#### **DANUBE COMMISSION**

Expert Meeting on Hydrotechnical Issues February 29, 2024, Budapest

# Fairway conditions in the Republic of Serbia - Activities for their improvement -

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#### **Critical Sectors for navigation on the Danube in Serbia**



nland Waterways in the Republic of Serbia – Danube Commission, Budapest, 29.02.2024.



#### **Activities on the common SRB-CRO sector**



## **Collected hydrographic data on the common sector**

#### HUNGARY



- Each planned Cross Sectional profile has been hydrographicaly measured and stored in an electronic database for later analysis.
- Total number of 1375 CS (688 NO + 687 DP)

D profila (delimiter: , )		Vrsta profila:	
		136 🔲 Evidencioni (EP)	
Reka:		1059 🗍 Kontrolni (KP)	
Dunav 👻		73 🔲 Plicaci (PL)	
Vrsta deonice:		84 🔲 Zimovnici (ZM)	
Cela duzina reke 👻		688 🔽 Novi -200m (NO)	4.275.00
Deonica:		687 🔽 Dopunski -50m (DP)	1375 (5
Dunav	-	10 🔽 Vodomeri (VS)	
Uzvodna KM:	Nizvodna KM:	7 🔲 Mostovi (MO)	
1433.000	1295.600	40 Sidrista (SI) Konv.	



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Bank



#### **Closer look at the cs layout**

Spatial arrangement of CS that are usually measured (200m from each other)

Double the density for project-related modeling purposes (100m from each other).



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European Investment Bank The Cil benk 1376



## **Expected outputs**

- 1D hydraulic model for the entire Serbian and Croatian common Danube stretch + ENR 2023
- Redefinition and prioritization of navigational bottlenecks
- Definition of parameters for the multi-criteria analysis
- Definition of alternative solutions for prioritized sectors and hydrodynamic and morphological 2D modelling
- Development of the integrated study on alternative solutions and definition of next steps for future investments.





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# Hydrographic surveys during 2023

During 2023 the Plovput carried out hydrographic survey of the Danube river from km 1295+500 to km 1132+000 and from km 859+200 to km 845+800 with single-beam.

Hydrographic survey of 6 critical sectors in Serbia was carried out by Plovput subcontractor, with multi-beam during August 2023.



## New vessels procurement

is the deadline for submitting bids.

Public procurement and construction of one surveying vessel and one marking vessel in order to increase the technical capacity of the Serbian waterway administration.

The surveying vessel will be equipped with multi-beam and ADCP.

The Tender has been announced and will remain open until March 20th, which



#### **Status of Main Critical Sectors in Serbia**

#### River Training Works on Danube (2017-2021)

- Hydrotechnical structures have been built in three of the six critical navigation sectors to improve navigation conditions
- All hydrotechnical structures were built in accordance with the "Handbook of Good Practice in Sustainable Waterway Planning"



Removal of Bottlenecks





The Project is funded by the European Union

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## Critical Sector Susek (km 1287+000 – km 1281+000)



Required water level for fairway dimensions 2,5/200 on GS Backa Palanka: H<sub>req</sub>=100cm

Number of days on GS Backa Palanka with water level  $H < H_{req}$ : 36

Gauging Station Backa Palanka "0"=73.97mnm, ENR=47cm, HNL=578cm

Critical Cross Section: km 1284+750

- min fairway depth: 2m
- available width: 175m (200m)



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## Critical Sector Futog (km 1287+000 – km 1281+000)

Favorable morphological development of the riverbed was achieved by the construction of an detached groyn (km 1263+350) and a chevron (km 1262+800 – km 1262+700).



Critical Cross Section: km 1266+950 •min fairway depth: 2.7m •available width: 180m

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

PP 180 x 2 5n

#### Critical Sector Arankina Ada (km 1248+000 – km 1244+800)



Gauging Station Novi Sad

"0"=71.73mnm, ENR=57cm, HNL=574cm

Critical Cross Section: km 1246+550

- min fairway depth: 2.1m
- available width: 150m (180m)

Required water level for fairway dimensions 2,5/180 on GS Novi Sad:  $H_{req}=100$ cm

Number of days on GS Novi Sad with water level  $H < H_{req}$ : 46



## Critical Sector Cortanovci (km 1241+600 – km 1235+000)



#### In 2023 critical cross section: km 1236+850

- min fairway depth: 2.8m
- available width: 180m

During February 2024 the Plovput carried out hydrographic survey from km 1237+350 to km 1236+250 with single-beam

In 2024 critical cross section: km 1236+850 • min fairway depth: 1.5m



## Critical Sector Beska (km 1232+000 – km 1226+600)

![](_page_12_Figure_1.jpeg)

![](_page_12_Figure_2.jpeg)

Critical Cross Section: km 1230+450

• min fairway depth: 2.7m

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![](_page_12_Picture_6.jpeg)

![](_page_12_Picture_8.jpeg)

#### Critical Sector Preliv (km 1207+000 – km 1195+000)

![](_page_13_Picture_1.jpeg)

Favorable morphological development of the riverbed was achieved by the construction of the chevron (km 1200+900 – km 1200+700).

Critical Cross Section: km 1200+850

- min fairway depth: 3.5m
  - available width: 200m

![](_page_13_Figure_6.jpeg)

![](_page_13_Picture_8.jpeg)

![](_page_13_Picture_10.jpeg)

# Planned activities to ensure navigation in 2024 (from Backa Palanka to Belgrade)

#### **Dredging works on**

#### **Critical Sector Cortanovci**

- Will be performed by Plovput for purpose of fairway maintenance
- Result of dredging will be fairway with depth/width = 3.5/150

# Dredging works on

#### **Critical Sector Arankina Ada**

- Will be performed by Koridori Srbije for purpose of highway construction
- Result of dredging will be fairway with depth/width = 3.5/180

![](_page_14_Figure_9.jpeg)

#### Upgrade of Iron Gate I lock (2017-2022)

![](_page_15_Picture_1.jpeg)

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![](_page_15_Picture_3.jpeg)

## FAIRway works! in the R-D Corridor (2020-2023)

![](_page_16_Figure_1.jpeg)

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![](_page_16_Picture_3.jpeg)

# Upgrade of Iron Gate II lock (2022-ongoing)

- The Contractor commenced with Works on Site on 26th of March 2023.
- Construction works started.
- Since July 18th, the lock has been closed for one year, and traffic has been redirected to the Romanian lock .

![](_page_17_Picture_4.jpeg)

International Inland Waterways in Serbia

![](_page_17_Picture_5.jpeg)

Removal of

**Bottlenecks** 

![](_page_17_Picture_6.jpeg)

![](_page_17_Picture_7.jpeg)

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![](_page_17_Picture_9.jpeg)

![](_page_17_Picture_10.jpeg)

![](_page_17_Picture_11.jpeg)

![](_page_17_Picture_13.jpeg)

![](_page_17_Picture_14.jpeg)

## AtoNs on the Sava River (2023-ongoing)

![](_page_18_Picture_1.jpeg)

![](_page_18_Picture_2.jpeg)

- Public procurement of one hundred (100) new buoys with AIS and lighting modules.
- These will enable remote
  monitoring of the position of
  floating marking signs.
  Communication with AIS
  AtoNS will be enabled from
  the central marking control
  room.
- The contract was signed in April 2023, delivery is completed in February 2024.

#### **Application of ICT**

![](_page_18_Picture_7.jpeg)

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![](_page_18_Picture_10.jpeg)

![](_page_18_Picture_12.jpeg)

# Uxo Survey and Removal of sunken German fleet (2020 - ongoing)

![](_page_19_Figure_1.jpeg)

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![](_page_19_Picture_3.jpeg)

#### VTS and Voice (2022-2023) VHF & Network of HMSs

![](_page_20_Figure_1.jpeg)

# **Preparing River Training and Dredging Works on the Sava Drina Confluence (2019 - ongoing)**

![](_page_21_Figure_1.jpeg)

#### **Development of lock on the Tisza River**

![](_page_22_Figure_1.jpeg)

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# Thank you for your kind attention Ljubisa Mihajlovic, BSc Civil Eng.

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

![](_page_24_Picture_0.jpeg)

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![](_page_24_Picture_2.jpeg)

![](_page_24_Picture_4.jpeg)