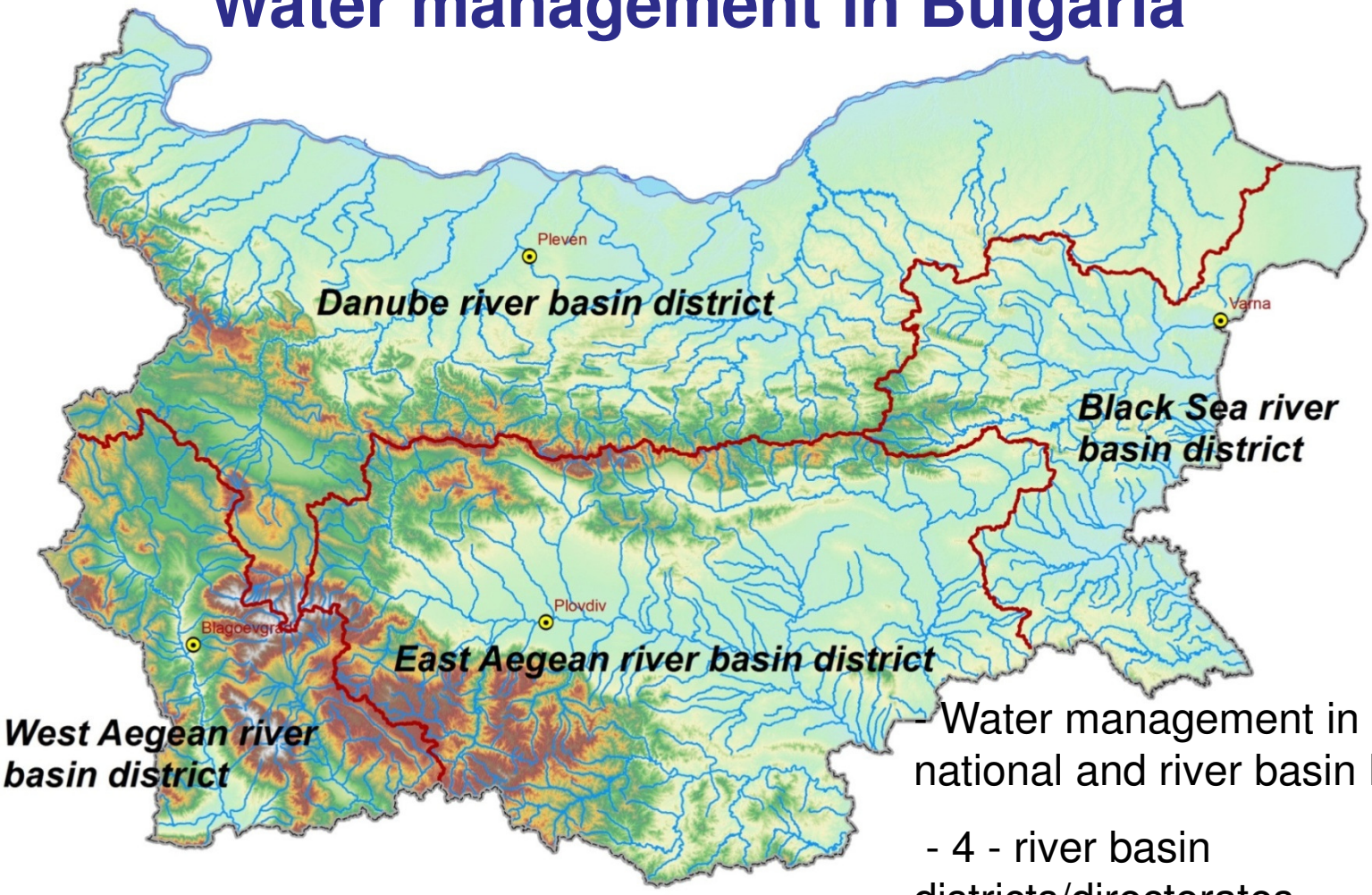
Experience in Wetlands restoration and conservation concerning natural water retention measures

Ministry of Environment and Water, Bulgaria

Water management in Bulgaria



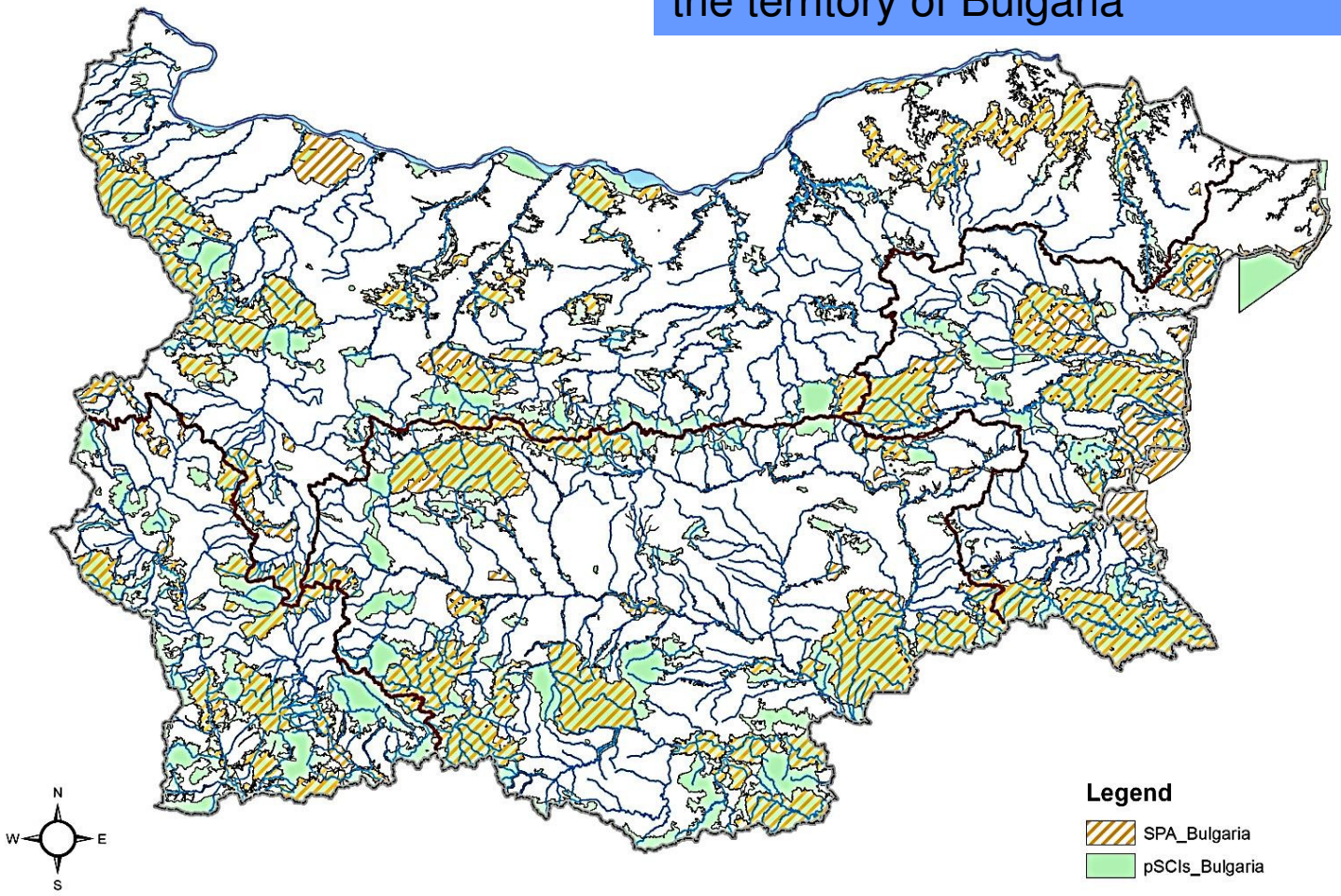
- Water management in Bulgaria – national and river basin level

- 4 - river basin districts/directorates

- 4 River basin management plans (RBMP) 2010-2015

Protected areas according the WFD

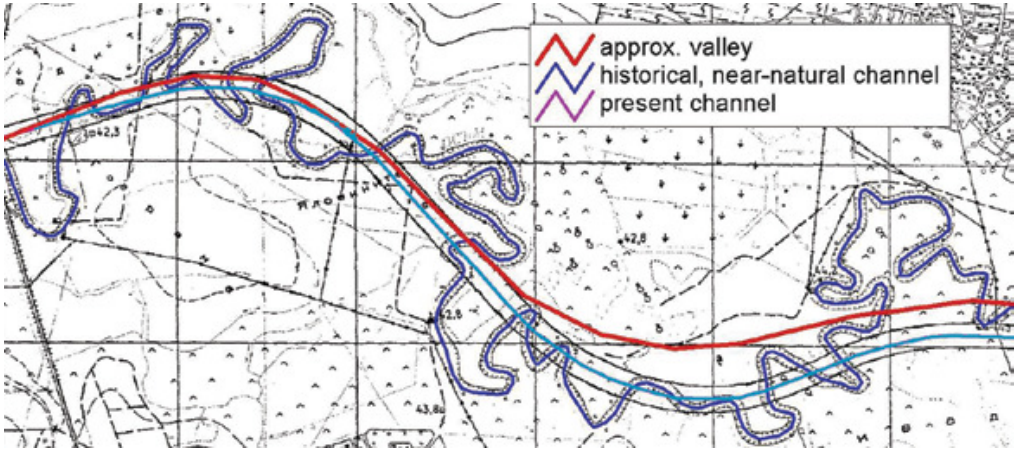
NATURA 2000 – more than 30% of the territory of Bulgaria



Main anthropogenic impacts identified in RBMPs

- River straightening;
- Incision of the riverbed due to erosion and sediment excavation;
- Interruption of the water body continuum by barrages, hydro power dams;
- Regulation of the water flow - water use infrastructures;
- Water pollution;
- Reduction of river catchments retention capacity.

Osam River near Obnova village before and after strenghtening



After river training, the coefficient of curvedness is 3 times shorter and the shortening or the river is more than 3 times. It could be assumed totally straightened.

Measures in the RBMPs in relation to protected areas

The most important **restrictive** measures aiming to enhance water quality and protection of water ecosystems in the RBMPs are:

- Building of hydro-power plant at rivers
- Sediment excavation of from river beds
- Felling of natural riparian tree vegetation
- Discharge of waste water in the protected areas

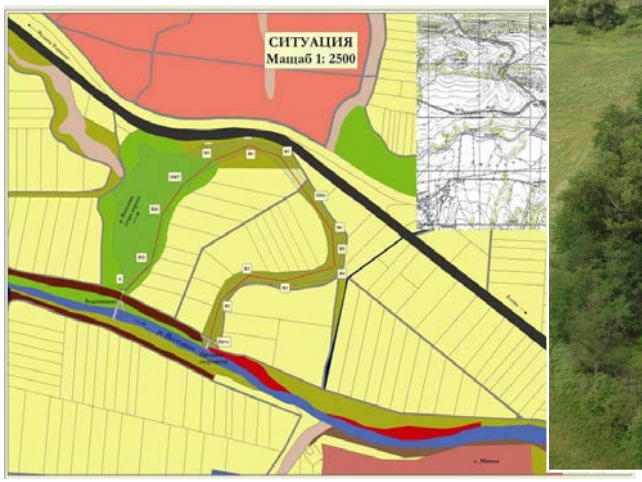
Some measures in the RBMPs in relation to NWRM

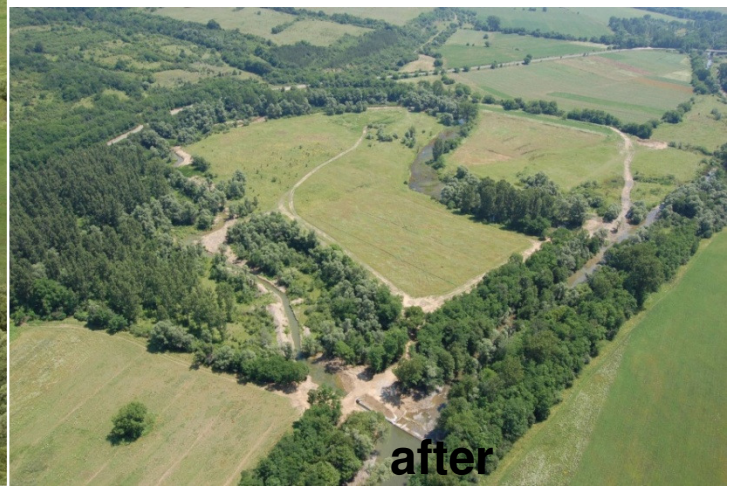
- Measures for restoration of wetlands, afforestation, remeandring, etc.
- Forest management , including afforestation of reservoir catchments and drinking water protection zone of a reservoir;
- Regulation of water regime;
- Sustainment of high water level in freshwater marsh in northeast part of Protected area Atanasovsko lake(BSRBD);
- Increase of water level in surrounding canal in Protected area Atanasovsko lake (BSRBD);
- Enlargement of old ones and creation of new water surfaces among massifs of hydrophyte vegetation (BSRBD).

Wetlands restoration and conservation practice in Bulgaria

Example 1 – Restoration of meander of Vesselina river, DRBD

- A project realized by WWF, Mindya village community
- Object: Remeandering of the Vesselina river with its former meander near the village.
- In the years when the meander have been cut off the river, the river have carved into the river bed nearly 150 cm deeper, it have been indispensable to build a threshold so that the water level to be raised at a point to enable water flowing back to its former bed.





Example 2 – Reconnection between the Danube River and the wetlands of Persin Island

Pilot project for Bulgaria and for the lower Danube floodplains **Wetland Restoration and Pollution Reduction**, carried out by the MOEW and funded by the Global Environment Facility (GEF), as part of the initiative “Lower Danube Green Corridor”.

Under this project the Danube dyke was open at three points and huge inlet structures (sluices) were built to ensure controlled water flow from the river to the wetlands. Adjacent arable lands are protected by intermediate dyke and drainage canal with drain pumping station.

Example 2 – Reconnection between the Danube River and wetlands

- **Persina Island**

The restored wetland is a man controlled floodplain at area of about 2200 ha which is flooded at a different stage. The depth of flooding varies up to 2.5 m.

Results: Restored wetlands of the east part of the island;

Four relatively large marshes appeared in the eastern part of the island.

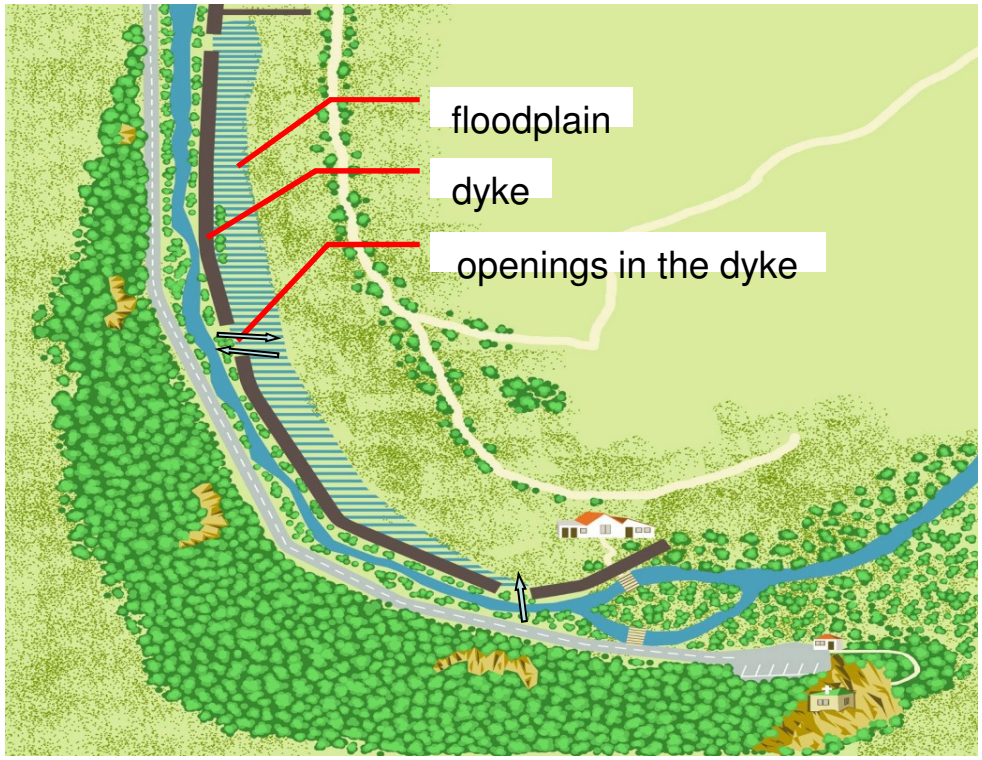
Pictures: Persina Nature park - Model of the drain pumping station at Persina Island

- **Kalimok marsh**

Restored by the same means. Floodplain at about 2000 ha, flooded by Danube waters

Example 3 – Restoration of Russenski Lom River near Ivanovo Rock Monasteries

- In the mid 20th century biggest part of the lower stream of Russenski Lom River have been completely strengthened.
- High waters flooding the road and cutting off the access to archeological reserve of the Monasteries.
- When water overflows the dyke it is impossible to get back into the river.
- In a flood in 2006 the dyke had been partially broken at 3 points. Land stayed flooded for 1 year.
- Solution: entire rupture at those points
- The first example in Bulgaria for application of the principle “more space for the river – more safety for people”, proven yet in mid 20th century.

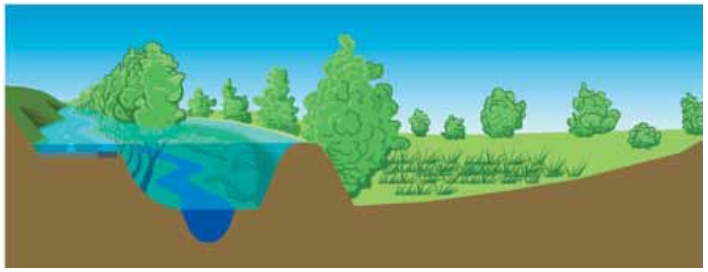


Sponsored by the German Federal Environmental Foundation
DBU
Deutsche Bundesstiftung Umwelt

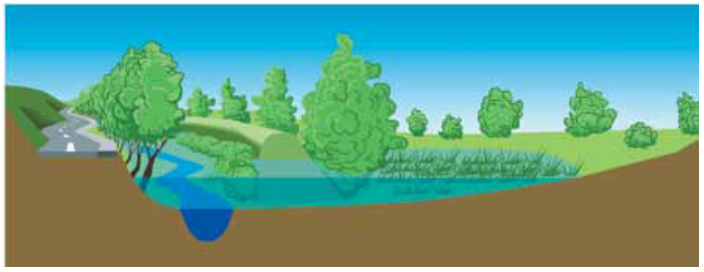
Example 3 – Restoration of Russenski Lom River near Ivanovo Rock Monasteries

- A project realized by Directorate of Natural Park Russenski Lom and WWF, funded by the German Federal Environmental Foundation (DBU).
- Nowadays river can overflow its banks, tease and soon after – to get back to its bed, without leaving inundated land.

Average water level



High water level before flooding



High water level after restoration

Example 4 – Restoration, protection and sustainable development of Zlato pole

- Restoration Activities for restoration of a wetland near Maritza river.

- Objectives:
- additional water storage quantities aiming to maintain the hydrological regime of the wetland;
- restoration and protection of wet woods aiming protection of biodiversity.

Example 5 – Atanasovsko lake

- Project „Life for Bourgas Lakes“ funded by Life + Program - Bulgarian Society for the Protection of Birds - Atanasovsko lake /Ramsar site/ (Black sea district);

✓ Activities in restoration of the wetland zone;

✓ Activities in creation of new water storage volume near– aiming to enhance biodiversity of water ecosystem and so – diversity of protected birds.

✓ Restoration of the protection dyke and canal surrounding the lake

Pictures: Veradina Pavlova, MOEW

Constructed Wetlands for wastewater treatment

- Example 1: Lagoon for treatment of wastewater generated from a tourism utility in Falkovets village, Northwest Bulgaria (Danube river basin district)

Final stage of the lagoon, 2006
Picture: Daniel Popov,
Centre for Environmental Information and Education

Lagoon in 2009
Picture: Georgi Stefanov, WWF

Analysis of effluent, 2006:

Reduction of pollution loads Category of water:

1-ва категория
2-ва категория
3-ва категория
над 3-та категория

Показател	1-ва катего-рия	2-ра катего-рия	3-та катего-рия	Стойност на показателя		Намаляване на показате-лите (в%)
				преди пречистване	след пречистване	
БПК5	5	15	25	622 +/- 62	39 +/- 4	93,73
ХПК	25	70	100	1285 +/- 51	83 +/- 3	93,55
Нитрити (N – NO_2)	0,002	0,04	0,06	0,703 +/- 0,080	0,176 +/- 0,080	74,97
Нитрати (N – NO_3)	5	10	20	1,260 +/- 0,403	1,966 +/- 0,403	+56,03
Азот по Келдал органичен	1	5	10	20,0 +/- 0,1	2,3 +/- 0,1	88,5
Фосфор	0,4	2	3	8,478 +/- 0,280	3,847 +/- 0,280	54,62

Analysis of effluent, 2009:

Показател	1-ва катего-рия	2-ра катего-рия	3-та катего-рия	Стойност на показателя		Намаляване на показате-лите (в%)
				преди пречистване	след пречистване	
БПК5	5	15	25	159 +/- 16	51 +/- 5	67,93
ХПК	25	70	100	336 +/- 13	106 +/- 4	68,46
Нитрити (N – NO_2)	0,002	0,04	0,06	0,057 +/- 0,002	0,021 +/- 0,002	63,16
Нитрати (N – NO_3)	5	10	20	3,334 +/- 0,010	0,157 +/- 0,005	53,00
Азот по Келдал органичен	1	5	10	11,8 +/- 0,6	9,8 +/- 0,5	16,95
Фосфор	0,4	2	3	9,953 +/- 0,299	9,638 +/- 0,289	3,17

Constructed Wetlands for wastewater treatment

- Example 2: Lagoon for treatment of wastewater generated from a Home for mentally challenged /children with intellectual disability/ children in Vidrare village, Sofia district (Danube river basin district)



Accomplished in 2011 by NGOs together with Pravets Municipality.

Surface A = 3.5 m²/PE * 76 PE = 266 m²

Designed with vertical drainage:

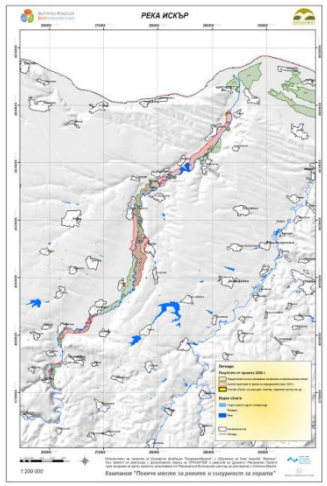
- pretreatment stage - supplied with storage tank
- biological bed stage – gravel.

Effluent is discharged in the existing sewage system.

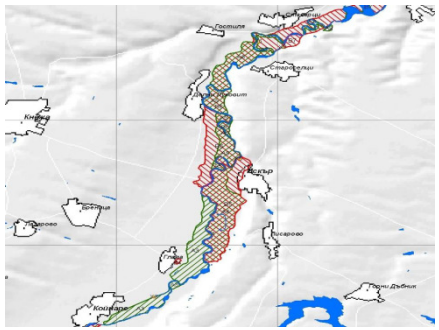
Evaluation of zones, suitable for creation of water retention volume

A project realized by NGOs, funded by GEF, with the support of Danube river Basin Directorate for research of affected lengths of the rivers, damages and other activities

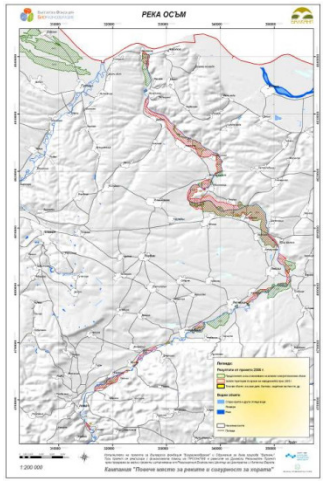
Iskar river

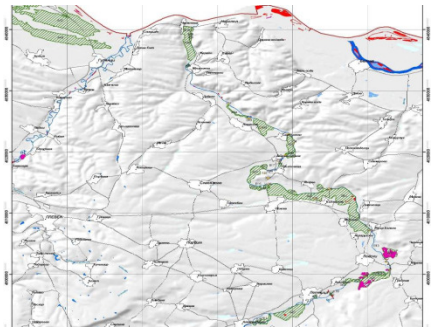


Maps: Suggestions for Wetlands /Retension volumes/



Osam river





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