

# APES Midterm Study Guide

## Chapter 1: Intro

- Sustainability
- Economic Growth
  - gross domestic product (GDP) and gross national product (GNP)
  - per capita GDP; PPP
  - developed vs developing countries
- Resources
  - renewable and non-renewable
  - Tragedy of the Commons
  - Ecological footprint
- Pollution
  - point-source
  - non-point source

## Supplement 5: History

- Cultural changes
  - Industrial-medical revolution
  - Information and globalization revolution
- Important figures
  - Teddy Roosevelt
  - Rachel Carson
  - Aldo Leopold

## Chapter 2: Matter and Energy

- Nature of Science
  - inductive vs deductive reasoning
  - scientific method
- Models
  - feedback loops-positive/negative
  - time delays
  - synergism
- Matter
  - Atoms and Ions
  - pH scale
  - organic molecules
- Law of Conservation of Matter
- Nuclear decay
  - alpha, beta, gamma decay
  - half life
- Energy Laws
  - First Law of Thermodynamics
  - Second Law of Thermodynamics

## Chapter 3: Ecosystems

- Ecosystem components
  - range of tolerance
    - law of tolerance
  - Producers/consumers/decomposers
  - Biodiversity
    - genetic, species
    - ecological, functional

- Energy Flow
  - food web/food chain
  - ecological efficiency
- Primary Productivity
  - GPP vs NPP
  - aerobic and anaerobic respiration
- Soils
  - soil horizons/soil profile
  - sample soil profiles
- Matter Cycling-effects on...
  - water cycle
  - carbon cycle
  - nitrogen cycle
  - phosphorous cycle

## Chapter 4: Evolution and biodiversity

- Evolution
- Ecological Niches and Adaptation
- speciation, Extinction
  - geographic isolation
  - reproductive isolation
- species extinction
  - local, biological, ecological
  - endangered, threatened,
  - extinction rates
    - background, mass
- Species Diversity
  - species richness/evenness
- roles of species
  - generalist vs specialist
  - native/non-native
  - indicator
  - keystone
  - foundation

## Chapter 5: Biodiversity, species interactions and population control

- Species interactions
  - parasitism, mutualism, commensalism
- Population dynamics
  - variables
  - limits-environmental resistance, biotic potential
  - Logistic vs exponential
  - predator-prey relationships
    - top-down control
    - bottom-up control
- Reproductive patterns
  - asexual vs. sexual reproduction
  - k-selected vs r-selected
  - survivorship curves
- Succession
  - primary vs secondary
- Sustainability
  - persistence, constancy, resilience

## Chapter 7: Climate and Terrestrial Bio

- Weather vs Climate
  - currents and winds effect on climate
  - El Nino vs La Nina (very impotent)
  - greenhouse gases
  - rain shadow effect
- Biomes
  - locations/characteristics/life adaptations

## Chapter 8: Aquatic Bio

- Environments
  - life zones-plankton/nekton/benthos/
- Saltwater life zones
  - continental shelf, euphotic, bathyal, abyssal
    - fig 7-6
- Freshwater life zone
  - littoral, limnetic, profundal, benthic
    - fig 7-16
  - oligotrophic vs eutrophic lake
- Protecting Wetlands
  - Everglades restoration

## Chapter 9: Species Approach

- Species diversity
  - theory of Island Biogeography
- Extinction Threats
  - "HIPPCO"
  - non-native species
    - kudzu, fire ant, **zebra mussel**
- Poaching and Hunting
  - smuggling, bushmeat
- Other Threats
  - predator control
  - exotic pets
  - climate change
- Protecting Species
  - CITES
  - ESA
- Sanctuary protection
  - wildlife refuges
  - gene bank
  - Zoos/Aquariums
- Precautionary Principle

## Chapter 10: Terrestrial Bio

- Human Impacts
  - Intrinsic, instrument value
- Public Lands
  - Parks and preserves
  - national forests
  - wildlife refuges
- managing forests

- old-growth, second-growth, tree plantation
- uneven- and even-aged management
- Harvesting techniques
  - selective, clear-cutting, strip
- sustainable timber
- resources and management in the US
  - Fires
    - surface/crown
    - prevention/prescribed burning
    - healthy forests initiative
- Tropical Deforestation
  - causes: poverty, pop growth, gov't, etc.
  - solutions: debt for nature, neem tree