

DEPARTMENT OF FOREST, RANGELAND, AND FIRE SCIENCES

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The Department of Forest, Rangeland, and Fire Sciences (FRFS, www.uidaho.edu/frfs) offers five Bachelor of Science (B.S.) degrees in ecology and ecosystem science; forest resources; fire ecology and management; rangeland ecology and management; and forest and sustainable products.

The department offers three Associate of Science (A.S.) degrees in forest nursery technology and operations, forest harvesting technology and operations, and wildland fuel and fire technology.

While graduate degrees are administered through the College of Natural Resources, students can select a specialization within FRFS that would lead to either a Master of Science (M.S.) in Natural Resources (thesis and non-thesis options) or a Doctor of Philosophy (Ph.D.) in Natural Resources (see Forest, Rangeland, and Fire Sciences Graduate Degree Programs (p. 4) for more information). Students seeking an advanced degree of the professional nature should explore the Master of Natural Resources (M.N.R.) program, for which faculty in FRFS serve as mentors.

Undergraduate and graduate students in the Department of Forest, Rangeland, and Fire Sciences are provided with an opportunity to learn from globally-recognized faculty. Using a mix of teaching methods, students are exposed to both the scientific background and the hands-on practice needed to become leaders in their chosen field. Extensive opportunities exist for students to develop as practitioners and scientists through partnership with our Experimental Forest, Pitkin Forest Nursery, numerous laboratories (Fire, Forest Operations, Paleoecology, Rangeland Ecology, Forest and Sustainable Products, Seedling Quality) and regional cooperative units.

Department faculty and administration strive to provide graduates with diverse opportunities for personal growth while maintaining curricula that ensure competency upon entering the workforce or continuing into advanced study. Students are provided with courses that expand critical thinking skills and understanding of concepts rather than rote learning of facts and principles. Class sizes are managed to appropriate student to faculty ratios for the subject matter to be taught effectively. Courses emphasize the dynamic nature of forest, rangeland, and fire sciences and technologies by incorporating new concepts and methods as they emerge. Field and lab-based study is also an integral part of all curricula. The faculty and staff of the college encourage and assist students in finding seasonal professional employment and opportunities for involvement in student clubs and professional organizations. Faculty members seek to provide research opportunities for students that advance science in the broad fields of study in which they have expertise.

Bachelor of Science in Ecology & Ecosystem Science

Ecology is the study of the relationships between living organisms, including humans, and their physical environment. Ecologists seek to understand the vital connections of natural and artificial ecosystems.

Our students are prepared to address complex, interdisciplinary problems that threaten ecosystems across the world by focusing on ecological, cultural, and sociological relationships; studying how living and nonliving factors interact; and asking what organisms need to survive and thrive.

The ecology and ecosystems science curriculum is strongly grounded on research, culminating in a guided, hands-on senior thesis experience. Students may research topics such as the removal or return of apex predators or the strengths and weaknesses of invasive species on ecosystems.

Graduates are equipped to be leaders in ecology, providing critical insight to our changing biosphere. Our ecologists go on to work in academia, government agencies such as the U.S. Geological Survey, and non-governmental organizations like Conservation International. Our ecologists perform fieldwork to analyze environmental conditions and habitats, and they gather information for ecosystem management or restoration projects. Graduates go on to create essential solutions to worldwide problems such as biodiversity conservation, disease dynamics, the effects of anthropogenic changes, and the course of pollutants.

Bachelor of Science in Fire Ecology and Management

The College of Natural Resources has provided over 35 years of leadership in fire education. We offer more courses focused on fire than any other natural resources school in the country. Our courses and degree programs are developed to help students understand fundamental concepts, the science behind issues, and the skills to become leaders in fire and natural resource management. Our fire research program attracts top graduate students and collaborates both with the leading fire scientists and innovative effective fire managers. Our research and outreach efforts provide useful, timely, and sound science to address fire ecology and management issues across the state, region, and nation.

We provide a range of educational opportunities for wildland fire managers and others interested in a career in wildland fire research with a focus on solving real world problems through an interdisciplinary approach that focuses on educating current and future fire professional leaders. The B.S. in Fire Ecology and Management has recently been recognized by the National Association for Fire Ecology as a leading program in the US.

A Fire Ecology and Management Minor as well as academic certificates in fire ecology, management, and technology are also available.

Bachelor of Science in Forest and Sustainable Products

Forest and sustainable products are those that can be replaced by biological means, such as sustainably-managed forests or residues from agricultural food crops, and offer environmental benefits as well as useful products for society. Renewable and biodegradable materials typically consume less energy in their preparation and can be reused, recycled, or composted at the end of their useful life. Wood is a primary renewable, recyclable, and biodegradable material in the U.S. and the world and is

used to produce over 5,000 different products for shelter, packaging, and chemicals. Renewable, bio-based energy sources reduce greenhouse gas emissions and contribute to energy self-reliance.

The B.S. in Forest and Sustainable Products curriculum prepares students for a wide range of careers in the manufacture, marketing, and utilization of sustainable, renewable materials. Interdisciplinary coursework and project-based learning opportunities lead to a choice of several career tracks including procurement of timber and other renewable materials; production management, marketing and distribution of bio-based products; green building materials selection, construction and design; and bio-based energy production systems. The undergraduate curriculum is structured, but it still allows students to follow specific interests through course selection from restricted and unrestricted electives in the areas of architecture, business, entrepreneurship, forest operations, and agriculture. This degree program is accredited by the Society of Wood Science and Technology.

Bachelor of Science in Forestry

Forestry is "managing and using for human benefit the forest lands and natural resources that occur on and in association with forest lands." These benefits may include values, services, or products such as stable human communities, aesthetics, biodiversity, recreational opportunities, clean water and air, soil protection, forage, fish and wildlife, medicinal and ornamental items, wood products, and many others. One-third of the nation's land area and 40 percent of Idaho's land area are forested. Present-day forest management requires professionals highly trained in an interdisciplinary approach that adapts to scientific developments and sociological and economic constraints while sustaining healthy forest ecosystems.

The B.S. in Forestry is accredited by the Society of American Foresters, the specialized accrediting body recognized by the Commission on Recognition of Post-secondary Accreditation as the accrediting agency for forestry in the United States.

The curriculum provides students with an interdisciplinary education founded on the principles of science-based stewardship. Students are given an opportunity to strengthen their understanding of ecology, forest ecosystem processes, social sciences, remote sensing and geographic information systems, silviculture, pest management, forest operations, and other specialties by selective use of elective credits. Graduates with a professional forestry degree are employed by a wide range of federal and state forestry and natural resource agencies; private forestland companies, such as Potlatch-Deltic, Forest Capital, Weyerhaeuser; consulting companies that work with private non-industrial forest landowners and others that do environmental assessments and monitoring of forest lands; and non-governmental agencies that manage and/or are interested in forest ecosystem land management.

Specific learning outcomes associated with the B.S. in Forestry include developing the ability to

- communicate effectively by listening actively, formulating, articulating, and explaining ideas clearly using oral and written techniques;
- demonstrate critical thinking and problem-solving skills;
- demonstrate skills in working with teams of people, including effective leadership of groups working toward a common goal;
- develop and apply scientific knowledge (i.e. ecological, social, and economic) to evaluate and justify forest management decisions;

- access, evaluate, and appropriately use scientific literature, technologies, and expert advice when considering critical resource issues and management alternatives;
- forecast potential outcomes of forestry decisions in time and space, while considering risks and uncertainty; and
- assess forest, site, and socioeconomic conditions across temporal and spatial scales using appropriate metrics.

Bachelor of Science in Rangeland Ecology and Management

"Rangeland" describes the extensive, unforested lands dominating the western half of the continent and covering half of land's earth surface, including 48% of Idaho. Rangelands around the world are known by many names including prairie, plains, grassland, shrubland, savanna, steppe, desert, semi-desert, sward, tundra, and alpine.

Limited precipitation, generally sparse vegetation, sharp climatic extremes, highly variable soils, frequent salinity, and diverse topography characterize the kind of land called "rangeland." Rangelands produce a wide variety of goods and services desired by society, including livestock forage, wildlife habitat, water, mineral resources, wood products, wild-land recreation, open space, and natural beauty. The geographic extent and many important resources of rangelands make their proper use and management vitally important to people everywhere.

Rangeland managers enjoy careers with a variety of private organizations and government agencies. State and federal land management agencies, such as the US Forest Service, Bureau of Land Management, and State Department of Lands, hire rangeland professionals to oversee the management of public rangelands. Wildlife management agencies also hire range managers to maintain and improve wildlife habitat. Private landowners employ range consultants and managers to oversee livestock operations, enhance hunting programs, maintain forage resources, and control weeds. Biological assessment companies require the careful measurement and assessment of vegetation resources; therefore, they often hire rangeland professionals. A growing number of rangeland professionals work as natural resource facilitators to bring rangeland stakeholders together to craft plans for environmental stewardship. Internships are also available. Over 85% of the graduates of the Rangeland Conservation B.S. program at the University of Idaho in the last 10 years have secured careers in natural resource management or advanced to graduate school.

Fire Ecology, Management and Technology Academic Certificate

This 15-credit certificate program is designed for traditional and non-traditional students who would like to receive more depth in the concepts, science, and tools currently used in fire ecology and management, or for those seeking educational requirements required for federal employment. After completing this certificate program, students will be able to apply sound science to solving complex issues facing fire management. Many of our students combine this certificate with other degrees.

Students who wish to complete the certificate program may register for courses online. We strongly recommend that students contact us at fire@uidaho.edu to talk to an advisor who will help develop an individualized program of study to help meet individual educational needs. Note that there is an additional fee for all online courses and for

some campus-based courses and that there is no additional fee for part-time non-resident students who are taking online courses.

University of Idaho academic certificate requirements include coursework that must not be more than five years old unless it is being used in conjunction with the completion of a graduate degree, with up to six of the required credits able to consist of coursework completed at another regionally accredited institution. For more information, please contact us or visit the following website: www.uidaho.edu/cnr/frfs/ (<http://www.uidaho.edu/cnr/frfs/>).

Associate of Science in Forest Nursery Management and Technology

This degree engages in an experiential commercial forest nursery program with an emphasis on practices, technology, and operations unique to the North American nursery industry. Students prepare to directly enter the workforce after two years of hands-on learning and training.

Students focus on propagation and production of trees, shrubs, and native plants using advanced technologies at the environmentally controlled modern greenhouses located at the University of Idaho's Pitkin Forest Nursery in Moscow. The University of Idaho is one of only two universities nationwide that operate a forest nursery on a commercial scale (400,000+ seedlings a year).

Students prepare with both business-related coursework and applied practices and engage with private enterprises and public nurseries to gain the skills necessary to manage a commercial nursery.

Associate of Science in Forest Operations and Technology

This degree prepares students to directly enter the workforce after two years of training and learning. Students develop hands-on training using modern forest harvesting equipment and technology to meet industry workforce needs on the University of Idaho's 10,000+ acre Experimental Forest near Moscow. The program partners with industry to train students in a variety of commercially available harvesting technologies.

The college also offers the nationally acclaimed Idaho's Logger Education and Advance Professionalism (LEAP) program and networking opportunities within coursework to form relationships with forestry companies and family forest owners.

Associate of Science in Wildland Fuel and Fire Technology

The A.S. in Wildland Fuel and Fire Technology is a two-year online program that prepares students for careers in the wildland fire sector. It is ideal for permanent and seasonal employees employed as wildland firefighters and fire suppression technicians and for professionals seeking to complete the Office of Personnel Management Federal Series certification.

Based on our nationally ranked B.S. in Fire Ecology and Management degree, the program is built by faculty expertise with wildland fire and fuels management as well as an extensive network of stakeholders at federal and state levels. Faculty collaborate to develop online content with the National Wildfire Coordinating Group (NWCG), an operational

group designed to coordinate fire management programs of eleven participating federal agencies, including training.

Graduate Programs

Graduate programs are offered in many specialization areas across five general topic areas in which FRFS faculty are conducting research:

1. Ecology and Biogeosciences of Forest and Rangeland Ecosystems: ecosystem processes/modeling, biometrics, biogeochemistry, hydrology and ecohydrology, remote sensing and geospatial ecology, landscape ecology, community ecology, population ecology, ecosystem ecology, disturbance ecology, paleoecology, restoration ecology, ecophysiology, global environmental change, conservation biology/genetics, and molecular plant systematic;
2. Forest Sciences and Management: forest mensuration, forest regeneration, forest ecosystem management, tree physiology, forest pathology, forest policy, forest operations, silviculture, forest ecology, and forest genetics;
3. Forest and Sustainable Products: procurement of timber and other renewable materials; production management, marketing and distribution of bio-based products; green building materials selection, construction and design; and bio-based energy production systems;
4. Fire Sciences and Management: fire effects and recovery, fire behavior, fuels management, biophysical controls of fire and fire regimes, air quality and smoke management, fire history, and fire ecology; and
5. Rangeland Sciences and Management: grazing behavior and management, invasive plant management, livestock-wildlife relations, rangeland and habitat management, rangeland riparian management, and rangeland ecology.

Admission to the graduate program is based on 1) the evidence of ability to complete graduate-level work as discerned from undergraduate transcripts, the applicant's statement of career objectives, and letters of recommendation; 2) the compatibility of the student's educational and career objectives with faculty expertise and departmental objectives; and 3) the availability of graduate faculty to act as major advisor for an applicant. An undergraduate degree related to our programs is also recommended, but an applicant may be accepted with the understanding that certain course deficiencies may be required by the student's advisory committee.

Students can transfer up to 12 approved credits taken as a non-degree seeking student into a M.S. or Ph.D. program in the College of Natural Resources with permission of the departmental graduate committee. Students who are considering transferring non-degree credits into a CNR graduate program should request early advising from the appropriate department.

Further information can be obtained from the department head (208-885-7952).

Bachelor of Science Degrees

- Ecology and Ecosystem Science (B.S.) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/ecology-and-ecosystems-science-bs/>)
- Forestry (B.S. Forestry) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forestry-bsforestry/>)

- Fire Ecology and Management (B.S.Fire.Ecol.Mgmt.) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/fire-ecology-management-bsfireecolmgmt/>)
- Rangeland Ecology and Management (B.S.) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/rangeland-conservation-bsrangelandconsv/>)
- Forest and Sustainable Products (B.S.) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-sustainable-products-bs/>)

Minors

- Ecology Minor (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/ecology-minor/>)
- Fire Ecology and Management Minor (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/fire-ecology-management-minor/>)
- Forest Operations Minor (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-operations-minor/>)
- Forest Resources Minor (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-resources-minor/>)
- Rangeland Ecology and Management Minor (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/rangeland-ecology-management-minor/>)
- Renewable Materials Minor (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/renewable-materials-minor/>)

Associate of Science Degrees

- Forest Nursery Management and Technology (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-nursery-management-technology-as/>)
- Forest Operations and Technology (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-operations-and-technology-as/>)
- Wildland Fuel and Fire Technology (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/wildland-fuel-and-fire-technology-as/>)

Certificates

- Natural Resource Management Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/natural-resource-management-academic-certificate/>)
- Rangeland Management Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/rangeland-management-undergraduate-academic-certificate/>)
- Restoration Ecology Undergraduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/restoration-ecology-undergraduate-academic-certificate/>)

Forest, Rangeland, and Fire Sciences Graduate Program

- Forest, Rangeland, and Fire Science (M.S.) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-rangeland-fire-science-ms/>)
- Forest, Rangeland, and Fire Science (Ph.D.) (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/forest-rangeland-fire-science-phd/>)
- Fire Ecology, Management and Technology Graduate Academic Certificate (<https://catalog.uidaho.edu/colleges-related-units/natural-resources/forest-rangeland-fire-sciences/fire-ecology-management-technology-graduate-academic-certificate/>)