UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Biodiversity and Conservation

2324-1-F7501Q082

Aims

The contents of the Biodiversity and Conservation course aim to provide the student with a solid awareness of the ongoing biodiversity crisis. Specifically, it aims to:

- list the factors of direct or indirect threat, general and specific, for animal species, deriving from the exploitation of natural resources by humans

- highlight the effects of the loss of Biodiversity, Natural Capital and related Ecosystem Services (instrumental value of natural resources)

- illustrate the ethical reasons for the conserving Biodiversity (intrinsic value of Biodiversity)

- provide the tools to analyze the trends of animal populations through monitoring programs (topic particularly detailed during the practical part / field trips)

- indicate possible management actions and strategies (eg ecological networks), by applying the Island Biogeography Theory and Metapopulation Theory, aiming at the protection and restoration of fragmented landscapes.

The course includes practical activities such as field trips and data processing activities, which will allow to familiarize with the practice of conservation. Specifically, in the field, wildlife census programs will be simulated and, subsequently, in the laboratory, analyzes of the data collected will be carried out.

Contents

Threats to biodiversity. Destruction, fragmentation and degradation of habitats, introduction of alien species, climate change. Conservation status of fauna. Wildlife monitoring methods. Regulatory aspects relating to the

protection of fauna. Demographic models, Theory of island biogeography, Meta-populations, Minimum Viable Population and Extinction vortex. Ecological networks and models of environmental suitability.

Detailed program

In the first part of the course will discuss the threatening factors to biological diversity and, in particular, the problems related to (a) the destruction, fragmentation, degradation of habitats, (b) the introduction of alien species, (c) the effect of xenobiotic, (d) the effect of climate change.

In the second part, the conservation status of the fauna will be assessed from the global to the local scale. The regulatory aspects (Directives, Conventions, national and regional laws) concerning the protection of fauna will be treated. For wildlife groups of greater conservation interest or for which there are specific legal obligations for their protection, the monitoring methods will be illustrated.

In the third part of the course, the demographic models, the principles of the theories of Island Biogeography and Meta-populations and the concept of Minimum Viable Population will be analyzed from a quantitative point of view, as bases for addressing issues related to sustainable management of the landscape and therefore, the planning of the Territorial Ecological Network, as a tool to limit the effects produced by the aforementioned threats to biodiversity. A mathematical-statistical approach will be used for the development of environmental suitability models for indicator species used for the objective identification of ecological networks and the principles for their validation will also be illustrated, using molecular markers or ecological approaches. Finally, the main ecological restoration techniques for the reconstruction of ecological connectivity in fragmented landscapes will be explained.

The course includes practical activities aimed at deepening the topics covered during the lectures.

Prerequisites

Basic knowledge of zoology, botany, ecology, mathematics and statistics

Teaching form

- Frontal lesson, 4 credits, 32 h.

- Field activities, 2 credits, 20 h.

Textbook and teaching resource

Primack R. Essential of Conservation Biology

Material provided by the teacher.

Semester

First year, second semester

Assessment method

Oral exam. There are 8 ordinary exam sessions during the teaching breaks.

The oral exam is aimed at ascertaining the level of knowledge set by the objectives of the course, as well as the skills, evaluated in terms of clarity and exposition correctness, and the student's ability to critically analyze the contents, synthesise and re-elaborate concepts illustrated both during the frontal lessons and in the practical ones.

Office hours

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Sustainable Development Goals

LIFE BELOW WATER | LIFE ON LAND