed. It was observed that the navigability conditions, specifically a fairway depth of 2.5 meters and a width of 200 meters appeared to have been consistently met over the years. In light of this, clarification was requested as to why any structural measures, such as chevrons, were being proposed in this particular section if the minimum navigation requirements were already fulfilled.

A (Mr. Romeo Soare, Hidrozavod DTD): During low water levels, the fairway parameters in the critical area are not ensured. Therefore, structural intervention is necessary, as the fairway parameters are not consistently preserved throughout the entire year, which leads to navigation difficulties. It may be more illustrative to present data on minimum water levels and provide specific information on the minimum fairway depth in order to clearly illustrate the navigation issues in this section.

Written comment in the chat (Mr. Dejan Trifunović, Danube Commission): “We especially follow the references that DC has when it comes to this topic (The plan of the basic works on the Danube and DC Recommendations). Namely, the minimum requirements of the Danube Commission regarding the width of the waterway are not met at this bottleneck (Apatin). The total width of the waterway on this part of the Danube should be at least 120–150 metres (in line with the DC Recommendations), but experts agreed that the optimal width of the waterway is 200 metres to ensure unhindered navigation in both directions.”

Q (Ms. Kerstin Bock, WWF Austria): A request for clarification was made regarding the basis for defining the proposed structural measures—specifically, the two chevrons and three bottom sills. It was noted that the report refers to expert judgement as the underlying rationale, and further clarification was sought on which experts were involved in this process—whether the modelling team alone or also the monitoring consortium.

Additionally, it was requested to explain how the selection process was conducted and whether any quantifiable benefits could be presented. In particular, an inquiry was made about the potential improvement in navigability, such as the number of additional days per year when two-way navigation would be possible as a result of implementing the proposed measures.

A (Mr. Romeo Soare, Hidrozavod DTD): The objective was to achieve a good navigation status, in line with the recommendation of the Danube Commission. This recommendation served as the guiding principle for the development of the scenarios. It was further noted that only hydrological conditions at or above the LNWL were considered during the analysis. Water levels falling below the LNWL were explicitly excluded from the assessment. The selection and definition of the proposed structural measures were described as the result of a joint decision involving the modelling team, the monitoring team, and based on the available data.

Additional information (Mr. Siniša Špegar, TA): In line with the information provided by Nikola prior to this meeting, it is not yet possible to present final modelling results. The materials shown during the meeting represent the initial states for Scenario 2 and Scenario 4. Final modelling outputs will include the precise locations, dimensions, and quantities of all proposed structures. It was emphasized that the modelling team is highly familiar with the problematic navigation sectors, and that evaluations should not be based solely on individual cross-sections. Given the early stage of the scenario presentation, it was considered difficult to provide detailed explanations for each proposed structure. While requests for more information are understandable, it was cautioned that overly detailed discussions at this stage could delay overall project progress. From a technical perspective, confidence was expressed in the proposed approach, and interest was reiterated in reviewing the final results of the modelling process.

Q (Mr. Arno Mohl, WWF Austria): With reference to the Apatin section, it was noted that this example was used for illustrative purposes. It was further pointed out that one of the presented materials included a biodiversity map. A question was raised regarding how the identified biodiversity elements had been taken into account within the scenario development and modelling process. A follow-up clarification was requested as to whether biodiversity aspects were or would be taken into account in the analysis of the different scenarios. It was asked whether such parameters had been considered at this stage, or whether they were entirely excluded from the scenario evaluation process.

A (Mr. Romeo Soare, Hidrozavod DTD): The consideration of biodiversity elements will not be fully addressed within the current project scope, as the preparation of an Environmental Impact Assessment (EIA) is not part of this project. At this stage, the available information originates from the beneficiary and includes the locations of protected areas, as well as data stemming from the monitoring activities carried

out by the Croatian side, which have also supported the modelling process. These data were presented to provide context and facilitate understanding of the spatial relationship between the proposed interventions and environmentally protected areas, as well as the type of information currently available for each location.

Q (Mr. Arno Mohl, WWF Austria): A follow-up clarification was requested as to whether biodiversity aspects had been or would be considered in the analysis of the different scenarios.

A (Mr. Romeo Soare, Hidrozavod DTD): It was confirmed that biodiversity-related data, such as the presence and location of protected areas, were acknowledged and presented for informational purposes. However, these elements were not included in the analytical comparison of the scenarios.

It was further clarified that no Environmental Impact Assessment (EIA) had been conducted within the scope of this study. While the existence of protected areas and the available related data were taken into account contextually, the development of an environmental impact analysis or assessment falls outside the objectives of the current modelling and scenario evaluation activities.

Q (Ms. Kerstin Bock, WWF Austria): A question was raised concerning the structure and differentiation of the scenarios, particularly Scenario 2, which was described as a combination of structural and revitalization measures. It was noted that, from the stakeholder's perspective, these represent conceptually distinct types of interventions and should be treated separately.

Additionally, concern was expressed regarding the scope of so-called "soft measures" as referenced in the report. It was pointed out that these were currently limited to fairway realignment, whereas soft measures should, in the stakeholder's view, include a broader range of interventions—such as one-way navigation—currently not covered under any scenario. In order to improve clarity and consistency, a revised scenario structure was proposed: Scenario 1-Baseline (do-nothing), Scenario 2-Soft measures, including fairway realignment and one-way navigation, Scenario 3-Revitalization measures only (excluding structural measures) and Scenario 4-Structural measures only. This alternative framing was presented as a way to ensure clearer scenario differentiation and a more logically structured analysis.

A (Mr. Romeo Soare, Hidrozavod DTD): The proposed restructuring of the scenarios would be taken into consideration and analyzed. However, it was noted that, based on initial expert judgment, relying solely on either revitalization or structural measures might not be sufficient to achieve the desired outcomes. The final evaluation will further explore the feasibility and effectiveness of each approach.

Q (Mr. Georg Rast, consultant): A proposal was put forward suggesting the inclusion of an additional modelling option based on a fairway width of 150 metres. It was noted that, the Danube Commission recommends a minimum fairway width of 120 to 150 metres for this sector of the Danube. While this width does not accommodate three vessels in parallel, it still allows for two-way navigation. It was therefore suggested that modelling a 150-metre fairway could represent a relevant and realistic scenario aligned with official recommendations.

A (Mr. Siniša Špegar, TA): Reference was again made to the Danube Commission's recommendations, which allow for widths of both 120 m and 150 m, noting that even at 120 m, two-way navigation remains feasible. It was emphasized that one-way navigation implies significantly narrower widths and, in this context, does not align with the core objectives of the project. Therefore, the inclusion of scenarios with widths below 120 m was discouraged.

Additional information (Mr. Romeo Soare, Hidrozavod DTD): Further clarified that the fairway parameters recommended by the Danube Commission are interrelated, particularly in terms of the relationship between fairway width and curvature. A 150 m width is generally not recommended for sections with tight bends. In such cases, a minimum width of 180 m is advised to reduce navigational risks. This recommendation is directly linked to navigation safety considerations.

Q (Mr. Georg Rast, consultant): Noted that detailed discussions regarding dredging were not conducted, and that maintenance activities were not included in the current scope of the analysis. A question was raised as to whether all structural interventions include initial dredging or if dredging is treated separately.

A (Mr. Mr. Romeo Soare, Hidrozavod DTD): The maintenance activities were not explicitly included; however, the current morphological situation, which incorporates the effects of dredging, was used for model calibration and validation.

Challenges and river restoration potentials in the Croatian-Serbian Danube stretch (Arno Mohl & Kerstin Böck, WWF Austria, 2025-03-25_PPT_PFW2_SHFM14_external_Challenges_Restoration_Potencial_TBR_MDD_A.Mohl-K.Böck.pdf)

The presentation addressed key ecological challenges and restoration opportunities in the Croatian-Serbian section of the Danube River. Emphasis was placed on the unique natural and cultural values of the area, highlighting the floodplain forests, lateral connectivity between land and water, and the coexistence of nature and human activities, exemplified by the Apatin section.

The Croatian-Serbian Danube hosts outstanding ecological features, including 50% of the Danube's most natural river stretches and floodplains, extensive protected areas spanning approximately 82,000 hectares, and significant biodiversity such as the highest breeding density of white-tailed eagles in continental Europe and important fish-spawning grounds at Kopački Rit. The area also serves as a refuge for the nearly extinct species.

Attention was drawn to the proposal for establishing a national park at Kopački Rit, underscoring the need to consider such initiatives in future infrastructure or development plans to avoid threats to protected areas.

Key challenges discussed include significant riverbed incision and erosion, with rates reaching up to 2.6–3.1 cm per year at specific locations, loss of natural riverbanks and dynamic river habitats, and a drastic reduction of side channels by 97% compared to historical conditions. These habitat losses are largely attributed to historical river regulation and infrastructure close to the river.

The legal framework governing the area was outlined, referencing relevant EU Directives (Water Framework Directive, Floods Directive, Habitats and Birds Directive), the Nature Restoration Law, national protected areas, and international designations including the Five-Country Biosphere Reserve and RAMSAR sites. These frameworks impose strict requirements on any interventions in the river and floodplain areas.

Restoration potential was highlighted with maps showing significant opportunities for floodplain lateral extension, removal of bank revetments, and reconnection of side arms. Specifically, up to 102 km of riverbanks could be restored to near-natural conditions, 21 major side channels totaling 180 km reconnected, and over 55,000 hectares of flatland restored by replacing existing dikes.

The presentation concluded that the Croatian-Serbian Danube represents an exceptional ecological ecosystem that must be preserved, with natural river stretches considered “no-go” zones for structural measures. For already impacted areas, adaptation or removal of structures and a ban on sediment removal (allowing only reallocation) were proposed.

Regarding this project, positive monitoring results were acknowledged. However, it was stressed that a business-as-usual approach or isolated structural measures without integrative consideration of nature conservation and restoration needs would likely fail. An integrative, multi-disciplinary approach from project inception is strongly recommended for future efforts.

Questions & Answers:

Q (Mr. Georg Rast, consultant): An inquiry was made regarding the accessibility of the referenced study by Schwartz, noting that many assumptions or recommendations appear to be based on specific conditions or preconditions. It was also requested to clarify to what extent navigation interests and needs were considered within the study.

A (Ms. Kerstin Bock, WWF Austria): The first referenced study is publicly available online, while the actual numerical data remain internal.

Q (Mr. Georg Rast, consultant): Raised a question regarding recommendations to address riverbed incision and water level recession. It was noted that while examples exist from other European rivers where sediment supply deficits have caused similar issues, structural interventions have been successfully applied in cases such as the Lower Rhine near the Dutch border to halt incision. Further information on applicable measures was requested.

A (Ms. Kerstin Bock, WWF Austria): Restoration measures represent a promising approach to reduce riverbed incision, as supported by discussions with experts such as Helmut Habersack, who conducted

relevant studies. Emphasis was placed on the importance of sediment reallocation within the river system rather than sediment removal. Positive effects of restoration on reducing incision have been observed in various rivers, including sections of the Danube east of Vienna.

Additional information (Mr. Tibor Mikuška, Croatian Society for Bird and Nature Protection): The sediment management remains a significant challenge in European rivers. Effective solutions are still lacking, particularly in sand-bed river sections, which present greater complexity compared to gravel-bed areas. It was noted that sediment supply is hindered primarily by hydropower installations upstream, which trap sediments and limit their downstream transport. Local interventions such as bank opening, promoting meandering, and side erosion may contribute some sediment input, but this is insufficient to fully prevent riverbed degradation. The importance of every unit of sediment in maintaining riverbed stability was highlighted. It was concluded that both local measures to reduce erosion and strategic upstream modifications of hydropower operations are necessary to address sediment deficits in downstream river sections.

Additional information (Mr. Georg Rast, consultant): Pointed out that attributing sediment issues primarily to hydropower is not entirely accurate. Investigations on the Elbe River revealed that over 50% of riverbed incision resulted from the shortening and narrowing of the main river channel. This perspective suggests that, for the Danube as well, addressing sediment and riverbed incision challenges will require significant measures involving the widening of the riverbed and restoration of sidearms, including the protection and enhancement of valuable natural habitats such as sandbars.

Q (Mr. Siniša Špegar, TA): Posed a question regarding the financial impact if the full restoration potential were to be utilized, including whether any cost assessments or estimates have been made to date.

A (Ms. Kerstin Bock, WWF Austria): No financial assessment regarding the full utilization of restoration potential has been conducted yet. However, the importance of such an evaluation was fully acknowledged. The current study was described as an initial step driven mainly by interest rather than being part of a formal project. It was emphasized that in future integrative projects, assessing the financial impact would be highly beneficial and an important aspect to consider.

Additional information (Mr. Siniša Špegar, TA): Acknowledged that the need for restoration is attributed not only to navigation but also to other factors such as flood protection, irrigation, and various water users within the basin. This broader perspective was valued, as it challenges the common assumption that navigation is the primary cause of negative impacts on the river basin.

Furthermore, the potential effects of fully utilizing the restoration capacity on the status of riverbanks were noted. Questions were raised regarding the assessment of possible impacts on flood protection and navigation resulting from such changes to the riverbanks. The need for evaluation of these impacts was emphasized.

A (Ms. Kerstin Bock, WWF Austria): Stated that no models or detailed assessments regarding the impacts of full restoration potential on flood protection and navigation currently exist. The current study represented only an initial scoping effort focused on identifying restoration potential, without further evaluation of associated impacts. It was acknowledged that a subsequent, more detailed study would be necessary to comprehensively assess these effects.

Navigation on the Middle Danube river for the 21st century (Tibor Mikuska, Croatian Society for Birds and Nature Protection, 2025-03-25_PPT_PFW2_SHFM14_external_Navigation_on_Middle_Danube_21st_century_T.Mikuska.pdf)

The presentation addressed navigation on the Middle Danube River, focusing mainly on the Croatian-Serbian joint section. It was clarified that the content is independent of Stakeholders Forum work but inspired by the 15th Joint Statement meeting in Vienna on navigation and environmental sustainability.

Historically, the Danube was a large meandering river with extensive floodplains and limited, mainly local navigation powered by humans or animals. The industrial revolution introduced steam and diesel boats, leading to intensive river regulation and land reclamation projects to improve navigation from the 19th century onward.

After World War II, the Danube Commission successfully restored navigation across large river sections and connected the Danube to the Rhine-Main waterway. However, extensive channelization caused ecological

degradation, including reduced river length, increased flow velocity, loss of natural habitats, sediment deficits, and wetland drainage.

Since the 1990s, EU environmental legislation and the Danube River Protection Convention have promoted river protection and restoration. The joint statement on inland navigation and environmental sustainability, supported by the Platinum Manual, seeks to balance navigation with ecological needs.

Currently, about €70 million is spent annually on navigation infrastructure maintenance. Despite favorable navigation parameters, inland waterway transport on the Middle Danube is declining, impacted by external factors such as the pandemic and regional conflicts. Vessel traffic remains low even in critical sections.

Looking ahead, climate policies will phase out fossil fuel engines and encourage hydrogen and autonomous transport in road and rail sectors. Inland navigation must innovate vessel technologies and adapt to remain competitive. The presenter recommended that structural maintenance costs be borne by shipping companies while public funds prioritize river restoration.

In conclusion, the navigation sector must expand its focus beyond fairway maintenance, lead internal discussions on future adaptation, and embrace innovation to ensure long-term viability.

Questions & Answers:

Additional information (Mr. Siniša Špegar, TA): Remarked that the presentation appeared biased, as it thoroughly covered the future of road and railway transport with regard to alternative fuels and related developments, yet omitted any mention of navigation. The speaker expressed uncertainty whether this omission was intentional or due to a lack of information. They challenged the conclusions presented, stating a strong belief that the data related to navigation was misused or misrepresented over the past few years. However, they acknowledged that if this perspective represents Tibor Mikuska's official stance, they would accept it as such. It was pointed out that the presentation did not mention anything related to inland navigation or alternative fuels in that sector. The observation was made that, according to the presentation, only road and railway transport appear to be developing in this regard.

Additional information (Mr. Georg Rast, consultant): Pointed out that several important aspects closely related to navigation appear to be missing. First, the entire agricultural sector, excluding it effectively disregards a significant component of Central and Eastern Europe's economic outlook. This could ultimately lead to increased migration from the region due to a lack of business opportunities. While hydrogen appears promising, it is currently not a priority for trucks in Germany. It might play a minor role, but the main focus remains on synthetic fuels derived from biomass. This is particularly relevant for inland navigation, especially in Central and Eastern European countries where agricultural land is extensive.

He further noted that the economics of road transport raise additional questions, and some of the underlying assumptions may not be entirely robust from that perspective. Of course, this remains a matter of interpretation. He recommended engaging with the Danube Commission, particularly Manfred Seitz, who can provide a broader perspective, not only from a business point of view but also focused on the future of navigation itself.

Additional information (Ms. Lucia Karpatyova, viadonau): There are many ongoing initiatives across various parts of inland water transport, as Tibor Mikuska also pointed out. For example, challenges like personnel shortages, especially with captains, are being addressed. There are also efforts to introduce vessel trains on the rivers, though certain sectors, especially free-flowing ones, present more challenges.

Smart shipping projects are underway, along with numerous initiatives focused on greening vessels and improving sustainability.

The inland waterway transport sector is taking proactive steps to address future challenges and ensure long-term sustainability. A range of initiatives is already underway, focusing on innovation, digitalisation, and environmental performance.

While significant challenges remain comparable to those in ecological and environmental fields the sector is increasingly aligning with climate and sustainability goals. This reflects a shared understanding of the need to preserve natural resources and ensure a resilient future for all.

Next steps & AOB

- Stakeholder Forum meetings planning for 2025

Following the discussions among participants at the Forum, it has been decided that the next meeting will take place on **7th of May 2025**.

Upcoming Meetings

Meeting	Date / time	Place
Stakeholder Forum Meeting #15	7 May in the morning	Online

Attachments

- List of participants (separate file)
- Presentations (Stakeholder Forum website: <https://www.viadonau.org/en/company/project-database/preparing-fairway-2-works-in-the-rhine-danube-corridor-study/stakeholder-forum>)