Foto: Anna-Lena Holm

Do round gobies overcome strong currents in fish passes? -Application of 3D-printed fish

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Introduction

- River restoration and system connectivity become relevant to support system stability, biodiversity and to reduce flood effects.
- Border passage in riverine systems of economically relevant fish (e.g. salmonids) is well investigated.
- Less is known about how benthic fishes can stay, survive, and disperse in waters with strong currents.

Questions

- How can benthic species stay, survive, and disperse in habitats with strong currents?
- What is the physical effect of flow on fish?
- How does the physical effect of flow depend on the ground structure?
- Can artificial 3D-models reveal insights that cannot be offered by living individuals?

Aims

- Understanding of how benthic species resist currents.
- Insights for design of species-selective fish passes.
- Development of an experimental setup to determine the physical impact of flow on the fish.
- Reduction of animal experiments by application of 3D-print-technology in ecology.

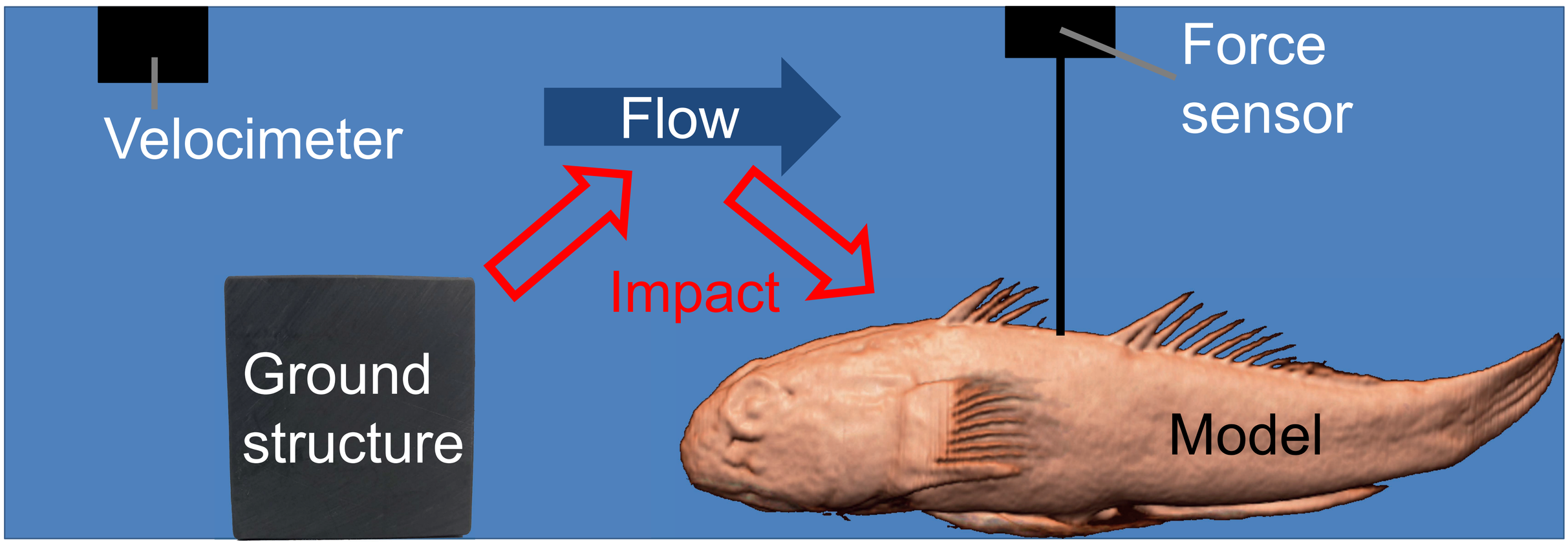

Figure 1: Experimental setup in the flow channel. Forces acting on the 3D-fish-model will be measured (force sensor) at specific velocities (velocimeter) to determine the impact of the ground structure on the fish body.

Material and Methods

- Measurement of forces (impact) acting on the fish while variation of ground structure, flow velocity and 3D-fish-model (Fig. 1).
- Determination of relations between measured flow and acting forces.
- Description of ground characteristics supporting the occurrance of specific species (e.g round goby, gudgeon, bullhead) and life stages.
- Verification of those insights in the field (Fig. 2).
- Testing of relevance of insights on living fish.
- Integration of insights in modern fishpass design.

QR-code

This pattern can be scanned by several smart phone applications. It encodes a web adress, where you can find the 3D-model of this poster (Fig. 1). You can rotate the model for 360° in each direction for individual view.

Figure 2: Areas with reduced flow behind barriers (e.g. rocks) might be important for benthic fishes to stay in habitats with strong currents.

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