

**Department of Aquatic Resources**

Institute of Freshwater Research

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**Do we really need all the measurements on eel to determine maturity?**

*Master project in biology, SLU Aqua, 30-60 hp*

**Background**

The mythical European eel has experienced severe decline in population size over the past decades. The distribution range extends over most of Europe, as well as the Mediterranean coasts and parts of the Asian and African continents. When the eel hatches, the larva is transparent and flat, and when the fry reach the coasts of Europe they are still transparent and called glass eels. During the growth stage in fresh- and brackish water, the eel gets pigmented and is called yellow eel. When the eel is fully grown and begins its migration towards the Sargasso Sea, it is called silver eel. The adult eel has now become physically adapted to the spawning migration that takes place at great depths.

To monitor the eel stock, data is collected on a number of variables, such as landings, but also on individual length and age. Maturation stage is also determined, that is, if the yellow eel has started its sexual maturation to become a silver eel. To determine maturation, length and weight is measured, but we also measure the eyes and the pectoral fins, as these change and adapt in time for the spawning migration.

**Question**

This type of data collection is time consuming and therefore costly. Hence, it is important that it is efficient. The question is whether eel maturity stage can be determined based on fewer measurements? If so, this part of the data collection can be made more efficient!

At present, the eel's left and right eyes are measured both vertically and horizontally, and we measure the length of the left and right pectoral fin. These measurements are used to calculate Durif's index - a measure of maturity stage, as well as the Pankhurst eye index. The student's task will be to analyse existing data to determine if all measures are needed, or if maturity stage can be obtained through fewer measurements. Depending on the length of the master project, photographs on the eyes can be analysed to examine differences in measurement error between measurements from photographs and traditional measurements done directly on the eel.

The work will take place at the Institute of Freshwater Research, Drottningholm, under supervision of Dr Josefin Sundin and Dr Håkan Wickström. The student should have an interest in data analysis, statistics and scientific writing. The work can commence in 2020.

