

Directorate for Inland Waterways, Belgrade, Serbia  
(on behalf of the Croatian Agency for IWT)

# Current state of IWT bottleneck projects in Republic of Serbia and Republic of Croatia

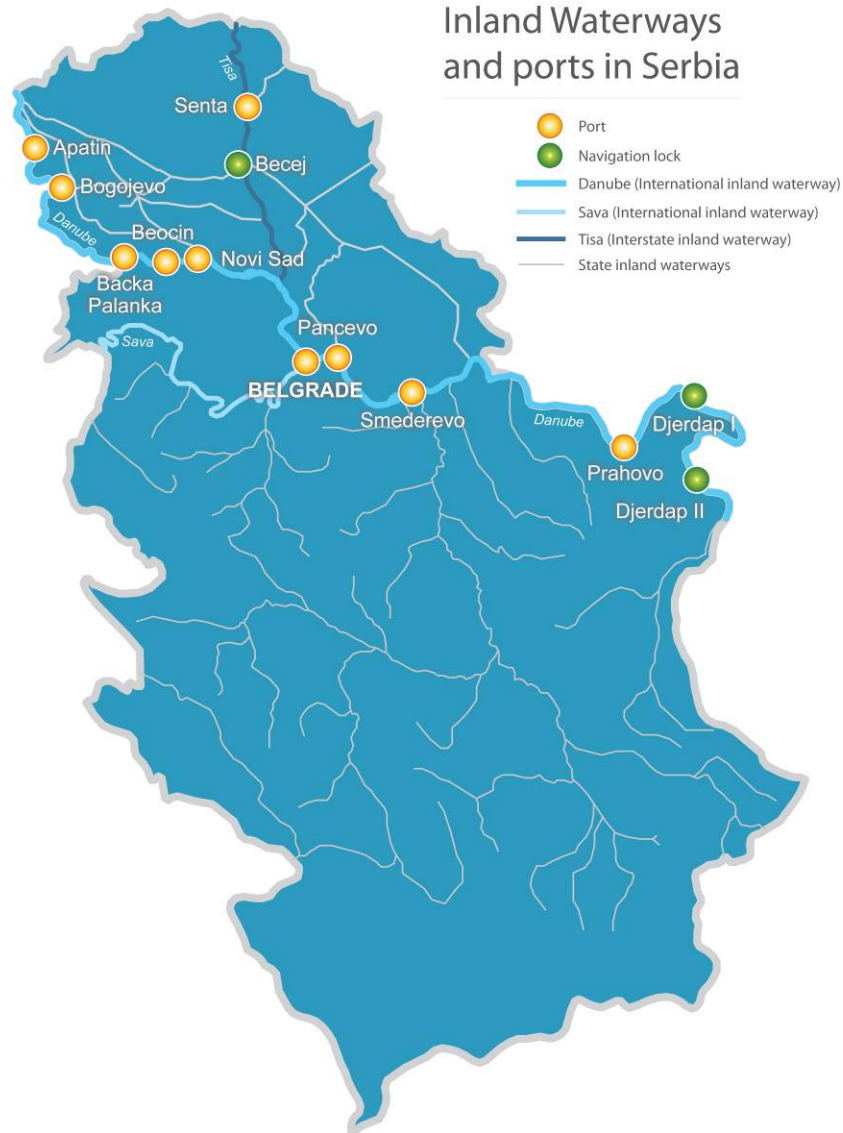
## - Current Projects and Future Plans -

Joint Presentation of  
the Republic of Serbia and the Republic of Croatia

Vienna, April 5, 2011



## Inland Waterways and ports in Serbia



# Legal framework

- *International legal framework*
- *Bilateral agreements*
- *National legal frameworks*



# International legal framework

- Relevant Policies
- Relevant International Legal Conventions
  - EU Directives



# Relevant Policies

## ***EU environment policy***

- River Basin Management Plan for the Danube - 2009
- White Paper (introducing the framework for adaptation measures and policies to reduce EU`s vulnerability to climate change) – 2009
- Guidance document on adaptation to climate change in water management

## ***EU transport policy***

- NAIADES (EC action programme on the promotion of IWT) 2006
- EU PLATINA project (supports the implementation of the NAIADES action programme)
- EU strategy for the Danube region (2011)



# Relevant International Legal Conventions

- Sofia Convention on the Protection of the Danube River (1994)
- Rhine Protection Convention (1999)
- Espoo Convention *on EIA in a Transboundary Context* (1997)
- RIO Convention *on Biological Diversity* (1992)
- Ramsar Convention *for the conservation of internationally significant wetlands* (1971)
- World Heritage Convention (1972)
- Bern Convention (1979)
- Lower Danube Green Corridor Agreement (2000)
- Framework Agreement on the Sava River Basin (2002)
- Belgrade Convention *on the Navigation Regime on the Danube* (1948)
- European Agreement on Main IWs of International Importance (AGN, 1996)
- European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways (AND, 2000)



# Directives

- EU Water Framework Directive 2000/60/EC
- Birds Directive (79/409/EEC)
- Habitats Directive (92/43/EEC)
- “EIA Directive” (85/337/EEC)
- "SEA-Directive“ (2001/42/EC)
- Flood Risk Directive (2007/60/EC)



# Joint statement on Inland Navigation and Environment Protection in the Danube Basin (new common starting point)

- A number of proposed new waterway extension and maintenance projects along the Danube have created **potential conflict** with the EU Water Framework Directive (WFD) and other EU environmental law
- Basis needed for improvement of navigation and protection of the natural landscape and water quality of the Danube at the same time
- ***The Joint Statement provides guiding principles and criteria for the planning and implementation of waterway projects that reconcile the conflicting interests of navigation and the environment***





# Bilateral agreements

- Serbia has two joint sections of the Danube River, one **with Croatia** (km 1433 – km 1295.5) and one **with Romania** (km 1075 to km 845.5).
- Serbia and Croatia have signed the **Bilateral Agreement on navigation on IWWs and their technical maintenance, on October 13th, 2009, in Belgrade. The Interstate SRB-CRO Commission** for the implementation of the **Bilateral Agreement** was founded in 2010. Two countries share the section the **Danube River in the length of 137 km.**
- Agreement **between the Government of former SFRY and the Government of Romania from 1976** on demarcation and control of application of the rules of navigation, maintenance and improvement of navigation conditions in the sector where Danube forms the border between the two countries is still in force.



# National legal framework (Serbia)

## Strategic documents and legislation

### Strategic documents:

Strategy for sustainable development (2005)

Master plan for IWWs in Serbia (2006)

Transport strategy 2008-2015 (2007)

General master plan for transport (2009)

### Legislation:

Law on navigation and ports on IWWs (2010)

Law on waters (2010)

Set of environmental laws (2009)



# National legal framework (Croatia)

- Republic of Croatia Physical planning Strategy (1997)
- Republic of Croatia Programme of Physical Planning (1999)
- Water management Strategy (2008)
- Republic of Croatia IWW development Strategy 2008 – 2018 (2008)
- National Environmental Strategy (2002)
- National Plan for Flood protection (1997)
- Physical Planning and Construction Act (2007)
- IWW and ports Act (2007)
- Environment Protection Act (2007)
- Nature Protection Act (2005 & 2008)
- Act on Waters (2009)



# Master Plan for IWW transport in Serbia (2006)

**18 Critical sectors identified on the Danube stretch in Serbia (including joint stretch with Croatia)**



# Prospect for regulation works in the Danube

Project: Preparation of **documentation** for river training works on the critical sections on the Danube River in Serbia

Programme: IPA 2010

Duration: 2011-2012

Overall budget: EUR 2 Million



Critical sections on the Danube River in Serbia, Master Plan for IWW transport in Serbia (2006)



# Prospect for regulation works in the Danube

## Project: **River training works on the 5 critical sections on the Danube River in Serbia**

Programme: IPA 2012-2013 (OP for ED – IPA component III)

Duration: 2013-2016

Overall budget: EUR 12 Million



Critical sections on the Danube River in Serbia, Master Plan for IWW transport in Serbia (2006)



# Joint Section



# Joint sector

Length of the joint sector of the Danube River is 137.5 km

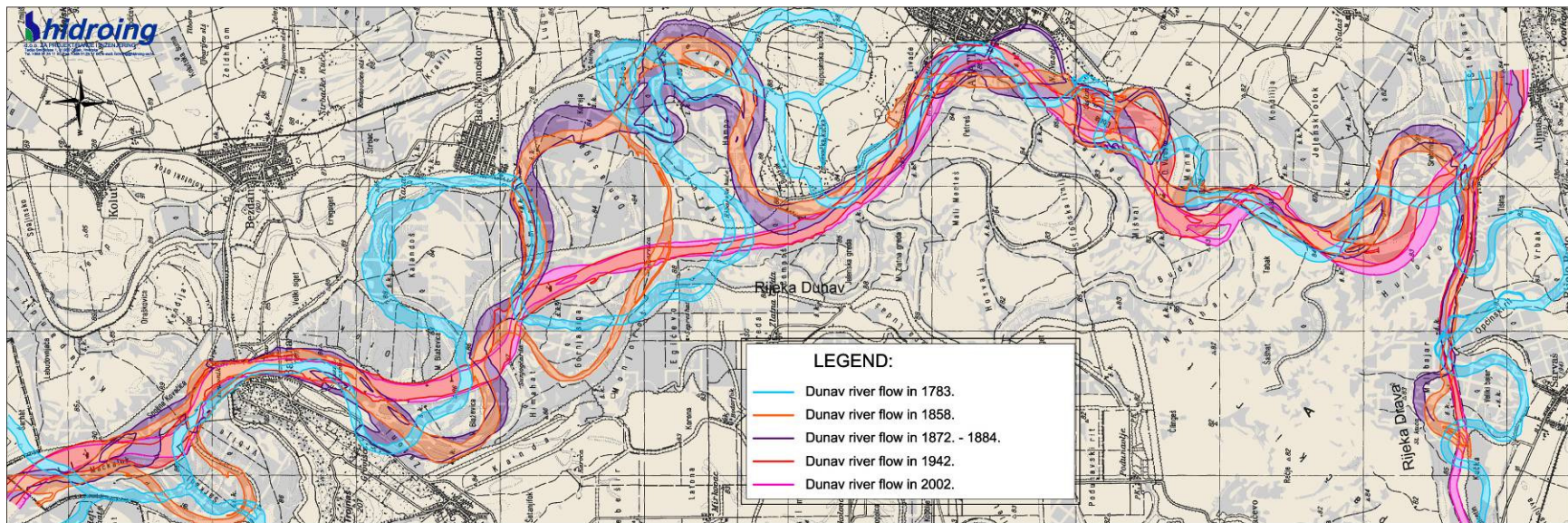




- According to results of the **Joint research** of the Danube river that was carried out **on two occasions** (in 2001 and 2007) by International Commission for the Protection of the Danube River, joint section was tentatively defined as a natural water body, although during last centuries were executed **massive river engineering works** as well as meander cutoffs that **significantly changed hydrological situation** of the Danube.
- However provisional definition of this stretch as a natural water body points out that in spite of numerous anthropogenic influences, **state of natural environment maintained at high level**. The cause partially lies in the fact that river engineering works in the Danube channel consisted mainly of structures of the so called classical type built of natural material that easily fit into the environment.



# Historical overview of the morphological changes in the Danube watercourse



# Joint Section - Characteristics

- REACH OF THE MUTUAL INTEREST IS FROM 1295.5 RIVER km (BORDER WITH REPUBLIC OF SERBIA) TO 1433.0 RIVER km (BORDER WITH REPUBLIC OF HUNGARY)
- REACH IS CHARACTERISED BY SIGNIFICANT MORPHOLOGICAL CHANGES CAUSED BY NATURAL PROCESSES OF EROSION AND DEPOSITION OF SEDIMENT
- RIVER REGULATION WORKS ON THE THAT STRATCH HAVE NOT BEEN FULLY EXECUTED HENCE THE RIVER BED STABILITY PROBLEMS OCCUR AND CONSEQUENTIALLY PROBLEMS WITH TRANSPORT CAPABILITIES (OF WATER, SEDIMENT AND ICE), INLAND NAVIGATION, STATE BORDER, FLOOD PROTECTION ETC.
- THE RIVER REACH FROM 1400 TO 1410 RIVER km IS CHARACTERISED (AS THE REST OF THE JOINT SECTOR) BY LACK OF THE CONTINUED MAINTENANCE AND MANAGEMENT DUE TO THE STATE BORDER PROBLEMS AND INSUFFICIENT FUNDING



# SECTORS WITH NAVIGATION PROBLEMS

- SECTOR APATIN
- SECTOR SOTIN – BANK EROSION PROBLEMS, BIFURCATION
- SECTOR MOHOVO – PROBLEMS WITH VARIABLE DEPTHS
- CONFLUENCE OF DRAVA – SEDIMENTATION OF THE MOUTH OF DRAVA
- THERE ARE OTHER POTENTIALLY PROBLEMATIC SECTORS FOR NAVIGATION DUE TO BANK EROSION (ŠARENGRAD, VUKOVAR, DALJ) OR PROBLEMS WITH SEDIMENT DEPOSITION



# ADVICES - GUIDELINES

- WITH THE COOPERATION IN THE MANAGEMENT OF DANUBE RIVER THERE IS A POSSIBILITY OF FINANCING USING THE EU PRE-ACCESSION FUNDS WHICH WOULD RESULT IN THE **SHARED REACH REGULATION** AND THAT WOULD RECONCILE ECOLOGICAL, SOCIOLOGICAL AND OTHER PROBLEMS WHICH EMERGE IN DANUBE AS AN INTERNATIONAL WATERWAY – **GREAT FUNDS ARE NEEDED BUT NO ONE SIDE CAN BEAR THEM ALONE**
- IT IS NECESSARY TO OBEY THE WATER FRAMEWORK DIRECTIVE
- **HARMONIZED MUTUAL TECHNICAL SOLUTION FOR THE REACH (CROATIA AND SERBIA)**
- **EIA STUDY FOR BOTH COUNTRIES**



# ADVICES - GUIDELINES

- **ADEQUATE DESIGN METHODOLOGY**
- **APPLICATION OF MODERN TECHNOLOGIES** (GPS, ORTOPHOTO, SATELLITE RECORDS, MATHEMATICAL MODELLING, MEASUREMENT OF HYDRAULIC AND HYDROLOGIC PARAMETERS) RELIEVES DESIGN AND PLANNING
- **INTEGRAL MANAGEMENT** AND CARE FOR DANUBE AS A UNIQUE RESOURCE DICTATES **INTERNATIONAL COOPERATION AND MUTUAL EFFORTS** (FINANCIAL AND EXPERT) **ON PROBLEM SOLUTION**
- **COOPERATIVE MEETINGS WITH SERBIA** (EXCHANGE OF INFORMATION)
- REGULATION AND WATERWAYS DESIGNS HAVE TO BE **HARMONIZED AND VERIFIED** BY BOTH SIDES WITH THE RESPECT TO THE INTERNATIONAL CONVENTIONS AND AGREEMENTS



# The most important measures for the protection of endangered biotopes

- Protection of water habitats and wetlands as much as possible in the state that resembles natural as well as revitalization of them if needed
- Provision of enough water in water habitats and wetlands necessary for survival of habitats and their species
- Protection of favorable physical-chemical properties of water and improvement of the same if they are unfavorable for the survival of habitats and their species
- Maintenance of favorable water regime for the protection of wetlands
- Protection on favorable content of mineral and nutrient matters in the water and soil of wetlands
- Protection of biodiversity in water courses (natural river channels, shoals, rapids, etc.) and favorable water dynamics (meandering, sediment movement and deposition, periodical natural flooding of armlets, etc.)
- Protection of the interconnection of water course
- Protection of species important for the biotope



# Proposed measures for environment protection

- Avoidance of river engineering and changes in water regimes of water habitats and wetlands, unless it is necessary for the protection of human lives and settlements
- Avoidance of use of sediments from sand bars
- Training structures should be built at the level of mean low waters





# Technical documentation (Variant solutions to the regulation of the joint sector)

- Conceptual design and feasibility study for the river channel engineering and rehabilitation of banks at the **sector Apatin**, Institute for Water Management «Jaroslav Cerni», Directorate for Inland Waterways, Faculty of Civil Engineering (University of Belgrade), 2006
- Conceptual design – rehabilitation of the channel and right bank of the Danube river **from km 1410 to km 1433** with the aim of technical and economic maintenance of the river and international waterway, Hidroing d.o.o. Osijek, 2007
- Conceptual design – rehabilitation of the channel and right bank of the Danube river **from km 1400 to km 1400**, Hidroing d.o.o. Osijek, 2004
- Conceptual design – rehabilitation of the channel and right bank of the Danube river **from km 1380 to km 1400** with the aim of technical and economic maintenance of the river and international waterway, Hidroing d.o.o. Osijek, 2006



# Possible environment impacts of planned river engineering works

- Changes in natural composition of the river channel
- Changes in hydrologic and hydro-morphologic characteristics or river ecosystems
- Hydrologic and hydro-morphologic changes in flood plains (inundations)
- Changes in the composition of water habitats and wetlands in flood plains
- Changes in species populations



- In order to preserve natural values of river habitats for bird nesting total amount of river engineering works was significantly reduced. Out of originally considered 57, now is planned execution of only 19 river engineering structures.
- The idea of the construction of the T-groin was abandoned at the stretch between km 1401 and 1404 that represents exceptionally preserved landscape with a sand bar as a significant area of ecological network for the protection of ornitofauna.
- On the whole, abandonment of construction of certain river engineering structures at the stretches important primarily for birds significantly reduced the possibility of negative effects on protected bird species of river habitat.

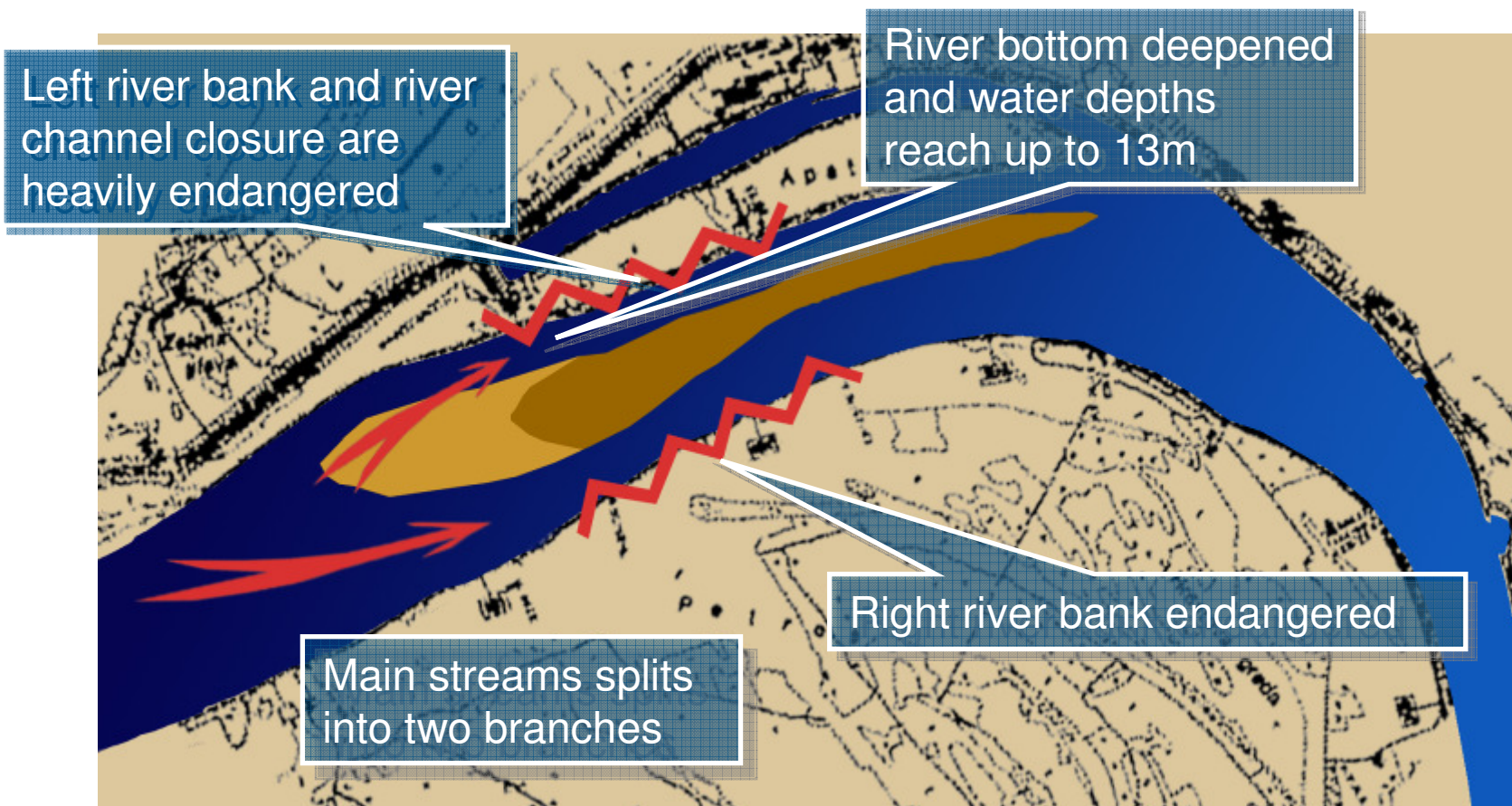


# DANUBE REACH FROM 1400 TO 1410 km



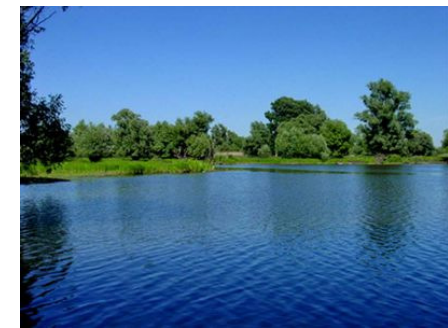
# APATIN Section

Apatin section is one of **the most critical** sections for navigation  
It creates problems for both sides, Croatian and Serbian



# APATIN Section

On the Croatian side of this part of the Danube River, there is a nature park Kopacki Rit, a unique reserve of plants and birds



# APATIN Section

On the Serbian side of this part of the Danube River, there is a town of Apatin, with its shipyard, port and marine



# REACH FROM 1400 TO 1410 km

- FOLLOWING THE TECHNICAL INSPECTION OF RIVER DANUBE AFTER THE PEACEFUL REINTEGRATION AND DUE TO OBSERVED OBSTACLES TO NAVIGATION SIGNIFICANT CHANGES WERE DETERMINED TO THE DANUBE RIVER CAUSED BY LACK OF MAINTENANCE ON THE REGULATION STRUCTURES FOR MULTIPLE YEARS
- THE REACH FROM 1400 TO 1410 km WAS CHOSEN BECAUSE FURTHER EROSION OF THE RIGHT BANK WOULD CAUSE A WATER BREACH FROM DANUBE TO THE AREA OF KOPAČKI RIT NATURE PARK WHICH ENJOYS A SPECIAL STATUS AND NOT ONLY IN CROATIA (IT IS INCLUDED IN THE LIST OF AREAS PROTECTED BY RAMSAR CONVENTION AND ON THE LIST OF ORNITHOLOGICAL IMPORTANT AREAS BY UNESCO)
- BESIDES THE ALREADY MENTIONED PROBLEMS WHICH ARE A CONSEQUENCE OF NATURAL PROCESSES OF THE DANUBE RIVER, IT IS IMPERATIVE TO ACCEPT THE ECONOMIC (WATERWAYS), SOCIOLOGICAL (STATE BORDER), ECOLOGICAL (NATURE PARK) AND LEGISLATIVE TERMS DURING THE PLANNING OF REGULATION OF THE DANUBE RIVER
- ON THE TERRITORY OF REPUBLIC OF CROATIA IS THE KOPAČKI RIT NATURE PARK, WHILE THE URBAN AREA OF THE CITY APATIN IS ON THE RIGHT BANK





# APATIN Section

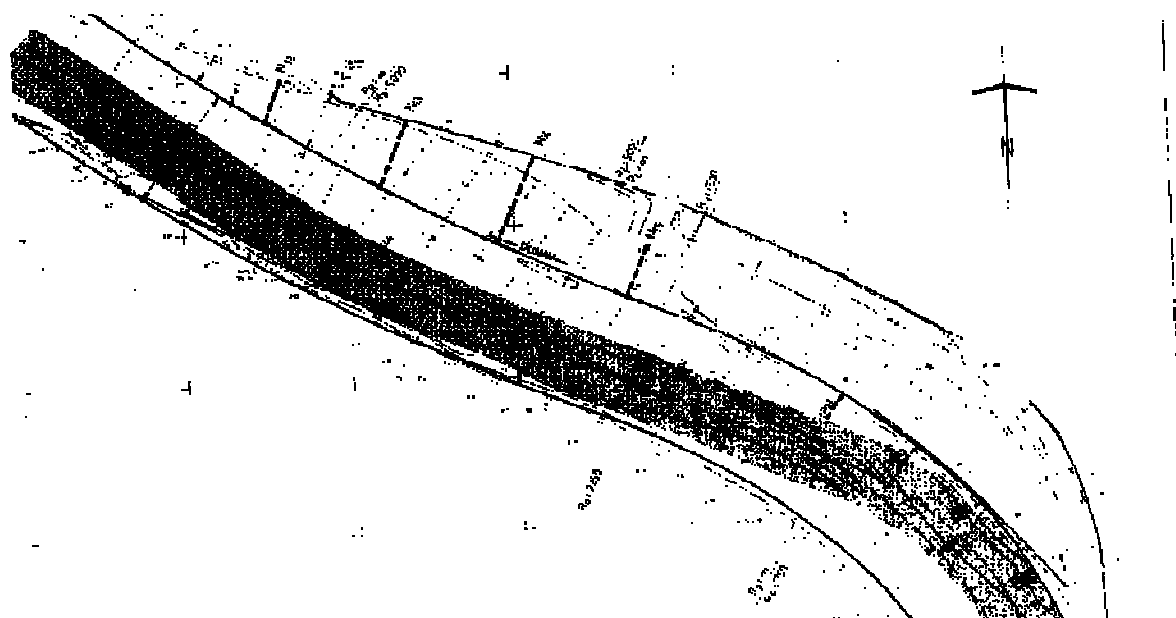


**Solution:**  
Large scale river training works with  
joined forces from both countries



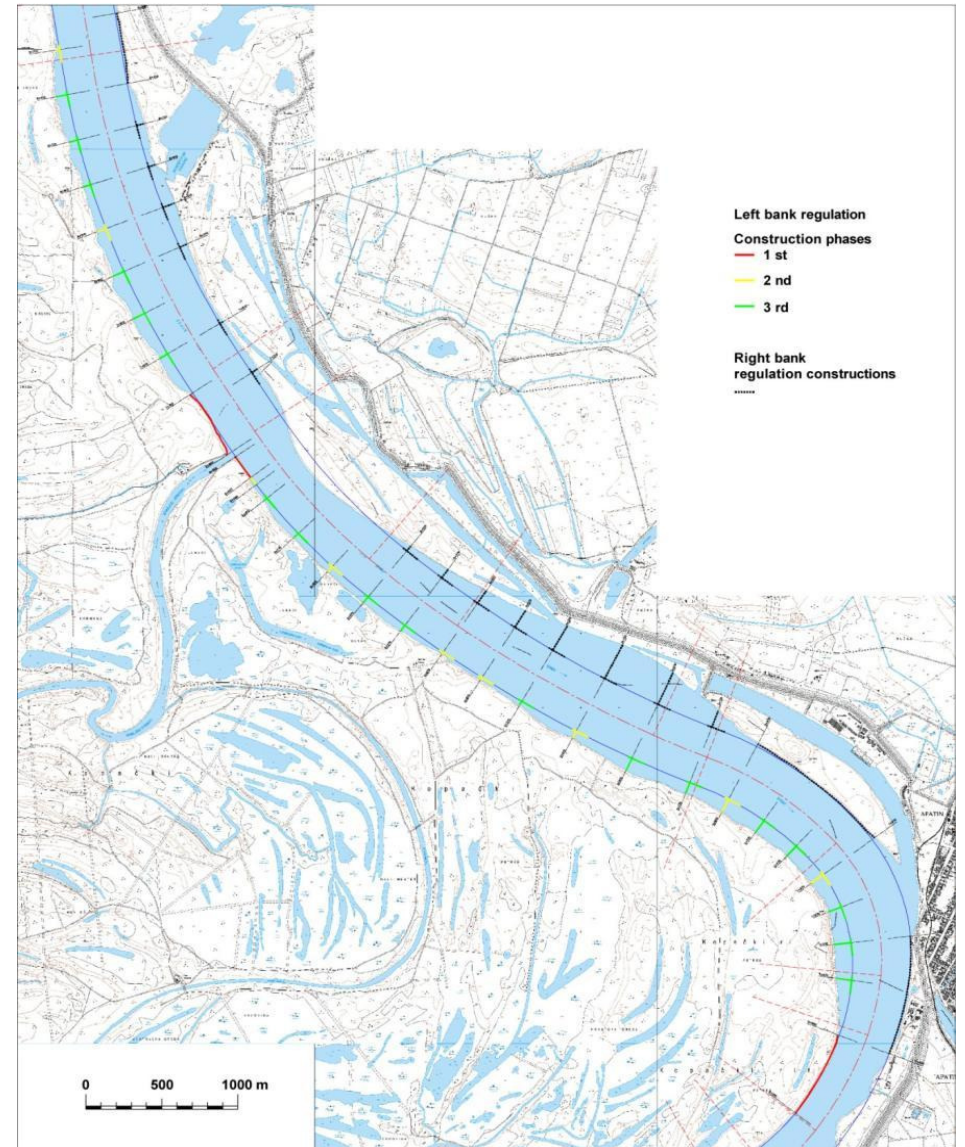
# STARTING POINT

- **AS A BASIS DURING THE WORK REGULATION ELEMENTS WERE ADOPTED IN ACCORDANCE TO THE REGULATION PROJECT OF THE YUGOSLAVIAN PART OF DANUBE SECTOR FROM SHARED INTEREST, MADE BY „JAROSLAV ČERNI“ INSTITUTE FOR WATER MANAGEMENT, BELGRADE, 1987:**
  - **REGULATION WIDTH OF DANUBE - 300 TO 450 m,**
  - **MINIMAL CURVE RADIUS - 1600 m (ON AN EXCEPTIONAL BASIS 1000 m),**
  - **THE HEIGHT OF THE REGULATION STRUCTURES - AVERAGE LOW WATER LEVEL+1,00 m**



# REGULATION SOLUTION

- REGULATION SOLUTION WAS DEFINED INTEGRALLY **FOR THE WHOLE REACH**
- OBJECTS WERE DEFINED FOR BOTH BANKS
- PHASES OF WORKS AND BoQs WERE MADE **FOR RIGHT BANK**
- INVESTMENT VALUE ESTIMATE FOR THE RIGHT BANK - AROUND 20.000.000,00 € FOR 10 KM



## Executed works on the right bank

- 2 T-groins at km 1405+570 and km 1406+170 and km 1406+170
- training works (bank protection) immediately downstream from the Vemelj canal, from km 1406+680 to km 1406+800
- baffle pier from km 1406+637 to km 1406+680



**Thank you  
for your kind attention**

**Dusko Isakovic**  
Directorate for Inland Waterways, Belgrade Serbia

