

Trout on the move: Open vs. Closed vertical slot fishways

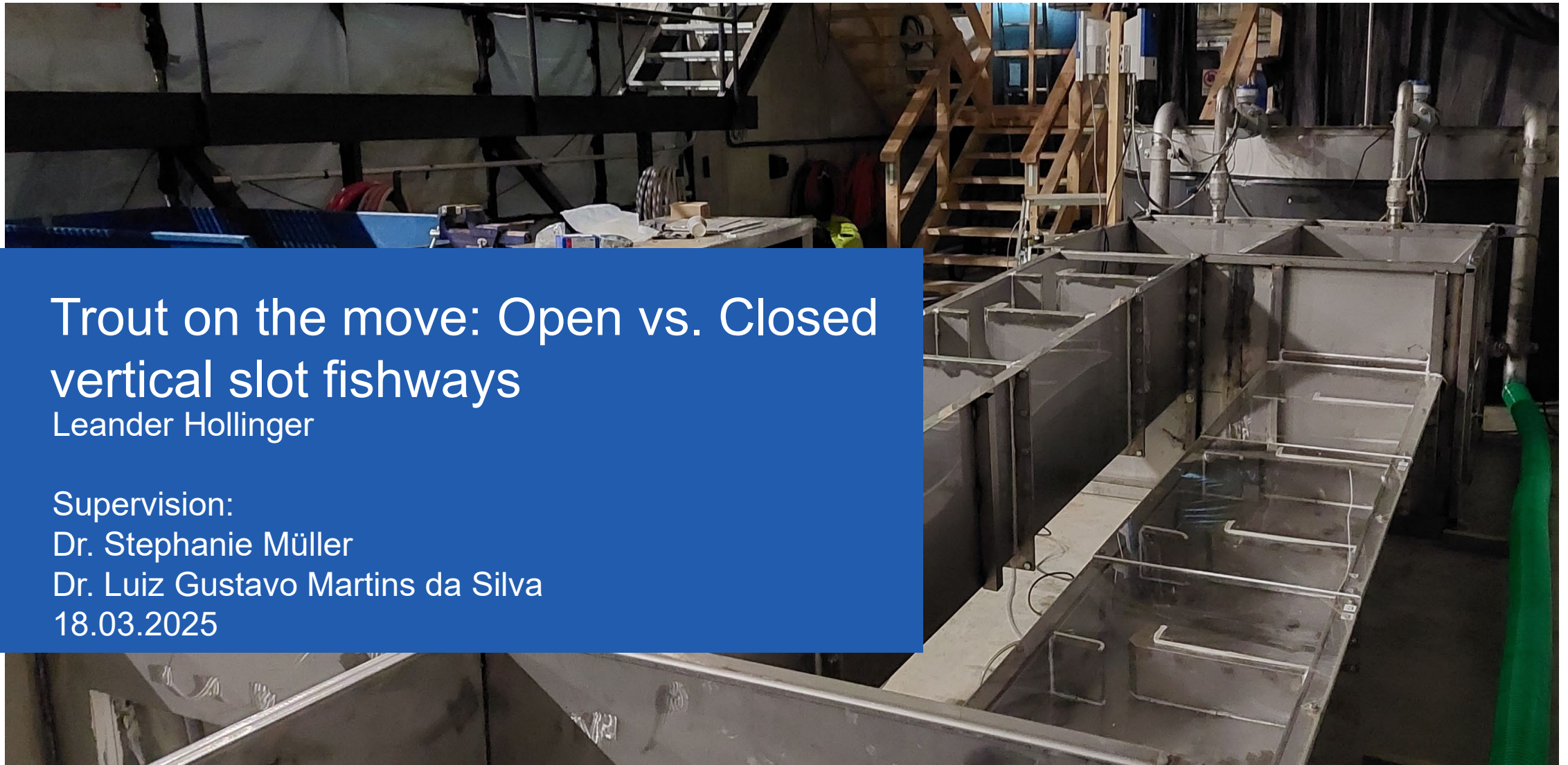
Leander Hollinger

Supervision:

Dr. Stephanie Müller

Dr. Luiz Gustavo Martins da Silva

18.03.2025



Context

- European Water Framework directive → good ecological status
- Sweden: Review process for hydropower plants (NAP)
 - Natural and technical fish passage solutions

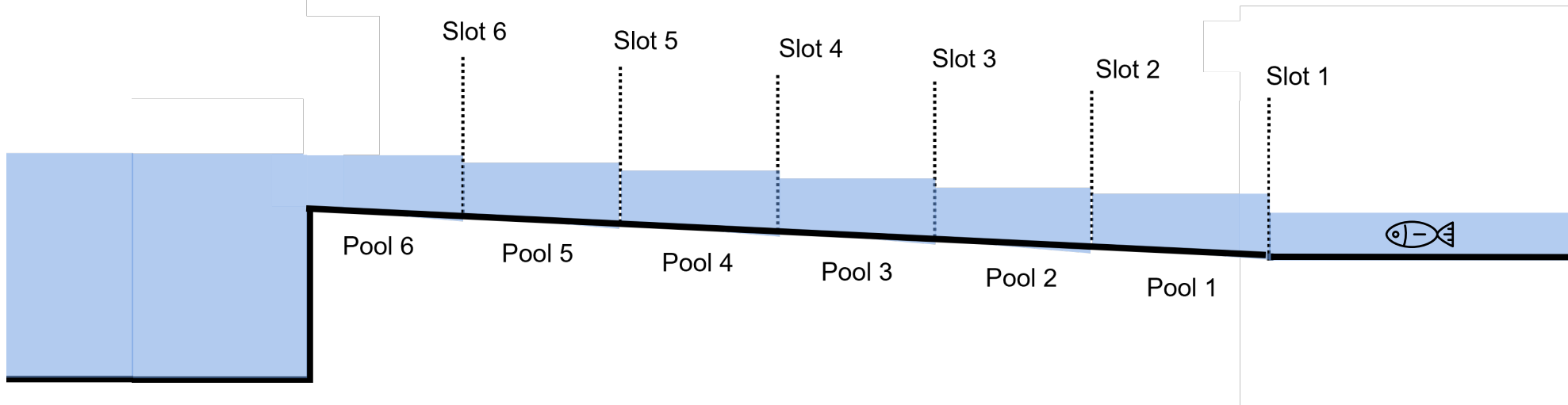


natural channels (Maine)



vertical slot fishway (Brazil)

Vertical Slot Fishway



Side view of a typical VS fishway

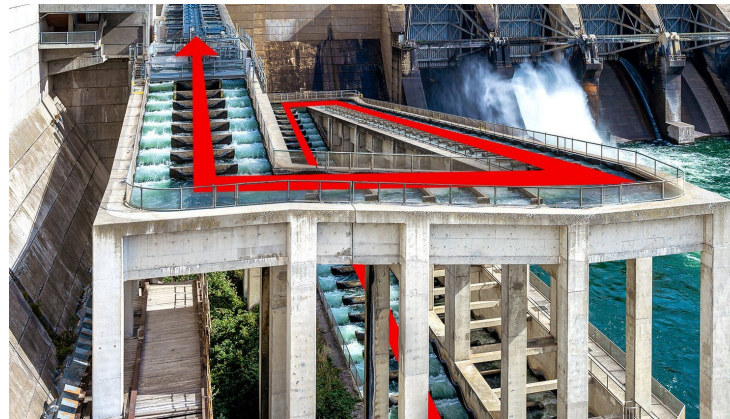
Challenges

Slope is limited

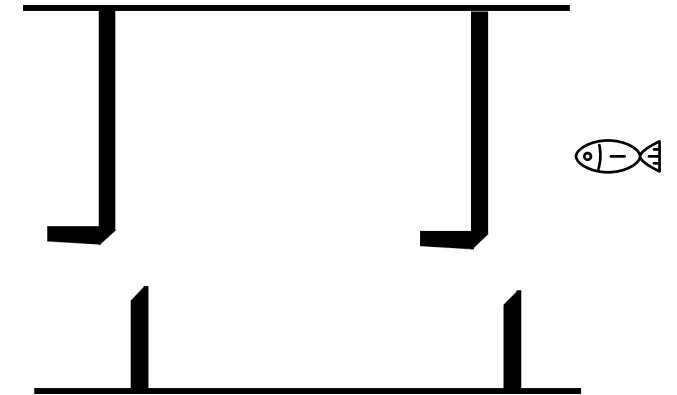
- large constructions

Water level fluctuation

- non-uniform flow structures



Large construction of a fishway (Oregon)



Plane view of a typical VS fishway

How can we ease those constraints?

Experimental setup



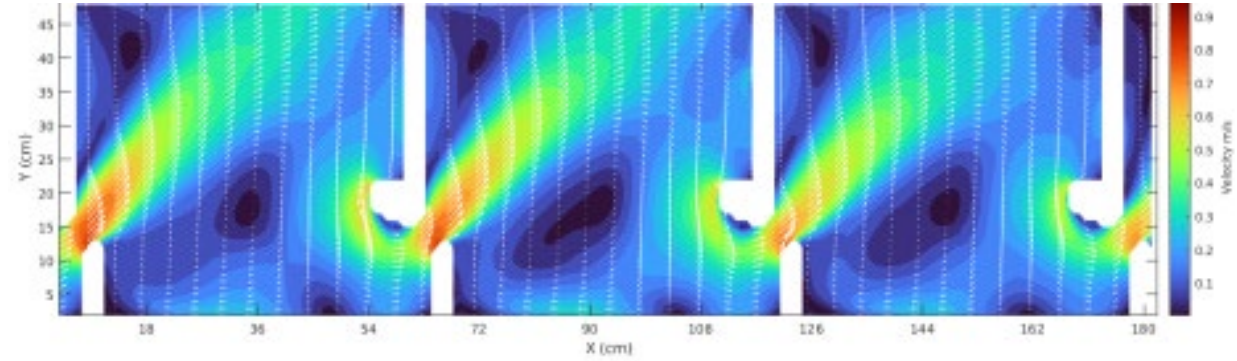
Open fishway



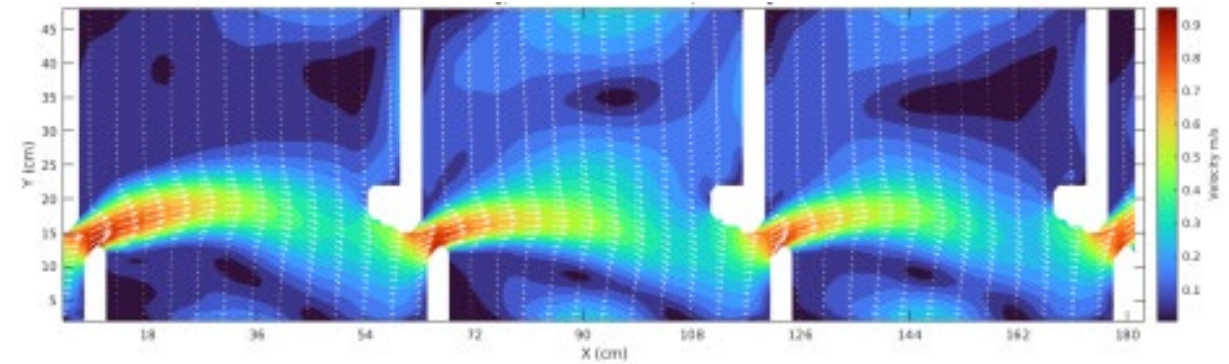
Closed fishway

Numerical Hydraulic model

open



closed



CFD modelled velocity in the fishways (Hedlund, 2025)

Fish experiment

Closed fishway pool 3&4



Open fishway pool 3&4



Acceptance of fishway

- Passage / Attempts / Time

Outlook

- Relate suitability to hydraulic parameters
- Propose design for further test procedures

Work in progress...