Danube River Basin Management Plan - Hydro-morphological pressures and their effects on water ecological status

Dr. Aurora Vasiu
Dr. Graziella Jula
Dr. Andreea Gălie
Dr. Felicia Popovici
Biol. Ruxandra Gârbea
Geogr. Ramona Curelea

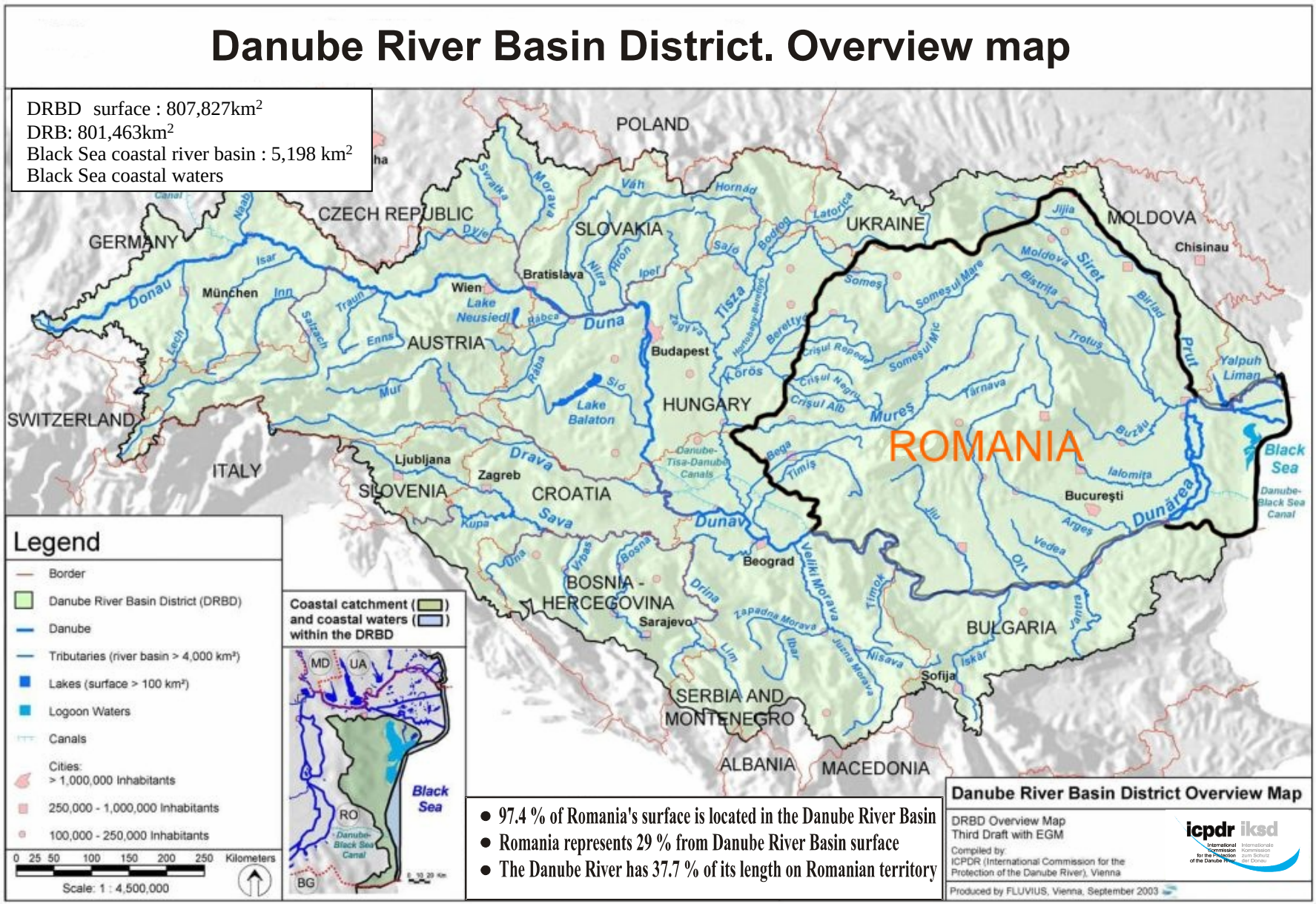
National Administration "Apele Romane"

BIOWETMAN - wetlands management and conservation
INTERNATIONAL WORKSHOP
INSTITUTE OF BIOLOGY BUCHAREST, ROMANIAN ACADEMY, 19 February 2009

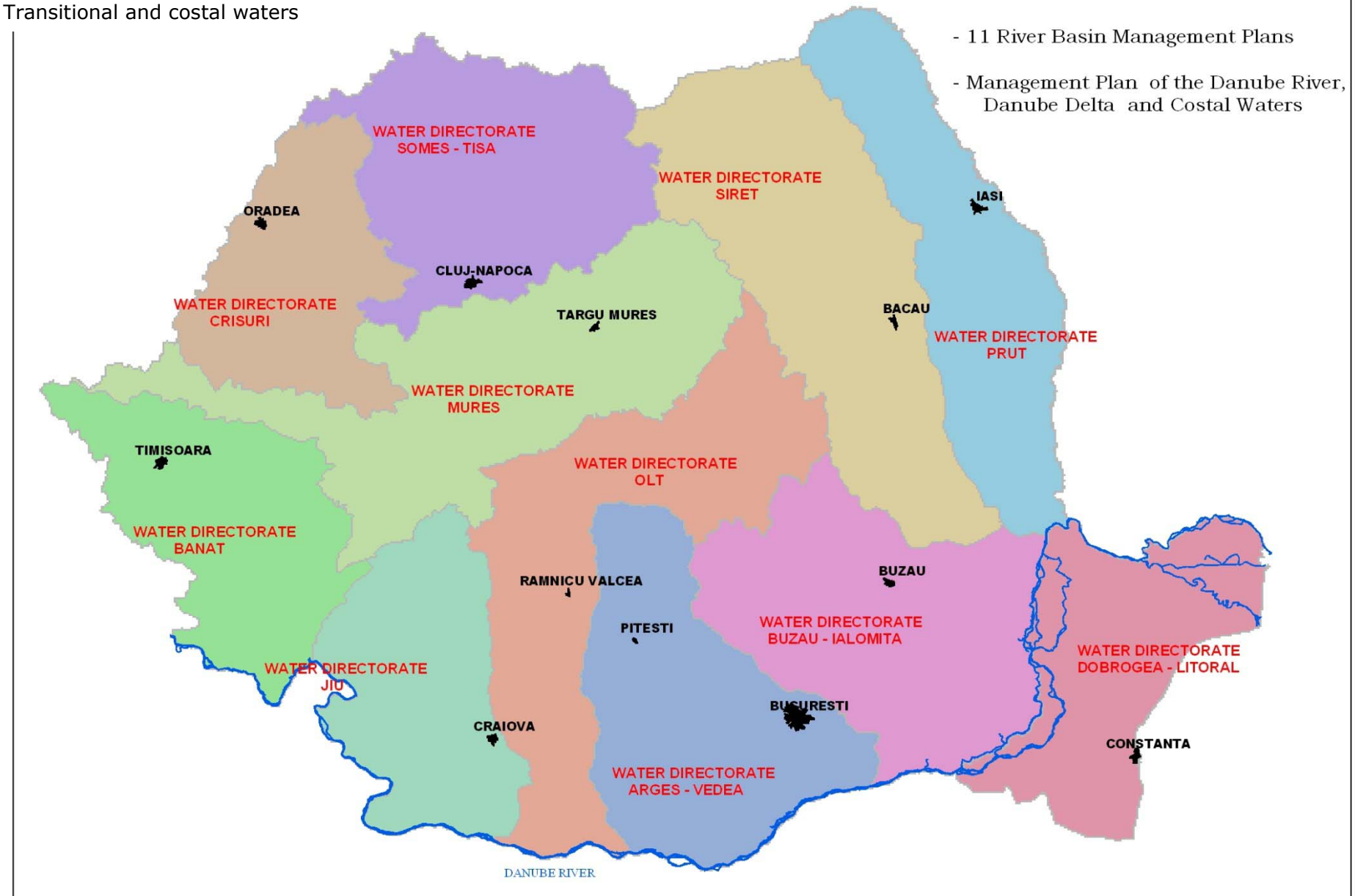
Water Framework Directive Revolutionary Elements

- River Basin Management Plan (ex. Rhine, Danube, Elbe, a.s.o.);
- The setting of the European-scale common objective of "good status";
- Defining of lower environmental objectives for heavily modified and artificial water bodies;
- Combined approach of emission controls and water quality standards, stressing the phasing out of priority hazardous substances;
- Including of the economic analysis in water management at basin level in order to estimate the most cost-effective combination of measures for water uses;
- Public participation in the development of river basin management plans encouraging active involvement of interested parties.

Danube River Basin District. Overview map



The Danube River Basin District Plan (done by ICPDR) deals with
all rivers with catchments of > 4000 km²
all lakes, reservoirs with an area of > 100 km²
all groundwater bodies with an area of > 4000 km² or smaller GW bodies if they are of great importance (needs to be bilaterally agreed)
Transitional and costal waters



River Basin Management Plan - 2009

- Characteristics of River Basin District
- Analysis of pressures and impacts
- Identification and mapping of protected areas
- Monitoring networks and programmes
- Establishing the environmental objectives
- Economic analysis of water uses
- Programme of measures
- Summary of public participation
- List of competent authorities
- Contact points and the procedures for obtaining the background documentation and information referred to in Article 14(1) and in particular details of the control measures in accordance with Article 11(3)(g) and 11(3)(i) and of the actual monitoring data gathered in accordance with Article 8 and Annex V.

Pressure identification - Impact Assessment – Programme of measures

Durable Development

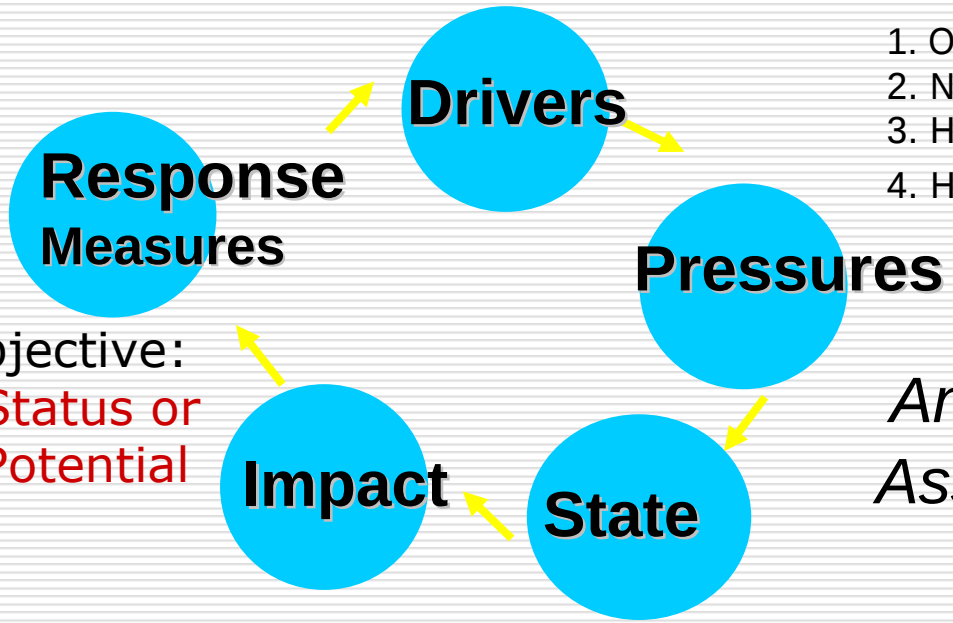
Durable Water Management

WFD 2000/60

Water body

Unitary element

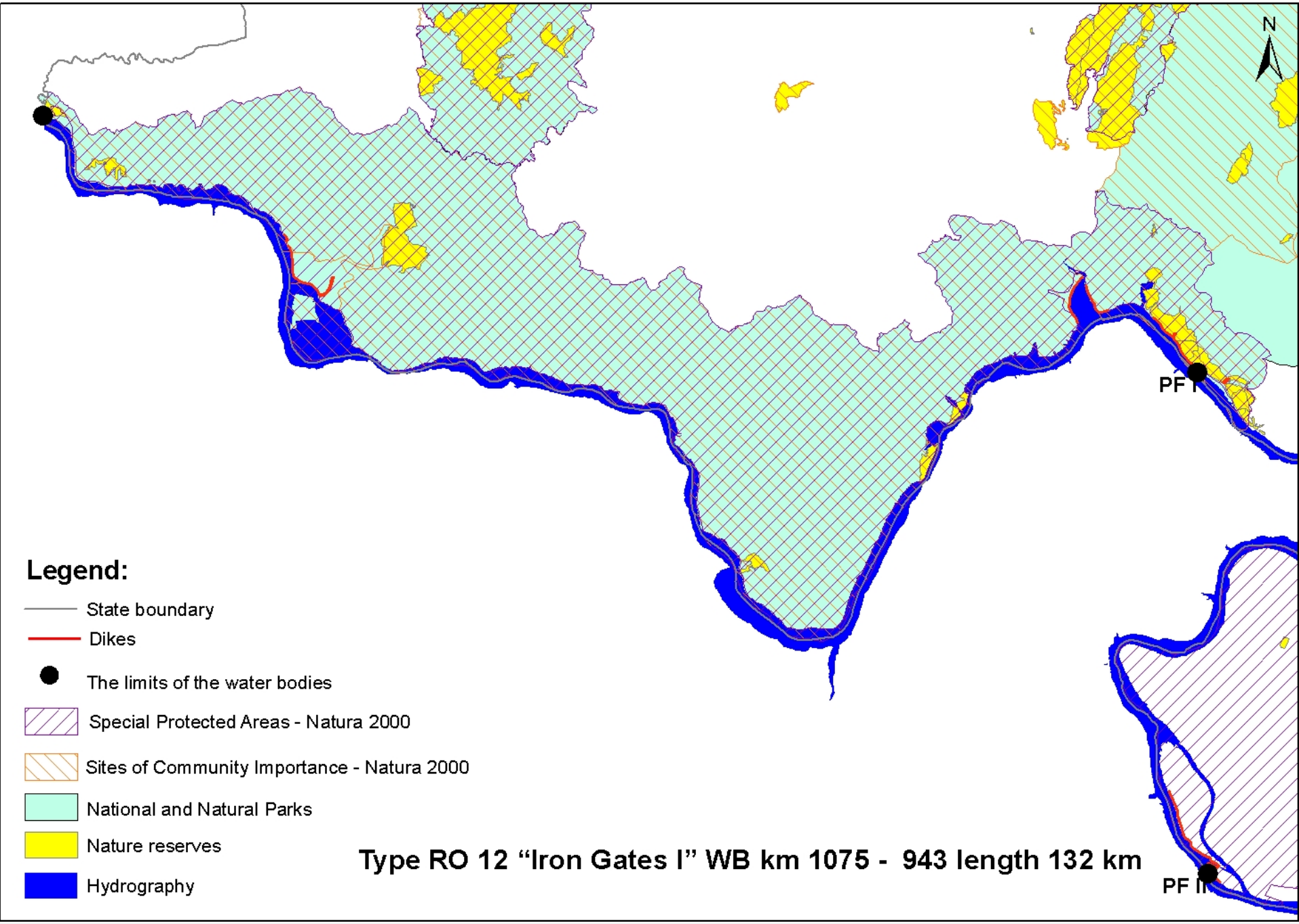
Water Management Concept

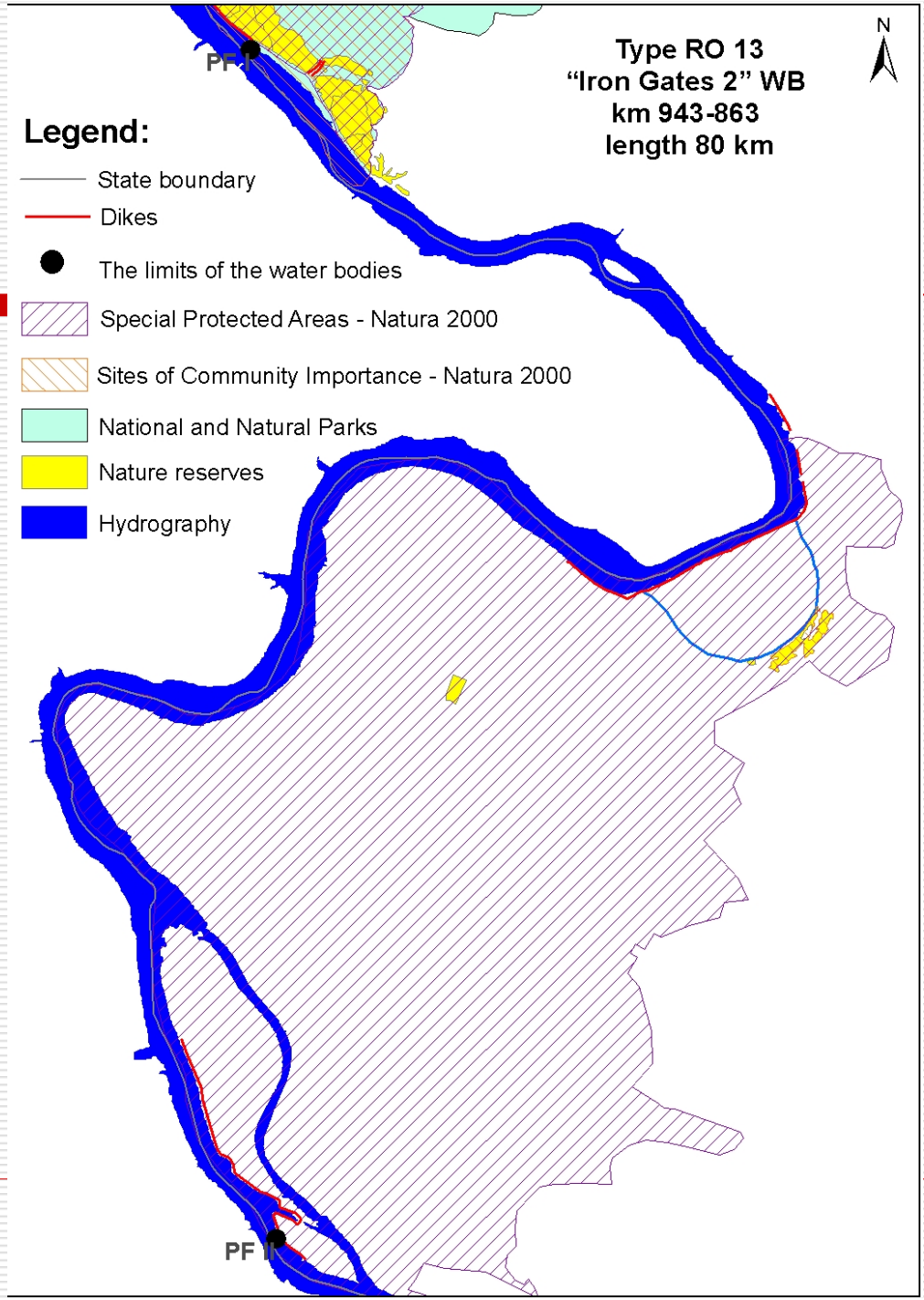


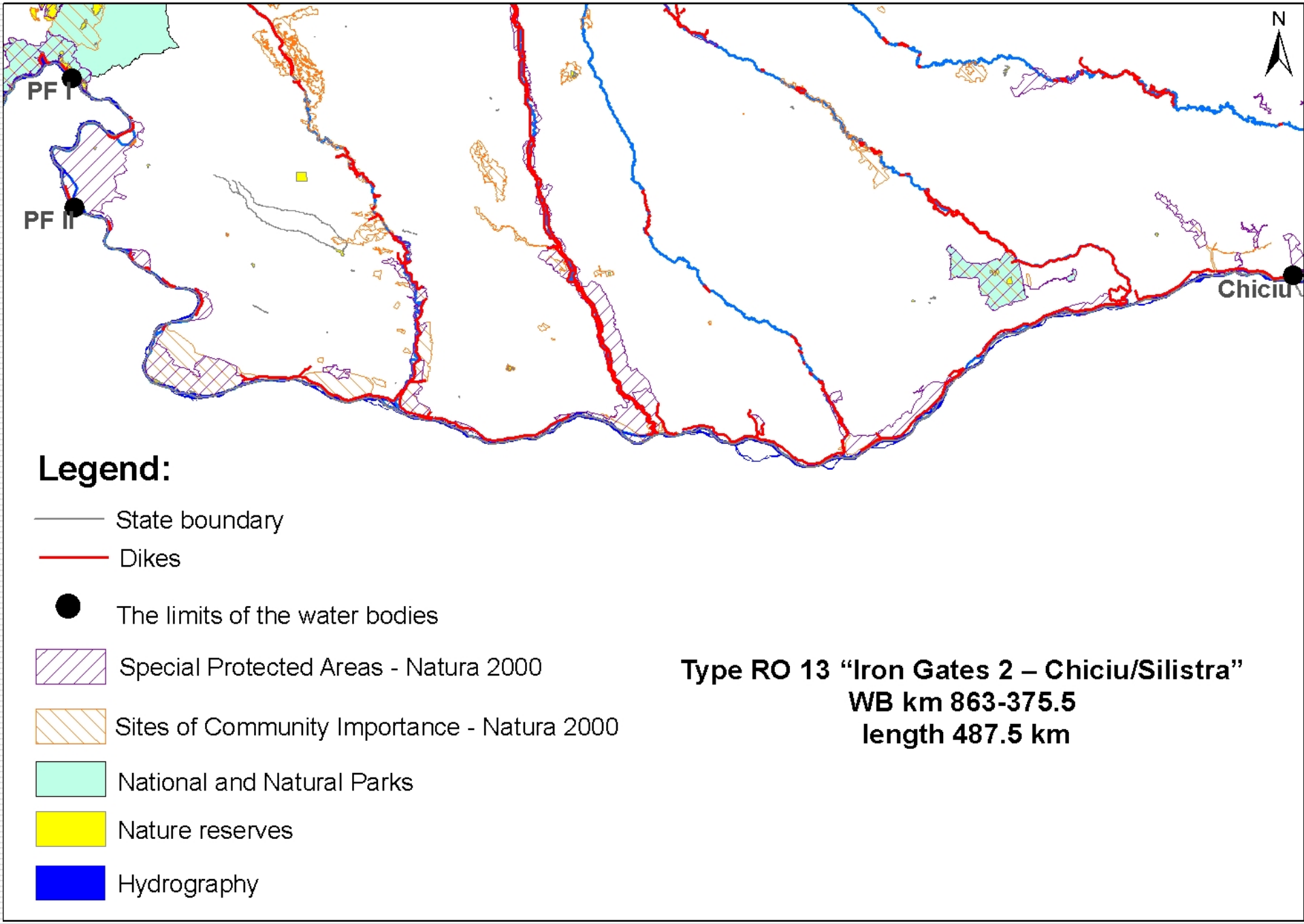
1. Organic pollution
2. Nutrient pollution
3. Hazardous substances pollution
4. Hydromorphological alterations

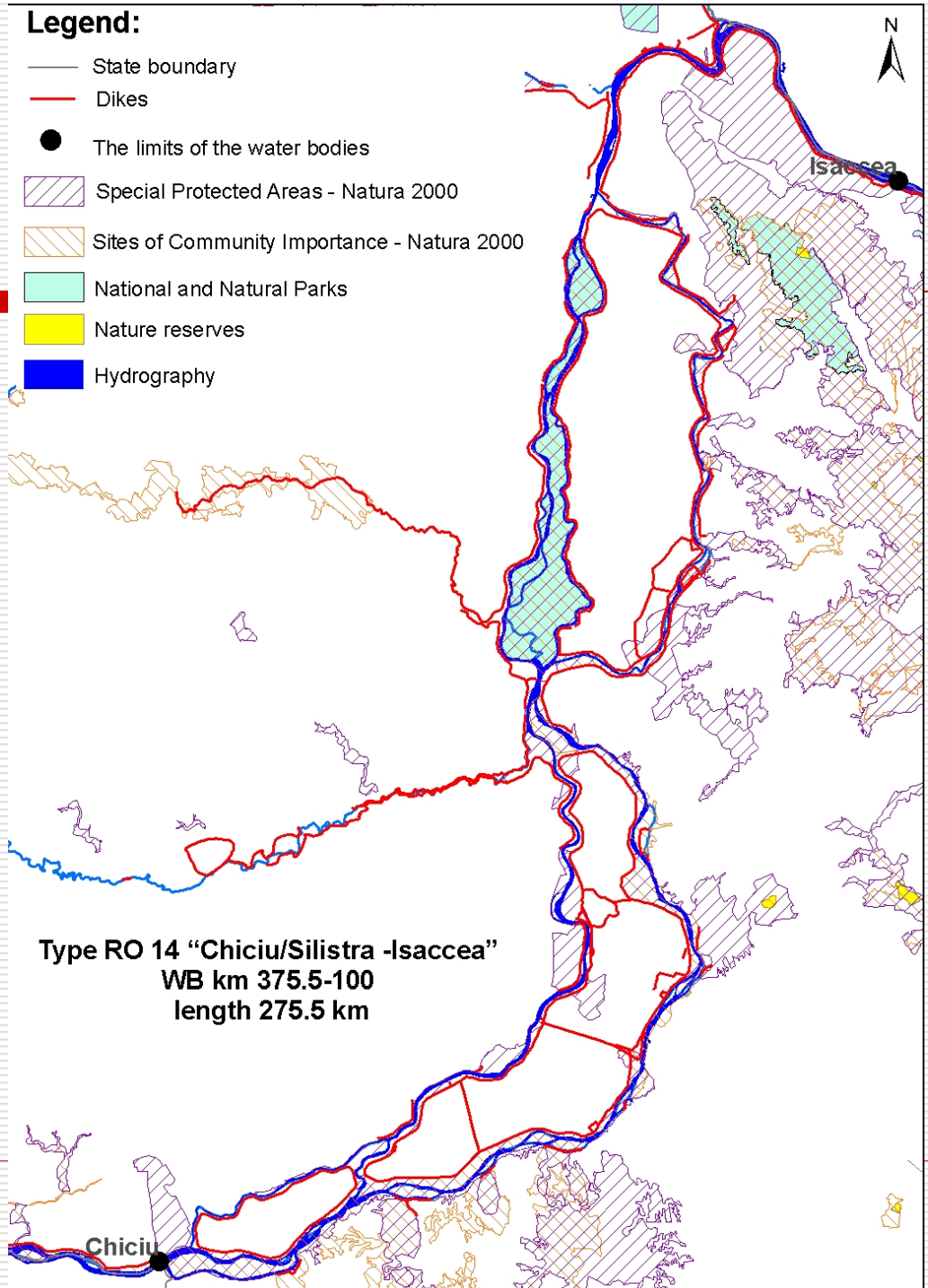
Analysis
Assessment

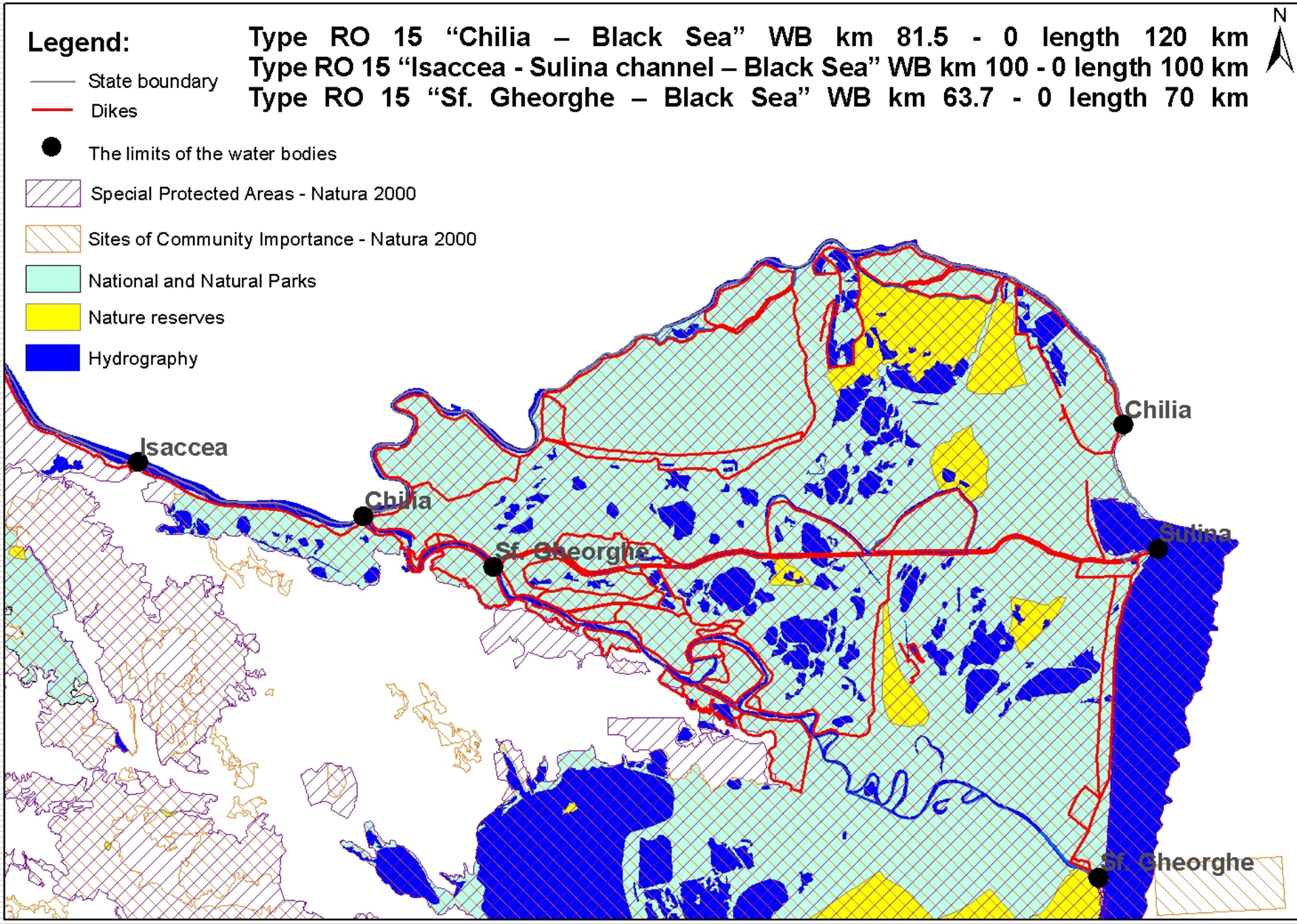
Environmental objective:
Good Ecological Status or
Good Ecological Potential


N
PF I
PF II
Legend:
State boundary
Dikes
The limits of the water bodies
Special Protected Areas - Natura 2000
Sites of Community Importance - Natura 2000
National and Natural Parks
Nature reserves
Hydrography
Type RO 12 “Iron Gates I” WB km 1075 - 943 length 132 km

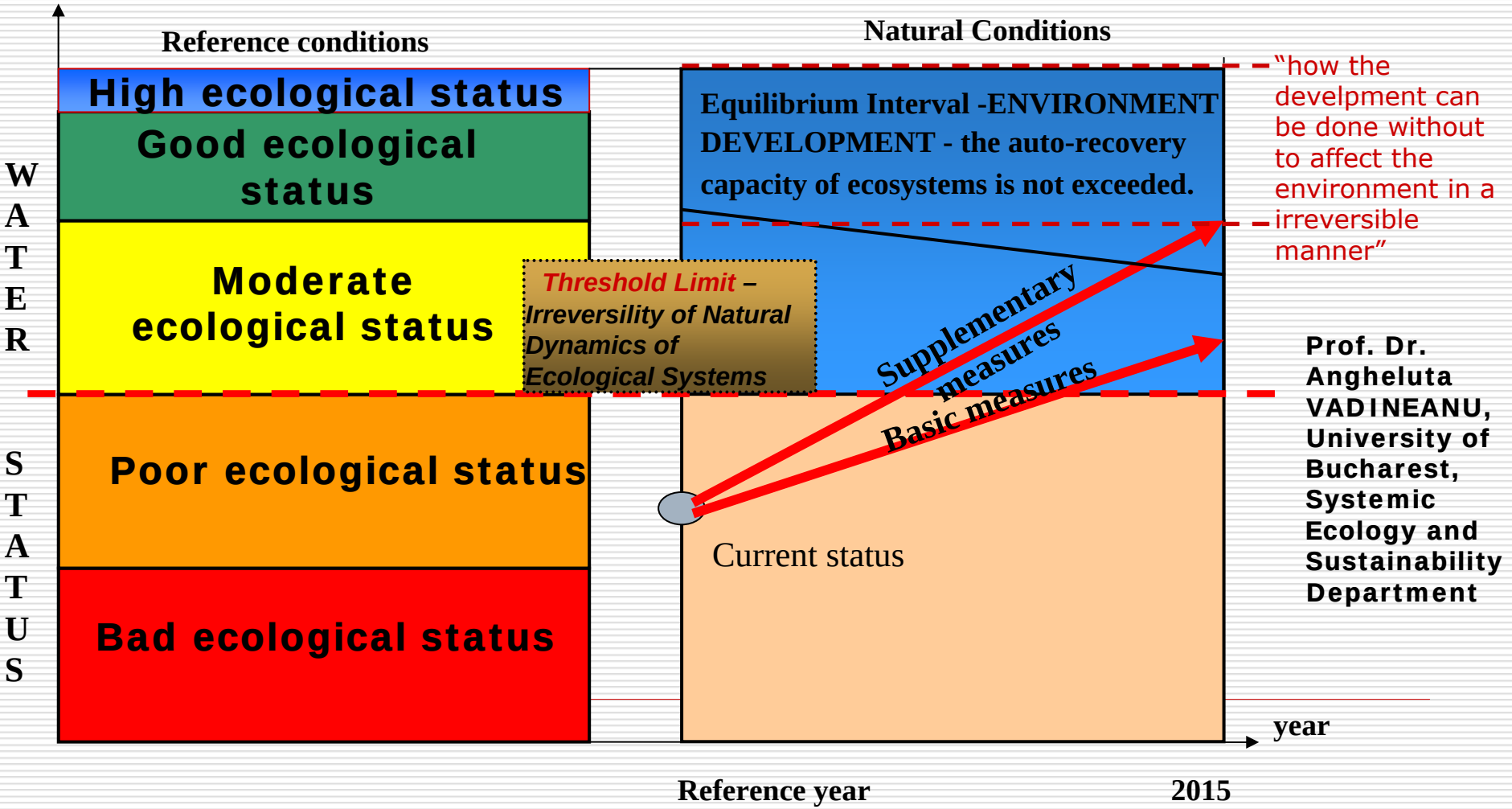

Type RO 13
"Iron Gates 2" WB
km 943-863
length 80 km
N
Legend:
State boundary
Dikes
The limits of the water bodies
Special Protected Areas - Natura 2000
Sites of Community Importance - Natura 2000
National and Natural Parks
Nature reserves
Hydrography
PF I
PF II


N
PF I
PF II
Chiciu
Legend:
State boundary
Dikes
The limits of the water bodies
Special Protected Areas - Natura 2000
Sites of Community Importance - Natura 2000
National and Natural Parks
Nature reserves
Hydrography
Type RO 13 "Iron Gates 2 – Chiciu/Silistra"
WB km 863-375.5
length 487.5 km


Legend:
State boundary
Dikes
The limits of the water bodies
Special Protected Areas - Natura 2000
Sites of Community Importance - Natura 2000
National and Natural Parks
Nature reserves
Hydrography
N
Isaccea
Chiciu
Type RO 14 "Chiciu/Silistra -Isaccea"
WB km 375.5-100
length 275.5 km


Legend:
State boundary
Dikes
The limits of the water bodies
Special Protected Areas - Natura 2000
Sites of Community Importance - Natura 2000
National and Natural Parks
Nature reserves
Hydrography
Type RO 15 "Chilia – Black Sea" WB km 81.5 - 0 length 120 km
Type RO 15 "Isaccea - Sulina channel – Black Sea" WB km 100 - 0 length 100 km
Type RO 15 "Sf. Gheorghe – Black Sea" WB km 63.7 - 0 length 70 km
N
Isaccea
Chilia
Sf. Gheorghe
Chilia
Sulina
Sf. Gheorghe

- **Biological quality elements**: Phytoplankton, Macrophytes and phytobenthos, Benthic invertebrate fauna, Fish fauna
- **Physico-chemical quality elements**: General conditions, Specific synthetic pollutants, Specific non synthetic pollutants
- **Hydromorphological quality elements:** Hydrological regime, River continuity, Morphological conditions



Prof. Dr. Angheluta VADINEANU, University of Bucharest, Systemic Ecology and Sustainability Department

Hydro-morphological pressures on the Danube River

- **Transversal river works: *Dams, reservoirs – IRON GATES I AND II***

  Effect : on the flow downstream reservoir and biota

- **Longitudinal river works*:***

  Embankments along the Romanian reach of the Danube

  Effect : on lateral connectivity, the foodplain vegetation and spawning habitat

Hydro-morphological pressures on the Danube River

- **Longitudinal river works:** ***Banks regulation / consolidation works along the Romanian reach of the Danube***

  Effect : on river longitudinal profile, on substrate structure and biota

- **Navigation channel** ***along the Danube***

  Effect : on bed stability and biota

Concepts of River Ecology (ICPDR vision)

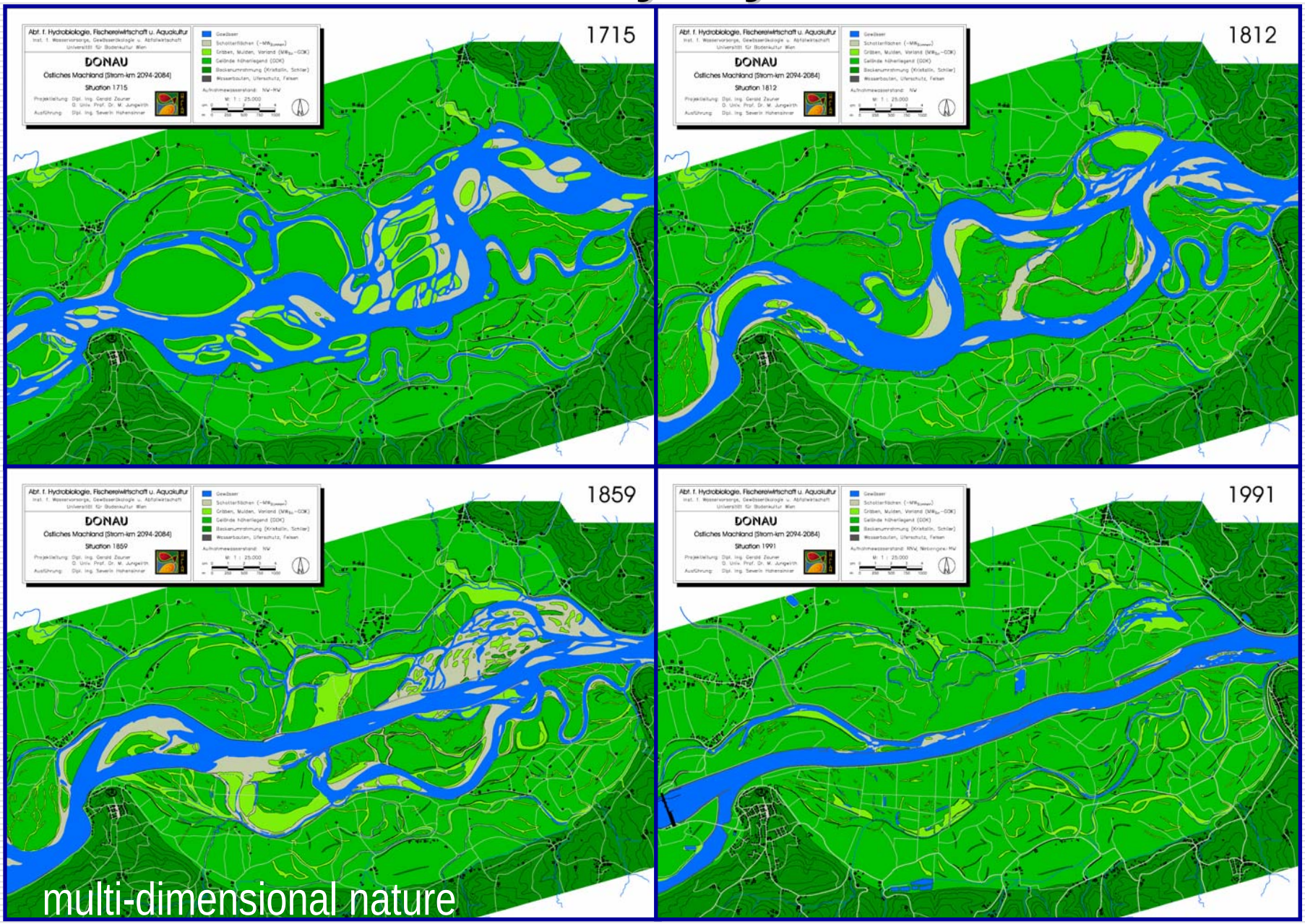
Connection wetlands/floodplains

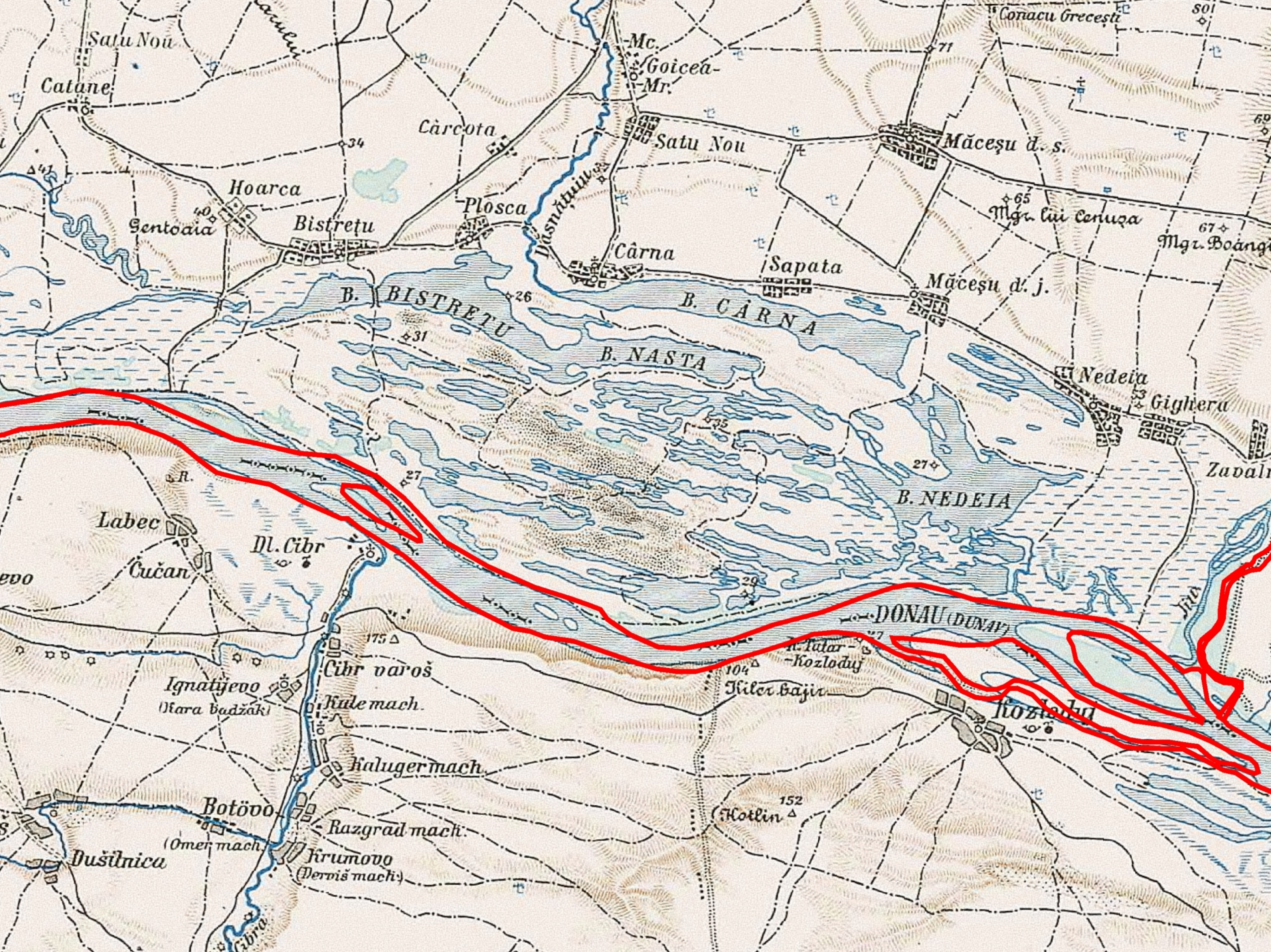
- multidimensional landscape - systems
- highly dynamic nature
- disturbances key element
- complex connectivity conditions
- heterogeneous habitat complex
- shifting mosaic, steady state
- outstanding high biodiversity

multi-dimensional nature

Connectivity / dynamics

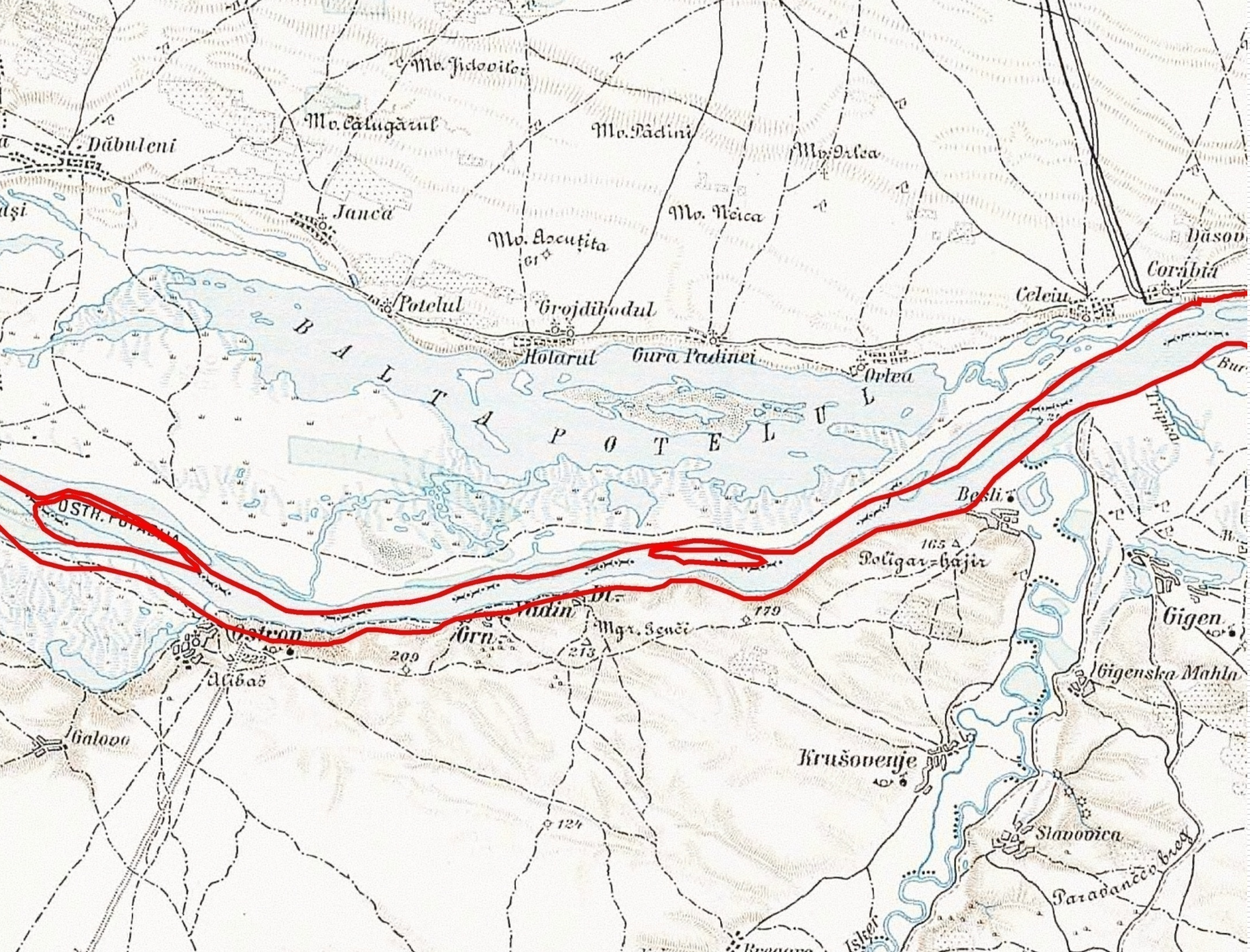
Source: The Danube Delta National Institute for Research and Development, Tulcea, Romania





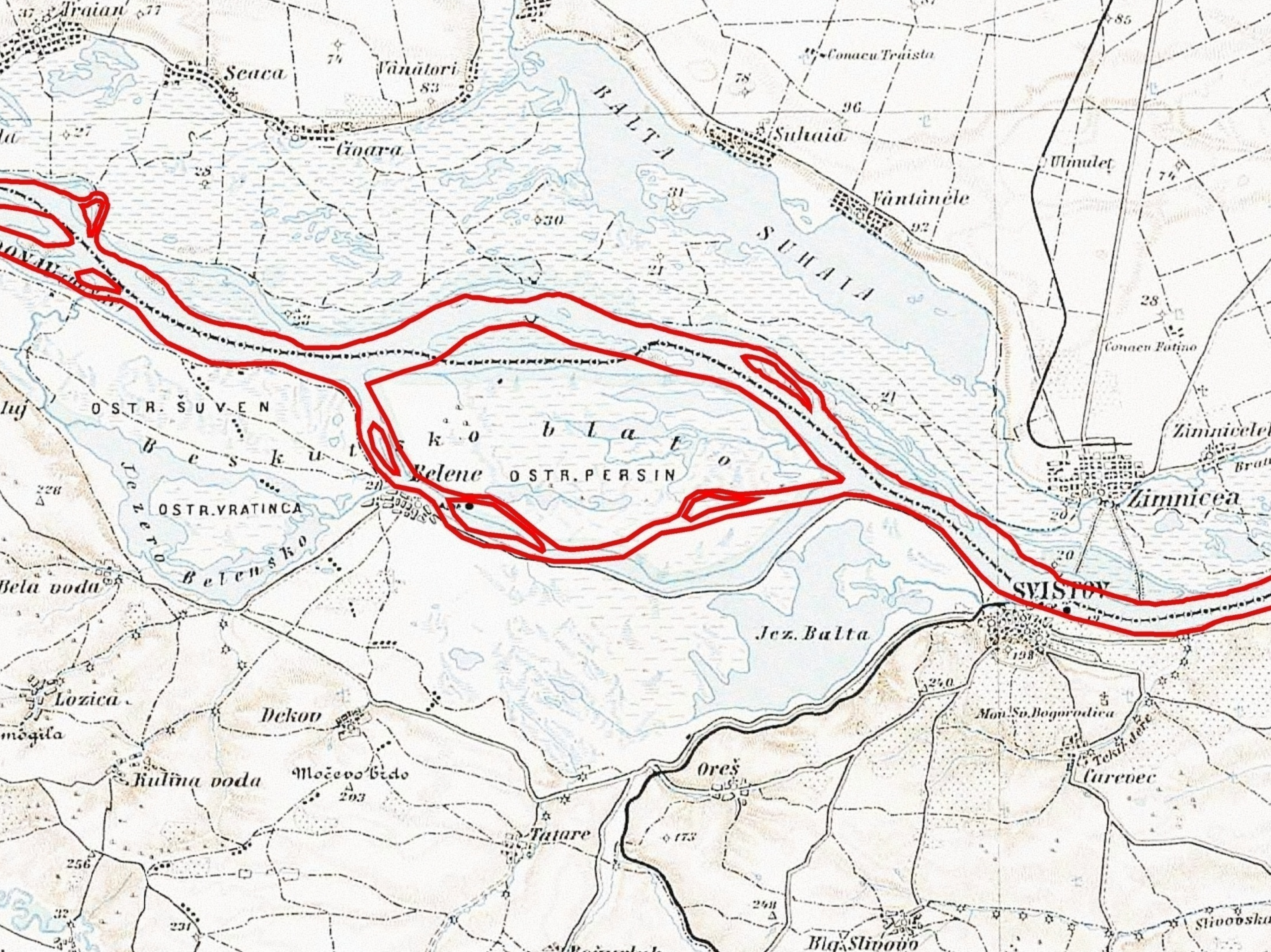
Satu Nou
Catane
Cârcota
Mc.
Goicea
Mr.
Satu Nou
Măceşu d. s.
Conacu Grecești
Hoarca
Gentoaia
Bistrețu
Plosca
Dăsnățuiu
Cârna
Sapata
Măceşu d. j.
Mgr. lui Cenuşa
Mgr. Boăng
B. BISTREȚU
B. CÂRNA
B. NASTA
Nedeia
Gighera
Zavaln
B. NEDEIA
Labec
Dl. Cibr
Čučan
DONAU (DUNAV)
Jiu
K. Tatar-
-Kozloduj
Kiler Bajir
Kozloduj
Cibr varoš
Ignatijevo
(Kara badžak)
Kalemach.
Kalugermach.
Botövo
(Omer mach.)
Razgrad mach.
Krumovo
(Derviš mach.)
Dušilnica
(Kotlin
Cibra

Argeșul
Izvoarele
Hotarele
Coadele
Valea Popi
Mitreni
Floreasca
Cunați
Puțul Grecii
Zboiu
Greaca
Căscioarele
Talaba
Clătești
Chirnogi
Oltenița
BALTA GREACA
Prund
Flaminda
Tutrakan
Kalimok
Jez. Kalimok
Breslen
Babovo
Rjahovo
Staroselo
(Str. Smil)
Türk-Smil
Glm. Vranovo
Sijahlar
Mese Mahle



Mo. Jidovilor
Mo. Călugărul
Dăbuleni
Mo. Pădini
Mo. Orlea
Janca
Mo. Neica
Mo. Ascuţita
Dăsov
Corabia
Potelul
Grojdibodul
Celeiu
Holarul
Gura Padinei
Orlea
B A L T A P O T E L U L
Tripka
Besli
165
Poligar-bajir
OSTR. POTADNA
Gigen
Vadin
Grn.
Mgr. Senči
179
Ostrov
222
209
213
Alibas
Gigenska Mahla
Galovo
Krušovenje
Slavovica
124
Paradančev breg
Isker


Seaca de Câmp
Tunari Noui
Tunari
Piscu Nou
Piscu
Ghidiciu
Mgr. Ogeloaia
Satu Nou
Catane
Negoiu
Cârcota
Hoarca
Gentoaia
Bistreţu
Plosca
Rastu
B. RASTU
B. BISTREŢU
Nebuna
LOM (Lom palanka)
Dl. Linevo
Labec
Dl. Cibr
Nikolajevo
Aligina mach
Golinci
Grn. Linevo
Čučan
Kalen potok
Kovačica
Momin brod
Dlgoševci
Ignatijevo
(Kara badžak)
Cibr varoš
Kale mach.
Kalugermach
Lom
Klučova-mach.
Krivodol
Vlaška-mach
Mokreš
Botövo
(Omer mach.)
Razgrad mach.
Dušilnica
Krumovo
(Derviš mach.)
Vasilovci
Dušilnica



Traian
Seaca
Vânători
Goara
Conacu Traista
Suhaia
Ulmuleț
Fântânele
Balta Suhaia
Conacu Fotino
Zimnicelel
Zimnicea
Ostr. Šuven
Beskutsko blato
Belene
Ostr. Persin
Ostr. Vratinca
Jezero Belensko
Bela voda
Svištov
Jez. Balta
Lozica
Dekov
Kulina voda
Močevo brdo
Tatare
Oreš
Mon. Sv. Bogorodica
Carevec
Blg. Slivovo

Measures to reduce hydro-morphological pressures
A. Restoration of natural landscape

A1. Longitudinal connectivity

- carrying out some **fish paths / fish ladders** for obstacles with the height greater than 40 cm. The fish paths should be done only on river reaches where migratory species (sturgeon) are living.
- Iron Gates – Feasibility study should be done in order to find a solution for a fish migration aid (ICPDR is helping Romania in finding funds)

Possible measure to assure fish migration

Measures to reduce hydro-morphological pressures
A. Restoration of natural landscape

A2. Lateral connectivity

- restoration of wetlands;
- restoring meanders / secondary channels;
- removal or reallocation of dikes on short river reaches;
- banks renaturation / improvement of the bank and bed structure;
- stopping the economical activities in the floodplain and restoration of relief;
- Restoration of river – floodplain relation (flooding).

Economic Benefits of Wetlands

- Wetlands are multifunctional systems and offer multifunctional solutions
- Drinking water quality
- Flood control
- Cleaning the water
- Fisheries
- Recreation
- Wildlife Habitat
- Other Commercial Benefits

AMENAJARE AGRICOLĂ ABANDONATĂ ÎN DELTA DUNĂRII
Abandoned agricultural polder in the Danube Delta before restoration

2 YEARS AFTER FLOODING

AMENAJARE AGRICOLĂ RENATURATĂ ÎN DELTA DUNĂRII
Agricultural polder in the Danube Delta after restoration

BABINA-CERNOVCA PILOT PROJECT Source: The Danube Delta National Institute for Research and Development, Tulcea, Romania

BIOLOGICAL FILTERING CAPACITY OF THE PALUSTRIAN AND AQUATIC VEGETATION

BABINA-CERNOVCA PILOT PROJECT Source: The Danube Delta National Institute for Research and Development, Tulcea, Romania

CONTROL FISHING RESULTS IN RESTORED AREAS INDICATES THE PRESENCE OF BOTH REPRODUCERS AND YOUNG FISHES

BABINA-CERNOVCA PILOT PROJECT Source: The Danube Delta National Institute for Research and Development, Tulcea, Romania

Measures to reduce the effect of embankments (Driver: flood protection, urbanization, agriculture)

- The measures proposed within the Danube Basin Management Plan are the measures proposed in the study "Ecological and Economical Re-dimensioning of Romanian Sector of Lower Danube" done by The Danube Delta National Institute for Research and Development, Tulcea, Romania

Measures to reduce the effect of bank consolidation and dredging activities (Driver: navigation)

The measures proposed within the Danube Basin Management Plan are the measures proposed within the ICPDR - Joint Statement on Guiding Principles for the Development of Inland Navigation and Environmental Protection in the Danube River Basin


THANK YOU FOR YOUR ATTENTION!