

Department of Ecology

The Department of Ecology at Montana State University offers undergraduate majors a broad range of specializations in basic to applied biological and ecological sciences. Courses offered include plant and animal ecology, conservation biology, quantitative biology, terrestrial and aquatic resources and management, and conservation genetics. Undergraduate majors work toward a Bachelor of Science degree in biological sciences in one of four options.



Professor David Roberts teaches tree species identification during an all-day field trip for the course "Rocky Mountain Vegetation."

CURRICULUM OPTIONS

Biology Teaching Option

The Biology Teaching Option is designed for students who wish to become licensed to teach biology in grades 5-12. Coursework is similar to the Organismal Biology Option and includes professional preparation courses through the Teacher Education Program. Upon completion of the degree, students are eligible for licensure in the State of Montana.

Conservation Biology and Ecology Option

The primary goal of the Conservation Biology and Ecology Option is to give students a clear understanding of the ways that natural and human-related processes affect biological diversity and relate this knowledge to its broad societal context. The program of study for the Conservation Biology and Ecology Option will train students broadly and comprehensively in ecology and conservation biology, provide extensive coursework in the scientific method

and statistical analysis, and be highly interdisciplinary, reflecting the broad scope of conservation biology.

Fish and Wildlife Ecology and Management Option

The option in Fish and Wildlife Ecology and Management is a professional degree program offered for those students who have an interest in employment in these fields. Study leading toward a bachelor's degree emphasizes basic principles of animal ecology, with considerable work in related fields.

Organismal Biology Option

The Organismal Biology Option provides a rigorous program of study in plant or animal biology at the whole-organism, species, population and community levels, while allowing students flexibility in selecting biology courses that best meet their interests and objectives. It accomplishes this by requiring students to select 20 required credits in biology in consultation with their advisor to achieve a personal curriculum.



A student downloads data used to examine movements of Yellowstone cutthroat trout.

Options within Major

- Biology Teaching
- Conservation Biology & Ecology
- Fish & Wildlife Ecology & Management
- Organismal Biology

Minors

- Genetics
- Water Resources

Graduate Degrees

- M.S. in Biological Sciences
- M.S. in Fish & Wildlife Management
- Ph.D. in Biological Sciences
- Ph.D. in Ecology & Environmental Sciences
- Ph.D. in Fish & Wildlife Biology

What can I do with a degree in Biological Sciences?

- Biologist
- Biostatistician
- Botanist
- Conservationist
- Ecologist
- Ecotourism coordinator
- Environmental impact analyst
- Environmental educator
- Fish hatchery manager
- Fisheries biologist
- Game Warden
- Geneticist
- Geographic information systems analyst
- Laboratory technician
- Lobbyist
- Marine biologist
- Natural resources manager
- Parasitologist
- Park conservationist
- Public affairs manager
- Research assistant
- Soil conservationist
- Statistician
- Teacher
- Toxicologist
- Veterinarian
- Water resources manager
- Watershed technologist
- Wildlife biologist
- Wildlife manager
- Zoologist

Most professional positions in ecology and fish and wildlife require an M.S. or Ph.D. The undergraduate program at MSU is designed to prepare students for graduate study, while allowing the flexibility to develop an area of specialization, or to study a broad range of disciplines related to ecology.

EDUCATIONAL FACILITIES

Teaching and research laboratories provide access to and training in contemporary field and laboratory technologies and methodologies. Field courses use the varied ecosystems present within easy driving distance from campus, ranging from high plains to alpine environments, as one of the best outdoor laboratories in the nation. Certain summer courses also use the natural setting of Yellowstone National Park for field-oriented education.

RESEARCH OPPORTUNITIES

In the Department of Ecology, students are strongly encouraged to gain research experience. This can be done by enrolling in undergraduate research courses in which the student works closely with a faculty member for at least a semester. Another approach is through summer employment on research projects, on campus or with state or federal agencies, as a paid or volunteer worker. Some examples of recent or current department research programs include:

- Land impact studies
- Fire, climate, and vegetation interactions
- Population studies of managed or threatened and endangered species
- Inter-specific relationships between native mammals and fisheries
- Behavioral and environmental factors influencing invasive hybridization of native trout

The MSU Library provides an outstanding service in making an extensive collection of materials available to students. The library is a selective depository for federal, state and Canadian government documents and offers the world's most comprehensive collection of trout and salmonid materials. The library has been a pioneer in providing computer-based access to federal databases on a wide range of topics.

- Effects of climate upon the population ecology of large mammals
- Behavioral ecology of wolves
- Ecology and habitat management of waterfowl
- Raptor habitat studies
- Bird population studies in relation to land use changes
- Ecological factors limiting numbers and distribution of African wild dogs
- Inter-specific competition between carnivores
- Ecology of warm- and cold-water fisheries
- Management of whirling disease



Assistant professor Jia Hu studies the impacts of climate change on forests.



Student Carson Butler uses radio telemetry to locate a bighorn sheep.

For additional information:

Department of Ecology
Montana State University

310 Lewis Hall
P.O. Box 173460
Bozeman, MT 59717-3460

Tel: 406-994-4548
Fax: 406-994-3190

www.montana.edu/ecology/
ecology@montana.edu