

CHAPTER 53 POPULATION ECOLOGY

Learning objectives

Characteristics of Populations

1. Distinguish between density and dispersion of a population.
2. Explain how ecologists may estimate the density of a species.
3. Describe conditions that may result in clumped dispersion, uniform dispersion, and random dispersion of individuals in a population.
4. Explain how a life table is constructed.
5. Distinguish between a life table and a reproductive table.
6. Describe the characteristics of populations that exhibit Type I, Type II, and Type III survivorship curves.

Life Histories

7. Define and distinguish between semelparity and iteroparity. Explain what factors may favor the evolution of each life history strategy.
8. Explain, with examples, how limited resources and trade-offs may affect life histories.

Population Growth

9. Compare the exponential model of population growth with the logistic model.
10. Explain how an environment's carrying capacity affects the per capita rate of increase of a population.
11. Explain the meaning of each of the following terms in the logistic model of population growth:
 - a. r_{max}
 - b. $K - N$
 - c. $(K - N)/K$
12. Distinguish between r -selected populations and K -selected populations.

Population-Limiting Factors

13. Explain how density-dependent and density-independent factors may affect population growth.
14. Explain, with examples, how biotic and abiotic factors may work together to control a population's growth.
15. Describe boom-and-bust population cycles, explaining possible causes of lynx/hare fluctuations.

Human Population Growth

16. Describe the history of human population growth.
17. Compare the age structures of Italy, Afghanistan, and the United States. Describe the possible consequences for each country.
18. Describe the problems associated with estimating Earth's carrying capacity for the human species.
19. Define the demographic transition.

20. Explain how an ecological footprint can be calculated for an individual or country. Describe the possible currencies of this calculation.