

# ECOLOGY, MASTER OF SCIENCE

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## Master of Science in Ecology with concentration in Ecology and Conservation

The Ecology and Conservation concentration prepares students for careers and advanced research in Ecology. This track broadly covers the fields of ecology and conservation but is expected to facilitate student specialization in a range of topics, including, but not limited to, molecular ecology, population ecology, community ecology, landscape ecology, biogeochemistry, ecosystem ecology, restoration, conservation, and modeling. Students may also work on any number of organisms or ecological processes (e.g., invertebrates, plants, wildlife, fire, and climate).

The Ecology and Conservation concentration will provide content and theoretical understanding of ecology and hands-on experience developing and conducting ecological research in a way unique to Western's liberal arts traditions. The program takes full advantage of the biogeographic setting of Colorado's western slope and beyond and includes both the development of new scientific insight and the application of ecological knowledge toward broader social-ecological impacts. The Ecology and Conservation concentration is a 33-credit track with topical coursework in biology, research methods, and MS proposal development and thesis research. MS students in Ecology and Conservation must complete an MS Thesis. Upon the acceptance of MS proposals (BIOL 690), Ecology and Conservation students must continuously enroll in at least one credit of BIOL 695 until a successful thesis defense.

## Master of Science in Ecology with concentration in Fisheries and Wildlife Management

The Fisheries and Wildlife Management emphasis prepares students for careers in the fields of fisheries, wildlife, and their management. This concentration focuses on the study of fisheries, wildlife, and selected current topics in their management.

The Fisheries and Wildlife Management concentration will provide graduate-level content and theoretical, ecological understanding of fisheries and wildlife management with experience developing and conducting ecological research in a way that is unique to Western's liberal arts traditions. The program takes full advantage of the biogeographic setting of Colorado's western slope and beyond and includes both the development of new scientific insight as well as the application of scientifically based knowledge towards broader social-economic-ecological-ethical impacts of fisheries and wildlife management. The Fisheries and Wildlife Management concentration is a 33-credit track with topical coursework in biology, management, research methods, and MS proposal development and thesis research. MS students in Fisheries and Wildlife Management must complete an MS Thesis. Upon the acceptance of MS proposals (BIOL 690), Fisheries and Wildlife Management students must continuously enroll in at least one credit of BIOL 696 until a successful thesis defense.

## Program Goals

- Improving student understanding of biology, particularly concepts in ecology, evolution, conservation, wildlife, and/or fisheries.
- Developing students' capacities for basic and applied research in ecology, including acquiring information, developing methods, conducting sampling and data analysis, demonstrating scientific communication, and advancing broader impacts.
- Advancing the role of science in society, through training ecologists prepared to elevate the ability of agencies, organizations, and communities to address ecological problems.
- Enhancing opportunities for careers and advanced research in ecology.

## Master of Science in Ecology with concentration in Applied Ecological Science

The Applied Ecological Science concentration is a non-thesis track that prepares students for careers in the application of ecological science. This track broadly covers the field of ecology but facilitates student specialization in applied science for natural resources management, education, policy, and/or planning. Students may also work on any number of organisms or ecological processes (for example, invertebrates, plants, wildlife, fire, climate). The Applied Ecological Science concentration will provide content and theoretical understanding of ecology and hands-on experience with ecological research in a way that is unique to Western's liberal arts traditions. The program takes full advantage of the biogeographic setting of Colorado's western slope and beyond, and focuses on the application of ecological knowledge towards broader social-ecological impacts. The Applied Ecological Science Concentration is a 33-credit track that includes topical coursework in biology, research methods, independent study and practical internship experience, and demonstration of graduate proficiency in ecology via public communication. MS students in Applied Ecological Science do not complete a thesis, but with their MS Advisory Committee, develop a program of coursework, independent research, internship experience(s), and demonstration of proficiency leading to the completion of the Applied Ecological Science capstone, BIOL 693: Comprehensive Study in Biology.

## Admissions Criteria

- Admissions packages will include: academic transcripts; a resume outlining related research, leadership, and volunteer experience; a statement of purpose describing the student's intellectual and professional interests in ecology; and three letters of recommendation from professors or supervisors in related fields.
- Applicants are expected to have been in contact with a faculty advisor prior to submission of application.

## Program Prerequisites:

- BA or BS degree in biology or related field with college courses in Statistics and upper-level Ecology with minimum grade of B, completed prior to the student's first fall in the program.

## Program goals include:

- Improving student understanding of biology, particularly concepts in ecology, evolution, conservation, wildlife, and/or fisheries.
- Developing students' capacities for basic and applied research in ecology, including acquiring information, developing methods,

conducting sampling and data analysis, demonstrating scientific communication, and advancing broader impacts.

- Advancing the role of science in society, through training ecologists prepared to elevate the ability of agencies, organizations, and communities to address ecological problems.
- Enhancing opportunities for careers and advanced research in ecology.

## Ecology and Conservation Concentration

Conferral of the MS degree requires a minimum of 33 credits of 600-level coursework, each with a grade of a B- or above, and the completion and acceptance of an MS thesis.

Code	Title	Credits
<b>Core Courses</b>		
BIOL 606	Ecological Research Methods	3
BIOL 613	Advanced Ecological Analysis	3
BIOL 690	Ecology MS Proposal Development	3
BIOL 695	Ecology/ Conservation Thesis Research	9
<b>15 credits of the following electives to be chosen in consultation with thesis committee:</b>		
BIOL 620	Ornithology	
BIOL 622	Mammalogy	
BIOL 625	Invertebrate Zoology with laboratory	
BIOL 627	Field Entomology	
BIOL 630	Wildlife Ecology and Management	
BIOL 631	WILDLIFE TECHNIQUES WORKSHOP	
BIOL 633	WILDLIFE POPULATION ANALYSIS	
BIOL 640	Conservation Biology	
BIOL 652	Botany	
BIOL 653	Rocky Mountain Flora	
BIOL 662	Evolution	
BIOL 667	Biology of Fishes	
BIOL 668	Ichthyology Laboratory	
BIOL 670	FISHERIES MANAGEMENT	
BIOL 676	Aquatic Ecology with lab	
BIOL 681	Forest Ecology	
BIOL 692	Independent Study	
BIOL 697	SPECIAL TOPICS IN ECOLOGY	
ENVS 608	Environmental Politics & Policy	
ENVS 611	Integrative Skills for Environmental Management	
ENVS 615	From Climate Science to Action	
ENVS 618	Public Lands Management	
ENVS 623	Studies in Environmental Management	
ENVS 625	Studies in Integrative and Public Land Management	
<b>Total Credits</b>		<b>33</b>

## Fisheries and Wildlife Management Concentration

Conferral of the MS degree requires a minimum of 33 credits of 600-level coursework, each with a grade of a B- or above, and the completion and acceptance of an MS thesis.

Code	Title	Credits
<b>Core Courses</b>		
BIOL 606	Ecological Research Methods	3
BIOL 613	Advanced Ecological Analysis	3
BIOL 690	Ecology MS Proposal Development	3
BIOL 696	Fisheries/ Wildlife Thesis Research	9
<b>15 credits of the following electives to be chosen in consultation with thesis committee:</b>		
BIOL 620	Ornithology	
BIOL 622	Mammalogy	
BIOL 625	Invertebrate Zoology with laboratory	
BIOL 627	Field Entomology	
BIOL 630	Wildlife Ecology and Management	
BIOL 631	WILDLIFE TECHNIQUES WORKSHOP	
BIOL 633	WILDLIFE POPULATION ANALYSIS	
BIOL 640	Conservation Biology	
BIOL 652	Botany	
BIOL 653	Rocky Mountain Flora	
BIOL 662	Evolution	
BIOL 667	Biology of Fishes	
BIOL 676	Aquatic Ecology with lab	
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ENVS 618	Public Lands Management	
ENVS 623	Studies in Environmental Management	
ENVS 625	Studies in Integrative and Public Land Management	
<b>Total Credits</b>		<b>33</b>

## Applied Ecological Science Concentration

Conferral of the MS degree requires a minimum of 33 credits of 600-level coursework, each with a grade of a B- or above, and the completion of three credits BIOL 693.

Code	Title	Credits
<b>Core Courses</b>		
15 credits from the following:		15
BIOL 606	Ecological Research Methods	
BIOL 613	Advanced Ecological Analysis	
BIOL 692	Independent Study	
BIOL 699	Graduate Internship in Ecology	
BIOL 693	Comprehensive Study in Ecology	
18 credits of the following electives, to be chosen in consultation with the student's MS Advisory Committee (at least 9 credits must be BIOL electives, and up to 9 credits may be ENVS electives):		18
BIOL 620	Ornithology	
BIOL 622	Mammalogy	
BIOL 625	Invertebrate Zoology with laboratory	

BIOL 627	Field Entomology
BIOL 630	Wildlife Ecology and Management
BIOL 631	WILDLIFE TECHNIQUES WORKSHOP
BIOL 633	WILDLIFE POPULATION ANALYSIS
BIOL 640	Conservation Biology
BIOL 652	Botany
BIOL 653	Rocky Mountain Flora
BIOL 662	Evolution
BIOL 667	Biology of Fishes
BIOL 668	Ichthyology Laboratory
BIOL 670	FISHERIES MANAGEMENT
BIOL 676	Aquatic Ecology with lab
BIOL 681	Forest Ecology
BIOL 692	Independent Study
BIOL 697	SPECIAL TOPICS IN ECOLOGY
ENVS 608	Environmental Politics & Policy
ENVS 611	Integrative Skills for Environmental Management
ENVS 615	From Climate Science to Action
ENVS 618	Public Lands Management
ENVS 623	Studies in Environmental Management

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**Total Credits****33**