Module Name
Food Webs and Invasion Biology of Freshwater Fish

Type of Module	**Module Code**
o Advanced Module	Ecology of Freshwater Fish

Identification Number	**Workload**	**Credit Points**	**Term**	**Offered Every**	**Start**	**Duration**
MN-B-SM (E 2)	360 h	12 CP	2nd term of studying	Summer term, 1st half	Summer term only	7 weeks

1	**Course Types**	**Contact Time**	**Private Study**
	a) Lectures	21 h	42 h
	b) Practical/Lab	155 h	113 h
	c) Seminar	5 h	24 h

2 Module Objectives and Skills to be Acquired

Students who successfully completed this module

- have acquired detailed knowledge regarding the food web ecology of freshwater ecosystems, including freshwater fish, macrofauna and zooplankton in the Rhine river with special emphasis on invasive species. Students will learn about fishing methods, spatial and temporal aspects of population dynamics in relation to their ecological community as well as biodiversity assessment with a focus on the trophic spectrum of fish, molecular methods to prepare, sequence and analyze metabarcoding data.
- are able to use a variety of different fishing and sampling methods that are needed as baseline in projecting different kind of studies in the field of ecology.
- can independently carry out small scientific projects related to the topic of the module.
- have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level.
- are able to transfer skills acquired in this module to other fields of biology.

3 Module Content

- Ecology of freshwater fish, macrofauna and zooplankton (esp. spatial and temporal aspects of ecology; incl. excursions)
- Invasion biology of the Rhine river
- Variety of fishing and biodiversity assessment methods
- Methods for field experiments including on-site and real-time DNA metabarcoding (Nanopore sequencing)
- Food web analysis, morphometrics and anatomy of fish
- Accomplishment and analysis of field data, species diversity and abundance data, molecular metabarcoding data

4 Teaching Methods

- Lectures; Practical/Lab; Seminar; Field excursions; Guidance to independent research; Training on presentation techniques in oral and written form

5	**Prerequisites (for the Module)** Enrollment in the Master's of Science degree course "Ecology, Evolution and Environment"; Completion of the basic modules Lecture, Tutorial and Seminar of the Master's of Science degree course "Ecology, Evolution and Environment"
6	**Type of Examination** The final examination consists of two parts: One hour written examination about topics of the lectures and the practical/lab part (50 % of the total module mark), oral presentation (20-30 min; 50 % of the total module mark)
7	**Credits Awarded** Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	**Compatibility with other Curricula** None
9	**Proportion of Final Grade** 12.0 %
10	**Module Coordinator** Prof. Dr. Ann-Marie Waldvogel, phone 470 5294, e-mail: a.waldvogel@uni-koeln.de
11	**Further Information** **Participating faculty:** Prof. Dr. A.-M. Waldvogel, Dr. Kristin Scharnweber, Dr. A. Schönle **Literature:** Information on recommended textbooks and other reading material will be given in the ILIAS repository of the course (see https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html) **General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical/lab and preparation for the seminar talk (topic and date will be arranged individually); Location either at the Ecological Research Station Rees, Dores-Albrecht-Str., 46459 Rees-Bienen or in Cologne at the Biocenter. Preparation for the written examination **Note:** The module contains hands-on laboratory and field work, is conducted in small groups. Students will spend most of the time in the field and gain experience in collecting and analyzing field data. **Introduction to the module:** 27.05.2024, 10 am, Biocenter -1.004 **Written examination:** July, 19, 2024, second/supplementary examination August 30, 2024; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.