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
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

2) Should ‘intrinsic’ or ‘instrumental’ values be the basis for planning conservation efforts? Why? (due 07 Sep)
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 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 million 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 society's 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 new 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 critical high value resources in conjunction with those resources future demand.
Values, Ethics, Philosophy...

Systematic organization of values

Basis for estimation of worth

VALUE OF BIODIVERSITY

- Instrumental/utilitarian
- Intrinsic/inherent

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goods</td>
<td>Food, fuel, fiber, medicine</td>
</tr>
<tr>
<td>Services</td>
<td>Pollination, recycling, nitrogen fixation, homeostatic regulation</td>
</tr>
<tr>
<td>Information</td>
<td>Genetic engineering, applied biology, pure science</td>
</tr>
<tr>
<td>Psycho-spiritual</td>
<td>Aesthetic beauty, religious awe, scientific knowledge</td>
</tr>
</tbody>
</table>

Callicott 1997
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

Madagascar Periwinkle Argument
(Callicott p. 30)

“Arrogant and Trivial”?
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.

Figure 2-3. Ecological view of economic activity. Ecological economists see all economies as human subsist systems that depend on resources and services provided by the sun and the earth’s natural resources. A consumer society devoted to economic growth is a society that consumes resources faster than they are replenished, depletes renewable resources, and pollutes and degrades the environment. Ecological economists, such as William Cobb, believe there are limits to economic growth that must be considered in sustainable economic development. An ethical economy is one that: (1) substitutes to overcome any limits on resources and (2) keeps pollution and environmental degradation at acceptable limits. 

Conventional Economics

=14-1 Miller 2003

Ecological Economics

=14-2 Miller 2003
Ecological vs Conventional Economics

- Anthropocentric
- Biocentric
- Ecocentric
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>~Developers</th>
<th>~Conservationists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Instrumental</td>
<td>B of P</td>
</tr>
<tr>
<td>2 Intrinsic</td>
<td>B of P</td>
</tr>
<tr>
<td>3 BCA</td>
<td>B of P</td>
</tr>
<tr>
<td>4 SMS</td>
<td>B of P</td>
</tr>
</tbody>
</table>
Plastic Trees in Los Angeles?

“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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**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.
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 3.3  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>
</tr>
</thead>
<tbody>
<tr>
<td>Indus/Christian stewardship</td>
<td>Theocentric</td>
<td>Preserve the ecological systems that God has committed humans to care for, as exemplified by the planting of trees in the garden to work it and take care of (Gen. 2:15). Humans should respect and not destroy God's handiwork.</td>
</tr>
<tr>
<td>Deep ecology and related value systems</td>
<td>Ecocentric</td>
<td>The rights of intrinsic values attributed to nonhuman nature place limitations on human prerogatives to use or alter nature and must be respected.</td>
</tr>
<tr>
<td>Transcendental/transformationism</td>
<td>Anthropocentric</td>
<td>Respect the spiritual value of nature, which provides a means to consider the deepest questions and can cure human alienation.</td>
</tr>
<tr>
<td>Constrained economics</td>
<td>Anthropocentric</td>
<td>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 justifications.</td>
</tr>
<tr>
<td>Scientific rationality</td>
<td>Science-centered/anthropocentric</td>
<td>Scientific theories of evolution and ecology reveal necessary limits on population growth and violence in the land. Dynamics and coexistence are emphasized.</td>
</tr>
<tr>
<td>transcendentalism</td>
<td>Anthropocentric</td>
<td>Because man's domination over nature is symbolic of his domination over women, preserving the environment rights of both environmental and social problems.</td>
</tr>
<tr>
<td>Pluralism/pragmatism</td>
<td>Anthropocentric</td>
<td>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.</td>
</tr>
</tbody>
</table>


Van Dyke 2003
"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
Role of scale... (context of disturbance and extinction)

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)
“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?

“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
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?”
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

Leopold

- Property vs. propriety

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

- Sacrifice
- Obligation of private landowner
- Livestock, Violence

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

- Leopold

“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?