

Lecture 03, 28 Aug 2007
Ethics, Rationale behind
Conservation Biology

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



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Upcoming Readings

today: [Textbook chapter 3](#); [Callicott 1997](#) (from Meffe and Carroll)

Thurs 30 Aug: [Textbook Ch. 3](#), [Leopold readings](#)
[Q1 due 30 Aug if you choose to answer.]

Tues 04 Sept: [Text Ch. 4](#); [Costanza et al. 1997](#), [Driessen 2004](#)

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Conservation Biology Lab 406L/506L

[Next Lab Friday 07 September](#)

1230 S or W side BSE
(4th and Highland)

Hat, water, sunscreen, close-toed shoes

[Readings on Course Website](#)

07 September - Sabino Canyon
VAN
Flooding, Wilderness, Forest
Management, Nuisance Wildlife



(Schedule stands, could not change our 28-30 September trip.)

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Especially relevant for 506 students:

Conservation Seminar meeting Wed @3

If you are interested in participating in the Conservation Seminar (RNR696a – but you don't need to enroll) please attend our first meeting this **Wednesday at 3 in BSE 218**. We will pick a final meeting time, introduce ourselves and brainstorm ideas of what we do or don't want to discuss.

Thanks,

Chris McDonald

cmcdon@email.arizona.edu

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Public Water Lecture with Peter Gleick

Fresh water availability is a growing issue of concern across the world, but no where more than in arid lands. Tucson is no exception.

Will projections of our water supply in the distant future - even in the next decade or two - be accurate? How will prolonged drought affect both water quantity and quality? What impacts will water supply have on the region's economic viability?

Sustainable Tucson is co-host of a public lecture by international water expert, Peter Gleick, along with the Water Resources Research Center (WRRRC) and Institute for the Study of Planet Earth (ISPE) at the University of Arizona, and the Southern Arizona Leadership Council (SALC).

A **MacArthur Fellow** and widely published in leading scientific journals, Dr. Peter Gleick is one of the world's top experts on the impacts of climate change on water supply. His work with communities and governments across the Southwest and the world brings a broad perspective to the local discussion.

How can we define **sustainable water policies**, based on sound laws and science? To what extent will water transfers and markets - the economics of shifting water - help us reconcile growth and supplies which are limited, keeping in mind that global warming, as well as land-use changes, will likely affect both surface and groundwater systems?

Sustainable Tucson believes Dr. Gleick's vision can help inform local planning by bringing the experience of many communities to bear on Tucson's creative solutions to long-term water security.

Dr. Gleick will address water experts and other leaders at the Arizona Hydrologic Society's regional conference, "Sustainable Water, Unlimited Growth, and Quality of Life: Can We Have It All?" to be held August 27 – 30 in Tucson.

The joint planning of this public lecture amongst university departments, civic, business, and community groups, points to exciting new dialogue over water and sustainability taking place in our community.

The lecture will take place in **Tucson on August 30, at 7:30 p.m. at Temple Emanu-El - 225 N. Country Club Rd.**

**Contact Madeline Kiser (mkiser@dakotacom.net)
or Susan Williams (susanleewilliams@cox.net) for more information.**

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

<10?

>20?

Mean for class was 16 acres in US, 10.5 elsewhere



Is Conservation Biology a Distinct Discipline?

Is the answer important?

-Noss 1999

Noss 1999

Is there a special conservation biology?

Origins

Soulé et al. 1978+

SCB 1986

Conservation Biology 1987



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Noss 1999

Principles:

1. Species with large ranges safer than spp. with small.
2. Prefer large blocks of habitat and large populations.
3. Prefer habitat blocks in close proximity to each other.
4. Prefer unfragmented habitat. [Reserve Design](#)
5. Prefer interconnected habitat to isolated.
6. Prefer roadless and inaccessible habitat.
7. **PRECAUTIONARY PRINCIPLE**
-If we don't have enough data, err on side of caution.
8. Prefer ecosystem approach to species approach.
9. Consider biodiversity hotspots.

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Pattern and Generality vs. Special Case



p. 116, Noss 1999

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Normative Postulates:

1. Diversity of organisms is good
2. Ecological complexity is good
3. Evolution is good
4. Biotic diversity has intrinsic value

Michael Soule, 1985, 1986 (see p. 57 Van Dyke)

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Noss 1999

Is advocacy appropriate?

Objectivity vs. Neutrality



Value-laden

Responsible Advocacy?



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Ethical Advocacy?

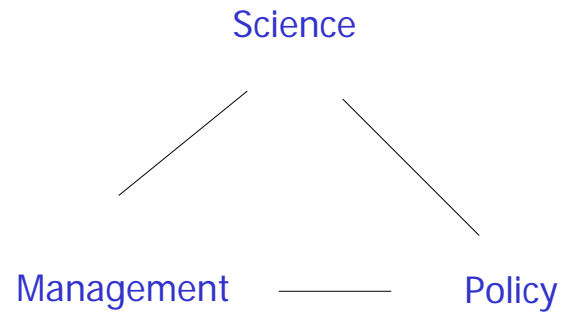
p.117, Noss 1999:

tropical rainforest

vs.

economic development program

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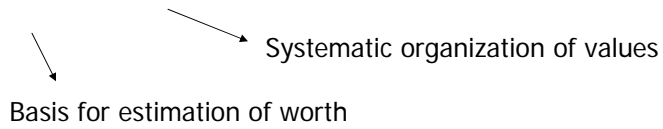
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Quiz:

1. Explain what is meant by the “Madagascar Periwinkle Argument”.
2. In the context of economics, what does it mean to “enclose” as opposed to the alternative, “commons”?
3. Why so much discussion about “Burden of Proof” in your readings?

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Values, Ethics, Philosophy...



VALUE OF BIODIVERSITY

-Instrumental/utilitarian

-Intrinsic/inherent



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Table 2.1
Four Categories of the Instrumental Value
of Biodiversity

Category	Examples
Goods	Food, fuel, fiber, medicine
Services	Pollination, recycling, nitrogen fixation, homeostatic regulation
Information	Genetic engineering, applied biology, pure science
Psycho-spiritual	Aesthetic beauty, religious awe, scientific knowledge

Callicott 1997

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Values, Ethics, Philosophy...

Monetizing

- discount rate
- rates of growth and reproduction

Economic development short sighted?

BCA

Valuation methods

- willingness to pay/ accept
- travel cost
- existence value
- contingent valuation
- bequest value



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Madagascar Periwinkle Argument

(Callicott p. 30)

“Arrogant and Trivial”?

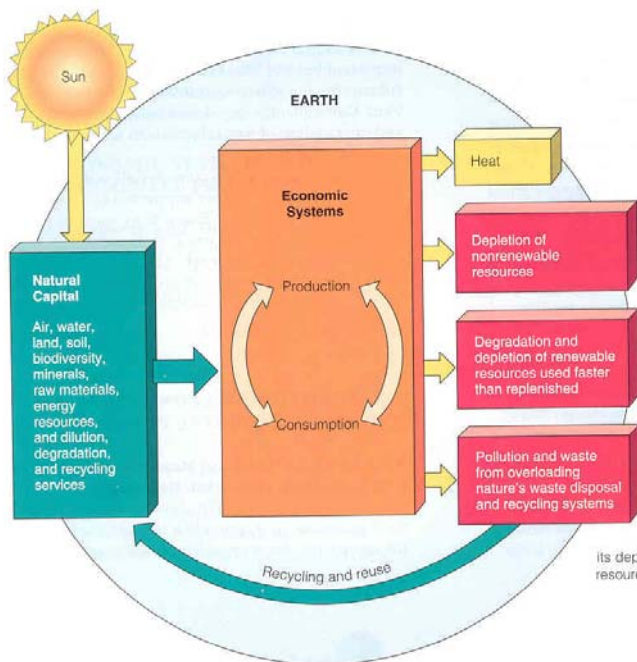
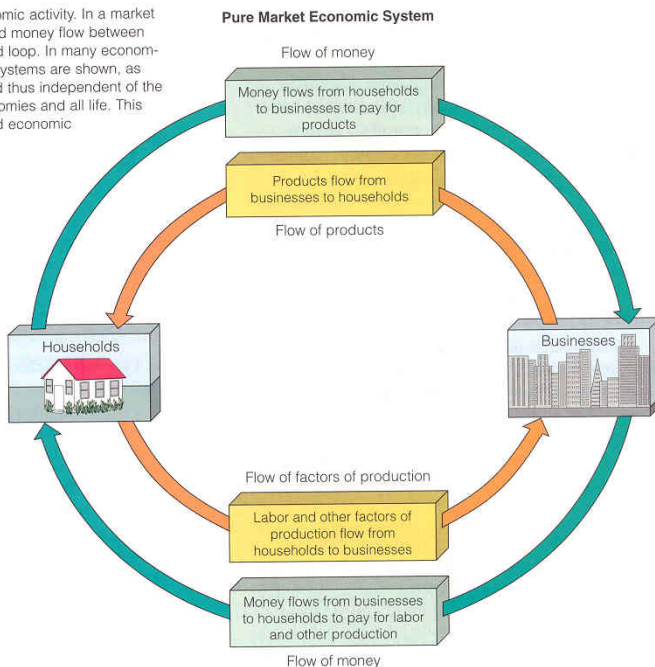


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Figure 2-2 *Conventional view of economic activity.* In a market economic system, economic goods and money flow between households and businesses in a closed loop. In many economics textbooks, such market economic systems are shown, as here, as if they were self-contained and thus independent of the natural resources that support all economies and all life. This model reinforces the idea that unlimited economic growth of any kind is sustainable.

=14-1 Miller 2003

Conventional Economics



Ecological Economics

Figure 2-3 *Ecological view of economic activity.* Ecological economists see all economies as human subsystems that depend on resources and services provided by the sun and the earth's natural resources. A consumer society devoted to economic growth to satisfy ever-expanding wants assumes that our technological cleverness will allow us to find (1) substitutes to overcome any limits on resources and (2) ways to keep pollution and environmental degradation at acceptable levels. To ecological economists, such a society is unsustainable because of its depletion and degradation of natural resources, many of which have no substitutes.

=14-2 Miller 2003

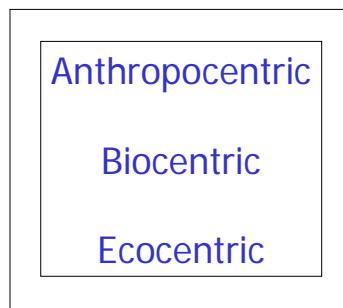
Ecological
vs
Conventional
Economics

Characteristic	Unsustainable Economic Growth	Environmentally Sustainable Economic Development
Production emphasis	Quantity	Quality
Natural resources	Not very important	Very important
Resource productivity	Inefficient (high waste)	Efficient (low waste)
Resource throughput	High	Low
Resource type emphasized	Nonrenewable	Renewable
Resource fate	Matter discarded	Matter recycled, reused, or composted
Pollution control	Cleanup (output reduction)	Prevention (input reduction)
Guiding principles	Risk-benefit analysis	Prevention and precaution

—14-3 Miller 2003

Figure 2-4 Comparison of unsustainable economic growth and environmentally sustainable economic development.

mente
india



Evolution of rights...

monarchs
white males
"all men"
humanity
sentient beings
nature?



Eastern Kingbird
(*Tyrannus tyrannus*)

"Bonuses?"

(Callicott p. 47)

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Shift Burden of Proof/Responsibility (precautionary principle)

SMS (safe minimum standard)

	~Developers	~Conservationists
1 Instrumental		B of P
2 Intrinsic	B of P	
3 BCA		B of P
4 SMS	B of P	

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Discussion:

1. How do conservationists respond to the question, “What good is it?”
2. How do we verify that humans, or anything, has intrinsic value?
3. “Enclosed/Private” Goods, or “Common” Goods - Which of these is a better approach for conservation? Why?
4. What is the conservation role of the world’s religions?

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Debate 20 Sept 2007:

Should the flat-tailed horned lizard (*Phrynosoma mcallii*) be ESA listed?

Three groups – one will debate, another will evaluate, third will observe, then we rotate.

406	Debate 1 (20 Sept.)
	Group A debate
	Group B evaluate
	Group C observe
	Debate 2 (23 Oct.)
	Group A observe
	Group B debate
	Group C evaluate
	Debate 3 (15 Nov.)
Group A evaluate	
Group B observe	
Group C debate	

Debate 1 (20 Sept.)
506 A assist
506 B assist
506 C observe
Debate 2 (23 Oct.)
506 A assist
506 B observe
506 C assist
Debate 3 (15 Nov.)
506 A observe
506 B assist
506 C assist

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Horned Lizard Debate (20 Sept 2007):

506 A and 506 B look for relevant interest groups and readings, think about debate “rules”.

Group A will also look for relevant interest groups, confer about resource leads from 506 A and B.

Exchange contact information, choose a leader?, divide up tasks, set timeline, practice with your 506 mentors, confer with instructors.

Possible Interest Groups: US Govt, USFWS, AZ, CA, BLM, USFS, CBD, US Military, etc.
Information: Federal Register, CBD, BLM, USFWS

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Plastic Trees
in Los Angeles?

knowledge -> advocacy?



“ Perhaps our grandsons,
having never seen a wild
river, will never miss the
chance to set a canoe in
singing waters.”

-Leopold

Values, Ethics, Philosophy...

Rolston Essay (p. 35 in Callicott Chapter)

-species vs. species in the system
(definition of species)



-value of evolutionary trajectory

-extinction and doors
(temporal and spatial scales)



Values, Ethics, Philosophy...

Ethics:

constrain self-serving behavior in
deference to some other good

Tragedy of the Commons

Role of religions?

interpretation...

Science, Vol 162, Issue 3859, 1243-1248 , 13 December 1968

The Tragedy of the Commons

Garrett Hardin

The tragedy of the commons develops in this way. Picture a **pasture** open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of **social stability** becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy.

As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive component.

1) The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1.

2) The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decision-making herdsman is only a fraction of - 1.

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another. . . . But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the **tragedy**. Each man is locked into a system that compels him to increase his herd without limit--in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.

Judeo-Christian Tradition

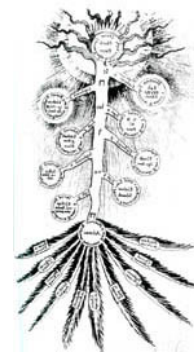
Intrinsic value by divine decree.
Noah saving "species".

Islam

No separation of church and state.
Unity, Trusteeship, Accountability.

Hinduism

Core of all being is one reality, *Brahman*.
Prakrti; matrix of the material creation



Buddhism

Limit use of resources.
Nirvana: self+surroundings

Jainism

Each living thing has a soul.



Taoism

The way of nature; don't buck it.

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Iroquois



consider the impact of their decisions on the seventh generation to come

Chipko (Hindu links)

The ultimate tree-huggers.
Himalayas of India



Table 3.3 Seven Major Worldviews that Shape Environmental and Conservation Ethics

WORLDVIEW	TYPE OF VALUE	MOTIVATION FOR CONSERVATION
1. Judeo-Christian stewardship	Theocentric	Preserve the ecological systems that God has commanded humans to care for, as exemplified by the placing of man in the garden to "work it and take care of it"(Genesis 2:15). Humans should respect and not destroy God's handiwork.
2. Deep ecology and related value systems	Ecocentric	The rights or intrinsic values attributed to nonhuman nature place limitations on human prerogatives to use or alter nature and must be respected.
3. Transformationalist/transcendentalism	Anthropocentric	Respect the spritual value of nature, which provides solace to consider life's deepest questions and can cure human alienation.
4. Constrained economics	Anthropocentric	Resource use is primarily a problem of human economics. Because avoiding irreversible damage to the environment is beneficial, the environment should be preserved when the economic cost is not too great. Low risk taking, common sense, and avoiding irreversible damage to the environment are justification.
5. Scientific naturalism	Science-centered/ecocentric	Scientific theories of evolution and ecology reveal necessary limits on population growth and violence to the land. Dynamism and contextualism are emphasized.
6. Ecofeminism	Anthropocentric feminism	Because man's domination over nature is symbolic of his domination over women, preserving the environment fights to cure both environmental and social problems.
7. Pluralism/pragmatism	Anthropocentric	Philosophy, although it can serve as a tool to solve moral problems, is not emphasized. Rather, practical problem solving and ethical principles are used to address environmental issues.

*Norton, B. G. 1991. *Toward unity among environmentalists*, 197-99. New York: Oxford University Press.

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Van Dyke 2003

Personal Example?
Virtue?
(Van Dyke p. 75)

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"Conservation may be a sign of personal virtue but it is not a sufficient basis for a sound, comprehensive energy policy."

-Vice President R. Cheney, April 2001

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Role of scale... (context of disturbance and extinction)



Anthropogenic perturbations:

...fast rate and large spatial scale.

(Cited in Callicott 1997)

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Five axioms of consensus among environmentalists:

1. Dynamism
2. Interrelatedness
3. Nested systems
4. Creative processes
5. Differential fragility

Norton 1991 (see Van Dyke p. 72)