Lecture 04, 31 Aug 2006
Noss 1999, Ch3, Callicott

Conservation Biology
ECOL 406R/506R
University of Arizona
Fall 2006
Kevin Bonine
Kathy Gerst

Ch3 and Leopold readings for Tuesday
No lab this Friday (01 Sept 2006)

Housekeeping, 31 August 2006
If not in lecture last week, please see us after class.

Upcoming Readings
Today: Noss 1999, Textbook chapter 3; Callicott 1997
Tues 05 Sept: Textbook Ch. 3, Leopold readings
Thurs 07 Sept: Text Ch.4, Costanza 1997, Driessen 2004

Short oral presentations
31 Aug Kevin Gilliam and Whitney Henderson
05 Sept open
07 Sept open

Carl Bock, SNR Seminar, 30 Aug 2006
National Audubon Society
Appleton-Whittell Research Ranch
Elgin, Arizona

Grazed  Ungrazed

<table>
<thead>
<tr>
<th></th>
<th>Exurban</th>
<th>~Ranch</th>
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<tbody>
<tr>
<td>Grazed</td>
<td>12</td>
<td>12</td>
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<tr>
<td>Ungrazed</td>
<td>12</td>
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Grass, Oak, Mesquite

Kevin Gilliam and Whitney Henderson  (take 2)…

Sonoita Valley, Carl Bock, working hypothesis

Noss 1999
Is there a special conservation biology?

Origins
Soulé et al. 1978+
SCB 1986
Conservation Biology 1987
Noss 1999

1. Are there principles of conservation biology?

2. Is advocacy appropriate?

3. Are we educating conservation biologists appropriately?

4. Is conservation biology distinct from other disciplines?

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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.
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.

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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

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Ethical Advocacy?

p.117, Noss 1999:
tropical rainforest
vs.
economic development program

Science

Management   Policy
Values, Ethics, Philosophy...

**VALUE OF BIODIVERSITY**
- Instrumental/utilitarian
- Intrinsic/inherent

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

### Table 2.1

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods</td>
<td>Food, fuel, fibre, minerals</td>
</tr>
<tr>
<td>Services</td>
<td>Pollutant, controlling, amenity, fu-</td>
</tr>
<tr>
<td></td>
<td>ture, homestead, medication</td>
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<tr>
<td>Information</td>
<td>Genetic engineering, applied biologi-</td>
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<td></td>
<td>cal, pharmacology</td>
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<tr>
<td>Intrinsic</td>
<td>Artistic beauty, religious sites,</td>
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<td></td>
<td>aesthetic value, academic awards</td>
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</table>

Callicott 1987

Madagascar Periwinkle Argument

(Callicott p. 30)

“Arrogant and Trivial”??
Conventional Economics

Ecological Economics

Evolution of rights...
monarchs
white males
"all men"
humanity
sentient beings
nature?

"Bonuses?"
(Callicott p. 47)

Shift Burden of Proof/Responsibility (precautionary principle)
SMS (safe minimum standard)

<table>
<thead>
<tr>
<th></th>
<th>Developers</th>
<th>Conservationists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B of P</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>B of P</td>
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<td>3</td>
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<tr>
<td>4</td>
<td>B of P</td>
<td></td>
</tr>
</tbody>
</table>
"Perhaps our grandsons, having never seen a wild river, will never miss the chance to set a canoe in singing waters."

- Leopold

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...

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.

"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

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

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**Table 1.3 Seven Major Worldviews that Shape Environmental and Conservation Ethics**

<table>
<thead>
<tr>
<th>WORLDVIEW</th>
<th>TYPE OF VALUE</th>
<th>MOTIVATION FOR CONSERVATION</th>
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</table>
| Judeo-Christian     | Theocentric   | Prevents the cycle of systems that the Bible commands humans to care for, as exemplified by Noah’s Ark (Genesis 8:14).
|                      | Eco-centric   | The rights to intrinsic values attributed to nonhuman nature place limitations on human prescriptive power over natural and moral matters.
| Islamic             | Anthropocentric | Respects the spiritual value of nature, which provides value to the human life experience consistent with community affection.
|                      | Anthropocentric | Recognizes the goal of human economics. Becomes valuing, in wholeness and interconnectedness that the environment should be protected when the economic cost is not too great. From this ethics, economic issues, and investing property is necessary to the environment and its justification.
| Scientific Material | Science-oriented | Scientific theories and technology are necessary tools to create long-term solutions for the land, dimension and construct.
|                      | Anthropocentric | Science-based level of concern is in response to the identification of environmental threats to the bodies, environment, and social order.
| Reflections          | Anthropocentric | Doctrinal or philosophical level of concern is in response to the identification of environmental threats to the bodies, environment, and social order.
|                      | Anthropocentric | Philosophy, although can serve as action in solving problems, is not emphasized. Rather, practical problems and ethical principles are used to address environmental issues.

**Van Dyke 2003**

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**Role of scale...**

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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)**