Environmental problems = symptoms

- Mass extinction?
- Soil erosion
- Desertification
- Altered hydrological cycles
- Altered nitrogen cycle (local & global)
- Biotic mixing and homogenization
- Climate change

The Extinction Crisis

Ehrlich’s “rivets”

Karner Blue
Lycaeides melissa

Human Alteration of Biosphere


Living Planet Index, 1970-1999

World Ecological Footprint, 1961-1997

Biodiversity change, year 2100

Conservation Biology

Definition:
science of preserving biological diversity

Synthetic discipline:
• basic + applied sciences
  ecology, genetics
  forestry, range, wildlife, & fisheries management
• natural sciences + social sciences
  economics, anthropology, sociology, philosophy

Critical Timing

• Pivotal period in Earth’s biotic history
• “end game”
  ⇒ unique responsibility

Two Emphases

• Preserve rare elements (species)
  – narrow focus
  – traditional role
• Maintain system
  – broad focus
  – contemporary bandwagon

New Aspects of Conservation

• Science
  – development of theory
  – “pure” vs. “applied” research
• Shift from utilitarian view
  (= management for select species)
  – interest in all species
  – shift from species to ecosystems
• Embrace of non-scientists

History of Conservation Biology

• Romantic-Transcendental preservation ethic
  – Emerson, Thoreau, Muir
  – Nature has value beyond human gain
• Resource conservation ethic
  – Gifford Pinchot
  – multiple use
  “greatest good of greatest number for longest time”
  – categories: useful, useless, or noxious
• Evolutionary-ecological land ethic
  – Leopold
  – complex system; interacting parts & processes
• Society founded 1985

Characteristics

• Crisis discipline
• Multidisciplinary
• Young, dynamic
• Inexact
• Value-laden
• Evolutionary time scale
• Applications require eternal vigilance
Guiding Principles
1. Evolutionary change structures ecol. systems
2. Ecological systems are dynamic
3. Cons. planning must consider human presence
4. Human-dominated planet
   ⇒ emphasize managing human influence,
   less on managing nature

Conclusion
• No easy answers
  (memorization not an effective strategy)
• Ecol. systems: idiosyncratic & dynamic
• Emphasis on processes and mechanisms
  Goal:
  ability to think like a conservation biologist