



Sediment management concept at the Strobl Weißenbach

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Sediment balance and dynamics are crucial for the ecological and morphological state of running waters. Alpine rivers provide the link between sediment production in the mountainous regions and the need for sediment of downstream rivers. Protective hydraulic engineering measures like e.g. bedload retention dams may cause a total interruption in sediment continuity or at least retard sediment availability. As a consequence, sediment deficit in downstream areas, reduces the potential for morphodynamic processes, leads to river bed incision, and decreases the availability of spawning habitats in gravel. Therefore sediment continuity is becoming increasingly important in water management and hydraulic engineering projects.

Due to hazard mitigation, two slit dams were constructed at the Strobl Weißenbach, an Alpine river in the Northern Limestone Alps of Austria in the seventies of the last century. Frequent clogging of the structure by woody debris annually leads to retention of huge amounts of limestone gravel. Besides the downstream sediment deficit, this results in high costs for restoring the protective effect of the structure (e.g. costs for excavation, hauling or landfilling fees).

The goal of the presented study was to identify the most effective approach concerning the emptying of the structure considering both, downstream river ecology and morphology. Therefore, an extensive pre- and post-monitoring program was conducted at the study site focusing on water level, sediment transport (PIT tag tracer, suspended sediment probes), changes in biotic data (fishing data, mapping of spawning grounds), and stream morphology (bathymetry, weighted usable area for biota). Based on these findings, an integrative novel sediment management concept for alpine headwater rivers was developed, also taking the effects of sediment transport to lower reaches, the fisheries and certain aspects of flood protection into account.