



Lecture 05, 05 Sept 2006
Ch3, Callicott, Leopold

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

Kevin Bonine
Kathy Gerst

Values and Ethics
in Conservation

Ch4, Costanza et al. 1997, Driessen 2004 for Thurs
Lab this Friday (08 Sept 2006), meet S side BSE
(see website for lab readings later today)

Housekeeping, 05 September 2006

Upcoming Readings

today: [Textbook chapter 3](#); [Callicott 1997](#), [Leopold](#)
Thurs 07 Sept: [Text Ch.4](#), [Costanza 1997](#), [Driessen 2004](#)
Tues 12 Sept: [Textbook Ch. 4](#)

Short oral presentations

[12 Sept](#) Gabe Wigtil and Kim Baker
14 Sept open
19 Sept Tara Luckau and Frank Emmert?
21 Sept Grant Rogers and Jeremy Daniel

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Grading for Oral Presentations:

Content

(quality of content, relevance to conservation issues):

20 points

Presentation

(speaking, slide design, professionalism):

10 points

Response to questions:

5 points

3

2) Should 'intrinsic' or 'instrumental' values be the basis for planning conservation efforts? Why? (due 07 Sep)

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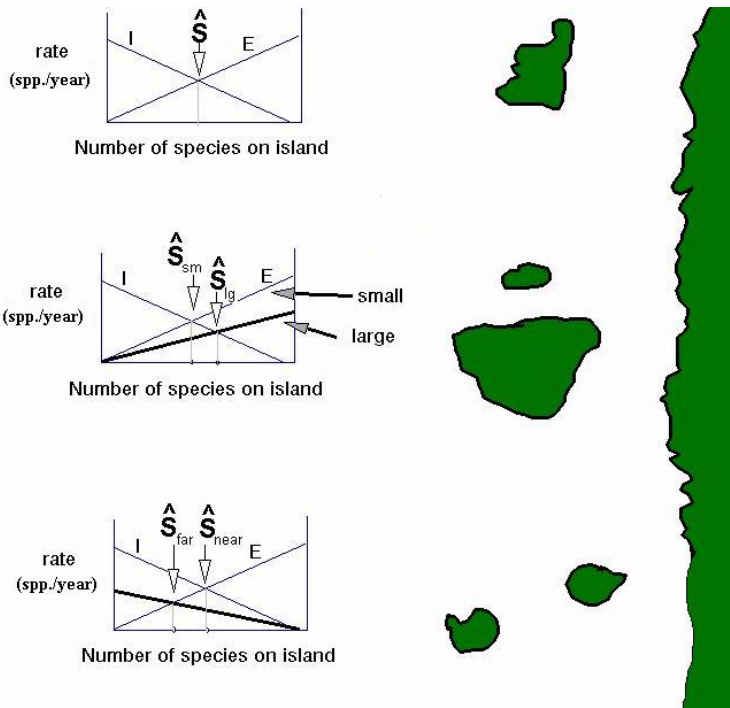
Arizona Geological Society
Defining a Science Strategy for the 21st Century
P. Patrick Leahy, Acting Director, USGS
InnSuites Hotel, 475 North Granada Avenue, Tucson
Lecture at 8:00 PM, Tuesday, September 5

SCHEDULE: CASH BAR @ 6:00 PM DINNER @ 7:00 PM TALK @ 8:00 PM, WITH RESERVATION: MEMBER = \$20.00, GUEST = \$22.00, STUDENT = \$7.00 Without reservations you may not get dinner. If you do, an extra \$2.00 will be charged.

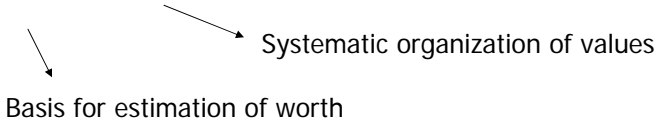
To make dinner reservations please call the AGS answering machine at (520) 663-5295 by 5:00 P.M. on the Friday before the meeting. Leave name, number of attendees, and whether a vegetarian or low-salt meal is required. This number can be used for field-trip reservations and leaving messages for Society officers. Please cancel your reservation via the answering machine if you find that you will be unable to attend.

Abstract

The United States has enormous mineral and natural resource wealth, and people have benefited from that wealth since from the earliest days. Minerals are the essential building blocks of society. They sustain life and provide the wealth that allows us to buy goods and services that we cannot provide ourselves. Yet despite their enormous importance, society is largely unaware of the role minerals play in our everyday lives. As our global population continues to rise, currently exceeding 6.5 billion people worldwide, considerable natural and anthropogenic pressures are being placed on our environment and natural resources. (Source: U.S. Census Bureau) The increasing demand and competition for our minerals and natural resources have placed our Nations leadership and land managers in the spotlight, facing the daunting challenge of trying to balance the needs of society and the ecosystem with the need for continued economic growth. With an estimated value of domestically processed non-fuel mineral materials totaling \$478 billion in 2005 (an increase of about 8 percent over 2004), the demand for metals and minerals by emerging industrial giants China and India directly correspond with the growing demand and production in the mining of copper, iron ore, molybdenum, and aggregates (crushed stone, sand and gravel.) (Source: USGS Mineral Commodity Summaries 2006 report.) Here in the Southwest, we do not have to look far to see how these considerable demand for production of these minerals have provided for the economy and altered the landscape. States like Arizona, who from 1980 2000 witnessed their states population nearly double, are today facing the challenge to provide both efficient and economic recovery of mineral commodities in a way that ensures the security and health of the ecosystem and continue to meet the needs of the growing population. The need to identify solutions has resulted in an increasing demand for unbiased science, data, information and products; more specifically practices that are designed to identify and promote more efficient science and business processes that keep pace with and anticipate societys future needs. The USGS, with its five functional disciplines, Biology, Geography, Geology, Geospatial Information and Water, has endeavored to look at these natural, environmental and economic issues in a holistic manner. And while much of our scientific focus is shifting towards anticipating and changing resource demands, such as the shift from coal and oil to natural gas, and technology-driven substitutions, other focused efforts concentrate on developing new principles and concepts to increase scientific understanding of



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”?

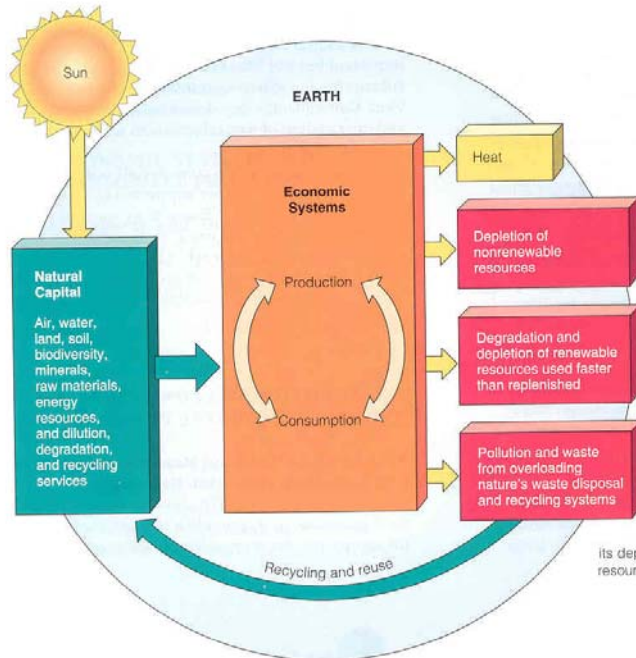
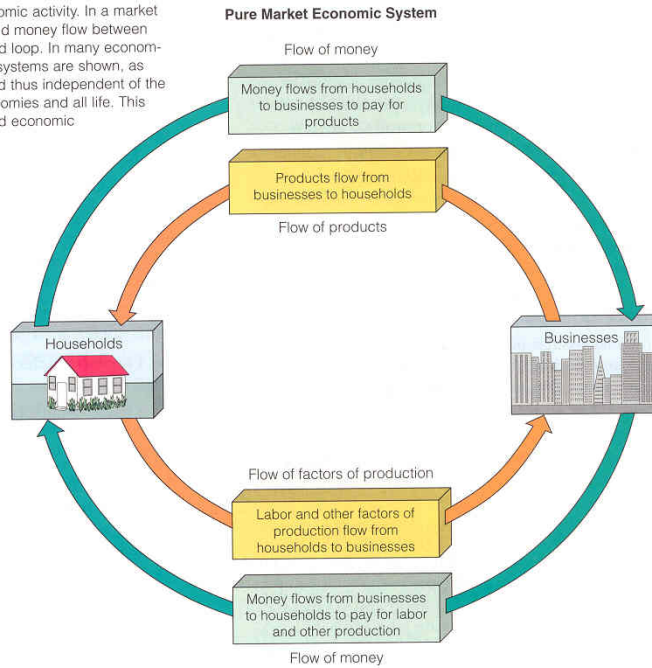


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Figure 2-2 *Conventional view of economic activity.* In a market economic system, economic goods and money flow between households and businesses in a closed loop. In many economics textbooks, such market economic systems are shown, as here, as if 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

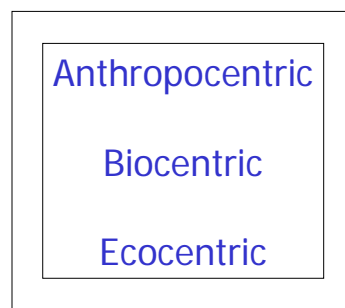
Ecological
vs
Conventional
Economics

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

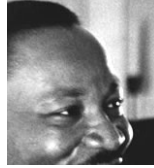
Figure 2-4 Comparison of unsustainable economic growth and environmentally sustainable economic development.

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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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...

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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

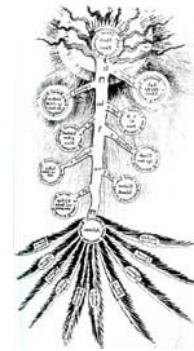
Intrinsic value by divine decree.
Noah saving “species”.

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



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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 spiritual 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.

¹Norton, B. G. 1991. *Toward unity among environmentalists, 197-99*. New York: Oxford University Press.

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)



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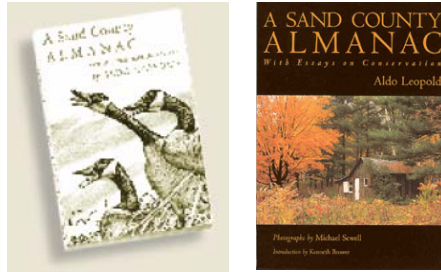
Five axioms of consensus among environmentalists:

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

Norton 1991 (see Van Dyke p. 72)

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1887-1948



<http://www.aldoleopold.org/Biography/Biography.htm>

Aldo Leopold Foundation

“Objectivity is only possible in matters too small to be important, or in matters too large to do anything about.” (p. 226)

-Leopold

Leopold

Thinking like a mountain

" a mountain lives in mortal fear of its deer"

Escudilla

progress?

"It's only a mountain now."

The planet will survive, will we?

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"a thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise"

Aldo Leopold

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Aldo Leopold Land Ethic

-land ethic enlarges the community
to include biota

-processes

-evolutionary/ecological biology

-scale of perturbation (temporal, spatial)

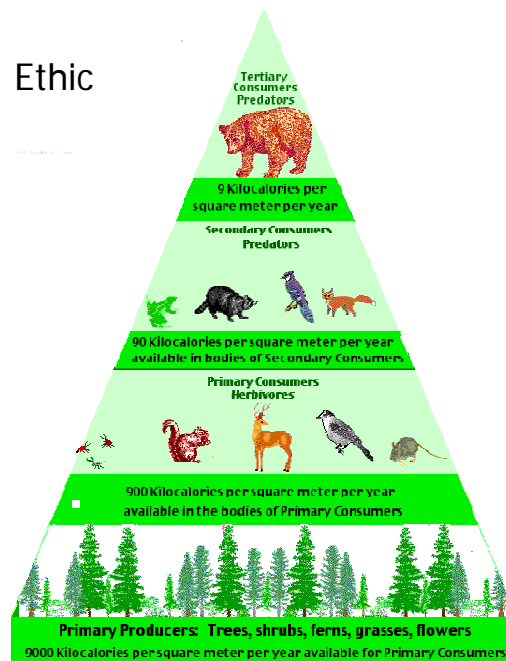
-violence

-What is "land-health?"

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Aldo Leopold Land Ethic

-land pyramid



Aldo Leopold Land Ethic

-social evolution (social disapproval for wrong actions)

-human as plain member and citizen,
not ruler

-Conquerer self defeating because falsely thinks
s/he understands how the system works
and can control it

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Leopold

-Property vs. propriety

-Role of land in human history
(Diamond, Guns Germs and Steel)

-Sacrifice

-Obligation of private landowner

-Livestock, Violence

-Economics?

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“In our attempt to make
conservation easy we have
made it trivial” (p.246)

-Leopold

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“Whether you will or not
You are a King, Tristram, for you are one
Of the time-tested few that leave the world,
When they are gone, not the same place it was.
Mark what you leave.”

As quoted in Leopold, 1949
p. 261 (The Land Ethic)

1. Should conservation biologists explain the value of biodiversity in purely instrumental terms or should they also include reasons invoking intrinsic value?

2. How should we respond to the question of "What good is it?"

3. How do we know that humans, or anything, have intrinsic value?