Driftwood retention with rope net constructions

Various flood events showed that the channel capacity of the river Enziwigger (canton Luzern) is too small (Fig.1). Therefore, a flood control concept was developed that involves a spillway tunnel, among other things. In order to prevent driftwood jams at the inlet of the spillway tunnel it is planned to retain the wood further upstream with two rope net constructions, which are spanned perpendicular to the direction of flow (Fig.2). A gap of 0.50 m height between the lower edge of the net and the river bed is left, in order to assure an unhindered passage of small floods without woody debris and bedload transport.

Experiments in a physical model were arranged to test the efficiency of the rope nets. These test demonstrated that the driftwood retention is not satisfactory. Already at the beginning of the floods hydrograph fine parts may be entrapped in the meshes of the net. This results in an afflux and consequently a great part of the wood is transported over the net top edge into the lower reach.

The tests and further calculations have shown that the specific discharge is too high for the considered boundary conditions. Following this, the driftwood retention should be performed with alternative solutions, such as other retention structures (for instance a V-rack).

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