

Department of Forest, Range, and Wildlife Sciences

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Undergraduate Advisor:

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Degrees offered: Bachelor of Science (BS) in Conservation and Restoration Ecology; BS, Master of Science (MS), and Doctor of Philosophy (PhD) in Forestry; BS in Rangeland Resources; BS in Wildlife Science; MS and PhD in Ecology; MS and PhD in Range Science; and MS and PhD in Wildlife Biology

Graduate specializations: *MS, PhD in Ecology*—Conservation Biology, Wildlife Ecology; *MS, PhD in Wildlife Biology*—Conservation Biology, Problem Wildlife Management, Wildlife Management

Undergraduate Programs

Objectives

The Department of Forest, Range, and Wildlife Sciences (FRWS) offers four undergraduate degrees: Conservation and Restoration Ecology, Forestry, Rangeland Resources, and Wildlife Science. These degree programs offer broad educational opportunities for students interested in the analysis and management of forest and rangeland ecosystems and their associated wildlife populations. The department's philosophy of education is to promote a broad interdisciplinary approach to natural resources analysis, management, and science.

The first two years of study in the Department of Forest, Range, and Wildlife Sciences are designed to provide students with a sound background in the natural sciences, an introduction to the field of natural resources management, and an introduction to their respective major. The last two years are designed to provide an advanced understanding of natural resource management and science, depth concentration in the major, and experience with the integration of scientific and management concepts across a diversity of disciplines and management scenarios. Students are expected to enroll for 15 or more credits of coursework per semester.

Career Opportunities

Graduates in Forest, Range, and Wildlife Sciences (FRWS) qualify for a broad range of career opportunities specific to their major. The Bachelor of Science degrees in Forestry, Rangeland Resources, and Wildlife Science are designed to meet the U.S. Office of Personnel Management (OPM) requirements for professional, permanent, full-time jobs with the Forest Service, Fish and Wildlife Service, Bureau of Land Management, National Park Service, or other federal natural resources agencies. The Bachelor of Science in Conservation and Restoration Ecology is designed to meet OPM requirements for Ecologist, but is flexible and intended to meet the needs of nongovernmental careers as well, such as the Nature Conservancy or private natural resource consulting firms, as well as state and county restoration and management agencies. Graduates in all degree programs receive a solid background in biological and quantitative sciences, as well as the communication skills needed to succeed in many career paths.

Requirements

Admission Requirements

Admission requirements for the Department of Forest, Range, and Wildlife Sciences are the same as those described for the College of Natural Resources on pages 117-118.

Graduation Requirements

All *General Science Foundation Courses*, *Departmental Common Courses*, and all courses listed as major subject courses must be taken on an *A-B-C-D-F* basis. A grade of *C-* or better is required for all Forest, Range, and Wildlife Sciences courses used to meet the requirements for a major or minor in the department. The grade point average for all courses taught by the College of Natural Resources must be 2.5 or higher.

In addition to completing the University Studies course requirements (see pages 46-54), all students earning an undergraduate degree in the Department of Forest, Range, and Wildlife Sciences must complete the *General Science Foundation Courses* and the *Departmental Common Courses*, as listed below. Some of these courses may be used toward the University Studies requirements, as indicated by the University Studies designations listed in parentheses following the course numbers.

A. General Science Foundation Courses (34 credits)

BIOL 1210 Biology I (F).....	4
BIOL 1220 (BLS) Biology II (Sp).....	4
MATH 1050 (QL) College Algebra (F,Sp,Su).....	4
MATH 1100 (QL) Calculus Techniques (F,Sp,Su).....	3
SOIL 3000 Fundamentals of Soil Science (F,Sp).....	4
STAT 2000 (QI) Statistical Methods (F,Sp,Su) (3 cr) or	
STAT 3000 (QI) Statistics for Scientists (F,Sp) (3 cr).....	3
NR 2220 General Ecology (F,Sp).....	3

Select one of the following chemistry series (9 credits):

CHEM 1110 (BPS) General Chemistry I (F,Sp).....	4
CHEM 1130 General Chemistry Laboratory (Sp).....	1
CHEM 1120 (BPS) General Chemistry II (Sp).....	4
OR	
CHEM 1210 Principles of Chemistry I (F,Sp).....	4
CHEM 1230 Chemical Principles Laboratory I (F,Sp).....	1
CHEM 1220 (BPS) Principles of Chemistry II (F,Sp,Su).....	4

B. Departmental Common Courses (28 credits)

FRWS 2000 Introduction to Forest, Range, and Wildlife Sciences (F).....	1
FRWS 3600 Wildland Plant Ecology and Identification (F).....	4
FRWS 3610 Wildland Animal Ecology and Identification (F).....	4
FRWS 3700 (CI) Inventory and Assessment in Natural Resource and Environmental Management (F).....	3
FRWS 3710 Monitoring and Assessment in Natural Resource and Environmental Management (Sp).....	3
FRWS 3800 Wildland Ecosystems (Sp).....	3
FRWS 3810 Plant and Animal Populations (Sp).....	3
FRWS 3850 Vegetation and Habitat Management (F).....	3
FRWS 3900 Managing Dynamic Ecological Systems (Sp).....	4

Bachelor of Science in Conservation and Restoration Ecology

Students in the Conservation and Restoration Ecology major must meet the course requirements for University Studies, as well as complete the *General Science Foundation Courses* and the *Departmental Common Courses* listed above. They must also complete 13 credits of Degree Program Courses, as follows:

Department of Forest, Range, and Wildlife Sciences

A. Degree Program Courses (13 credits)

ENVS 3000 Natural Resources Policy and Economics (F)	4
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management (F)	3
FRWS 4600 Conservation Biology (F)	3
FRWS 4700 Ecological Foundations of Restoration (Sp)	3

In addition, they must complete a 21-credit specialization, which is designed by the student in consultation with a faculty advisor to meet specific goals and career objectives and must be approved by the FRWS department head.

B. Degree Program Electives (21 credits)

Students in the Conservation and Restoration Ecology major must meet with their advisor and plan a program of study for their 21 credits of degree program electives. Students must identify an organizing theme or comprehensive plan to guide the selection of their degree program electives, and all courses counted toward this requirement must be approved in advance by the student's advisor. Courses taken to complete a dual major with another major within the College of Natural Resources may *not* be counted toward fulfillment of this requirement.

C. Free Elective Credits (24 credits)

Students may take the remainder of the 120 credits from any department. Courses which meet General Education "Breadth Requirements" and University Studies "Depth Education Requirements" should be included to ensure meeting General Education and University Studies Requirements.

Note: Students wanting to pursue federal employment should check the following U.S. Office of Personnel Management website for a listing of required coursework:

<http://www.opm.gov/qualifications/SEC-IV/B/GS0400/0408.HTM>

Conservation and Restoration Ecology Major Recommended Four-Year Plan of Study

Students should meet regularly with their faculty advisor and carefully plan their academic program, keeping in mind that many upper-division courses have prerequisites and must be taken in sequence. Students following the recommended schedule listed below should be able to complete degree requirements in four years (eight semesters).

A. First Year (28 credits)

Fall Semester (14 credits)

BIOL 1210 Biology I	4
ENGL 1010 (CL) Introduction to Writing: Academic Prose	3
ENVS 2340 (BSS) Natural Resources and Society (recommended)	3
FRWS 2000 Introduction to Forest, Range, and Wildlife Sciences	1
USU 1300 (BAI) U.S. Institutions (or other approved Breadth American Institutions course)	3

Spring Semester (14 credits)

BIOL 1220 (BLS) Biology II	4
MATH 1050 (QL) College Algebra	4
USU 1320 (BHU) Civilization: Humanities (or other approved Breadth Humanities course)	3
USU 1330 (BCA) Civilization: Creative Arts (or other approved Breadth Creative Arts course)	3

B. Second Year (31 credits)

Fall Semester (14 credits)

CHEM 1110 (BPS) General Chemistry I	4
CHEM 1130 General Chemistry Laboratory	1
OR	
CHEM 1210 Principles of Chemistry I	4
CHEM 1230 Chemical Principles Laboratory I	1

MATH 1100 (QL) Calculus Techniques	3
NR 2220 General Ecology	3
Approved Depth Humanities and Creative Arts (DHA) course	3

Spring Semester (17 credits)

CHEM 1120 (BPS) General Chemistry II	4
OR	
CHEM 1220 (BPS) Principles of Chemistry II	4

ENGL 2010 (CL) Intermediate Writing: Research Writing in a Persuasive Mode	3
SOIL 3000 Fundamentals of Soil Science	4
STAT 2000 (QI) Statistical Methods (3 cr) or	
STAT 3000 (QI) Statistics for Scientists (3 cr)	3
Elective Course(s)	3

C. Third Year (30 credits)

Fall Semester (14 credits)

FRWS 3600 Wildland Plant Ecology and Identification	4
FRWS 3610 Wildland Animal Ecology and Identification	4
FRWS 3700 (CI) Inventory and Assessment in Natural Resource and Environmental Management	3
FRWS 3850 Vegetation and Habitat Management	3

Spring Semester (16 credits)

FRWS 3710 Monitoring and Assessment in Natural Resource and Environmental Management	3
FRWS 3800 Wildland Ecosystems	3
FRWS 3810 Plant and Animal Populations	3
FRWS 3900 Managing Dynamic Ecological Systems	4
Elective Course(s)	3

D. Fourth Year (31 credits)

Fall Semester (16 credits)

ENVS 3000 Natural Resources Policy and Economics	4
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management	3
Elective Courses	9

Spring Semester (15 credits)

FRWS 4600 Conservation Biology	3
FRWS 4700 Ecological Foundations of Restoration	3
Elective Courses	9

Bachelor of Science in Forestry

Students in the Forestry major must meet the course requirements for University Studies, as well as complete the *General Science Foundation Courses* and the *Departmental Common Courses* listed above. They must also complete 32 credits of *Professional Coursework*, including the following:

A. Professional Coursework (32 credits)

AWER 3700 (CI) Fundamentals of Watershed Science (Sp)	3
AWER 4930 Geographic Information Systems (F)	4
ENVS 3300 Fundamentals of Recreation Resources Management (F)	3
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management (F)	3
ENVS 4400 Economic Applications in Natural Resource Management (Sp)	4
FRWS 4520 Wildland Fire Management and Planning (F)	2
FRWS 5350 Wildland Soils (Sp)	3
FRWS 5420 (CI) Forest and Shade Tree Pathology (Sp)	3
FRWS 5510 Forest Entomology (F)	2
FRWS 5700 Forest Assessment and Management (Sp)	3
FRWS 5750 Applied Remote Sensing (F)	3

Department of Forest, Range, and Wildlife Sciences

B. Electives (26 credits)

Students may take the remainder of the 120 credits from any department. Courses which meet General Education "Breadth Requirements" and University Studies "Depth Education Requirements" should be included to ensure meeting University Studies Requirements.

Note: Students wanting to pursue federal employment should check the following U.S. Office of Personnel Management website for a listing of required coursework:

<http://www.opm.gov/qualifications/SEC-IV/B/GS0400/0460.HTM>

Forestry Major Recommended Four-Year Plan of Study

Students should meet regularly with their faculty advisor and carefully plan their academic program, keeping in mind that many upper-division courses have prerequisites and must be taken in sequence. Students following the recommended schedule listed below should be able to complete degree requirements in four years (eight semesters).

A. First Year (28 credits)

Fall Semester (14 credits)

BIOL 1210 Biology I	4
ENGL 1010 (CL) Introduction to Writing: Academic Prose	3
ENVS 2340 (BSS) Natural Resources and Society (recommended)	3
FRWS 2000 Introduction to Forest, Range, and Wildlife Sciences	1
USU 1300 (BAI) U.S. Institutions (or other approved Breadth American Institutions course)	3

Spring Semester (14 credits)

BIOL 1220 (BLS) Biology II	4
MATH 1050 (QL) College Algebra	4
USU 1320 (BHU) Civilization: Humanities (or other approved Breadth Humanities course)	3
USU 1330 (BCA) Civilization: Creative Arts (or other approved Breadth Creative Arts course)	3

B. Second Year (31 credits)

Fall Semester (14 credits)

CHEM 1110 (BPS) General Chemistry I	4
CHEM 1130 General Chemistry Laboratory	1
OR	
CHEM 1210 Principles of Chemistry I	4
CHEM 1230 Chemical Principles Laboratory I	1
MATH 1100 (QL) Calculus Techniques	3
NR 2220 General Ecology	3
Approved Depth Humanities and Creative Arts (DHA) course	3

Spring Semester (17 credits)

CHEM 1120 (BPS) General Chemistry II	4
OR	
CHEM 1220 (BPS) Principles of Chemistry II	4
ENGL 2010 (CL) Intermediate Writing: Research Writing in a Persuasive Mode	3
SOIL 3000 Fundamentals of Soil Science	4
STAT 2000 (QI) Statistical Methods (3 cr) or	
STAT 3000 (QI) Statistics for Scientists (3 cr)	3
Elective Course(s)	3

C. Third Year (30 credits)

Fall Semester (14 credits)

FRWS 3600 Wildland Plant Ecology and Identification	4
FRWS 3610 Wildland Animal Ecology and Identification	4
FRWS 3700 (CI) Inventory and Assessment in Natural Resource and Environmental Management	3
FRWS 3850 Vegetation and Habitat Management	3

Spring Semester (16 credits)

AWER 3700 (CI) Fundamentals of Watershed Science	3
FRWS 3710 Monitoring and Assessment in Natural Resource and Environmental Management	3
FRWS 3800 Wildland Ecosystems	3
FRWS 3810 Plant and Animal Populations	3
FRWS 3900 Managing Dynamic Ecological Systems	4

D. Fourth Year (34 credits)

Fall Semester (17 credits)

AWER 4930 Geographic Information Systems	4
ENVS 3300 Fundamentals of Recreation Resources Management	3
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management	3
FRWS 4520 Wildland Fire Management and Planning	2
FRWS 5510 Forest Entomology	2
FRWS 5750 Applied Remote Sensing	3

Spring Semester (17 credits)

ENVS 4400 Economic Applications in Natural Resource Management	4
FRWS 5350 Wildland Soils	3
FRWS 5420 (CI) Forest and Shade Tree Pathology	3
FRWS 5700 Forest Assessment and Management	3
Elective Course(s)	4

Bachelor of Science in Rangeland Resources

Students in the Rangeland Resources major must meet the course requirements for University Studies, as well as complete the *General Science Foundation Courses* and the *Departmental Common Courses* listed above. They must also complete 29 credits of *Professional Coursework*, including the following:

A. Professional Coursework (29 credits)

ADVS 2080 Beef Production Practices (Sp) (2 cr) or	
ADVS 2090 Sheep Production Practices (Sp) (2 cr)	2
AWER 3700 (CI) Fundamentals of Watershed Science (Sp)	3
BIOL 4400 (QI) Plant Physiology (F)	4
BIOL 4420 Plant Taxonomy (Sp)	3
ENVS 3000 Natural Resources Policy and Economics (F)	4
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management (F)	3
ENVS 5000 Collaborative Problem-Solving for Environment and Natural Resources (Sp)	3
FRWS 4000 Principles of Rangeland Management (Sp)	3
SOIL 5130 Soil Genesis, Morphology, and Classification (F)	4

B. Electives (29 credits)

Students may take the remainder of the 120 credits from any department. Courses which meet General Education "Breadth Requirements" and University Studies "Depth Education Requirements" should be included to ensure meeting University Studies Requirements.

Note: Students wanting to pursue federal employment should check the following U.S. Office of Personnel Management website for a listing of required coursework:

<http://www.opm.gov/qualifications/SEC-IV/B/GS0400/0454.HTM>

Rangeland Resources Major

Recommended Four-Year Plan of Study

Students should meet regularly with their faculty advisor and carefully plan their academic program, keeping in mind that many upper-division courses have prerequisites and must be taken in sequence. Students following the recommended schedule listed below should be able to complete degree requirements in four years (eight semesters).

Department of Forest, Range, and Wildlife Sciences

A. First Year (28 credits)

Fall Semester (14 credits)

BIOL 1210 Biology I	4
ENGL 1010 (CL) Introduction to Writing: Academic Prose	3
ENVS 2340 (BSS) Natural Resources and Society (recommended)....	3
FRWS 2000 Introduction to Forest, Range, and Wildlife Sciences	1
USU 1300 (BAI) U.S. Institutions (or other approved Breadth American Institutions course)	3

Spring Semester (14 credits)

BIOL 1220 (BLS) Biology II.....	4
MATH 1050 (QL) College Algebra.....	4
USU 1320 (BHU) Civilization: Humanities (or other approved Breadth Humanities course)	3
USU 1330 (BCA) Civilization: Creative Arts (or other approved Breadth Creative Arts course)	3

B. Second Year (30 credits)

Fall Semester (14 credits)

CHEM 1110 (BPS) General Chemistry I	4
CHEM 1130 General Chemistry Laboratory	1
OR	
CHEM 1210 Principles of Chemistry I	4
CHEM 1230 Chemical Principles Laboratory I	1

MATH 1100 (QL) Calculus Techniques	3
NR 2220 General Ecology.....	3
Approved Depth Humanities and Creative Arts (DHA) course	3

Spring Semester (16 credits)

ADVS 2080 Beef Production Practices (2 cr) or	
ADVS 2090 Sheep Production Practices (2 cr).....	2

CHEM 1120 (BPS) General Chemistry II	4
OR	
CHEM 1220 (BPS) Principles of Chemistry II	4

ENGL 2010 (CL) Intermediate Writing: Research Writing in a Persuasive Mode.....	3
SOIL 3000 Fundamentals of Soil Science.....	4
STAT 2000 (QI) Statistical Methods (3 cr) or	
STAT 3000 (QI) Statistics for Scientists (3 cr)	3

C. Third Year (30 credits)

Fall Semester (14 credits)

FRWS 3600 Wildland Plant Ecology and Identification	4
FRWS 3610 Wildland Animal Ecology and Identification	4
FRWS 3700 (CI) Inventory and Assessment in Natural Resource and Environmental Management	3
FRWS 3850 Vegetation and Habitat Management.....	3

Spring Semester (16 credits)

AWER 3700 (CI) Fundamentals of Watershed Science.....	3
FRWS 3710 Monitoring and Assessment in Natural Resource and Environmental Management	3
FRWS 3800 Wildland Ecosystems.....	3
FRWS 3810 Plant and Animal Populations	3
FRWS 3900 Managing Dynamic Ecological Systems	4

D. Fourth Year (32 credits)

Fall Semester (15 credits)

BIOL 4400 (QI) Plant Physiology	4
ENVS 3000 Natural Resources Policy and Economics.....	4
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management	3
SOIL 5130 Soil Genesis, Morphology, and Classification	4

Spring Semester (17 credits)

BIOL 4420 Plant Taxonomy	3
ENVS 5000 Collaborative Problem-Solving for Environment and Natural Resources.....	3
FRWS 4000 Principles of Rangeland Management	3
Elective Courses	8

Bachelor of Science in Wildlife Science

Students in the Wildlife Science major must meet the course requirements for University Studies, as well as complete the *General Science Foundation Courses* and the *Departmental Common Courses* listed above. They must also complete 28 credits of Degree Program Courses, including the following:

A. Degree Program Courses (28 credits)

BIOL 5250 (CI) Evolutionary Biology (F).....	3
BIOL 5560 Ornithology (Sp) (3 cr) or	
BIOL 5570 Herpetology (Sp) (3 cr)	3
BIOL 5580 Mammalogy (F).....	3
ENVS 3000 Natural Resources Policy and Economics (F)	4
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management (F).....	3
FRWS 3300 Management Aspects of Wildlife Behavior (Sp).....	3
FRWS 4500 Principles of Wildlife Management (Sp).....	3
FRWS 4600 Conservation Biology (Sp)	3
FRWS 4880 Genetics in Conservation and Management (F)	3

B. Electives (30 credits)

Students may take the remainder of the 120 credits from any department. Courses which meet General Education "Breadth Requirements" and University Studies "Depth Education Requirements" should be included to ensure meeting University Studies Requirements.

Note: Students wanting to pursue federal employment should check the following U.S. Office of Personnel Management website for a listing of required coursework:

<http://www.opm.gov/qualifications/SEC-IV/B/GS0400/0486.HTM>

Wildlife Science Major Recommended

Four-Year Plan of Study

Students should meet regularly with their faculty advisor and carefully plan their academic program, keeping in mind that many upper-division courses have prerequisites and must be taken in sequence. Students following the recommended schedule listed below should be able to complete degree requirements in four years (eight semesters).

A. First Year (28 credits)

Fall Semester (14 credits)

BIOL 1210 Biology I	4
ENGL 1010 (CL) Introduction to Writing: Academic Prose	3
ENVS 2340 (BSS) Natural Resources and Society (recommended)....	3
FRWS 2000 Introduction to Forest, Range, and Wildlife Sciences	1
USU 1300 (BAI) U.S. Institutions (or other approved Breadth American Institutions course)	3

Spring Semester (14 credits)

BIOL 1220 (BLS) Biology II.....	4
MATH 1050 (QL) College Algebra.....	4
USU 1320 (BHU) Civilization: Humanities (or other approved Breadth Humanities course)	3
USU 1330 (BCA) Civilization: Creative Arts (or other approved Breadth Creative Arts course)	3

Department of Forest, Range, and Wildlife Sciences

B. Second Year (31 credits)

Fall Semester (14 credits)

CHEM 1110 (BPS) General Chemistry I	4
CHEM 1130 General Chemistry Laboratory	1
OR	
CHEM 1210 Principles of Chemistry I	4
CHEM 1230 Chemical Principles Laboratory I	1

MATH 1100 (QL) Calculus Techniques	3
NR 2220 General Ecology	3
Approved Depth Humanities and Creative Arts (DHA) course	3

Spring Semester (17 credits)

CHEM 1120 (BPS) General Chemistry II	4
OR	
CHEM 1220 (BPS) Principles of Chemistry II	4
ENGL 2010 (CL) Intermediate Writing: Research Writing in a Persuasive Mode	3
SOIL 3000 Fundamentals of Soil Science	4
STAT 2000 (QI) Statistical Methods (3 cr) or	
STAT 3000 (QI) Statistics for Scientists (3 cr)	3
Elective Course(s)	3

C. Third Year (30 credits)

Fall Semester (14 credits)

FRWS 3600 Wildland Plant Ecology and Identification	4
FRWS 3610 Wildland Animal Ecology and Identification	4
FRWS 3700 (CI) Inventory and Assessment in Natural Resource and Environmental Management	3
FRWS 3850 Vegetation and Habitat Management	3

Spring Semester (16 credits)

FRWS 3300 Management Aspects of Wildlife Behavior	3
FRWS 3710 Monitoring and Assessment in Natural Resource and Environmental Management	3
FRWS 3800 Wildland Ecosystems	3
FRWS 3810 Plant and Animal Populations	3
FRWS 3900 Managing Dynamic Ecological Systems	4

D. Fourth Year (31 credits)

Fall Semester (16 credits)

BIOL 5580 Mammalogy	3
ENVS 3000 Natural Resources Policy and Economics	4
ENVS 4000 (DSS) Human Dimensions of Natural Resource Management	3
FRWS 4880 Genetics in Conservation and Management	3
Elective Course(s)	3

Spring Semester (15 credits)

BIOL 5250 (CI) Evolutionary Biology	3
BIOL 5560 Ornithology (3 cr) or	
BIOL 5570 Herpetology (3 cr)	3
FRWS 4500 Principles of Wildlife Management	3
FRWS 4600 Conservation Biology	3
Elective Course(s)	3

Financial Assistance

The main opportunities for undergraduates to find financial support through grants, work-study, and loans are listed on pages 23-27 in the *Financial Aid and Scholarship Information* section. In addition, more than 30 scholarships are available for eligible students in the College of Natural Resources. Some students may be able to find paid internships with private or governmental organizations, or work for a faculty

member on a research project. Interested persons should contact the college's Academic Service Center for more information on financial assistance for undergraduate students.

Departmental Honors

Students who would like to experience greater academic depth within their major are encouraged to enroll in departmental honors. Through original, independent work, Honors students enjoy the benefits of close supervision and mentoring, as they work one-on-one with faculty in select upper-division departmental courses. Honors students also complete a senior project, which provides another opportunity to collaborate with faculty on a problem that is significant, both personally and in the student's discipline. Participating in departmental honors enhances students' chances for obtaining fellowships and admission to graduate school. Minimum GPA requirements for participation in departmental honors vary by department, but usually fall within the range of 3.30-3.50. Students may enter the Honors Program at almost any stage in their academic career, including at the junior (and sometimes senior) level. The campus-wide Honors Program, which is open to all qualified students regardless of major, offers a rich array of cultural and social activities, special classes, and the benefit of Honors early registration. Interested students should contact the Honors Program, Merrill Library 374, (435) 797-2715, honors@cc.usu.edu. Additional information can be found online at: <http://www.usu.edu/honors/>

Additional Information

The undergraduate program may be tailored to individual student needs with the help of a faculty advisor. For additional information about the degree requirements, course sequencing, and departmental specialization options and their related coursework, as well as updated information describing current programs and courses offered by the Department of Forest, Range, and Wildlife Sciences, visit the Forest, Range, and Wildlife Sciences main office, Natural Resources 206, or visit: <http://www.cnr.usu.edu/frws>

Major requirement sheets, which outline career opportunities and required courses for departmental majors, can be obtained from the department, or online at: <http://www.usu.edu/ats/majorsheets/>

Graduate Programs

Admission Requirements

The Department of Forest, Range, and Wildlife Sciences offers opportunities for graduate study through MS and PhD degree programs in Ecology, Forestry, Range Science, and Wildlife Biology. The department also offers opportunities to participate in a college-wide Master of Natural Resources (MNR) degree program administered through the College of Natural Resources. The MNR is described more fully on page 369.

The programs of instruction and research leading to graduate degrees in the department are available only to students meeting high scholastic standards who are accepted for study by the departmental faculty. Students desiring entrance to these graduate programs should contact the department head for information concerning eligibility.

USU School of Graduate Studies general admission requirements are described on pages 93-94. Applicants for graduate study in the department should have a bachelor's degree from an accredited

Department of Forest, Range, and Wildlife Sciences

college or university, a cumulative GPA of at least 3.0 (out of 4.0), and GRE scores (quantitative and verbal) above the 40th percentile. Foreign students should submit a TOEFL score of at least 550. Exceptions to these standards will be considered on a case-by-case basis. Written statements of interest help match applicants with faculty advisors. A faculty member must agree to serve as the major professor in order for an applicant to be accepted for study. Prospective students are encouraged to contact faculty members early in the application process to investigate mutual interests, projects, and prospects for financial support.

A natural resources baccalaureate degree is not required for admission to the department, although a sound background in the natural sciences is strongly recommended. Students lacking the requisite background will work with their supervisory committee to address deficiencies.

Degree Programs

The MS degree is offered for students motivated toward a management or administrative career in natural resources management. The MS may be obtained through either a Plan A (research thesis) or Plan B (nonthesis) program, as described on page 98. The **Plan A** option requires a thesis based on original research conducted by the student. The **Plan B** option is recommended for professional forestry, rangeland, or wildlife managers who do not desire research training. The PhD degree is intended for students seeking a natural resources research or academic career. Comprehensive exams (both oral and written) are required in the doctoral program.

The minimum requirement for an MS degree is 30 credits, including at least 24 credits in residency and 6 credits of thesis research. The minimum requirement for a PhD degree is 60 approved graduate credits in addition to an MS degree, or 90 approved graduate credits with no MS degree. At least one year (a minimum of 32 credits), including a minimum of two consecutive semesters, of full-time registration must be in residence at USU.

With committee approval, graduate credit may be transferred from accredited graduate schools, provided the minimum residency requirement (including thesis and dissertation credit) at USU is met. Transfer credit, which must not have been used for any other degree, will be shown on official USU transcripts at completion of the degree.

Research

Cooperation with other departments and research centers of the University, as well as with government collaborators, permits strong graduate programs in all aspects of forest, range, and wildlife-related sciences. Particular mention should be made of the USU Ecology Center, in which the Forest, Range, and Wildlife Sciences Department is very active; the Utah Agricultural Experiment Station, which has a full program in both applied and basic research; the Utah Cooperative Fisheries and Wildlife Research Unit; the Predator Ecology and Behavior Field Station; the Jack H. Berryman Institute; the U.S. Forest Service Rocky Mountain Forest and Range Experiment Station; and the USDA Agricultural Research Service.

Financial Assistance

General aspects of financial support for graduate students at Utah State University are listed on pages 92-93 in the *Graduate Financial Assistance* section. This includes important information on the University-wide policies and terms of reference for research and

teaching assistantships, graduate tuition obligations and benefits, Western Regional Graduate Programs, and competitive University-wide fellowships and scholarships. The College of Natural Resources also offers a limited number of Quinney Doctoral Fellowships for incoming doctoral students.

Graduate research assistantships may be available on a competitive basis to both MS and PhD students through major professors having contracts, grants, or other awards from the University, private sector, or government agencies. These assistantships vary in the amount of support offered, but they commonly offer a stipend to help cover living expenses and operating funds to carry out the research. Other benefits may include assistance with tuition and student health insurance, as well as opportunities to travel.

The department also has a few graduate teaching assistantships for students who help with teaching, grading, or recitation in large courses. These typically pay only a modest supplement on a semester basis, however, and are not sufficient to cover living expenses. Domestic PhD students on a research assistantship in some departmental degree programs are required to hold at least one teaching assistantship during their program, to obtain experience in classroom (mainly undergraduate) instruction. MS students may also hold teaching assistantships, contingent upon availability of funds. Acceptance to pursue graduate study does not guarantee the student financial assistance.

Additional Information

For more information about graduate programs and departmental faculty and their research emphasis areas, as well as updated information describing current programs and courses offered by the Department of Forest, Range, and Wildlife Sciences, visit the Forest, Range, and Wildlife Sciences main office, Natural Resources 206, or visit <http://www.cnr.usu.edu/frws>

Forest, Range, and Wildlife Sciences Faculty

Professors

John A. Bissonette, Leader, Utah Cooperative Fish and Wildlife Research Unit, landscape ecology, terrestrial vertebrate ecology
F. E. "Fee" Busby, Dean of College of Natural Resources, effects of livestock grazing

Martyn M. Caldwell, Director Ecology Center, plant physiological ecology

Michael R. Conover, animal behavior, wildlife damage management

Raymond D. Dueser, conservation ecology

James N. Long, forest ecology, silviculture

John C. Malechek, rangeland management

Terry A. Messmer, fisheries and wildlife extension specialist, wild ungulate and waterfowl management, wetlands ecology, private land management, conservation communication

Frederick D. Provenza, range animal production

Michael L. Wolfe, wildlife ecology and management

Research Professors

Michael M. Jaeger, behavioral ecology

Frederick F. Knowlton, Predator Ecology and Behavior Project, predator ecology, behavior and management

Jesse A. Logan, forest insect ecology, disturbance ecology, dynamical systems analysis

Leila McReynolds Shultz, plant taxonomy and geography

Department of Forest, Range, and Wildlife Sciences

Adjunct Professors

Barbara H. Allen-Diaz, plant community ecology
Gary E. Belovsky, population ecology
James E. Bowns, range ecology
John W. Connelly, upland game ecology, conservation, management
Norbert V. DeByle, forest ecology
Douglas A. Johnson, plant ecophysiology
Jerran T. Flinders, range science and wildlife ecology
David W. Roberts, forest ecology, forest modeling, vegetation ecology
Scott R. Winterstein, wildlife population dynamics and management

Professors Emeriti

Thadis W. Box, range management
John A. Kadlec, wetlands ecology, wildlife management
Ronald M. Lanner, forest genetics, dendrology
Frederic H. Wagner, wildlife ecology, natural resources policy
Neil E. West, rangeland desertification/condition/trend
John P. Workman, range economics

Associate Professors

Frederick A. Baker, forest pathology, computer applications
Roger E. Banner, range extension specialist
Christopher A. Call, vegetation manipulation/management
Thomas C. Edwards, Jr., Utah Cooperative Fish and Wildlife Research Unit, spatial ecology, habitat modelling, biostatistics
Michael J. Jenkins, disturbance ecology and management, insects, fire, snow avalanches
Michael R. Kuhns, forestry extension specialist, urban forestry, tree physiology
R. Douglas Ramsey, remote sensing, geographic information systems, landscape ecology, spatial analysis
Eugene W. Schupp, plant population ecology and restoration ecology
Helga Van Miegroet, forest soils and biogeochemistry

Research Associate Professors

Eric M. Gese, Predator Ecology and Behavior Field Station, predator behavior and ecology
John A. Shivik, predator ecology

Adjunct Associate Professors

Dale L. Bartos, range ecology
Mark W. Brunson, social and psychological aspects of forest and rangeland management
David C. Chojnacky, forest mensuration
D. Layne Coppock, animal production systems/technology transfer and international pastoral development
John L. Crane Jr., environmental resource management
Thomas A. Jones, native grass breeding
Bruce A. Kimball, range ecology
Niki S. Nicholas, biogeochemistry

Kenneth C. Olson, grazing livestock nutrition
James A. Pfister, poisonous range plants
Michael H. Ralphs, poisonous plants/grazing management
Robert H. Schmidt, wildlife policy, wildlife damage management

Associate Professors Emeriti

Brien E. (Ben) Norton, grazing ecology, international range management
Gar W. Workman, wildlife ecology and management

Assistant Professors

Karen H. Beard, community ecology, ecosystem ecology, conservation biology
Karen E. Mock, conservation genetics and applied molecular ecology
Ronald J. Ryel, plant physiological ecology

Research Assistant Professors

Barbara J. Bentz, forest entomology
Juan J. Villalba, foraging behavior

Adjunct Assistant Professors

Larry M. Conner, wildlife ecologist, wildlife damage management, mammalogist
Mary M. Conner, quantitative ecology and estimation of population parameters
Charles G. Johnson, Jr., plant and community ecology
Kyran E. Kunkel, carnivores, predator/prey ecology, mammal restoration ecology
Chris L. Lauver, range ecology
Nicole L. McCoy, natural resource economics
Thomas A. Monaco, research ecologist
Dale L. Nolte, foraging behavior
William C. Pitt, Acting Station Leader and wildlife research biologist, Predator Ecology and Behavior Field Station
Johanna M. Ward, population dynamics, avian ecology, conservation biology

Assistant Professor Emeritus

Barrie K. Gilbert, wildlife ethology, behavioral ecology

Adjunct Instructors

Jon Keith Schnare, timber harvest planning and logging methods
David Torelli, collaborative processes, natural resources issues management, volunteer management, fundraising
Katherine S. Voth, wildland/urban interface, fire fuels management, student internships

Course Descriptions

Forest, Range, and Wildlife Sciences (FRWS), pages 520-523