



Danube Delta Biosphere Reserve Authority

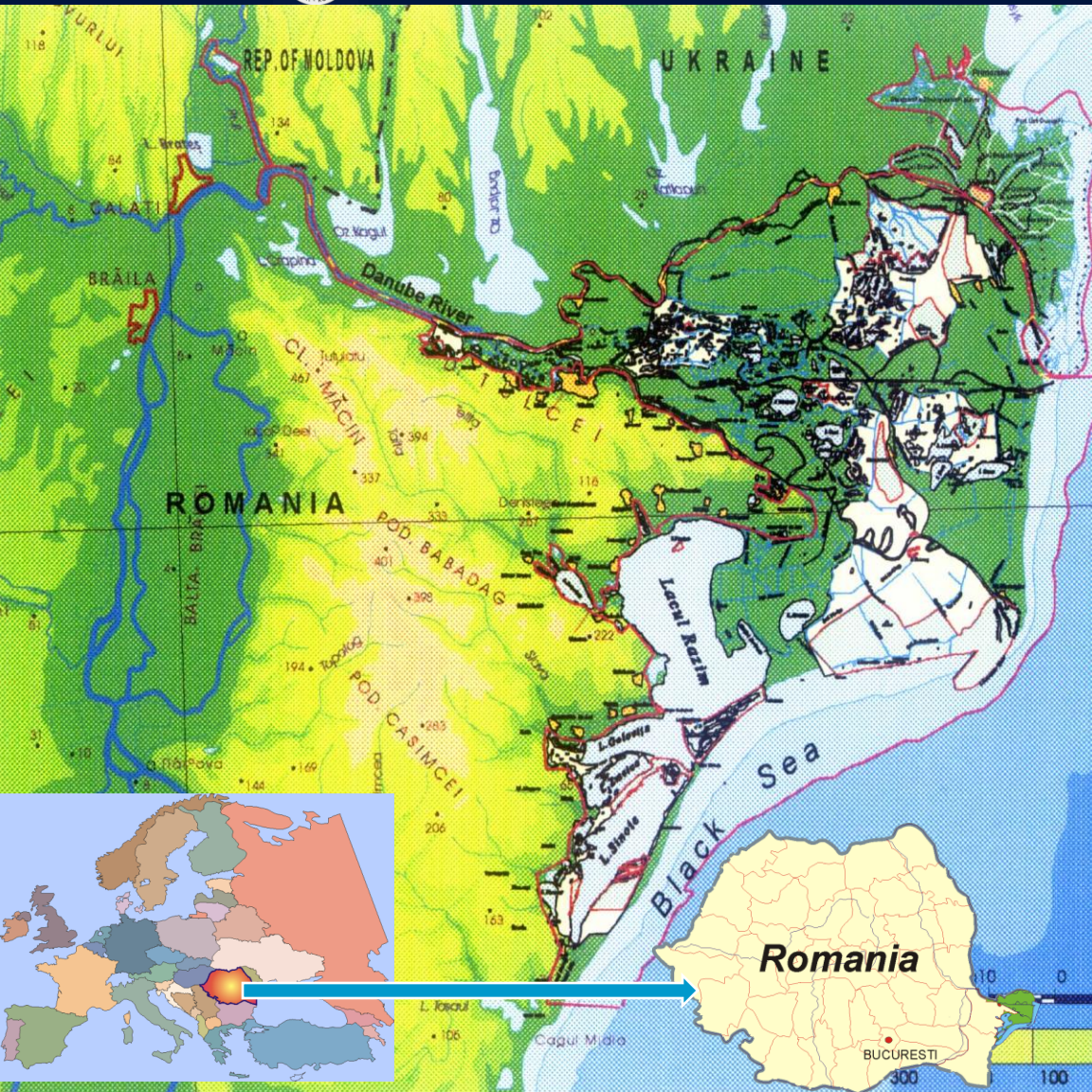
Diaspora în Cercetarea Științifică și Învățământul Superior din Romania
“Semințe de viitor - Seeds for the Future”

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The biodiversity conservation in the Danube Delta Biosphere Reserve

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DANUBE DELTA REGION (S: 6,600 km²)

- **Danube Delta (Romania) S: 4,178 km²;**
- **Razim – Sinoie Complex (Romania) S: 1,015 km²;**
- **Isaccea – Tulcea Flood Plain (Romania) S: 92,0 km²**
- **Lower Prut River Flood Plain (Romania/Rep. of Moldova) S: 275 km²**
- **Kilia Branch Delta (Ukraine) S: 464 km²**
- **Lower Danube Lakes (Ukraine) S: 576 km²**



DANUBE RIVER: The main natural resource/factor of the region

- The Danube River Basin is Europe's second largest river basin (total area of 801,463 km²)
- It is the world's most international river basin as it includes the territories of 19 countries.
- Total population: 81,000,000 inhabitants.
- The ecosystems of the Danube River Basin are highly valuable in environmental, economic, historical and social terms.





Danube River Hydrology

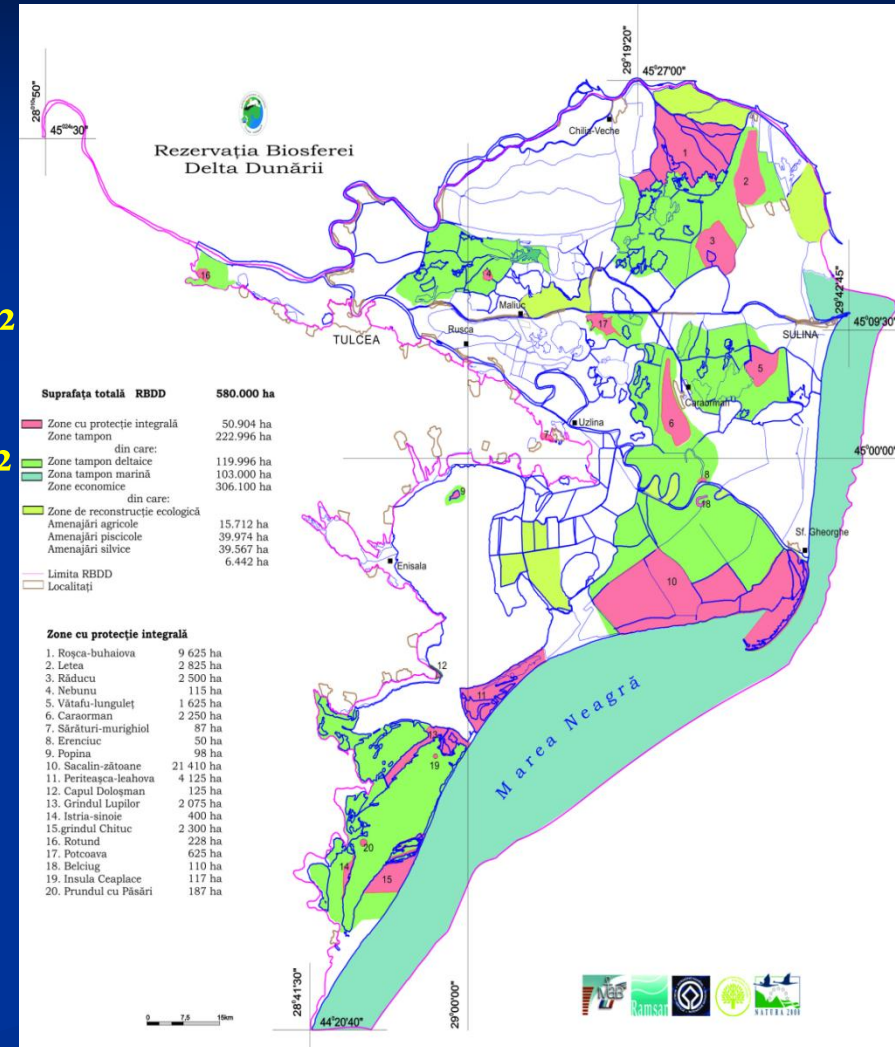
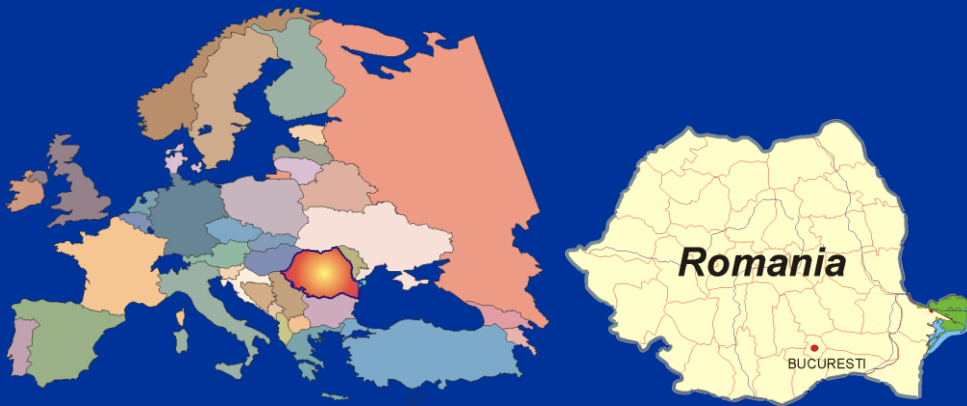
- Average annual water discharge (1921-1990): 6,570 m³/s
- Highest value: 17,700 m³/s (1958)
- Chilia branch: 54.5 %
- Sulina branch: 20.1 %
- Sf. Gheorghe branch: 25.4 % (1991 – 2000)
- Water volume: 5 km³ (delta)
- Suspended sediments: 1.5 M tons/year (46 kg/s)





DANUBE DELTA BIOSPHERE RESERVE

- Total surface: **5,800 km²**
- Strictly protected areas: **509 km²**
- Buffer zones: **2,230 km²**
- Marine buffer zones: **1,030 km²**
- Economic zones: **3,061 km²**
- Ecological restoration: **157 km²**





Danube Delta Biosphere Reserve Authority

POPULATION:

- Rural settlements: 25 (64.3% of inhab.)
- Urban settlements: 1 (35.7% of inhab.)
- Total population: 14,000 inhabitants
- Ethnical structure: Romanians (79 %), Lipovans (11 %), Ukrainians (9 %), Other ethnic groups (Greeks, Turks, Hungarians, etc. – 1%)



ECONOMIC ACTIVITIES:

- Fishing and fishfarming: 32.5 %
- Agriculture: 31.0 %
- Industry, construction, transport: 22.5%
- Education, culture: 3.8%
- Trade, services: 2.1%
- Tourism: 2.1%
- Health system: 1.5%
- Administration: 1.5%



MAIN NATURAL RESOURCES

➤ Fish & Fishery:

Total surface: cca. 162,000 ha

Potential: 3,000 – 5,000 t/year

➤ Reed & reed harvesting:

Total surface: 156,000 ha

Exploitation potential: 70,000 t/year

Level of exploitation: <10.000 t/year

➤ Forests & Forestry: 22.796 ha

➤ Pastures (Cattle breeding): 23,930 ha

➤ Agriculture lands: 61.453 ha,

➤ Landscape (Tourism)



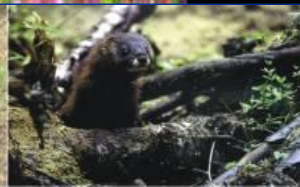
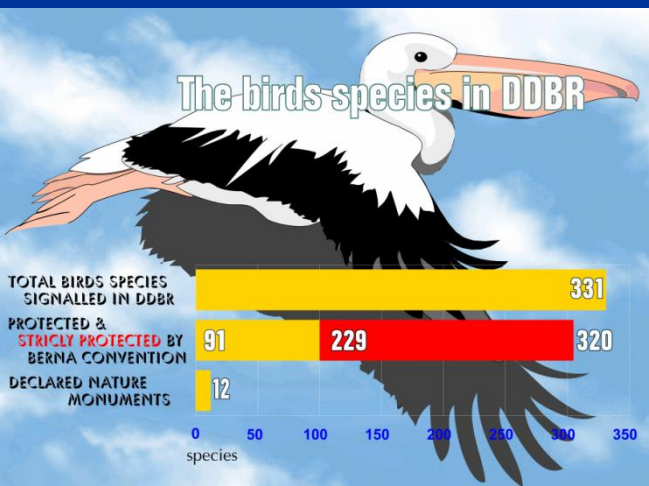


BIODIVERSITY VALUES

Total species: 7,439

Ecosystems: 30 (23 natural and 7 anthropic)

**Habitats: - 29 habitats in Steppic Bioregion
(7 high priority habitats)
- 3 habitats in Pontic Bioregion
(„Natura 2000” Network)**





BIODIVERSITY VALUES

TOTAL species inventoried to date: 7,439 including:

- **Plantae: 2,382 species,**
- **Animalia: 4,064 species,**
- **Fungus: 145 species,**
- **Protozoa: 429 species,**
- **Chromista: 210 species,**
- **Bacteria: 209 species.**

(According to „Universal Taxonomic Services” and „Sistema Naturae 2000”)



BIODIVERSITY VALUES

Vertebrates (479 species):

- fish: 85 species
- amphibians: 10 species
- reptiles: 11 species
- birds: 331 species
- mammals: 42 species



BIODIVERSITY VALUES

- Nesting birds: 172 species
- Migratory or partial migratory birds: 284 species
- Birds declared monuments of nature:

Tadorna tadorna

Tadorna ferruginea

Corvus corax

Otis tarda

Pelecanus onocrotalus

Pelecanus crispus

Himantopus himantopus

Platalea leucorodia

Egretta alba

Egretta garzetta

DDBR: MAIN CHARACTERISTICS

BIODIVERSITY VALUES

➤ Globally endangered species

- *Phalacrocorax pygmaeus*
- *Pelecanus crispus* (300 - 400)
- *Anser erythropus* (5 - 10)
- *Branta ruficollis* (50,000 - 55,000)
- *Oxyura leucocephala* (300 - 400)
- *Aythya nyroca* (400 - 600)

➤ Birds species under Bern Convention

- strictly protected species: 229 species
- protected species: 91



ROLE OF WETLANDS :

ECOLOGICAL

- **Habitats for specific aquatic flora and fauna (biodiversity);**
- **Water quality improvement (Nutrients removal: 15kg P/ha/year, 335 kg N/ha/year; Sediments trapped: 11 to/ha/year)**
Accumulation of substances and energy as raw material for the natural ecosystems

SOCIAL

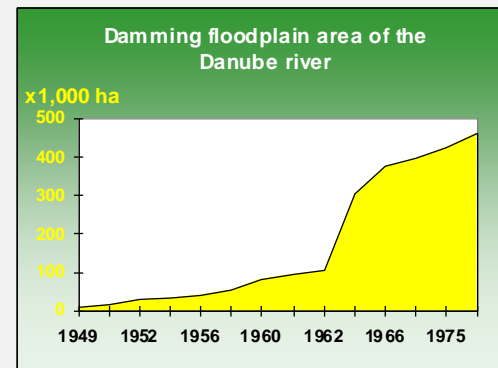
- **Flood alleviation**
- **Water source for drinking water supply**
- **Specific landscape for recreation**
- **Specific area for education in nature protection**



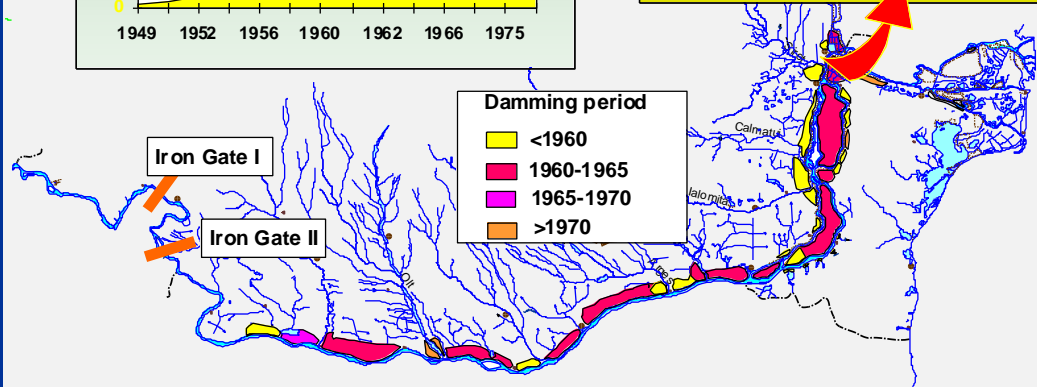
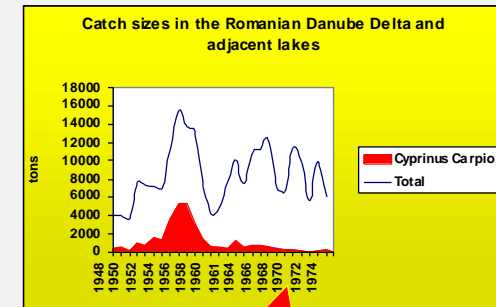
THREATS AND PRESSURES

- Damming upstream Danube Delta (Danube Floodplain);
- Damming inside Danube Delta;
- Cannalising the natural water ways;
- Development of navigation;
- Pollution;
- Natural resources over exploitation;
- Climate changes;

DAMMING OF DANUBE RIVER FLOODPLAIN



IMPACT ON DANUBE DELTA'S FISHERY





MAJOR EFFECTS OF DAMMING IN DELTA

Nitrogen: 300.000-400.000 t/year
Phosphorous: 45.000-60.000 t/year
Oil: 45.000-50.000 t/year

HUMAN INDUCED CHANGES IN THE LOWER DANUBE RIVER

BY

HABITAT
REDUCTIONS

BY

DAMMING
UPSTREAM FLOODPLAIN
AND 22% OF THE DELTA

AND

BUILDING BARRAGES
AT KM 942 AND KM 863
FROM RIVER MOUTHS

HABITAT
ALTERATIONS

BY

POLLUTION

AND


DRADGING CHANNELS

DANUBE

TULCEA

Black Sea

LEGEND

 Damming (22%)

 Pollution

 New channels



HYDROLOGY AND WATER CHEMISTRY CHANGES

DANUBE RIVER

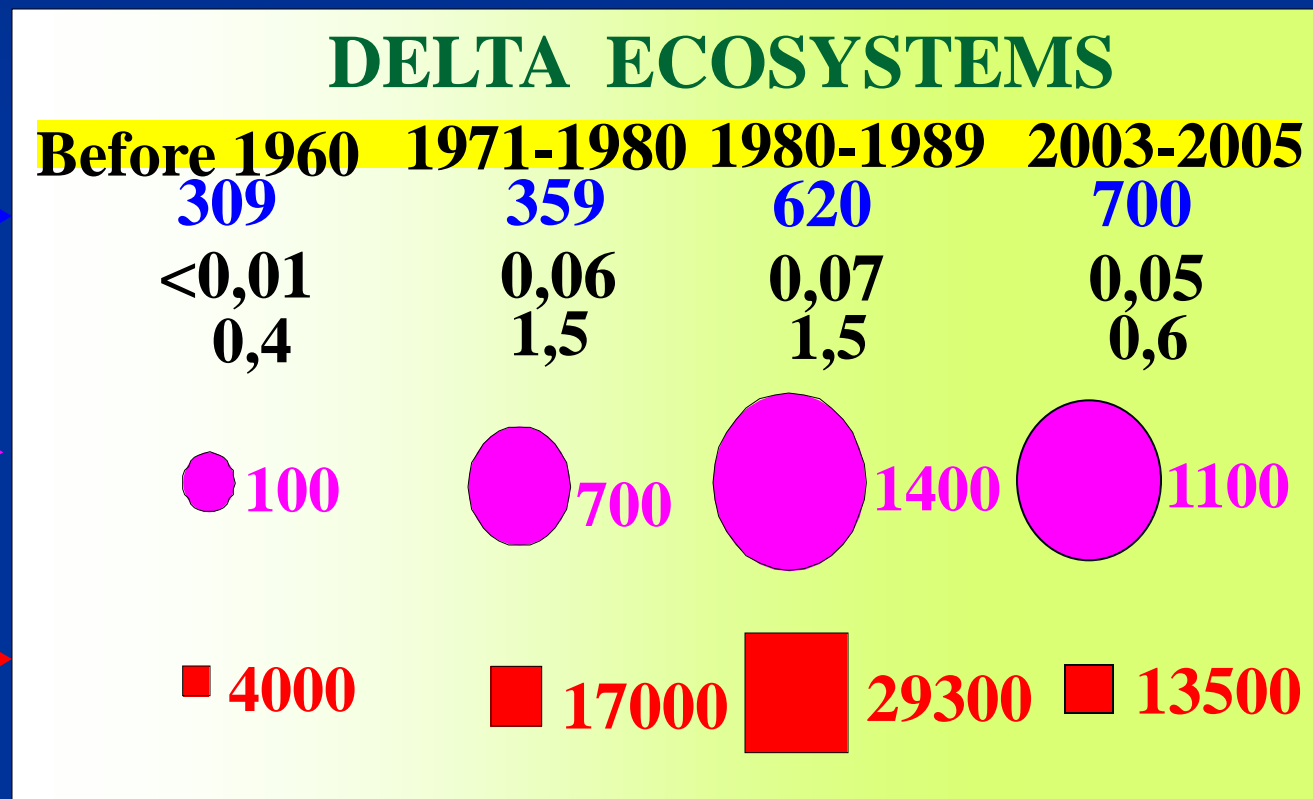
Water inflow
(m³/s)

P(PO₄) (mg/l)

N(NO₃) (mg/l)

P(PO₄) inflow
tons/year

N(NO₃) inflow
tons/year

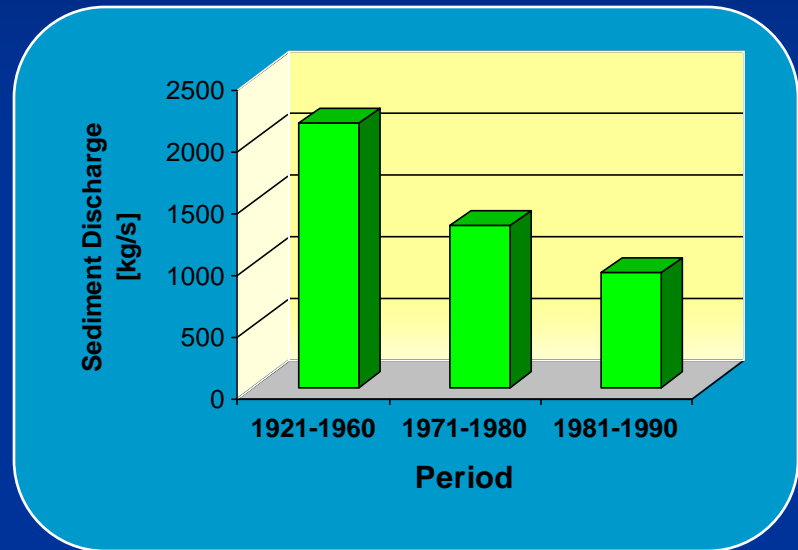




CHANGES OF SEDIMENTS DISCHARGE

Decreased sediment discharge at the delta entrance:

- 2138 kg/s (1921-1960)
- 1308 kg/s (1971-1980)
- 926 kg/s (1981-1990)

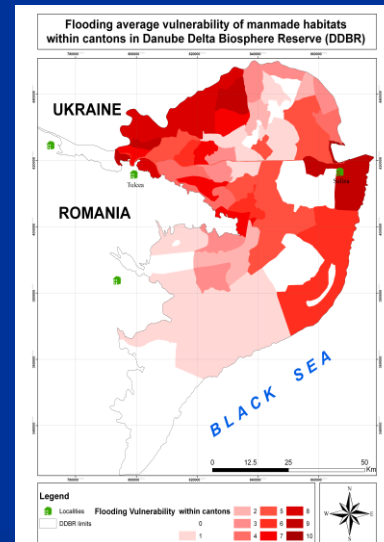
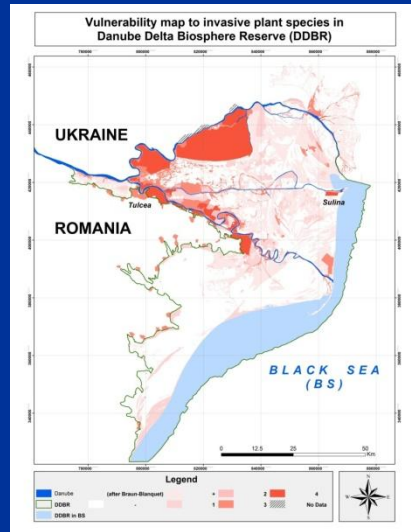
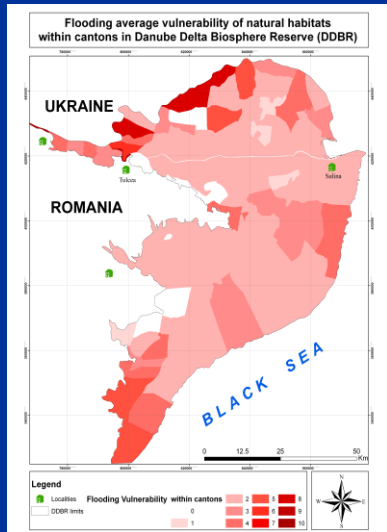


causing Black Sea coast strong erosion processes,
whereas sea water raised last century 1.5 - 2 mm / year.



CLIMATE CHANGE

- **Flooding** (Flooding vulnerability of habitats maps)
- **Severe dry season**
- **Habitat changes**
 - The growing number of alien plant species;
 - Warming climate will inevitably cause changes in habitats in Europe (vulnerability map to invasive species)





RESPONSES TO THREATS AND PRESSURES:

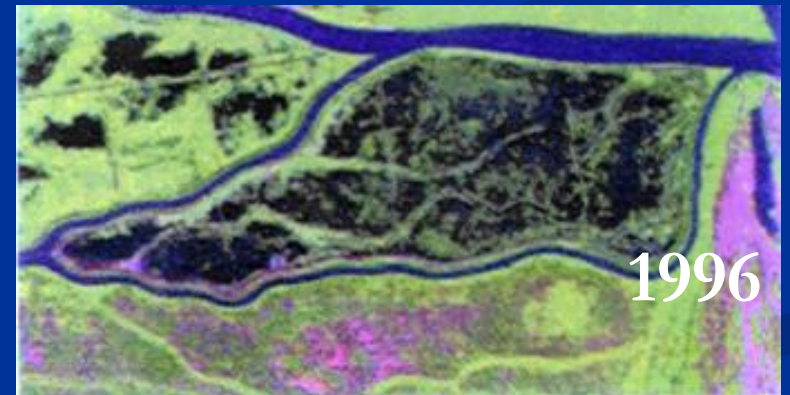
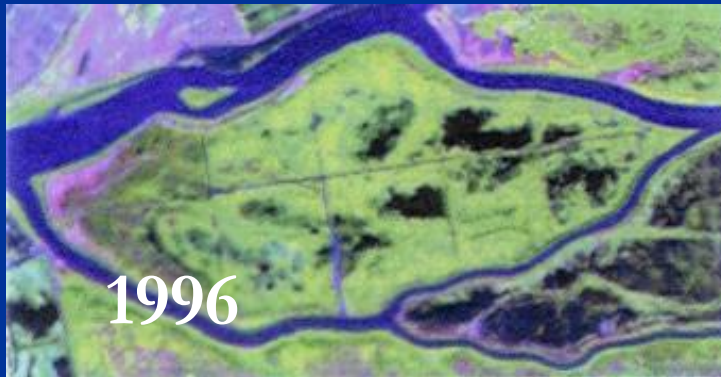
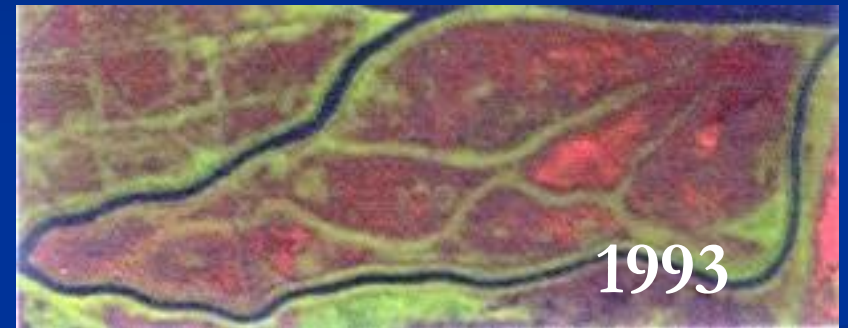
- **Wetlands restoration works in the Danube Delta;**
- **Wetlands restoration works in upper flood plain;**
- **Restoration of habitats and ecosystems, endangered species, affected landscape;**
- **Waste water management ;**
- **Nature protected areas development for biodiversity;**
- **Cross border and regional cooperation – Danube Strategy.**





RESTORATION WORKS IN POLDERS: 157 Km²

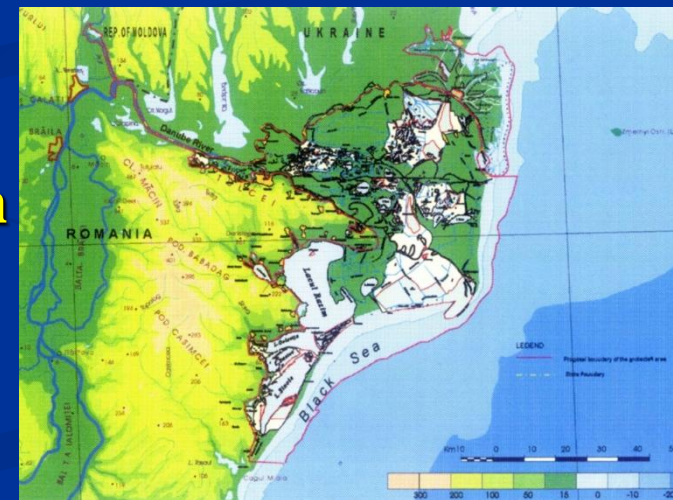
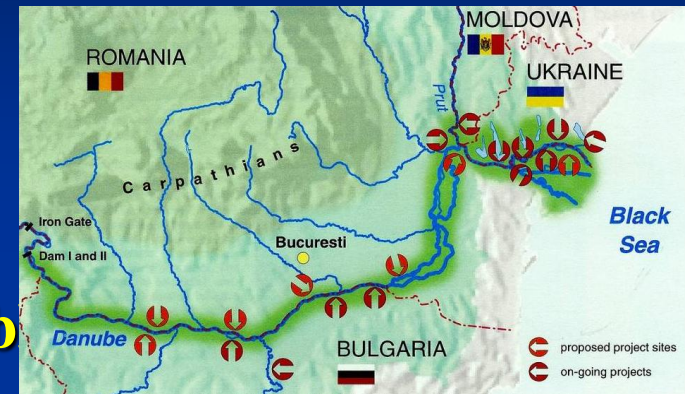
Babina polder: 2,100 ha Cernovca polder: 1,580 ha





DEVELOP THE TRANSBOUNDARY/REGIONAL/ INTERNATIONAL COOPERATION

- Lower Danube Green Corridor
- Transboundary Biosphere Reserve
Danube Delta and Lower Prut for
biodiversity conservation and sustainable
development
- Danube Parks Network
- Natura 2000 Network
- Cooperation within Danube River Basin
on protection of the Danube River/
Danube Delta Black Sea System;
- Europe/Asia exchange of experience.





Danube Delta Biosphere Reserve Authority

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