**AP Biology Ecology Reading Guide**

# Chapter 40

1. What is ecology?

1. Study Figure 40.2 in your text. It shows the different levels of the biological hierarchy studied by ecologists. Notice also the different types of questions that might be studied by an ecologist at each level of study. Use this figure to define or explain the following terms: organismal ecology:

population:

population ecology:

community:

community ecology:

ecosystem:

ecosystem ecology:

landscape ecology:

biosphere:

global ecology:

# Section 3

1. What role does dispersal play in the study of the distribution of species?

1. Read this section carefully to understand different types of experiments and observations that help explain the distribution of species. As you conclude this section, list five examples of biotic factors that may influence species distribution.

1. List five abiotic factors. Include an example and description of each factor’s influence on living organisms.

 Abiotic Factor Example and Description

1.

2.

3.

4.

5.

# Section 4

1. What two pieces of data are needed to mathematically determine population density?

1. What is the difference between density and dispersion?

1. Explain the impact of immigration and emigration on population density.

1. What is territoriality? Give an example.

1. In what population statistics do demographers have a particular interest? How is this data often presented?

1. Survivorship curves show patterns of survival. In general terms, survivorship curves can be classified into three types. Explain the three survivorship patterns.
2. What type of survivorship curve is represented by the human population?

# Section 5

1. What does it mean for a population to be in exponential population growth?
2. What is the formula for population growth? Indicate what each variable represents.
3. What is the formula for exponential growth? Indicate what each variable represents.
4. What is carrying capacity? What symbol represents it?
5. What are some limiting factors that affect carrying capacity?
6. What is logistic population growth?
7. What is the formula for logistic population growth? Indicate what each variable represents.
8. Sketch a graph indicating exponential growth and another indicating logistic population growth.

# Section 6

1. On what is the life history of an organism based?

1. What three variables form the life history of a species?
2. What is the difference between density-dependent and density-independent selection? What symbol represents each?

:

1. Give both biotic and abiotic reasons for population fluctuations over the last 50 years in the moose population on Isle Royale, based on population dynamics.

1. Complete the following chart.

## Density-Dependent Population Regulation

|  |  |  |
| --- | --- | --- |
| **Negative Feedback Mechanism**  | **Explanation**  | **Example**  |
| Competition for Resources    |   |   |
| Predation    |   |   |
| Toxic Wastes    |   |   |
| Intrinsic Factors    |   |   |
| Territoriality    |   |   |
| Disease    |   |   |

**Chapter 41**

***Section 1***

1. How are +, -, o symbols used to define interspecific interactions?
2. Define ecological niche.
3. What is the principle of competitive exclusion?
4. Using symbols, what type of interaction is exploitation? List three exploitative interactions.
5. Define predation.
6. Describe how coloration affects predation in animals and give some examples.
7. Define herbivory.
8. What is parasitism?
9. Define and describe two types of positive interactions.

***Section 2***

1. What is species diversity? What are its two components? Why is it important?
2. What is biomass?
3. What is an invasive species? How do they usually impact an ecosystem?
4. What does an ecologist summarize in a food web?
5. Know the levels of trophic structure in food chains. Give a food chain here, including four links that might be found in a prairie community (Figure 41.13), and tell the level for each organism.
6. What is a dominant species?
7. How is a keystone species different from a dominant species?
8. Name one keystone species, and explain the effect its removal has on the ecosystem.

***Section 3***

1. What is a disturbance? Give some examples.
2. What is ecological succession? What is the difference between primary and secondary succession?
3. What animal has the greatest impact on communities worldwide?

***Section 5***

1. Summarize how pathogens affect communities.

**Chapter 42**

***Section 1***

1. This concept reviews trophic relationships. Know all terms in your textbook that are bolded. What are trophic levels? What is always at the first trophic level?
2. What are detritivores? What is their importance in chemical cycling? Give some examples of detritivores.

***Section 2***

1. What is primary production?
2. What is a limiting nutrient?
3. How does overabundance of nutrients lead to eutrophication?

***Section 3***

1. Define trophic efficiency. What is the average trophic efficiency?

***Section 4***

1. Describe the carbon cycle.
2. Describe the nitrogen cycle.

**Chapter 43**

***Section 1***

1. What is biodiversity and why is it critical to a species’ survival?
2. How do introduced species affect ecosystems? (look at SC reference in Figure 43.7!)
3. Describe how overharvesting has affected the North Atlantic bluefin tuna.

***Section 2***

1. Describe what happened to the prairie chicken.

**Section 4**

1. How have humans affected the following?

Nutrient enrichment-

Environmental toxins-

Greenhouse gases and global warming-

1. Briefly describe how climate change has affected each level of biological organization.

Cells-

Organisms-

Populations-

Communities and Ecosystems-

# Section 5

1. Summarize human population growth since 1650. (Of all the reported statistics, which one surprises you the most?)

1. What is demographic transition? In demographic transition, which falls first, birth or death rates?

1. Why do infant mortality and life expectancy vary so greatly between certain countries?

1. Can the world’s population sustain an ecological footprint that is currently the average American footprint? Explain.

# Section 6

1. Explain the concept behind the phrase “sustainable development.”