

1-D NUMERICAL SIMULATION OF THE WATER LEVEL OF A RIVER SECTION WITH RIPARIAN FOREST

K. Träbing (1), H. Yoshida (2), A. Dittrich (1)

(1) Institute of Water Resources Management, Hydraulic and Rural Engineering, University of Karlsruhe, Germany, (2) Department of Civil Engineering, The University of Tokushima

klaus.traebing@bau-verm.uni-karlsruhe.de / Fax: +49-721-606046

In the frame of the Integrated Rhine Programme retention basins of different types and size are planned. The aim of the measure south of Breisach consists in the creation of a retention volume of 25 Mio m³. It is realised by increasing the width of the River Rhine by about 90 m and by dredging the flood-plain up to 6 m. In the process of natural succession the dredged flood-plain will be covered by a riparian forest. A modified 1-d steady state numerical model was used and calibrated for different discharges in order to estimate the retention effect and flow resistance of the expected riparian forest. The calibration showed the water level is mainly dominated by the bed roughness and the chosen width of the main channel without vegetation at the present state. Furthermore, it was seen that the resistance due to vegetation calibrated at low and medium discharges overestimates the resistance at high discharges. This is due to the effect that e.g. willows are streamline shaped under high flow velocities and not rigid. The calibration also indicated that the expected riparian forest influences the water level to a high extent at the state of dredged flood-plains. The influence of the forest on the water level is in the same order of magnitude as the identified flood-plain areas without vegetation.