Department of Fish and Wildlife Resources

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Fish and wildlife resources deals with the application of principles of biology and ecology to the understanding of how fish and wildlife populations interact with each other and with their environment, which includes humans. There are four areas of emphasis within the department: **aquaculture, fisheries, wildlife, and conservation genetics**. Persons interested in aquaculture or fisheries can design their major within the B.S. in Fishery Resources and those interested in wildlife, within the B.S. in Wildlife Resources. Conservation genetics courses may be incorporated into either degree.

Fishery biologists and scientists conduct research or apply management principles to aquatic ecosystems. They may become involved with biological monitoring, environmental impact assessment, maintenance of endangered fish, hatchery operation, commercial fish farming, control and prevention of fish diseases, and management of stream or lake ecosystems.

Wildlife biologists, or managers, attempt to maintain adequate populations of game and nongame wildlife species. This involves studying wildlife and its habitat so that management programs can be biologically based. The job often involves coordinating wildlife management programs with other natural resource activities such as forest management, range management, and land use planning.

Both professions offer opportunities in law enforcement, communications, and public relations. A common saying, and one with a great deal of truth, is that fish or wildlife management is largely people management.

Bachelor of Science degrees are offered in fishery resources and wildlife resources. In the fishery resources degree, students may design a program that emphasizes fisheries ecology, aquatic ecology, aquaculture, or fisheries management. In the wildlife resources degree, the program emphasizes the principles of wildlife ecology, population dynamics, and management. Elective courses in all programs provide an opportunity to gain additional knowledge in a special area of interest or to broaden into other fields. To ensure that the student gains practical experience, one season of approved work experience before graduation is required. For information on the NRECB program, see the section on "Natural Resources."

Fish and wildlife graduates find employment with numerous federal and state agencies, educational institutions, and in the private sector. These include the U.S. Fish and Wildlife Service, the Bureau of Land Management, the U.S. Forest Service, the National Marine Fisheries Service, the Army Corps of Engineers, state fish and game or conservation departments, tribal agencies, and private organizations such as power companies, commercial fish growers, consulting agencies, and non-profit organizations. Recent surveys have shown that fish and wildlife baccalaureate graduates of UI obtain employment at a rate considerably above the national average.

The graduate program is offered to meet the needs of students who are interested in either specialized or generalized advanced study. Because specific requirements for each degree are determined by the student's supervisory committee, individual study plans allow for differences in preparation while providing all students with a comparable background by the time the graduate program is completed.

In addition to the admission requirements of the College of Graduate Studies, the prospective student should have maintained a cumulative grade-point average of at least 3.00 (on a 4.00 scale) during the undergraduate program. Acceptance of students who do not have this minimum grade-point average or other stated requirements is possible, subject to recommendation by the department head and approval of the College of Graduate Studies. The decision will be based on an analysis of the applicant's situation. The Graduate Record Examination is required for admission. At least one summer's experience with a natural resource agency is strongly recommended.

The graduate program in **fishery resources** is oriented toward the applied and basic aspects of fishery management, aquatic ecology, and fish health management. The fishery management area includes population analysis, management systems, and environmental stresses; the aquatic ecology area includes limnology and habitat management; and the fish health management area includes finfish culture (coldwater and warmwater), fish disease diagnostics and epidemiology, and fish physiology. The Idaho Cooperative Fish and Wildlife Research Unit and the Aquaculture Research Institute also provide important opportunities for graduate studies in fishery resources and aquaculture.

Students planning to begin graduate studies in fishery resources should have a broad background in the life sciences with specific emphasis on courses in the fishery sciences. They should also have a background in quantitative data processing and communication, both oral and written.

Admission to the graduate program in **wildlife resources** requires an undergraduate degree with a major in wildlife resources or a closely related field emphasizing the principles of wildlife ecology, population dynamics, and management. Students with differing backgrounds are also admitted if they have substantial preparation in the biological and physical sciences. Candidates must fulfill entrance requirements of the Graduate College and of the Department of Fish and Wildlife Resources.

Graduate work in wildlife resources offers students the opportunity to do research in one of several areas including wildlife behavior, predator ecology, population dynamics, habitat relationships, and conservation biology, as well as big game, nongame, upland game, and waterfowl management. Students are encouraged to select topics that will benefit some portion of the wildlife program at the state or national level. Graduate projects in wildlife resources may be developed in cooperation with the Idaho Cooperative Fish and Wildlife Research Unit, an active participant in the department and the overall research program of the college.

In addition to the requirements listed above, graduate admission is based on the compatibility of the student's research interests with the areas of concentration in the department and the availability of research faculty.

The **research mission** of the department is attainment of new knowledge and the understanding of natural resources, their interrelationships and uses. The objectives of the research program are to attain knowledge of the environment and to develop management alternatives that will assist in the conservation of resources while meeting society's needs. The dissemination of this knowledge through publications, continuing education, and other channels of communication is an essential departmental function.

For additional information, please call the department at (208) 885-6434 or visit the web at http://www.cnrhome.uidaho.edu/fishwild.

Courses

See Part 6 for courses in Fishery Resources (Fish) and Wildlife Resources (WLF).

Undergraduate Curricular Requirements

FISHERY RESOURCES (B.S.Fish.Res.)

Students pursuing a B.S. degree in fishery resources (management or aquaculture emphasis) must have received a grade of C or better in each of the following four indicator courses to register for fish- and wildlife-prefixed upper-division courses and to graduate with a B.S.Fish.Res.: Biol 116 and 213, Stat 251, and For/Rnge 221.

To graduate, students must achieve a grade of C or better in Biol 481, and each fish- and wildlife-prefixed upper-division course listed in the requirements for the B.S. degree in fishery resources.

Required course work includes the university requirements (see regulation J-3) and:

First and Second Years
Biol 115 Cells and the Evolution of Life (4 cr)
Biol 116 Organisms & Environments (4 cr)
Biol 213 Principles of biological Structure and Function (4 cr)
Chem 101 Introduction to Chemistry I (4 cr)
Chem 275 Carbon Compounds or Chem 277 Organic Chemistry (3 cr)
Comm 101 Fundamentals of Public Speaking (2 cr)
Econ 202 Principles of Economics (3 cr)
Fish 102 The Fish and Wildlife Professions (1 cr)
For/Rnge 221 Ecology (3 cr)
For/CSS 235 Society and Natural Resources (3 cr)
Geol 101 Physical Geology or Soil 205, 206 The Soil Ecosystem and Lab (4 cr)
Math 160 Survey of Calculus (4 cr)
NR 101 Exploring Natural Resources (1 cr)
Phys 100 Fundamentals of Physics or Phys 111 General Physic I (4 cr)
Stat 251 Statistical Methods (3 cr)

Third and Fourth Years
AVS 371 Anatomy and Physiology or Biol 423 Comparative Vertebrate Physiology (4 cr)
Biol 481 Ichthyology (4 cr)
CSS/For/ForP/Rnge 470 Interdisciplinary Natural Resource Planning (3 cr)
Engl 313 Business Writing or Engl 317 Technical Writing (3 cr)
Fish 314 Fish Ecology (3 cr)
Fish 315 Fish Ecology Lab (1 cr)
Fish 316 Principles of Population Dynamics (2 cr)
Fish 415 Limnology (4 cr)
Fish 418 Fisheries Management (4 cr)
Fish 422 Concepts in Aquaculture (3 cr) or Fish 424 Fish Health Management (4 cr)
Fish 495 Seminar (1 cr)
Gene 314 General Genetics or Biol 210 Genetics (3-4 cr)
MMBB 250, 255 General Microbiology and Lab (5 cr)
WLF 448 Fish and Wildlife Population Ecology (4 cr)
Approved work experience in major field required

Electives to total 128 credits for the degree

ECOLOGY AND CONSERVATION BIOLOGY (B.S.Ecol.Cons.Biol.)

See the section on "Natural Resources" in Part 5.

WILDLIFE RESOURCES (B.S.Wildl.Res.)

Students pursuing a B.S. in wildlife resources must have received a grade of C or better in each of the following four indicator courses to register in fish- and wildlife-prefixed upper-division courses and to graduate with a B.S. in wildlife resources: Biol 116 and 213, Stat 251, and For/Rnge 221.

To graduate, a student must receive a grade of C or better in each fish- and wildlife-prefixed upper-division course listed in the requirements for the B.S. in wildlife resources.

Required course work includes the university requirements (see regulation J-3) and:

First and Second Years
Biol 115 Cells and the Evolution of Life (4 cr)
Biol 116 Organisms & Environments (4 cr)
Biol 213 Principles of Biological Structure and Function (4 cr)
Biol 341 Systematic Botany or For 320 Dendrology or Rnge 353 Rangeland Plant Identification and Ecology (3 cr)
Chem 101 Introduction to Chemistry I (4 cr)
Chem 275 Carbon Compounds or Chem 277 Organic Chemistry I (3 cr)
Comm 101 Fundamentals of Public Speaking (2 cr)
Econ 202 Principles of Economics (3 cr)
For/Rnge 221 Ecology (3 cr)
For/CSS 235 Society and Natural Resources (3 cr)
Geol 101 Physical Geol or Soil 205, 206 The Soil Ecosystem and Lab (4 cr)
Math 160 Survey of Calculus or Math 170 Analytic Geometry and Calculus I (4 cr)
NR 101 Exploring Natural Resources (1 cr)
Stat 251 Statistical Methods (3 cr)
WLF 102 The Fish and Wildlife Professions (1 cr)

Third and Fourth Years
AVS 371 Anatomy and Physiology (4 cr)
Engl 208 Personal and Exploratory Writing, Engl 317 Technical Writing, or Comm 431 Professional Presentation Techniques (3 cr)
For 383 Economics for Natural Resource Managers, AgEc 451 Land and Natural Resource Economics, or Econ 385 Environmental Economics (3 cr)
Gene 314 General Genetics or Biol 210 Genetics (3-4 cr)
Phys 100 Fundamentals of Physics or Phys 111 General Physics I (4 cr)
WLF 314, 315 Wildlife Ecology I and Lab (4 cr)
WLF 316 Wildlife Ecology II (4 cr)
WLF 440 Conservation Biology (3 cr)
WLF 448 Fish and Wildlife Population Ecology (4 cr)
WLF/For 470 Interdisciplinary Natural Resource Planning (3 cr)
WLF 492 Wildlife Management (4 cr)
WLF 495 Wildlife Seminar (1 cr)
Restricted electives, choose two courses from the following (must receive a grade of C or better):
- Biol 481 Ichthyology (4 cr)
- Biol 483 Mammalogy (3 cr)
- Biol 484 Invertebrate Zoology (4 cr)
- WLF 482 Ornithology (4 cr)

Approved work experience in major field required
Electives to total 128 credits for the degree

Academic Minor Requirements

AQUACULTURE MINOR

Biol 481 Ichthyology (4 cr)
Fish 422 Concepts in Aquaculture (3 cr)
Fish 424 Fish Health Management (4 cr)
MMBB 250 General Microbiology (3 cr).
MMBB 255 General Microbiology Lab (2 cr).
Courses selected from the following (12 cr):
- AgEc 278 Farm and Agribusiness Management (4 cr)
- Fish 469 Aquaculture Systems Design (2 cr)

ASM 107 Beginning Welding (2 cr)
AVS 305 Animal Nutrition (4 cr)
Bus 321 Marketing (3 cr)
Ent 472 Aquatic Entomology (3 cr)
ForP 495 Biomaterial Product and Process Development (2 cr)

FISHERY RESOURCES MINOR

Fish 314 Fish Ecology (3 cr)
Fish 315 Fish Ecology Lab (1 cr)
Fish 495 Seminar (1 cr)
For/Rnge 221 Ecology or Biol 314 Ecology and Population Biology (3-4 cr)
Four of the following courses (12-15 cr):
- Biol 481 Ichthyology (4 cr)
- Fish 415 Limnology (4 cr)
- Fish 418 Fisheries Management (4 cr)
- Fish 422 Concepts in Aquaculture (3 cr)
- Fish 424 Fish Health Management (4 cr)
- Fish 430 Riparian Ecology and Management (3 cr)
- Fish 435 Wetland Ecology and Management (3 cr)

WILDLIFE RESOURCES MINOR

For/Rnge 221 Ecology or Biol 314 Ecology and Population Biology (3-4 cr)
WLF 314, 315 Wildlife Ecology I and Lab (4 cr)
WLF 316 Wildlife Ecology II (4 cr)
WLF 495 Wildlife Seminar (1 cr)
Three of the following courses (8-11 cr):
- Biol 483 Mammalogy (3 cr)
- WLF 440 Conservation Biology (3 cr)
- WLF 448 Fish and Wildlife Population Ecology (4 cr)
- WLF 482 Ornithology (4 cr)
- WLF 492 Wildlife Management (4 cr)

Graduate Degree Programs

Candidates must fulfill the requirements of the College of Graduate Studies and of the Department of Fish and Wildlife Resources. See the College of Graduate Studies section of Part 4 for the general requirements applicable to each degree.

Master of Science. Majors in Fishery Resources or Wildlife Resources. The M.S. degree with major study in either fishery resources or wildlife resources is awarded when a student has met the requirements listed below. A formal graduate program of at least 30 semester hours is chosen in consultation with the major professor and the student's supervisory committee. At least 18 credits must be courses numbered 500 and above. For the thesis option, no more than 10 of the 500-level credits of Research and Thesis may be applied toward the degree. (A) Thesis option: General M.S. requirements apply except that the thesis requirement may be fulfilled by one or more journal publications at the discretion of the candidate's supervisory committee. (B) Non-thesis option: General M.S. requirements apply. A professional paper is required.

The Ph.D. degree is available with a major in natural resources. General Ph.D. requirements apply; see the section on "Natural Resources" in Part 5 for details.