



Conference Abstract

# Alpine freshwater fish biodiversity assessment: an intercalibration test for metabarcoding method set up

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## Abstract

Environmental DNA (eDNA) based methods (Fig. 1) are proving to be a promising tool for freshwater fish biodiversity assessment in Europe within the Water Framework Directive (WFD, 2000/60/EC) especially for large rivers and lakes where current fish monitoring techniques have known shortcomings. Freshwater fish are actively involved in aquatic ecosystems functioning and diversity, contributing to the health, well-being and economy in every geographic realm. Unfortunately, many freshwater fish are experiencing critical population decline with risk of local or global extinction because of intense anthropogenic pressure. Within the EU project Eco-AlpsWater, advanced high throughput sequencing (HTS) techniques are used to improve the traditional WFD monitoring approaches by using environmental DNA (eDNA) collected in Alpine waterbodies. To evaluate the performance

of the metabarcoding approach specifically designed to measure freshwater fish biodiversity in Alpine lakes and rivers, an intercalibration test was performed. This exercise forecasted the use of mock samples containing either tissue-extracted DNA of different target species or water collected from aquaculture tanks to mimic real environmental water sampling and processing. Moreover, three water samples collected in Lake Bourget (France) were used to compare the efficiency of taxonomic assignments in natural and mock community samples. Our results highlighted a good efficiency of the molecular laboratory protocols for HTS and a good amplification success of the selected primers, providing essential information concerning the taxonomic resolution of the 12S mitochondrial marker. As further confirmation, different concentration of species DNA in the mock samples were well represented by the relative read abundance. This preliminary test confirmed the applicability of eDNA metabarcoding analyses for the biomonitoring of freshwater fish inhabiting Alpine and perialpine lakes and rivers.

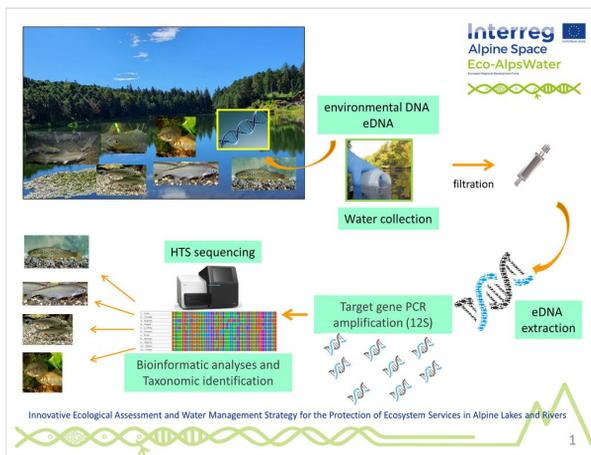


Figure 1. [doi](#)  
eDNA concept framework

## Keywords

environmental DNA, fish biodiversity, metabarcoding, Alpine space, Alpine lakes and rivers

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