Lecture 01, 21 Aug 2007
Introduction and photos

Conservation Biology
ECOL 406R/506R
University of Arizona
Fall 2007

Kevin Bonine
Cathy Hulshof

1. Introductions
2. 3x5 cards, photos

3. Syllabus
4. Topics

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'3x5' card

1. Registered? 2. 406R or 506R? 3. In Lab?

Name (and what you prefer to be called)
-Distinguishing characteristic

Email address

Year in school

Major

NAME very LARGE on back
hold until photo

Relevant courses taken, or research projects, etc.

Why are you taking this course?
What do you hope to get out of this course?

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1. Overall course objectives

- Grasp scientific material (content & literacy)
- Provide real-world relevancy and applications
- Place in context of students' lives
- Foster life-long appreciation and respect for:
  - field, findings, organisms, biodiversity,etc.

3

1. Please take out a piece of paper.

2. Write a definition of Conservation Biology.

3. Do you think Conservation Biology has a mission or goal?

4. What is that mission/goal?

5. Has Conservation Biology been successful at achieving that goal?

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Conservation Biology (ECOL 406R/506R)
aka GEOS 406R/506R, RNR 406R/506R
Syllabus fall 2007 (21 August 2007, 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., kebonine@u.arizona.edu
Biological Sciences East (BSE) 1D (in the basement)
Office Hours in BSE 1D: 11-noon Tues and noon-1pm Thurs, or by appointment.
Office phone: 626-0092, Home phone: 751-1349 (please call before 9pm or after 7am)
email.

Graduate Teaching Assistant
Cathy Hulshof, hulshof@email.arizona.edu
Office hours: Mon and Wed 2-3, location TBA, and by appointment.

Meeting Times
LECTURE: Tuesday and Thursday 1400-1530h in MINES 225.
LAB (only for 406L/506L): Friday 1230-1530 (nominally in KOFFL 410, but we rarely meet there).
We will usually be meeting on the S or W 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 UA Bookstore - http://www.uofabookstores.com/uazi)

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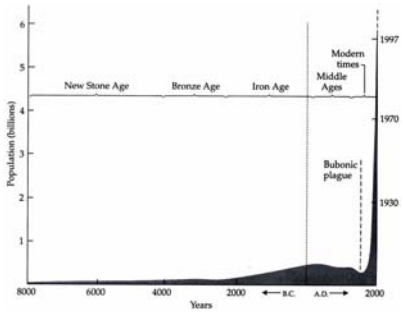
Humans on planet Earth



Meffe and Carroll 1997

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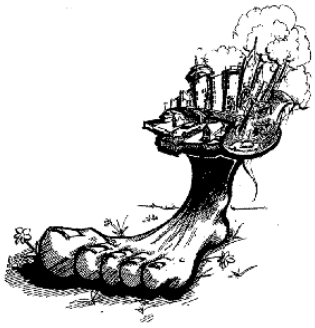

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Ecological Footprint

1 ha = 2.47 acres

Figure 1-5 Relative ecological footprints of the United States, the Netherlands, and India. An *ecological footprint* is the amount of land needed to produce the resources needed by an average person in a country. It would take the land area of about three planet earths if all the world's 6.2 billion people consumed the same amount of resources as is consumed by the 288 million people in the United States. Miller, 2003

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P.S. Learn the metric system

Ecological Footprint

Def: Number of productive acres (fishing grounds, forests, agricultural fields) needed to maintain a given lifestyle

- -Driving (roads, vehicles, fuel, etc.)
- -Housing (land and resources for construction)
- -Food (land, transport, inputs, trophic level)
- -Other goods and services

US citizens use 24 acres/person on average (Canadians 17, Italians 9, Pakistanis 2)

As of ~2002, planet has about 4.5 acres/person

Sustainability?

(1 acre = 0.405 hectare)

Contribution to Greenhouse Gas Emissions and Global Warming

~Ecological Footprint

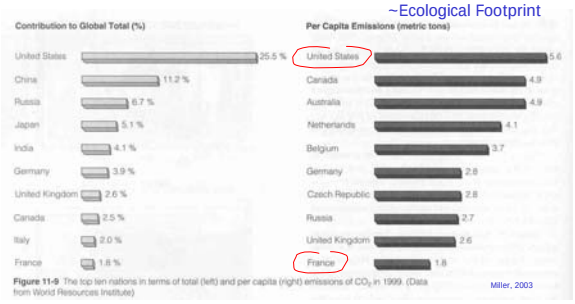

Figure 11-9 The top ten nations in terms of total (left) and per capita (right) emissions of CO_2 in 1999. (Data from World Resources Institute)

Ecological Footprint HOMEWORK!

earthdaynetwork

AVERAGE ECOLOGICAL FOOTPRINT IN USA IS 24 ACRES PER PERSON.
WORLDWIDE, THERE EXIST 4.5 BIOLOGICALLY PRODUCTIVE ACRES PER PERSON.

http://www.earthday.net/footprint/index.asp

For Thursday, please calculate your ecological footprint TWICE:

Once for your life here in the U.S.
A second time using the same information, but choose a different country.

http://www.earthday.net/footprint/index.asp

Frequently Asked Questions re: Ecological Footprint:
http://www.rprogress.org/ecological_footprint/footprint_FAQs.htm)

Bring the Numbers to Class on Thursday.
Convert to Acres.

Table 2.1 Ecosystem Services and Functions

Ecosystem service*	Examples
Gas regulation	Carbon dioxide/oxygen balance, ozone for protection against ultraviolet light
Climate regulation	Greenhouse gas regulation, dimethyl sulphide production affecting cloud formation
Disturbance regulation	Storm protection, flood control, drought recovery, and other aspects controlled by vegetation structure
Water regulation	Provisioning of water for agricultural (such as irrigation) or industrial (such as milling) processes or transportation
Water supply	Provisioning of water by watersheds, reservoirs, and aquifers
Erosion control and sediment retention	Prevention of loss of soil by wind, runoff, or other removal processes; storage of silt in lakes and wetlands
Soil formation	Weathering of rock and the accumulation of organic material
Nutrient cycling	Nitrogen fixation, nitrogen, phosphorus, and other elemental or nutrient cycles
Waste treatment	Waste treatment, pollution control, detoxification
Pollination	Provisioning of pollinators for the reproduction of plant populations
Biological control	Keystone predator control of prey species; reduction of herbivory by top predators
Refugia	Nurseries, habitat for migratory species, regional habitats for locally harvested species, or overwintering grounds
Food production	Production of fish, game, crops, nuts, and fruits by hunting, gathering, subsistence farming, or fishing
Raw materials	The production of lumber, fuel, or fodder
Genetic resources	Medicine, products for materials science, genes for resistance to plant pathogens and crop pests, ornamental species (pets and horticultural varieties of plants)
Recreation	Ecotourism, sport fishing, and other outdoor recreational activities
Cultural	Aesthetic, artistic, educational, spiritual, and/or scientific values of ecosystems

* *Ecosystem "goods" included in ecosystem services.*
Source: Adapted with permission from Robert Costanza et al., "The value of the world's ecosystem services and natural capital," *Nature*, May 1997.

Brennan and Withgott 2005

Consilience* in Conservation Biology

Science and the Humanities

* the uniting of knowledge