

# Conservation Biology (ECOL 406R/506R)

aka GEOS 406R/506R, RNR 406R/506R

## Syllabus fall 2009 (25 August 2009, subject to change)



**William A. Calder III, 1934–2002**  
(EEB professor, taught this course until 2002)

**Bill Calder, Rocky Mountain Biological Station, Gothic, CO.**  
Photograph taken in July 1999 by Lorene Calder.

### **Introduction**

Welcome to Conservation Biology, a three-unit course designed to present principles of conservation biology. Lectures, discussions, and other in-class activities will introduce information that is relevant to the conservation of biological diversity. This information will be derived from the arenas of biology, ecology, policy, psychology, economics, and law. Upon completion of this course, students should be able to use knowledge of conservation biology to make informed decisions in research and to guide their personal and professional lives.

Conservation Biology (ECOL 406/ECOL 506) is a senior- and graduate-level course. If you have not completed the catalog pre-requisites for this course, you can expect to have difficulty grasping some concepts and you will likely have to undertake some independent research to "catch up."

This course also has a one-unit lab (ECOL 406L/506L) which is strongly recommended to enhance your learning experience, but is not required. However, if you are enrolled in the lab you must be enrolled in the lecture.

### **Instructor**

**Kevin E. Bonine**, Ph.D., kebonine@u.arizona.edu  
Biological Sciences East (BSE) 113 (west end of first floor)  
Office Hours in BSE113, Wed 3-4pm, Thurs 4-4:50pm, or by appointment.  
Office phone: 626-0092, Home phone: 751-1349 (please call before 9pm or after 7am)

### **Graduate Teaching Assistant**

**Mary Jane Epps**, mycota@gmail.com  
Office hours: Tues 11am-12noon in Marley 701, and by appointment.

### **Meeting Times**

LECTURE: Tuesday and Thursday 1400-1515h in PAS 224.

LAB (only for 406L/506L): Friday 1300-1600h (nominally in KOFFL 410, but we rarely meet there).

We will usually be meeting at the NW corner of BSE to take a van into the field.

See lab schedule for lengthened labs and multi-day labs.

### **Course Materials**

**Primack, Richard B.** 2008. *A Primer of Conservation Biology*, 4<sup>th</sup> edition. Sinauer, Sunderland, MA. (Available at UA Bookstore - <http://www.uofabookstores.com/uaz/>)

Other required readings will be available as pdf files placed on the course website. We will be adding or changing readings as the course progresses so please ask in class and/or check the course website often for updates.

We used to place on reserve in the Science Library copies of other conservation biology texts. These, as well as other optional readings, we will try to make available to you somehow, or point out, during the semester.

**Web Site**

We will maintain a course website ([http://eebweb.arizona.edu/eeb\\_course\\_websites.htm](http://eebweb.arizona.edu/eeb_course_websites.htm)) with readings, assignments, schedules, announcements, etc. Appropriate powerpoint lectures will likely be posted to the website the day after they are given.

**406R Course Work**

Lecture exams (two midterms @ 125 pts each, final 200 pts)	450
Semester creativity project (see description below for details)	100
Participation in lecture, quizzes, short homeworks	100
Writing assignments (three of nine, 40 pts each)	120
Seminar attendance and summary	<u>30</u>
<b>Total Points</b>	<b>800</b>

**Graduate Student 506R Course Work**

Every-other-week journal club or group project. We will find a mutually agreeable time and place to meet for an hour every other week and discuss recent and/or classic papers in conservation biology or tackle a small conservation project. More information will be forthcoming after we get a chance to meet. Attendance, participation, and preparation will be worth 50 pts (506R total of 850 pts). Otherwise, coursework same as 406R but with higher expectations for quality and sophistication of work.

**Grading**

Assignments are due *no later than the beginning of lecture* on the due date, unless otherwise noted. Late assignments will be penalized 10% for each day they are late (this includes being late to lecture on the due date). There will be no 'make up' exams or 'extra credit'. We realize that you have lives (cars do break down, people die, stuff happens). In exceptional cases, and if arrangements are made in advance, we will consider your unique situation.

Grades will generally be distributed as follows (any curving will not be "against you"):

≥ 90%	A
80-89%	B
70-79%	C
60-69%	D
≤ 59%	F

Keep in mind the following, adapted from J.M. Williams (1993, Clarifying grade expectations, The Teaching Professor 7(7):1):

The "A" Student--An Outstanding Student

- \* Attendance: "A" students have virtually perfect attendance. Their commitment to the class resembles that of the instructor.
- \* Preparation: "A" students are prepared for class. They always read the assignment. Their attention to detail is such that they occasionally catch the instructor in a mistake.
- \* Attitude: "A" students have a winning attitude. They have both the determination and the self-discipline necessary for success. They are curious and they show initiative. They do things they have not been told to do.
- \* Talent: "A" students have something special. It may be exceptional intelligence and insight. It may be unusual creativity, organizational skills, commitment--or a combination thereof. These gifts are evident to the instructor and usually to the other students as well.
- \* Results: "A" students make high grades on assignments--usually the highest in the class. Their work is a pleasure to grade.

Please re-familiarize yourself with policies against plagiarism, etc., within the UA Student Code of Academic Integrity: <http://studpubs.web.arizona.edu/policies/cacaint.htm>

Students caught cheating may be penalized by failing the relevant assignment or exam, failing the course, or being expelled.

*Students with Disabilities:*

If you anticipate the need for reasonable accommodations to meet the requirements of this course, you must register with the Disability Resource Center (Disability Resource Center, 1224 East Lowell Street Tucson, Arizona 85721, Phone: (520) 621-3268 V/TTY Fax: (520) 621-9423, E-mail: [uadrc@email.arizona.edu](mailto:uadrc@email.arizona.edu)) and request that the DRC send the instructor official notification of your accommodation *by the beginning of the 3<sup>rd</sup> week of class*. If you do not talk with us by the third week of class then we will not make any accommodations for you. Please plan to meet with us by appointment or during office hours to discuss accommodations and how the course requirements and activities may impact your ability to fully participate. All related discussions will remain confidential.

**Attendance**

You are expected to attend each lecture and each discussion/laboratory session prepared and ready to contribute. Quizzes and homework will be used to motivate your attendance and participation (**100 pts**), and also to assess your learning. All holidays or special events observed by organized religions will be honored for those students who indicate affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean's designee) will also be honored.

**Class meeting suggestions:**

Please consider employing these suggestions (modified from Guy McPherson) during class discussions:

1. Listen carefully to others before speaking
2. Challenge and refute ideas, not people
3. Focus on the best ideas, not on being the best, or "winning"
4. Before adding your own contribution, practice listening by trying to formulate in your own words the point that the previous speaker made
5. Speak whenever you wish (without interrupting!) even though your ideas may seem incomplete
6. Avoid disrupting the flow of thought by waiting until the present topic reaches its natural end before introducing a new issue
7. If you wish to introduce a new topic, warn the group that what you are about to say will address a new topic and that you are willing to wait to introduce it until people are finished commenting on the current topic
8. Give encouragement and approval to others
9. To stay engaged, continually think of an intriguing question to ask of the speaker about their presentation.

Please be aware of the UA policies against threatening behavior by students: <http://policy.web.arizona.edu/~policy/threaten.shtml>

**Course Work Details**

**Writing Assignments (40 pts each, 120 pts total; three of nine possible assignments throughout semester;** you must turn in one assignment in September, one in October, and one in November.

Turn in no more than two pages (typed, min. 2cm margins, min. 10 point font) **electronically via email to Mary Jane ([mycota@gmail.com](mailto:mycota@gmail.com)) as an attached word document**. Be concise, but convey sophisticated knowledge of subject matter, include relevant examples and peer-reviewed citations (at least two; use the format of the journal *Conservation Biology*), and show that you have thought about and integrated material. Two thirds of your grade will come from content, the other 1/3 from your ability to express yourself appropriately in English.

**Lecture Exams (450 points)**

You will have two midterm examinations and a final examination. The final will be cumulative. Topics covered in the lecture period, by guest speakers, and in the assigned readings will be fair game. Format will be mixed and may include: matching, fill-in, multiple choice, short answer, and essay. We may occasionally have some portion of an exam as a short take-home essay. Be prepared to synthesize ideas, rather than just regurgitate information. There will be no make-up exams. Exams will be closed book and closed note.

Midterm exams may be administered in a modified cooperative manner. First, each student will complete the exam as an individual and will submit this test for grading -- the resulting score will be the base score. Then, students will complete a portion of the exam in small groups. Bonus points will be added to each individual's base score, and the number of bonus points will depend on the score of the group, as shown below.

Group score and bonus points added to each base score:

>95% add 5%, 90.01-95 add 4%, 85.01-90 add 3%, 80.01-85 add 2%, 75.01-80 add 1%

### **STUDENT CREATIVITY PROJECTS (100 points)** (Adapted from Guy McPherson, 2002)

You are responsible for developing a substantial, original piece of art or literature that incorporates at least one major theme of conservation biology. Examples include painted, sketched, quilted, or sculpted art, photography, poems, songs, plays, and short stories. Performance art is encouraged, but make sure you clear this in advance (so we budget time for it during the public presentation). You may work in a group of up to 3 students if your project requires a high level of effort. Bear in mind that each person in the group is responsible for understanding each component of the project; therefore, the group must work together and plan well enough in advance to give each member an opportunity to thoroughly review the final project.

Because assessment of art and literature is inherently subjective, projects will be co-graded by students and the instructors. We will have outside evaluators (e.g., campus faculty and graduate students) assess your work as well. Those projects receiving especially favorable remarks from evaluators may earn up to 10 points extra credit.

If you are working on a "literature" project, we encourage you to read several of the works of these authors first: Edward Abbey, William Bartram, Wendell Berry, Charles Bowden, John Burroughs, Rachel Carson, Annie Dillard, Joseph Wood Krutch, Aldo Leopold, Barry Lopez, Peter Matthiessen, William Least Heat Moon, Gary Paul Nabhan, David Quammen, Henry David Thoreau, David Rains Wallace, Terry Tempest Williams, and others.

If you complete a project that involves written materials, we will expect you to demonstrate excellent writing skills. Written projects must be typewritten and double-spaced. Please use no binders, folders, or fasteners except a staple in the upper left-hand corner.

Each project can be reviewed as many times as you would like before final submission. You must allow 2 weeks for each review (i.e., it will take us 2 weeks to return your submission); therefore, no projects will be reviewed less than 2 weeks before the due date. We will review draft projects for content, but we will not provide editorial reviews of drafts. We encourage you to seek editorial reviews from peers.

On one piece of paper, in **14 point font or larger**, please include your name, the name of your project, and a short description of the role/meaning/intent/background of your creative expression (aka *Artist's Statement*). This paper is **due Tues 24 Nov (15 pts)**, one week before the public presentation) and will be posted by you next to your project on December 1<sup>st</sup>.

You will propose the criteria and the weights that will be used to evaluate your project. For example, you may want to employ the following criteria, and associated weights: link to conservation (30%), creativity (30%), effort (30%), artistry (i.e., is it evocative, aesthetically pleasing? 10%). We encourage you to propose alternative criteria and associated weights. Please submit these criteria one week (i.e., **Tues 24 Nov; 10 points**) before projects are due. Everyone, including you, will grade your project based on your criteria.

Projects will not be blind-graded, but they will be co-graded (**65 pts**): the grade you (**10 points**; students awarding all their peers the same score on the projects suggests those students did not think critically about each project) and your peers assign your project will have equal or greater weight than the grade assigned by the instructor. Late projects, or those that do not follow the prescribed format, will not be graded. Projects will be displayed at a **public forum on Tuesday December 1<sup>st</sup> from noon to 4pm. Evaluating will take place 2-3pm**. Please plan accordingly.

### **Seminar Attendance and Summary (30 points)**

Once during the semester you are required to attend a scientific seminar relevant to conservation biology and write up a 1-2 page summary. We will alert you to possible seminars (there are many!). The only caveat is that you must turn in your **write-up within 2 weeks** of attending the seminar. In your summary, please provide the name of the presenter, title of presentation, and date & location of seminar. Again, appropriate use of English and indication of comprehension and thought will factor into your grade for this assignment. This assignment is to be **emailed** to Kevin Bonine (**kebonine@u.arizona.edu**) as an **attachment**.

**Tentative 2009 Class Schedule** (30 class meetings + final exam)  
**See course website for updated topics and readings as the semester progresses.**  
Please complete assigned readings before class; links to most are on your course website

**Week 1**

**Tues Aug 25**, Introductions & Syllabus

(Ecological footprint for Thursday, [take quiz - choose metric, US, + another country; check out FAQs]  
<http://www.myfootprint.org/>

[optional in-depth footprint calculator: [http://eebweb.arizona.edu/Courses/Ecol406R\\_506R/ef\\_household\\_0203.xls](http://eebweb.arizona.edu/Courses/Ecol406R_506R/ef_household_0203.xls)]  
[optional: Bill Calder Memoriam from *The Auk*, 2003; available on course website]

**Thurs Aug 27**, Ecological footprint; What is conservation biology?

(Primack CH1; Meine et al. 2006), [optional: Meffe and Carroll 1997, Chap 1]

**Week 2**

**Tues Sep 1**, Conservation Ethics and Rationale

(Primack CH1 and pp. 64-68 of CH3) {optional: Callicott, Chap 2 of Meffe and Carroll 1997}

(Leopold readings - see website for links)

**Thurs Sep 3**, Biodiversity

(Primack CH2; Myers et al. 2000)

**Week 3**

**Tues Sep 8**, Value of Biodiversity

(Primack CH3; Costanza et al. 1997, *Nature*; Driessen 2004, DDT, Malaria, EcolImperialism)

**Thurs Sep 10**, Threats to Biodiversity

(Primack CH4; <http://www.davidsuzuki.org/Forests/Biodiversity/Threats.asp>)

**Week 4**

**Tues Sep 15**, Invasive Species

(Primack pp. 109-117 of CH4; TREE2007, Biocontrol article)

**Thurs Sep 17**, Global Climate Change

(Primack CH4; Walther et al. 2002)

**Week 5**

**Tues Sep 22**, Preparing for Loihi?

**Rob Robichaux** (xx)

**Thurs Sep 24, EXAM 1** (covers lectures through 22 Sep, Primack CH1-4 and other assigned readings)

**Week 6**

**Tues Sep 29**, Global Turtle Conservation?

**Ed Moll** (see course website for chapter of his book)

**Thurs Oct 1**, Extinctions and Small Populations (Island Biogeography, Metapopulations, etc.)

(Primack CH5; Harper et al. 2008; Quammen *Song of the Dodo* excerpt)

**Week 7**

**Tues Oct 6**, Extinctions and Small Populations (MVP, Genetics, etc.)

(Primack CH5-6; Panther PVA (skim))

**Thurs Oct 8**, Populations and Species (incl PVA, MVP, etc.)

(Primack CH6; Marmontel et al. 1997 (PVA Manatee) [optional: Gilpin 1996 PVA commentary])

**Week 8**

**Tues Oct 13**, Conservation Genetics

**Adrian Quijada Mascarenas** (xx)

**Thurs Oct 15**, Conservation Genetics

**Adrian Quijada Mascareñas (xx)**

**Week 9**

**Tues Oct 20**, Populations and Species (incl ESA, SDCP, etc)  
(Primack CH6; ESA and SDCP readings)

**Thurs Oct 22**, Habitat and Reserve Design, Protected Areas (incl SLOSS)  
(Primack CH7; xx)

**Week 10**

**Tues Oct 27**, Fire & Conservation (aka Burning Conservation Issues)  
**Mary Jane Epps** (Donovan & Brown 2007)

**Thurs Oct 29, Exam 2** (material not yet covered by Exam 1 through 27 Oct and related readings and lectures)

**Week 11**

**Tues Nov 3**, Landscape Conservation and Sky Island Alliance?  
**Matt Skroch** (xx)

**Thurs Nov 5**, Conservation Practices, Ecosystem Management  
(Primack CH7-8; Donlan et al. 2005, Pleistocene Rewilding)

**Week 12**

**Tues Nov 10**, Conservation Practices, Ecosystem Management  
(Primack CH7-8; Kellerman et al. 2008)

**Thurs Nov 12**, Professional Panel?  
**Margi Brooks (NPS), Mima Falk (USFWS), Dale Turner (TNC)** (xx)

**Week 13**

**Tues Nov 17**, Ecological Restoration, Reconciliation Ecology  
(Primack CH8; xx)

**Thurs Nov 19**, Conservation: Philosophies & Approaches?  
**Guy McPherson, Michael Rosenzweig, Scott Bonar** (xx)

**Week 14**

**Exhibit annotation and grading criteria due**

**Tues Nov 24**, Conservation Biology, a synthesis  
(xx)

**Thurs Nov 26**, Thanksgiving (**no class**)

**Week 15**

**Tues Dec 1**, Creativity **EXHIBIT (Public)** - art/literature project due today at noon  
**Noon – 4pm. Judging from 2-3pm.**

**Thurs Dec 3**, Sustainable Development, Economics  
(Primack CH9; xx)

**Week 16+**

**Tues Dec 8**, Last Lecture; Sustainability, Wrap-Up  
(Primack CH9; Chan 2008; Lackey 2007; Noss 2007)

**Thurs Dec 17**, Cumulative **Final Exam**: 1400-1600h (aka 2-4pm)

