



Diversity of flow requirements on fish habitats and interaction with river morphology

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The water framework directive of the European Union aims a good ecological status of the surface waters in the member states until 2015. To achieve this good status a variety of restoration measures have to be done, because in most cases the physical conditions of river habitats to fulfill the good ecological status are not given anymore. Different to the parameters of water quality the morphological situations are limiting the successful stocking of autochton fish. Fish need different habitat patterns with different morphological characteristics in their lifetime. An interdisciplinary team of hydraulic engineers and biologists did a lot of research at different river types over the past. The investigations showed a strong influence of morphodynamic processes on the abiotic habitat parameters of fish. In some cases the numerically modelled habitat change could be validated by electro – fishing. One main point of the studies was the investigation of the morphological development of river restorations which were realized during flood protection measures. The results showed that a lot of measures improve the habitat conditions only at low- and mean flow situations. At higher discharges until bankfull the physical conditions and velocities are often equal to the regulated river bed and not comparable with the historical “Leitbild” situation. The main endangered life stages of fish are the spawning grounds and the juveniles which need a complex velocity pattern in a river. Morphodynamic processes like deposition and erosion of materials influence that important habitat parameter directly. To forecast the morphological development and the trend of aquatic habitats in future the river continuum and the investigation of larger scales are important. It was found that only long term river monitoring can allow an evaluation of the effects of restoration measures for aquatic ecology.