

## Optical fish identification to refine ecological studies and support fish welfare

### Background

Identification of animals is essential in many scientific approaches. Marking techniques are diverse and commonly include physical impairment in the living individual (e.g. tagging, tattooing,...). Especially fin clipping as marking technique for fish has been prohibited to avoid suffering of the animals. However, in ecological studies (e.g. recapture studies), low impact approaches are needed to maintain the fish behaviour as unaffected as possible. Our species of interest, the invasive round goby, provides characteristic colour patterns.

#### **Can individuals of the invasive round goby be reliably identified based on their coloration patterns?**

Pictures of the round goby (*Neogobius melanostomus*) and two comparison species, gudgeon (*Gobio gobio*) and bullhead (*Cottus gobio*) will be used to perform a first assessment of the coloration and potential identification. Furthermore, the stability of color patterns of living individuals will be assessed over time to describe the reliability of this technique.

#### **Knowledge gap**

Low impact fish identification is essential in ecological studies and for welfare in fish. Individual color patterns are promising, but have been less performed for fish and are not present for the invasive round goby.

### Why we want you

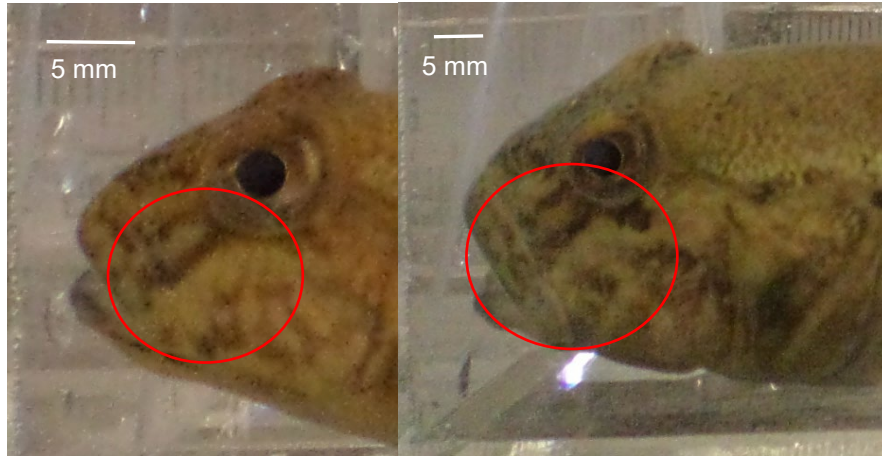
This project will improve the performance of ecological studies and support welfare of fish. We are looking for a highly motivated student with technical understanding and the willingness to share his/her findings with the scientific community by publication.

### Research questions for the master thesis

- 1. Can individuals of the round goby, gudgeon and bullhead be identified based on their coloration?
- 2. Are the color patterns stable over time?

Depending on expertise and interests, the master student can develop and use different methods to assess these questions, for example:

- Modern photographing techniques
- Data processing



**Fig. 1: Two different round gobies with characteristic color patterns (red circles).**

## Supervision

The project is embedded in a larger project funded by the BAFU and the cantonal authorities. It aims at contributing the scientific background for the development of measures preventing further spread of the invasive gobies. The student will be part of a project team, the “goby team” composed of 5-7 students, PhD candidates, postdocs and the project leader Prof. Dr. Patricia Holm. Hypothesis and methodological approaches will be developed together. Supervision will also include the participation in regular group meetings.

## Requirements

We welcome candidates who bring enthusiasm for a topical research project on animal welfare. Experiences in working with fish (on a scientific or private basis) and technical understanding is beneficial.

You should have a background in natural science and we expect independent study of international literature.

## Contacts

Please send your application to

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For any questions also feel free to contact

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