ATTRACTING SILVER PERCH INTO A TUBE FISHWAY: PRELIMINARY RESULTS

Maryam Farzadkhoo YP[1]*, Stefan Felder[1], Iain M Suthers[2], William L Peirson[1], Richard T Kingsford[2] & John H Harris[2]

[1]*Water Research Laboratory, UNSW Sydney, Australia;* [2]*Centre for Ecosystem Science, UNSW Sydney, Australia*

*Correspondence YP: maryam.farzadkhho@unsw.edu.au

Abstract The UNSW tube fishway has been developed recently. A detailed understanding of methods for fish attraction into a tube is essential for the operation of the tube fishway. Herein, systematic fish attraction experiments were conducted to find suitable fish attraction conditions for silver perch (Bidyanus bidyanus), an Australian native fish species. Groups of five naïve silver perch were attracted into the tube irrespective of the attraction flow velocities, with the highest entry rate for velocities of 0.15 to 0.4 m/s. Streamlining of the entry geometry increased the entry rate and reduced the first entry time. The preliminary results show that hatchery-bred juvenile silver perch can be attracted reliably into a closed conduit, paving the way for field deployment of the UNSW tube fishway.

Keywords: attraction velocity, fishway entrance, fish attraction, silver perch, tube fishway.

Methods

- Attraction velocities: V = 0, 0.15, 0.4 & 0.5 m/s
- Additional configuration with streamlined entrance for V = 0.15 m/s
- Water depth: 80% of the attraction tube diameter of Ø = 0.4 m
- Slotted entrance opening: 0.03 m
- Experimental duration: 1-hour acclimation time, 1-hour main test
- 5 juvenile silver perch per experiment
- Number of repetition: 3 to 4

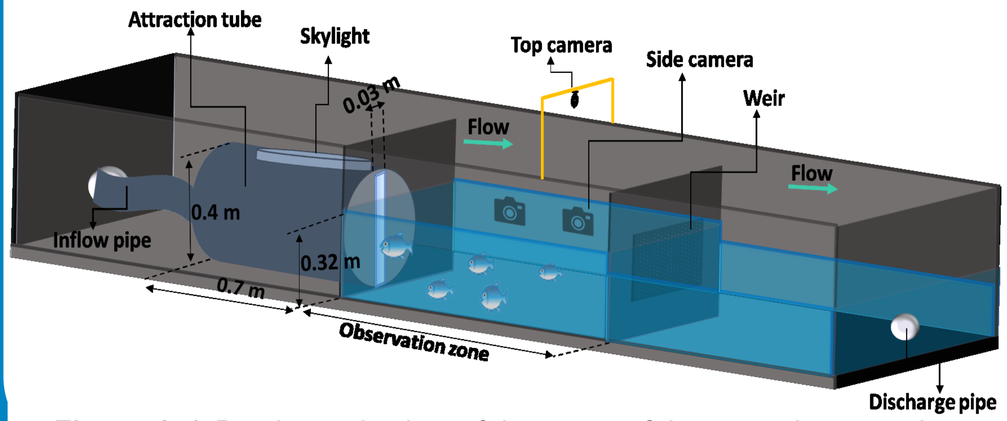

Figure 1. 3-D schematic view of the setup of the attraction experiments

Results

- Fish were successfully attracted into the tube for all flow conditions with best fish attraction performance for V = 0.15 m/s
- Fish tended to stay inside the tube for longer duration as the velocity was reduced
- Streamlining the entry further improved the first entry time, reducing by up to 28%
- Fish entry rate reduced with increasing attraction flow velocity

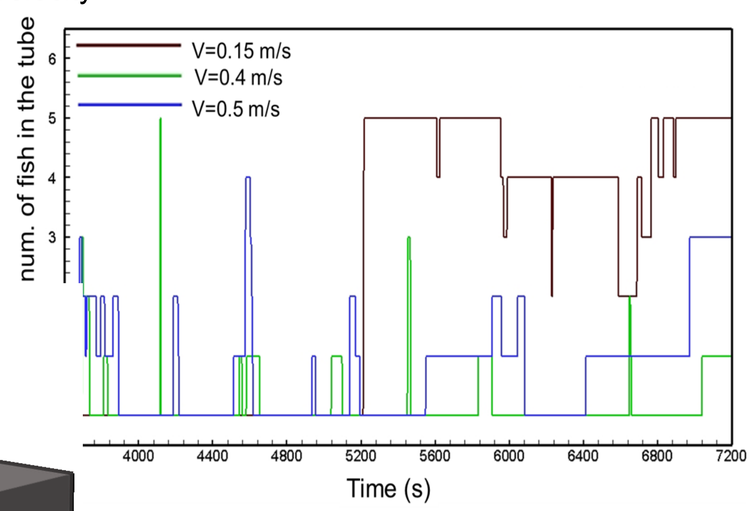

Figure 2. Accumulative number of fish in the tube for attraction velocities of 0.15, 0.4 and 0.5 m/s

Table 1: Entry rate versus different flow conditions

Velocity (m/s)	Average entry rate (%)	Standard deviation
0	0	0
0.15	90	10
0.15-streamlined entry	100	0
0.4	70	30
0.5	70	10

Conclusions

- Fish can be attracted into a closed conduit
- Research is ongoing involving repeated experiments with naïve fish of different sizes and different attraction tube diameters to test the scalability of the tube fishway.
- In parallel, prototype employment of the tube fishway is in preparation

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