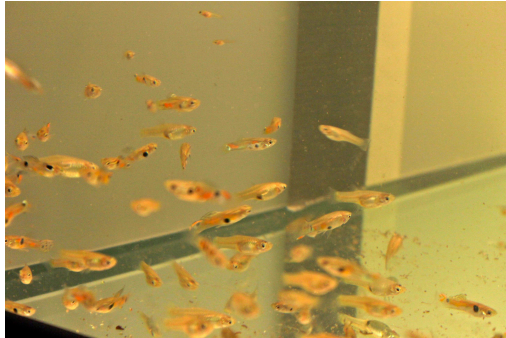


Can fishing affect fish cognition?

We want to know whether selective fishing affects the cognitive ability of fish. Have fishes adapted to high fishing mortality (i.e., maturing early and with higher fecundity) worse cognitive abilities?



Background

The environment where a fish lives shapes its brain, cognition and behavioural phenotype. Thus, fish reared in different environments can develop different coping styles. Bigger brains present a selective advantage, as it is associated with cognitive ability and an individual can adapt to novel environments. However, brain size is limited by a trade-off in energy allocation between the brain and other traits, such as gut size, fecundity, growth, etc.

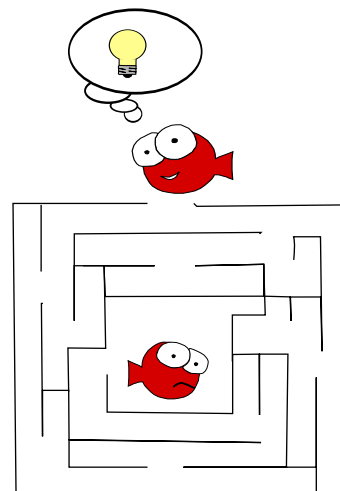
Fishing pressure affects fecundity and growth of the individuals; we thus expect that it would also affect brain size and cognitive ability.

In connection with our project on experimental evolution in guppies (read more <http://www.uib.no/en/rg/evofish/53201/experimental-evolution-guppies> and <http://www.uib.no/persons/Beatriz.Diaz-Pauli#prosjekt>), we want to assess how size-selective fishing can affect guppy cognitive ability and brain size.

Objective: Do guppies that experienced different size-selective mortality have different cognitive ability?

Hypothesis: Removal of large individuals in a population leads to slower growth and higher fecundity, while removal of large individuals leads to faster growth and lower fecundity. Higher fecundity has been associated with smaller brains and lower cognitive ability.

Methods: Male and female guppies will be tested for spatial and numerical learning ability.



Supervision: Beatriz Diaz Pauli and Mikko Heino

Further reading:

Ebbesson, L.O.E. & Braithwaite, V.A. 2012. Environmental effects on fish neural plasticity and cognition. *Journal of Fish Biology* **81**: 2151–2174.

Kotrschal, A., Rogell, B., Bundsen, A., Svensson, B., Zajitschek, S., Brännström, I., *et al.* 2013. Artificial Selection on Relative Brain Size in the Guppy Reveals Costs and Benefits of Evolving a Larger Brain. *Current Biology* **23**: 168–171.

Heino, M., and Godø, O. R. 2002. Fisheries-induced selection pressures in the context of sustainable fisheries. *Bulletin of Marine Science*, 70: 639-656.