

# The Integrated River Engineering Project on the Danube East of Vienna

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The Danube River East of Vienna is affected by several severe, conflicting processes and influences. First, the river bed is degrading at a rate of 3-4 cm per year. Furthermore, the free flowing Danube section downstream of Vienna is part of a National Park, which in the long term is endangered by the lowering of the groundwater table in the Aue area. Sedimentation of side channels, which are remnants of the former huge braided system, leads to a lowering of habitat quality.

On the other hand the Danube is an international shipping way with high priority on the European Union level, where an adequate water depth at low flows is important. During an interdisciplinary discussion and planning phase a solution for reaching all three goals (stopping the river bed degradation, improving the ecological functionality and improving the quality of the shipping way) could be found. To stop the river bed degradation the so-called granulometric bed improvement was developed, whereby the enrichment of the river bed by larger grain sizes, which are already part of the river bed, reduces the transport capacity to about 10 % of the existing level. The removal of the bank protection at all inner bends, the allowance of side erosion and the reconnection of the former side channels lead to a significant improvement for the ecology. The modification of the existing groins and further measures leads to an improvement for the shipping.

In a first test reach of three kilometres the theoretically designed and in a physical model proved methods are tested in Nature by an interdisciplinary, comprehensive monitoring. The talk presents the designed, integrated measures and the monitoring program which includes the development of 3D numerical hydrodynamic and sediment transport models, innovative field measurements, biotic investigations and an integrated habitat modelling concept.