

# Natural Resources (BS): Ecosystem Assessment Concentration

To see more about what you will learn in this program, visit the Learning Outcomes website (<https://apps.oirp.ncsu.edu/pgas/>)!

Two natural resources curricula are offered by the Department of Forestry and Environmental Resources. The curricula are also accredited by the Society of American Foresters and produce natural resources professionals with a broad interdisciplinary background coupled with specifically focused skills needed to manage natural resources. The Natural Resources curricula include a series of common courses to highlight the integrated nature of work by interdisciplinary teams.

The curriculum in Natural Resources Ecosystem Assessment produces graduates who have knowledge and skills to inventory and describe ecosystems characteristics and to evaluate the impacts of management decisions. Ecosystem assessment or environmental impact assessment is an important part of development planning that calls for individuals who understand ecosystem structure and processes; who can identify, measure, inventory, and describe ecosystems; and who can apply standard evaluation and classification systems such as wildlife habitat evaluation procedures and the federal wetland delineation criteria. The curriculum entails a strong science base, as well as advanced courses in sampling and measurements, vegetation, soils, hydrology, and wildlife and fisheries are added. The 400-level courses also address techniques and issues of natural resource management.

The curriculum in Natural Resources Policy and Administration produces graduates who have knowledge and skills to manage natural resources programs in a variety of settings and organizations with an emphasis on public agencies. The advanced courses of the curriculum provide background in economics, policy, government, public administration, and natural resources management. An economics track begins with introductory microeconomics and culminates with environmental economics and public finance. Courses in government and public administration provide knowledge of how public institutions work. Courses in forestry, wildlife and fisheries, and outdoor recreation provide techniques of managing natural ecosystems for various uses. A common thread of how public policy on natural resources is influenced and developed runs through many of the courses already noted and culminates in two senior courses that focus on policy. For information on entrance requirements, contact the program coordinator:

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## Plan Requirements

**Natural Resources (BS): Ecosystem Assessment Concentration:** 120  
Total Units

Course	Title	Hours
<b>First Year</b>		
ENV 100	Student Success in Environmental First Year	1
ENV 101	Exploring the Environment	2
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
Math Electives (p. 2)		6
FOR 150	Critical Thinking and Data Analysis	2
Acad Writing Research (p. 2) <sup>1</sup>		4
Select one of the following:		3
ARE 201	Introduction to Agricultural & Resource Economics	
ARE 201A	Introduction to Agricultural & Resource Economics	
EC 201	Principles of Microeconomics	
EC 205	Fundamentals of Economics	
Hours		26
<b>Second Year</b>		
COM 110 or COM 112	Public Speaking or Interpersonal Communication	3
Physics Elective (p. 2)		4
FOR 252	Introduction to Forest Science	3
FOR 339	Dendrology	4
SSC 200 & SSC 201	Soil Science and Soil Science Laboratory	4
PS 201 or PS 202	American Politics and Government or State and Local Government	3
Hours		21
<b>Third Year</b>		
ENG 333	Communication for Science and Research	3
Select one of the following:		4
AEC 360	Ecology	
FOR 260	Forest Ecology	
PB 360	Ecology	
NR 300	Natural Resource Measurements	4
NR 301	Practicum for Professional Development I	1
Spatial Technology Elective (p. 2)		3
ST 311	Introduction to Statistics	3
ARE 336	Introduction to Resource and Environmental Economics	3
Hours		21
<b>Summer</b>		
NR 360	Internship Experience	3
Hours		3
<b>Fourth Year</b>		
NR 400	Natural Resource Management	4
NR 460	Renewable Natural Resource Management and Policy	3
NR 484	Environmental Impact Assessment	4
Select one of the following:		3
FW 333	Conservation Biology in Practice	

FW 353	Wildlife Management	
FW 404	Wildlife Habitat Management	
	Hours	14
	Total Hours	85

<sup>1</sup> A grade of C- or better is required.

Code	Title	Hours
<b>Technical Electives</b>		
	Management Sciences (p. 2)	6
	Resource Sciences (p. 3)	16
<b>GEP Courses</b>		
	GEP Humanities ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a> )	6
	GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )	2
	GEP Additional Breadth ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/</a> ) (Humanities/Social Sciences/Visual and Performing Arts)	3
	GEP Interdisciplinary Perspectives ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a> )	2
	GEP U.S. Diversity ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/</a> ) (verify requirement)	
	GEP Global Knowledge ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a> ) (verify requirement)	
	Foreign Language Proficiency ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/</a> ) (verify requirement)	
	Total Hours	35

## Acad Writing Research

Code	Title	Hours
<b>Acad Writing Research</b>		
ENG 101	Academic Writing and Research	4
FLE 101	Academic Writing and Research	4
<b>Transfer Sequence</b>		
ENG 1GEP	100 Level English Composition	3
ENG 202	Disciplinary Perspectives in Writing	3

## Math Electives

Code	Title	Hours
MA 114	Introduction to Finite Mathematics with Applications	3
MA 121	Elements of Calculus	3
MA 131	Calculus for Life and Management Sciences A	3
MA 141	Calculus I	4
MA 231	Calculus for Life and Management Sciences B	3
MA 241	Calculus II	4

## Physics Electives

Code	Title	Hours
PY 131	Conceptual Physics	4
PY 205	Physics for Engineers and Scientists I	3
PY 206	Physics for Engineers and Scientists I Laboratory	1
PY 211	College Physics I	4

## Spatial Technology Electives

Code	Title	Hours
FOR 353	GIS and Remote Sensing for Environmental Analysis and Assessment	3
GIS 510	Fundamentals of Geospatial Information Science and Technology	3
SSC 440	Geographic Information Systems (GIS) in Soil Science and Agriculture	3
SSC 540	Geographic Information Systems (GIS) in Soil Science and Agriculture	3

## Management Science Electives

Code	Title	Hours
<b>Management Category</b>		
ACC 200	Introduction to Managerial Accounting	3
ACC 220	Introduction to Managerial Accounting	3
ACC 280	Survey of Financial and Managerial Accounting	3
FOR 248	Forest History, Technology and Society	3
FW 221	Conservation of Natural Resources	3
FW 333	Conservation Biology in Practice	3
GIS 295	Special Topics in Geospatial Information Science	1-4
LAR 430	Site Planning	3
NR 350	International Sustainable Resource Use	4
PRT 350	Outdoor Recreation Management	3
PRT 451	Principles of Recreation Planning and Facility Development	3
<b>Economics Category</b>		
ARE 301	Intermediate Microeconomics	3
ARE 304	Agribusiness Management	3
EC 301	Intermediate Microeconomics	3
EC 348	Introduction to International Economics	3
EC 410	Public Finance	3
FOR 319	Forest Economics	3
<b>Policy Category</b>		
ARE 309	Environmental Law & Economic Policy	3
FOR 414	World Forestry	3
FW 411	Human Dimensions of Wildlife and Fisheries	3
FW 511	Human Dimensions of Wildlife and Fisheries	3
MIE 305	Legal and Regulatory Environment	3
NR 406	Conservation of Biological Diversity	3
PS 201	American Politics and Government	3
PS 202	State and Local Government	3
PS 312	Introduction to Public Administration	3
PS 320	U.S. Environmental Law and Politics	3

PS 336	Global Environmental Politics	3
PS 401	American Political Parties	3

### Resource Science Electives

Code	Title	Hours
<b>Flora</b>		
CS 414	Weed Science	4
FOR 204	Silviculture	2
FOR 261	Forest Communities	2
FOR 265	Fire Management	1
FOR 273	Forest System Mapping and Mensuration II	3
FOR 303	Silvics and Forest Tree Physiology	3
FOR 318	Forest Pathology	3
FOR 330	North Carolina Forests	3
FOR 411	Forest Tree Genetics and Biology	3
PB 220	Local Flora	3
PB 345	Economic Botany	3
PB 400	Plant Diversity and Evolution	4
PB 403	Systematic Botany	4
PB 421	Plant Physiology	3
PB 464	Rare Plants of North Carolina	3
PB 503	Systematic Botany	4
PB 564	Rare Plants of North Carolina	3
PP 318	Forest Pathology	3
<b>Fauna</b>		
AEC 419	Freshwater Ecology	4
AEC 420	Introduction to Fisheries Science	3
AEC 423	Introduction to Fisheries Sciences Laboratory	1
AEC 441	Biology of Fishes	3
AEC 442	Biology of Fishes Laboratory	1
AEC 460	Field Ecology and Methods	4
AEC 501	Ornithology	4
AEC 509	Biology of Aquatic Insects	3
AEC 519	Freshwater Ecology	4
AEC 586	Aquaculture	3
ENT 402	Forest Entomology	3
ENT 425	General Entomology	3
ENT 509	Biology of Aquatic Insects	3
FOR 264	Forest Wildlife	1
FOR 402	Forest Entomology	3
FOR 430	Forest Health and Protection	3
FW 311	Piedmont Wildlife Ecology and Management	3
FW 312	Fisheries Techniques and Management	1
FW 313	Mountain Wildlife Ecology and Management	1
FW 314	Coastal Ecology and Management	1
FW 353	Wildlife Management	3
FW 373	Vertebrate Natural History	3
FW 403	Urban Wildlife Management	3
FW 404	Wildlife Habitat Management	3
FW 405	Tropical Wildlife Ecology	3
FW 444	Mammalogy	3
FW 544	Mammalogy	3

FW 586	Aquaculture	3
MEA 220	Marine Biology	3
ZO 333	Captive Animal Biology	3

### Earth Sciences

AEC 380	Water Resources: Global Issues in Ecology, Policy, Management, and Advocacy	3
ES 150	Water and the Environment	3
ES 200	Climate Change and Sustainability	3
FOR 420	Watershed and Wetlands Hydrology	4
FOR 520	Watershed and Wetlands Hydrology	4
GEO 200	Principles of Geography	3
MEA 200	Introduction to Oceanography	3
MEA 210	Oceanography Lab	1
MEA 250	Introduction to Coastal Environments	3
MEA 251	Introduction to Coastal Environments Laboratory	1
MEA 300	Environmental Geology	4
NR 420	Watershed and Wetlands Hydrology	4
NR 421	Wetland Assessment, Delineation and Regulation	3
NR 520	Watershed and Wetlands Hydrology	4
NR 521	Wetland Assessment, Delineation and Regulation	3
SSC 421	Role of Soils in Environmental Management	3
SSC 442	Soil and Environmental Biogeochemistry	3
SSC 452	Soil Classification	4
SSC 455	Soils, Environmental Quality and Global Challenges	3
SSC 461	Soil Physical Properties and Plant Growth	3
SSC 470	Wetland Soils	3
SSC 570	Wetland Soils	3

### Semester Sequence

This is a sample.

Course	Title	Hours
<b>First Year</b>		
<b>Fall Semester</b>		
BIO 181	Introductory Biology: Ecology, Evolution, and Biodiversity	4
GEP Health and Science Studies		1
ENG 101	Academic Writing and Research <sup>1</sup>	4
Math Elective		3
ENV 100	Student Success in Environmental First Year	1
ENV 101	Exploring the Environment	2
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		Hours
		15
<b>Spring Semester</b>		
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
FOR 150	Critical Thinking and Data Analysis	2
General Education Elective		3
Math Elective		3

ARE 201 or EC 201	Introduction to Agricultural & Resource Economics or Principles of Microeconomics	3
Hours		15

**Second Year****Fall Semester**

Physics Elective		4
GEP Health and Exercise Studies ( <a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a> )		1
FOR 339	Dendrology	4
General Education Elective		3
Hours		12

**Spring Semester**

FOR 252	Introduction to Forest Science	3
SSC 200	Soil Science	3
PS 201 or PS 202	American Politics and Government or State and Local Government	3
COM 110 or COM 112	Public Speaking or Interpersonal Communication	3
Hours		12

**Third Year****Fall Semester**

Ecology Elective		4
NR 301	Practicum for Professional Development I	1
Spatial Technology Elective		3
ST 311	Introduction to Statistics	3
Technical Elective		4
Hours		15

**Spring Semester**

ARE 336	Introduction to Resource and Environmental Economics	3
ENG 333	Communication for Science and Research	3
NR 300	Natural Resource Measurements	4
General Education Elective		3
Technical Elective		3
Hours		16

**Summer**

NR 360	Internship Experience	3
Hours		3

**Fourth Year****Fall Semester**

Technical Electives		6
NR 460	Renewable Natural Resource Management and Policy	3
NR 484	Environmental Impact Assessment	4
Wildlife Elective		3
Hours		16

**Spring Semester**

NR 400	Natural Resource Management	4
General Education Electives		3

Technical Electives	9
Hours	16
Total Hours	120

<sup>1</sup> A grade of C- or better is required.

## Career Opportunities

Graduates of the Natural Resources Ecosystem Assessment curriculum work in environmental service firms, public agencies, non-governmental organizations, and industries. The U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the N.C. Division of Water Quality, and county and city governments employ graduates to help manage compliance with county, state, and federal environmental regulations, particularly wetlands and protected species. Non-governmental organizations and private engineering and environmental consulting firms employ graduates to prepare environmental impact statements and assessments, delineate wetlands, and conduct searches for threatened or endangered plant and animal species. The broad background in natural resources provided by this curriculum also provides a strong base for students interested in graduate school or environmental law.

The curriculum in Natural Resources Policy and Administration produces managers and administrators for public agencies and private organizations involved with management, administration, policy-making, planning, preservation, or regulation of natural resources. Examples are the USDI National Park Service, the US Environmental Protection Agency, the US Geological Survey, state and local government agencies, and not-for-profit environmental organizations. Background in government, economics, policy, and natural resource management also provides a strong base for students who wish to pursue a graduate program in natural resources economics and policy or environmental law.