WILDLIFE RESOURCES (WLF)

WLF 102 The Fish and Wildlife Professions (1 credit)
Cross-listed with FISH 102
Orientation of students to the profession of fishery resources and wildlife resources: introduction to fish and wildlife faculty, review of fish and wildlife curriculum, awareness of career opportunities, employment procedures, associated job duties/responsibilities, job preparation, educational preparation, and management challenges in the Pacific Northwest. (Fall only)

WLF 105 Hunter Education (1 credit)
The course provides an overview of hunter ethics; wildlife management, conservation, and survival; and wildlife laws and law enforcement. This course also fulfills the state requirement for hunter education for purchase of a hunting license. Course includes in-class instruction and one outdoor field day. Graded P/F.

WLF 200 (s) Seminar (1-16 credits)
Credit arranged

WLF 201 Fish and Wildlife Applications (2 credits)
This course will introduce students to research and monitoring methods; data analysis and report writing in fish and wildlife sciences; potential state, federal and tribal employers; and management challenges for fish and wildlife populations and habitats. The course will include an off campus experiential learning field trip and activities with professional mentors.
Prereqs: NR 101 or Permission

WLF 203 (s) Workshop (1-16 credits)
Credit arranged

WLF 204 (s) Special Topics (1-16 credits)
Credit arranged

WLF 205 Wildlife Law Enforcement (2 credits)
This course will provide students with an introduction to the history of wildlife laws and the role of a Conservation Officer. It will also provide students with a better understanding of wildlife crimes and the impact they have on fish and wildlife. This course is designed for students seeking a career in wildlife law enforcement as well as those pursuing a career in wildlife/fisheries/habitat management.

WLF 220 Principles of Ecology (3 credits)
Cross-listed with FOR 221, REM 221
Principles of ecology and their relevance to management of natural resources. Major topics include plant and wildlife population, community, ecosystem, and landscape level processes and how these processes interact with the environment. Exploration of how ecosystems are affected by humans and global change. Introduction to the types of questions asked by ecologists, the principal concepts and theories that guide ecological inquiry, and the methods that are used to answer ecological questions. Both terrestrial and aquatic systems are considered. Typically Offered: Spring.
Prereqs: BIOL 102/BIOL 102L or BIOL 114 or BIOL 115 or PLSC 205; or Permission.

WLF 299 (s) Directed Study (1-16 credits)
Credit arranged

WLF 314 Ecology of Terrestrial Vertebrates (3 credits)
Ecology and natural history of birds, mammals, reptiles, and amphibians. Typically Offered: Fall.
Prereqs: FOR 221, REM 221, WLF 220 or BIOL 314

WLF 315 Techniques Laboratory (2 credits)
Techniques associated with wildlife research and local habitats and areas where wildlife species are present. Three hours of lab per week. One weekend field trip required. Two additional animal trapping sessions also required. (Fall only)
Prereqs or Coreqs: WLF 314

WLF 370 Management and Communication of Scientific Data (3 credits)
Students will learn skills to analyze, manage, and present scientific data in the fish and wildlife field. Analyses will be conducted in R, spreadsheets, and basic data management software. Data summaries will include graphical and tabular presentation. Written presentation of scientific information will include organization, grammar, and citation formats appropriate for scientific reports.

WLF 371 Physiological Ecology of Wildlife (2 credits)
Study of how biotic and abiotic components of the environment influence animal physiology, and how the physiology of animals influences their ecology (e. g. , behavior, distribution, etc.). Major topics include energetics, thermal ecology, nutritional ecology, reproductive physiology, locomotion and movement, and adaptations to extreme environments. (Spring only)
Prereqs: BIOL 213

WLF 398 (s) Renewable Natural Resources Internship (1-16 credits)
Credit arranged Supervised field experience with an appropriate public or private agency. Required for cooperative education students. Graded P/F.
Prereqs: Department Permission

WLF 400 (s) Seminar (1-16 credits)
Credit arranged
Prereqs: Permission

WLF 403 (s) Workshop (1-16 credits)
Credit arranged

WLF 404 (s) Special Topics (1-16 credits)
Credit arranged

WLF 411 Wildland Habitat Ecology and Assessment (2 credits)
Cross-listed with REM 411
Joint-listed with REM 511, WLF 511
This course integrates theoretical concepts with field sampling related to scientific research, wildlife habitat, and land management practices. Students collect, analyze, and report on ecological data in various formats, and learn specific protocols used by professionals to assess wildlife habitat. Class field trips are required for on-campus students, and alternative field assignments will be required for remote, online students. Additional assignments required for graduate credit. Recommended preparation: REM 252 and REM 253, REM 341, or other plant identification class; introductory statistics course; ability to use excel. Co-enrollment in REM 410 is recommended. Typically Offered: Varies.

WLF 412 Wildlife Tracks and Sign I (1 credit)
Joint-listed with WLF 512
Students will learn to identify wildlife signs and tracks. This course is intended for ecologists, naturalists, and others who wish to have a deeper understanding of the behavior of terrestrial animals in terms of the habitats they frequent, what and where they feed, den and bedding locations, and other activities. This course includes an introduction to animal sign and tracking and focuses on tracking canids, felids and ungulates. Additional work required for graduate credit. Typically Offered: Summer.

WLF 413 Wildlife Tracks and Sign II (1 credit)
Joint-listed with WLF 513
Students will learn to identify wildlife signs and tracks. This course is intended for ecologists, naturalists, and others who wish to have a deeper understanding of the behavior of terrestrial animals in terms of the habitats they frequent, what and where they feed, den and bedding locations, and other activities. This course focuses on tracking bears, birds, reptiles, amphibians, and medium and small mammals not covered in Wildlife Tracks and Sign I. Additional work required for graduate credit. Typically Offered: Summer.
Prereqs: WLF 412

WLF 414 Wildlife Tracks and Sign III (1 credit)
Joint-listed with WLF 514
This course focuses on advanced wildlife tracking using scats, pellets and other animal sign. Students will also learn to age tracks and sign and evaluate animal gaits. Additional work required for graduate credit. Typically Offered: Summer.
Prereqs: WLF 412

WLF 418 Wildlife Monitoring (1 credit, max 5)
Experiential learning course that provides students with field skills for monitoring of wildlife. A multi-day field trip and extensive walking is expected. Graded Pass/Fail.

WLF 440 Conservation Biology (3 credits)
Patterns of biological diversity; factors producing changes in diversity; values of diversity; management principles applied to small populations, protected area and reserve design, landscape scale conservation, biotic integrity, restoration, and conservation law and policy. Typically Offered: Fall and Summer.
Prereqs: FOR 221, REM 221, WLF 220, or BIOL 314 or Permission

WLF 448 Fish and Wildlife Population Ecology (4 credits)
Dynamics of animal populations resulting from balance between birth, death, and movement processes; quantitative methods for measuring distribution, abundance, survival and population growth; competition, predation, and self-regulation; viability and management of fish and wildlife populations. Three lectures and one lab per week. One weekend field trip required. Typically Offered: Spring.
Prereqs: STAT 251; and MATH 143, MATH 160 or MATH 170

WLF 473 ECB Senior Presentation (1 credit)
General Education: Senior Experience
Cross-listed with FISH 473, FOR 473
, FSP 473, NRS 473, REM 473. Reporting and presenting the senior project (thesis or internship); taken after or concurrently with REM 497. Serves as the senior capstone course for Ecology and Conservation Biology (ECB).
Prereqs: Instructor Permission

WLF 482 Ornithology (4 credits)
Evolution, systematics, distribution, identification, and biology of birds, including current conservation efforts. Two days of field trips required. (Spring only)
Prereqs: BIOL 114 and BIOL 115

WLF 483 Senior Project Presentation (1 credit)
Cross-listed with FISH 483
Reporting and presenting the senior project (thesis or internship); taken after or concurrently with WLF 485 or WLF 497.

WLF 485 Ecology and Conservation Biology Senior Project (1-3 credits, max 3)
Cross-listed with FOR 485 and NRS 485
Scholarly work; learning objectives include development and formal proposal of a specific project and conducting the project or research with the guidance of a faculty mentor.

WLF 492 Wildlife Management (4 credits)
General Education: Senior Experience
Review of social and biological context for current practice of wildlife management including a hands on wildlife management project. Three lectures and one lab per week; two days of field trips. (Spring only)
Prereqs: WLF 314, Senior standing Prereqs or
Coreqs: WLF 448

WLF 497 Senior Thesis (1-3 credits, max 6)
Preparation of thesis, exhibition, video, computer program, multimedia program, or other creative presentation based on research conducted under the guidance of a faculty mentor.
Prereqs: Cumulative GPA of at least 3. 2 in all college courses, completion of at least 90 credits, and Permission of a faculty mentor.

WLF 499 (s) Directed Study (1-16 credits, max arranged)
Credit arranged. For the individual student; conferences, library, field, or lab work.
Prereqs: Senior standing, 2. 5 GPA, and Permission

WLF 500 Master's Research and Thesis (1-16 credits)
Credit arranged

WLF 501 (s) Seminar (1-16 credits, max arranged)
Credit arranged. Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Graded Pass/Fail.
Prereqs: Permission

WLF 502 (s) Directed Study (1-16 credits)
Credit arranged

WLF 503 (s) Workshop (1-16 credits)
Credit arranged. Selected topics in the conservation and management of wildlife.

WLF 504 (s) Special Topics (1-16 credits)
Credit arranged. New selected topics in the conservation and management of wildlife.

WLF 505 (s) Professional Development (1-16 credits)
Credit arranged

WLF 506 (s) External Speakers (1 credit, max 6)
Students will attend (or view recorded) seminars of fish and wildlife researchers and managers invited to present in our departmental seminar series. Students will read papers of external speakers, lead discussions of papers, and assist with hosting speakers. Graded P/F.

WLF 511 Wildland Habitat Ecology and Assessment (2 credits)
Cross-listed with REM 511
Joint-listed with REM 411, WLF 411
This course integrates theoretical concepts with field sampling related to scientific research, wildlife habitat, and land management practices. Students collect, analyze, and report on ecological data in various formats, and learn specific protocols used by professionals to assess wildlife habitat. Class field trips are required for on-campus students, and alternative field assignments will be required for remote, online students. Additional assignments required for graduate credit. Recommended preparation: REM 252 and REM 253, REM 341, or other plant identification class; introductory statistics course; ability to use excel. Co-enrollment in REM 410 is recommended. Typically Offered: Varies.

WLF 512 Wildlife Tracks and Sign I (1 credit)
Joint-listed with WLF 412
Students will learn to identify wildlife signs and tracks. This course is intended for ecologists, naturalists, and others who wish to have a deeper understanding of the behavior of terrestrial animals in terms of the habitats they frequent, what and where they feed, den and bedding locations, and other activities. This course includes an introduction to animal sign and tracking and focuses on tracking canids, felids and ungulates. Additional work required for graduate credit. Typically Offered: Summer.

WLF 513 Wildlife Tracks and Sign II (1 credit)
Joint-listed with WLF 413
Students will learn to identify wildlife signs and tracks. This course is intended for ecologists, naturalists, and others who wish to have a deeper understanding of the behavior of terrestrial animals in terms of the habitats they frequent, what and where they feed, den and bedding locations, and other activities. This course focuses on tracking bears, birds, reptiles, amphibians, and medium and small mammals not covered in Wildlife Tracks and Sign I. Additional work required for graduate credit. Typically Offered: Summer.
Prereqs: WLF 412

WLF 514 Wildlife Tracks and Sign III (1 credit)
Joint-listed with WLF 414
This course focuses on advanced wildlife tracking using scats, pellets and other animal sign. Students will also learn to age tracks and sign and evaluate animal gaits. Additional work required for graduate credit. Typically Offered: Summer.
Prereqs: WLF 412

WLF 516 Wildlife Genetics Lab Experience (1 credit)
Joint-listed with WLF 416
Hands on training in the basic procedures in molecular biology that have applications in wildlife ecology and conservation. Graduate students must complete an independent project. Typically offered: Fall.

WLF 521 Communicating Science Broadly (2 credits)
Communicating science in a clear, compelling way is critical for being an effective scientist. The purpose of this course is to master techniques that will help students communicate clearly and effectively to a diversity of audiences. This course will focus on developing oral and visually-rich products (e. g. , infographics, video shorts, research interviews, message boxes) that students can use to promote their research and science broadly. The course will focus on techniques for clear communication of science regardless of the medium used (e. g. , Twitter, vlog, etc.). Typically Offered: Varies. Cooperative: open to WSU degree-seeking students.

WLF 522 Community Ecology (2 credits)
Cross-listed with FISH 521
Introduction to literature and contemporary research into processes structuring ecological communities. Topics will encompass community-level patterns and processes in a range of ecological systems at local, regional, and global scales, including community impacts on ecosystem processes. Recommended preparation: Introductory level ecology courses.

WLF 530 Riparian Ecology (2 credits)
This course examines the ecology of streamside and floodplain systems from the perspective of habitat, landscape, and community ecology, conservation, and management. The course is structured as a combination of readings, discussions, lectures, and assignments. Recommended preparation: Introductory-level ecology courses.

WLF 540 Conservation Genetics (1-3 credits, max 3)
Basic principles of population genetics and phylogenetics and their applications to the field of conservation and natural resource management. Taught in three 1-credit modules, students can register for 1-3 credits. Module 1 includes introduction to conservation genetics and phylogenetics, module 2 includes population genetic theory and methods, and module 3 includes applications in conservation genetics and genomics. Cooperative: open to WSU degree-seeking students. (Spring, alt/years)

WLF 545 Wildlife Habitat Ecology (2-3 credits)
Reading and discussion on habitat concepts, analyses, and applications. Students enrolled in the 3rd credit will complete additional readings and quantitative problem sets. Cooperative: open to WSU degree-seeking students.
Prereqs: WLF 492 or Permission, animal and plant ecology

WLF 550 Quantitative Analysis of Fish and Wildlife Populations (2 credits)
Contemporary mathematical and statistical models central to fish and wildlife research and management, including capture-recapture, occupancy, resource selection, movement, population, growth, and hierarchical models. Typically Offered: Fall (Odd Years).
Prereqs: MATH 160 or equivalent, STAT 431 Cooperative: open to WSU degree-seeking students.

WLF 551 Applied Mixed Effects Modeling (2 credits)
Analysis of complex ecological data with mixed effects models and their various extensions. After a brief review of generalized linear modeling, students will gain practical experience in the use of linear and generalized linear modeling, students will gain practical experience in the use of linear and generalized linear mixed models to analyze hierarchical datasets (continuous, count, binary, etc.) that include inherent serial or spatial autocorrelation. Cooperative: open to WSU degree-seeking students. (Fall, alt/years)
Prereqs: STAT 431

WLF 552 Ecological Modeling (3 credits)
Theory and practice of modeling individuals, populations, and communities in heterogenous environments. Construction of spatially-explicit and aspatial models of individual behavior, fitness, population regulation, metapopulation dynamics, and species interactions. Analysis of stability, population viability, harvest, and conservation interventions. Computer-intensive use of R and MATLAB for simulation and parameter estimation. In consultation with instructor, each student will independently develop a novel model of their research system. Typically Offered: Fall (Odd Years).
Prereqs: STAT 431 and MATH 160 or permission Cooperative: open to WSU degree-seeking students.

WLF 555 Statistical Ecology (3 credits)
Cross-listed with STAT 555
Stochastic models in ecological work; discrete and continuous statistical distributions, birth-death processes, diffusion processes; applications in population dynamics, population genetics, ecological sampling, spatial analysis, and conservation biology. Cooperative: open to WSU degree-seeking students. (Spring, alt/years)
Prereqs: MATH 451 or Permission

WLF 561 Landscape Genetics (2 credits)
Landscape genetics is an interdisciplinary field of study that evaluates how landscape and environmental features influence gene flow, population structure and local adaptation by integrating landscape ecology, population genetics, and spatial statistics. This course covers applications of landscape genetics that can improve our understanding of ecology, evolution, and management of wild populations. Recommended Preparation: Population genetics or conservation genetics, and multivariate or spatial statistics. Cooperative: open to WSU degree-seeking students. (Spring, alt/even years)

WLF 562 Landscape Genetics Lab (1-2 credits)
This optional lab course is a complement to WLF 561 Landscape genetics and should be taken concurrently. Students will learn to analyze and interpret landscape genetic datasets using a variety of methods. If taken for two credits, students will do a project analyzing landscape genetic data. Recommended Preparation: Population genetics or conservation genetics, and multivariate or spatial statistics. Cooperative: open to WSU degree-seeking students. (Spring, alt/even years)
Coreqs: WLF 561

WLF 575 Behavioral Ecology (2 credits)
Behavioral Ecology is the study of evolutionary causes and fitness consequences of behavioral decisions by animals. This course will explore theoretical and empirical approaches to understanding behavioral ecology across a diversity of species, with an emphasis on vertebrates. The format will include short lectures and facilitated discussions of primary literature. The course is open to graduate students and seniors with instructor permission. Cooperative: open to WSU degree-seeking students.

WLF 598 (s) Internship (1-16 credits)
Credit arranged

WLF 599 (s) Non-thesis Master's Research (1-16 credits)
Credit arranged. Research not directly related to a thesis or dissertation.
Prereqs: Permission

WLF 600 Doctoral Research and Dissertation (1-45 credits)
Credit arranged
Prereqs: Admission to the doctoral program in Natural Resources and Department Permission