

Lecture 01, 22 Aug 2006
Introduction and photos

Conservation Biology
ECOL 406R/506R
University of Arizona
Fall 2006

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1. Introductions
2. 3x5 cards, photos
3. Syllabus
4. Topics



'3x5' card

Registered? 406R or 506R? In Lab?

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

Email address

Year in school

Major

Relevant courses taken, or research projects, etc.

Why are you taking this course?

What do you hope to get out of this course?

hold until photo

2

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

Rank self from 1-10 on
knowledge of
Conservation Biology

10: Very knowledgeable

1: Know nothing about it, I might be in the
wrong room

Please add this number to
the top right of your card.

4



5



6

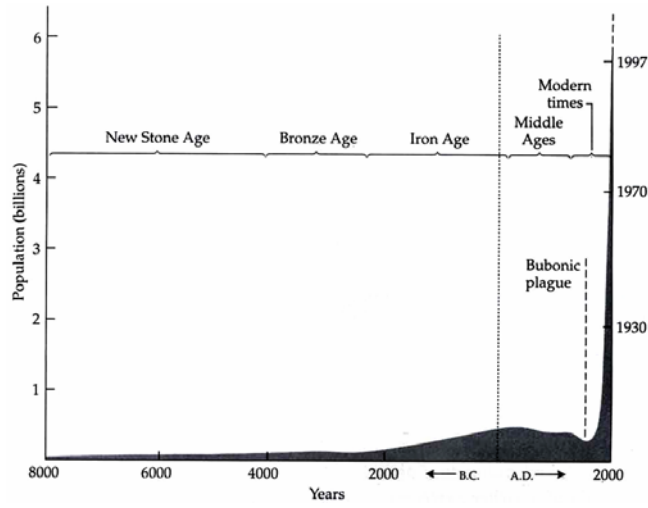


8



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Humans on planet Earth



Meffe and Carroll 1997

10



11



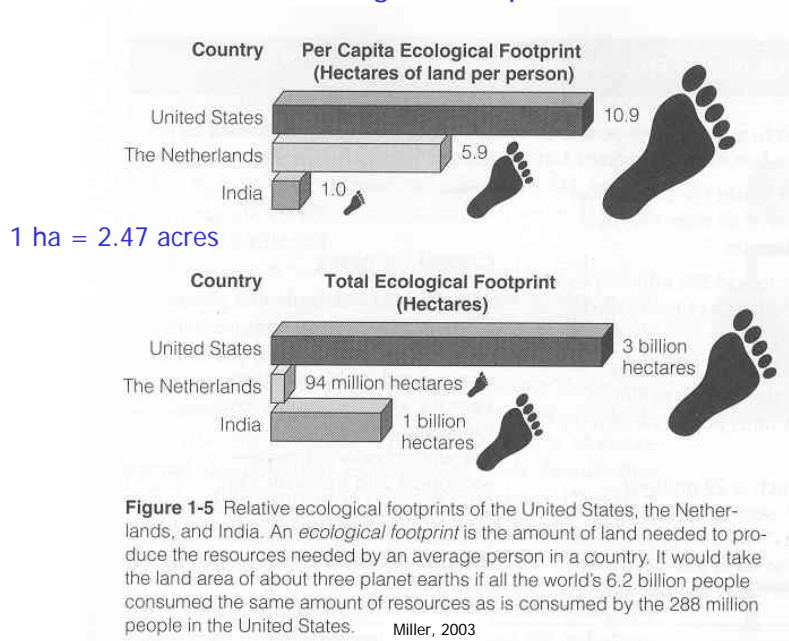
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Ecological Footprint



P.S. Learn the metric system

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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

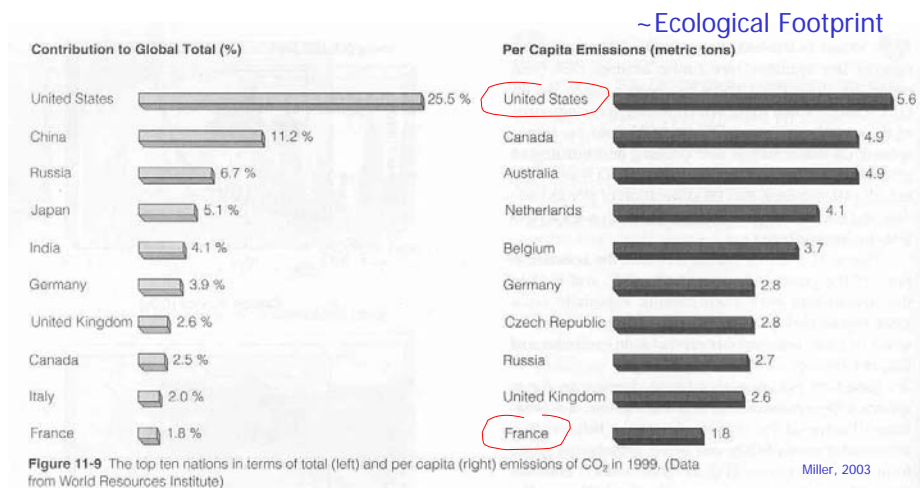
US citizens use **24 acres/person** on average
(Canadians 17, Italians 9, Pakistanis 2)

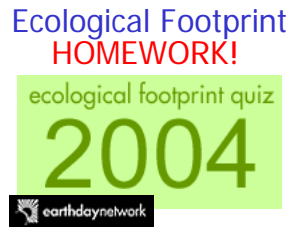
As of ~2002, planet has about 4.5 acres/person

Sustainability?

(1 acre = 0.405 hectare)

Contribution to Greenhouse Gas Emissions and Global Warming





How many planets needed, at 4.5 acres/person, to live like the mean ECOL406R/506R student?

$$= \text{mean}/4.5 = ??$$

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>

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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