Chapter 6: Population and Community Ecology

Reading Guide

Vocabulary

Learn the definition of each term. The *italicized* words are not necessarily in the textbook. The **bold** words require you to know more than just the definition.

Population
Exponential growth (J)
Resource partitioning
Community
Predation
Population ecology
Logistic growth (S)
Population size
Mutualism
Population density
Overshoot
Commensalism
Population distribution
Die-off
Symbiotic
Sex ratio

K-selected species
Keystone species
Age structure
r-selected species
Predator-mediated competition
Density-dependent factors
Survivorship curves
Ecosystem engineers
Limiting resource
Ecological succession
Carrying capacity (K)
Metapopulation
Primary succession
Density-independent factors
Community ecology

Secondary succession
Growth rate
Competition
Pioneer species
Intrinsic growth rate (r)
Competitive exclusion principle
Theory of island biogeography
Biotic potential
Bottom up control
Doubling time
Environmental resistance
Top down control
Climax community

Reading Outline

New England Forests Come Full Circle

1. Explain why the forests of New England demonstrated resilience. You should start by defining resilience (from an environmental perspective).

2. Describe the series of changes that occurred as the land changed from farm to forest.

3. Provide three examples of interdependency in New England forests (ways a specie relies on another)

6.1 Nature exists at several levels of complexity

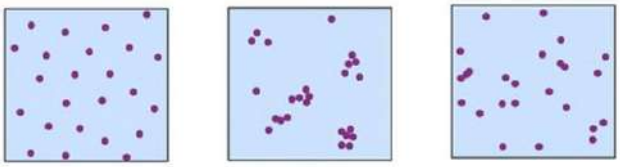
4. Put the following levels of organization in order from least complex (1) to most complex (5)
   a. ____ Biosphere
   b. ____ Community
   c. ____ Ecosystem
   d. ____ Individual
   e. ____ Population

6.2 Population ecologists study the factors that regulate population abundance and distribution

5. For each statement below, match it with the appropriate term

____ How a population occupies space	a. Size
____ The number of individuals in each age category	b. Density
____ The number of individuals per unit area	c. Distribution
____ The ratio of males to females	d. Sex ratio
____ The total number of individuals in a population	e. Age Structure

6. Label the following pictures as random, uniform or clumped distribution.



7. Label the following as density dependent (DD) or density independent (DI) factors

a. _____ A tornado
b. _____ Amount of food available
c. _____ Availability of water
d. _____ Climate change
e. _____ Drought
f. _____ Freezing temperatures
g. _____ Predation
h. _____ Spread of disease

6.3 Growth models help ecologists understand population changes

8. Fill in the following chart (careful – mine is organized differently than the book)

Trait	r-selected	K-selected
Level of parental care		
Life Span		
Number of offspring		
Number of reproductive events		
Population dynamics		
Population growth rate		
Population regulation		
Size of offspring		
Time to reproductive maturity		

9. Fill in the following chart on survivorship curves

Survivorship Curve	Description	Example species
Type I		
Type II		
Type III		

6.4 Community ecologists study species interactions

10. What is the difference between competitive exclusion and resource partitioning? Which one is likely to be associated with a full niche overlap? A partial niche overlap?

11. Give an example of each type of resource partitioning
    a. Temporal –
    b. Spatial –
    c. Morphological -

12. Fill in the following chart for species relationships

Relationship	Description	Specific Example	+/+, +/-, +/0
Commensalism			
Competition			
Herbivores			
Keystone Specie			
Mutualism			
Parasites			
Parasitoids			
True predators			

6.5 The composition of a community changes of time

13. What is the main difference between primary and secondary succession?

6.6 The species richness of a community is influenced by many factors

14. What happens to the level of biodiversity as
    a. You move from the poles to the equator?
    b. A habitat gets older?
    c. A habitat gets smaller?
    d. The more separated a habitat is?

WTS – Bringing Back the Black-Footed Ferret

15. Describe the role of prairie dogs in the grassland ecosystem. Why did ranchers not like them?

16. Describe the role of the black-footed ferret in the grassland ecosystem? Why did their populations decline?

17. What kind of specie is the black-footed ferret (K or r) and how did this impact its recovery?

18. List some of the actions taken to help the ferret population recover.

Additional Work:

Answer the MC questions at the end of the chapter.