

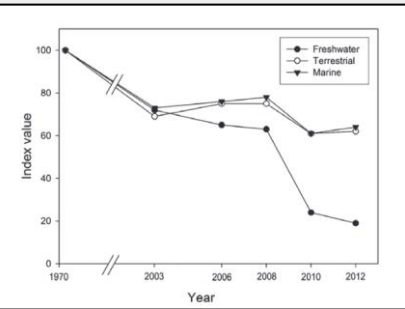
Biodiversity Safeguard in River Systems

Fabio Tarena*, Claudio Comoglio, Alessandro Candiotto, Costantino Manes, Daniel Nyqvist

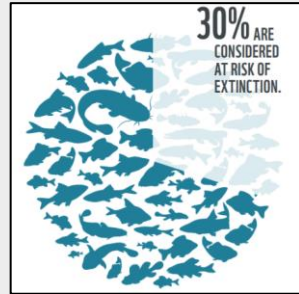
Politecnico di Torino

Dipartimento di Ingegneria dell'Ambiente, del Territorio e delle Infrastrutture (DIATI)

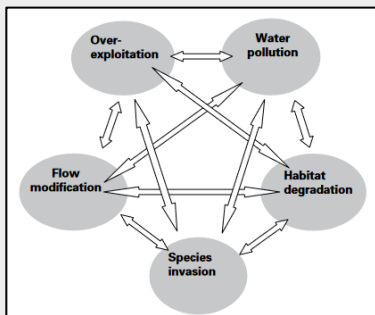
FRESHWATER BIODIVERSITY CONTEXT



Reid et al. (2019)



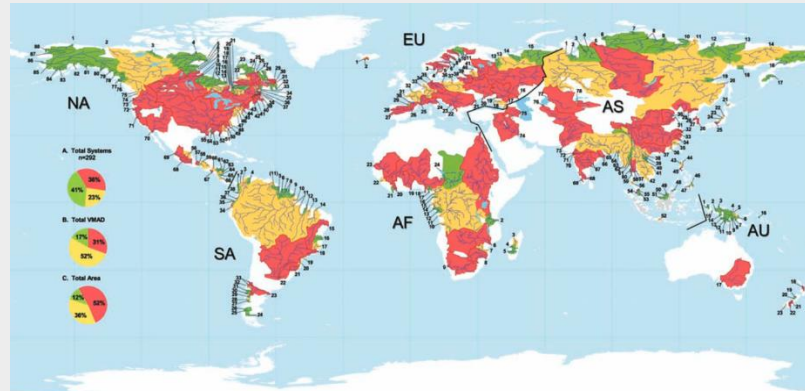
WWF (2018)



Dudgeon et al. (2005)



RIVER CONNECTIVITY PROBLEM!



Nilsson et al. (2005)

ISSUES

- DAMS AND IMPOUNDMENTS
- MANY ENDANGERED SPECIES
- UNSUITABLE HYDRODYNAMICS OF FISHWAYS
- BIOLOGY KNOWLEDGE GAP

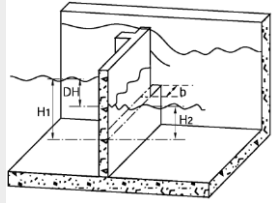
OBJECTIVES

- FISHWAY HYDRODYNAMICS (CFD + FLUME)
- EFFECTS OF DIFFERENT ENVIRONMENTAL STIMULI ON FISH BEHAVIOUR
- OPTIMIZATION OF FISH PASSAGE PERFORMANCE

PHD ACTIVITY

FLUME EXPERIMENT → Artificial light at night affects fish passage rates in two small sized cyprinids.

HYDRODYNAMICS



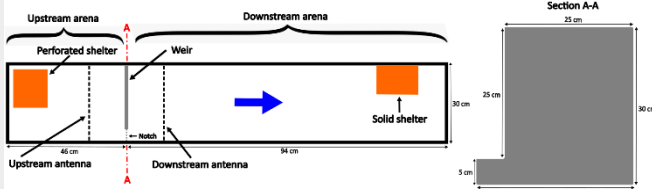
Larnier (2001)

ARTIFICIAL LIGHT



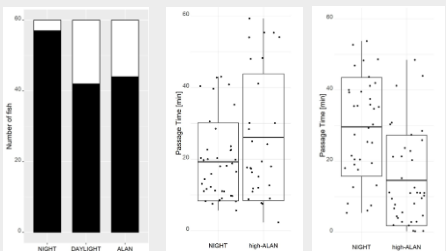
EXPERIMENTAL SETUP

(a)



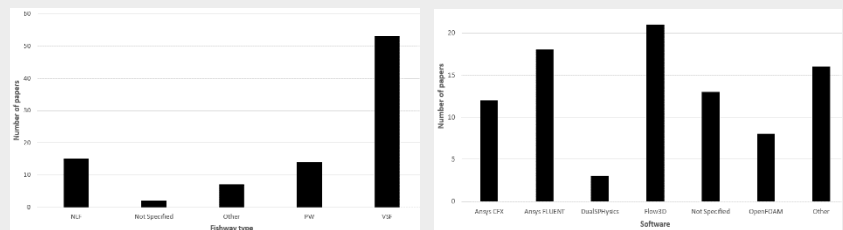
(b)

SOME RESULTS



LITERATURE REVIEW → Numerical modeling (CFD) for fishways. What has been done in the last 20 years?

SOME RESULTS



RESEARCH PERIOD IN SWEDEN (KAU) → Field activities and numerical modelling. New techniques for both upstream and downstream fish migration.

