

DRAVA

Importance of Sediments in the river

Drava - River of sediments

The Drava is a Lifeline, which is not only characterised by a flow of water but also - not visible for humans - by a flow of gravel and sand. Each year, the Drava transports on average about 40,000 m³ of gravel downstream of the Mura confluence at Botovo. Normally, the sediment transport of the Drava is balanced - that means e.g. for the stretch between Legrad and Ferdinandovac that the same amount of sediment is coming from upstream as removed further downstream. This natural condition doesn't exist on the Drava any more. The building of hydropower dams, channelling of the river course and sediment extraction has led to a "deficit of sediments" in the river, that means the Drava transports more gravel and sand than being provided from further upstream. Therefore the river is taking sediments from its bed. The consequences: the Drava is deepening its bed from year to year, e.g. at Botovo about 2.6 cm. In the last eighty years the Drava has deepened its bed e.g. at Botovo of about 2 m or at Terezino Polje about 2.3 m.



River channelling

Naturally, the river takes and gives, that means, erosion of sediments on one bank – natural River banks are an important source of sediments – is leading to sedimentation on another bank. By removing sediments from one place to another, the river flow reduces its speed. This natural balance is disturbed, if the riverbed is being regulated; that means if the natural banks of the Drava are fixed with stones and its flow diverted by groins. If the riverbed is being straightened, narrowed and fixed, the flow velocity of the Drava increases. This leads to an increased removal of sediments from the river bed; the Drava goes into the depth instead into the width, which causes river bed erosion. As channelling on the Drava is going hand in hand with dredging of sediments from the river bed and natural banks, the deepening process is being accelerated.

Sediment extraction

Because of the negative consequences, sediment extraction from sources that are non-renewable is forbidden according to the Water Act in Croatia. The Drava sediments have to be considered non-renewable as long as a deficit of sediments is predominated. Therefore, sediment extraction on the Drava is illegal and should be banned. According to a meeting between the Croatian State Secretary for Water Management, Mr. Božo Galić and NGOs in Zagreb in August 2004, it was stated that no concessions will be given to commercial sediment extraction on the Drava and Mura Rivers in future. It was also said that sediment extraction is only accepted from renewable deposits for the purpose to maintain the regulated river course. Thus, as the Drava sediments have to be considered non-renewable, any extraction has to be banned. However, in reality it is continuing. It is one of the revenues of Croatian Waters as the extraction permissions are being sold out to contractors, which on the other hand are selling or using the sediments for other purposes (building, roads, enforcement of the dike system etc.).



Living Drava at Repaš
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**Beside water,
sediments is the key-
ecological factor for the
Drava ecosystem**

Plans by Croatian-Hungarian Water Management

The overall management goal of Croatian and Hungarian Water Management for the Drava is to establish and maintain a “river regulation corridor” with about 110 m width at Legrad. In the last 20 years huge quantities of sediment – officially about 5,000,000 m³ – have therefore been extracted and large river channelling schemes have been implemented. Recent plans by Croatian Waters even promote more sediment extraction and stronger channelling in the near future. Croatian Waters is indicating the extraction potential along the Drava in the period 2005-2009 of about 3,000,000 m³, equalling 300,000 trucks. At the same time more river training structures are planned or already under construction. This is specified by the annual maintenance plans of Croatian Waters, which determine the work on river regulation activities.

Ecological consequences

Further sediment extraction from the river bed and natural banks and river channelling is leading to increased river bed deepening and falling of the water table of the river. As the water table of the Drava corresponds with the adjacent groundwater table as well as numerous water bodies in the floodplain area, it is also decreasing.

- **Direct loss of valuable habitats:** The extraction of sediments and removal of natural banks causes a loss of one of the most valuable habitats of the river ecosystem: gravel and sand banks. For endangered species, as the populations of the Little and Common Tern on the Drava, the Little Ringed Plover or the Common Sandpiper, these habitats are crucial for their survival. Fixing of the river banks with stones causes a loss of important habitats for Sand Martin, Bee-eater and Kingfisher. Typical fish populations, e.g. Sterlet *Acipenser ruthenus*, Barbell *Barbus barbus* or Baltic vimba *Vimba vimba* which breed in shallow water zones on gravel and sand, are also affected negatively.

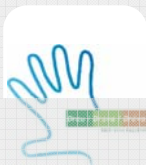
- **Drying out of wetland and forest areas:** Small floods are remaining in the main channel instead of inundating the floodplain area, which means “less water in the floodplain area”. Also in drier periods, as in the summer, the corresponding groundwater levels are very low. Both have considerable impacts on the forests and water bodies of the floodplain area. In the Repaš area, the 4000 ha oak forest – one of the ecological and economically most important forest areas along the Drava and which highly depends on the good groundwater conditions along the river – is drying out. The roots can't follow the falling groundwater table any more. This is also true for the entire floodplain area, as willow forests and wet meadows as well as side arms or oxbows generally become drier and disappear in the long-term. This has negative affects on the Hungarian Danube-Drava National Park and Natura 2000 sites on the Drava. Also drinking water wells in the adjacent communities and arable land is suffering from falling groundwater tables.



Sediment extraction and river straightening causes loss of valuable habitats, falling groundwater tables and drying out of floodplain forests.



Natural river bank at the Drava-Mura confluence
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