Welcome to Conservation Ecology!

Why are we here?

The great outdoors??

"You know what I mean?...No, for example, I couldn’t work in some stuffy little office...The outdoors just calls to me."

Not really...The human population

- What type of growth?
- "The greatest shortcoming of the human race is our inability to understand the exponential function."
  - Albert Bartlett, U. Colorado Boulder Emeritus Professor of Physics

![Fig. 1.1](image)

And the kicker...

- Are numbers of individuals the whole story?

We need stuff

Human Appropriation of the Products of Photosynthesis

1986

Nearly 40% of potential terrestrial net primary productivity is used directly, co-opted, or foregone because of human activities

From M. Yonew, Paul R. Ehrlich, Anne H. Ehrlich, and Pamela L. Munson

Human Appropriation of

Primary production required to sustain global fisheries

1995

D. Pauly & V. Christensen

The shelf systems exhibit high PPR, from 24-71% of total, mostly due to industrialized fisheries operating at high trophic levels, a factor in which they differ from terrestrial systems, for example, where people depend on plants for 8% of their energy.

Human Appropriation of Renewable Fresh Water

1996

Sandra L. Postel, Gretchen C. Daily, Paul R. Ehrlich

Humanity now uses 26 percent of total terrestrial evaportranspiration and 54 percent of runoff that is geographically and temporarily accessible. Increased use of evaportranspira-

Why are we REALLY here?

- LOTS of people X resource use = Conflict and competition with other organisms
Time to reflect…

Captain Obvious (hint = me) says:

- So, how can you have a positive interaction with the planet?
- Be mindful of:
  - 1)
  - 2)

A simple model

\[ I = P \times A \times T \]

Impact of Population Growth

Complacency concerning this component of man's predicament is unjustified and counterproductive.

Paul R. Ehrlich and John P. Holdren

(1971; Science)

One dude's view

Is green energy one solution?

North Myrtle Beach

Yes, but…

Bats Killed in Large Numbers at United States Wind Energy Facilities

> 600,000 in 2012

Estimates of bird collision mortality at wind facilities in the contiguous United States

2013

140,000 – 328,000 / year

Scott R. Loeb, Tom Will, Peter P. Marra
What is conservation ecology?

- What do you think? Key parts?

A “crisis discipline”

What is Conservation Biology?

- Soule (1985; BioScience)
  - Analogous to surgery to physiology; war to political science
  - Decisions have to be made, actions must be taken BEFORE knowing all of the relevant facts
  - Uncertainty
  - Why the urgency?
  - 20% of the world’s vertebrate species that have been evaluated are labeled as at least Threatened on 2014 IUCN Red List

“Crisis discipline” in action: The “Lord-God Bird”

- Evidence
  - Ivory-billed
  - Pileated

Some guiding principles

- Evolution unites all of biology, including conservation biology, and should be a central focus
- The natural world is dynamic and largely non-equilibrial
- Humans are a part of nature and must be included

See Table 1.1 Soule (1985)
Ethical postulates—conservation values

- Biotic diversity is good
- Ecological complexity is good
- Evolution is good
- Biotic diversity has intrinsic value

Soule (1985)

Conservation Ecology vs. Wildlife Management

Historical differences
- Utilitarian vs. intrinsic value
  - The A-B cleavage (Aldo Leopold)
  - Both focus on species, but...

Origins of conservation ecology: 3 “ethics”

The Romantic-Transcendentalist Ethic
- Ralph Waldo Emerson (1803 – 1882)
  - “Into the woods we return to reason and faith.”
- Henry David Thoreau (1817 – 1862)
  - “All good things are wild and free.”
  - “In wildness is the preservation of the world.”
- John Muir (1838 – 1914)
  - “The clearest way into the universe is through a forest wilderness.”
  - Yosemite (1)
  - Preservationist
  - The Sierra Club

The Resource Conservation Ethic
- Teddy Roosevelt (1858 – 1919)
- Gifford Pinchot (1865 – 1946)
  - “the greatest good for the greatest number for the longest time”

The Evolutionary-Ecological Land Ethic
- Aldo Leopold (1887 – 1948)
  - “The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land.”
  - “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.”
  - “To keep every cog and wheel is the first precaution of intelligent tinkering.”
  - “Wilderness is the raw material out of which man has hammered the artifact called civilization.”
Some more recent contributors

- Rachel Carson (1907 – 1964)
  - *Silent Spring* (1962)

- Paul and Anne Ehrlich
  - *The Population Bomb* (1968)

- E.O. Wilson
  - *The Diversity of Life* (1993)

- Wangari Maathai (1940 – 2011)
  - 2004 Nobel Peace Prize Winner
  - 2007 Nobel Peace Prize Winner