

“Fish cannons” – novel approaches to transport fish over dams

Fish move up - and downstream within river systems to find suitable habitat or to migrate to their spawning grounds. Providing solutions for safe and efficient up- and downstream passage is crucial to improve the longitudinal connectivity within rivers and support native fish stocks. The Swiss Waters Protection Act requires longitudinal connectivity to be reestablished in Swiss rivers by 2030 rendering this a highly relevant topic for both research and engineering companies.

A novel approach to fish passage is the use of siphons and tubes to transport fish over dams (Fig. 1). Similar approaches have been developed in Finland, the US and Australia (Fishheart, Whoosh, UNSW Tube Fishway, respectively).



Fig. 1: Whoosh “fish cannon” (Source: news.wsu.edu)

The goal of this Bachelor's thesis is to identify key differences and similarities of these systems and to give recommendations in which situations one or several of them can be a good solution to improve up and/or downstream passage efficiencies. A particular focus should be on the transferability of published results to Swiss riverine species and attractiveness of the entrance. The student will provide a comparison of the novel siphon systems to existing up – and downstream fish passage solutions and specify possible advantages or disadvantages. The student will collect and analyze existing publications, talk to the suppliers and ideally visit a pilot site in Switzerland or Germany (if any). This Bachelor's thesis provides an opportunity to dive into a highly relevant topic and gain knowledge which is currently highly sought after by engineering companies.

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Remarks:

Communication and report may also be possible in German (depending on supervisor);
Group work possible; topic can be distributed more than once