

**Bases for the Conservation and Management of
Biodiversity**

Code: 42914
ECTS Credits: 6

Degree	Type	Year	Semester
4313774 Terrestrial Ecology and Biodiversity Management	OB	0	1

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Teachers

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Use of Languages

Principal working language: spanish (spa)

Prerequisites

There are no specific requirements.

Objectives and Contextualisation

Current threats to biological diversity are getting bigger. Environmental problems (climate change, degradation of the environment through the effects of urban expansion, road infrastructure, intensification of agriculture, etc.) represent a dramatic impact on species and ecosystems with direct consequences, not only on the correct functioning of these, but also on the goods and services that they provide to the society. The need for management and conservation of biological diversity is, therefore, increasingly urgent.

The BCGB module aims to provide students with basic training in the conservation and management of animal and plant diversity, as well as the management of problematic species that interact with human activities. Especial attention is paid to those species that are in a situation of high vulnerability and those who, due to their invasive or problematic status, have a negative effect on native biodiversity or economic activity.

We discuss the different foundations on which to establish objective and solid criteria for the conservation of species and habitats, from strictly scientific (with their different types) to those strictly legal. With respect to the latter, examples of European, state and regional regulations are analyzed and discussed. The study of the conservation and management of threatened fauna and flora is addressed, emphasizing the different conservation strategies and the methodology used in them, as well as the management of problematic fauna and flora. The presence of species with different degrees of endemism, vulnerability or threat in a floristic community determines to a large extent the type of protection that a natural space receives. For all this, it is essential to know the biology of these species, as well as the particularities of the legal figures that protect them, when it comes to implementing policies and management mechanisms in a critical and well-informed way.

Competences

- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Communicate, give presentations and write articles in English.
- Deal with the theory and practice of sustainable management and use of biodiversity and of terrestrial and aquatic biotic resources.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Seek out information in the scientific literature using appropriate channels, and use this information to formulate and contextualise a project.
- Understand and apply the most cutting-edge and influential theories in terrestrial ecology and conservation of biodiversity, and assess their importance for mitigating the main environmental problems caused by human activity.

Learning Outcomes

1. "Analyse and foresee possible unintended consequences ("side-effects") of recovery plans, re-introductions or measures for the conservation of species. "
2. Analyse technical and scientific documents written in English and understand presentations in English.
3. Describe the structure of a cartographic model and its main potential advantages and limitations, as well as its application to the solving of a particular problem and the premises on which it is based.
4. Identify the basic elements needed to advise companies and other entities working in the field of management and sustainable use of biodiversity.
5. Know the European, Spanish and regional-level legal frameworks for the conservation of species and habitats.
6. Know the basic types of management of species populations and be able to critically apply different management strategies to suit the problem being faced.
7. Know, interpret and evaluate the principles and general applications of conservation biology applied to flora and fauna.
8. Use the main tools for searching in specialist literature.
9. Use the technical language of the laws on conservation of species and habitats.

Content

PROGRAM OF BASES FOR THE CONSERVATION AND MANAGEMENT OF BIODIVERSITY

1.- Basic concepts of conservation and legislation:

1.1.- Fundamentals for the conservation of species and habitats.

1.2.- Criteria for the selection or prioritization in the protection of taxa.

1.3.- Worldwide, European, state and autonomous legislative framework for the conservation of species.

1.4.- Recovery and conservation plans: analysis of the main characteristics of scientific-conservation-legal documents (national and international examples).

1.5.- Methodologies and examples of problems in applications of monospecific and multispecific plans.

1.6.- Evaluation of the effectiveness of the results obtained (in the context of an adaptive type management) based on the objectives, resources and methodologies used.

1.7.- Analysis of cases of unanticipated effects related to measures for the release of biological material (introductions, reintroductions and population reinforcements).

2.- Conservation and management of threatened species:

2.1.- In situ conservation:

- Resolution of cases in the conservation of genetic diversity, of species and of ecosystems.

2.2.-Ex-situ conservation strategies:

- Contributions from wildlife conservation centers. Recovery of species. Captive breeding programs.
- Seminar on the application of reproductive techniques to the conservation of wild animal species.

3.- Conservation and management of species and populations.

3.1.- Conference on the management and conservation of flora by an expert in the field.

3.2.- Study of cases of management and conservation of fauna:

- Study of cases of ex situ and in situ conservation of fauna (*Falco naumanni*, *Calotriton arnoldi*, etc.).

4.- Management of problematic wildlife.

- Interactions between wildlife and human activities: identification and analysis of damages.
- Management and control strategies.
- Case study: urban pigeon management.

5.- Mechanisms and policies for the conservation of communities and ecosystems.

Type of protected natural spaces.

Parks and protected natural reserves: challenges to the classic conservation model in the designation and maintenance of protected areas.

The dialectic between separation and integration ("land sparing / land sharing") for the conservation of spaces: an agroecological vision.

6.-Seminars for analysis and evaluation of different plans for the recovery / conservation of species.

7.- Visits:

- Visit to the center of recovery of wildlife of Torreferrussa.

- Visit to the Botanical Garden and the Botanical Institute (CSIC) of Barcelona. The value of the conservation centers of ex-situ plants and repositories of vegetal diversity.

Methodology

Different methodologies will be used. In the master classes, the expositive method will be used, accompanied by multimedia materials that reinforce understanding, combined with dialogic techniques that allow to stimulate the expositive method and involve students more participatory. Likewise, targeted seminars and case resolution will be held.

Throughout the module the students will carry out tutored works. The work will be focused on the analysis and comprehension of specific bibliography (directly related to the course, which will be made available to students), and to the oral presentation of a work. The follow-up of the elaboration of the different works will be done through sessions of discussion conveniently programmed.

Examples of ex situ and in-situ conservation will be discussed in the classroom (case study) and two field trips or visits to specialized centers will be carried out.

1. Oral presentation of a topic related to the module (2 tutorials): work in groups of 2 students. 15 subjects will be offered to choose 1 per group, the topics will be proposed by the teachers of the module. There will be two sessions of work directed and tutored by group.

The students will do the work directed and tutored by the teacher of the subject that they will choose from the list that will be indicated previously.

The award of the topics for the oral presentation will be done by rigorous order of request via email to javier.lopez.alvarado@uab.cat. The request of each group has to include a list of 5 subjects according to preference. If there is no request at the indicated deadline, the Coordinator of the module, Javier López, will form the group and will directly award the work.

The work will consist of an oral presentation of the chosen subject in PowerPoint, of a maximum duration of 15 minutes. Presentation in paper and digital format will be delivered. The minimum of documentary sources (articles, books, websites, etc.) to consult for the realization of the work is 8 (between which there can be no more than two web pages), being no upper limit. Within the presentation the documentary sources used will be cited and in the end of the presentation they will be indicated in a section of references following the instructions that will appear in the Virtual Campus (Instructions for the bibliographical references).

Attendance to all oral presentations is mandatory.

2. Written work on the resolution of cases and/or visits: Ex-situ and in-situ conservation cases will be discussed in the classroom and two visits will be made. An individual written work will be done on these activities.

3. Written exam: test questions with 4 possible responses of which only one is valid and/or short questions.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Case studies	3	0.12	5, 6, 8, 9
Field trips/visits	8	0.32	6, 7, 4
Master Classes	20	0.8	5, 6, 7, 4
Seminars	7	0.28	2, 1, 7, 8, 3, 9
Type: Supervised			
Tutorial classes	5	0.2	1, 6, 7, 4
Type: Autonomous			
Personal study and work	101	4.04	2, 1, 5, 6, 7, 4, 8, 9

Assessment

The evaluation of this module is carried out throughout the course.

1. Oral presentation of a topic related to the module

In this work it will be valued:

- Content of the presentation: adequate information, quality, ability to synthesise information, correction, presentation structure, etc.

- Clarity, conciseness and rigor in the oral expression.
- Quality of the documentary sources chosen
- Adaptation to the established time (15 ')

Rating: 40% of the total of the score. There is no possibility to remedial examination for this activity.

2. Written work on the resolution of cases and / or visits:

Rating: 20% of the total of the score. There is the option of a remedial examination if necessary.

3. Written exam

Rating: 35% of the total of the score.

IMPORTANT: To be able to make average with the rest of module evaluation items, a minimum score of 4 out of 10 must be taken. There is the option of a remedial examination if necessary.

4. Attendance and active participation in classes, tutorials and practical activities.

Rating: 5% of the total of the score.

IMPORTANT: In order to be able to make average with the rest of module assessment items, at least 80% of all module activities must be attended.

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance and active participation in classes, tutorial classes and practical activities	5%	1	0.04	1, 5, 6, 7, 4, 9
Delivery and oral defense of the work	40%	1	0.04	2, 1, 7, 8, 3, 9
Written theoretical-practical test (exam)	35%	2	0.08	5, 6, 7, 4
Written work on the resolution of cases and/or visits	20%	2	0.08	5, 6, 8, 9

Bibliography

Alcaide, M., Negro, J.J., Serrano, D., Antolín, J.L., Casado, S., Pomarol, M. 2010. Captive breeding and reintroduction of the lesser kestrel *Falco naumanni*: a genetic analysis using microsatellites. *Conservation genetics* 11: 331-338.

Bellés, X. 1995. *Entendre la Biodiversitat*. Ed. Magrana. Barcelona.

Falk, D.A., Holsinger, K.E. 1991. *Genetics and conservation of rare plants*. Oxford University Press, New York.

Falk., D. A., Millar, C.I., Olwell, M., et al. 1996. *Restoring Diversity. Strategies for reintroduction of endangered plants*. Falk., D. A., Millar, C.I., Olwell, M. (Eds.), Island Press, Washington DC.

Gitzendanner, M.A., Soltis, P.M. 2000. Patterns of genetic variation in rare and widespread plant congeners. *Amer. J. Bot.* 87: 783-792.

Godefroid S., Piazza, C., Rossi, G., et al. 2011. How successful are plant species reintroductions? *Biol. Conserv.* 144: 672-682.

Gray, A. 1996. Genetic diversity and its conservation in natural populations of plants. *Biodivers. Lett.* 3:71-80.

Guerrant, E.O., Havens, K., Maunder, M. 2004. *Ex situ plant conservation: supporting species survival in the wild.* Island Press. Washington.

Hadlik, C.M., Hadlik, A., Linares, O.F., Pagezy H. et al. 1993. Tropical forests, people and food: Biocultural interactions and applications to development. UNESCO/Parthenon Publ. Vol. 15 in *Man and the Biosphere Series*, Paris.

Jiménez-Pérez, I., Delibes de Castro, M., et al. 2005. Al borde de la extinción: Una visión integral de la recuperación de fauna amenazada en España. Ignacio Jiménez Pérez y Miguel Delibes de Castro, Eds. España. 440 pp.

Lavergne, S., Thompson, J.D., Garnier, E., Debussche, M. 2004. The biology and ecology of narrow endemic and widespread plants: a comparative study of trait variation in 20 congeneric pairs. *Oikos* 107:505-518.

Mayor, P. Santos D. Lopez-Bejar, M.2007. *Sostenibilidad en la Amazonía y cría de animales silvestres.* CETA, Iquitos, Peru.

Pineda, F.D., et al. 2002. *La diversidad biológica de España.* Prentice Hall, Eds. Madrid. 412 pp.

Primack, R. B. 2006. *Essentials of Conservation Biology.* Sinauer Associates, Eds. Sunderland, MA. 601 pp.

Robinson, J.G. Redford, K.H. 1991. *Neotropical wildlife use and conservation.* The University of Chicago Press, Chicago.

Terborg, J. 2004. *Requiem for nature.* Island Press, Washington DC.

Telleria, J.L. 1986. *Manual para el censo de los vertebrados terrestres.* Raices, Eds. 278 pp.

Thompson, J.D. 2005. *Plant evolution in the Mediterranean.* Oxford University Press, New York.

Valbuena-Ureña, E., Amat, F., Carranza, S. 2013. Integrative Phylogeography of *Calotriton* Newts (Amphibia, Salamandridae), with Special Remarks on the Conservation of the Endangered Montseny Brook Newt (*Calotriton arnoldi*). *PLoS ONE* 8(6): e62542. doi:10.1371/journal.pone.0062542.

Most specific bibliography will be provided by each professor at the beginning of the module.

Webs of interest:

www.uicn.org

www.iucnredlist.org

<http://www.amphibianark.org/>

<http://www.magrama.gob.es/es/biodiversidad/temas/conservacion-de-la-biodiversidad/>

Departament d'agricultura, ramadaria, pesca, alimentació i medi natural: Flora, fauna i animals de companyia:

<http://www20.gencat.cat/portal/site/DAR/menuitem.8ea90a68a0f0f53053b88e10b031e1a0/?vgnextoid=0940debe>

Ecosistemas, Scientific Magazine of Ecology and Environment: various numbers. Online Magazine of the "Asociación Española de Ecología Terrestre" (Spanish Association of Terrestrial Ecology):

<http://www.revistaecosistemas.net/index.php/ecosistemas>

Software

There is no specific software for this module. If you have to use any, apart from the basic software, the rest will be free software, such as the R program. You will not be required to subscribe to purchase any licensed software.