WILDLIFE RESOURCES (WLF)

WLF 1020 The Fish and Wildlife Professions (1 credit)
Cross-listed with FISH 1020
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. Typically Offered: Fall.

WLF 1050 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 Pass/Fail.

WLF 2000 (s) Seminar (1-16 credits, max 99)
Credit arranged

WLF 2010 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 1010 or Permission

WLF 2030 (s) Workshop (1-16 credits, max 99)
Credit arranged

WLF 2040 (s) Special Topics (1-16 credits, max 99)
Credit arranged

WLF 2050 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 2200 Principles of Ecology (3 credits)
Cross-listed with FOR 2100, REM 2210
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 1020/BIOL 1020L or BIOL 1140 or BIOL 1150 or PLSC 2050; or Permission.

WLF 2990 (s) Directed Study (1-16 credits, max 99)
Credit arranged

WLF 3140 Ecology of Terrestrial Vertebrates (3 credits)
Ecology and natural history of birds, mammals, reptiles, and amphibians. Typically Offered: Fall.
Prereqs: FOR 2100, REM 2210, REM 2210, WLF 2200, or BIOL 3140

WLF 3150 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. Typically Offered: Fall. Prereqs or
Coreqs: WLF 3140

WLF 3700 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 3710 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. Typically Offered: Spring.
Prereqs: BIOL 2130

WLF 3980 (s) Renewable Natural Resources Internship (1-16 credits, max 99)
Credit arranged. Supervised field experience with an appropriate public or private agency. Required for cooperative education students. Graded Pass/Fail.
Prereqs: Department Permission

WLF 4000 (s) Seminar (1-16 credits, max 99)
Credit arranged
Prereqs: Permission

WLF 4030 (s) Workshop (1-16 credits, max 99)
Credit arranged

WLF 4040 (s) Special Topics (1-16 credits, max 99)
Credit arranged

WLF 4110 Wildland Habitat Ecology and Assessment (2 credits)
Cross-listed with REM 4110
Joint-listed with REM 5110, WLF 5110
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 2520 and REM 2530, REM 3410, or other plant identification class; introductory statistics course; ability to use excel. Co-enrollment in REM 4100 is recommended. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

WLF 4160 Wildlife Genetics Lab Experience (1 credit)
Joint-listed with WLF 5160
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. Graded Pass/Fail. Typically Offered: Fall.
Prereqs: Permission

WLF 4180 Wildlife Monitoring (1 credit)
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. Typically Offered: Varies.

WLF 4400 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 2100, REM 2210, WLF 2200, or BIOL 3140

WLF 4480 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 2510; and MATH 1143, MATH 1160, or MATH 1170

WLF 4730 ECB Senior Presentation (1 credit)
General Education: Capstone Experience
Cross-listed with FISH 4730, FOR 4730
, FSP 4730, NRS 4730, REM 4730. Reporting and presenting the senior project (thesis or internship); taken after or concurrently with REM 4970. Serves as the senior capstone course for Ecology and Conservation Biology (ECB).
Prereqs: Instructor Permission

WLF 4820 Ornithology (4 credits)
Evolution, systematics, distribution, identification, and biology of birds, including current conservation efforts. Two days of field trips required. Typically Offered: Spring.
Prereqs: BIOL 1140 and BIOL 1150

WLF 4830 Senior Project Presentation (1 credit)
Cross-listed with FISH 4830
Reporting and presenting the senior project (thesis or internship); taken after or concurrently with WLF 4850 or WLF 4970.

WLF 4850 Ecology and Conservation Biology Senior Project (1-3 credits, max 3)
Cross-listed with FISH 4850, NRS 4850
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 4920 Wildlife Management (4 credits)
General Education: Capstone 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. Typically Offered: Spring.
Prereqs: WLF 3140, Senior standing Prereqs or
Coreqs: WLF 4480

WLF 4970 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 4990 (s) Directed Study (1-16 credits, max 99)
Credit arranged For the individual student; conferences, library, field, or lab work.
Prereqs: Senior standing, 2. 5 GPA, and Permission

WLF 5000 Master's Research and Thesis (1-16 credits, max 99)
Credit arranged

WLF 5010 (s) Seminar (1-16 credits, max 99)
Credit arranged. Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Graded Pass/Fail.
Prereqs: Permission

WLF 5020 (s) Directed Study (1-16 credits, max 99)
Credit arranged

WLF 5030 (s) Workshop (1-16 credits, max 99)
Credit arranged. Selected topics in the conservation and management of wildlife. Cooperative: open to WSU degree-seeking students.

WLF 5040 (s) Special Topics (1-16 credits, max 99)
Credit arranged. New selected topics in the conservation and management of wildlife. Cooperative: open to WSU degree-seeking students.

WLF 5050 (s) Professional Development (1-16 credits, max 99)
Credit arranged

WLF 5060 (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 Pass/Fail.

WLF 5110 Wildland Habitat Ecology and Assessment (2 credits)
Cross-listed with REM 5110
Joint-listed with REM 4110, WLF 4110
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 2520 and REM 2530, REM 3410, or other plant identification class; introductory statistics course; ability to use excel. Co-enrollment in REM 4100 is recommended. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

WLF 5160 Wildlife Genetics Lab Experience (1 credit)
Joint-listed with WLF 4160
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. Graded Pass/Fail. Typically Offered: Fall.

WLF 5210 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 5220 Community Ecology (2 credits)
This course provides an 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 species interactions and community impacts on ecosystem processes. Recommended preparation: introductory ecology course. Typically Offered: Spring (Even Years). Prereqs or
Coreqs: Instructor permission

WLF 5300 Riparian Ecology (2 credits)
This course examines the ecology of stream-side 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. Typically Offered: Spring.

WLF 5400 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. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

WLF 5450 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.
Prereqs: WLF 4920, or Permission, animal and plant ecology Cooperative: open to WSU degree-seeking students.

WLF 5500 Statistical Distributions and their Applications in Ecology (2 credits)
Contemporary mathematical and statistical distributions central to analysis of ecological data. Students will gain an understanding of the characteristics of diverse distributions and their applications in ecological research. Graded Pass/Fail. Typically Offered: Fall (Odd Years).
Prereqs: MATH 1160 and STAT 4310, or equivalent Cooperative: open to WSU degree-seeking students.

WLF 5510 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 mixed models to analyze hierarchical datasets (continuous, count, binary, etc.) that include inherent serial or spatial autocorrelation. Typically Offered: Fall.
Prereqs: STAT 4310 Cooperative: open to WSU degree-seeking students.

WLF 5520 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 to simulate and analyze mathematical and algorithmic models. In consultation with instructor, each student will independently develop a novel model of their research system. Typically Offered: Fall (Odd Years).
Prereqs: STAT 4310 and MATH 1160, or permission Cooperative: open to WSU degree-seeking students.

WLF 5530 Reproducible Data Science (3 credits)
Students will learn best practices in data management and processing for reproducible science. The course will cover computational tools and techniques to effectively manage data throughout their life cycle, from the moment they get entered into a computer to the moment they are used in a published document. Software tools include spreadsheets for data entry; SQL relational databases for data management; R and the tidyverse for data cleaning, processing, analysis, and visualization; Git for version control of code scripts and data files; and the GitHub platform for code sharing and efficient collaboration. A basic familiarity with R is beneficial but not required. Typically Offered: Varies. Cooperative: open to WSU degree-seeking students.

WLF 5550 Statistical Ecology (3 credits)
Cross-listed with STAT 5550
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. (Spring, alt/years) Typically Offered: Spring.
Prereqs: MATH 4510 or Permission Cooperative: open to WSU degree-seeking students.

WLF 5610 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. Typically Offered: Spring (Even Years). Cooperative: open to WSU degree-seeking students.

WLF 5620 Landscape Genetics Lab (1-2 credits)
This optional lab course is a complement to WLF 5610 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. Typically Offered: Spring (Even Years).
Coreqs: WLF 5610 Cooperative: open to WSU degree-seeking students

WLF 5750 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 5980 (s) Internship (1-16 credits, max 99)
Credit arranged

WLF 5990 (s) Non-thesis Master's Resrch (1-16 credits, max 99)
Credit arranged. Research not directly related to a thesis or dissertation.
Prereqs: Permission

WLF 6000 Doctoral Research and Dissertation (1-45 credits, max 99)
Credit arranged
Prereqs: Admission to the doctoral program in Natural Resources and Department Permission