ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA AGRONÓMICA Y DE MONTES

GRADO DE INGENIERÍA FORESTAL

2024/25 YEAR

WILDLIFE MANAGEMENT AND CONSERVATION

Course details

Course name: WILDLIFE MANAGEMENT AND CONSERVATION
Code: 642019
Degree/Master: GRADO DE INGENIERÍA FORESTAL **Year:** 4
Field:
Character: OPTATIVA **Duration:** SECOND TERM
ECTS Credits: 4.0 **Classroom hours:** 40
Face-to-face classroom percentage: 40.0% **Study hours:** 60
Online platform: https://moodle.uco.es/

Coordinating teacher

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Brief description of the contents

This course provides the comprehension of the basis and methods to estimate population size of vertebrate wild animals and principles on wildlife management for conservation and recovery of endangered species.
Besides, the course deals with the main features concerning wildlife management such as: population dynamics, habitat,
diseases, genetics, carrying capacity and interactions among those factors. Description of some endangered
species as well as actions and strategies to be implemented to recover endangered wildlife populations

Prerequisites

Prerequisites established in the study plan

None

Recommendations

Subject Ecología y Fauna Forestal taken and passed.

Study programme

1. Theory contents

1. Theory contents:
Part One. ESTIMATING POPULATION SIZE IN VERTEBRATES
Theme 1. SPATIAL AND TEMPORAL DISTRIBUTION OF ANIMAL POPULATIONS
The concept of animal population
Spatial patterns of animal populations
Spatial distribution analysis
Temporal distribution of vertebrate populations.
Theme 2. COMPLETE CENSUS OR TOTAL COUNTS
Total counts of social units
Census of breeding colonies
Census of post-breeding gathering
Others total counts methods:
Complete removal
Thermal scanners.
Theme 3. DISTANCE METHODS
Itineraries of census
Itineraries based on elements interception
Hayne estimator and variants
Itineraries based on contacts distribution
Line transect
Finnish transect
Emlen method
Crain et al. method
Bird census stations (variable circular plots)
Järvinen method
Emlen method.
Theme 4. CAPTURE CONTROL METHODS
Change in ratio or Kelker method
Index-removal or Eberhardt method
Catch-effort methods
Theme 5. CAPTURE, MARKING AND RECAPTURE METHODS
Capture and branding
Closed populations
One mark, one recapture
Petersen estimator
Chapman estimator
Bailey estimator
Sample size and confidence interval calculation
Several marks and recaptures
Schnabel weighted mean
Nonweighted mean
Open populations
Triple capture
Jolly-Seber method.

Theme 6. ABUNDANCE INDICES
Direct count
Captures
Tracks and traces
Frequency.
Theme 7. BIODIVERSITY INDICES
Definitions and calculation
Part Two. CONCEPTS AND TOOLS FOR WILDLIFE MANAGEMENT
Theme 8. POPULATION DYNAMICS AND MAIN INTERACTIONS
Definitions
Models for population dynamics
Main inter and intra specific interactions.
Theme 9. HABITAT AND WILDLIFE MANAGEMENT
Definitions. Use and selection of habitat
Habitat structure and components (food and shelter requirements)
Home range. Habitat improvement actions.
Theme 10. CARRYING CAPACITY
Definition
Methods to assess carrying capacity.
Theme 11. FEATURES CONCERNING WILDLIFE MANAGEMENT
Food selection. Overgrazing problems
Genetics: basic concepts and wildlife management implications
Wildlife diseases: Prevention and therapy strategies.
Theme 12. DESCRIPTION OF SOME ENDANGERED WILDLIFE SPECIES
Morphological, habitat, food, distribution features
Problems associated with species conservation.
Theme 13. WILDLIFE RECOVERY STRATEGIES
Legal, national and international protection rules
Different status of protection
Multispecific strategies: flagship, key species. Wildlife corridors
Monospecific and/or selected species strategies: Recovery plans for a single or a group of species.

2. Practical contents

2. Practical contents:
Classroom exercises, presentations and case studies.
Visit to natural areas and/or wildlife rescue and recovery facilities.

Bibliography

1. Basic Bibliography:
Bookhout, T. A. (ed.). 1996. Research and management techniques for wildlife and habitats. Fifth ed., rev.
The Wildlife Society, Bethesda, Md, 740 pp.
Buckland, S.T., D.R. Anderson, K.P. Burnham, and J.L. Laake. 1993. Distance sampling: estimating abundance

of biological populations. Chapman and Hall, New York, N.Y. 446 pp.
McComb, B.C. 2008. Wildlife habitat management. Concept and applications in forestry. CRC Press (ed.). New York.
Payne, N. F. 1992. Techniques for wildlife habitat management of wetlands. McGraw-Hill bio-logical resource management series. New York. 549 pp.
Shaw, J. H. 1985. Introduction to wildlife management. McGraw-Hill series in forest resources. New York. 316 pp.
Telleria, J. L. 1986. Manual para el censo de los vertebrados terrestres. Editorial Raíces. Madrid. 279 pp.
2. Further reading:
Brownie, C., D. R. Anderson, K. P. Burnham, and D. S. Robson. 1985. Statistical inference from band recovery data: a handbook, 2nd ed. U. S. Fish and Wildl. Serv. Res. Publ. 156, Washington, D. C. 305pp.
Burnham, K. P., J. L. Laake, and D. R. Anderson. 1980. Estimation of density from line tran-sect sampling
of biological populations. Wildl. Monogr. 72:1-202.
Burnham, K. P., D. R. Anderson, G. C. White, C. Brownie, and K. H. Pollock. 1987. Design and analysis methods for
fish survival experiments based on release-recapture. Am. Fish. Soc. Monogr. 5:1-437.
Burnham, K. P. 1993. A theory for combined analysis of ring recovery and recapture data. Pages 199-213 in J.-
D. Lebreton and P. M. North, eds. Marked Individuals in the Study of Bird Popula-tion. Birkhauser Verlag,
Basel, Switzerland.
Chao, A. 1988. Estimating animal abundance with capture frequency data. J. Wildl. Manage. 52:29 300.
Chao, A. 1989 Estimating population size for sparse data in capture-recapture experiments. Biometrics 45:427-
438.
Chao, A., S. M. Lee, and S. L. Jeng.1998. Estimation population size for capture-recapture data when capture probabilities vary by time and individual animal. Biometrics.
Hudson, D. J. 1971. Interval estimation from the likelihood function. J. R. Stat. Soc. B 33:256-262.
Krebs, C. J. 1989. Ecological methodology. Harper and Row, Publ., New York. 654pp.
Laake, J. L., S. T. Buckland, D. R. Anderson, and K. P. Burnham. 1994. DISTANCE User's Guide. Colorado Cooperative Fish & Wildlife Research Unit, Colorado State University, Fort Collins, CO. 84 pp.
Lebreton, J.-D., K.P. Burnham, J. Clobert, and D.R. Anderson. 1992. Modeling survival and testing biological hypotheses using marked animals: case studies and recent advances. Ecol. Monogr. 62:67-118.
Otis, D.L., Burnham, K.P.,White, G.C.,Anderson, D.R. 1978. Statistical inference from cap-tured data on
closed animal populations. Wildlife Monographs nº 62. The Wildlife Society. 135 pp.
Pollock, K. H., and M. C. Otto. 1983. Robust estimation of population size in closed animal populations
from capture-recapture experiments. Biometrics 39:1035-1049.
Pollock, K. H., J. D. Nichols, C. Brownie, and J. E. Hines. 1990. Statistical inference for cap-ture-recapture

experiments. Wildl. Monogr. 107. 97pp.
Rexstad, E., and K. Burnham. 1991. User's guide for interactive program CAPTURE. Colorado Coop. Fish and
Wildl. Res. Unit, Colorado State University, Fort Collins. 29pp.
Seber, G. A. F. 1982. The estimation of animal abundance and related parameters, 2nd ed. Macmillan, New
York, NY.
Wheelan, J. 1993. Wildlife management (apuntes de clase). Dpt. Of Environmental Resource Management.
Faculty of Agriculture. Univesity College, Belfield, Dublin.
White, G. C., Anderson, D. R., Burnham, K. P., Otis, D. L. 1982. Capture-recapture and re-moval methods
for sampling closed populations. Los Alamos Nat. Lab. Report LA-8787-NERP, Los Alamos, New Mexico. 235pp.

Methodology

General clarifications on the methodology (optional)

Students will have all the class materials in English and Spanish.

Methodological adaptations for part-time students and students with disabilities and special educational needs

Most of material will be provided in moodle platform, and could be adapted to educational needs.

Face-to-face activities

Activity	Large group	Total
Assessment activities	2	2
Field trips	5	5
Information processing activities	6	6
Projects based on the course contents	27	27
Total hours:	***40***	***40***

Off-site activities

Activity	Total
Exercise and problem solving activities	14
Information processing activities	38
Information search activities	8
Total hours	***60***

Results of the training and learning process

Knowledge, competencies and skills

CB1 Knowledge of raw, scientific and technological materials which allow constant learning, as well as an capacity to adapt to new situations and changing surroundings

CB2 Capacity to resolve problems with creativity, initiative, methodology and critical reasoning

CB4 Capacity to search for the norms and regulations relevant to one´s present environment and put them into use.

CEC2 Capacity to learn, understand and utilize principles of: Zoology and Entomological Forestry.

Assessment methods and instruments

Intended learning outcomes	Attendance checklist	Examination	Means of practical execution	Oral means
CB1		X		
CB2			X	
CB4				X
CEC2	X	X	X	
Total (100%)	***10%***	***50%***	***20%***	***20%***
Minimum grade (*)	***5***	***4***	***5***	***5***

(*)Minimum mark (out of 10) needed for the assessment tool to be weighted in the course final mark. In any case, final mark must be 5,0 or higher to pass the course.

General clarifications on instruments for evaluation:

There will be just one final exam that could be passed by a previous exonerating exam.
Means of practical execution refer basically to solving problems. Oral means refer to presentations in the classroom.
Attendance sheets refer both to the classroom attendance and outdoor visit.
In case of failing the subject, the items passed are kept except for the exam, which be kept just within the same academic year.

Clarifications on the methodology for part-time students and students with disabilities and special educational needs:

Part-time students and students with disabilities and special educational needs will be excused to be evaluated of the instruments of evaluation that they communicate to the teacher(s) at the beginning of the course, except for the exam. To pass the module they should mark over 5 in the final exam. If possible, and after agreement with the teacher(s), those students could be evaluated by moodle facilities except for the outdoor visit.

Clarifications on the evaluation of the extraordinary call and extra-ordinary call for completion studies:

Students in these situations will be evaluated with a theoretical-practical exam. To pass the course they should mark over 5 on the exam. Marks obtained for those students in the rest of instruments of evaluation in previous years will be applied. In these extraordinary calls, the weight of the exam can arise up to 80% of the calification.

Qualifying criteria for obtaining honors:

The minimum criteria are marks rating over 9 in all the evaluation items. After having accomplished these criteria, the teacher(s) will decide to give it or not..

Sustainable development goals

Good health and well-being
Responsible consumption and production
Life below water
Life on land
Partnerships for the goals

The methodological strategies and the evaluation system contemplated in this Teaching Guide will respond to the principles of equality and non-discrimination and must be adapted according to the needs presented by students with disabilities and special educational needs in the cases that are required. Students must be informed of the risks and measures that affect them, especially those that may have serious or very serious consequences (article 6 of the Safety, Health and Welfare Policy; BOUCO 23-02-23).