Teaching Guide				
Identifying Data				2023/24
Subject (*)	Sustainability and Conservation of Faunal		Code	610G02034
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Fourth	Optional	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía			
Coordinador	Fernández Rodríguez, Nuria	E-mail	n.fernandez1@udc.es	
Lecturers	Fernández Rodríguez, Nuria Llaneza Rodríguez, Luís Aladino	E-mail	n.fernandez1@udc.es luis.llaneza@udc.es	
Web				
General description	The objective of this subject is to provide students with the theoretical bases of the conservation and sustainable management, in relation to issues of basic science and other issues related to decision making, using an approach to applied problem solving .			

Study programme competences	
Code	Study programme competences
A1	Recoñecer distintos niveis de organización nos sistemas vivos.
A4	Obter, manexar, conservar e observar especímenes.
A6	Catalogar, avaliar e xestionar recursos naturais.
A9	Identificar e utilizar bioindicadores.
A18	Levar a cabo estudos de produción e mellora animal e vexetal.
A20	Muestrear, caracterizar e manexar poboacións e comunidades.
A22	Describir, analizar, avaliar e planificar o medio físico.
A23	Avaliar o impacto ambiental. Diagnosticar e solucionar problemas ambientais.
A24	Xestionar, conservar e restaurar poboacións e ecosistemas.
A26	Deseñar experimentos, obter información e interpretar os resultados.
A27	Dirixir, redactar e executar proxectos en Bioloxía.
A28	Desenvolver e implantar sistemas de xestión relacionados coa Bioloxía.
A29	Impartir coñecementos de Bioloxía.
A32	Desenvolverse con seguridade no traballo de campo.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar en colaboración.
B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B10	Exercer a crítica científica.
B11	Debater en público.
B12	Adaptarse a novas situacións.
B13	Comportarse con ética e responsabilidade social como cidadán e como profesional.

Learning outcomes

Learning outcomes	Study programme competences		
Análise de problemas relacionados ca sostenibilidade e a conservación da biodiversidade	A1 A4 A6 A9 A20 A22 A23 A26 A29	B1 B3 B4 B6 B7 B9 B10 B12 B13	
Análise interdisciplinar dos problemas de xestión dos recursos vivos e os ecosistemas	A1 A6 A9 A18 A20 A22 A23 A24 A27 A28	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13	
Elaboración de propostas de plans de xestión da biodiversidade, dos ecosistemas e dos recursos explotados	A1 A4 A9 A22 A23 A24 A27 A28 A29	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13	
Desenvolvemento de proxectos relacionados ca sostenibilidade e a conservación biolóxica	A1 A4 A6 A9 A18 A20 A22 A23 A24 A26 A28 A32	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12 B13	

Contents	
Topic	**Sub-topic**
1. CONSERVATION BIOLOGY	Management of living natural resources. Concepts.
2. BIODIVERSITY AND ECOSYSTEM FUNCTION.	Definition and levels of biodiversity. Taxonomic Diversity. Biodiversity and ecosystem functioning
3.ECOSYSTEM SERVICES AND THEIR VALUATION.	Environmental economics / ecological economics. Goods and services provided by ecosystems. Economic valuation of ecosystem services.
4. ENVIRONMENTAL MANAGEMENT SYSTEMS FOR THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY	Sustainability. Sustainable development. Socioeconomic and legal bases. Property rights. The tragedy of the commons. Components and managment models
5. SUSTAINABLE EXPLOITATION.CONCEPTS AND BASIC MODELS OF ANIMAL POPULATIONS.	Logistic model.Growth rates. Carriying capacity. Avoiding overexploitation. Monitoring and adaptative managment. Management of the carriying capacity.
6. MARINE FISHING AS A MODEL FOR EXPLOITATION OF RESOURCES	The socio-economic importance of marine fisheries. Trends in global fisheries: historical development and current status. Status of fish stocks.
7. ECOLOGICAL EFFECTS OF FISHING.	Human activities affecting marine ecosystems. Direct effects on stock. Direct effects on habitat. Effects on communities and ecosystems
8. AQUACULTURE: ALTERNATIVE OR EXPLOITATION DRIVER?	Population Growth vs productive systems.The marine aquaculture. Ecological effetcs of aquaculture. Alternatives for sustainable aquaculture.
9. METHODS FOR THE ASSESSMENT OF EXPLOITED POPULATIONS.	Objectives.Data collection. Estimations of abundance. Direct methods for assessment. Indirect methods.
10. MANAGEMENT STRATEGIES FOR EXPLOITED RESOURCES.	Components of the fisheries management systems. Scientific information for preventive management. Regulatory measures. Major fisheries management strategies. Experiences on achievements and problems of regulatory measures.
11. EXTERNAL THREATS TO ANIMAL DIVERSITY.	Habitat changes. Presence of non-native organisms . Environmental pollution. Overexploitation. Global changes.
12. INTRINSIC THREATS TO ANIMAL DIVERSITY.	Problems of small populations. Minimum viable population. Genetic variability and effective population.
13. METHODS FOR POPULATION CONSERVATION ASSESSMENT.	Monitoring populations. Predictive Models
14. STRATEGIES FOR CONSERVATION OF POPULATIONS AND SPECIES.	In situ conservation vs ex situ conservation
15. STRATEGIES FOR COMMUNITIES CONSERVATION.	Protected areas. Priority areas for protection. Approaches to the designation of protected areas. Design. Management.
16. RESTORATION AND CONSERVATION.	Spatial and temporal scales of degradation of natural habitats. Habitat degradation and loss of biodiversity. Elements for effective restoration. Risks and limitations in the process of environmental restoration.

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A1 A6 A9 A18 A23 A24 A28 B1 B3 B7 B8 B9 B10	21	63	84
Seminar	A4 A26 A29 B2 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13	7	21	28
Objective test	A6 A9 A24 B2 B3 B4 B6 B8 B10 B13	4	0	4

Case study	A6 A20 A22 A23 A24 A26 A27 A32 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12	14	14	28
Introductory activities	B6 B8 B9 B13	1	0	1
Personalized attention		5	0	5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Guest lecture / keynote speech	Presentation of 16 topics with the main contents of the subject. Each of them will last 50 minutes. Attendance is not compulsory but it is recommended.
Seminar	There will be talks/discussions by a guest speaker. There will also be analysis and discussion of a scientific article or audiovisual document related to the subject. There will also be exercises to reinforce the theoretical content of some of the topics presented in the lectures. Attendance is not compulsory but highly recommended.
Objective test	This is a test with short-answer questions on basic concepts of the subject and theoretical/practical problems to be solved by the student.
Case study	There will be 3 practical sessions in which different problems of conservation and sustainable management of animal resources will be formulated and solved by each student individually or in groups. In addition, a field trip is planned. This could be a visit to one of the old lignite mines in Galicia, where a process of ecological restoration with its advantages and limitations can be seen in situ; or a visit to Terra Chá (Lugo) to discuss how modifications of agricultural uses interfere/affect an endangered population, as is the case of the Little Bustard Tetrax tetrax. Attendance is compulsory.
Introductory activities	The first hour of the course will be devoted to explaining the subject matter, how the assessment will be carried out, selecting the topics on which the students will do individual work (when this activity is proposed) and resolving any doubts related to the subject.

Personalized attention	
Methodologies	**Description**
Guest lecture / keynote speech Seminar Case study	During the keynote speech, seminars and case studies, the students could request any doubt be explained or debated. If for duly justified reasons, in accordance with current regulations, a student is unable to attend a lecture, case study and/or seminar session, he/she will be assisted by means of personalised support tutorials, in a time and manner agreed by the lecturer and the student, to help him/her cope with specific tests or alternative activities that will be added to the "objective test".

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Seminar	A4 A26 A29 B2 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13	En todos os seminarios avaliarase a participación activa, e a realización dun traballo breve sobre o tema tratado. Os alumnos que non asistan aos seminarios e, polo tanto, non estean presentes nas sesións de discusión nin realicen os exames curtos, obterán unha cualificación de 0 puntos na actividade realizada ese día. A nota obtida dos seminarios manterase invariable para o cómputo da nota final, no caso dos alumnos que teñan que acudir á segunda oportunidade (xullo).	30
Objective test	A6 A9 A24 B2 B3 B4 B6 B8 B10 B13	Trátase dunha proba con 10-20 preguntas de respostas curtas, cada unha delas cualificada sobre 10.	50

Case study	A6 A20 A22 A23 A24 A26 A27 A32 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12	Os estudos de casos son de caracter obrigatorio. Ao finalizar o estudo de casos haberá un exame na plataforma Moodle . A nota obtida nesta proba manterase invariable para o cómputo da nota final, no caso dos alumnos que teñan que acudir á segunda oportunidade (xullo).	20
Others			

Assessment comments
The assessment of the subject will take into account knowledge of the theoretical programme, practical activities such as "case studies", discussions and short exams in seminars, as well as active participation in all these activities. In order to pass the course, the stipulated assessment criteria must be met and a minimum of 5.0 points must be obtained. For the final grades of both opportunities, students who do not appear for the objective tests on the official dates indicated will be considered as "exam not taken". Students who do not achieve the overall mark of 5.0 points or who do not achieve 5.0 points out of 10 in the objective test (regardless of the marks obtained in the seminars and practicals) will be considered as "Failed". If, for duly justified reasons, in accordance with the regulations in force, a student was unable to attend any session of the case studies and/or seminars, he/she must (in the case of case studies) or may (in the case of seminars) take specific tests or alternative activities which will be added to the "objective test". The mark achieved in these specific tests or alternative activities will be added to the mark already obtained in the case studies and seminars in which he/she participated. The fraudulent performance of the evaluation tests or activities, once verified, will directly imply a failing grade of "0" in the subject in the corresponding opportunity, in compliance with the established in Article 14 of the Rules for the assessment, review and appeal of qualifications for university degree and master's degree courses, and the UDC Student Statute For those students who apply for the December call, the teaching guide of the previous academic year will be applied.

Sources of information	
Basic	- Tellería, JL (2012). Introducción a la Conservación de las Especies. Tundra Ediciones. Valencia. - King, M (2006). Fisheries Biology, Assessment and Management. Blackwell Publishing - Chaparro, L (2014). Sin mala espina. Guía de consumo responsable de pescado y de marisco. Libros en Acción - Jennings S, MJ Kaiser & JD Reynolds (2001). Marine fisheries ecology.. Blackwell Science. - Primack RB (1993). Essentials of conservation biology.. Sinauer Associates - Pullin AS (2002). Conservation biology. Cambridge University Press. - Akçakaya HR, MA Burgman & LR Ginzburg (1999). Applied population ecology. Principles and computer exorcices using RAMAS Ecolab (2nd edition). Snauer Associates. - Gibbs JP, ML Hunter Jr. & EJ Sterling (1998). Problem-solving in conservation biology and wildlife management. Blackwell Science. - Van Dyke, F. (2008). Conservation Biology. Springer
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Genetics/610G02019 Zoology I/610G02031 Zoology II/610G02032 Animal Biodiversity and the Environment/610G02033 Ecology II: Populations and Communities/610G02040
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus

Other comments
Because the subject synthesize knowledge from other many different subjects in the fields of Biology, especially Ecology and Animal Biodiversity and Environment, and that there is no text that meets all course content, it is recommended that students attend the keynote speech.It is essential for students to make use of the Virtual Platform of the UDC.To complement this, for each of the themes, several references will be recommended, all them available in the UDC library. We recommend to have a knowledge of English at an intermediate level of reading.We recommend to have knowledge of basic computer tools at user level.Green Campus Programme of Faculty of Science In order to help achieving an immediate sustainable environment and comply with points 6 and 8 of the "Environmental Declaration of the Faculty of Science (2020)", the documentary work to be carried out in this subject: a. They will be requested mainly in virtual format and computer support.b. If on paper: - Plastics shall not be used. - Double-sided printing shall be used. - Recycled paper shall be used. - Drafts shall be avoided.