



Status and Future Perspectives of the Drava River Basin

DRAVA RIVER VISION-Symposium, Sept. 23-25, 2008 ■ DI Arno Mohl, WWF Austria

Photo Credit: Miklos Toldi



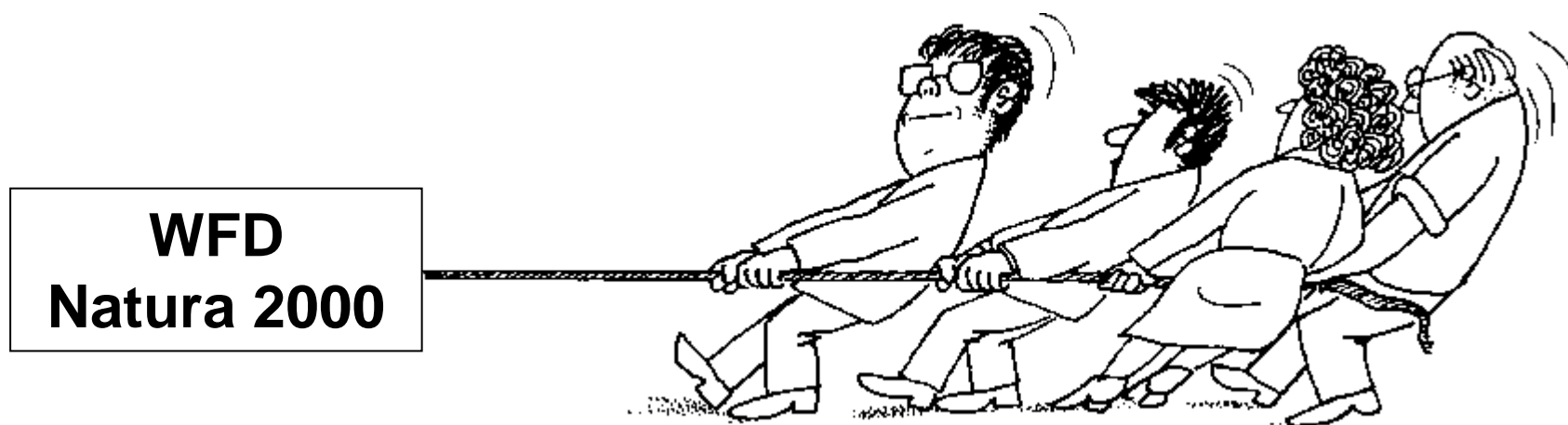
until 1989 ...



Photo Credit: Mario Romulic



Five Countries, One River, One Challenge

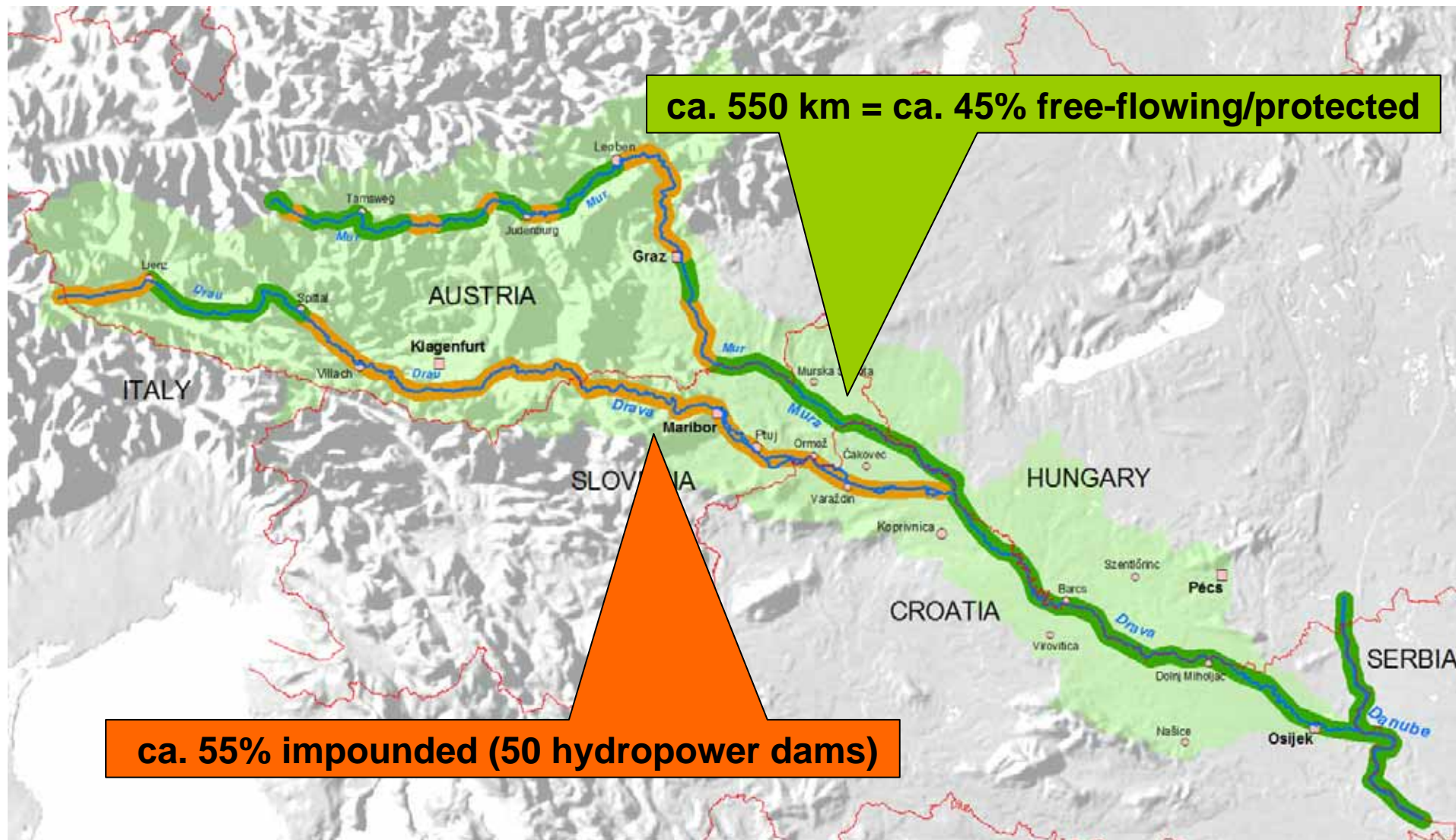


Austria, Croatia, Hungary, Italy, Slovenia

→ Conservation and sustainable management of the natural values and resources of the Drava and Mura Rivers

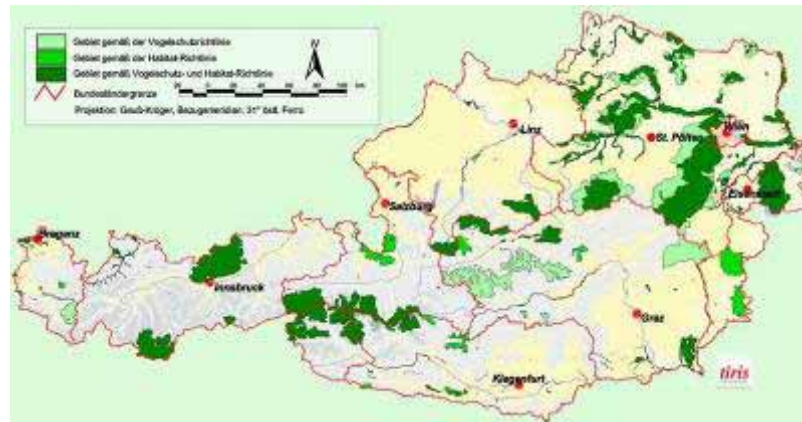


River stretches of the Drava and Mura



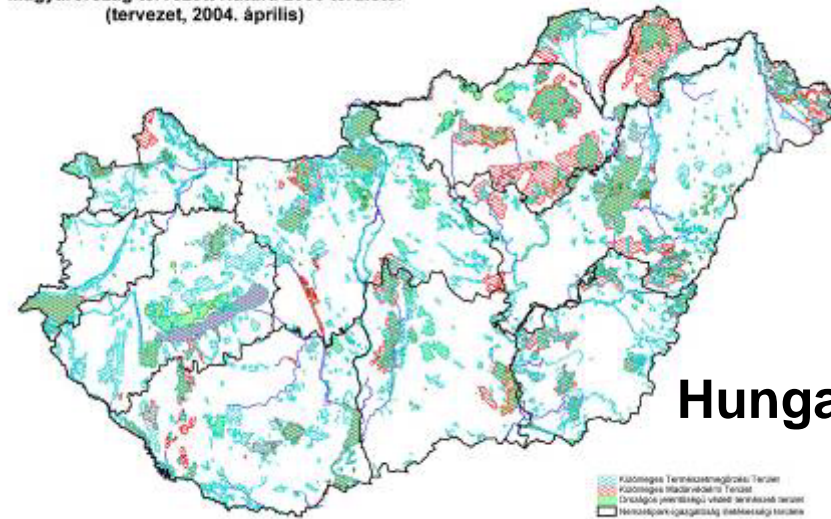


Natura 2000: Protected Area System of the EU

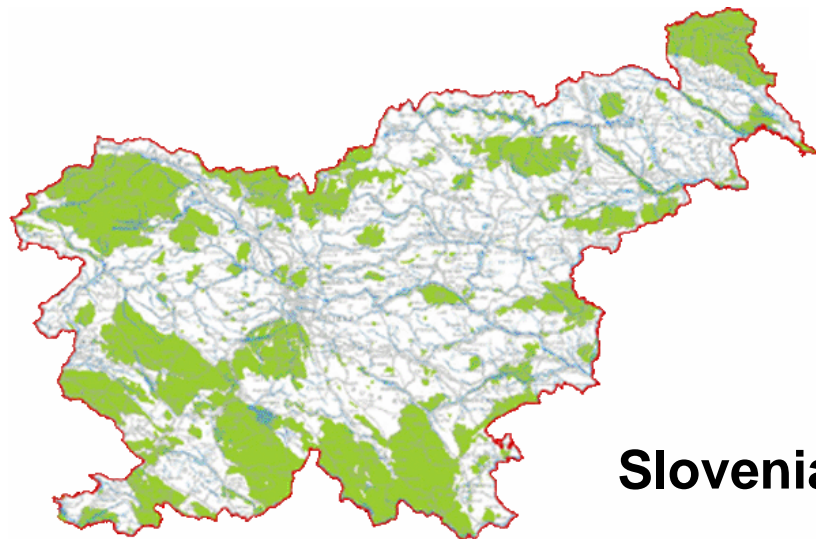


Austria

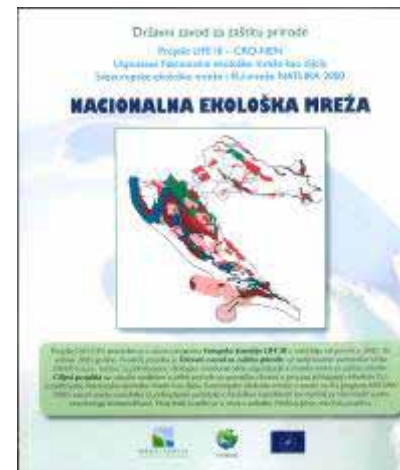
Magyarország tervezett Natura 2000 területei
(tervezet, 2004. április)



Hungary



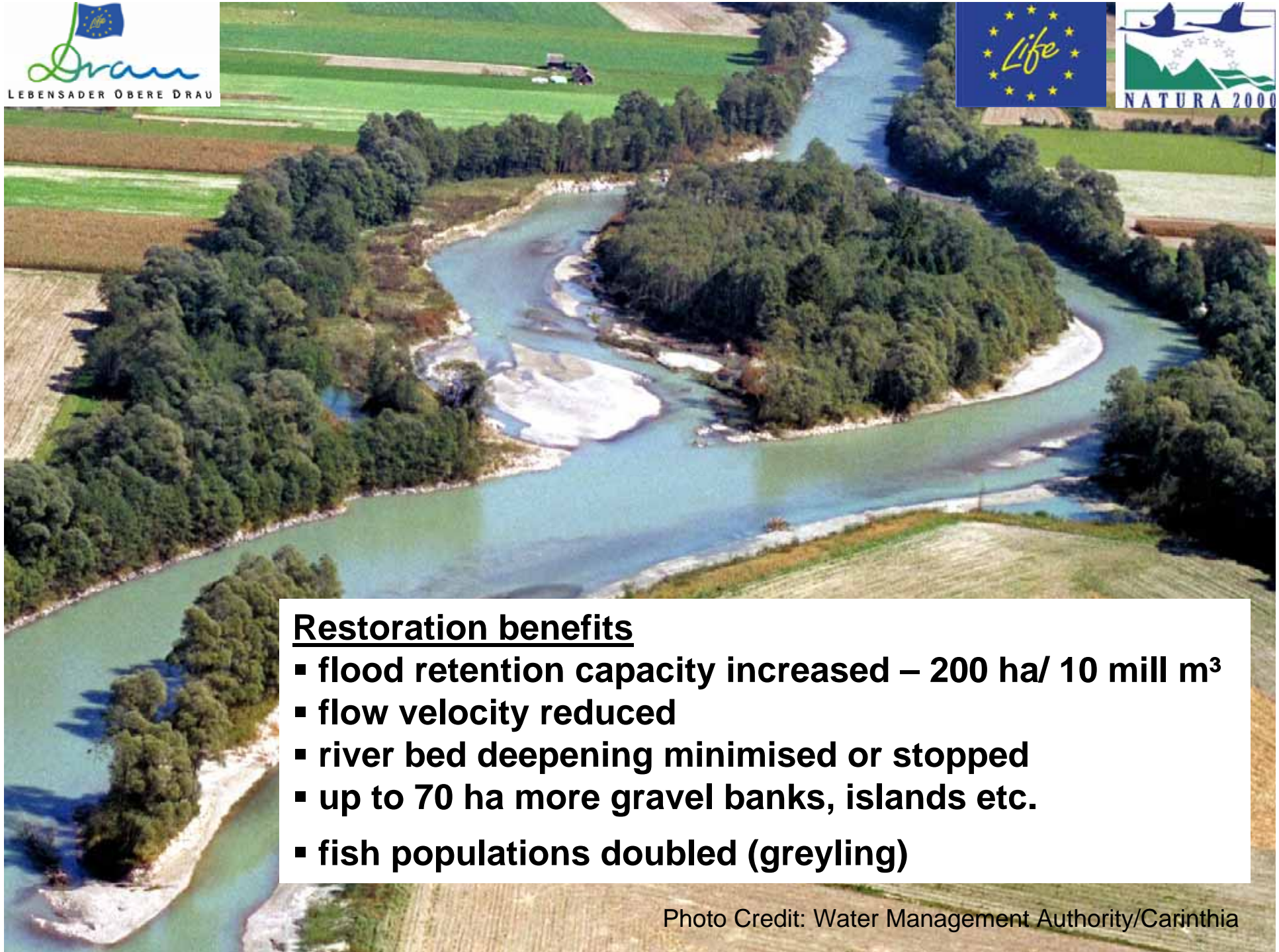
Slovenia



Croatia

Upper Drava River before and after restoration





Restoration benefits

- flood retention capacity increased – 200 ha/ 10 mill m³
- flow velocity reduced
- river bed deepening minimised or stopped
- up to 70 ha more gravel banks, islands etc.
- fish populations doubled (greyling)



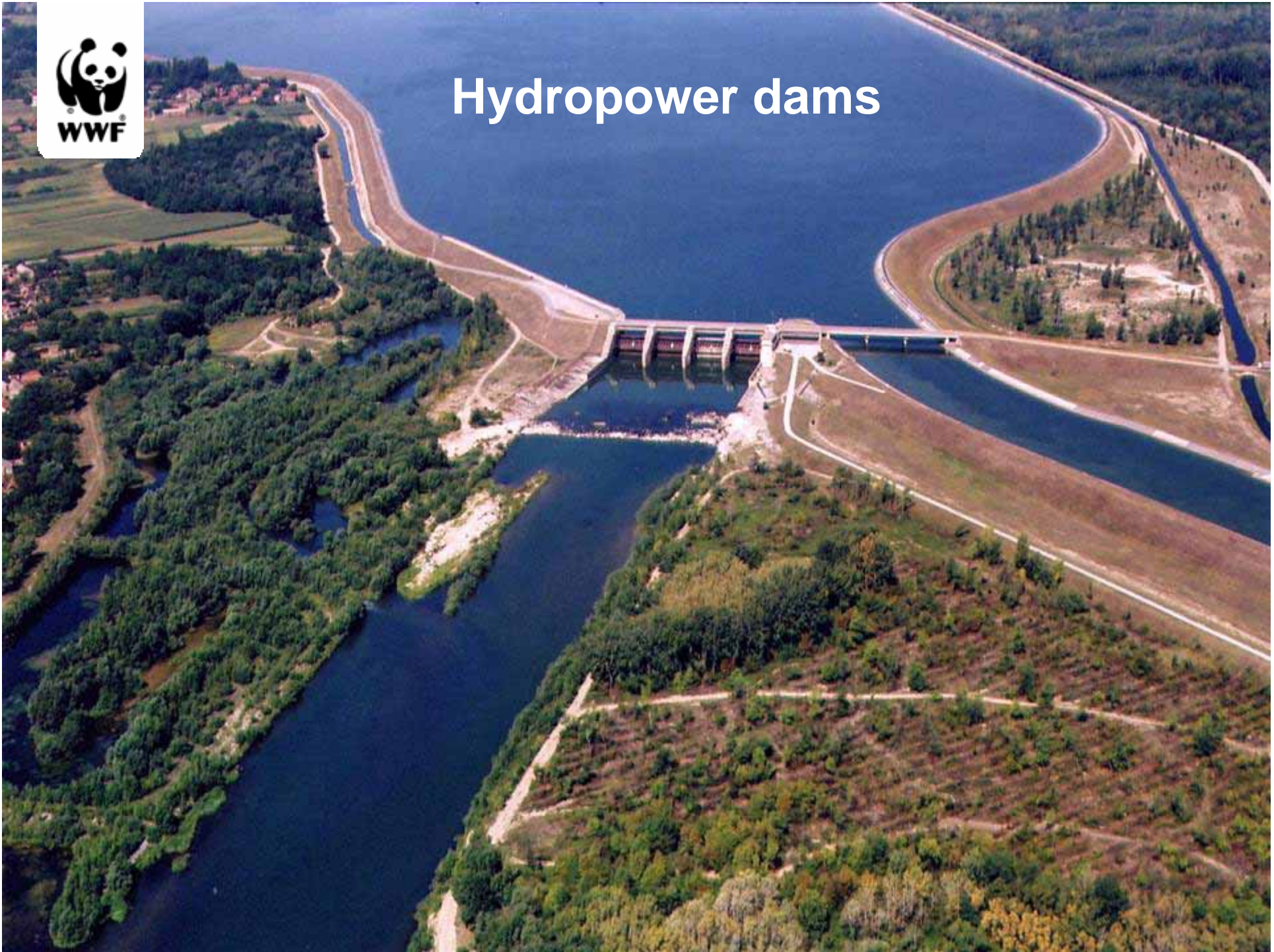
EU funded restoration of degraded river stretches

Along the Drava and Mura in Austria and Slovenia (since 1998)

Life Mura, Slovenia	€ 1.975.519
Life Mura, Austria	€ 2.125.000
Interreg Mura I, Austria/Slovenia	€ 2.600.000
Interreg Mura II, Austria/Slovenia	€ 3.200.000
Life Drava I, Austria	€ 6.300.000
Life Drava II, Austria	€ 3.768.262
	<u>€19.968.781</u>



Hydropower dams





Sediment extraction



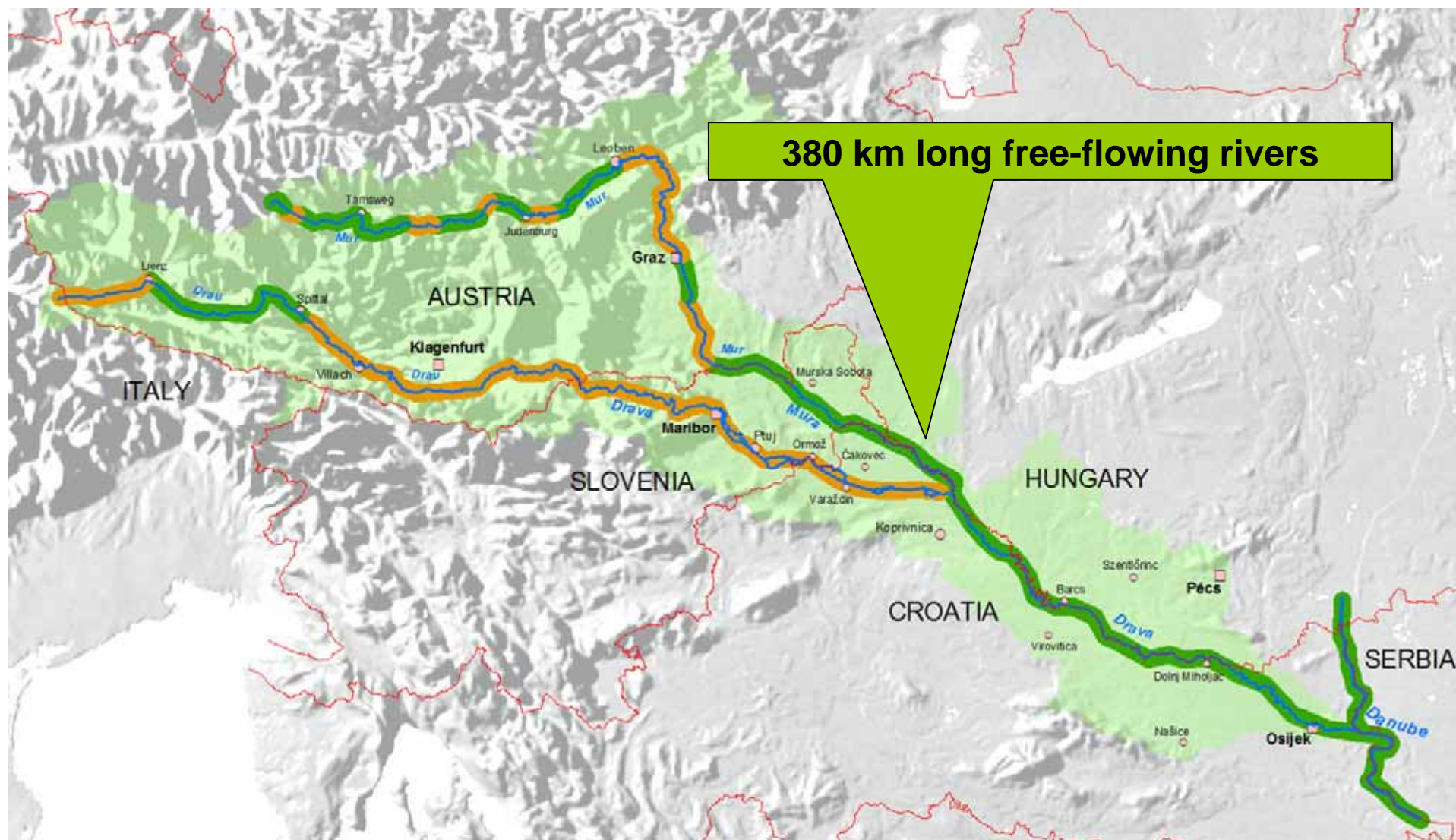


River canalisation





Lower Drava and Mura





The “Amazon of Europe”



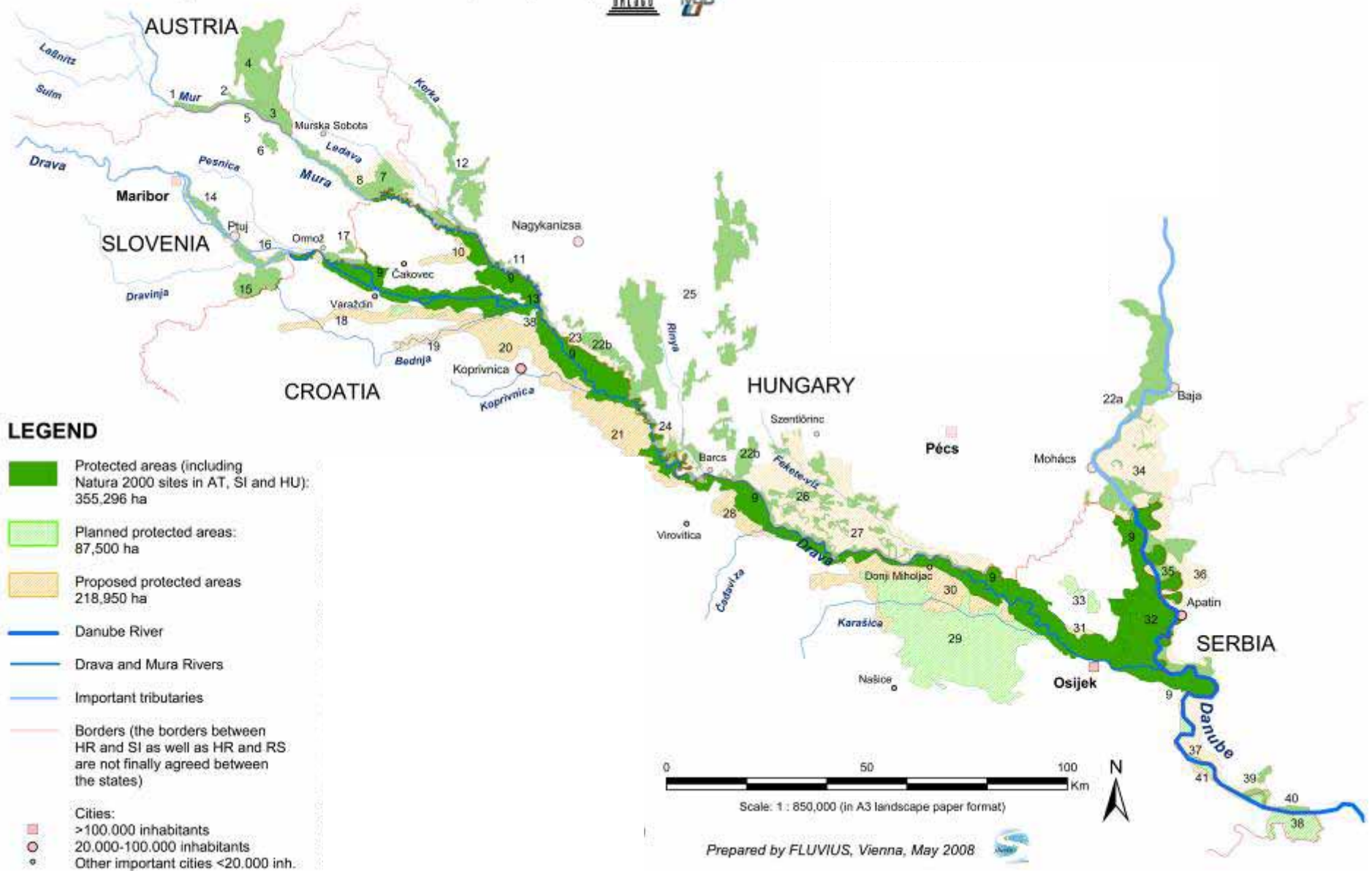






Protected Areas along the European Lifeline Danube-Drava-Mura

Proposal for a Trans-Boundary Biosphere Reserve "Danube-Drava-Mura" within the framework of UNESCO's Programme on Man and the Biosphere (MAB)





Plan:
Trans-Boundary UNESCO Biosphere Reserve
„Danube-Drava-Mura“
(more than 400,000 ha)



= 15 times the size of Ljubljana

= Europe's Largest Single River Protected Area



Restoration of the lower Mura in Austria and Slovenia

INTERREG IIIA - Maßnahmen Unteres Murtal

Maßnahmen Unteres Murtal

Zum Projekt
Aktuelle Projekte
Umgesetzte Projekte
News/ Veranstaltungen
Kontakt
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Suchbegriff Suchen

Das INTERREG IIIA Programm "Maßnahmen Unteres Murtal" Lebensraum der Region Unteres Murtal in der Kärnten. Einem der Hauptziele des Projekts ist die Verbesserung Grundwasserstufen in der Gesamtregion.

BIOMURA

Home
Project definition
Goals, actions and activities
Order and details
Target sector
Project execution
Nature 2000
Mura and the people
News
Did you know?
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Galeri

About the project BIOMURA

The Mura River, Slovenia, has been designated as environmentally significant habitat of high biotic diversity. Therefore, a large part of the river corridor has been included in the Natura 2000 sites. Relevant to environmental conservation are especially the drain, alluvial forests, abandoned river branches and oxbows, islands, gravel deposits and erosion-prone areas in river channels. The insurance of biodiversity of an area and conservation and restoration of wetlands mainly depends on the preservation and rising of the groundwater table, and more intensive hydrodynamic processes in the river corridor. The measures to be undertaken depend on the knowledge of natural processes and encroachments upon the river habitat made in the past.

Intensive water use, activities in the river and riverside space and the change of land use in the Mura River catchment (drain of hydro-power plants on the Mura in Austria, dam protection structures and facilities, water supply, management of agricultural land, urban development) have considerably altered the river space. Most of all, they affect the bed-load discharge and processes of self-formation of the river space in Slovenia. At the border between Slovenia and Austria, the river bed of the Mura River has deepened by as much as 1.5 m in the last decades (by 30 cm on average), and there is a trend of slow deepening of the river bottom downstream of Petenje and change of hydrological features of the Mura wetlands. Flood events occur less often and the low flow periods are longer, resulting in the gradual drying-out of the alluvial forests along the Mura. The water dynamics in oxbow, side branches and on the ground is becoming less diverse. The creative power of water, needed for operation of such a habitat structure, is diminishing. With improper management of forest, and agricultural stress the ecological habitat conditions of these wetlands are deteriorating.

INSTITUT ZA VODO REPUBLIKE SLOVENIJE Institut für Wasser der Republik von Slowenien

BIOMURA LEONARDA SI0000060

Partneri:

INŽENIRING ZA VODO IZV

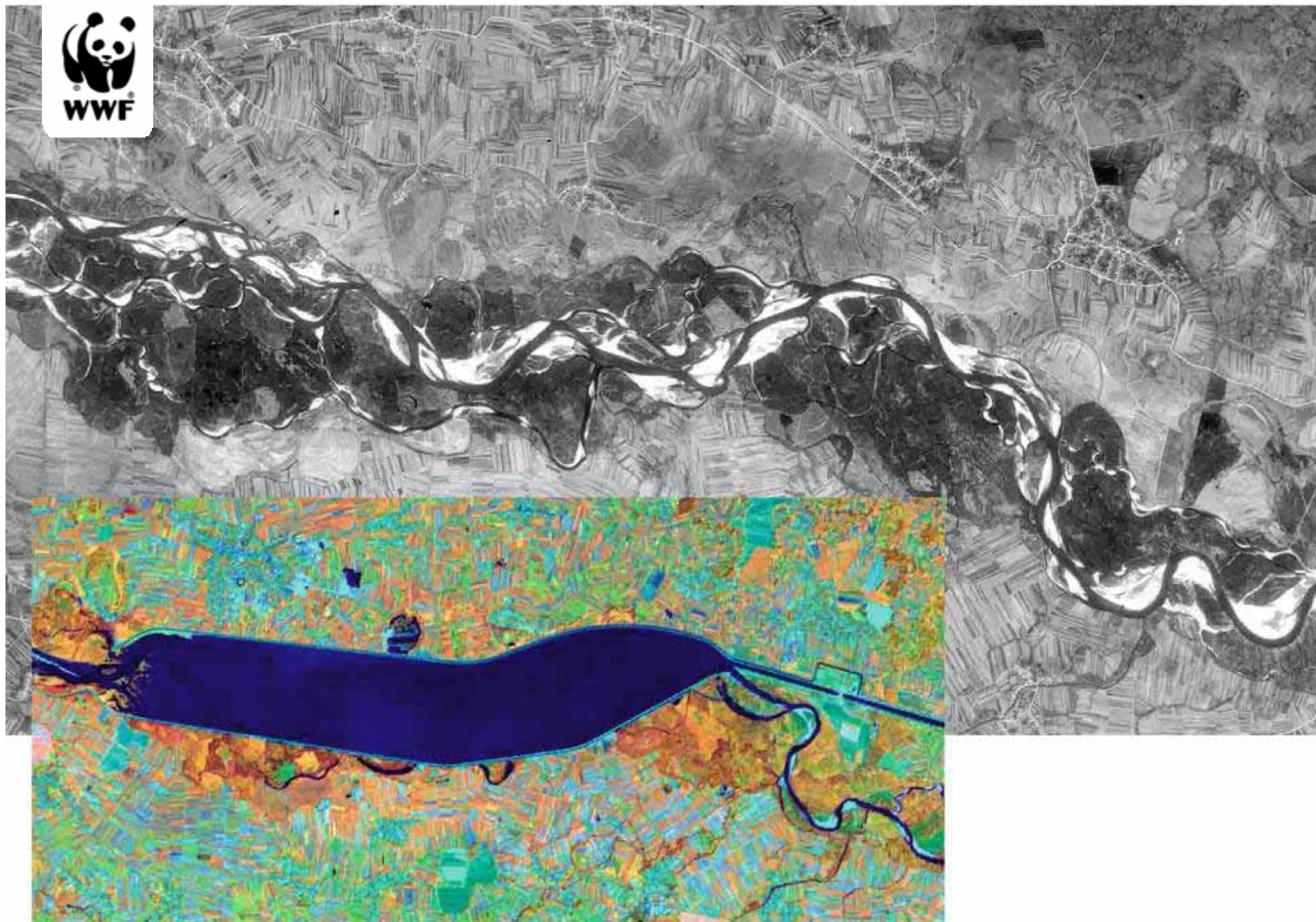
INRA INSTITUT ZA RURALNO EKONOMIKO

INRA INSTITUT ZA RURALNO EKONOMIKO



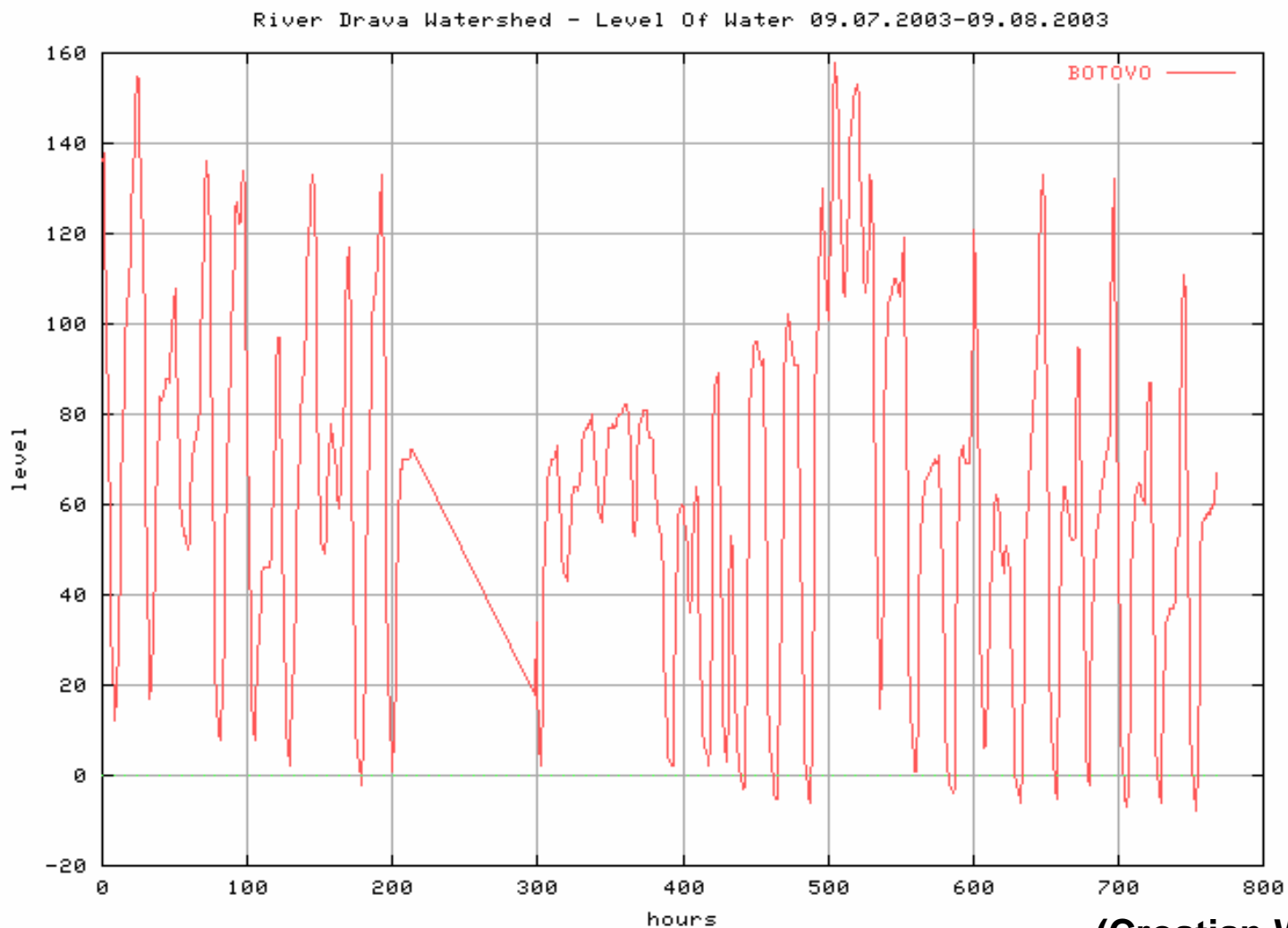
Impacts on key elements of the Drava







Hydropeaking along the lower Drava (~230 km) (up to 1,8 m; two times per day)



(Croatian Waters)



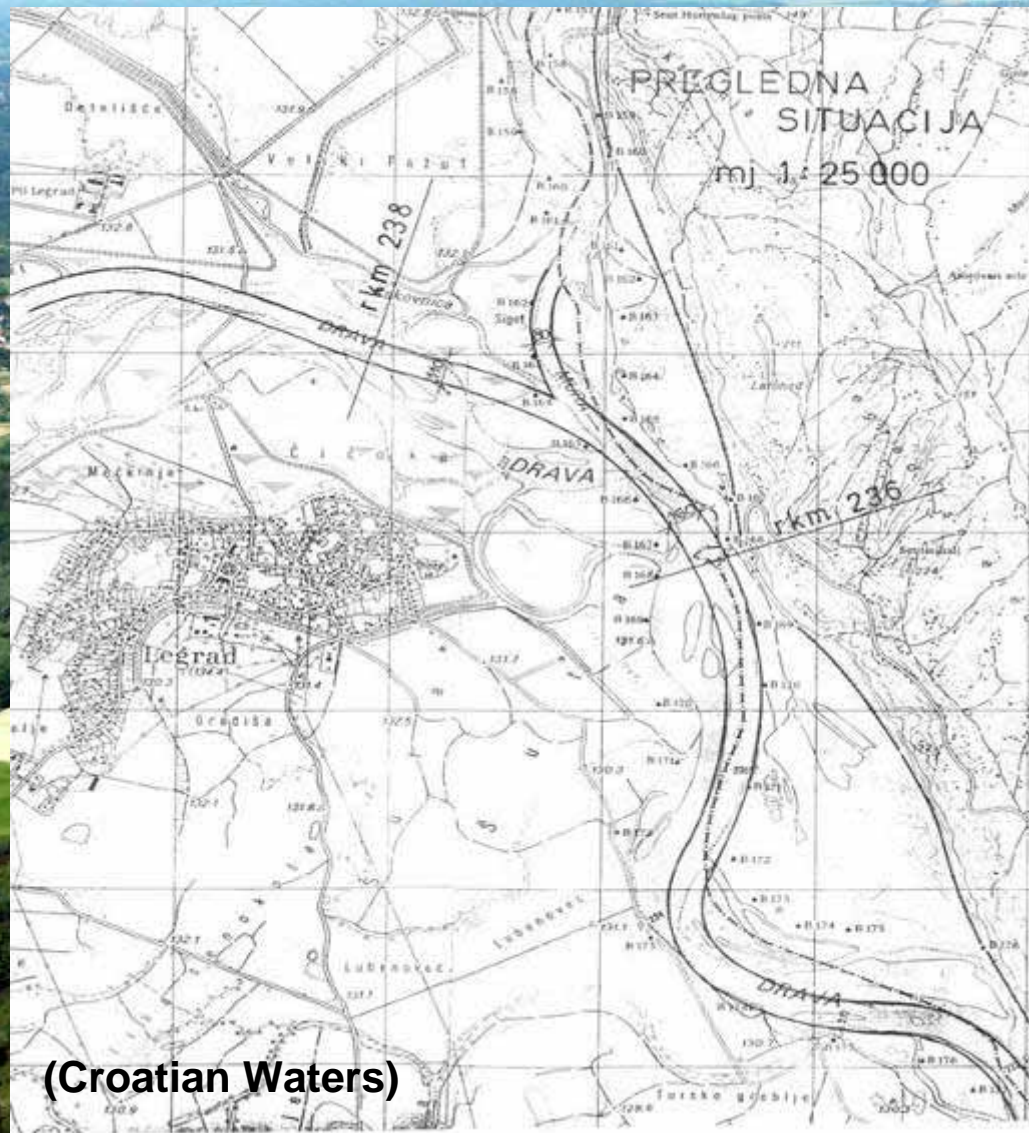
Living River or Canal?

Photo Credit: Dubravko Lešar





Living River or Canal?



(Croatian Waters)

Water Management Goal:
Creation and maintenance of a uniform canalised river corridor free of side arms, gravel/sand banks and islands

According to the regulation system the river should be:

Zákány-Barcs:	160 m
Barcs-Drávaszabolcs:	170 m
Drávaszabolcs-Osijek:	180 m
Osijek-Danube confl.:	220 m

(South-Danubian Water Auth. Hungary, 2006)

Photo Credit: Dubravko Lesar

Water management impacts along the lower Drava and Mura Rivers in Croatia and Hungary

Preliminary investigation WWF, October 2008



for a living planet®

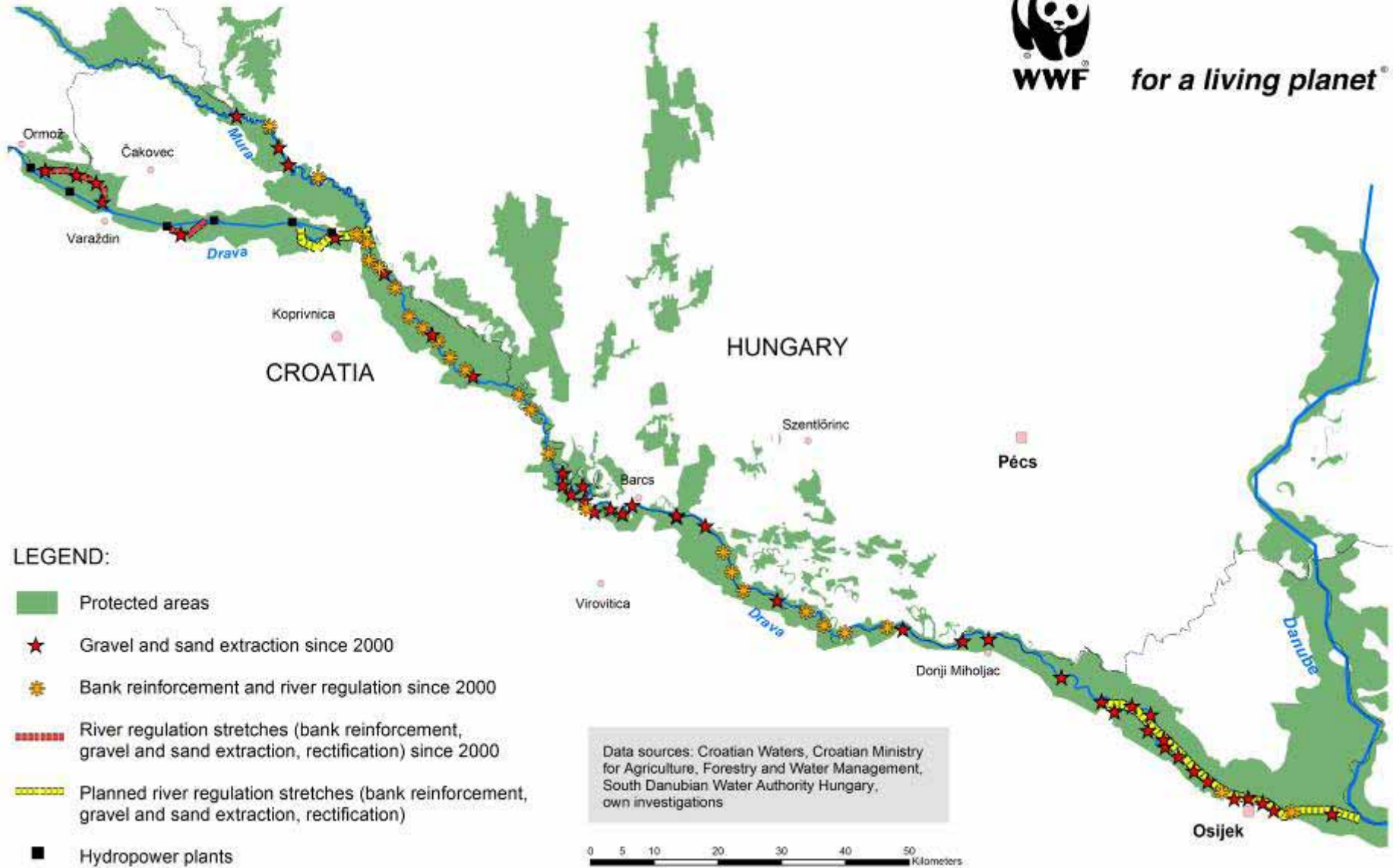




Photo Credit: Darko Grlica



Naručitelj: AGENCIJA ZA PLOVNE PUTOVE UNUTARNJIH VODA
Broj projekta: I-837/06

STUDIJA O UTJECAJU NA OKOLIŠ REGULACIJSKIH RADOVA NA R. DRAVI OD 0+000 DO 56+000 R. KM Sažetak studije za javni uvid



U Osijeku, siječanj 2008. god.



Photo Credit: Darko Grlica

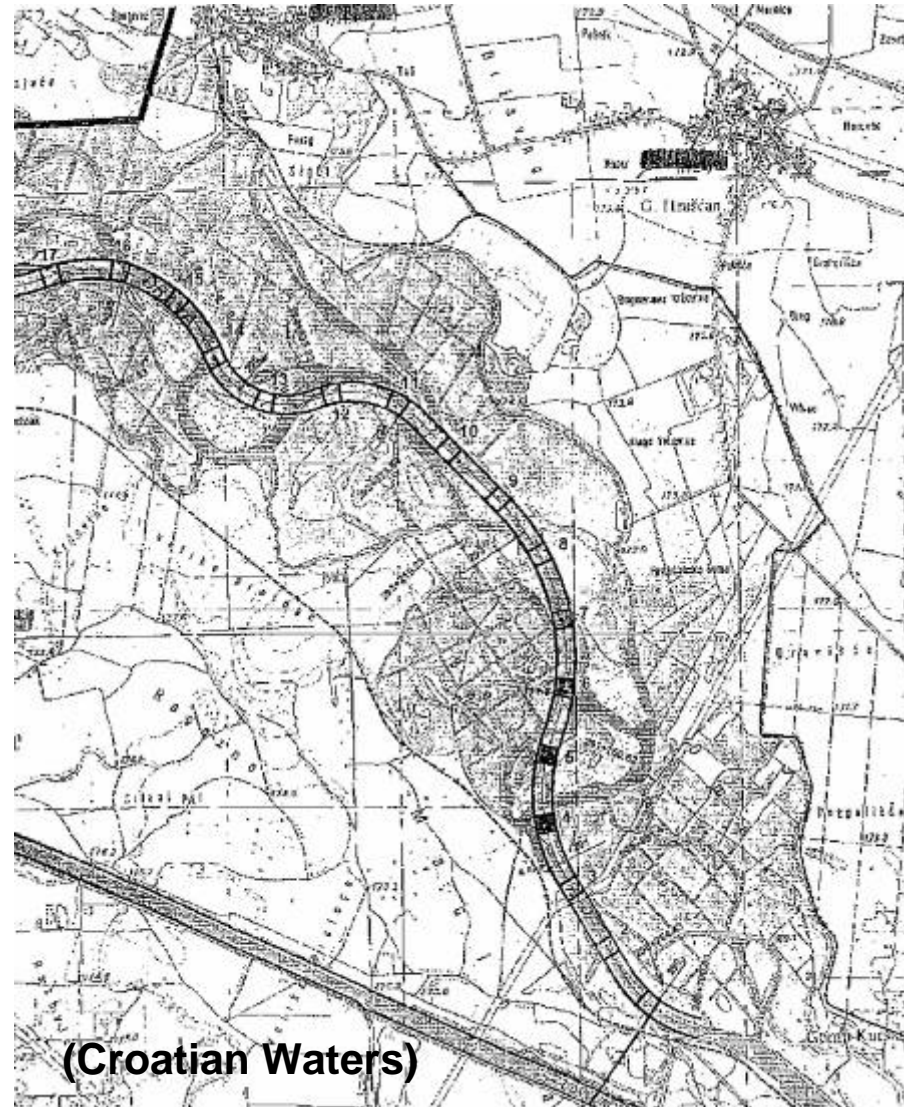


Regulation of the „Stara Drava“ at Varazdin/ Croatia, 2007





Regulation of the Drava at Varazdin/Croatia, 2007



(Croatian Waters)



2007, Drava in Croatia, rkm 220

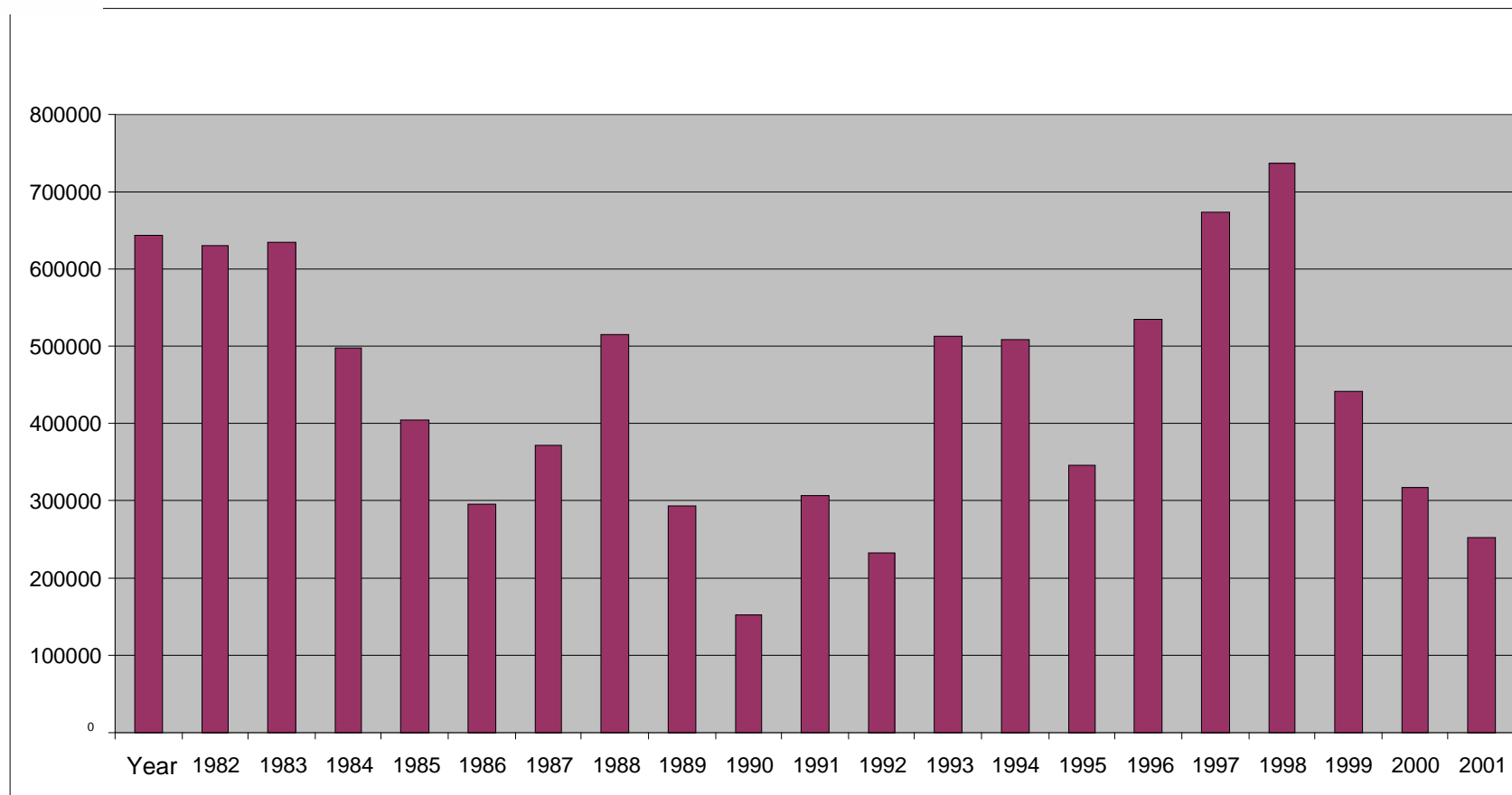


2007, Drava in Croatia, rkm 220





Extracted gravel and sand along the HR-HU Drava (rkm 90- 236)



1981-2001: about 7 million tons, equal to 350,000 t/yr (after Burian, 2006)

Average bedload sediment transport 100,000 t/yr, 1986-2003 (after Rakoczi, Szekeres 2004)



**Jutarnji list, 17. March 2005
2,000,000 m3 between 2005-2009**

ASI

Jutarnji LIST



Na temelju članka 144. stavka 1. Zakona o vodama ("Narodne novine" broj 107/95) na vodama i javnom vodnom dobru ("Narodne novine" broj 99/96 i 11/98) a u svezi sa člankom 199/03), Ministarstva poljoprivrede, šumarstva i vodnoga gospodarstva, Uprava vodnoga go

JAVNI NATJE
za dodjelu koncesija za vadenje pijeska i šljunak
sličnim napravama iz obnovljivih ležišta u

I. Javnom natječaju mogu pristupiti zainteresirane domaće fizičke i pravne osobe koje su re

II. Koncesije za vadenje pijeska i šljunak dodjeljuju se:

1. za ležišta obnovljivih količina nanosnog materijala (pijeska i šljunak) iz korita rijeke Drave u m3 i vrsti materijala:

a. "Zeleno Polje I"	km	15+500	do km	16+220
b. "Zeleno polje II"	km	15+220	do km	16+500
c. "Pampas I"	km	23+550	do km	23+980
d. "Pampas II"	km	24+600	do km	25+330
e. "Bokroš"	km	31+465	do km	31+835
f. "Jblengrad"	km	35+300	do km	36+500
g. "Nehaj I"	km	38+750	do km	39+200
h. "Nehaj II"	km	39+200	do km	39+600
i. "Nehaj III"	km	39+600	do km	40+300
j. "Nehaj IV"	km	40+300	do km	41+000
k. "Valpovačke plaže I"	km	49+230	do km	50+000
l. "Valpovačke plaže II"	km	50+000	do km	51+080
m. "Jemina"	km	157+300	do km	157+700
n. "Okrugljača"	km	161+200	do km	161+700
o. "Križnica I"	km	166+500	do km	168+000
p. "Križnica II"	km	168+800	do km	169+040
r. "Durešina"	km	175+700	do km	176+950
s. "Kingovo"	km	193+250	do km	196+300
t. "Repaš-most"	rkm	204+400	do rkm	209+00
u. "Božovo-most - nizvodno"	rkm			225

Na svim ležištima određuje se vadenje pijeska (i/ili šljunak) isključivo plovnom mehanizacijom osim za ležišta pod s., t. i u. koje je moguće izvesti i pri nižim vodostajima) vadenje šljunak i suhozernom mehanizacijom uz prethodno razradene postavke u elaboratu za vadenje šljunak i prema vodopravnoj dozvoli.

Na svim ležištima postoji mogućnost zaostalih minsko eksplozivnih sredstava te se preporučuje prije korištenja koncesija isto provjeriti u Centru za mine i MUP-u.

MINISTARSTVO POLJOPRIVREDE, ŠUMARSTVA
I VODNOGA GOSPODARSTVA
Uprava gospodarenja vodama

Na temelju članka 144. stavka 1. Zakona o vodama ("Narodne novine" broj 107/95 i 150/05) i članka 24. Uredbe o uvjetima i postupku za dodjelu koncesija na vodama i javnom vodnom dobru ("Narodne novine" broj 99/96 i 11/98), Ministarstvo poljoprivrede, šumarstva i vodnoga gospodarstva, raspisuje

JAVNI NATJEČAJ
za dodjelu koncesija za vadenje pijeska iz obnovljivih ležišta u koritu rijeke Drave

I. Javnom natječaju mogu pristupiti zainteresirane domaće fizičke i pravne osobe koje su registrirane za obavljanje djelatnosti vadenja pijeska.

II. Koncesije za vadenje pijeska dodjeljuju se:

1. za ležišta obnovljivih količina nanosnog materijala, pijeska, iz korita rijeke Drave na dionicama prema procijenjenim količinama u m3 :

a. "Nemetin" plovni put i sidrišta	km	8+000	do km	12+000	150.000 m3 pijesak; × 3
b. "bazen Luke Osijek Polje I"	km	12+525	do km	13+640...	260.000 m3 pijesak; × 5
c. "bazen Luke Osijek Polje II"	km	13+640	do km	14+000....	60.000 m3 pijesak; × 2
d. "Osijek"	km	15+000	do km	16+000 ...	40.000 m3 pijesak; × 2
e. "Nehaj I".....	km	38+750	do km	39+200...	200.000 m3 pijesak; × 5
f. "Valpovačke plaže".....	km	49+230	do km	50+000.....	90.000 m3 pijesak; × 3

Na svim ležištima određuje se vadenje pijeska isključivo plovnom mehanizacijom.

Na svim ležištima postoji mogućnost zaostalih minsko eksplozivnih sredstava te se preporučuje prije korištenja koncesija isto provjeriti u Centru za mine i MUP-u.

2. na rok od četiri (4) godine za ležišta pod b. i e., na rok od tri (3) godine za ležište pod a i f., i na rok od dvije (2) godine za ležište pod c i d. . .

3. uz godišnju naknadu za koncesiju koja iznosi 2,00 kn/m3 za izvađeni pijesak, te uz jednokratnu

**Jutarnji list, 23. Sept. 2007
800,000 m3 between 2008-2011**



2006, Drava in Croatia, rkm 230





Sediment extraction along the Drava in 2008



2008, Drava in Croatia, rkm 31

Photo Credit: Darko Grlica



Sediment extraction along the Drava in 2008



Croatia, rkm 55



Croatia, rkm 176



Hungary, rkm 153



Hungary, rkm 185



Hungary, rkm 156



D. Biondić

Subject review

Lower Drava riverbed erosion

The phenomenon of the lower Drava riverbed erosion, which is directly related to ground water lowering in the drainage basin of this river, is described. The analysis of historic data shows that this erosion results from various types of anthropogenic activity: riverbed regulation, excessive gravel and sand extraction from riverbed, construction of dams and storage reservoirs on the river and within its drainage basin, and dyke construction. The most favorable solution to this problem is construction of the planned multipurpose system of hydroelectric power plants.

D. Biondic, Gradevinar 51 (1999) 5, 321-329



Photo Credit: B. Stumberger

Riverbed deepening along the Croatian-Hungarian Drava

Botovo (1970-1995): 2m
(3-3,5 cm/a)

Terezino Polje (1876-1996): 3,7m
(2,5 cm/a)

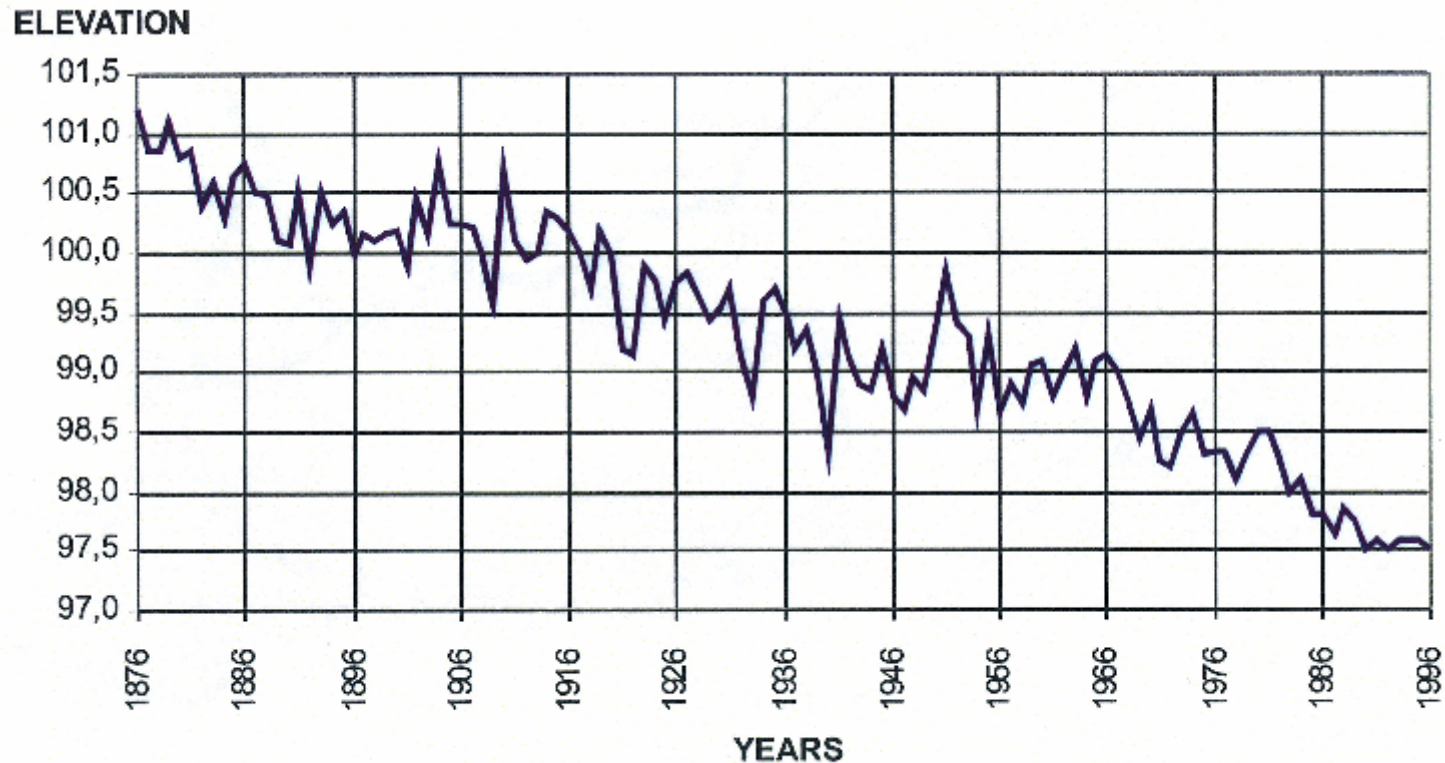


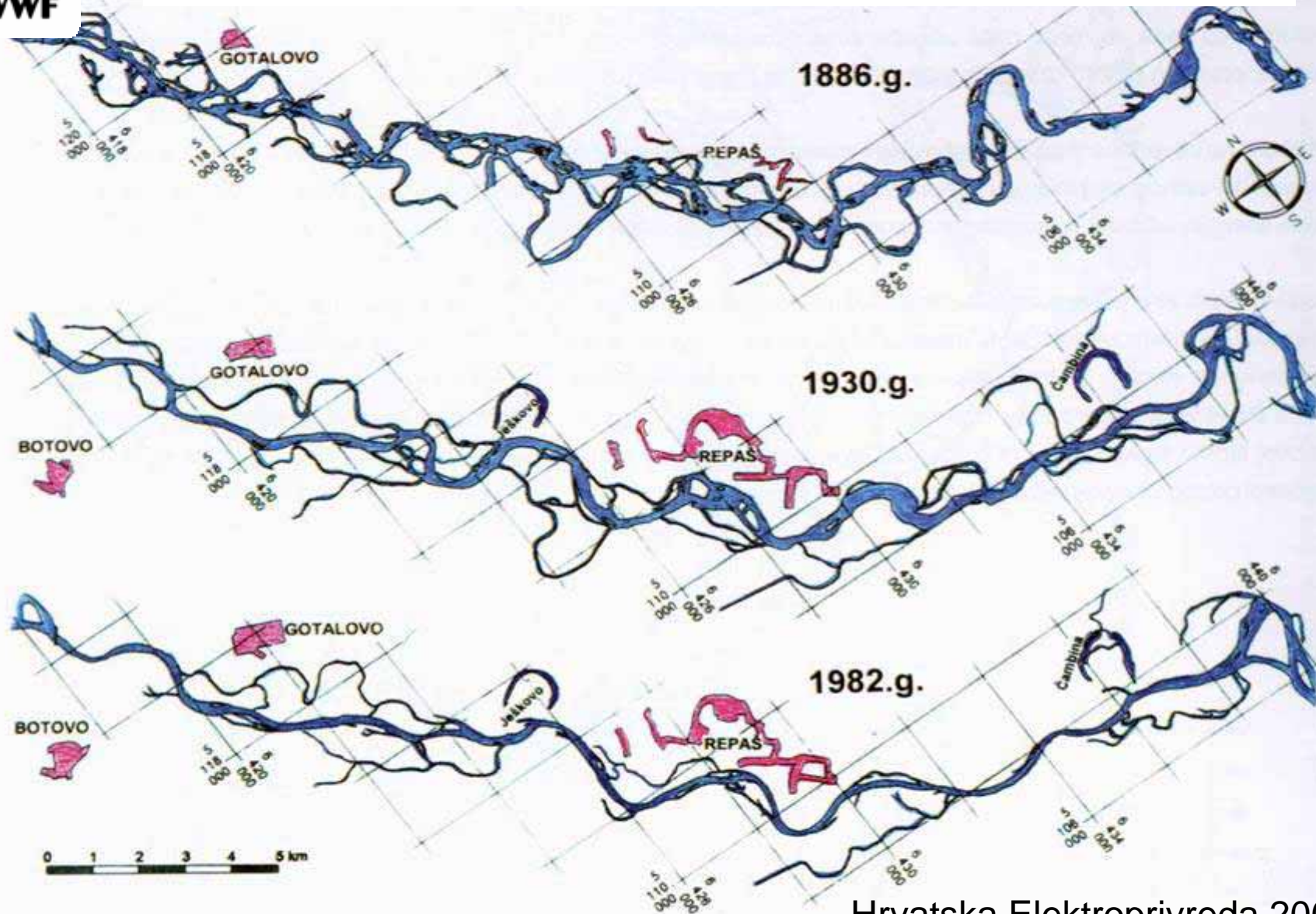
Figure 2. Annual low water levels on water station Terezino polje [1].

N. Kuspilic, D. Bekic, Proceedings RRC 2004, 165-171, Zagreb

D. Biondic, Gradevinar 51 (1999) 5, 321-329



Degradation of the Drava river course within 100 years (Botovo-Ferdinandovac)



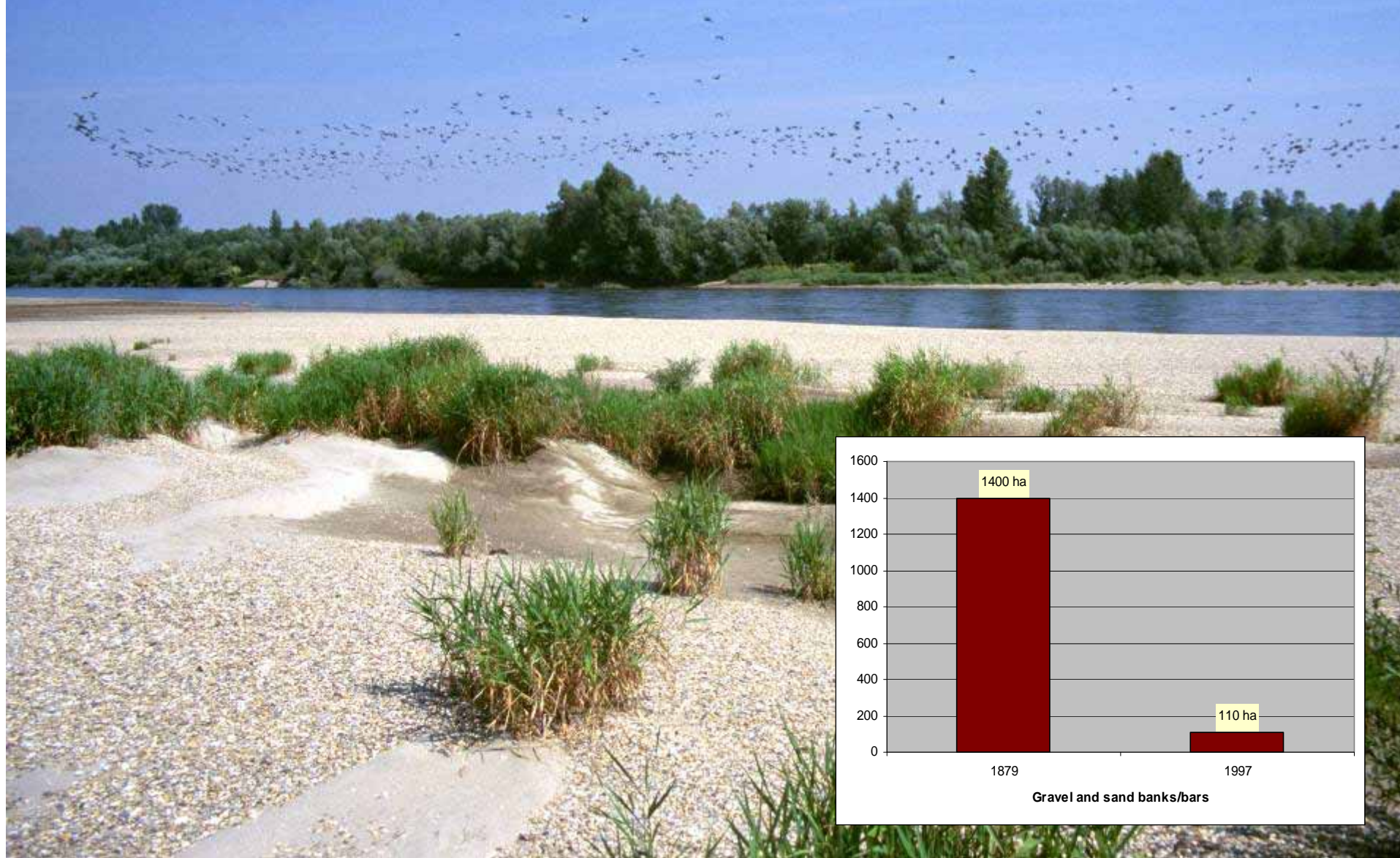
Hrvatska Elektroprivreda 2000



Reduction of sand banks/bars along the Drava

(Botovo-Ferdinandovac, last 100 years)

euRONATUR FOUNDATION

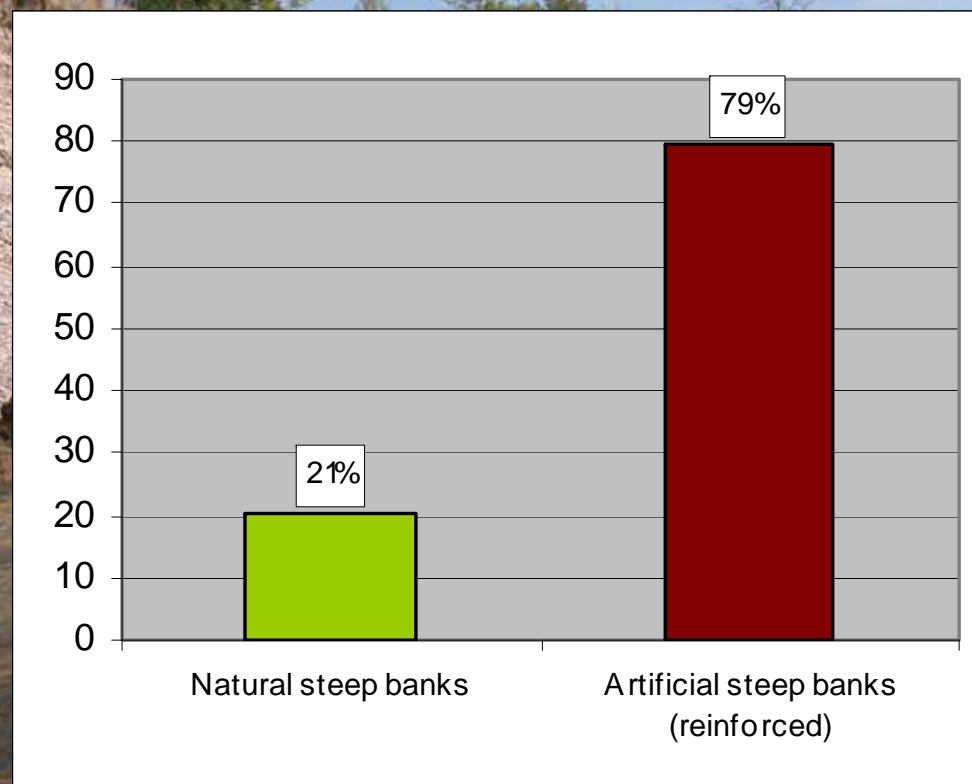




Reduction of natural steep banks along the Drava and Mura

(selected banks, Murska Sredisce-Osijek 2005)

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Affected Protected Areas along the Drava and Mura

- 100% existing/proposed Natura 2000 sites
- 1 National Park – ca. 10,000 ha
- 1 Regional Park – ca. 145,000 ha
- 1 Special Zoological Reserve – ca. 17,000 ha
- 1 Ramsar Site

Photo Credit: B. Stumberger



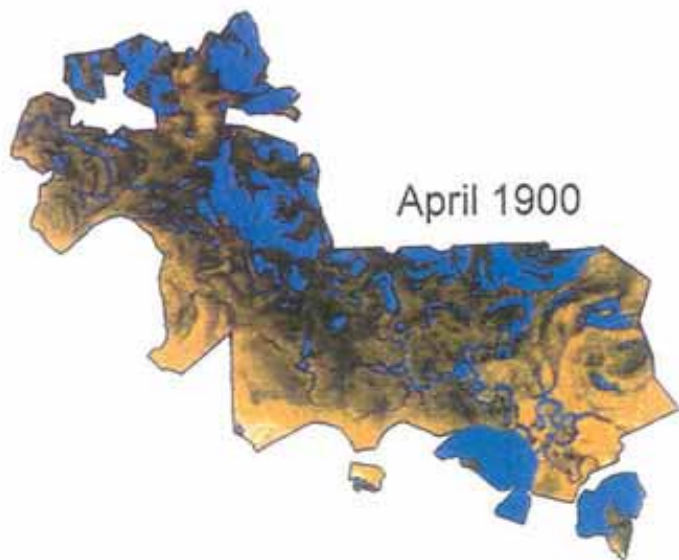
Low groundwater tables impacts forests



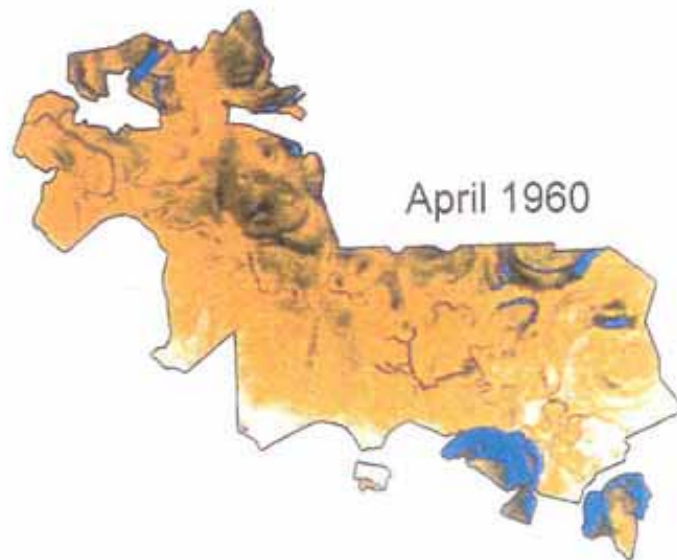
Photo Credit: Mario Romulic



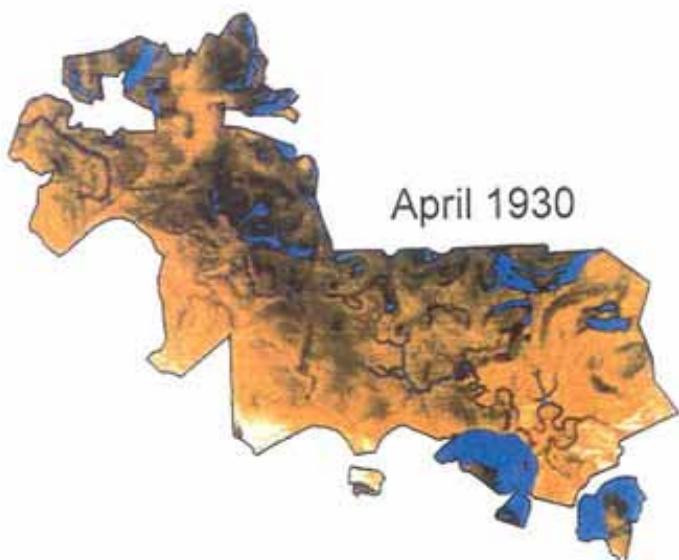
Low groundwater tables impacts forests



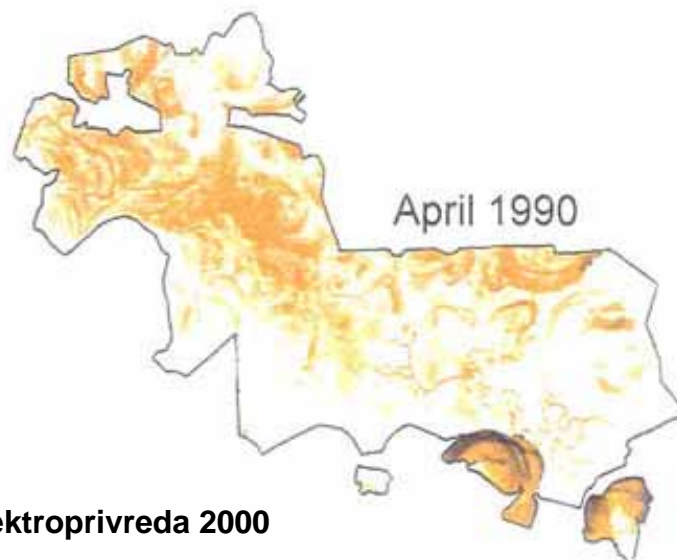
April 1900



April 1960



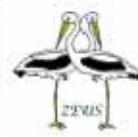
April 1930



April 1990

Hrvatska Elektroprivreda 2000

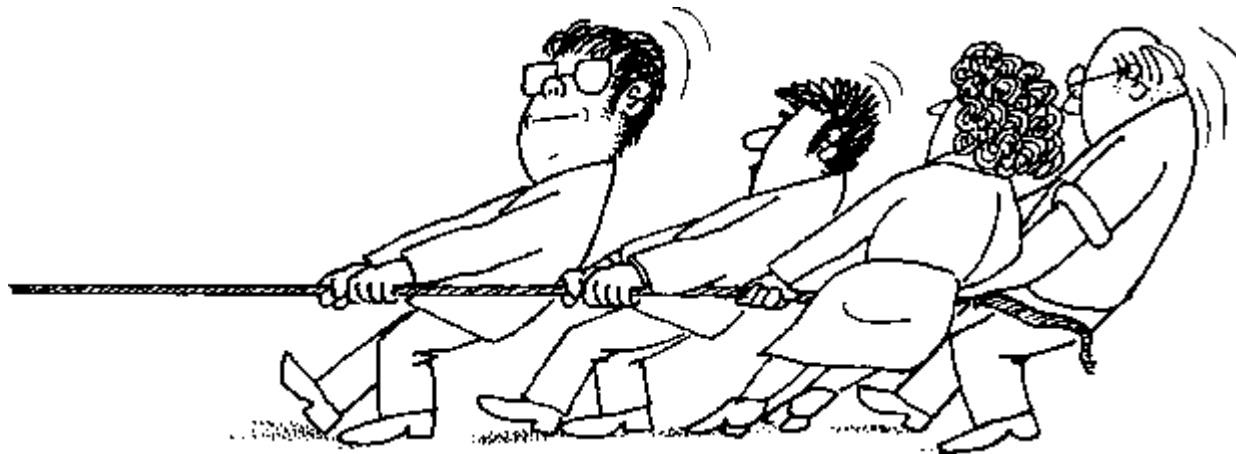
Photo Credit: Mario Komulic



EURONATUR FOUNDATION

What needs to be done?

More impacts or joint management?



- Stop further deterioration of the lower stretches
- International River Restoration Programme
- Hydropower: Masterplan (incl. „No Go Areas“)
- TBR DDM (Natura 2000 management)



Lifeline Drava-Mura 2008-2020

euRONATUR FOUNDATION



LIFELINE DRAVA-MURA 2008 - 2020

A Plan for Conserving and Restoring
the Drava and Mura Rivers for Nature and People



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In a nutshell



Photo Credit: Water Management Authority/Carinthia



Thank you for your attention!

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Photo Credit: S. Steiger