



# Preparing Fairway 2 and the 5-country Biosphere Reserve Mura-Drava-Danube

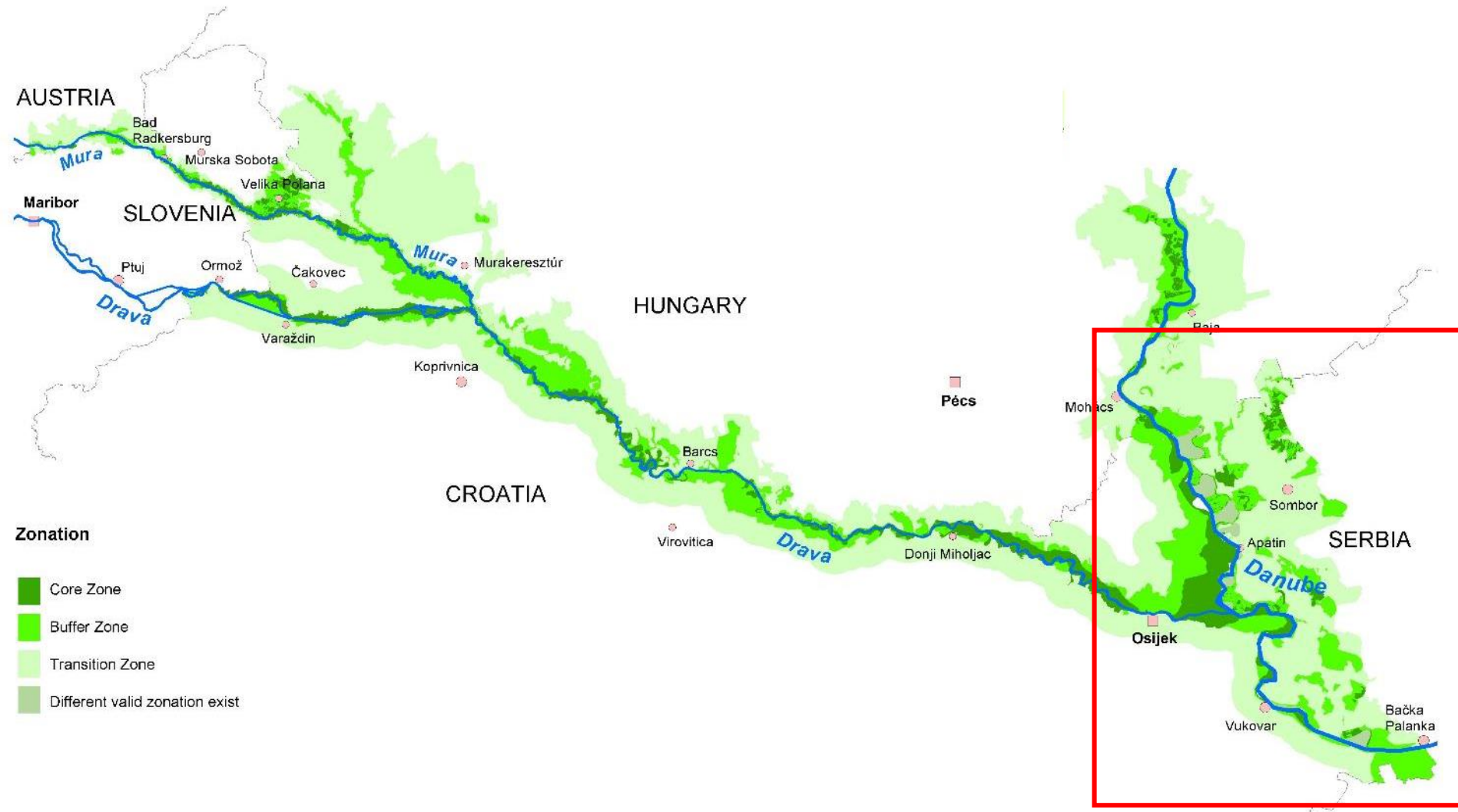
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# Croatian-Serbian Danube - key area of the 5-country Biosphere Reserve



# Croatian-Serbian Danube - European outstanding ecological values

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- **50% of the most natural river stretches** on the first 2000 km (ICPDR 2014/21)
- **Most natural floodplains** on the first 2,000 kilometers (source to Iron Gate) → corresponds to 50% of all river stretches with intact floodplains on the Danube (ICPDR 2014/21)
- **the largest floodplain forests** on the entire Danube River
- **5 large protected areas totalling about 82,000 ha** (2 nature parks, 2 nature reserves, Natura 2000 and Emerald sites → all included in the **5-country Biosphere Reserve**)
- **the highest breeding density of white-tailed eagles** in continental Europe (over 100 breeding pairs)
- **the most important fish spawning area** (Kopacki Rit) next to the Danube Delta
- probably the **last refuge** for the almost extinct **ship sturgeon** (*Acipenser nudiiventris*)

# Goal of the 5-country Biosphere

## Preservation and restoration of:

- natural processes of a dynamic river and the associated floodplains
- natural hydrological and natural hydro-morphological regime



### TRANSBOUNDARY NOMINATION FORM



### 5-COUNTRY BIOSPHERE RESERVE MURA-DRAVA-DANUBE (TBR MDD)

Austria | Croatia | Hungary | Serbia | Slovenia



# OPERATIONAL GOAL 1.2.

## Preserve natural water regimes and processes

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- Strive to **prevent further embankments/other structures** along intact riverbanks and promote the **removal of existing, non-functioning river training structures** and enlarge floodplain areas by reallocating dikes where possible
- Advocate **ban on further sediment extractions** and improve sediment flow and longitudinal continuity

# Navigation Bottlenecks

## Analysis of the existing state Critical sections (2)



Criteria fulfilled	Green
Criteria not fulfilled	Red

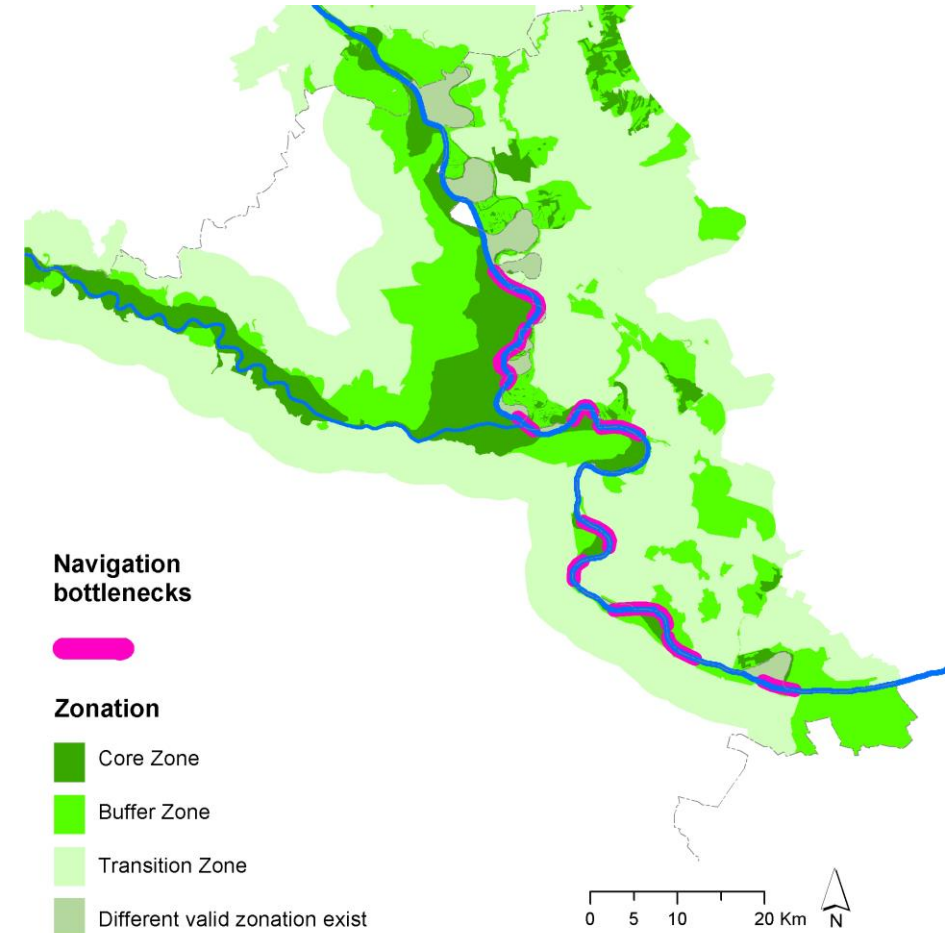
No	Name of critical section	from rkm	to rkm	Depth of waterway	Width of waterway					Radius of waterway	Width and height of bridge passes	Critical sections due to erosion	TOTAL
					200 m	150 m	120 m	100 m	80 m				
1	Batina / Bezdan	1429,00	1425,00										Green
2	Siga-Kazuk	1424,20	1414,40										Green
3	Apatin	1408,20	1400,00										Green
4	Židovski/Čivutski rukavac	1397,20	1389,00										Green
5	Ušće Drave	1383,40	1381,60										Green
6	Aljmaš	1381,40	1378,20										Green
7	Staklar	1376,80	1373,40										Green
8	Erdut	1371,40	1366,40										Green
9	Bogojevo	1366,20	1361,40										Green
10	Dalj	1357,00	1351,00										Green
11	Borovo I	1348,40	1343,60										Green
12	Borovo II	1340,60	1338,00										Green
13	Vukovar	1332,00	1325,00										Green
14	Sotin	1324,00	1320,00										Green
15	Opatovac	1315,40	1314,60										Green
16	Mohovo	1311,40	1307,60										Green
17	Ilok	1302,00	1300,00										Green

- 10 critical sectors determined (out of 17), predominantly due to insufficient waterway depth/width and erosion potential
- Currently, no ongoing/long-term traffic disturbances in critical sections – short distances with small occurrence of two-way traffic
- Critical sections – to be further analyzed, potentially to implement mitigation measures

# Biosphere reserve zonation and Bottlenecks



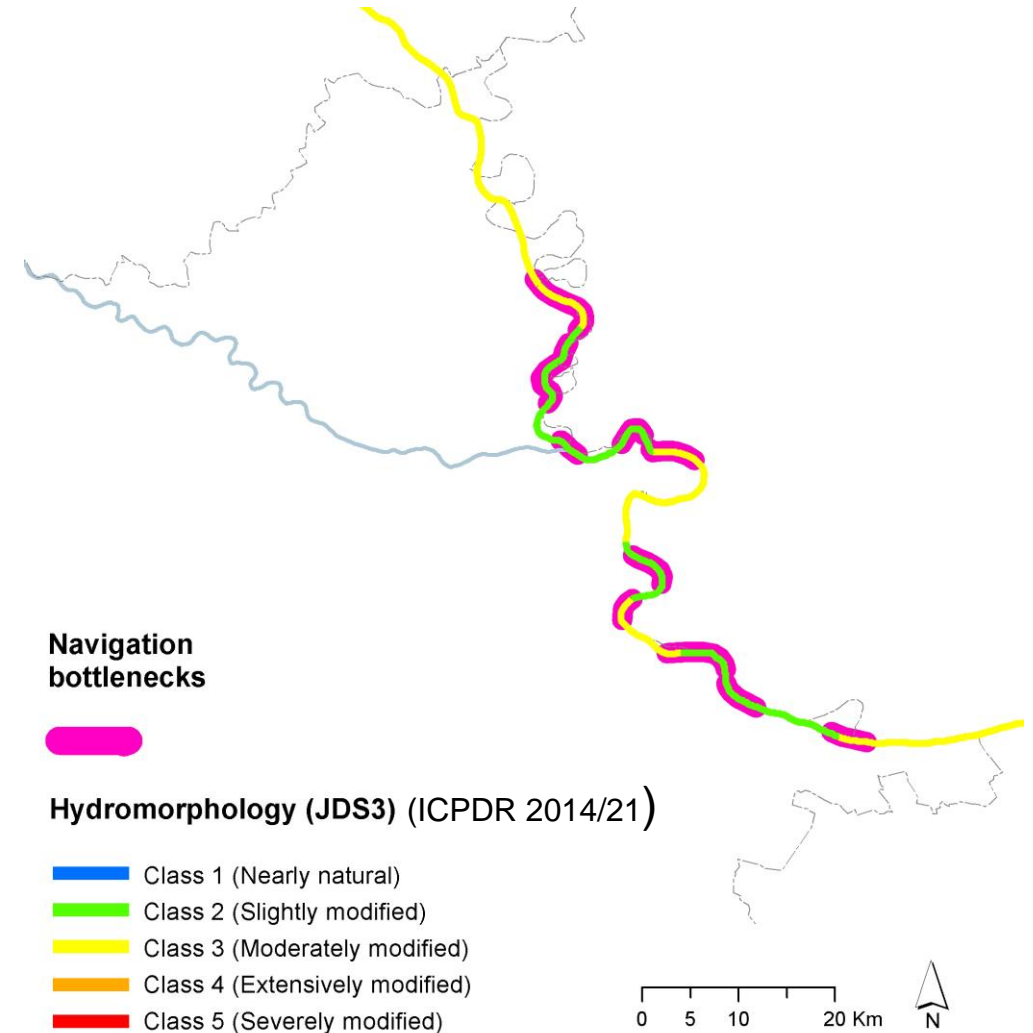
- **89% of Bottlenecks** are situated in the **core zone**
- **11% of Bottlenecks** are situated in the **buffer zone**



# Hydromorphological conditions and Bottlenecks



- 35 km of intact **slightly modified (very natural) river stretches** are designated Bottlenecks  
= 30% of all very natural river stretches in first 2000 km of Danube (source to Iron Gate)
- 19 km of **moderately modified river stretches** are designated bottlenecks





# Floodplain conditions and Bottlenecks

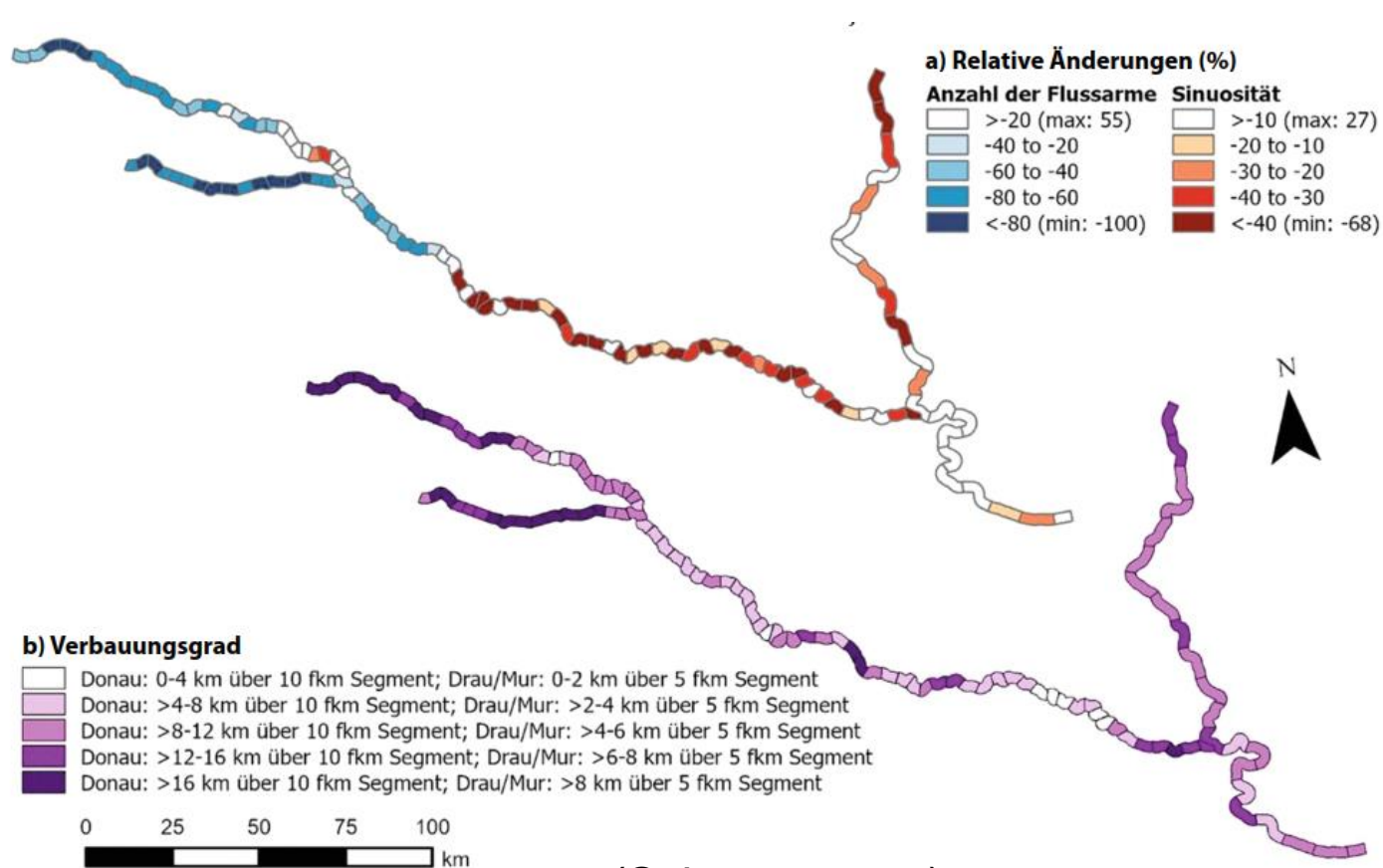


- **Most intact floodplains** on the first 2000 km, which corresponds to 50% of all intact floodplains on the entire Danube (except Danube Delta).
- **Largest floodplain forests** along the entire Danube River

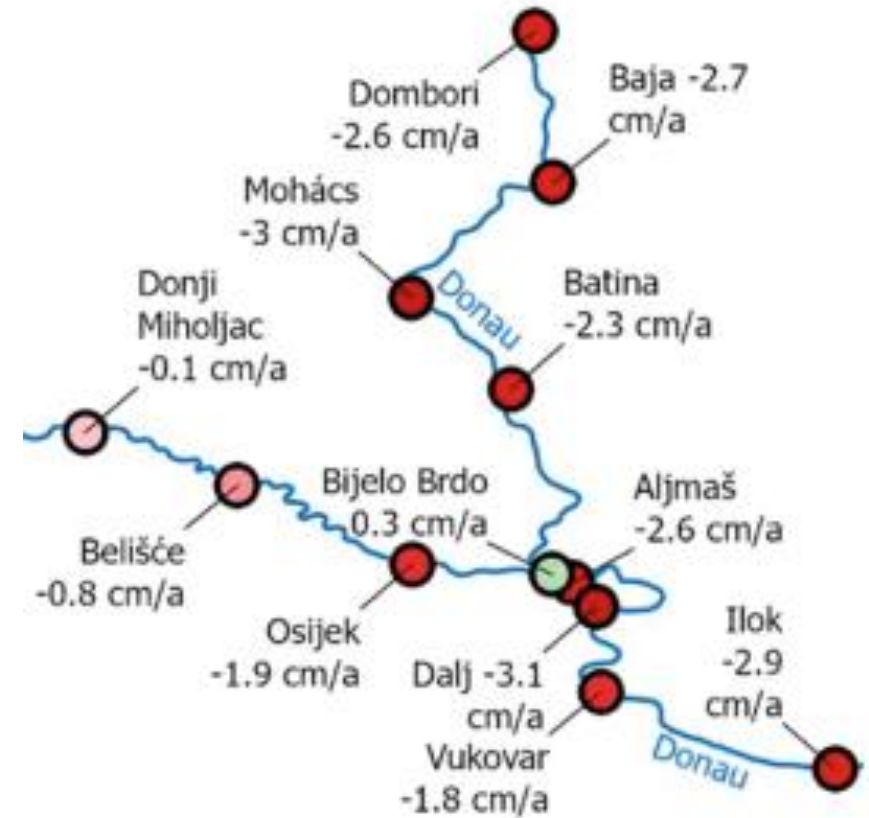
(ICPDR 2014/21)



# River bed degradation



(Schwarz 2022)



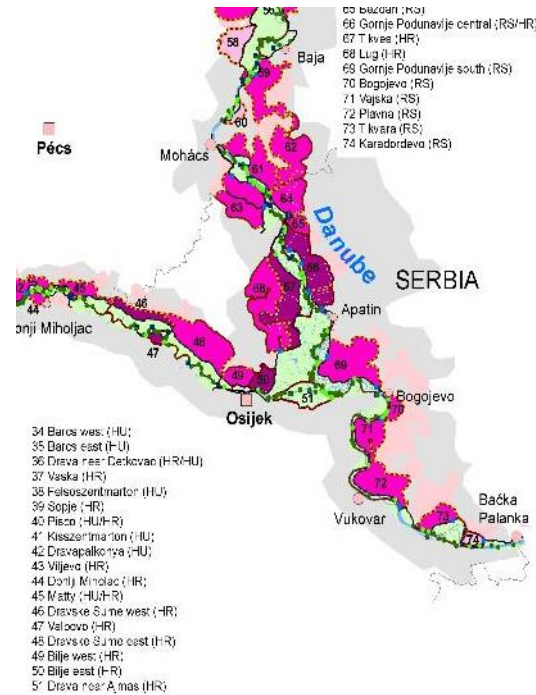
(Habersack et al 2023)



# Restoration potential



- 280 km new natural river banks
- 160 km new side arms
- 60.000 hectares new floodplains



(Schwarz 2013)



# Conclusions from Biosphere Reserve perspective



- Croatian-Serbian Danube - Outstanding ecological ecosystem in Europe
- Biosphere Reserve aims to preserve and restore river and floodplain dynamics
- Further development of navigation route should comply with the goals of the reserve
- **Natural river stretches ("holy stretches"):** No Go areas for structural measures
- **Impacted river stretches:** Adaption/removal of existing structures
- **No sediment removal, only sediment reallocation**

