

# Vegetation dynamics in a regulated gravel bed river

Riparian vegetation is an essential component of river corridors providing numerous ecosystem services. Periodic inundations of floodplain areas are essential for plant communities to maintain a good ecological status. However, climate change and human activities, in particular hydropower operations, heavily impacted the flow regime causing a rapid change in vegetation cover in many rivers across Europe. Previous studies highlighted that hydropeaking and residual flow levels could have had a significant role on such process.

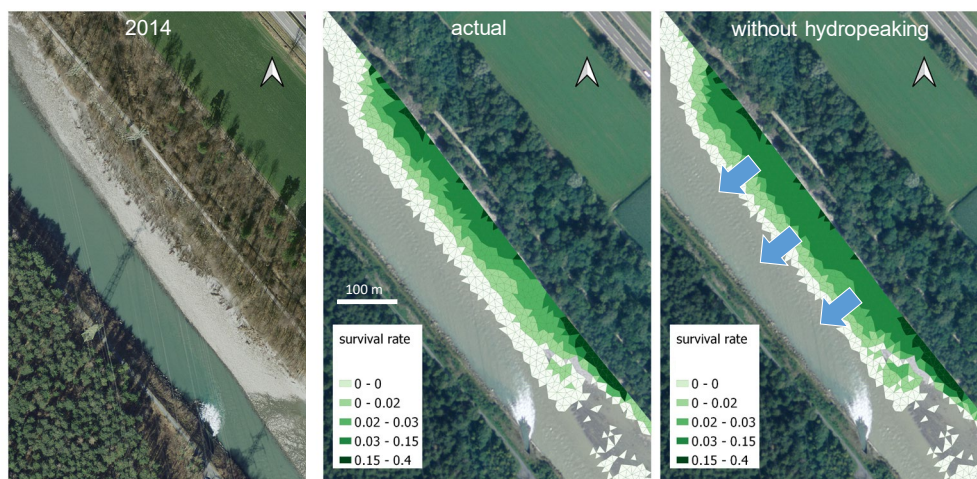


Fig. 1: Comparison between vegetation cover in a gravel bar of the Alpine Rhine river (left) and model results showing vegetation survival rate with (centre) and without (right) hydropeaking

The scope of this project is quantifying the evolution of the vegetation cover of a reach of the Alpine Rhine characterized by alternate bars (Fig. 1) to understand the main components of the flow regime affecting it. For this purpose, a simple vegetation recruitment model will be applied in different hydrological scenarios (e.g. with and without hydropeaking) and results compared with field data. The model is based on the output of an already available hydrodynamic model in BASEMENT for the study reach. The expected outcome of the thesis will greatly help designing mitigation measures for preserving riparian habitat for several plant species.

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**Remarks:** Research-oriented thesis. Prior attendance of River Morphodynamic Modelling course is preferred. 1 student for Master or 2 students for Project thesis.