Conservation Biology

Definition:
science of preserving biological diversity

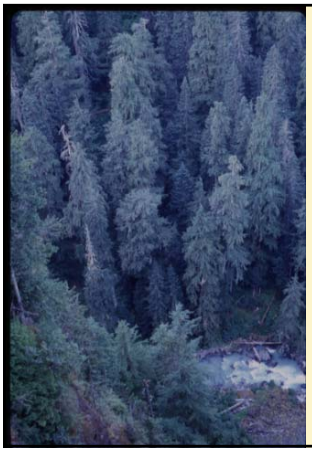
Synthetic discipline:
- basic + applied sciences
  - ecology, genetics
  - forestry; range, wildlife, & fisheries management
- natural sciences + social sciences
  - economics, anthropology, sociology, philosophy

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

Outline

- What is biodiversity?
- Distribution of species diversity
- Creation of species richness
- Values of biodiversity



Levels of Biodiversity

- Genetic
- Intra-specific
- Species
- Habitat / community
- Ecosystem / Landscape

Distribution of Species Diversity

- α-diversity
- β-diversity
- γ-diversity
- $\gamma = \alpha\beta$
- Implications for conservation planning

Species Richness

- Latitudinal & altitudinal gradients
- correlation w/ structural complexity
- correlation w/ productivity
- Species-area relationship
- Patterns of endemism

Species-Area Curve

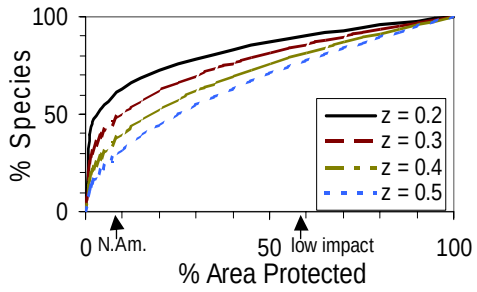
$S = cA^z$

S = # species

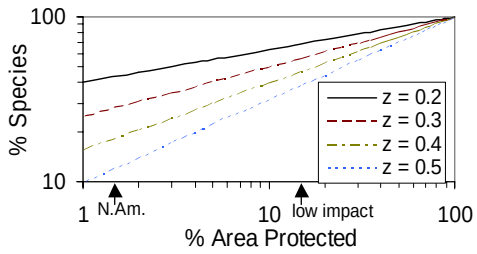
A = area

c,z = fitted constants

Species-Area Curves; $S = cA^z$



Species-Area Curves; $S = CA^z$



Limits to Species Richness

- Evolutionary limits
- Ecological limits
  - productivity
  - structure
  - species interactions
  - stability
  - time

Processes that Create/Maintain Biodiversity

- Plate tectonics
- Orogeny
- Innundation
- Climate change

Biodiversity Hotspots

Reid, MV. 1998. Biodiversity hotspots. *Tr.Ecol.Evol*. 13(7)275-280.

Values of Biodiversity

- Goods
- Information
- Aesthetic, Recreational
- Religious / Spiritual
- Services (≈ 1-2x global GNP)
  - e.g., oysters are filters
- Intrinsic

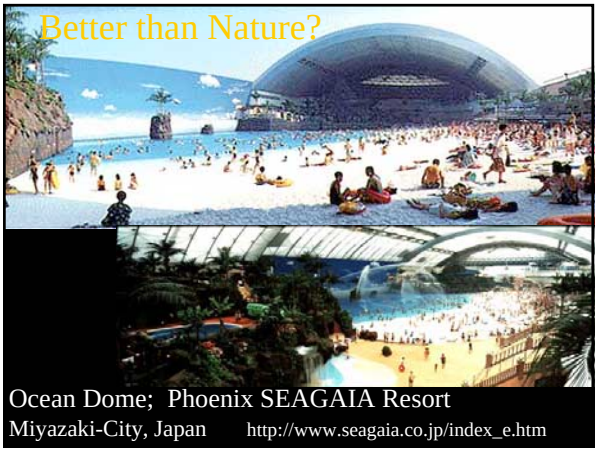
Intrinsic Value

"Every form of life is unique, warranting respect regardless of its worth to man, and, to accord other organisms such recognition, man must be guided by a moral code of action."

– World Charter for Nature (UN General Assembly, 1982)

Biodiversity Valuation

- Biodiversity economics
  http://biodiversityeconomics.org/



Ocean Dome; Phoenix SEAGAIA Resort
Miyazaki-City, Japan http://www.seagaia.co.jp/index_e.htm