ECOLOGY AND CONSERVATION BIOLOGY (B.S. ECOL. CONS. BIOL.)

Improving global environmental conditions requires researchers and other citizens who can understand ecological principles, who can analyze and interpret ecological conditions, and who can predict the consequences of alternative natural resource management decisions. Understanding the importance of social values and policy for ecology and management of rare, threatened, and endangered species and their habitat is necessary to reverse the order of their decline. In the ecology and conservation biology program, students learn to apply biological, ecological, social, and political understanding to solve problems related to long-term conservation of biological diversity and to sustainable management of ecosystems.

This degree combines the biological, ecological, and social sciences to provide
1. An interdisciplinary understanding of the composition, structure, and processes of ecosystems, and
2. The skills necessary to provide long-term planning for the conservation and sustainable management of populations, species, and ecosystems.

Students will examine topics from molecular to landscape scales and integrate the social and biophysical worlds. Graduates will be equipped to address the issues and problems of sustainable resource use, conservation of rare, threatened, or endangered biota, management of ecosystems, and long-term conservation of biological diversity. This program is flexible enough to adapt to the interests of individual students, while remaining firmly grounded in ecological principles applicable to species, populations, communities, landscapes, and ecosystems. It is distinctly different from the emphasis on management in the other forestry, wildlife, fisheries, range, and conservation social sciences programs, or the more general environmental science programs. Graduates of the program often continue advanced studies at national and international universities. This natural resources "liberal science" degree can also serve as pre-professional training for law school, or for professional positions in federal, state, and private environmental organizations including local and regional planning groups and consulting firms.

The program requires 120 credits, and students must choose either the Natural Resources Ecology or Conservation Biology option. Students pursuing a B.S. Ecol. Cons. Biol. must receive a grade of 'C' or better in each of the following 4 indicator courses to register in upper division courses in NRS/FISH/FOR/REM/WLF and to graduate with either option: BIOL 114, BIOL 213, FOR 221, NR 321, STAT 251, or WLF 220. Before students are allowed to begin their senior thesis or project (NRS 485 or NRS 497), they must attend two evening thesis/project sessions and one senior poster presentation.

Required course work includes the university requirements (see regulation J-3 (https://catalog.uidaho.edu/general-requirements-academic-procedures/j-general-requirements-baccalaureate-degrees/#j3)) and:

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<tr>
<th>Code</th>
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<tr>
<td>BIOL 114</td>
<td>Organisms and Environments</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 115</td>
<td>Cells and the Evolution of Life</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 115L</td>
<td>Cells and the Evolution of Life Laboratory</td>
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<tr>
<td>BIOL 213</td>
<td>Structure and Function Across the Tree of Life</td>
<td>4</td>
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<tr>
<td>COMM 101</td>
<td>Fundamentals of Oral Communication</td>
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<tr>
<td>ECON 202</td>
<td>Principles of Microeconomics</td>
<td>3-4</td>
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<tr>
<td>ENGL 317</td>
<td>Technical Writing</td>
<td>3</td>
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<tr>
<td>or ECON 272</td>
<td>Foundations of Economic Analysis</td>
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<tr>
<td>or WLF 370</td>
<td>Management and Communication of Scientific Data</td>
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<tr>
<td>FOR 220</td>
<td>Forest Biology &amp; Dendrology</td>
<td>3</td>
</tr>
<tr>
<td>or REM 341</td>
<td>Systematic Botany</td>
<td></td>
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<tr>
<td>FOR 235</td>
<td>Society and Natural Resources</td>
<td>3</td>
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<tr>
<td>FOR 375</td>
<td>Introduction to Spatial Analysis for Natural Resource</td>
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<tr>
<td>MATH 160</td>
<td>Survey of Calculus</td>
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<td>or MATH 170</td>
<td>Calculus I</td>
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<tr>
<td>NR 101</td>
<td>Exploring Natural Resources</td>
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<td>NR 200</td>
<td>Seminar</td>
<td>1-16</td>
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<td>NR 300</td>
<td>Ecology and Conservation Biology Thesis Seminar</td>
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<td>NRS 383</td>
<td>Natural Resource and Ecosystem Service Economics</td>
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<td>STAT 251</td>
<td>Statistical Methods</td>
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Select one of the following: 3-4

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<tr>
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<tr>
<td>BIOL 314</td>
<td>Ecology and Population Biology</td>
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<tr>
<td>FOR/REM 221/WLF 220</td>
<td>Principles of Ecology</td>
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<tr>
<td>NR 321</td>
<td>Ecology</td>
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Select one of the following: 4

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<tr>
<td>CHEM 101</td>
<td>Introduction to Chemistry</td>
<td>3</td>
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<td>&amp; 101L</td>
<td>and Introduction to Chemistry Laboratory</td>
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<tr>
<td>CHEM 111</td>
<td>General Chemistry I</td>
<td>3</td>
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<tr>
<td>&amp; 111L</td>
<td>and General Chemistry I Laboratory</td>
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Select one of the following: 1

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<thead>
<tr>
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<tr>
<td>FISH 473</td>
<td>ECB Senior Presentation</td>
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<td>FOR 473</td>
<td>ECB Senior Presentation</td>
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<tr>
<td>FSP 473</td>
<td>Ecology and Conservation Biology Senior Thesis</td>
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<tr>
<td>NRS 473</td>
<td>ECB Senior Presentation</td>
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<tr>
<td>REM 473</td>
<td>ECB Senior Presentation</td>
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<tr>
<td>WLF 473</td>
<td>ECB Senior Presentation</td>
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Select one of the following: 3

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<thead>
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<th>Title</th>
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<tr>
<td>FISH 497</td>
<td>Senior Thesis (Max 6 credits)</td>
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<tr>
<td>FOR 497</td>
<td>Senior Thesis (Max 98 credits)</td>
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<td>NR 497</td>
<td>Senior Thesis (Max 3 credits)</td>
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<td>REM 497</td>
<td>Senior Research and Thesis</td>
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<td>WLF 497</td>
<td>Senior Thesis (Max 6 credits)</td>
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Options

Select one of the following options: 36-43

- Natural Resources Ecology (https://catalog.uidaho.edu/colleges-related-units/natural-resources/natural-resources/ecology-conservation-biology-bsecolconsbiol/#naturalresourcesecology)
A. Natural Resources Ecology Option

The Natural Resources Ecology option combines ecological theory, field experience, and quantitative tools to gain an interdisciplinary understanding of the structure and function of ecosystems. This field covers ecological topics from local, regional, and landscape scales while integrating the social and biophysical worlds.

To graduate in this option, students must achieve a 'C' or better in the following six core courses: FOR 330, NR 200, REM 429, SOIL 205/206, and WLF 448.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FOR 330</td>
<td>Terrestrial Ecosystem Ecology</td>
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<tr>
<td>REM 429</td>
<td>Landscape Ecology</td>
<td>3</td>
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<tr>
<td>SOIL 205</td>
<td>The Soil Ecosystem</td>
<td>3</td>
</tr>
<tr>
<td>SOIL 206</td>
<td>The Soil Ecosystem Lab</td>
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<tr>
<td>WLF 448</td>
<td>Fish and Wildlife Population Ecology</td>
<td>4</td>
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</table>

Select one of the following:

- **PHYS 100**: Fundamentals of Physics and Fundamentals of Physics Lab
- **PHYS 111**: General Physics I and General Physics I Lab

Select one Quantitative Resource Analysis Restricted elective from the following: 2-4

- **FOR 472**: Remote Sensing of the Environment
- **GEOG 385**: GIS Primer
- **NRS 310**: Social Science Methods
- **REM 410**: Principles of Vegetation Monitoring and Measurement
- **REM 411**: Wildland Habitat Ecology and Assessment
- **STAT 422**: Survey Sampling Methods
- **STAT 431**: Statistical Analysis
- **WLF 411**: Wildland Habitat Ecology and Assessment

Select one Resource Management Restricted elective from the following: 3-4

- **FISH 418**: Fisheries Management
- **FOR 424**: Silviculture Principles and Practices
- **FOR 462**: Watershed Science and Management
- **NRS 386**: Managing Complex Environmental Systems
- **NRS 490**: Wilderness and Protected Area Management
- **NRS 496**: 
- **REM 456**: Integrated Rangeland Management
- **WLF 492**: Wildlife Management

Select 10 credits of Ecology Restricted electives from the following: 10

- **BIOL 421**: Advanced Evolution/Population Dynamics
- **BIOL 478**: Animal Behavior
- **ENT 469**: Introduction to Forest Insects
- **FISH 314**: Fish Ecology
- **FISH 315**: Fish Ecology Field Techniques and Methods
- **FISH 415**: Limnology

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<tr>
<th>Code</th>
<th>Title</th>
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<tr>
<td>FISH 340</td>
<td>Riparian Ecology and Management</td>
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<tr>
<td>FOR 326</td>
<td>Fire Ecology</td>
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<tr>
<td>FOR 468</td>
<td>Forest and Plant Pathology</td>
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<tr>
<td>GEOG 410</td>
<td>Biogeography</td>
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<td>PLSC 410</td>
<td>Invasive Plant Biology</td>
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<tr>
<td>REM 440</td>
<td>Restoration Ecology</td>
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<td>REM 459</td>
<td>Rangeland Ecology</td>
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<tr>
<td>REM 460</td>
<td>Integrated Field Studies in Rangelands</td>
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<tr>
<td>WLF 314</td>
<td>Ecology of Terrestrial Vertebrates</td>
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<td>WLF 315</td>
<td>Techniques Laboratory</td>
<td></td>
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<tr>
<td>WLF 440</td>
<td>Conservation Biology</td>
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</table>

Select one Social/Political Restricted elective from the following: 2-3

- **COMM 410**: Conflict Management
- **FOR 484**: Forest Policy and Administration
- **GEOG 420**: Land, Resources, and Environment
- **HIST 424**: American Environmental History
- **NRS 311**: Public Involvement in Natural Resource Management
- **NRS 387**: Environmental Communication Skills
- **NRS 462**: Natural Resource Policy
- **NRS 493**: 
- **PHIL 452**: Environmental Philosophy
- **POLS 364**: Politics of the Environment

Total Hours 36-40

Courses to total 120 credits for this degree

1. Both REM 410 and REM 411 must be completed to satisfy Quantitative Resource Analysis Restricted Elective requirement.
2. At least 2 credits from FISH 315, FISH 415, FISH 430, REM 460, and/or WLF 315

B. Conservation Biology Option

The Conservation Biology option is centered around a multidisciplinary curriculum that provides students with training to work in jobs aimed at conserving the earth’s biodiversity. This option provides a broad-based education that covers biological diversity from the genetic level to the landscape level, and it provides additional training in social sciences and management. In the words of Hunter (1996), “Conservation biology is cross-disciplinary, reaching far beyond biology into subjects such as philosophy, economics, and sociology; disciplines that are concerned with the social environment in which we practice conservation—as well as into subjects such as law and education that determine the ways we implement conservation.”

To graduate in this option, students must achieve a 'C' or better in the following seven core courses: BIOL 421, NR 200, PHIL 452, REM 429, WLF 440, and WLF 448.

<table>
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<tr>
<th>Code</th>
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<tr>
<td>BIOL 310</td>
<td>Genetics</td>
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<td>or GENE 314</td>
<td>General Genetics</td>
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<td>BIOL 421</td>
<td>Advanced Evolution/Population Dynamics</td>
<td>3</td>
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<tr>
<td>PHIL 452</td>
<td>Environmental Philosophy</td>
<td>3</td>
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<tr>
<td>REM 429</td>
<td>Landscape Ecology</td>
<td>3</td>
</tr>
<tr>
<td>WLF 440</td>
<td>Conservation Biology</td>
<td>3</td>
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</tbody>
</table>
Select one Quantitative Resource Analysis Restricted elective from the following:
- WLF 448 Fish and Wildlife Population Ecology 4

Select one Resource Management Restricted elective from the following:
- FISH 418 Fisheries Management
- FOR 424 Silviculture Principles and Practices
- FOR 462 Watershed Science and Management
- NRS 386 Managing Complex Environmental Systems
- NRS 490 Wilderness and Protected Area Management
- NRS 496 REM 456 Integrated Rangeland Management
- WLF 492 Wildlife Management

Select 6 credits of Ecology Restricted electives from the following:
- BIOL 478 Animal Behavior
- ENT 469 Introduction to Forest Insects
- FISH 314 Fish Ecology
- FISH 315 Fish Ecology Field Techniques and Methods
- FISH 415 Limnology
- FISH 430 Riparian Ecology and Management
- FOR 330 Terrestrial Ecosystem Ecology
- FOR 326 Fire Ecology
- FOR 468 Forest and Plant Pathology
- GEOG 410 Biogeography
- PLSC 410 Invasive Plant Biology
- REM 440 Restoration Ecology
- REM 459 Rangeland Ecology
- REM 460 Integrated Field Studies in Rangelands
- WLF 314 Ecology of Terrestrial Vertebrates
- WLF 315 Techniques Laboratory

Select one Organismal Biology Restricted elective from the following: 3-4
- BIOL 483 Mammalogy
- BIOL 489 Herpetology
- FISH 481 Ichthyology
- WLF 482 Ornithology

Select two Social/Political Restricted electives from the following: 4-6
- COMM 410 Conflict Management
- ENVS 225 International Environmental Issues Seminar
- FOR 484 Forest Policy and Administration
- GEOG 420 Land, Resources, and Environment
- HIST 424 American Environmental History
- NRS 386 Managing Complex Environmental Systems
- NRS 387 Environmental Communication Skills
- NRS 462 Natural Resource Policy

Both REM 410 and REM 411 must be completed to satisfy Quantitative Resource Analysis Restricted Elective requirement.
At least 2 credits from FISH 315, FISH 415, FISH 430, REM 460, and/or WLF 315

Courses to total 120 credits for this degree

Natural Resources Ecology Option

<table>
<thead>
<tr>
<th>Fall Term 1</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BIOL 114 Organisms and Environments</td>
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<tr>
<td>ENGL 101 Writing and Rhetoric I</td>
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<tr>
<td>MATH 143 College Algebra</td>
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<tr>
<td>NR 101 Exploring Natural Resources</td>
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<td>Elective Course</td>
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<thead>
<tr>
<th>Spring Term 1</th>
<th>Hours</th>
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<tr>
<td>COMM 101 Fundamentals of Oral Communication</td>
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<td>ENGL 102 Writing and Rhetoric II</td>
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<td>NR 200 Seminar</td>
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<td>MATH 160 OR MATH 170 (CHEM 101 AND CHEM 101L) OR (CHEM 111 AND CHEM 111L)</td>
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<thead>
<tr>
<th>Fall Term 2</th>
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<tbody>
<tr>
<td>BIOL 115 Cells and the Evolution of Life</td>
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<tr>
<td>BIOL 115L Cells and the Evolution of Life Laboratory</td>
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<tr>
<td>FOR 235 Society and Natural Resources</td>
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<tr>
<td>STAT 251 Statistical Methods</td>
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<td>ECON 202 OR ECON 272</td>
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<tr>
<th>Spring Term 2</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BIOL 213 Structure and Function Across the Tree of Life</td>
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<tr>
<td>FOR 375 Introduction to Spatial Analysis for Natural Resource Management</td>
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NR 300  Ecology and Conservation Biology Thesis Seminar  1

SOIL 205  The Soil Ecosystem  3

SOIL 206  The Soil Ecosystem Lab  1

BIOL 314 OR FOR 221 OR NR 321 OR REM 221 OR WLF 220  3

Hours  15

Fall Term 3
ENGL 317 OR WLF 370  3
FOR 220 OR REM 341  3
(PHYS 100 AND PHYS 100L) OR (PHYS 111 AND PHYS 111L)  4
COMM 410 OR FOR 484 OR GEOG 420 OR HIST 424 OR NRS 311 OR NRS 387 OR NRS 462 OR NRS 493 OR PHIL 452 OR POLS 364  3

Hours  13

Spring Term 3
FOR 330  Terrestrial Ecosystem Ecology  4
NRS 383  Natural Resource and Ecosystem Service Economics  3

WLF 448  Fish and Wildlife Population Ecology  4

FOR 472 OR GEOG 385 OR NRS 310 OR REM 410 OR REM 411 OR STAT 422 OR STAT 431 OR WLF 411  2
BIOL 421 OR BIOL 478 OR ENT 469 OR FISH 314 OR FISH 315 OR FISH 415 OR FISH 430 OR FOR 326 OR FOR 468 OR GEOG 410 OR PLSC 410 OR REM 440 OR REM 459 OR REM 460 OR WLF 314 OR WLF 315 OR WLF 440  3

Hours  16

Fall Term 4
American Diversity Course  3
Elective Course  3
FISH 497 OR FOR 497 OR NR 497 OR REM 497 OR WLF 497  3
FISH 418 OR FOR 424 OR FOR 462 OR NRS 386 OR NRS 490 OR NRS 496 OR REM 456 OR WLF 492  3

BIOL 421 OR BIOL 478 OR ENT 469 OR FISH 314 OR FISH 315 OR FISH 415 OR FISH 430 OR FOR 326 OR FOR 468 OR GEOG 410 OR PLSC 410 OR REM 440 OR REM 459 OR REM 460 OR WLF 314 OR WLF 315 OR WLF 440  4

Hours  16

Spring Term 4
REM 429  Landscape Ecology  3

International Course  3
Humanistic and Artistic Ways of Knowing Course  3
Elective Course  2
FISH 473 OR FOR 473 OR NRS 473 OR REM 473 OR RMAT 473 OR WLF 473  1
BIOL 421 OR BIOL 478 OR ENT 469 OR FISH 314 OR FISH 315 OR FISH 415 OR FISH 430 OR FOR 326 OR FOR 468 OR GEOG 410 OR PLSC 410 OR REM 440 OR REM 459 OR REM 460 OR WLF 314 OR WLF 315 OR WLF 440  3

Hours  15

Total Hours  120

Conservation Biology Option

Fall Term 1
BIOL 114  Organisms and Environments  4
ENGL 101  Writing and Rhetoric I  3
MATH 143  College Algebra  3
NR 101  Exploring Natural Resources  2
Elective Course  2

Hours  14

Spring Term 1
COMM 101  Fundamentals of Oral Communication  2
ENGL 102  Writing and Rhetoric II  3
NR 200  Seminar  1
MATH 160 OR MATH 170  4
(Chem 101 AND Chem 101L) OR (Chem 111 AND Chem 111L)  4

Hours  14

Fall Term 2
BIOL 115  Cells and the Evolution of Life  3
BIOL 115L  Cells and the Evolution of Life Laboratory  1

FOR 235  Society and Natural Resources  3

STAT 251  Statistical Methods  3
Humanistic and Artistic Ways of Knowing Course  3
ECON 202 OR ECON 272  3

Hours  16

Spring Term 2
BIOL 213  Structure and Function Across the Tree of Life  4
FOR 375  Introduction to Spatial Analysis for Natural Resource Management  3

Hours  16

Fall Term 3
PHIL 452  Environment Philosophy  3
WLF 440  Conservation Biology  3

Hours  14
ENGL 317 OR WLF 370
FOR 220 OR REM 341
FOR 472 OR GEOG 385 OR NRS 310 OR REM 410 OR REM 411 OR STAT 422 OR STAT 431

Hours 15

Spring Term 3
BIOL 421
Advanced Evolution/Population Dynamics 3

NRS 383
Natural Resource and Ecosystem Service Economics 3

WLF 448
Fish and Wildlife Population Ecology 4

BIOL 478 OR ENT 469 OR FISH 314 OR FISH 315 OR FISH 415 OR FISH 430 OR FOR 326 OR FOR 330 OR FOR 468 OR GEOG 410 OR PLSC 410 OR REM 440 OR REM 459 OR REM 460 OR WLF 314 OR WLF 315
COMM 410 OR ENVS 225 OR FOR 484 OR GEOG 420 OR HIST 424 OR NRS 311 OR NRS 386 OR NRS 387 OR NRS 462 OR POLS 364

Hours 16

Fall Term 4
American Diversity Course 3
International Course 3
FISH 497 OR FOR 497 OR NR 497 OR REM 497 OR WLF 497 3
FISH 418 OR FOR 424 OR FOR 462 OR NRS 386 OR NRS 490 OR NRS 496 OR REM 456 OR WLF 492 3
BIOL 483 OR BIOL 489 OR FISH 481 OR WLF 482 3

Hours 15

Spring Term 4
REM 429
Humanistic and Artistic Ways of Knowing Course 3

FISH 473 OR FOR 473 OR NRS 473 OR REM 473 OR RMAT 473 OR WLF 473 1
ENVS 225 OR NRS 493 3
BIOL 478 OR ENT 469 OR FISH 314 OR FISH 315 OR FISH 415 OR FISH 430 OR FOR 326 OR FOR 330 OR FOR 468 OR GEOG 410 OR PLSC 410 OR REM 440 OR REM 459 OR REM 460 OR WLF 314 OR WLF 315
COMM 410 OR ENVS 225 OR FOR 484 OR GEOG 420 OR HIST 424 OR NRS 311 OR NRS 386 OR NRS 387 OR NRS 462 OR POLS 364

Hours 16

Total Hours 120

The degree map is a guide for the timely completion of your curricular requirements. Your academic advisor or department may be contacted for assistance in interpreting this map. This map is not reflective of your academic history or transcript and it is not official notification of completion of degree or certificate requirements. Please contact the Registrar’s Office regarding your official degree/certificate completion status.

Natural Resources Ecology Option
1. Articulate disciplinary Identity:

Students will convey an accurate and nuanced understanding of the unique history and character of the discipline of Ecology and its distinctiveness from related disciplines, as well as their own personal rationale for matriculating within the discipline.

2. Understand principles and theories:

a. Students will accurately articulate key principles concerning the ecology of species, populations, communities, ecosystems, and landscapes.

b. Students will demonstrate an understanding of the interconnection between ecological systems and basic aspects of human ecology (as defined by economics, social sciences, and other related fields).

3. Locate, organize, analyze, and critically evaluate information.

a. Students will demonstrate the ability to locate pertinent ecological, social, economic and political information.

b. Students will organize, analyze, and critically evaluate information using professional, discipline-appropriate standards

4. Effectively communicate ideas and technical knowledge:

Students will effectively utilize diverse forms of communication (written oral, visual) to convey information to scientific and nonscientific audiences in formal and professional formats.

5. Work collaboratively

Students will practice effective team management and participatory skills (in disciplinary and interdisciplinary team settings) to evaluate complex situations and formulate solutions to basic problems

6. Practice ethical behavior

Students will adhere to professional standards of ethics when using or synthesizing knowledge, doing research, employing field practices, engaging in conservation management, and when working with stakeholders.

Conservation Biology Option
1. Articulate disciplinary Identity:

Students will convey an accurate and nuanced understanding of the unique history and character of the discipline of Conservation Biology and its distinctiveness from related disciplines, as well as their own personal rationale for matriculating within the discipline.

2. Understand principles and theories:

a. Students will accurately articulate key principles concerning the ecology of species, populations, communities, ecosystems, and landscapes.

b. Students will demonstrate an understanding of the interconnection between ecological systems and basic aspects of human ecology (as defined by economics, social sciences, and other related fields).

3. Locate, organize, analyze, and critically evaluate information.

a. Students will demonstrate the ability to locate pertinent ecological, social, economic and political information.

b. Students will organize, analyze, and critically evaluate information using professional, discipline-appropriate standards

4. Effectively communicate ideas and technical knowledge:

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