Syllabus

Course Description

Course Title	Wildlife management in mountain areas
Course Code	47311
Course Title Additional	
Scientific-Disciplinary Sector	AGRI-09/C
Language	English
Degree Course	Master in Smart Sustainable Agriculture Systems in Mountain Areas
Other Degree Courses (Loaned)	
Lecturers	
Teaching Assistant	
Semester	First semester
Course Year/s	2
CP	6
Teaching Hours	36
Lab Hours	24
Individual Study Hours	90
Planned Office Hours	18
Contents Summary	This course focuses on the conservation and management of wildlife in mountain ecosystems, covering topics such as habitat conservation, species interactions, biodiversity, and the impact of human activities on wildlife.
Course Topics	Module 1: Ecological Foundations and Population Dynamics Principles of wildlife management and conservation in mountain ecosystems . Intraspecific and interspecific competition, biological, agro-forestry, and socio-human carrying capacity concepts . Theoretical models of predator-prey systems, Lotka-Volterra equations, functional and numerical responses, optimal foraging theory, and the marginal value theorem . Trophic cascades (bottom-up and top-down mechanisms)

	. Spatial dynamics, dispersal, home range, metapopulation models, and source-sink systems . Focal species ecology: brown bear (Ursus arctos), wolf (Canis lupus), Eurasian lynx (Lynx lynx), golden jackal (Canis aureus), and Eurasian otter (Lutra lutra) . Module 2: Wildlife Monitoring and Quantitative Inventory Techniques Status, distribution, and biology of game and protected mountain species . Direct and non-invasive monitoring methodologies: snow and mud tracking, camera trapping, radio-telemetry, eDNA sampling, and wolf howling surveys . Statistical applications of occupancy models to evaluate habitat use and account for imperfect detection probability . Module 3: Sustainable Game Management and Harvest Planning Principles of game management, spring (pre-breeding) and summer (post-breeding) population censuses . Design of selective hunting plans for wild ungulates (roe deer, red deer, chamois, wild boar) under contrasting ecological scenarios (with and without large carnivores) . Application of adaptive management cycles . Module 4: Human-Wildlife Interaction and Conflict Mitigation Anthropogenic impacts and habitat fragmentation caused by mountain infrastructure (power lines, wind farms, ski resorts, highways) . Technical damage-prevention tools for agriculture and livestock farming: electric and fladry fencing, livestock guardian dogs, and diversionary feeding . Management protocols for habituated or confident animals, hazing techniques, emergency response teams, and translocation . Module 5: Conservation Policy, EU LIFE Projects, and Stakeholder Engagement European environmental regulatory frameworks: EU Habitats Directive (Directive 92/43/EEC, Annexes II, IV, V), Natura 2000 network, and favourable conservation status criteria . Analysis of transboundary conservation initiatives and EU LIFE projects (LIFE WolfAlps, LIFE Dinalp Bear, LIFE Lynx, Nat2Car, 4Pethabeco)

	. Citizen science, stakeholder collaboration, and communication strategies for fostering human-wildlife coexistence
Keywords	Wildlife management, Population dynamics,, Invasive and Non-invasive monitoring, Human-wildlife conflict, co existence strategies.
Recommended Prerequisites	Foundational Knowledge in Biology & Ecology: Basic understanding of general ecology, zoology, ecosystem functioning, and plant-animal ecological interactions. Basic Quantitative & Statistical Skills: Familiarity with introductory mathematical concepts, algebra, and basic statistical principles applied to biological datasets (e.g., population growth rates, basic probability). Environmental & Agro-Forestry Background: Elementary understanding of mountain ecosystems, forestry, rural land use, and livestock production systems. English Language Competence: Adequate proficiency in scientific English to read academic literature, research papers, and European environmental policy documents (e.g., EU Directives, LIFE project reports).
Propaedeutic Courses	No
Teaching Format	Frontal Lectures & Digital Learning: Interactive classroom lectures supported by multimedia presentations, scientific articles, and video documentation . All lecture notes, slides, reading lists, and digital resources are shared via the official MS Teams / OLE university platform . Practical Exercises & Quantitative Modeling: Practical sessions dedicated to analyzing population dynamics, predator-prey Lotka-Volterra equations, and bottom-up/top-down trophic cascades (such as the multi-species interactions between beech mast production, micromammals, red foxes, and black grouse) . Case Study Analysis & Working Groups: Group work aimed at evaluating anthropogenic impacts on mountain ecosystems—including habitat fragmentation caused by infrastructure such as power lines, wind farms, highways, and ski resorts . Students analyze real-world case studies to assess technical conflict-mitigation systems (electric/fladry fencing, guardian dogs,

	diversionary feeding) . Field Excursions: Outdoor field trips designed to practice non-invasive monitoring methodologies (snow tracking, transect sampling, biological sample collection) and inspect practical damage-prevention installations and emergency team interventions directly on-site . Applied Project Work: Development of an individual or small-group project (1–3 students) focused on creating a species management plan, hunting harvesting strategy, or EU LIFE conservation project, culminating in a 15-minute oral PowerPoint presentation
Mandatory Attendance	No
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding --> - actively participate in research projects in the field of mountain agriculture - collaborate with other professionals in the fields of architecture, engineering and natural sciences - work in interdisciplinary, national and international teams Ability to apply knowledge and understanding --> Graduates of the Master SAM degree programme have a solid scientific and technical foundation that enables them to tackle and solve complex problems. Thanks to their scientific and technical training in the fields of agriculture, economics and management, graduates are able to develop analyses and plans for the development and management of farms in mountain regions, taking into account their specific characteristics and multifunctionality (ecosystem services). In these specialist areas, graduates are able to coordinate interdisciplinary teams in the agricultural sector. The ability to apply the specialist knowledge acquired is achieved through critical reflection on the teaching materials offered and classroom learning activities, supplemented by case study analysis and practical exercises by teachers. In addition, there are practical exercises in the laboratory, on the computer and in the field, excursions, bibliographic research, the development of individual and/or group projects and the preparation of the final thesis. The assessment of success (oral and written exams, seminar

	reports) and exercises are designed in such a way that graduates must demonstrate that they have mastered the tools of the trade, the methods learned and a critical and independent way of working. Autonomy of judgement --> - choosing the best production techniques, taking into account environmental protection; - analysing data and information to independently assess the quality and effectiveness of the results obtained in the design of strategies to control difficulties - making independent decisions on professional issues. These may relate in particular to the feasibility of projects in the field of agricultural activities - planning activities and strategies on the basis of predefined objectives, taking into account timescales and methods Communication skills --> Graduates will be able to work professionally in one or more foreign languages. Compulsory and elective courses are taught in English. In addition, some elective courses may be offered in Italian or German. In accordance with unibz's trilingual policy, the unibz Language Centre offers extracurricular courses (levels A1-C1) in Italian and German. Graduates will be able to communicate fluently with other professional groups with whom they work and will be able to participate in European projects with foreign partners thanks to the international orientation of the Master's programme. Written and oral communication skills are promoted in seminars, excursions, exercises and teaching activities, which include the preparation of reports and written documents and their oral presentation in English and, where applicable, in Italian and German in elective subjects. The acquisition and assessment/verification of the above communication skills also takes place through the writing of the final thesis and its discussion in English. The master's degree programme also promotes the acquisition of additional language skills in German and Italian. This should enable graduates to successfully enter the international job market (e.g. Austria-Switzerland-Italy-Germany).

	Learning skills -->
Graduates will be able to manage complex projects thanks to the specialist knowledge acquired during their studies. They will be able to continuously expand the specialist knowledge acquired during their studies and keep it up to date. They will learn to use the most modern methods to be able to competently carry out analysis, project planning and management measures in their professional lives. Graduates will be able to use various IT systems to further their cultural and professional development. They will also be able to choose the methods and training paths best suited to their cultural and professional development. Graduates will be able to manage complex projects thanks to the specialist knowledge acquired during their studies. They will be able to continuously expand the specialist knowledge acquired during their studies and keep it up to date. They will learn to use the most modern methods to be able to competently carry out analysis, project planning and management measures in their professional lives. Graduates will be able to use various IT systems to further their cultural and professional development. They will also be able to choose the most suitable methods and training paths for their cultural and professional development. Learning skills are encouraged throughout the degree programme. Particular attention is paid to individual study, especially in the completion of group work on the proposed topics. These skills are enhanced during compulsory lessons, which include group work, and subsequently in the preparation of the final thesis. Learning progress is assessed regularly during the courses and during the writing of the final thesis. In particular, this practice-oriented training involves working in small groups (3-5 students) on a joint project (e.g., a plan for the development of farms in mountain areas) from the initial stages (development of objectives and measures, collection of available data) to cooperation with various stakeholders (e.g., public administration, mountain agriculture advisory centre, farmers' association), which also includes communication activities for agriculture and society. The projects are carried out under the supervision of two or more teachers, with an exchange between students and private companies and/or the public authorities concerned. Learning ability is assessed through continuous assessment during the learning units and in the preparation of the final thesis.

Specific Educational Objectives and Learning Outcomes (additional info.)	Applying knowledge and understanding: Ability to design scientifically sound non-invasive monitoring schemes (snow tracking, camera trapping, telemetry) and process wildlife presence data . Ability to evaluate habitat connectivity and anthropogenic fragmentation risks using spatial data and ecological models . Capability to select, implement, and assess technical conflict-mitigation measures (electric fences, guardian dogs, diversionary feeding) tailored to specific farming and forestry contexts . Ability to formulate sustainable game harvesting plans based on demographic census data and ecological carrying capacities . Making judgements: Capability to critically evaluate management trade-offs between wildlife conservation goals, agricultural/livestock interests, and public safety . Ability to analyze the functional and perceived effectiveness of human-wildlife conflict mitigation practices. Capacity to interpret population trends, occupancy probabilities, and harvest impacts using quantitative ecological framework
Assessment	Assessment structure: The final grade is based on two integrated components : Written Examination (70% of the final mark): A written test consisting of 5 to 10 open-ended questions . The questions assess theoretical knowledge of ecological principles, population dynamics models, monitoring techniques, human-wildlife conflict mitigation strategies, and European conservation frameworks . Oral Presentation / Project Work (30% of the final mark): An individual or small-group PowerPoint presentation (1–3 students; 15 minutes presentation + 10 minutes) focused on a specific species management plan, an EU conservation project (e.g., LIFE projects), human-wildlife coexistence methods, or a protected area case study

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Evaluation Criteria	Written Exam Criteria: Assessment focuses on the accuracy and completeness of theoretical concepts, understanding of quantitative ecological models, correct description of monitoring and management techniques, logical structuring of arguments, and proper command of scientific terminology . Oral Presentation Criteria: Evaluation is based on the scientific rigor of the proposed management or conservation project, critical synthesis of literature and data, clarity and quality of visual slides, oral communication skills, and the ability to answer technical questions during the Q&A session
Required Readings	1. Lecture Slides and Handouts: PPT presentations, lecture notes, and scientific papers uploaded by the instructor on the MS Teams / OLE platform. 2. Reference Textbook: Sinclair, A. R. E., Fryxell, J. M., & Caughley, G. (2006). Wildlife Ecology, Conservation, and Management (2nd Edition). Blackwell Publishing. 3. Legal Frameworks: European Commission (1992). Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive), Annexes II, IV, and V
Supplementary Readings	1. EU LIFE Project Guidelines & Reports: Implementation reports and management guidelines from European conservation projects (LIFE WolfAlps, LIFE Dinalp Bear, LIFE Lynx, LIFE Otter). 2. Species Identification Guides: Nat2Care Species Identification Guide: Transboundary Monitoring between Italy and Slovenia. 3. Selected Scientific Articles: Scientific literature on large carnivore management, spatial occupancy modeling, and conflict mitigation efficacy (provided via MS Teams)
Further Information	Course Platform & Materials: All lecture slides, reading lists, sample written exam questions, and project presentation guidelines are available on the course MS Teams / OLE space . Instructor Contact: Prof. Stefano Filacorda (Email: stefano.filacorda@uniud.it / sfilacorda@unibz.it)

	. Office hours are available by appointment via email.
Sustainable Development Goals (SDGs)	Responsible consumption and production, Life on land, Climate action