



Sediment transport during flushing flows in the lower River Ebro

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This study describes the sediment transport which occurred during several flushing flows between 2002 and 2008 in the impounded lower River Ebro (Northeast Spain). The experimental releases were designed and undertaken to control the excess of aquatic vegetation and enhance sediment-related processes in the river channel downstream the lowermost dams in the basin. Macrophytes cause problems to water users, especially to the hydroelectric and the nuclear power plants located in the vicinity of the river. Sediment transport results from flushing flows are compared with those observed during natural floods. Observations show distinct patterns of sediment transport owing to the particular channel conditions (i.e. exhaustion of fine sediment and removal of the surface layer). Flushing flows depict notably higher suspended sediment concentrations in relation to natural floods. Bed load rates during flushing flows are typically low and, because the flood duration is short, no incision is observed in the river bed. In spite of that, large quantities of macrophytes were removed. The combination of hydraulic and sedimentary parameters during the designed floods maximizes the ecological and management benefits of the experimental releases without significant adverse geomorphological impacts on the river channel.