

RANGELAND RESOURCE SCIENCE

Bachelor of Science degree with a major in Rangeland Resource Science

Bachelor of Science degree with a major in Rangeland Resource Science — concentration in Wildland Soil Science

Minor in Rangeland Resource Science

Minor in Wildland Soil Science

See *Natural Resources* for information on the *Master of Science* degree.

Department Chair

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The Program

Students completing this program will be able to:

- Identify plants and quantify vegetation attributes
- Describe, classify and evaluate soil resource attributes
- Evaluate rangeland health using national standards
- Communicate effectively, using oral and written means, the factual basis, interconnectedness, and interpretation of rangeland/wildland soil science and management
- Demonstrate reasoning and critical thinking skills in solving scientific and resource management problems

Rangeland Resource Science. Learn to manage rangeland ecosystems wisely. Study forage, timber, wildlife, recreation, watersheds, and their interrelationships.

Classroom instruction is enhanced by the university's plant, soil, and animal science laboratories. Humboldt also has a range herbarium. Nearby privately owned ranches and federal lands offer excellent opportunities for field study.

Potential careers: range conservationist, biological technician, range manager, environmental specialist, agricultural inspector, lands specialist, soil conservationist or soil scientist, range consultant, natural

resources specialist, watershed manager, or ecosystem restoration specialist.

The Rangeland Resource Science concentration meets the qualifications for "Rangeland Management Specialist" and "Soil Conservationist" classifications for federal employment, and meets the educational requirements to apply to take the California Certified Rangeland Manager examination.

Wildland Soil Science Concentration.

Learn to address the unique management requirements and problems of wildland soils. Wildland soils are uncultivated, natural soils supporting herbaceous and woody plant communities supplying timber, wildlife habitat, livestock forage, watershed values, and other ecosystem services.

Courses in this concentration cover the basic physical and biological sciences, introductory and advanced soil science, and soil and natural resource management.

Classroom instruction is enhanced by the university's soil science laboratories and greenhouses. Research and demonstration sites on private and public lands in Northern California enhance field studies.

Potential careers: soil conservationist, soil scientist, soil consultant, environmental specialist, agricultural inspector, lands or natural resources specialist, restoration specialist, or watershed manager.

The Wildland Soil Science Concentration meets the qualifications for "Soil Conservationist" and "Soil Scientist" position classifications in federal employment. This concentration also meets the educational requirements to take the Fundamentals of Soil Science Examination.

Preparation

In high school take courses in biology, chemistry, mathematics, and earth sciences.

REQUIREMENTS FOR THE MAJOR

For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see "The Bachelor's Degree" section of the catalog, pp. 67-82.

Unit Requirements

Core units: 74
Concentration units: 16-22
Total units in the major: 90-96
Total units required for the degree: 120

Special Grade Requirement

Complete all courses in the major with a C- or better.

Core Courses (74 units)

Lower Division

BIOL 105	(4) Principles of Biology
BOT 105	(4) General Botany
CHEM 107	(4) Fundamentals of Chemistry
ESM 105	(3) Natural Resource Conservation
GSP 101/GSP 101L	(2/1) Geospatial Concepts and Lab
GSP 216	(3) Introduction to Remote Sensing, or
GSP 270	(3) Geographic Information Science (GIS)
PHYX 106	(4) College Physics: Mechanics & Heat
SCI 100	(3) Becoming a STEM Professional in the 21st Century
SOIL 260	(3) Intro to Soil Science
STAT 109	(4) Introductory Biostatistics

Upper Division

BOT 310	(4) General Plant Physiology
BOT 350	(4) Plant Taxonomy
ESM 305	(3) Environmental Conflict Resolution
FOR 315	(3) Forest Management
FOR 359	(3) CA & US Forest & Wildland Policy
RRS 306	(3) Wildland Resource Principles
RRS 360	(3) Wildland Plant Communities
RRS 370	(3) Wildland Ecology Principles
RRS 375	(3) Vegetation Analysis & Health
SOIL 360	(3) Origin & Classification of Soils
SOIL 460	(3) Wildland Soil Management & Erosion Control
WSHD 310	(4) Hydrology & Watershed Management

Select Rangeland Resource Science or the Wildland Soil Science Concentration and an associated emphasis.

Rangeland Resource Science (20-22 units)

See core course requirements.

ESM 215	(3) Natural Resources & Recreation, or
FOR 321	(3) Fire Ecology (required for Fire Emphasis), or
WLDF 301	(3) Principles of Wildlife Management
ECON 423	(3) Environmental & Natural Resource Economics
RRS 420	(3) Intro to Animal Science
RRS 430	(3) Wildland Restoration & Development
RRS 460	(3) Rangeland & Ranch Planning

Approved Electives / Emphases

Complete one of the following emphases for the Rangeland Resource Science concentration (5-7 units), or any combination of courses below or advisor-approved electives totaling a minimum of 6 units.

Botany Emphasis (6 units)

Complete a minimum of 6 units selected from:

BOT 354	[4] Agrostology
BOT 355	[4] Lichens & Bryophytes
BOT 358	[2] Biology of the Microfungi
BOT 359	[2] Biology of the Ascomycetes & Basidiomycetes
BOT 360	[2] Biology of the Fleshy Fungi

Ecological Restoration Emphasis (7 units)

ESM 355	[3] Principles of Ecological Restoration
ESM 455	[4] Applied Ecological Restoration

Geospatial Technology Emphasis (6 units)

Complete 6 units of advisor-approved GSP courses (not already taken in core requirements)

Fire Emphasis (5 units)

FOR 223	(2) Introduction to Wildland Fire
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and one of the following:

FOR 323	(3) Wildland Fire Behavior & Use
FOR 423	(3) Wildland Fuels Management

Natural Resource Policy Emphasis (6 units)

ESM 210	(3) Public Land Use Policies & Management
ESM 325	(3) Environmental Law & Regulation

Soil Emphasis (6 units)

Complete two of the following courses.

SOIL 363	[3] Wetland Soils
SOIL 462	[3] Soil Fertility
SOIL 465	[3] Soil Microbiology
SOIL 467	[3] Soil Physics

Wildland Soil Science Concentration

See core course requirements.

Soil courses are embedded in this concentration to meet federal "Soil Scientist" requirements.

In addition to core courses, complete one of the following emphases for the Wildland Soil Science Concentration or any combination of the courses below or advisor-approved electives totaling a minimum of 18 additional units.

Botany Emphasis (18 units)

Complete a minimum of 6 units from the following:

BOT 354	[4] Agrostology
BOT 355	[4] Lichens & Bryophytes
BOT 358	[2] Biology of the Microfungi
BOT 359	[2] Biology of the Ascomycetes & Basidiomycetes
BOT 360	[2] Biology of Fleshy Fungi

Complete 12 units from the following:

FOR 130	[3] Dendrology
SOIL 363	[3] Wetland Soils
SOIL 462	[3] Soil Fertility
SOIL 465	[3] Soil Microbiology
SOIL 468	[3] Intro to Agroforestry

Earth Sciences Emphasis (19-20 units)

GEO 109	[4] General Geology
GEO 306	[3] General Geomorphology
SOIL 467	[3] Soil Physics

Complete one additional GSP course not taken in the core (3-4 units)

Complete 6 units from the following:

SOIL 363	[3] Wetland Soils
SOIL 462	[3] Soil Fertility
SOIL 465	[3] Soil Microbiology

Ecological Restoration Emphasis (19 units)

ESM 355	[3] Principles of Ecological Restoration
ESM 455	[4] Applied Ecological Restoration
RRS 430	[3] Wildland Restoration & Development
SOIL 363	[3] Wetland Soils

Complete two of the following courses.

SOIL 462	[3] Soil Fertility
SOIL 465	[3] Soil Microbiology
SOIL 467	[3] Soil Physics

SOIL 468	[3] Intro to Agroforestry
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Sustainable Agriculture Emphasis (16 units)

Complete three of the following courses.

SOIL 363	[3] Wetland Soils
SOIL 462	[3] Soil Fertility
SOIL 465	[3] Soil Microbiology
SOIL 467	[3] Soil Physics
SOIL 468	[3] Intro to Agroforestry

Complete one of the following courses.

BA 430	[4] Introduction to New Ventures
PSCI 365	[4] Political Ecology
PSCI 373	[4] Politics of Sustainability

Complete one of the following courses.

WSHD 333	[3] Wildland Water Quality
WSHD 458	[3] Climate Change & Land Use

REQUIREMENTS FOR THE MINORS

Rangeland Resource Science Minor

Total units required for the minor: 18

ESM 105	(3) Natural Resource Conservation
SOIL 260	(3) Intro to Soil Science
RRS 306	(3) Wildland Resource Principles
RRS 360	(3) Wildland Plant Communities
RRS 370	(3) Wildland Ecology Principles
RRS 375	(3) Vegetation Analysis & Health

Wildland Soil Science Minor

Total units required for the minor: 18

SOIL 260	(3) Intro to Soil Science
SOIL 360	(3) Origin & Classification of Soils
SOIL 460	(3) Wildland Soil Management & Erosion Control

At least three courses (including one or more with plus signs †) from the following:

GEO 306†	(3) General Geomorphology
SOIL 363	(3) Wetland Soils
SOIL 462	(3) Soil Fertility†
SOIL 465	(3) Soil Microbiology†
SOIL 467	(3) Soil Physics†
SOIL 468	(3) Intro to Agroforestry
WSHD 310	(4) Hydrology & Watershed Management, or
WSHD 424	(3) Watershed Hydrology



† Course requires a prerequisite that is not required elsewhere in the major.