**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**

David F. Greene, Ph.D.

**Rangeland Ecology & Management Lead**

Susan Edinger Marshall

**Department of Forestry & Wildland Resources**

Forestry Building 205

707-826-3935

humboldt.edu/fwr

**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**

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

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<thead>
<tr>
<th>Course</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>BOT 310</td>
<td>(4) General Plant Physiology</td>
</tr>
<tr>
<td>BOT 350</td>
<td>(4) Plant Taxonomy</td>
</tr>
<tr>
<td>ESM 305</td>
<td>(3) Environmental Conflict Resolution</td>
</tr>
<tr>
<td>FOR 315</td>
<td>(3) Forest Management</td>
</tr>
<tr>
<td>FOR 359</td>
<td>(3) CA &amp; US Forest &amp; Wildland Policy</td>
</tr>
<tr>
<td>RRS 306</td>
<td>(3) Wildland Resource Principles</td>
</tr>
<tr>
<td>RRS 360</td>
<td>(3) Wildland Plant Communities</td>
</tr>
<tr>
<td>RRS 370</td>
<td>(3) Wildland Ecology Principles</td>
</tr>
<tr>
<td>RRS 375</td>
<td>(3) Vegetation Analysis &amp; Health</td>
</tr>
<tr>
<td>SOIL 360</td>
<td>(3) Origin &amp; Classification of Soils</td>
</tr>
<tr>
<td>SOIL 460</td>
<td>(3) Wildland Soil Management &amp; Erosion Control</td>
</tr>
<tr>
<td>WSHD 310</td>
<td>(4) Hydrology &amp; Watershed Management</td>
</tr>
</tbody>
</table>

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

RRS 420 [3] Intro to Animal Science

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 355 [4] Lichens & Bryophytes
BOT 358 [2] Biology of the Microfungi
BOT 360 [2] Biology of the Fleshy Fungi

Ecological Restoration Emphasis (7 units)


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
and one of the following:


Natural Resource Policy Emphasis (6 units)

ESM 325 [3] Environmental Law & Regulation

Soil Emphasis (6 units)

Complete two of the following courses.

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 355 [4] Lichens & Bryophytes
BOT 358 [2] Biology of the Microfungi
BOT 360 [2] Biology of the Fleshy Fungi

Earth Sciences Emphasis (19-20 units)

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

Soil Emphasis (6 units)

Complete two of the following courses.

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

Sustainable Agriculture Emphasis (16 units)

Complete three 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

Wildland Soil Science Minor

Total units required for the minor: 18

ESM 105 [3] Natural Resource Conservation
SOIL 260 [3] Intro to Soil Science
RRS 375 [3] Vegetation Analysis & Health

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

SOIL 462 [3] Soil Fertility*
SOIL 465 [3] Soil Microbiology*
SOIL 467 [3] Soil Physics*
SOIL 468 [3] Intro to Agroforestry

WSHD 424 (3) Watershed Hydrology