Module name: Restoration Ecology

Identification number	Workload	Credits	Term of studying*	Frequency of occurrence	Duration**
MN-B-E 3	360 h	12	1st or 2nd term of studying	Summer term, 1st half	7 weeks

1	Type of lessons	Contact times***	Self-study times	Intended group size
	a) **Lectures** (L) b) **Practical/Lab** (P) c) **Seminar** (S)	a) 21 h b) 155 h c) 5 h	179 h (Preparing and reworking matters of L, P and S; Writing lab protocol)	a) 8 students b) 4 students / supervising tutor c) 4 students / supervising tutor

2 Learning outcomes / Skills

The restoration of degraded land represents the most profound land-use change of the coming century. Students who successfully completed this module will have acquired solid knowledge and skills in restoration ecology with focus on the study of the interactions between natural habitats and human land use. The students will have gained an understanding of topics spanning from soil biology through above-ground population, community, ecosystem and landscape ecology, with an emphasis on managing systems to enhance, restore or rebuild degraded habitats. Focusing on nearby brown-coal mining sites, the students will describe and quantitatively study the impacts of various management strategies on soil function, target species populations, community structure, ecosystem productivity and sustainability. They will apply ecological principles and site-specific relationships to develop management options for restoration conservation and improvement of natural areas.

3 Contents

Main topics:

• introduction to restoration ecology

• basic ecological principles related to restoration (succession, island biogeography and landscape ecology)

• techniques to modify abiotic and biotic component of ecosystems

• socioeconomic consequences of restoration

• roles of plants and animals in restoration

• restoration in practice: setting targets, planing, legal issues, practical actions, management and monitoring

• examples: post mining sites, meadows, forest, oligothrophic habitats (heathlands, sand dunes etc)

4 Teaching methods

Lectures; Seminar; Excursion; Guidance to independent research; Project work; Hands-on Training in collaboration with http://www.forschungsstellerekultivierung.de/

5 Requirements for participation

Bachelor; enrollment in the Master´s degree course “Biological Sciences” (see examination regulations for details)

Additionally: Successful participation in an advanced ecology course within a bachelor’s program (e.g. MN-B-WP I [Eco 1] or MN-B-WP II [Eco 2] at University of Cologne) or similar skills (after consultation)

6 Type of examinations

Exam prerequisites: Regular and active participation

Exams: Two hour written examination about topics of the lectures (accounts for 50 % of the total module mark), oral presentation of the project studies (10-15 min + discussion, accounts for 25 % of the total module mark) and written protocol from the practical part (accounts for 25 % of the total module mark)

See also remark under Additional information (11) for students beginning the degree course before winter term 2013/2014.

Restoration Ecology (MN-B-E 3) continued

7	**Requisites for the allocation of credits** Total module mark at least “adequate” (see § 10 of the examination regulations for details)
8	**Compatibility with other Curricula** None
9	**Significance of the mark for the overall grade** In the Master´s degree course “Biological Sciences”: 15 % of the overall grade (see appendix 2 of the examination regulations)
10	**Module coordinator and Participating faculty** **Module coordinator:** Prof. Dr. M. Bonkowski, phone 470-3152, e-mail: m.bonkowski@uni-koeln.de **Participating faculty:** Prof. Dr. M. Bonkowski, Prof. Dr. J. Frouz (Institute for Environmental Studies, Charles University, Prague), Dr. R. Koller
11	**Additional information** - **Subject module** of the Master´s degree course “Biological Sciences” - **Focus of research:** (E) Ecology and Evolution - **Literature:** (i) Zerbe, S., Wiegleb, G. (2009) Renaturierung von Ökosystemen in Mitteleuropa. Spektrum Akademischer Verlag - Additional reviews and original papers will be handed out during the module. - **General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical work and preparation for the oral presentation; Week 7 (Mon.-Fri.): Preparation for the written examination - **Attention: Students who have enrolled in the MSc Biological Sciences before winter term 2013/2014** and who want to continue in the old frame of the degree course scheme (*i.e.* 15 CP per subject module) have to write an additional essay of 8-12 pages. This essay is assessed as “passed” or “failed” and does not account to the total module mark. - **Introduction to the module:** April 07, 2014 at 9:00 a.m., Cologne Biocenter, room -1.005 (first basement floor) - **Written examination:** May 23, 2014; more details will be given at the beginning of the module

[*] According to the course schedule (see appendix 2 of the examination regulations)

[**] Preparation times before the official start of the module are not included here.

[***] All decimal numbers were rounded. The values correspond to the effective contact times over the total duration of the module (including examination times).