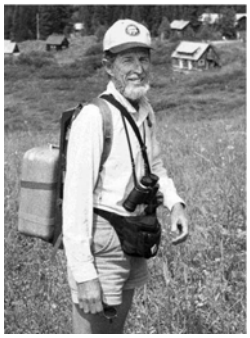
Conservation Biology (ECOL 406R/506R)

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

Syllabus fall 2006 (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, economics, and law. Upon completion of this course, students should be able to use knowledge of conservation biology to make informed decisions 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.
Biological Sciences East (BSE) 1D (in the basement)
Office Hours in BSE 1D, 2-3pm Tues and 11-noon Wed, or by appointment.
Office phone: 626-0092, Home phone: 751-1349 (please call before 9pm or after 7am)
email: **kebonine@u.arizona.edu**

Graduate Teaching Assistant

Kathy Gerst, katgerst@email.arizona.edu
Office hours Thurs. 2-3 pm in BSW506, and by appointment. Extra hours to be added during periods of high demand.

Meeting Times

LECTURE: Tuesday and Thursday 1230-1345h in FCS 114.
LAB (only for 406L/506L): Friday 1230-1530 (nominally in KOFFL 410, but we won't meet there).
We will usually be meeting on the S Side of BSE to take a van into the field.
See lab schedule for lengthened labs and multi-day labs.

Course Materials

Van Dyke, Fred. 2003. *Conservation Biology: Foundations, Concepts, Applications*. McGraw-Hill, New York. 413+xvii pages.
(Available at Antigone Books, (411 N. 4th Ave, 520-792-3715, antigonebooks.com); about $90)

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 have also placed on reserve in the Science Library a copy of your Van Dyke text and a copy of the second edition of Meffe, G.K., and Carroll, C.R. 1994. *Principles of Conservation Biology*. Sinauer Associates, Sunderland, Massachusetts. These, as well as other optional readings, we will try to make available to you, or point out, during the semester.

Web Site
We will maintain a course website (**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 @ 100 pts each, final 150 pts)	350
Semester creativity project (15 pts for grading criteria; 100 for project)	115
Participation in lecture & quizzes	50
Writing assignments (five of seven at 25 pts each)	125
Seminar attendance and summary	20
Short oral presentation	40
Total Points	**700**

Graduate Student 506R Course Work
Same as 406R with the addition of an additional written research project (100 pts) for a grand total of **800** points.

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):

<u>The "A" Student--An Outstanding Student</u>

* 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) and request that the DRC send the instructor official notification of your accommodation by the beginning of the 3rd week of class. 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 may be used to motivate your attendance and participation if necessary. 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 (borrowed 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

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 (25 points each, five of seven assignments in bold in lecture schedule below)
Turn in no more than one piece of paper (typed, double spaced, min. 2cm margins, min. 10 point font). Be concise, but convey sophisticated knowledge of subject matter, include relevant examples/citations, 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.

Short Oral Presentation (40 points)
In pairs, you will present no more than **10 minutes** of material to the class on a specific conservation-relevant locale somewhere other than N. America. Use powerpoint so you can show pictures (and very few words!). Explain what the impact of the conservation issue or area is on local biodiversity and people. Also discuss how the U.S. is involved or impacted. You will be graded on the sum of your oral presentation (including poise, clarity, and enunciation), your visual aides, and your fulfillment of the assignment. Please get your powerpoint file (via email is probably best) to both of your instructors by **5pm the day before** you are going to present.

Lecture Exams (350 points)
There will be 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 notes.

Exams will 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 (115 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 class). 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.

Among the authors who effectively incorporate natural history into literature are Edward Abbey, William Bartram, Wendell Berry, Charles Bowden, John Burroughs, Rachel Carson, Annie Dillard, Marjory Stoneham Douglas, Robinson Jeffers, Joseph Wood Krutch, Aldo Leopold, Barry Lopez, Peter Matthiessen, Simon Ortiz, John McPhee, William Least Heat Moon, Gary Paul Nabhan, David Quammen, Gary Snyder, Henry David Thoreau, David Rains Wallace, Opal Stanley Whiteley, Terry Tempest Williams, and Ann Zwinger. Particularly if you are working on a "literature" project, we encourage you to read several of the works of these authors, and potentially to model your writing efforts after them.

If you complete a project that involves written materials, I 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.

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, aesthetic? 10%). We encourage you to propose alternative criteria and associated weights. Please submit these during the class period (**28 Nov**) 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: the grade you and your peers assign your project will have equal or greater weight than the grade assigned by the instructor. Projects are due at the beginning of the lecture on **30 November**. Late projects, or those that do not follow the prescribed format, will not be graded.

Projects will be displayed at a public forum at the end of the semester.

Seminar Attendance and Summary (20 points)

Once during the semester you are required to attend a scientific seminar and write up a one-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. On your paper 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.

Graduate Student 506R Written Research Project (100 points)

This paper will be your opportunity to research a topic of interest to you that is pertinent to conservation biology. You will be expected to synthesize relevant information from the primary literature (containing original, peer-reviewed research results) in a well-written paper. Collecting and adding additional new data would be welcomed, but is not required. You will be graded in two stages: topic and annotated references (**12 October; 25 pts**.), and final submission (**21 November; 75 pts.**). This paper should be written in the format (including citations and literature cited) of articles in Conservation Biology and should be 10+ double-spaced pages in length. Please discuss topics of interest with the instructors **before** proceeding.

Tentative 2006 Class Schedule (30 Class meetings)
See course website for updated topics and readings as the semester progresses.

Date
Topic (Reading; please complete before class; other readings will be added)

Aug 22
Introductions and photos, sign up for paired presentations
Syllabus, philosophy, and context
(Ecological footprint for Thursday, http://www.earthday.net/footprint/index.asp,
http://www.rprogress.org/newprojects/ecolFoot/faq/)
(Optional: Bill Calder Memorium from The Auk, 2003; available on course website)
1) Explain why you think your ecological footprint differs depending on the country you claim to live in, even if all the data you input are the same? (due 24 Aug)

Aug 24
Discuss Ecological Footprint
What is conservation biology?
(Van Dyke CH1)
(optional: Meffe and Carroll 1997, Chap 1)

Aug 29
What is conservation biology?
(Van Dyke CH1; Noss 1999)
(optional: Meffe and Carroll 1997, Chap 1)

Aug 31
Conservation Ethics and Rationale
(Van Dyke CH3; Callicott, Chap 2 of Meffe and Carroll 1997)

Sep 05
Conservation Ethics and Rationale
(Van Dyke CH3; Leopold readings)
2) Should 'intrinsic' or 'instrumental' values be the basis for planning conservation efforts? Why? (due 07 Sep)

Sep 07
Biodiversity
(VanDyke CH4)
(Costanza et al. 1997, Nature)
(Driessen 2004, DDT, Malaria, EcoImperialism)

Sep 12
Biodiversity
(VanDyke CH4)
History of conservation biology/Legislation
(Van Dyke CH2)

Sep 14
History of conservation biology/Legislation
(Van Dyke CH2)
3) Is the endangered species act (ESA) the correct approach for US conservation efforts? Why or why not?
-OR-
Why is biodiversity important? How would you defend any one species to a non-conservationist? (due 19 Sept)

Sep 19
Sonoran Desert Conservation Plan

Sep 21
David Hall (guest speaker; desert aquatic populations [turtles, frogs, fish] and their conservation)

Sep 26
Paradigms and Theories, Island Biogeography, and Metapopulations
(Van Dyke CH5)

Sep28
Exam 1 (through ~26 Sept. over CH1-4 and associated readings)

Oct 03
Conservation Genetics
(Van Dyke CH6)

Oct 05
Conservation Genetics
(Van Dyke CH6)
Hans-Werner Herrman (guest speaker; Grand Canyon snails, etc.)

Oct 10
Populations
(Van Dyke CH7)
4) Which unit of biology deserves protection? Why? (due 17 Oct)

Oct 12
Population Viability Analysis, Minimum Viable Population Size
(Van Dyke CH7)
506R topic and annotated references due

Oct 17
Invasive Species
(Van Dyke CH7)
Kathy Gerst (guest speaker; invasive riparian plants)

Oct 19
Habitat and Reserve Design
(Van Dyke CH8)

Oct 24
Global Climate Change, Peak Oil
(Walther et al. 2002, Hayhoe et al. 2004)
5) What role does global climate change play in the arena of conservation biology? How can we combat it? (due 26 Oct)

Oct 26
The Four Spikes
Guy McPherson (guest speaker)

Oct 31
Conservation Practices
(Van Dyke CH10)
(Donlan et al. 2005, Pleistocene Rewilding)

Nov 02
Exam 2 (through ~31 October; covers CH5-8 and associated readings)

Nov 07
Conservation Practices (Aquatic)
(Van Dyke CH9)

Nov 09
Restoration Ecology/Practicing Conservation Biology
(Van Dyke CH11)
Don Falk (guest speaker?)

Nov 14
Reconciliation Ecology
Michael Rosenzweig (guest speaker?)
6) What roles do reconciliation and restoration ecology play in conservation biology? Explain and justify. (due 16 Nov)

Nov 16
Economics and Sustainable Development
(Van Dyke CH12)

Nov 21
Professional Panel
(Van Dyke CH13)
Margi Brooks (NPS), Mima Falk (USFWS), Dave Gori (TNC)
506R Written Research Project due

Nov 23
Thanksgiving (**no class**)

Nov 28
Economics and Sustainable Development
(Van Dyke CH12)
Exhibit criteria due.
7) What are the pros and cons of economic systems that follow either a 'steady-state' model or a 'growth is always better' model? Which do you think we should follow? Why? (due 05 Dec)

Nov 30
EXHIBIT (Public) - art/literature project due today, peer grading

Dec 05
Last Lecture
Wrap-Up, Sustainability, Course evaluations

Dec 14 (Thursday)
Cumulative **Final Exam**: 1100-1300h