

RAVEN CHAPTER 56 GUIDED NOTES: POPULATION ECOLOGY

1. Define ecology.

2. List the four key variables that characterize the environment in which an organism lives.

a. _____

b. _____

c. _____

d. _____

3. In coping with environmental changes organisms have evolved two distinct approaches. Characterize each. Give an example of each.

a. endotherm (regulator)

b. ectotherm (conformer)

4. Define population.

5. List the 3 characteristics that can be used to describe a population.

a. _____

b. _____

c. _____

6. List some of the factors that determine the range of a population of organisms. (In effect, explain why polar bears are found in the Arctic but not in the tropical rainforest).

7. Describe three patterns of population distribution.

a. _____

b. _____

c. _____

8. Application: One species of birds is highly territorial, while a second lives in flocks. What is each species' likely pattern of dispersion? Explain.

9. Define demography.

10. Describe how each of the following factors affect population growth rates.

a. sex ratio _____

b. generation time _____

c. age structure _____

11. What are life tables used for in population studies?

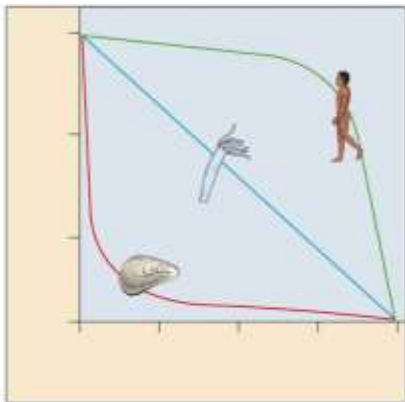
12. Compare the survival strategies of species and give an example of each type.

Type I

Type II

Type III

Label the survivorship curves diagram.



13. Life history adaptations involve many trade-offs between the cost of reproduction and the investment in survival. Explain this statement.

14. Briefly describe the trade-offs with respect to each of these factors.

a. Investment per offspring

b. Reproductive Events per Lifetime

c. Age at First Reproduction

15. Application: Consider two rivers— One is spring fed and is constant in water volume and temperature year-round; the other drains a desert landscape and floods and dries out at seasonal intervals. Characterize the likely reproductive strategy of the animals in each environment (semelparity vs. iteroparity). Explain

17. Define biotic potential.

18. Explain why the exponential growth curve produces a “J-shaped” curve instead of a straight line.

19. Explain why an exponential growth curve is rarely seen in nature. Give examples of when it is likely to occur.

20. Draw and label graphs illustrating the two models of population growth.

21. Define carrying capacity

22. Write the formula for population growth without limits. Define the terms.

23. Write the formula for population growth with limits. Define the terms.

24. What happens to a population when the number of individuals approaches carrying capacity?

25. Identify factors that regulate population size.

26. Compare density-independent and density-dependent factors limiting populations.

27. Compare K-selected to r-selected species. Give examples of each.

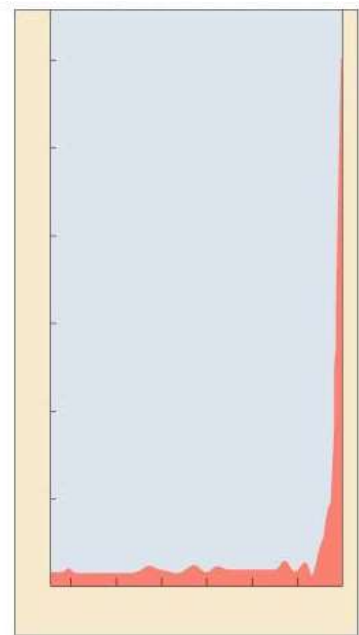
a. K-selected

b. r-selected

28. Look at the growth curve

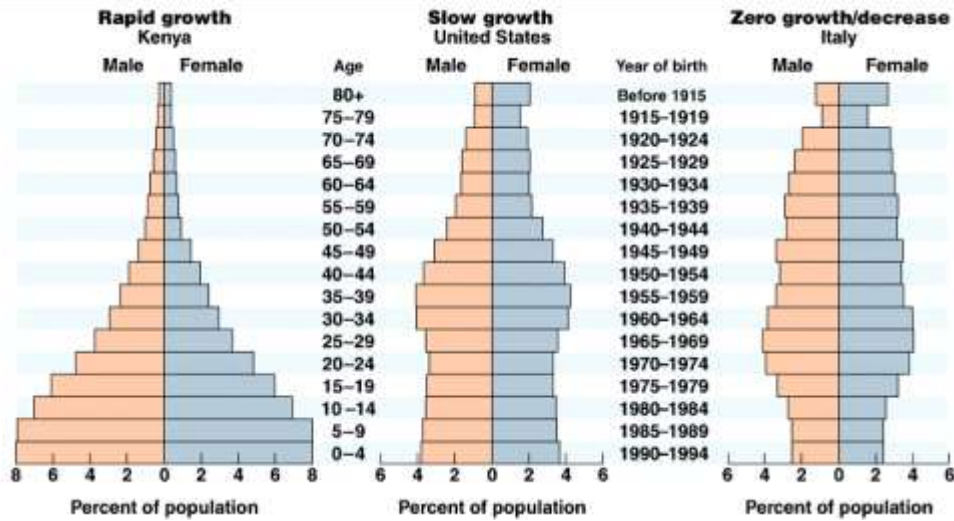
of the human population.

How does it compare to the growth curves earlier in the chapter?



29. Have humans reached K? What factors are significant when explaining our growth curve? Label the graph.

30. Look at the age structure diagrams (population pyramids) of different countries. What will the population distributions look like in 20 years? Application: How might the age structure influence policy?



31. Explain ecological footprint.

32. Explain the significance of this diagram. Application: What is the more significant cause of resource depletion—overpopulation or overconsumption?

