

# Hydraulic and morphological modelling of the common SRB-CRO stretch of the Danube River



Republic of Serbia  
Ministry of Construction, Transport and Infrastructure  
Directorate for Inland Waterways

5th Stakeholder's Forum Meeting (online)  
Wed, **07. June 2023** (09:30-11:00 CEST)

# Modelling Components with time frame estimates

- 1D hydraulic model for the entire Serbian and Croatian common Danube stretch (3-4 months)
- Redefinition and prioritization of navigational bottlenecks (1-2 months)
- Definition of parameters for the multi-criteria analysis (1-2 months)
- Definition of alternative solutions for prioritized sectors and 2D hydrodynamic and morphological modelling (3-4 months)
- Development of the integrated study on alternative solutions and definition of next steps for future investments (last 6 months).

*Starting in September 2023, the modeling procedure is expected to last a total of 12 months. Currently, a tendering procedure is being held in Serbia to select the most qualified candidate for the execution of this contract.*

*In the meantime, all relevant data that will be used for modeling are collected via the monitoring process.*



Република Србија  
Министарство грађевинарства,  
саобраћаја и инфраструктуре  
Дирекција за водне путеве  
Београд, Француска 9

Број: 20/50  
Датум: 09.05.2023

**Plovput's letter of support to the consortium**

ЧЛАНОВИМА КОНЗОРЦИЈУМА:

ОИКОН д.о.о.

Трг сенских ускока 1-2  
10020 Загреб

ХИДРОИНГ д.о.о.

Тадје Смичкласа



Република Србија  
Министарство грађевинарства,  
саобраћаја и инфраструктуре  
Дирекција за водне путеве  
Београд, Француска 9

Број: 20/40  
Датум: 21.04.2023.

**Notification regarding planned hydrographic measures (border police)**

МИНИСТАРСТВО УНУТРАШЊИХ ПОСЛОВА  
ДИРЕКЦИЈА ПОЛИЦИЈЕ  
Управа граничне полиције  
Одељење за границу - Начелнику

Булевар Михајла Пугина 2  
11000 Београд

Предмет: Обавештење о хидрографским мерењима реке Дунав на деоници  
km 1295+500 – km 1433+100

Поштовани,

На основу Споразума Владе Републике Србије и Владе Републике Хрватске о пловидби пловних путевима на унутрашњим водама и њиховом техничком одржавању, прослеђујемо Вам Обавештење о хидрографском мерењу реке Дунав од km 1295+500 до km 1433+100 које ће се обавити у оквиру пројекта „Припрема FAIRway 2 радова на коридору Рајна-Дунав“, који заједнички реализују Министарство мора, промета и инфраструктуре Републике Хрватске, Управе унутарње пловидбе из Вуковара и Министарство грађевинарства, саобраћаја и инфраструктуре Републике Србије. Копију Обавештења можете наћи у прилогу.



# Coordination activities during April and May 2023

- Plovput issued a letter of support to the members of the consortium with the aim of easier obtaining the necessary permits and instructions from the competent institutions.
- Agreed positions of end points and directions of cross section profiles at a mutual distance of 100m, which will be used for the needs of hydrographic measurements.
- Notifications regarding planned hydrographic measures were sent to the port authorities in the Danube common sector, as well as the border police.
- One online session with consortium representatives were held. The exchange of information is still going on.

5th Stakeholder's Forum Meeting (online)  
Wed, 07. June 2023 (09:30-11:00 CEST)

# Multi-criteria analysis (MCA)

Decision-making process used to evaluate and prioritize multiple options based on a set of criteria.



Main steps	
Define the problem	Clearly state the problem or decision that needs to be made and identify the objectives or goals to be achieved
Identify options	List all possible options that can address the problem or achieve the objectives
Establish criteria	Determine the criteria or factors that will be used to evaluate and compare the options
Assign weights to criteria	Assign a weight to each criterion to represent its relative importance in the decision-making process
Evaluate options	Assess each option against the criteria and assign a score or rating based on its performance
Calculate weighted scores	Multiply the scores for each option by the corresponding weights of the criteria and sum them up to obtain a weighted score for each option
Rank options	Rank the options based on their weighted scores, with the highest score indicating the best option
Make a decision	Based on the ranking and the sensitivity analysis, select the option that best meets the objectives and preferences of the decision-maker

**By considering various factors and their trade-offs, MCA enables more informed and transparent decision-making.**

# Multi-criteria analysis (MCA) on critical sector “Bogojevo”

## Options defined prior to the execution of the 2D modelling

Option 1	Construct a side channel closure bund at km 1,365.5, dredging at km 1,363.5 and 1,362
Option 2	Dredging
Option 3	Sills and reconstruction of bank protection
Option 4	Similar to option 1, but chevrons at right bank upstream of km 1,365.8 instead of closure bund

Extracted from 2013 FEASIBILITY STUDY – Preparation of Documentation for River Training and Dredging Works on Selected Locations along the Danube River in Serbia

Delegation of the European Union to the Republic of Serbia  
EuropeAid/129691/C/SER/RS



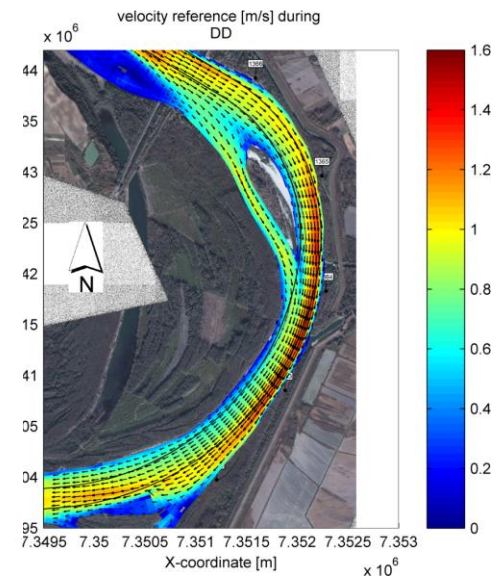
The presented options were evaluated and screened based on three criteria: effectiveness, environmental impact and cost, in order to determine which options would be subject to 2D modeling.

### Screening of the options

Based on the information presented the options have been listed in Table 12.2. From the evaluation and screening of the options it is decided to further investigate and model the option 1 and 4.

Table 12.2. Sector #09 - Screening of options

Option	Effectiveness	Environment	Cost
1	+	-	0
2	-	0	0
3	-	+	-
4	0	+	0








# Effects of newly built hydrotechnical infrastructure on the Danube in Serbia



- Hydrotechnical structures have been built in three of the six critical navigation sectors to improve navigation conditions.
- **Chevrons** were built on two critical sectors (Futog and Preliv) - the first hydrotechnical structures of this type on the Danube.
- The representative of Plovput will give a presentation of the effects of these structures, mainly in a morphological sense, at the next SHFM meeting in September 2023.
- A discussion on this topic within SHFM could be an excellent starting point to the following modeling process.





 Co-financed by the Connecting Europe Facility of the European Union



# Thank you for your kind attention

Ljubisa Mihajlovic, BSc Civil Eng.  
[ljmihajlovic@plovput.rs](mailto:ljmihajlovic@plovput.rs)

5th Stakeholder's Forum Meeting (online)  
Wed, **07. June 2023** (09:30-11:00 CEST)