

FW555
Conservation Biology

Spring 2016
TR 12:30-1:45 Wagar 107b 3 credits

Instructor

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Course Description

This course reviews major threats to biological diversity and contemporary techniques for investigating and addressing those threats. Students will gain a foundational knowledge of the history, theory, and principles of conservation biology. Students will also develop practical skills in communicating about conservation science to diverse audiences, including the scientific community, conservation and management professionals, and the public.

This interactive graduate-level course will emphasize student involvement and participation. Although there will be periodic lectures by the instructor or guest scientists to highlight relevant material, the focus of the course will be on independent research and student-led discussions, exercises, and presentations.

Readings

Readings for the course will include articles from the primary conservation science literature, book chapters, and occasionally other media. Most class sessions will have 2-3 articles or chapters assigned as required reading, and optional supplementary readings may be provided.

All required readings will be posted to Canvas at least one month prior to the class session. To access course materials, you will need an eID username and password (or if you are a non-credit student, you will need a non-credit login). Please visit <http://info.canvas.colostate.edu> and click on *Student Resources* for more information.

For additional background information, the textbooks *Essentials of Conservation Biology* (Primack 2010) and *Principles of Conservation Biology* (Groom et al. 2006) are recommended optional reading.

Reading Discussions

Many class sessions will include an in-class discussion focused on articles from the primary conservation science literature. Over the course of the semester, each student will co-lead two discussion sessions with two other students. The lead students are expected to post 2-3 discussion questions per article to Canvas a minimum of two days prior to the discussion (i.e., no later than 12:30pm on Tuesday for a Thursday discussion). At the start of the discussion, the lead students should collaborate to provide a concise overview

(< 5 minutes) of the assigned papers. This overview should: 1) Review the major points of the papers; 2) Raise topics of interest (e.g., highlight novel results and conclusions); 3) Relate the material to other published literature (e.g., articles citing or cited by the authors) and/or your knowledge of the subject; and 4) Identify any questions or objections you have regarding the methods, results, or conclusions. Following the overview, the lead students are expected to actively generate and facilitate discussion for the remainder of the class session. All other students should come to each discussion session prepared to discuss the posted questions and critique the paper. Students who are unable attend a course discussion may earn attendance/participation points by posting a written response to the discussion questions to Canvas (a maximum of two times during the semester).

Debates

Class debates will assign a team of students to each side of a controversial issue in conservation science and practice. These exercises are intended to encourage students to do independent research and to consolidate their learning by presenting the material in a concise and persuasive format to the class. The class will be divided into four groups; two teams will take part in the first debate, arguing the “pro” and “con” positions. The debate teams will submit brief position statements prior to the debate, and each side will make a presentation of their position and rebuttal of the other team. The other two teams will serve as the audience, asking questions of each presenting team. Roles will be reversed for the second debate.

Opinion-Editorial

Each student will be required to write a brief (500-700 word) opinion-editorial (“Op-Ed”) article that synthesizes and takes a position on a current conservation science issue of his or her choice. Topics should be timely, provocative, and likely to be of interest to the general public, and the article should be written for a real newspaper of an appropriate scope (e.g., local regional, national or international) and geographic location. We will workshop the articles in class and provide suggestions for improvement before submission to the instructor and (optional) submission to the newspaper.

Systematic Review Paper

The major assignment for the course will be a systematic review paper. A systematic review is a review of the scientific literature that follows a strict protocol to summarize available evidence and objectively assess the impact of an action or effectiveness of an intervention. By writing a systematic review, students will gain an in-depth understanding of one area of conservation science, demonstrate their ability to synthesize the primary literature and communicate the results to a scientific audience, develop skills in peer review and revision, and (optional) make a contribution to the literature by submitting their paper for publication. The systematic review paper assignment will be completed in several discrete steps. First, students will be expected to submit an explicit statement of their research question(s) and initial search strategy, followed by a flow diagram summarizing the results of their literature search and screening process. Next, a draft of the systematic review paper will be submitted mid-semester, and it will be assigned for peer review. Each student’s paper will be reviewed by two of their peers, and each student will review the papers of two other students. Lastly, students will revise their papers in response to the comments of the editor (instructor) and peer reviewers and submit the final version at the end of the semester.

Speed Presentation

At the end of the semester, students will deliver a speed presentation on the topic of their systematic review paper. A speed talk is a 5-minute oral presentation in the style of a scientific conference. Students will submit a powerpoint presentation to Canvas and deliver a 5-minute presentation summarizing the key ideas and results of their review, followed by questions from the audience.

Grading

Discussion lead (x2)	25 points (x2)
Debates	25 points (x2)
Op-Ed	50 points
<i>Optional submission to newspaper</i>	<i>(10 points)</i>
Systematic review paper	
Research question(s) and search protocol	25 points
Flow diagram	25 points
First draft	100 points
Peer review (x2)	25 points (x2)
Revised paper	50 points
Speed presentation	50 points
Attendance and participation	50 points
Total	500 points

Letter grades will typically be assigned based on the following percentages: 94-100=A; 90-93=A-; 88-89=B+; 84-87=B; 80-83=B-; 78-79=C+; 74-77=C; 70-73=C-; 60-69=D; ≤59=F. Assignments will be due at the start of the class on the due date; they will be penalized 10% if they are submitted after the start of class, and an additional 10% for each additional day that they are late.

Academic Integrity

This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog and the Student Conduct Code. Plagiarism will not be tolerated.

Special Needs

If you have special needs for lectures, assignments or tests, please contact me as soon as possible after the first day of class to explain these needs. Please also speak with me anytime if something should develop later in the semester.

Course Schedule

Date	Topic	Readings	Assignments
Biological Diversity and Conservation Science			
Jan. 19	Introduction and overview		
Jan. 21	Biodiversity and conservation science; <i>Systematic reviews</i>	Soulé 1985; Kareiva et al. 2012; Soulé 2013; <i>Pullin & Stewart 2006</i>	
Jan. 26	Rarity, vulnerability and extinction*	Pitman et al. 1999; Purvis et al. 2000; Wake & Vredenburg 2008	
Jan. 28	Conservation values and ethics*	Leopold 1949; Balmford et al. 2002; Teel & Manfredi 2009	Position statements due (<i>Debate 1</i>)
Feb. 2	<i>Class cancelled (snow day)</i>		
Feb. 4	<i>Debate 1: Ecosystem services</i>	McCauley 2006 and replies; Redford & Adams 2009	
Threats to Biodiversity			
Feb. 9	<i>Guest lecture: Joel Berger</i>	Berger et al. 1994; Berger & Cunningham 1994; Macilwain 1994	Systematic review questions and protocols due
Feb. 11	Habitat loss and fragmentation; <i>Op-eds</i>	Wilcove et al. 1998; Crooks & Soulé 1999; Brook et al. 2003; <i>Shipley 2004</i>	
Feb. 16	<i>Guest lecture: Bob Reed**</i>	McCleery et al. 2015	
Feb. 18	Invasive species and disease*	Strayer 2009; Davis et al. 2011 and replies; Disney & Dearing 2016	
Feb. 23	Habitat degradation and pollution; <i>Op-ed workshop</i>	Wickramasinghe et al. 2003; McClure et al. 2013; Li et al. 2016	Draft op-eds due
Feb. 25	Climate change*	Moritz et al. 2008; Heller & Zavaleta 2009; Cinner et al. 2013	Position statements due (<i>Debate 2</i>)
Mar. 1	<i>Debate 2: Assisted migration</i>	McLachlan et al. 2007; Ricciardi & Simberloff 2009	
Mar. 3	<i>Film: Darwin's Nightmare**</i>	Goldschmidt et al. 1993; Balirwa et al. 2003	Systematic review flow diagrams due
Mar. 8	Overexploitation and wildlife trade*	Poulsen et al. 2009; Brashares et al. 2014; Gao & Clark 2014	
Mar. 10	<i>Guest lecture: Luke George</i>	<i>tbd</i>	Final op-eds due
<i>Spring Break</i>			
Conservation Science Applications			
Mar. 22	Population modeling*	Shaffer 1981; Bulman et al. 2007; Bakker & Doak 2008	
Mar. 24	Captive breeding and reintroduction*	Alagona 2004; Massaro et al. 2013; Svenning et al. 2015	Draft systematic review papers due

Mar. 29	<i>Guest Lecture: Sara Oyler-McCance**</i>	DeYoung & Honeycutt 2005; Allendorf et al. 2010	
Mar. 31	Reserve design and conservation planning*	Joppa & Pfaff 2009; Gilbert-Norton et al. 2010; Whitehead et al. 2014	
Apr. 5	Protected area management*	Liu et al. 2001; Balmford et al. 2009; Mascia & Pailler 2011	
Apr. 7	Conservation policy*	Miller et al. 2009; Sokstad 2014; Weber et al. 2015	Peer reviews due
Apr. 12	<i>Guest lecture: Rick Knight**</i>	Maestas et al. 2003; Knight 2007	
Apr. 14	Human livelihoods and sustainable development*	Naughton-Treves et al. 2005; Loucks et al. 2009; Naidoo et al. 2016	
Communicating Conservation Science			
Apr. 19	Conservation leadership and communication*	Manolis et al. 2008; Blickley et al. 2013; Madden & McQuinn 2014	
Apr. 21	<i>Systematic review paper consultations</i>		
Apr. 26	<i>Film: Racing Extinction**</i>		Presentations due
Apr. 28	<i>Speed talks</i>		
May 3	<i>Speed talks</i>		
May 5	Research-implementation gap	Knight et al. 2008; Arlettaz et al. 2010 and replies; Walsh et al. 2015	Revised systematic review papers due

**Student-led discussion*

***Guest lecture or film will take place in Engineering 100*