Conservation Biology

BI 429 (CRN: 40421) & BI 529 (CRN: 40442)
Tuesdays and Thursdays, 1600–1750h, SRTC 246

Instructors:

PSU Biology: Dr. L. A. Ruedas
Dr. B. Csuti
Oregon Zoo: Dr. D. J. Shepherdson

Text:

Groom, M. J., Meffe, G. K., and C. R. Carroll. 2006. Principles of Conservation Biology, Third Edition. Sinauer Associates, Sunderland, Massachusetts, 673 pp. ISBN: 0–87893–518–5.

⇨⇨ Schedule tentative and subject to change ⇦⇦

Lect.	Date	Topic	Speaker	Reading
1	5 Jan	Background	Blair Csuti	Ch. 1, 2
2	7 Jan	Species Concepts	Luis Ruedas	Ch. 2
3	12 Jan	Ecological restoration: Regional (Metro) green spaces; Columbia River fisheries restoration	Elaine Stewart; Stuart Ellis	Ch. 6, 7
4	14 Jan	Biodiversity	Luis Ruedas	Ch. 3
5	19 Jan	**Mini symposium**: Biodiversity		Ch. 3
6	21 Jan	Invertebrate conservation	Scott Hoffman Black	Ch. 7, 11
7	26 Jan	Two unique case studies in species recovery: sage grouse and CA Condor	Jesse D'Elia	Ch. 12
8	28 Jan	Population Dynamics & Metapopulations	Sarah Eppley	Multiple
9	2 Feb	**Mini symposium**: Invasive species		Ch. 9
10	**4 Feb**	**MIDTERM EXAM**		
11	9 Feb	Global warming	Luis Ruedas	Ch. 10
12	11 Feb	Economics and the environment	Randall Bluffstone	Ch. 5, 16
13	16 Feb	Invasive species / group activity [mgmt]	Ruedas	Ch. 15
14	18 Feb	Federal listing and recovery	Cat Brown	Ch. 17
15	23 Feb	Conservation reserves	Blair Csuti	Ch. 14
16	25 Feb	Ecology and politics	TBD (Oregon Governor's Office)	Ch. 17
17	1 Mar	The role of hormone monitoring in species recovery, single species conservation management and case studies	Nadja Wielebnowski & David Shepherdson	Ch. 14
18	3 Mar	**Mini symposium**: Global warming		Ch. 10
19	8 Mar	Contaminants & Wildlife (Condors & Lead)	Jeremy Buck & Leland Brown	Ch. 15, 17

20	10 Mar	Conservation in the Anthropocene	Tierra Curry	Ch. 17, 18
21	**15 Mar**	**Final Exam**	**1530h–1720h**	

Speaker Affiliations:

Randall Bluffstone – Director of the Institute for Economics and the Environment, PSU
Cat Brown – Wildlife Biologist, US Fish & Wildlife Service
Leland Brown – Outreach & Education, Oregon Zoo
Jeremy Buck – Toxicologist, US Fish & Wildlife Service
Tierra Curry – Senior Scientist, Center for Biological Diversity
Jesse D'Elia – Endangered Species Division, US Fish & Wildlife Service
Stuart Ellis – Harvest Management Biologist, Columbia River Inter-tribal Fish Commission
Sarah Eppley– Professor, Department of Biology, PSU
Scott Hoffman Black – Executive Director, The Xerces Society for Invertebrate Conservation
Elaine Stewart – Senior Natural Resources Scientist, Metro-Natural Areas Program
Nadja Wielebnowski – Oregon Zoo

Expectations:

1. Students must take the midterm and final exams as shown on the schedule. There will be absolutely no make ups. This is a class *and* department policy.

2. Graduate students—i.e., those taking the course as 529—are required to develop and present a lecture on a topic of their choice, approved by the instructors. These lectures (about 15 minute PowerPoint presentations) will be presented in class during the 20th lecture (10 March). If more students are enrolled than time allows, we may reschedule one of the mini–symposia.

3. There are three mini–symposia spread more or less evenly throughout the class. *You have* ***potential*** *topics listed in the syllabus*! Please read up on the matter to be discussed well in advance of the date listed for the mini–symposium. The format is that there are topics assigned on the first day of class. Regardless of your personal stance on a particular issue, you will be expected to perform well in support of and against the position on said issue that you have chosen. In other words: ***take an unbiased stand!!!*** There are fewer than 30 students in the class, and 30 topics from which to pick, so you should find something suitable to your proclivities. In addition, a maximum two page paper is due ***electronically*** at the time of your presentation. Obviously, you are not going to undertake scientific research for this presentation (***are*** you? You could…), but we expect a solid, well researched, well cited, non–plagiarized item covering the major points of the topic of your choice, with extensive citations from the primary literature.

MAJOR THEMES IN CONSERVATION BIOLOGY

Conservation Biology is first and foremost a multidisciplinary subject requiring an integrative approach to problem solving. This class is therefore designed to bring into the classroom a broad variety of speakers from diverse disciplines, including US Fish and Wildlife Service, Oregon state government, Oregon Zoo, Berry Botanic Gardens, Portland State University Economics Department, and others on an opportunistic basis. The purpose of bringing in these apparently disparate guest lecturers is to provide students with a broader perspective of the discipline of conservation biology, and the realization that a narrow approach to conservation quandaries (i.e., only based on biology), likely will not be successful at solving problems. Below is an apperçu of what we see as being the major themes operative in conservation biology, and where they fit in relative to the topics in the syllabus.

1. Conservation Biology as an Emerging Science [Lecture 1]
    - Multi–Disciplinary nature
    - U.S. Conservation Movement
    - Conservation Issues Abroad
    - Society for Conservation Biology
    - Training of Conservation Biologists

2. Human Population Growth [Lectures 1, 6, 19]
    - Per Capita Resource Consumption
    - Rising Economic Expectations in Developing Nations
    - Pleistocene Extinctions
        - North America
        - Australia
        - Madagascar
        - New Zealand
        - Easter Island

3. Biodiversity [Lectures 2, 3, 5 (mini symposium)]
    - Definition
    - Classification
        - Genes
        - Species
        - Communities & Ecosystems
        - Landscapes
        - Biomes
    - Distribution
        - Global Hot Spots
    - Ecosystem Function
        - Community Interactions
            - Sea Otters
            - PNW Forests
        - Moral
        - Aesthetic
        - Economic/Medical
            - Drugs
            - Heritage Breeds & Crops
        - Ecosystem Services
            - NY Water Supply
            - Insectivory

4. Habitat Loss and Fragmentation [Lect. 4, 6]
    - Global Review
    - Island Biogeography
    - Tropical Forests
        - Africa
        - South America
        - Southeast Asia
    - Temperate Systems
        - Europe
        - United States
        - Australia
    - Nature Reserves
        - Size
        - Limitations

5. Alien Species [Lecture 7, 8 (mini symposium)]
    - Vertebrates
        - Brown Tree Snake
        - Feral Pig
    - Invertebrates
        - Zebra Mussel
    - Emerging Diseases
        - West Nile
        - HIV, SIV
        - Ebola, Marburg
    - Plants
    - Prevention and Control

6. Global Climate Change [Lecture 15 (mini symposium)]
    - Desertification
    - Melting Ice, Rising Waters

- Diseases and Vectors
- Agricultural and Economic Impacts

7. Economics and Conservation [Lect. 9, 18, 19]
    - Tragedy of the Commons
    - Direct and Indirect Costs
        - Oil–Based Economy
        - Synthetic Chemicals
        - Bioengineering
    - Globalization
    - Conservation vs. Development
    - Sustainable Growth/Development
    - Short vs. Long Term Return
        - Use of Capital
8. Endangered Species [Lecture 18]
    - Extinctions
        - Passenger Pigeon
        - Carolina Parakeet
        - Tasmanian Wolf
        - Tasmanian Aborigines
    - Threats
        - Channel Islands Fox

Recovery Strategies
- Species Specific
    - Successes?
        - Bald Eagle
        - Black–footed Ferret
        - California Condor
    - Ecosystems
        - Northern Spotted Owl
- Population Viability Analysis

Biodiversity: 19 January—potential topics may include (choosing your own is preferable!)…

1	Climate and Biodiversity	
2	Effects of Invasive species	
3	Coral reefs	
4	Tropical Forests	
5	Diseases and Biodiversity	
6	Food webs	
7	Productivity	
8	Ecological stability & ecosystem health	
9	Habitat fragmentation	
10	Soil loss	
11	Human population growth	
12	Pets	
13	Endangered species recovery	

Invasive Species: 2 Feb— potential topics may include (choosing your own is preferable!)…

1	English Ivy	
2	Brown Tree Snake	
3	Zebra Mussel	
4	Starling	
5	Scotch Broom	
6	Feral hogs (AKA Wild Boar)	
7	Indian mongoose	
8	*Boa constrictor* in the Everglades	
9	The vine that ate the South (Kudzu)	
10	Air–breathing flying Caribbean Piranas	
11	Chinese mitten crab	
12	Argentine ant (*Linepithema humile*)	
13	Fire ant	
14	Mountain pine beetle (*Dendroctonus ponderosae*)	

Global warming: 3 March—potential topics may include (choosing your own is preferable!)…

1	Phenology of plants	
2	Glaciers	
3	Water cycle and circulation	
4	Altitudinal effects (e.g., pika)	
5	Distributions of species	
6	Community composition	
7	Ecosystem dynamics	
8	Physico-chemical changes, effects	
9	Behavioral changes	
10	Disease and warming	
11	Whales & Humans (boat strikes)	
12		
13		
14		