

BIOLOGY AND WILDLIFE

B.A., B.S., M.S., Ph.D. Degrees, Minors

The Department of Biology and Wildlife offers a variety of undergraduate and graduate programs of study for students interested in the science of life.

Undergraduates may major in biological sciences or wildlife biology and conservation. The biological sciences B.A. and B.S. programs provide a broad education in biology that is foundational to careers in health, environment, life science education and research. The wildlife biology and conservation B.S. prepares students for a professional career focused on the management and stewardship of wild animal populations. Our undergraduate programs also provide excellent preparation for advanced study in graduate and professional degree programs.

Graduate students may pursue an M.S. degree in biological sciences or wildlife biology and conservation and a Ph.D. degree in biological sciences. Graduate students work closely with a small faculty committee to plan their coursework and research project. Our location offers unparalleled access to northern high-latitude ecosystems and the plants, animals, and microorganisms adapted to these environments, as well as unique opportunities to engage in health research relevant to the needs of the circumpolar North and its communities. UAF offers state-of-the-art laboratory facilities that support a wide range of biological disciplines, including molecular biology, physiology, behavior and ecology, and the chance to interact with a vibrant community of life science researchers.

College of Natural Science and Mathematics

Department of Biology and Wildlife (<https://www.bw.uaf.edu/>)
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B.A., BIOLOGICAL SCIENCES

Undergraduate majors in biological sciences may pursue either a B.A. or a B.S. degree. The B.A. degree is an excellent choice for students who wish to combine biology with another area of study, e.g. education, art, statistics or journalism. Students in the B.A. program supplement their coursework in biology and natural science with courses in the social sciences and humanities, and all students complete a minor. The student integrates these different areas of study within a cross-disciplinary capstone project. More information about the integrative capstone experience can be found on the Biology and Wildlife Department website (<https://www.uaf.edu/bw/>). Students in the biological sciences B.A. program may adopt an optional concentration in environmental change. The B.A. program, with or without concentration, may be completed either in person or online.

Minimum Requirements for Biological Sciences Bachelor's Degree: 120 credits

Learn more about the bachelor's degree in biological sciences (<https://uaf.edu/academics/programs/bachelors/biological-sciences.php>), including an overview of the program, career opportunities and more.

B.S., BIOLOGICAL SCIENCES

Relative to the B.A. program, the B.S. in biological sciences contains more coursework in biology and other natural sciences. It provides excellent preparation for a career in health science, environmental management, field and lab biology, and life science education, or

advanced study in graduate and professional degree programs. Students in the B.S. program may adopt an optional concentration in one of four sub-disciplines: cell and molecular biology, physiology, biomedical science or ecology and evolutionary biology. All students in the biological sciences B.S. conduct an original research project as part of the capstone experience. More information about the research capstone can be found on the Biology and Wildlife Department website (<https://www.uaf.edu/bw/>). The B.S. without concentration may be completed either in person or online; however, the concentrations currently require at least some on-campus coursework.

Minimum Requirements for Biological Sciences Bachelor's Degree: 120 credits

Learn more about the bachelor's degree in biological sciences (<https://uaf.edu/academics/programs/bachelors/biological-sciences.php>), including an overview of the program, career opportunities and more.

B.S., CLIMATE AND ENVIRONMENTAL CHANGE

Effective human responses to the challenge of climate change will require college graduates with broad scientific knowledge who can communicate effectively to a diverse audience. The B.S. in Climate and Environmental Change is an interdisciplinary program of study that combines coursework in physical science, biology, environmental management and social science, with opportunities to acquire additional employable tools such as computer programming, remote sensing and GIS. A subset of courses in the program may be completed online. Many courses in the program focus on the unique challenges of the circumpolar North, where climate is changing most rapidly.

Students emphasize areas of special interest and expertise by choosing among four concentrations representing different aspects of climate change: environmental earth science, physical processes, ecological processes, and sustainability. The concentrations prepare students for different aspects of environmentally-related work in agencies and industry, such as environmental scientist, environmental consultant, environmental technician and environmental policy analyst; and for graduate study in a variety of disciplines, including earth system science, resource management and biology.

Minimum Requirements for Climate and Environmental Change Bachelor's Degree: 120 credits

B.S., WILDLIFE BIOLOGY AND CONSERVATION

The wildlife biology and conservation B.S. program prepares students for a professional career that involves wild animal populations and their interactions with people and the environment. Career paths include wildlife management, research, conservation, stewardship, agency administration, tourism, education, communication and consulting. Our curriculum is designed to help students meet the requirements of a Certified Wildlife Biologist, an internationally recognized certificate administered by The Wildlife Society.¹ The undergraduate wildlife program also provides a solid foundation for further study at the graduate level.

The geographic location of UAF offers students unparalleled opportunities to learn about a diversity of wildlife species and the vast northern ecosystems (arctic tundra, boreal forest, temperate coastal rainforest) that they inhabit. Many of our courses include outdoor activities that foster hands-on training. With the Arctic warming 3-4 times faster than the global average, our students have a front-row seat to

observe and study the rapidly changing relationships between climate and wildlife.

Students gain real-life exposure to the wildlife profession through interactions with UAF faculty and personnel from several federal (USGS, NPS, USFWS, USFS) and state (ADFG) wildlife and conservation agencies. Students have numerous opportunities to participate in fieldwork, laboratory research and internships that provide invaluable experiences that prepare students for the next stage of their professional careers.

Minimum Requirements for Wildlife Biology and Conservation Degree: 120 credits

Learn more about the bachelor's degree in wildlife biology and conservation (<https://uaf.edu/academics/programs/bachelors/wildlife-biology-conservation.php>), including an overview of the program, career opportunities and more.

¹ Students interested in applying to become a Certified Wildlife Biologist with The Wildlife Society should work with their advisor to ensure that they include the necessary coursework in their degree program.

M.S., PH.D., BIOLOGICAL SCIENCES

Graduate students in the biological sciences program at UAF conduct independent research in a part of the world changing rapidly due to climate warming. The emphasis of a student's research is tailored to the student's academic and career goals. Students are encouraged to make connections with potential mentors on the faculty before applying to the program. A list of faculty with the disciplinary focus of their research appears on the Biology and Wildlife website (<https://www.uaf.edu/bw/>).

A variety of facilities are available for graduate research. The department has close connections with the Bonanza Creek Long Term Ecological Research program - focused on the boreal forest - and the Toolik Field Station - focused on the Arctic. Facilities available to graduate students on the Troth Yeddha' (Fairbanks) campus include IAB Genomics Core Laboratory, IAB Research Greenhouse, Molecular Imaging Facility, Biological Research and Diagnostics Facility and the Large Animal Research Station. Students and faculty work on systematic collections in the UA Museum of the North using a variety of approaches from traditional morphology to molecular biology.

Most students in the graduate degree programs are funded through research or teaching assistantships. Research assistantships are funded by grants to individual faculty members. Applicants interested in graduate research assistantships should contact individual faculty members for availability. Teaching assistants typically lead laboratory sections of undergraduate courses. Additionally, competitive fellowships and grants are available through the Institute of Arctic Biology, the University of Alaska Foundation, the UAF Graduate School (<https://uaf.edu/gradschool/current-students/funding.php>) and extramural sources. Graduates of biological sciences M.S. and Ph.D. programs often go on to positions at state and federal resource agencies, research institutions and universities.

Minimum Requirements for Biological Sciences Master's and Doctoral Degrees: M.S.: 30 credits; Ph.D.: 18 thesis credits

Detailed information on graduate programs in biological science is available on the Biology and Wildlife Department website (<https://www.uaf.edu/bw/>).

M.S., PH.D., EARTH SYSTEM SCIENCE

Earth System Science at UAF is a multidisciplinary degree program that provides the option for a disciplinary concentration in one of eight topics:

- Sustainability
- Ecosystems
- Hydrology
- Atmospheric and Climate Sciences
- Cryosphere
- Solid Earth Geophysics
- Geoscience
- Geospatial Science

The ESS program involves faculty participation from six departments and programs:

- Natural Resources and Environment
- Center for Cross-Cultural Studies
- Biology and Wildlife
- Civil, Geological, and Environmental Engineering
- Atmospheric Sciences
- Geosciences

and five research institutes:

- Institute of Agriculture/Natural Resources and Extension
- Institute of Arctic Biology
- Institute of Northern Engineering
- International Arctic Research Center
- Geophysical Institute.

Minimum Requirements for Earth System Science Degrees: M.S.: 30 credits; Ph.D.: 26-41 credits.

M.S., WILDLIFE BIOLOGY AND CONSERVATION

The M.S. degree in wildlife biology and conservation provides students with advanced education, training, and research opportunities in the biology of wild animals and their interactions with people and the environment. The geographic location of UAF offers students unparalleled opportunities to study a diversity of wildlife species in vast northern ecosystems (temperate coastal rainforests, boreal forests, arctic tundra) and state-of-the-art facilities. With the Arctic warming 3-4 times faster than the global average, our graduate students are on the front line of research on the relationships between climate change and wildlife. Some areas of expertise within our graduate program include wildlife population dynamics, species interactions (plant-animal, predator-prey), nutrition and physiology, landscape and movement ecology, management and the human dimensions of wildlife science.

Wildlife students work closely with the Institute of Arctic Biology, Alaska Cooperative Fish and Wildlife Research Unit, UA Museum of the North, several federal (USGS, NPS, USFWS, USFS) and state (ADFG) wildlife and conservation agencies, Alaska Native and nonprofit organizations and consulting businesses. Our department, institutes and collaborating agencies often support graduate student projects and provide post-graduate employment opportunities. Most students receive research or teaching assistantships that provide stipends and reimbursement of tuition costs while pursuing their degree. Ultimately, our students gain

the experience, skills and knowledge needed to be leaders in the wildlife profession. After receiving their M.S., the vast majority of our graduate students find positions with state or federal wildlife agencies, nonprofit conservation organizations or pursue a Ph.D.

Minimum Requirements for Wildlife Biology and Conservation Master's Degree: 30 credits (18-24 instructed courses and 6-12 thesis credits)

Detailed information on the graduate program in wildlife biology and conservation is available on the Biology and Wildlife Department website (<https://www.uaf.edu/bw/>).

GRADUATE CERTIFICATE, SCIENCE TEACHING AND OUTREACH

The certificate in science teaching and outreach is a voluntary program that prepares science graduate students for science careers that include teaching and/or communicating science to the public. It does NOT meet the requirements for earning a state teaching certificate and will not allow graduates to apply for certified positions in the K-12 school system. The science teaching and outreach certificate will enhance readiness for college-level teaching by providing hands-on training and familiarity with pedagogical theory. The certificate is expected to increase competitive ability in the higher-education job market.

Minimum Requirements for Science Teaching and Outreach Graduate Certificate: 12 credits

MINOR, BIOLOGICAL SCIENCES

The minor in biological sciences provides foundational knowledge in modern biology while allowing flexibility to tailor several courses to the student's interest.

Minimum Requirements for Wildlife Biology and Conservation Minor: 18 credits

MINOR, WILDLIFE BIOLOGY AND CONSERVATION

The minor in wildlife biology and conservation offers a minimum set of courses to provide students with an understanding of the principles upon which the management of wildlife populations is based and to familiarize students with techniques used in wildlife management and research.

Minimum Requirements for Wildlife Biology and Conservation Minor: 15 credits

Programs Degrees

- B.A., Biological Sciences (<https://catalog.uaf.edu/bachelors/biological-sciences-ba/>)
- B.S., Biological Sciences (with concentration) (<https://catalog.uaf.edu/bachelors/biological-sciences-bs-concentration/>)
- B.S., Biological Sciences (without concentration) (<https://catalog.uaf.edu/bachelors/biological-sciences-bs/>)
- B.S., Climate and Environmental Change (<https://catalog.uaf.edu/bachelors/climate-environmental-change-bs/>)
- B.S., Wildlife Biology and Conservation (<https://catalog.uaf.edu/bachelors/wildlife-biology-conservation-bs/>)

- M.S., Biological Sciences (<https://catalog.uaf.edu/masters/biological-sciences/>)
- M.S., Earth System Science (<https://catalog.uaf.edu/masters/earth-system-science/>)
- M.S., Wildlife Biology and Conservation (<https://catalog.uaf.edu/masters/wildlife-biology-and-conservation/>)
- Ph.D., Biological Sciences (<https://catalog.uaf.edu/phd/biological-sciences/>)
- Ph.D., (<https://catalog.uaf.edu/phd/earth-system-science/>)Earth System Science

Graduate Certificate

- Graduate Certificate, Science Teaching and Outreach (<https://catalog.uaf.edu/graduate-certificates/science-teaching-and-outreach/>)

Minor

- Minor, Biological Sciences (<https://catalog.uaf.edu/minors/biological-sciences/>)
- Minor, Wildlife Biology and Conservation (<https://catalog.uaf.edu/minors/wildlife-biology-conservation/>)