EEB 484 – Conservation Biology

Spring 2014; T TH 8:15-9:30, Jessie Harris Building 114
Prerequisites: Biology 240, or 250, or by permission of Instructor.

Instructor: Dr. Eric R. Larson
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Textbooks

Sutherland, W.J. 1998. Conservation Science and Action. Wiley-Blackwell. Available freely as an E-book from the UT library.

Kareiva, P. & Marvier, M. 2011. Conservation Science: Balancing the Needs of People and Nature. Available at the UT bookstore (***optional***).

Additional readings: Journal articles and other readings will also be assigned and will be posted through Online@UT.

Web Resources: Course materials and information will be available through Online@UT.

If any changes to this syllabus are required as the course evolves and students' interests and learning needs become apparent, we will discuss and agree these together as a class. Any such discussions will take place during scheduled class times and any agreed changes will be announced in class. *We reserve the right to exercise some flexibility in scheduling*.

Learning outcomes

By the end of the course, if you engage fully with the taught material and opportunities for guided independent study and you participate in class activities, then you should be able to…

1. Summarize what biodiversity is, what is happening to biodiversity and what arguments have been advanced to support actions to conserve biodiversity.
2. Critically review the evidence attributed to particular drivers of biodiversity declines.
3. Discuss possible strategies for addressing declines in biodiversity, evaluating how they can be deployed most effectively and identifying shortcomings of the different strategies available.
4. Discuss frontier research topics in Conservation Biology and the use of science in different areas of conservation practice.

Teaching methodology

Content will be introduced and discussed in class. However, class activities are a small fraction of what I expect of students in a 400-level undergraduate class. To do well on course assessments, you will be expected also to read extensively outside class time, to contribute actively to discussions, and to engage with the assignments that are set. Importantly, you will also be expected to reflect on the diversity of teaching activities to arrive at a synthetic interpretation of the material.

Course Topics

The core content of the course will progress through the following topics.

1. **What is Conservation Biology**? What is biodiversity? What is happening to biodiversity and why should society care?
2. **Leading threats to biodiversity** including habitat destruction and fragmentation, over-exploitation, invasive species, climate change and altered biogeochemistry.
3. **Conservation strategies**, including the use of terrestrial and marine protected areas, conservation on private lands, restoration ecology, etc. We will review the institutions (including both governmental and nongovernmental actors) active in conservation and discuss examples of key legislation (e.g. the US Endangered Species Act).

In addition, I will arrange for guest speakers to address the class in order to…

1. Share a practitioners' perspectives on how the science of Conservation Biology relates to real world conservation problems and
2. Present research frontier topics in Conservation Biology.

Assessment

1. **45% Mid-term and Comprehensive Final**. These exams will comprise multiple choice, multiple answer and short answer questions. The Final will be comprehensive. These exams will include questions that focus on BOTH the lecture material and the accompanying readings. *The midterm scheduled during regular class time in March (TBA), and our Final exam will be held from 8:00 – 10:00 a.m. on May 6th*
2. **20% Coursework essay.**
3. **20% Group project.** Group projects will be assessed based on a report and presentation and may include a peer assessment component.
4. **15%** Three short summaries of presentations by outside speakers (5% each).

All work will be assigned a score on a 100 point scale and the above percentages used to convert that to an overall percentage score for the course. Typically the various A-grades fall approximately in the 90-100% range, the various B-grades in the 80-90% range, and so on with specific cut-offs reflecting the different grade categories used for undergraduate and graduate students. If appropriate, normalization across the different assessment activities will be used to ensure they are of commensurate difficulty (e.g. to allow lower cut-offs to be set on the exams).

Course Outline

Here is a rough progression of the readings we'll do for major sections. Specific reading assignments outside of the Sutherland textbook will be posted on Blackboard in advance of class.

Overview

1. What is Conservation Biology? (*Soule 1985*)
2. What is biodiversity? (*Gaston chapter in Sutherland book*)
3. Measuring biodiversity
4. What is happening to biodiversity? (*Pimm chapter first half in Sutherland*)
5. Why should society care? (*Wilson 1984, McCauley 2006, Armsworth et al. 2007)*

Drivers of biodiversity loss

1. Human population growth and consumption patterns
2. Habitat destruction (*Pimm chapter 2nd half*)
3. Habitat fragmentation
4. Invasive species (*Godfray and Crawley chapter in Sutherland book*)
5. Overharvesting (*Sutherland and Reynolds chapter in Sutherland book*)
6. Climate change (*MacDonald and Brown 1992*)
7. Changing biogeochemistry (*Newton chapter in Sutherland book*)
8. Challenges faced by small populations (*Simberloff chapter in Sutherland book*)

Conservation strategies

1. Prioritization: where to work: hotspots (*Myers et al. 2000, Kareiva and Marvier 2003*)
2. Prioritization: what element of the biota to focus on: phylogenetic contrasts when ranking threats to species (*Fisher and Owens 2002*)
3. Prioritization: what actions to take: matrix models (*Kareiva and Marvier 2010 textbook*)
4. Institutions active in conservation
5. Conservation legislation: US Endangered Species Act (*Scott et al. 2006*)
6. Protected areas
7. Beyond protected areas: corridors and private land conservation
8. Restoration ecology
9. Ex situ conservation

Additional details

1. *You are expected to participate* in additional class activities that may provide opportunities for formative assessment to enhance your learning but will not count towards your final grade
2. *Our class is a shared learning environment* and you will be asked to adhere to some "ground-rules" in class to respect other students' learning and to enable the Instructor to use particular teaching methods. These include but are not limited to…
    - Arriving promptly to class
    - Being engaged in discussion (i.e refraining from texting, social media, and internet use)
    - Not posting materials provided to you in this class on other websites
    - Bringing a scientific calculator (or similar) with you
3. *Late submissions of coursework will be penalized at 10% per business day* if there is no prior arrangement or proof of emergency. All written, submitted work should be word processed, spell-checked and presented clearly. Word limits will be specified and work that is overly long may be penalized.
4. *Academic Honesty*: The course follows UT's Honor Statement, thus all work taken from another source must be documented and any work you turn in that is not documented, must be your own. By enrolling in the course for credit, you agree that written work may be examined using plagiarism detection software at the discretion of the Instructor.
5. *Disability Services*: If you need course adaptations or accommodations because of a documented disability or if you have emergency information to share, please contact the Office of Disability Services 209 Dunford Hall (974-6087). This will ensure that you are properly registered for services and receive the services you need.