

EGU2020-22184

<https://doi.org/10.5194/egusphere-egu2020-22184>

EGU General Assembly 2020

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## Linking changing grain size distributions with the development of shelter availability for fish in the bypass reach of a hydro power plant

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Nowadays, the aquatic biodiversity is highly under pressure due to anthropogenic changes of rivers such hydraulic structures changing the diversity of flow and aquatic fauna as well as sediment continuity. This can have severe consequences on the fish population in the river reach. Fish are strongly depending on a certain substrate composition throughout all their life stages. Juveniles e.g. are depending on a certain availability of shelter in the substrate in order to survive this stage. Therefore we investigate the effects of changes in the sediment composition at a Hydropower plant in Switzerland on the availability of potential shelter for juvenile fish. The investigation is conducted as part of the EU Horizon 2020 funded project FIThydro (funded under 727830).

To reach this goal, we measured the sediment compositions at several locations in the bypass reach with different measurement techniques such as sieving, photogrammetry (Basegrain) and the pebble count method. Further we measured the shelter availability in the corresponding locations, using the so called Finstad method. As the method was developed purely for Atlantic salmon, we modified it by expanded the variability of available sizes. The resulting correlation of the grain size distribution with the potential shelter availability at different locations showed a fairly high correlation coefficient. This equation can then be used in hydro-morphological models to estimate the spatial distribution of potential shelter availability for any given flow regime and grain size distribution. Further investigation at other sites will over time enlarge the database and therefore improve the correlation.