Title: Functional diversity of freshwater fish in Estonia: patterns, determinants and influence of human activities.

PhD Supervisor: Dr. Aurele Toussaint

Duration: 4 years

Context: The sixth biodiversity crisis induced by human activities has dramatic consequences on local communities by affecting the number of species but also their identity (Diaz et al. 2019). Freshwater fish is the most diverse group of vertebrates on Earth but also the most threatened by human activities. A large majority of the freshwater fish river across the world has experienced the introduction of non-native species and extinction of native species (Arthington et al. 2016). Coupled to climate change, the change in species composition can affect ecosystem functioning. Estonian waters are home to about 75 species of fish, most of whom are freshwater fish, semidiadromous or diadromous fish. Among them a large proportion are non-native as it is the case for European rivers. However, few studies have measured the consequences of change in both climate and species composition.

Objectives: Within this project, we will advance in characterizing the biodiversity of Estonian freshwater fish fauna from taxonomic and functional point of view, as well as quantify the effect of human activities, through species introduction and extinction and climate change.

The project has 3 main objectives: O1) to study the current patterns of Estonian freshwater fish communities from a taxonomic and functional point of view, O2) to quantify the change in taxonomic and functional diversity induced by either introduction and extirpation and/or climate change, and O3) to develop an index based on taxonomic and functional diversity of freshwater fish species of Estonian communities.

Profile of the candidate: The project mix fish sampling during fieldwork and data analyses. The candidate will be able to make fieldwork in Estonia's rivers/lakes and coastal sites during spring and summer. Statistical knowledge (R programing) and knowing fish species would be appreciated.

Collaborations. The candidate will collaborate with the Estonian of Marine Institute for the fieldwork campaign and with researchers of the Department of botany for expertise in functional diversity (Dr. Carlos Carmona). Through the PhD supervisor, international collaborations can be developed with Pr. Sebastien Brosse (Toulouse, France).

Location. The candidate will be in Tartu, Estonia within the Macroecology workgroup and will benefit from all needed facilities (office space, computers, experimental sites).

Publications. A minimum of three publications are expected.

Annual planning