

2010-2011 Course Catalog

The University Of Montana

Wildlife Biology

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Daniel H. Pletscher, Professor, Wildlife Biology Director

Wildlife Biology is the study of wild animals, their habitats, and their conservation. The Bachelor of Science in Wildlife Biology degree constitutes the preprofessional training for future employment in wildlife biology and management, and provides an excellent background in general ecology. The educational requirements for certification by The Wildlife Society can be met within the framework of the undergraduate program.

While employment opportunities do exist in wildlife conservation for students with the baccalaureate degree, many students plan to continue their education through the master's degree to qualify for wildlife management or research positions.

Three optional curricula are offered in the Wildlife Biology Program: terrestrial, aquatic, and honors. All three options follow the same schedule of courses for the freshman and most of the sophomore year, then pursue different curricula for the last two years. Each leads to a B.S. in Wildlife Biology. The University is well-suited for instruction in wildlife biology because of the excellent opportunities for field instruction and research, and the presence of such facilities as the Lubrecht Experimental Forest, Yellow Bay Biological Station at Flathead Lake, the Montana Forest and Conservation Experiment Station, the Montana Cooperative Wildlife Research Unit, and the Theodore Roosevelt Memorial and Bandy ranches.

High School Preparation: In addition to general University admission requirements, the student should elect four years of mathematics and three years of science, including biology, chemistry and physics.

Special Degree Requirements

Refer to graduation requirements listed previously in the catalog. See index.

The Upper-division Writing Expectation must be met by successfully completing BIOE 371 (BIOL 341) and two courses selected from BIOO 470, 475, 320, (BIOL 304, 306, 316), BIOE 428 (BIOL 366), WBIO 408, 470, 497 (senior thesis). The student must complete the requirements for one of the options indicated below. A reading knowledge of a modern foreign language is suggested for students electing preparation for graduate work leading to a doctorate.

To obtain the B.S. in Wildlife Biology, the student must have a 2.5 grade point average or higher in all courses taken at The University of Montana.

Suggested sequence subject to frequent change. Some courses are offered more than one semester/year.

Terrestrial and Aquatic Options

First Year	Credits
BIOB 160N (BIOL 110N) Principles of Living Systems 4	
CHMY 121N (CHEM 151N) Introduction to General Chemistry 3	
CHMY 123N (CHEM 152N) Introduction to Organic and Biochem 3	
CHMY 124N (CHEM 154N) Introduction Organic & Biochem Laboratory 2	
WRIT 101 (ENEX 101) College Writing I 3	
WBIO 180 Careers in Natural Resources 2	
M 162 (MATH 150) Applied Calculus 4	
Electives and General Education 8-14	

Summer	Credits
Experiential Learning 2 (For a list of options, see the Wildlife Biology Office.)	

Second Year	Credits
BIOB 260 (BIOL 221) Cellular and Molecular Biology 4	
BIOB 275 (BIOL 223) General Genetics 4	
BIOO 335 (BIOL 350)* Rocky Mountain Flora 3	
COMM 111A Introduction to Public Speaking 3	
STAT 216 (MATH 241) Statistics or WBIO 240 Introduction to Biostatistics 3-4	
WRIT 222 (FOR 220) Technical Approach to Writing or WBIO 245 Science Writing or WRIT 201 (ENEX 200) College Writing II 2-3	
Electives and General Education 11-15	
*BIOO 335 (BIOL 350) is not required for the Aquatic option	

Terrestrial Option

Third Year	Credits
Two of the following:	
BIOO 370 (BIOL 304) Ornithology and Lab 4	
BIOO 475 (BIOL 306) Mammalogy 4	
BIOO 340 (BIOL 308) Biology and Management of Fishes 4	

And one of the following

FOR 347 Multiple Resource Silviculture 3

FOR 360 Range Management 3

And

BIOE 370 (BIOL 340) General Ecology 3

BIOE 371 (BIOL 341) General Ecology 2

Lab

WBIO 370 Wildlife Habitat Conservation 3

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Fourth Year

Credits

WBIO 446 Wildlife Physiological Ecology 3

WBIO 470 Conservation of Wildlife Populations 3

WBIO 494 Senior Seminar 1

WBIO 480 The Upshot: Applied Wildlife Management 3

And one of the following

WBIO 410 Wildlife Policy and Biopolitics 3

FOR 422 Natural Resources Policy and Administration 3

Electives and General Education 16-22

Aquatic Option

Third Year

Credits

BIOO 340 (BIOL 308) Biology and Management of Fishes 4

BIOE 370 (BIOL 340) Ecology 3

BIOE 371 (BIOL 341) Ecology Lab 2

BIOE 428 (BIOL 366) Freshwater Ecology and Lab 5

BIOM 427/428 (BIOL 400-401) General Parasitology and Laboratory OR BIOE 406 (BIOL 406) Behavior and Evolution OR BIOO 462 (BIOL 410) Entomology 4

WBIO 446 Wildlife Physiological Ecology 3

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Fourth Year

Credits

WBIO 494 Senior Seminar 1

BIOO 320 (BIOL 316) General Botany 5

WBIO 408 Advanced Fisheries Science 3

FOR 385 Watershed Hydrology 3

WBIO 480 The Upshot: Applied Wildlife 3
Management

And one of the following

WBIO 410 Wildlife Policy and Biopolitics 3

FOR 422 Natural Resource Policy and 3
Administration

Electives and General Education 12-18

Wildlife Biology Honors Emphasis

The honors curriculum is designed particularly for students with strong academic records who intend to do graduate work. Entrance into this emphasis is open only to students who, at the beginning of the junior year of the wildlife biology program, have a grade-point average of 3.5 or above and who petition the faculty for entrance.

Honors students must complete either WBIO 370, 470 and 494 (terrestrial option) or BIOO 340 (BIOL 308), BIOE 428 (BIOL 366) and WBIO 494 (aquatic option). Honors students are encouraged to enroll also in WBIO 497 Senior Thesis. The balance of the coursework for the junior and senior years will be developed in consultation with the honors student's faculty advisor and committee appointed by the director of the wildlife biology program.

All students in the honors emphasis are required to meet with their faculty advisor prior to autumn semester registration of their junior and senior years to work out their course schedules.

Requirements for a Minor

To earn a minor in wildlife biology, the student must successfully complete the following coursework: BIOB 170N, 171N (BIOL 108N, 109N), BIOO 101N (BIOL 201N), BIOO 335 (BIOL 350), FOR 275, FOR 330 or 360, WBIO 105, 180.

Courses

U = for undergraduate credit only, UG = for undergraduate or graduate credit, G = for graduate credit. R after the credit indicates the course may be repeated for credit to the maximum indicated after the R. Credits beyond this maximum do not count toward a degree.

Wildlife Biology (WBIO)

U 105N Wildlife and People 3 cr. Offered autumn. Intended for non-wildlife majors. Interactions of wildlife and people in today's society.

U 170 Fish Interest Group 1 cr. Offered autumn. Discussion section for incoming students who do not qualify for freshman interest group in Wildlife Biology.

U 171 Wildlife Interest Group 1 cr. Offered autumn. Discussion section for incoming students who do not qualify for freshman interest group in Wildlife Biology.

U 180 Careers in Natural Resources 2 cr. Offered autumn and spring. Same as FOR 180, RECM 180. Subject matter and fields of study within natural resources

management. Topics include forestry, wildlife biology, range, water, recreation management, forest products production and other areas of opportunity for students seeking careers in natural resources.

U 195 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 240 Introduction to Biostatistics (Honors) 3 cr. Offered autumn even-numbered years. Prereq., calculus and consent of instr. Same as BIOB 240 (BIOL 240). Introduction to statistical ecology: distributions, hypothesis testing, and fitting models to data with emphasis on problems in ecological sampling.

U 245 Science Writing 3 cr. Offered spring. Prereq., WRIT 101 (ENEX 101) or equiv. and sophomore standing. Discussion of different types of science writing and focus on methods to achieve more fluent prose. Includes material on logic, inference, and developing arguments that rely on data.

U 295 Special Topics Variable cr. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

UG 370 Wildlife Habitat Conservation and Management 3 cr. Offered autumn and spring. Prereq., junior standing in wildlife biology, an ecology class, or consent of instr. Application of principles of wildlife biology to conservation and management of wild bird and mammal habitats including field applications.

UG 373 Wildlife Techniques 2 cr. Offered spring. Prereq., any statistics course; one 300-level ecology or wildlife biology course. Lab and field oriented class in commonly-used wildlife research and management techniques.

U 374 Hunter Check Stations 1 cr. (R-2) Offered autumn. Students learn techniques for determining species, age and sex of game animals, then work 3-5 days as volunteers at hunter check stations operated by management agencies.

U 395 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

U 396 Independent Study Variable cr. (R-6) Offered every term.

U 398 Internship Variable cr. (R-6) Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

UG 408 Advanced Fisheries Science 3 cr. Offered spring. Prereq., WBIO/BIOO 340 (BIOL 308). Quantitative analysis and interpretation of fish populations and community data for use in management. Selection, application and evaluation of management techniques.

UG 410 Wildlife Policy and Biopolitics 3 cr. Offered autumn. Overview of the laws affecting wildlife and how those laws are initiated, implemented, and enforced; impact of politics, interest groups, and agency jurisdictions.

UG 441 Experiential Learning for Fish Biology and Management 1-4 cr. Offered autumn and spring. Prereq., BIOO 340 (BIOL 308); consent of instr. Internship with practicing

biologists to learn techniques for evaluating and managing aquatic habitats and fish populations.

UG 446 Wildlife Physiological Ecology 3 cr. Offered autumn. Same as BIOE 446 (BIOL 446). Prereq., BIOB 260/261 (BIOL 221), BIOB 275 (BIOL 223) and BIOE 370/371 (BIOL 340). How physiological and biochemical processes in animals influence behavior and ecology. Application of physiological approaches to wildlife conservation such as assessment of animal health, nutritional condition, and physiological performance.

UG 460 International Wildlife Conservation Issues 2 cr. Offered spring. Prereq., a course in wildlife biology and/or conservation biology. Review of major international wildlife conservation issues with emphasis on the social context of the issues and applied solutions.

UG 470 Conservation of Wildlife Populations 3 cr. Offered autumn and spring. Prereq., 300-level animal ecology class and senior standing. Application of population ecology principles and theory to the conservation and management of wildlife populations.

UG 472 Wildlife Handling and Chemical Immobilization 2 cr. Offered spring. Principles of Wildlife chemical immobilization for researchers and managers. Ethical and legal issues, field organization, animal care and handling, immobilizing drugs, drug delivery systems, animal monitoring and veterinary emergencies. No labs.

UG 480 The Upshot: Applied Wildlife Management 3 cr. Offered spring. Designed for students to apply their knowledge in the development of wildlife management planning.

UG 494 Senior Wildlife Seminar 1 cr. Offered autumn and spring. Prereq., senior standing in wildlife biology or consent of instr. Analysis and discussion led by students of current topics in wildlife biology.

UG 495 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, new courses, or one-time offerings of current topics.

U 496 Independent Study Variable cr. (R-10) Offered every term. Prereq., consent of instr. Original investigations or problems not related to student's thesis.

U 497 Senior Thesis 1-3 cr. (R-6) Offered autumn and spring. Prereq., consent of instr.; senior standing. Preparation of major paper based on study or research of a topic selected with an advisor according to needs and objectives of student.

U 498 Internship 1-6 cr. Offered every term. Prereq., consent of department. Extended classroom experience that provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

G 540 Research Design 3 cr. Offered spring odd-numbered years. Prereq., introductory statistics course or consent of instr. Examination of study designs for experiments, quasiexperiments, observational studies, and sampling surveys with an emphasis on application.

G 542 Current Issues in Biometrics 1 cr. (R-3) Offered every term. Prereq., introductory statistics course or consent of instr. Exploration of current topics in biometrics through discussions, student presentations, and analysis.

G 560 Landscape Conservation 3 cr. Offered spring. Examination of how various spatial and temporal scales influence wildlife and their habitats.

G 562 Wildlife Habitat Modeling 3 cr. Offered autumn, odd years. Prereq., consent of instr. A survey of theory and applications in the study of resource selection by animals.

G 563 Advanced Topics in Habitat Ecology 1 cr. (R-10) Offered every term. Prereq., consent of instr. Discussion of recent scientific papers on advances in ecology, conservation, and population dynamics as related to habitat ecology and conservation. WBIO 562 or equivalent strongly recommended.

G 564 Scientific Writing for Publication 3 cr. Offered spring, even years. Exploration of the major components and process of scientific writing within the field of Wildlife Biology, primarily focusing on research proposals and peer-review publications.

G 568 Advanced Topics in Aquatic Ecology Variable cr. (R-10) Offered every term. Prereq., consent of instr. Review and synthesis of the scientific literature current issues and analyses in aquatic ecology. We assume a general understanding of fish biology, aquatic ecology, as well as a background in population, community and ecosystem ecological concepts.

G 570 Applied Population Ecology 3 cr. Offered spring even-numbered years. Prereq., courses in ecology, statistics, and calculus. Application of advanced population ecology tools and concepts to the evaluation of human perturbations on wildlife populations. Topics include methods to detect declining trends, the interacting components of population viability analysis, and identification of strategies to reverse declines.

G 572 Model Selection and Inference 3 cr. Offered autumn odd-numbered years. Prereq., one semester of 400-level statistics/biometry or consent of instr. Comparison and overview of statistical approaches commonly used in applied ecology, including frequentist/ANOVA models, information theoretic and Bayesian methods.

G 575 Frontiers in Conservation Research 2 cr. (R-6) Offered intermittently. Prereq., upper-level course in conservation genetics or populations genetics. Same as BIOB 575 (BIOL 575). Exploration of current topics in conservation biology with emphasis on genetic issues in conservation.

G 576 Ecological Modeling and Analysis 2-3 cr. Offered intermittently. Prereq., consent of instr. Investigation of mathematical and statistical problems in ecology and wildlife biology. Specific material each semester is determined by student interest.

G 580 Readings in Population Dynamics 1 cr. (R-6) Offered autumn and spring. Prereq., consent of instr. Discussion of recent papers on interface of population dynamics, ecological interactions, and wildlife management.

G 594 Graduate Seminar in Wildlife Biology 1 cr. (R-3) Offered autumn and spring. Prereq., graduate standing in wildlife biology or consent of instr. Analysis of selected problems in wildlife biology and conservation.

G 595 Special Topics Variable cr. (R-12) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

G 596 Independent Study Variable cr. (R-10) Offered every term. Prereq., graduate standing and consent of instr. Original investigations or problems not related to student's thesis.

G 597 Research Variable cr. Offered every term. Prereq., graduate standing in wildlife biology or consent of instr. Graded pass/not pass only.

G 599 Professional Paper Variable cr. (R-6) Offered every term. Prereq., graduate standing in wildlife biology and consent of instr. Professional paper written in the area of the student's major interest based on either primary or secondary research. Subject matter must be approved by graduate committee. Graded pass/not pass only.

G 697 Research 1-15 cr. (R-15) Offered every term.

G 699 Thesis Variable cr. (R-10) Offered every term. Prereq., graduate standing in wildlife biology. Preparation of thesis.