

FOREST AND WILDLIFE ECOLOGY (F&W ECOL)

F&W ECOL/ENVIR ST 100 – FORESTS OF THE WORLD

3 credits.

Ecology and conservation of a wide range of forests, from tropical rain and dry forests, boreal forests, to temperate forests, outside of the USA. The main threats to forests, and different strategies to solve conservation and sustainable management issues in international forestry. Trade-offs in forest conservation and management, resulting from different values that people place on forests, issues in equity and equality in access to forest resources. The role of forests in climate change and extinction of species.

Requisites: None

Course Designation: Breadth - Either Biological Science or Social Science

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Identify relevant stakeholders in forest landscapes across the world
Audience: Undergraduate

2. Give examples of conservation threats to forests in countries other than the USA and relevant solutions
Audience: Undergraduate

3. Communicate about evidence on forest conservation and threats rigorously, correctly, and under different formats
Audience: Undergraduate

4. Demonstrate, on specific examples, how trade-offs in forest conservation originate and work
Audience: Undergraduate

5. Explain the role of forests in solutions to climate change and species extinctions
Audience: Undergraduate

F&W ECOL 101 – ORIENTATION TO WILDLIFE ECOLOGY

1 credit.

Introduction to Wildlife Ecology and the profession of wildlife management/conservation. Emphasis on preparing for a successful career.

Requisites: Declared in Wildlife Ecology

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Describe opportunities to engage with faculty, staff, and students in the Department of Forest & Wildlife Ecology#

Audience: Undergraduate

2. Describe the skills of a successful college student and develop a plan for completing the wildlife ecology major

Audience: Undergraduate

3. Identify opportunities to gain additional skills and experience beyond the classroom

Audience: Undergraduate

4. Examine various career options and identify skills and attributes desired by employers#

Audience: Undergraduate

5. Identify resources and services available within the Department of Forest & Wildlife Ecology, CALS, and on the UW-Madison campus to help you achieve your academic and career goals

Audience: Undergraduate

6. Discuss complex issues in the field of wildlife ecology with peers and instructors

Audience: Undergraduate

7. Identify the value of multiple evidence-based perspectives in the field of forest and wildlife ecology#

Audience: Undergraduate

F&W ECOL 110 – LIVING WITH WILDLIFE - ANIMALS, HABITATS, AND HUMAN INTERACTIONS

3 credits.

A general survey of wildlife and wildlife conservation. Basic characteristics and management of wildlife populations and habitats. Human perceptions and interactions with wildlife. Current issues in wildlife management and conservation.

Requisites: None

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Discuss the ways in which humans interact with wildlife and how they influence our values and attitudes towards wildlife#
Audience: Undergraduate

2. List and describe the most significant events in the history of wildlife conservation in North America
Audience: Undergraduate

3. Explain the North American model for wildlife conservation and contrast it with wildlife conservation in other parts of the world
Audience: Undergraduate

4. Discuss the role that Aldo Leopold played in the development of the wildlife profession and the influence of his writings, including A Sand County Almanac
Audience: Undergraduate

5. Describe basic characteristics of animal populations and communities, and explain how populations increase or decrease#
Audience: Undergraduate

6. Describe the different types of terrestrial habitats and discuss ways in which they can be managed to enhance wildlife
Audience: Undergraduate

7. Discuss the most important and contentious issues relating to wildlife conservation#
Audience: Undergraduate

8. Describe the duties and responsibilities of wildlife professionals and the agencies and organizations that employ them
Audience: Undergraduate

9. Discuss the importance and impact of wildlife on human society
Audience: Undergraduate

F&W ECOL/C&E SOC/SOC 248 – ENVIRONMENT, NATURAL RESOURCES, AND SOCIETY

3 credits.

Introduces the concerns and principles of sociology through examination of human interaction with the natural environment. Places environmental issues such as resource depletion, population growth, food production, environmental regulation, and sustainability in national and global perspectives.

Requisites: None

Course Designation: Breadth - Social Science

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Describe and critique the role of social conditions and social change in shaping equities and disparities in environment, health, and community
Audience: Undergraduate

2. Place an understanding of local social conditions and change in the global context of rural and urban life, including political, ecological, economic, geographic, historical, and cultural dimensions
Audience: Undergraduate

3. Frame and conduct social science research
Audience: Undergraduate

4. Ethically apply research methods, such as qualitative, quantitative, historical, interdisciplinary, participatory, and action approaches, and evaluate findings
Audience: Undergraduate

5. Demonstrate leadership and collaboration skills for working with people from a diversity of backgrounds in professional and ethical ways that enable beneficial and regenerative relationships
Audience: Undergraduate

6. Demonstrate advanced verbal and written communication skills that are applicable in a professional setting
Audience: Undergraduate

7. Articulate the complex and intricate relationships between people and the planet by exploring the many stories that bind these two together in the US
Audience: Undergraduate

8. Describe how these social ecological relationships produce unequal health outcomes, life chances, and opportunities
Audience: Undergraduate

9. Identify the values and principles of environmental movements
Audience: Undergraduate

10. Evaluate how the climate change crisis exacerbates urgent and contemporary social problems
Audience: Undergraduate

11. Apply analytical skills in spatial, political economic, culture, and critical environmental analysis
Audience: Undergraduate

F&W ECOL 289 – HONORS INDEPENDENT STUDY

1-2 credits.

Research work for Honors students under direct guidance of a faculty member in an area of Forest and Wildlife Ecology. Students are responsible for arranging the work and credits with the supervising instructor.

Requisites: Consent of instructor

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2001

Learning Outcomes: 1. Develop critical, analytical, and independent thinking skills#

Audience: Undergraduate

2. Apply the scientific method and engage in constructive problem solving

Audience: Undergraduate

3. Demonstrate application of research skills and methodologies

Audience: Undergraduate

4. Effectively communicate findings

Audience: Undergraduate

F&W ECOL 299 – INDEPENDENT STUDY

1-3 credits.

Research work for students under direct guidance of a faculty member in an area of Forest and Wildlife Ecology. Students are responsible for arranging the work and credits with the supervising instructor.

Requisites: Consent of instructor

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2025

Learning Outcomes: 1. Develop critical, analytical, and independent thinking skills##

Audience: Undergraduate

2. Apply the scientific method and engage in constructive problem solving

Audience: Undergraduate

3. Demonstrate application of research skills and methodologies

Audience: Undergraduate

4. Effectively communicate findings#

Audience: Undergraduate

F&W ECOL 300 – FOREST MEASUREMENTS

4 credits.

Field measurements of trees and forests. Basic concepts of statistics and sampling as applied to forestry. Use of aerial photographs, GIS, and satellite imagery.

Requisites: None

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Demonstrate basic competency in the use of forest measurement equipment and technology#

Audience: Undergraduate

2. Calculate individual tree and stand parameters

Audience: Undergraduate

3. Estimate timber volume

Audience: Undergraduate

4. Apply basic statistics in forestry#

Audience: Undergraduate

5. Produce a simple forest inventory using a variety of sampling techniques

Audience: Undergraduate

6. Communicate the results of data collected in written form

Audience: Undergraduate

F&W ECOL 305 – FOREST OPERATIONS

2 credits.

Introduction to forestry operations in the implementation of forest plans, including site preparation, stand establishment, and harvesting systems. Analysis of costs and productivity, including system balance, marketing, timber procurement, and contractual services.

Requisites: F&W ECOL 300 or 410

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Identify the industrial products that come from our forests#

Audience: Undergraduate

2. Implement timber sale establishment and administration

Audience: Undergraduate

3. Describe the vast array of harvesting systems and their applications#

Audience: Undergraduate

4. Explain the importance of contract payment systems for the forest industry#

Audience: Undergraduate

5. Analyze transportation systems in the forest industry

Audience: Undergraduate

6. Discuss the application of ethics in forest management

Audience: Undergraduate

F&W ECOL 306 – TERRESTRIAL VERTEBRATES: LIFE HISTORY AND ECOLOGY

4 credits.

Life history, ecology, distribution, and taxonomy of reptiles, amphibians, birds, and mammals. Birds will receive less emphasis. Primary focus is on Wisconsin species, including conservation threats, but covers all major North American families, and surveys major groups of the world. Designed as a foundation for detailed study of vertebrates or to satisfy the need for a scientific introduction to Wisconsin vertebrates.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Provide examples of species for each major terrestrial vertebrate order, including basic life history information associated with each example

Audience: Undergraduate

2. Identify the geographic area where major terrestrial vertebrate orders reach their greatest abundance and the approximate number of extant species in each major order

Audience: Undergraduate

3. Compare and contrast key morphological, physiological, and behavioral differences that contribute to broad life history strategies among terrestrial vertebrate classes and that contribute to distinctions among selected finer scale taxa

Audience: Undergraduate

4. Compare and contrast the body plan, behavioral and physiological adaptations, geographic distribution, and traits contributing to abundance or rarity for terrestrial vertebrate species found in Wisconsin

Audience: Undergraduate

5. Identify and provide the scientific name of all mammals, reptiles, and amphibians in Wisconsin and identify and provide the common name of a subset of Wisconsin birds

Audience: Undergraduate

6. Identify, by sound, all Wisconsin anurans (frogs and toads) and a selection of birds

Audience: Undergraduate

7. Identify the majority of Wisconsin mammal species from the skull alone, or from a combination of skull plus skin

Audience: Undergraduate

F&W ECOL 318 – PRINCIPLES OF WILDLIFE ECOLOGY

3 credits.

Major environmental factors affecting wildlife; structure and behavior of wildlife populations; regional wildlife communities and their conservation.

Requisites: Declared in Wildlife Ecology

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Apply the scientific method to test ecological hypotheses and resolve wildlife management issues

Audience: Undergraduate

2. Describe and distinguish among the important properties of each ecological level of organization, including individual organisms, populations, communities, and ecosystems#

Audience: Undergraduate

3. Explain how animals balance between inputs and outputs of water, heat, energy, and nutrients to maintain homeostasis

Audience: Undergraduate

4. Explain how animals select habitats and food and adapt to seasonal changes#

Audience: Undergraduate

5. Use cost-benefit analysis to determine the environmental conditions under which animals are likely to defend territories or join social groups

Audience: Undergraduate

6. Define life history parameters that influence population growth and regulation and distinguish between exponential and logistic population growth

Audience: Undergraduate

7. Describe and distinguish among the different types of interspecific interactions and model how interspecific

Audience: Undergraduate

8. Describe the major types of ecological communities and how they vary in space and time

Audience: Undergraduate

F&W ECOL/ENVIR ST/ZOOLOGY 360 – EXTINCTION OF SPECIES

3 credits.

A comprehensive treatment of the ecology, causes, and consequences of species extinction. Ecology and problems of individual species, habitat alteration and degradation, socio-economic pressures and conservation techniques and strategies.

Requisites: Sophomore standing and ZOOLOGY/BIOLOGY/ BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), BIOLOGY/ BOTANY 130, or (BIOCORE 381 and 382)

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Describe the ecological and evolutionary processes shaping the distribution of species diversity globally

Audience: Undergraduate

2. Explain how human activities can threaten species with extinction

Audience: Undergraduate

3. Identify genetic problems and management in small populations

Audience: Undergraduate

4. Discuss social and political dimensions to conservation problems and solutions

Audience: Undergraduate

5. Identify the basic components of the US Endangered Species Act (ESA) and how the ESA has been applied to the conservation of species

Audience: Undergraduate

6. Evaluate and create conservation strategies for at-risk species

Audience: Undergraduate

F&W ECOL 375 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to undergraduate students.

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2026

F&W ECOL 379 – PRINCIPLES OF WILDLIFE MANAGEMENT

3 credits.

Ways of conserving desired numbers of animals for the overall best interests of society, be they aesthetic, ecological, economic, commercial or recreational; includes management of endangered species, exploited species, wildlife communities in nature reserves, and wildlife pests.

Requisites: F&W ECOL 318 or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Explain the history of wildlife management and conservation in North America.

Audience: Both Grad & Undergrad

2. Compare multiple stakeholder viewpoints demonstrating the ways in which human dimensions influence management decisions and outcomes.

Audience: Both Grad & Undergrad

3. Describe key policies governing wildlife management and conservation.

Audience: Both Grad & Undergrad

4. Apply the ecological principles that are used in biologically sound wildlife management and conservation plans to various scenarios.

Audience: Both Grad & Undergrad

5. Summarize management approaches for various groups of animals, including game, non-game, invasive, and rare/endangered animals.

Audience: Both Grad & Undergrad

6. Explain how different habitat types, including grasslands, forests, and wetlands, are managed to support the wildlife that depend on them.

Audience: Both Grad & Undergrad

7. Assess ways to approach wildlife management in the context of a changing global climate.

Audience: Both Grad & Undergrad

8. Synthesize and communicate advanced wildlife management concepts to an academic audience.

Audience: Graduate

F&W ECOL 390 – LEARNING TO ACTION: PROFESSIONAL DEVELOPMENT

1 credit.

Preparation for natural resources professions and the job market after graduation. Development of professional skills including communication, ethical decision-making, and conflict resolution. Experience in job searching, editing resumes, and interviewing for jobs.

Requisites: Declared in Forest Science

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Reflect on your internship experience, what you learned, and how it informs your professional future

Audience: Undergraduate

2. Understand opportunities and challenges in forestry and natural resources professions

Audience: Undergraduate

3. Improve your ability to find, apply, and interview for a job

Audience: Undergraduate

4. Improve your facilitation, communication, and conflict resolution skills

Audience: Undergraduate

5. Consider and articulate your desired long-term contributions to natural resources and society

Audience: Undergraduate

F&W ECOL 395 – DATA AND GIS TOOLS FOR ECOLOGY

3 credits.

Quantitative tools applicable to the investigation of ecological problems, including but not limited to, statistics, Geographic Information Systems (GIS), Remote Sensing, and spatial analysis. Overview of commonly used quantitative techniques in ecological sciences with an emphasis on GIS and spatial analysis. Introduces spatial tools and practical applications using ecological/environmental data sets.

Requisites: MATH 113, 114, 171, placement into MATH 221, or graduate/professional standing

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Describe ecological datasets spatially and statistically using data storage and Geographic Information Systems (GIS) tools

Audience: Undergraduate

2. Acquire and map spatially explicit ecological data using GIS tools

Audience: Undergraduate

3. Identify patterns in complex ecological data sets

Audience: Undergraduate

4. Conduct common statistical analysis of digitized ecological data (such as: description, correlation, univariate regression, and hypothesis testing)

Audience: Undergraduate

5. Critically evaluate the results of statistical analyses, including validation, of ecological datasets

Audience: Undergraduate

F&W ECOL 399 – COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION

1-8 credits.

An internship under guidance of a faculty or instructional academic staff member in Forest and Wildlife Ecology and an internship site supervisor. Students are responsible for arranging the work and credits with the faculty or instructional academic staff member and the internship site supervisor.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Workplace - Workplace Experience Course

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Summer 2025

Learning Outcomes: 1. Apply concepts learned in coursework to authentic professional situations

Audience: Undergraduate

2. Demonstrate professional skills appropriate for the industry

Audience: Undergraduate

3. Identify and reflect on how concepts learned in coursework apply to specific work settings and situations

Audience: Undergraduate

F&W ECOL 400 – STUDY ABROAD IN FOREST AND WILDLIFE ECOLOGY

1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses. Current enrollment in a UW-Madison study abroad program

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

F&W ECOL/BOTANY 402 – DENDROLOGY: WOODY PLANT IDENTIFICATION AND ECOLOGY

3 credits.

Identification, ecological characteristics, ranges, adaptations to environment, and uses of evergreen and deciduous woody plants, with emphasis on species native to Wisconsin; lab and field work.

Requisites: Sophomore standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Identify all native Wisconsin trees, some common shrubs and vines, and a few important woody exotics by common and scientific name, in summer or winter condition.

Audience: Both Grad & Undergrad

2. Demonstrate a basic understanding of wood structure and use a key to identify blocks of wood.

Audience: Both Grad & Undergrad

3. Recognize the characteristic tree taxa of some of the world's major forest types and some interesting examples of the diversity of trees and their adaptations to their environments.

Audience: Both Grad & Undergrad

4. Compare the morphology, life history, and ecology of woody species to their distribution and habits.

Audience: Both Grad & Undergrad

5. Understand how humans affect the composition, structure and economic value of tree communities and apply this information to questions about management of woody vegetation under changing conditions.

Audience: Both Grad & Undergrad

6. Compare at least two methods for learning to identify a plant species using evidence from your experience in this course.

Audience: Both Grad & Undergrad

7. Construct new materials to teach woody plant ID or tree management issues to a particular target audience.

Audience: Graduate

8. Survey current scientific literature on a particular topic relevant to management of woody vegetation under changing conditions, and summarize current knowledge and knowledge gaps. Recommend next steps in research to improve management.

Audience: Graduate

F&W ECOL 410 – SILVICULTURE: APPLIED FOREST ECOLOGY

3-4 credits.

Ecologically-based forest management principles and practices for sustainable timber production, maintenance or restoration of biological diversity, and maintenance of aesthetic quality and site productivity. Includes coverage of even-aged and uneven-aged management, reforestation principles, and ecological restoration techniques.

Requisites: ZOOLOGY/BOTANY/F&W ECOL 460, F&W ECOL 550, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Describe stand dynamics, including concepts of stand structure, function, establishment, growth, composition, health, and quality.

Audience: Both Grad & Undergrad

2. Explain the ecological underpinnings and technical considerations for common regeneration, establishment, and intermediate treatments that comprise modern silvicultural systems.

Audience: Both Grad & Undergrad

3. Develop data-driven, time- and space-bounded prescriptions for forest stands considering ecological, economic, and societal aspects of management decisions in an ethical context.

Audience: Both Grad & Undergrad

4. Communicate technical material using text, tables, graphs, and maps, including logical rationale supporting management decisions.

Audience: Both Grad & Undergrad

5. Create solutions to real-world forest management challenges by applying higher-order thinking skills to their knowledge of silviculture.

Audience: Both Grad & Undergrad

6. Survey current scientific literature on a particular topic relevant to management of forests in WI under changing conditions, summarize current knowledge and knowledge gaps, and recommend next steps in research to improve management.

Audience: Graduate

F&W ECOL 411 – PRACTICES OF SILVICULTURE

1 credit.

Utilization of ecologically-based forest management practices for sustainable timber production, maintenance or restoration of biological diversity, and maintenance of aesthetic quality and site productivity. Includes coverage of even-aged and uneven-aged management, reforestation principles, and ecological restoration techniques.

Requisites: F&W ECOL 410 or concurrent enrollment

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Describe stand dynamics, including concepts of stand structure, function, establishment, growth, composition, health, and quality

Audience: Undergraduate

2. Explain the ecological underpinnings and technical considerations for common regeneration, establishment, and intermediate treatments that comprise modern silvicultural systems

Audience: Undergraduate

3. Develop data-driven, time- and space-bounded prescriptions for forest stands considering ecological, economic, and societal aspects of management decisions in an ethical context

Audience: Undergraduate

4. Communicate technical material using text, tables, graphs, and maps, including logical rationale supporting management decisions

Audience: Undergraduate

5. Create solutions to real-world forest management challenges by applying higher-order thinking skills to their knowledge of silviculture

Audience: Undergraduate

F&W ECOL 420 – REGULATED TRAPPING IN WILDLIFE MANAGEMENT AND CONSERVATION

1 credit.

Training and professional skill development for future natural resources professionals. Introduction to the importance of regulated trapping as a technique used in research, wildlife damage management, wildlife reintroduction, disease management, fur/food acquisition, etc.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Identify the important biological and ecological aspects of furbearers

Audience: Undergraduate

2. Discuss furbearer management related laws and regulations, research, population modeling, and furbearer diseases

Audience: Undergraduate

3. Explain how regulated trapping is used by State, Federal and Tribal agencies to manage wildlife and their habitats

Audience: Undergraduate

4. Describe the many benefits of regulated trapping to society

Audience: Undergraduate

5. Identify terminology and workings of several types of traps, sets, and trapping equipment used to legally harvest furbearers and to avoid non-target species

Audience: Undergraduate

6. Summarize the goals of the Best Management Practices for Trapping Program (BMPs)

Audience: Undergraduate

7. Demonstrate proper fur handling and processing and knowledge of related terminology

Audience: Undergraduate

8. Communicate effectively about regulated trapping

Audience: Undergraduate

F&W ECOL 422 – HUNTING FOR CONSERVATION

1 credit.

Introduces the diverse values and important roles hunters and hunting play in wildlife conservation through historical and contemporary contexts. Provides practical skills for future natural resources professionals.

Requisites: Consent of instructor

Repeatable for Credit: No

Learning Outcomes: 1. Describe the demographics of hunters in North America and their motivations for participating.

Audience: Undergraduate

2. Explain the role of hunting in wildlife management and conservation and how this relationship evolved.

Audience: Undergraduate

3. Identify the reason for and effect of hunting laws and regulations.

Audience: Undergraduate

4. Demonstrate the principles of firearm safety and describe the role of hunter education.

Audience: Undergraduate

5. Identify methods, types of hunting, and skills hunters use to legally harvest game animals in North America.

Audience: Undergraduate

6. Discuss the unique roles hunting plays in society, including intrinsic, cultural, biological, ecological, economic, and personal values.

Audience: Undergraduate

7. Describe the responsibility and ethics hunters are charged with to not only pursue their quarry safely and legally, but also ethically.

Audience: Undergraduate

F&W ECOL 424 – WILDLIFE ECOLOGY SUMMER FIELD PRACTICUM

2 credits.

Practicum emphasizing research and habitat management techniques through individual and group field work, tours, demonstrations and lectures.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Summer 2024

Learning Outcomes: 1. Identify northern Wisconsin wildlife (birds, mammals, reptiles and amphibians) and plant (trees, shrubs, and herbaceous) species

Audience: Undergraduate

2. Perform wildlife inventory and monitoring techniques for birds, mammals, reptiles and amphibians

Audience: Undergraduate

3. Apply proper handling procedures for various wildlife species

Audience: Undergraduate

4. Conduct forest measurements and vegetation sampling

Audience: Undergraduate

5. Use a compass, Global Position System (GPS) and ArcGIS software

Audience: Undergraduate

6. Collect, summarize and integrate field data into a final report

Audience: Undergraduate

F&W ECOL/A A E 430 – DECISION METHODS FOR NATURAL RESOURCE MANAGERS

3 credits.

Applications of quantitative methods, including optimization and simulation, to the management of natural resources, especially forests.

Requisites: MATH 112, 114, or 171 or placement into MATH 211 or 221. Not open to students with credit for A A E 652 prior to Fall 2025.

Course Designation: Breadth - Social Science

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Quantify the timber and non-timber values of forest resources

Audience: Undergraduate

2. Describe and apply financial decision criteria to evaluate forest investments

Audience: Undergraduate

3. Explain how optimal rotation ages are determined and what factors affect this calculation

Audience: Undergraduate

4. Create harvest scheduling models and apply them to diverse landowner objectives

Audience: Undergraduate

5. Apply knowledge of mathematical models and financial theory to determine optimal rotation age for a given species and communicate findings in written and verbal formats

Audience: Undergraduate

F&W ECOL 448 – DISTURBANCE ECOLOGY

3 credits.

An introduction to fire, wind, flooding, disease, insects and other disturbance regimes that serve as primary drivers of the structure and function of terrestrial ecosystems. Discusses how these disturbances interact, using case studies and data that highlight the role of disturbance in different ecosystems (e.g. grasslands, forests, tundra) with a focus on the ecosystem services they provide. Discusses and critiques management strategies used to mitigate biotic and abiotic disturbances, gaining critical insights from the literature as well as personal perspectives and experiences.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Identify what characteristics are necessary to refer to an event as a disturbance and clearly define ways in which disturbances are categorized

Audience: Undergraduate

2. Determine and discuss mechanisms underlying different disturbance regimes in the context of ecological theory and observations

Audience: Undergraduate

3. Interpret, critique, and appropriately cite primary scientific literature in the field of disturbance ecology and extract critical information from figures and graphs

Audience: Undergraduate

4. Analyze and interpret data collected at various scales that relate to the causes and consequences of various disturbance regimes and identify the limitations and advantages of each data type

Audience: Undergraduate

5. Describe (through examples and case studies) how different disturbances interact with each other using appropriate terminology and definitions and evaluate context-dependent consequences for ecosystem function

Audience: Undergraduate

6. Evaluate how disturbance risk is assessed in various systems and determine approaches that are most amenable to intervention based on costs, benefits, and feasibility

Audience: Undergraduate

F&W ECOL 449 – DISTURBANCE ECOLOGY LAB (I): HERBIVORES AND FIRE

1 credit.

Explores natural and anthropogenic disturbances occurring in forest ecosystems through hands on learning experiences. Emphasis on the role of herbivores and fire with examination of management strategies. Applies basic ecological laboratory and field techniques to understanding disturbances that change the physical environment and disrupt ecosystem structure.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Discuss the importance of disturbance for ecosystem processes (e.g., nutrient cycling, biodiversity, soil development, etc.)

Audience: Undergraduate

2. Describe the effect of herbivores and fire on local forest habitats.

Audience: Undergraduate

3. Identify native and non-native members of local forest ecosystems and explain how they respond to herbivory and fire.

Audience: Undergraduate

4. Explain how population and community dynamics of plants are influenced by disturbance, stress, and species interactions.

Audience: Undergraduate

5. Formulate novel hypotheses related to declining forest understory biodiversity, design experimental protocols to falsify those hypotheses, and communicate research proposals in oral and written forms to a scientific audience.

Audience: Undergraduate

6. Apply basic ecological laboratory and field techniques to understanding ecological principles.

Audience: Undergraduate

F&W ECOL 450 – DISTURBANCE ECOLOGY LAB (II): FOREST PATHOGENS

1 credit.

Explores natural and anthropogenic disturbances occurring in forest ecosystems through hands on learning experiences. Focuses on the causes of impoverished forests and the role and management of pathogens. Applies basic ecological laboratory and field techniques to understanding disturbances that change the physical environment and disrupt ecosystem structure.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Discuss the importance of disturbance for ecosystem processes (e.g., nutrient cycling, biodiversity, soil development, etc.)

Audience: Undergraduate

2. Describe the problems associated with and causes of depauperate understories in the Deciduous Forest Biome.

Audience: Undergraduate

3. Describe the role of pathogens (including fungi, bacteria, and viruses) in forest disturbance.

Audience: Undergraduate

4. Explain how population and community dynamics of plants are influenced by disturbance, stress, and species interactions.

Audience: Undergraduate

5. Test novel hypotheses related to declining forest understory biodiversity, implement experimental protocols to falsify those hypotheses, graph/analyze/interpret results, and communicate these results in oral and written forms to a scientific audience.

Audience: Undergraduate

6. Apply basic ecological laboratory and field techniques to understanding ecological principles.

Audience: Undergraduate

F&W ECOL/SOIL SCI 451 – ENVIRONMENTAL BIOGEOCHEMISTRY

3 credits.

Explores long and short-term cycles of carbon, nitrogen, phosphorus, sulfur, and metals as well as water and energy cycles between water, the atmosphere, terrestrial vegetation, and soils. Emphasizes the linkage between terrestrial vegetation and soils across global biomes for managed and unmanaged ecosystems. Investigates biogeochemical processes through their biochemical constituents, conceptual models and exploration of isotopic and chemical data. Provides a practical understanding of the interactions between components and fluxes of terrestrial ecosystems and how data is developed and employed.

Requisites: CHEM 104, 109, 116, or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Describe global biogeochemical cycles of C, N, P, K, S, Fe, energy, and water and their importance

Audience: Both Grad & Undergrad

2. Explain the importance of human perturbations to and management of biogeochemical cycles

Audience: Both Grad & Undergrad

3. Describe key methods used to study biogeochemistry and explain their limitations

Audience: Both Grad & Undergrad

4. Predict which biogeochemical reactions would be likely across different environments and conditions

Audience: Both Grad & Undergrad

5. Discuss and critically evaluate scientific papers in biogeochemistry at a graduate level

Audience: Graduate

6. Discuss and critically evaluate scientific papers in biogeochemistry at an advanced undergraduate level

Audience: Undergraduate

7. Characterize elemental cycling within a system of interest, comparing and contrasting different elements

Audience: Graduate

8. Characterize elemental cycling within a system of interest

Audience: Undergraduate

F&W ECOL 458 – ENVIRONMENTAL DATA SCIENCE

3 credits.

Introduces fundamental machine learning techniques for numerical modeling and data analysis and modern computer programming tools used to analyze, prepare, and visualize data from common formats of datasets in the field of Earth and environmental sciences. Emphasizes opportunities to consider real-world applications for concepts in environmental data science.

Requisites: STAT 240, 301, 324, 371, or graduate/professional standing

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Demonstrate introductory skills in using collaboration technology (e.g. Jupyter Notebooks) to write, edit, and run programs in a scientific programming language (e.g. Python)

Audience: Both Grad & Undergrad

2. Recognize, read, write and use common environmental dataset formats

Audience: Both Grad & Undergrad

3. Use a scientific programming language (e.g. Python) to read and process environmental data

Audience: Both Grad & Undergrad

4. Produce visualizations of environmental data, including basic scientific charts, statistics, and maps

Audience: Both Grad & Undergrad

5. Understand fundamentals of modern machine learning algorithms and gain experience of practical use of them

Audience: Both Grad & Undergrad

6. Solve real-world data science problems individually and in teams

Audience: Both Grad & Undergrad

7. Identify the frontiers in real-world environmental science challenges and how data science can help

Audience: Both Grad & Undergrad

8. Identify a problem in environmental science that may be solved or better understood through data science, provide a basic visualization or analysis of a data set associated with that problem, and communicate findings effectively

Audience: Undergraduate

9. Develop in-depth spatial and/temporal analyses using advanced data science tools (such as machine learning) and visual datasets related to your own research or anticipated area of research that meet the standards of scientific journals, critically evaluate your findings, and situate them within the larger context of current research literature

Audience: Graduate

F&W ECOL/BOTANY/ZOOLOGY 460 – GENERAL ECOLOGY

4 credits.

Ecology of individual organisms, populations, communities, ecosystems, landscapes, and the biosphere. The interaction of organisms with each other and their physical environment. These relationships are studied, often in quantitative terms, in both field and laboratory settings.

Requisites: Satisfied Quantitative Reasoning (QR) A requirement and ZOOLOGY/BIOLOGY/BOTANY 152, (ZOOLOGY/BIOLOGY 101 and 102), BIOCORE 381, or BOTANY/BIOLOGY 130, or graduate/professional standing

Course Designation: Gen Ed - Quantitative Reasoning Part B
Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

F&W ECOL/ENVIR ST 515 – NATURAL RESOURCES POLICY

3 credits.

Examine natural resources policy and law in the United States relating to forests, wildlife, and other natural resources. Investigates the policy-making process and the role of science, values, property, economics, and justice in the development of federal and state resources policy. Practice professional written and oral communication and ethical engagement in resources policy and administration.

Requisites: Satisfied Communications A requirement or graduate/professional standing

Course Designation: Gen Ed - Communication Part B
Breadth - Social Science
Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Summarize the policy process, major federal and state laws, and decision-makers governing natural resources in the United States.

Audience: Both Grad & Undergrad

2. Analyze environmental policy and policy research drawing on the themes of values, economics, justice, and science and articulating policy implications for lay and professional audiences.

Audience: Both Grad & Undergrad

3. Differentiate the roles in policy development of different actors and their values and interests.

Audience: Both Grad & Undergrad

4. Apply advanced skills in professional communication through writing, speaking, logical thinking, persuasive rhetorical strategies to communicate with diverse audiences.

Audience: Both Grad & Undergrad

5. Evaluate and synthesize primary literature on natural resources policy to assess the influence of policy processes, legal frameworks, and stakeholder values on resource management, and effectively integrate these insights into policy development and communication strategies for diverse audiences.

Audience: Graduate

F&W ECOL/BOTANY/ENVIR ST/ZOOLOGY 516 – CONSERVATION BIOLOGY

3 credits.

Investigate the science behind the protection of nature and preservation of biodiversity by focusing on both the biological and socioeconomic factors that underlie the challenges to and the impacts of conservation efforts. Explore the theory, research, and application of biological conservation from an interdisciplinary, international, solutions-focused perspective. Learn about the many threats to Earth's biodiversity but also examine in-depth and apply approaches to overcome them.

Requisites: Satisfied Quantitative Reasoning (QR) A requirement and ZOOLOGY/BIOLOGY/BOTANY 152, BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY 101, BIOCORE 381, or graduate/professional standing

Course Designation: Gen Ed - Quantitative Reasoning Part B
Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Distinguish conservation biology from other scientific disciplines and describe its over-arching principles.

Audience: Both Grad & Undergrad

2. Articulate many reasons why the conservation of biological diversity (at many levels) is important.

Audience: Both Grad & Undergrad

3. Quantify biodiversity at the individual, population, and species level by applying various commonly used models and indices.

Audience: Both Grad & Undergrad

4. Explain orally and in writing the principal threats to biodiversity, to both scientific and layperson audiences (habitat loss and fragmentation; industrial agriculture; climate change; overexploitation; invasive species; pollution) and the specific biological effects of these threats.

Audience: Both Grad & Undergrad

5. Outline strategies to implement at the personal, local, and global scales for solving the biodiversity crisis.

Audience: Both Grad & Undergrad

6. Critically analyze, apply, and communicate recommendations for changing personal behaviors to mitigate the biodiversity and climate crises.

Audience: Both Grad & Undergrad

7. Assess the strengths and weaknesses of various conservation strategies or policy approaches.

Audience: Both Grad & Undergrad

8. Synthesize multiple investigations of conservation strategies to assess tradeoffs and synergies among them.

Audience: Graduate

9. Make science-based recommendations for the appropriate conservation approach or strategy for a given situation.

Audience: Graduate

10. Manipulate quantitative data using multi-step arguments to evaluate, interpret, and express solutions to problems in biodiversity estimation, population monitoring, and genetics in the context of conservation.

Audience: Both Grad & Undergrad

F&W ECOL/AN SCI/ZOOLOGY 520 – ORNITHOLOGY

3 credits.

Introduction to bird biology, ecology, and behavior. Topics include the evolutionary origin of birds and flight, anatomy and physiology, functional morphology, migration, communication, reproductive strategies, ecological adaptations and roles, and biogeographical patterns.

Requisites: ZOOLOGY/BIOLOGY 101 and 102, ZOOLOGY/BIOLOGY/BOTANY 152, (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

F&W ECOL/AN SCI/ZOOLOGY 521 – BIRDS OF SOUTHERN WISCONSIN

3 credits.

Outdoor and indoor labs/lectures emphasizing identification of southern Wisconsin birds by sight and vocalization. Two required Saturday field trips in Southern Wisconsin.

Requisites: ZOOLOGY/BIOLOGY 101 and 102, ZOOLOGY/BIOLOGY/BOTANY 152, (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

F&W ECOL/A A E/ECON 531 – NATURAL RESOURCE ECONOMICS

3 credits.

Economic concepts and tools relating to management and use of natural resources, including pricing principles, cost-benefit analysis, equity, externalities, economic rent, renewable and nonrenewable resources, and resource policy issues.

Requisites: ECON 301 or 311 or graduate/professional standing

Course Designation: Breadth - Social Science

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Employ appropriate concepts in order to correctly define the economic benefits accrued from different natural resources.

Audience: Both Grad & Undergrad

2. Apply appropriate methodologies and tools to demonstrate the conditions under which the benefits are likely to be captured or dissipated by real world actors.

Audience: Both Grad & Undergrad

3. Explain the social, economic, and/or environmental dimensions of the sustainability challenges of maintaining healthy supplies of forests, biodiversity, fish and wildlife, and freshwater.

Audience: Both Grad & Undergrad

4. Analyze the causes of and solutions for the sustainability challenges of maintaining healthy supplies of forests, biodiversity, fish and wildlife, and freshwater.

Audience: Both Grad & Undergrad

5. Apply academic principles of natural resource economics to a real-world policy problem.

Audience: Graduate

F&W ECOL/SURG SCI 548 – DISEASES OF WILDLIFE

3 credits.

Provides an overview of the issues involved across a wide range of wildlife diseases, presented within the context of ecosystem health or "one health". Content will be on the biological, epidemiological, clinical, public health and, in some cases, sociopolitical ramifications of wildlife diseases. Covers a wide variety of wildlife diseases caused by bacteria, viruses, parasites, prions, and environmental contaminants. Consequences associated with environmental changes on the manifestation of wildlife diseases will also be discussed. This range of diseases will be presented in order to familiarize the many facets involved in disease management, from animal and human health issues, to ecological and environmental considerations, to the role of society in contributing to, and managing, these diseases.

Requisites: BOTANY/BIOLOGY 130, (ZOOLOGY/BIOLOGY 101 and 102), ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Explain how an infection differs from disease.

Audience: Undergraduate

2. Recognize different groups of infectious microorganisms: viruses, bacteria, fungi, parasites, prions, etc.

Audience: Undergraduate

3. Define and describe ecosystem health or one health.

Audience: Undergraduate

4. Define the terms zoonosis, zoonoses, and zoonotic.

Audience: Undergraduate

5. Evaluate how anthropogenic influences exacerbate transmission of zoonotic diseases.

Audience: Undergraduate

6. Describe and explain the epidemiological concepts related to each wildlife disease presented in this course.

Audience: Undergraduate

7. Recognize diseases that are specific to animal groups or humans, or are nonspecific, having the potential to infect many different species.

Audience: Undergraduate

F&W ECOL 550 – FOREST ECOLOGY

3 credits.

Introduction to major abiotic and biotic factors that influence forest ecosystem composition, structure, and function. Reviews important processes that influence structure and function of forest ecosystems. Uses basic ecosystem concepts to elucidate influence of anthropogenic (including forest management) and natural disturbances on forest ecosystem structure and function.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 152, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Describe global and local biogeographical regions as well as the major palaeoecological events (e.g., continental drift and climate change) responsible for their development.

Audience: Both Grad & Undergrad

2. Explain how environmental factors influence net photosynthesis, ecosystem productivity, and nutrient cycling.

Audience: Both Grad & Undergrad

3. Explain how population and community dynamics of plants are influenced by disturbance, stress, and species interactions.

Audience: Both Grad & Undergrad

4. Explain natural and anthropogenic factors that influence soil types, mineral nutrient availability, and plant community characteristics.

Audience: Both Grad & Undergrad

5. Explain trade-offs involved in biodiversity conservation, economic development, and mitigation of climate change.

Audience: Both Grad & Undergrad

6. Discuss the value of forests (ecological, economical, and cultural) and the threats they face.

Audience: Both Grad & Undergrad

7. Evaluate and synthesize primary scientific literature to analyze complex ecological processes and interactions in forest ecosystems, and apply these findings to develop evidence-based strategies for addressing conservation challenges, climate change, and sustainable forest management.

Audience: Graduate

F&W ECOL 551 – FOREST ECOLOGY LAB

1 credit.

Review concepts presented in F&W ECOL 550 by exposing the key concepts and processes discussed that can best be seen in the field or illustrated with the use of ecosystem models.

Requisites: F&W ECOL 550 or concurrent enrollment, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Apply fundamental ecological principles in forest ecosystems.

Audience: Both Grad & Undergrad

2. Identify native and non-native members of local forest ecosystems and observe their interactions.

Audience: Both Grad & Undergrad

3. Select appropriate quantitative field sampling techniques for ecological investigations.

Audience: Both Grad & Undergrad

4. Critically evaluate survey and experimental data and draw appropriate scientific conclusions.

Audience: Both Grad & Undergrad

5. Apply software tools to organize, analyze, and present data and support reasoning.

Audience: Both Grad & Undergrad

6. Formulate hypotheses, design experimental protocols to falsify those hypotheses, graph/analyze/interpret results, and present studies in oral and written forms in manners appropriate for science.

Audience: Both Grad & Undergrad

7. Design and conduct independent research, incorporating primary scientific literature, applying advanced ecological sampling techniques, analyzing complex datasets with appropriate software tools, and presenting findings in professional formats that contribute to the scientific understanding of forest ecosystems.

Audience: Graduate

F&W ECOL 561 – WILDLIFE MANAGEMENT TECHNIQUES

3 credits.

Preparation of collections, analyses of food habits, sex and age determinations, censuses, trapping and banding, planting food and cover, research techniques.

Requisites: None

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Identify and list various wildlife research techniques, such as GIS, GPS, animal capture, and tracking methods
Audience: Undergraduate

2. Explain the principles and applications of different wildlife research techniques, including the use of trail cameras and habitat surveys
Audience: Undergraduate

3. Use field equipment and techniques, such as radio-tracking and stable isotope analysis, in real-world wildlife research scenarios
Audience: Undergraduate

4. Analyze data collected from field experiments, such as mark-recapture and occupancy models, to draw meaningful conclusions about wildlife populations and behaviors
Audience: Undergraduate

5. Critically evaluate the effectiveness and limitations of various wildlife research techniques and methodologies discussed in the course
Audience: Undergraduate

6. Design and propose a comprehensive wildlife research project, incorporating appropriate techniques and methodologies learned throughout the course
Audience: Undergraduate

F&W ECOL/LAND ARC/ZOOLOGY 565 – PRINCIPLES OF LANDSCAPE ECOLOGY

2 credits.

Emphasizes the importance of spatial patterns at broad scales. Concepts and applications are covered.

Requisites: (ZOOLOGY/BOTANY/F&W ECOL 460 or F&W ECOL 550) and (STAT 301, 371, or F&W ECOL/STAT 571), or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Advanced

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2019

F&W ECOL/STAT 571 – STATISTICAL METHODS FOR BIOSCIENCE I

4 credits.

Descriptive statistics, distributions, one- and two-sample normal inference, power, one-way ANOVA, simple linear regression, categorical data, non-parametric methods; underlying assumptions and diagnostic work.

Requisites: Graduate/professional standing

Course Designation: Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2025

F&W ECOL/STAT 572 – STATISTICAL METHODS FOR BIOSCIENCE II

4 credits.

Polynomial regression, multiple regression, two-way ANOVA with and without interaction, split-plot design, subsampling, analysis of covariance, elementary sampling, introduction to bioassay.

Requisites: STAT/F&W ECOL 571

Course Designation: Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

F&W ECOL 577 – COMPLEXITY AND CONSERVATION OF WHITE-TAILED DEER

3 credits.

Solve problems that arise in the conservation and management of wildlife populations requires that managers understand and evaluate human cultural, economic, and political issues in addition to ecological issues. Use case studies to understand the interdisciplinary nature of wildlife management while gaining practical hands-on experiences.

Requisites: Declared in Wildlife Ecology and Junior Standing

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Develop an interdisciplinary understanding of wildlife management, integrating ecological, cultural, economic, and political dimensions.

Audience: Undergraduate

2. Enhance problem-solving skills by addressing real-world deer management policy issues, analyzing these problems, and proposing viable solutions.

Audience: Undergraduate

3. Conduct thorough research and analysis on deer management topics, citing authoritative sources and addressing regulatory language.

Audience: Undergraduate

4. Create detailed policy proposals modeled on the "Green Sheet" process used by the Department of Natural Resources and the Natural Resources Board of Wisconsin, including a comprehensive written document and an oral presentation.

Audience: Undergraduate

5. Gain practical experience through extra credit opportunities such as fieldwork, attending Natural Resource Board meetings, shadowing wildlife professionals, and participating in deer research projects.

Audience: Undergraduate

F&W ECOL 590 – INTEGRATED RESOURCE MANAGEMENT

3 credits.

Resource management planning in state and federal land management agencies. Apply principles by working in teams to develop a management plan for a real property by inventorying resources; developing management objectives and alternatives; and analyzing their ecological, social and institutional implications.

Requisites: Declared in Forest Science, Junior Standing, and F&W ECOL 658

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Integrate and apply knowledge and skills in forest and wildlife ecology, forest management, hydrology and watershed management, forest economics and policy acquired during your tenure as a student

Audience: Undergraduate

2. Identify and propose solutions to resource management problems

Audience: Undergraduate

3. Collaborate effectively in teams to solve resource management issues

Audience: Undergraduate

4. Discuss resource management problems and solutions with scientific and professional audiences in both written and oral forms

Audience: Undergraduate

F&W ECOL 599 – WILDLIFE RESEARCH CAPSTONE

3 credits.

Synthesize concepts in wildlife ecology and prepare for a wildlife research career. Develop a professional-quality research proposal for an extended project, carry out a pilot ecological field study, and design and implement a social survey questionnaire.

Requisites: F&W ECOL 561

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Identify contemporary 'real world' issues facing wildlife specialists

Audience: Undergraduate

2. Apply knowledge gained in their academic programs to develop plans for addressing these issues

Audience: Undergraduate

3. Defend proposed plans in written and oral form

Audience: Undergraduate

4. Collaborate effectively in a team to carry out proposed plans

Audience: Undergraduate

5. Communicate findings in the form of written reports, professional presentations, and informal social media public communication

Audience: Undergraduate

6. Apply key professional skills marketable to future employers

Audience: Undergraduate

F&W ECOL 655 – ANIMAL POPULATION DYNAMICS

3 credits.

Fluctuations of animal populations: techniques of study, documentation, controls.

Requisites: (F&W ECOL 318 or ZOOLOGY/BOTANY/F&W ECOL 460) and (MATH 112, 114, 171 or placement into MATH 221), or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Apply field specific vocabulary and foundational theories of population dynamics to describe current understandings of how animal populations behave and interact

Audience: Both Grad & Undergrad

2. Assess how existing theories, models, and field data are understood and applied in wildlife conservation

Audience: Both Grad & Undergrad

3. Analyze population dynamics using species-specific examples that would be relevant to a professional wildlife biologist using data and conceptual models

Audience: Both Grad & Undergrad

4. Synthesize, evaluate, and formulate a position on current scholarly research in a focused area of population dynamics

Audience: Graduate

5. Demonstrate oral communication skills including identification and explanation of relevant content, clear organization, and effective delivery

Audience: Graduate

F&W ECOL 658 – FOREST RESOURCES PRACTICUM

3 credits.

Field training and experience; exposure to forestry operations, equipment, procedures, and management problems.

Requisites: None**Repeatable for Credit:** No**Last Taught:** Summer 2025**Learning Outcomes:** 1. Identify native and non-native members of local forest ecosystems, including plants, vertebrates, and invertebrates.

Audience: Undergraduate

2. Apply forest measurement techniques to complete forest ecosystem assessments.

Audience: Undergraduate

3. Collect, manage, analyze, and draw conclusions from datasets.

Audience: Undergraduate

4. Formulate and test novel hypotheses related to forest ecosystems.

Audience: Undergraduate

5. Work collaboratively to accomplish measurement, analysis, and writing tasks.

Audience: Undergraduate

F&W ECOL/ZOOLOGY 660 – CLIMATE CHANGE ECOLOGY

3 credits.

The evidence that the Earth's climate is changing at unprecedented rates is now overwhelming. Environmental tipping points are being crossed and many species are adapting or failing to adapt. Climate change poses a significant problem for conserving and managing wildlife and their habitats. Climate change, its ecological impacts, and the principle of climate change adaptation in natural resources conservation will be discussed.

Requisites: BOTANY/BIOLOGY/ZOOLOGY 152, (BIOLOGY/ZOOLOGY 101 and 102), BIOCORE 381, or BIOLOGY/BOTANY 130, or graduate/professional standing**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Fall 2025**Learning Outcomes:** 1. explain historic and future trends in climate change within an ecological context.

Audience: Both Grad & Undergrad

2. identify the eco-evolutionary impacts of climate change on biological communities (including changes in phenology and ranges, community dynamics, and altered trophic interactions).

Audience: Both Grad & Undergrad

3. develop a climate change vulnerability assessment for a given species or community.

Audience: Both Grad & Undergrad

4. analyze and incorporate climate and biological data in vulnerability assessments.

Audience: Graduate

F&W ECOL/BOTANY/ZOOLOGY 672 – HISTORICAL ECOLOGY

2 credits.

Study the importance of past events for current ecosystems. Emphasizes concepts and applications.

Requisites: Senior standing**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2024**F&W ECOL 675 – PROFESSIONAL DEVELOPMENT IN FOREST & WILDLIFE ECOLOGY**

1 credit.

Provides opportunities for additional training in professional development skills relevant to careers in natural resources.

Requisites: None**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Spring 2025

F&W ECOL 681 – SENIOR HONORS THESIS

2-4 credits.

Individual study for undergraduate students in an Honors program completing a thesis in the area of Forest and Wildlife Ecology, as arranged with a faculty member.

Requisites: Consent of instructor

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: No

Last Taught: Fall 2025

Learning Outcomes: 1. Review and analyze scientific literature

Audience: Undergraduate

2. Identify and use appropriate research methodologies to address a research question

Audience: Undergraduate

3. Begin structuring and writing a thesis based on original research

Audience: Undergraduate

F&W ECOL 682 – SENIOR HONORS THESIS

2-4 credits.

Second semester of individual study for undergraduate students in an Honors program completing a thesis in the area of Forest and Wildlife Ecology, as arranged with a faculty member.

Requisites: Consent of instructor

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Review and analyze scientific literature#

Audience: Undergraduate

2. Identify and use appropriate research methodologies to address a research question#

Audience: Undergraduate

3. Write a thesis based on original research#

Audience: Undergraduate

F&W ECOL 691 – SENIOR THESIS

2-4 credits.

Independent research for Honors students completing a thesis in the areas of Forest Science or Wildlife Ecology, under the guidance of a faculty member.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Review and analyze scientific literature

Audience: Undergraduate

2. Identify and use appropriate research methodologies to address a research question#

Audience: Undergraduate

3. Begin structuring and writing a thesis based on original research

Audience: Undergraduate

F&W ECOL 692 – SENIOR THESIS

2-4 credits.

Independent research for Honors students completing a thesis in the areas of Forest Science or Wildlife Ecology, under the guidance of a faculty member.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Review and analyze scientific literature

Audience: Undergraduate

2. Identify and use appropriate research methodologies to address a research question#

Audience: Undergraduate

3. Write a thesis based on original research#

Audience: Undergraduate

F&W ECOL 699 – SPECIAL PROBLEMS

1-4 credits.

Individual advanced work in an area of Forest and Wildlife Ecology under the direct guidance of a faculty member.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2026

Learning Outcomes: 1. Develop critical, analytical, and independent thinking skills#

Audience: Undergraduate

2. Apply the scientific method and engage in constructive problem solving #

Audience: Undergraduate

3. Demonstrate application of research skills and methodologies#

Audience: Undergraduate

4. Effectively communicate findings#

Audience: Undergraduate

F&W ECOL/ENTOM 711 – MULTIVARIATE ANALYSIS OF ECOLOGICAL AND COMMUNITY DATA

2 credits.

Examines common methods of multivariate data analysis in ecology and environmental science. Covers methods for the analysis of complex, multidimensional datasets that are collected in the study of plant, invertebrate, fish, and bird communities. Addresses the concurrent analysis of the environmental factors that may drive community distributions. Provides the basis for predictive modeling of distributions across landscapes. General methods covered include ordination (PCA, DCA, NMDS, CCA), clustering (or classification), and other comparative analyses of data matrices (ANOSIM, Mantel tests). Includes an applied, "hands-on" approach on how to use these tools, and the circumstances under which their uses are either appropriate or inappropriate.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2026

Learning Outcomes: 1. Apply common multivariate analysis techniques, such as ordination (PCA, DCA, NMDS, CCA) and clustering, to analyze complex, multidimensional datasets in ecology and environmental science.
Audience: Graduate

2. Interpret the results of multivariate analyses, understanding the ecological and environmental factors that drive community distributions and the relationships among different species and environmental variables.
Audience: Graduate

3. Develop predictive models of species distributions across landscapes using multivariate analysis methods, and evaluate the accuracy and reliability of these models.
Audience: Graduate

4. Conduct comparative analyses of data matrices using methods such as ANOSIM and Mantel tests, and understand the appropriate contexts for their application.
Audience: Graduate

5. Implement hands-on analytical approaches to multivariate data analysis, gaining practical experience with software tools and techniques, and understanding the circumstances under which different methods are appropriate or inappropriate.
Audience: Graduate

F&W ECOL 799 – PRACTICUM IN FORESTRY AND WILDLIFE ECOLOGY TEACHING

1-3 credits.

Instructional orientation to teaching at the higher education level in the agricultural and life sciences, direct teaching experience under faculty supervision, experience in testing and evaluation of students, and the analysis of teaching performance.

Requisites: Consent of instructor**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2022

Learning Outcomes: 1. Articulate learning goals for the practicum in cooperation with supervising instructor#
Audience: Graduate

Audience: Graduate

2. Prepare and/or implement lesson plans for a class period, week, or module of the class#
Audience: Graduate

Audience: Graduate

3. Deliver course content and/or facilitate discussion
Audience: Graduate

Audience: Graduate

4. Identify pedagogical strengths and opportunities for growth based on classroom assessment and/or feedback#
Audience: Graduate

Audience: Graduate

F&W ECOL/BOTANY/ENTOM/ZOOLOGY 821 – FOUNDATIONS OF ECOLOGY

2 credits.

Foundational ideas in the field of ecology. Discussion topics trace the development of ecology as a discipline, and the roots of modern ecological thought, as well as the research approaches in ecology.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2026

Learning Outcomes: 1. Identify and describe key debates in the history of ecology and ongoing controversies in the field.

Audience: Graduate

2. Differentiate ecological processes and how they sustain ecological systems.

Audience: Graduate

3. Moderate and participate in discussions about the significance of important ecological concepts.

Audience: Graduate

4. Summarize, interpret, and synthesize conceptual theories of ecology orally and in writing.

Audience: Graduate

5. Evaluate peer work and provide constructive, professional feedback.

Audience: Graduate

F&W ECOL 850 – DEMOGRAPHIC METHODS IN WILDLIFE CONSERVATION

3 credits.

Explores the application of demographic methods in the conservation and management of animal populations. Techniques explored include maximum likelihood and Bayesian estimation, count-based models, mark-recapture models, occupancy models, matrix models, and sensitivity analyses. Emphasizes application of these models in conservation decision making.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Estimate model parameters using maximum likelihood and Bayesian procedures

Audience: Graduate

2. Construct, implement, and interpret output from deterministic and stochastic matrix models of population growth

Audience: Graduate

3. Estimate and model ecological drivers of mortality and survival rates in wildlife populations using mark-recapture modeling methods

Audience: Graduate

4. Estimate and model ecological drivers of site occupancy rates for wildlife populations using occupancy modeling methods

Audience: Graduate

5. Evaluate model limitations, model assumptions, and the effects of violations of assumptions on inference

Audience: Graduate

6. Interpret population model output and apply results to conservation decision making in the face of uncertainty

Audience: Graduate

F&W ECOL 875 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to graduate students.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2026

F&W ECOL 990 – RESEARCH AND THESIS

1-12 credits.

Independent research in preparation of a graduate thesis under supervision of a faculty member.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2026

Learning Outcomes: 1. Devise an engaging overview of a research area#
Audience: Graduate

2. Explain background, methods, results, and a discussion of experimental data#

Audience: Graduate

3. Design charts/tables that effectively communicate data#

Audience: Graduate

4. Assess peers on the effectiveness of a scientific presentation#

Audience: Graduate

5. Generate goals to improve presentation skills#

Audience: Graduate

F&W ECOL 999 – ADVANCED INDEPENDENT STUDY

1-3 credits.

Independent graduate study under supervision of a faculty member.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2025

Learning Outcomes: 1. Develop critical, analytical, and independent thinking skills#

Audience: Graduate

2. Apply the scientific method and engage in constructive problem solving

Audience: Graduate

3. Demonstrate application of research skills and methodologies

Audience: Graduate

4. Effectively communicate findings#

Audience: Graduate