

## MIDTERM REVIEW 2008 APES UNIT 1 TOPICS

### **Fire Ecology:**

- Explain the benefits to fire on an ecosystem?
- Explain the drawbacks
- Describe what an urban interface is, and explain how does this influence the amount/intensity of fire within an ecosystem.
- Describe the succession of organisms within an ecosystem that has been affected by fire.

### **Sustainability:**

- Definition of sustainability
- What is endangered vs. threatened?
- What factors increase the risk of being E/T?
- Why is it important to protect E/T species?
- How can we protect E/T species?
- Relate sustainability to overfishing: causes, effects, solutions.
- Describe the different methods of fishing.
- Explain the tragedy of the commons and give 3 examples.
- What is GNP?
- What is the GNP per capita?
- Compare GNP per capita for developed and developing countries
- What is sustainable development?
- What is a renewable resource?
- What is a nonrenewable resource?
- How has human culture changes from hunter-gatherer to industrialization affected the impact of humans on the environment?

### **Ecology Organization**

- Define ecology
- Describe the levels of organization moving from organism to biosphere
- Describe the layers of the earth
- Plate tectonics: different types of plate movement, influence on tsunamis, earthquakes, volcanoes, role in recycling of nutrients/biogeochemical substances
- How does the sun help sustain life on earth?

### **Energy Concepts**

- Describe the laws of thermodynamics
- How the laws apply through a food chain
- What are the different trophic levels and how does energy move through each trophic level?
- Photosynthesis: overall reaction, type of organisms that perform this, organelle involved, light dependent vs. light independent (location, reactants, products), base of the food web, NPP vs. GPP, list 3 ecosystems with high NPP
- Cellular Respiration: overall reaction, type of organisms that perform this, organelle, role in the food web
- Fermentation: overall reaction, type of organisms that perform this, location in cell, role in the food web

### **Cycles**

- Describe the Carbon, Sulfur, Nitrogen, Water, and Phosphorus cycle
- Uses of these nutrients to biota – living things
- Human influence on these cycles?

### **Ecosystems**

- What is an indicator species? Why is it important?
- What is a keystone species? Why is it important?
- Describe the three different types of symbiotic relationships

- Describe the law of tolerance and how it applies to biotic and abiotic factors
- What is an ecotone?
- Describe the different types of ecosystems (distinguishing characteristics)
- What is biodiversity? Why is it important?
- What is a native species?
- What is a non-native species? Why are environmentalists so concerned with non-native species?
- What is an endemic species? Why are they important?
- Describe the situation with *Caulerpa Taxifolia* and one other non-native species.
- List three other situations with non-native species problems.
- What are decomposers? Why are they important?
- What are scavengers and detritivores? Why are they important?
- How is a food web different from a food chain? How do you represent competition? Predator vs prey?
- Types of interspecies relationships?
- What is GPP and net PP and global net PP? Why are these important?
- Succession: Primary vs. Secondary and how this influences the type of community in an ecosystem

### **Soil**

- What are the four layers of soil and what is in each layer?.
- What are the differences between infiltration and leaching?.
- Does topsoil regenerate quickly? Within a year?
- Describe 3 different types of soil texture and how this influences the ability to grow crops.
- Explain how acid rain influences the soil's ability to support plant growth.
- For the following qualities, list the natural and anthropogenic pollution source(s), importance of, and the effect of disrupting this quality within the soil: N, pH, P, K (pollution not relevant)

### **Evolution**

- Darwin-Natural Selection
- Types of Natural Selection
- Types of Adaptations: physical, physiological, behavioral, convergent, divergent
- Role of speciation & extinction
- Microevolution vs. macroevolution
- What role does biodiversity play in evolution? What helps facilitate biodiversity?
- Hardy-Weinberg: what is it? Limitations of? Conditions for HW? In a particular population, "C" is the allele coding for cute and c<sup>™</sup> is the allele coding for not so cute. Cuteness has autosomal recessive inheritance. The allele frequency of "C" is 0.7. Calculate the rest of the HW values. If in HW equilibrium, what would you expect in the next generation?

### **Water Properties**

- Describe water's properties and the application to the environment
- For the following qualities, list the importance of, natural and anthropogenic pollution sources, and the effect of disrupting this quality: turbidity, temperature, pH, DO, nitrogen, and salinity. Use cultural eutrophication in your answer.
- What is bioaccumulation and biomagnification? Give an example of a substance that bioaccumulates and is biomagnified.
- What is an oxygen sag curve? Describe the different zones: clean, decomposition, septic, recovery, clean zones
- What occurs to the following as you go deeper in the ocean: temperature, salinity, density, light, pressure
- For a lake, what is the difference between the seasons? Use the epilimnion and the hypolimnion in your answer. Why is this important?
- What is upwelling? What causes upwelling?
- For the following aquatic systems, explain which would be able to recover from pollution quicker: ground water, stream, ocean, estuary, lake
- What is the difference between point vs. nonpoint source pollution?

### **Climate/Oceanic Currents**

- Convection cells: label on a globe
- How temperature influences convection cells and the role they play in precipitation and wind patterns
- Specific wind currents (30 degree increments)
- What determines climate?
- What is the rainshadow effect?
- What causes oceanic currents?
- Why is it important to know whether or not it is a cold vs. warm water current?
- What is upwelling? What conditions allow upwelling? Why is upwelling important?
- Effect of El Niño?
- Possible effect of global warming on oceanic currents?
- Relationship between climate/oceanic currents and ecosystems. Look at climatograms.

### **Population Dynamics**

- Describe the predator/prey relationship.
- Difference between stable, irruptive, cyclic...what would cause the differences?
- Describe factors that increase the biotic potential of a population
- Describe factors that increase the environmental resistance of a population
- Describe R-Strategist vs. K-Strategist as well as survivorship curves
- How does genetic variability & biodiversity influence evolution?
- How does being an R-strategist vs. a K-strategist influence evolution?
- Draw a typical growth curve and label j curve, s curve, carrying capacity.
- Describe the human population growth dilemma: causes, effects.
- Describe the 4 different age structure diagrams
- Describe and explain the 4 phases of the demographic transition graph. Give examples of a country that represents each of the phases.
- Population dynamic problems

### **Laws**

Taylor Grazing Act, National Environmental Policy Act, Lacey Act; Migratory Bird Act, Duck Hunting Stamp Act, Endangered Species Act, Wild & Scenic Rivers Act;

### **Labs:**

Tragedy of the Commons, Water Mini Lab, Photosynthesis, Ecocolumn, San Elijo, Dissolved Oxygen, Hardy-Weinberg